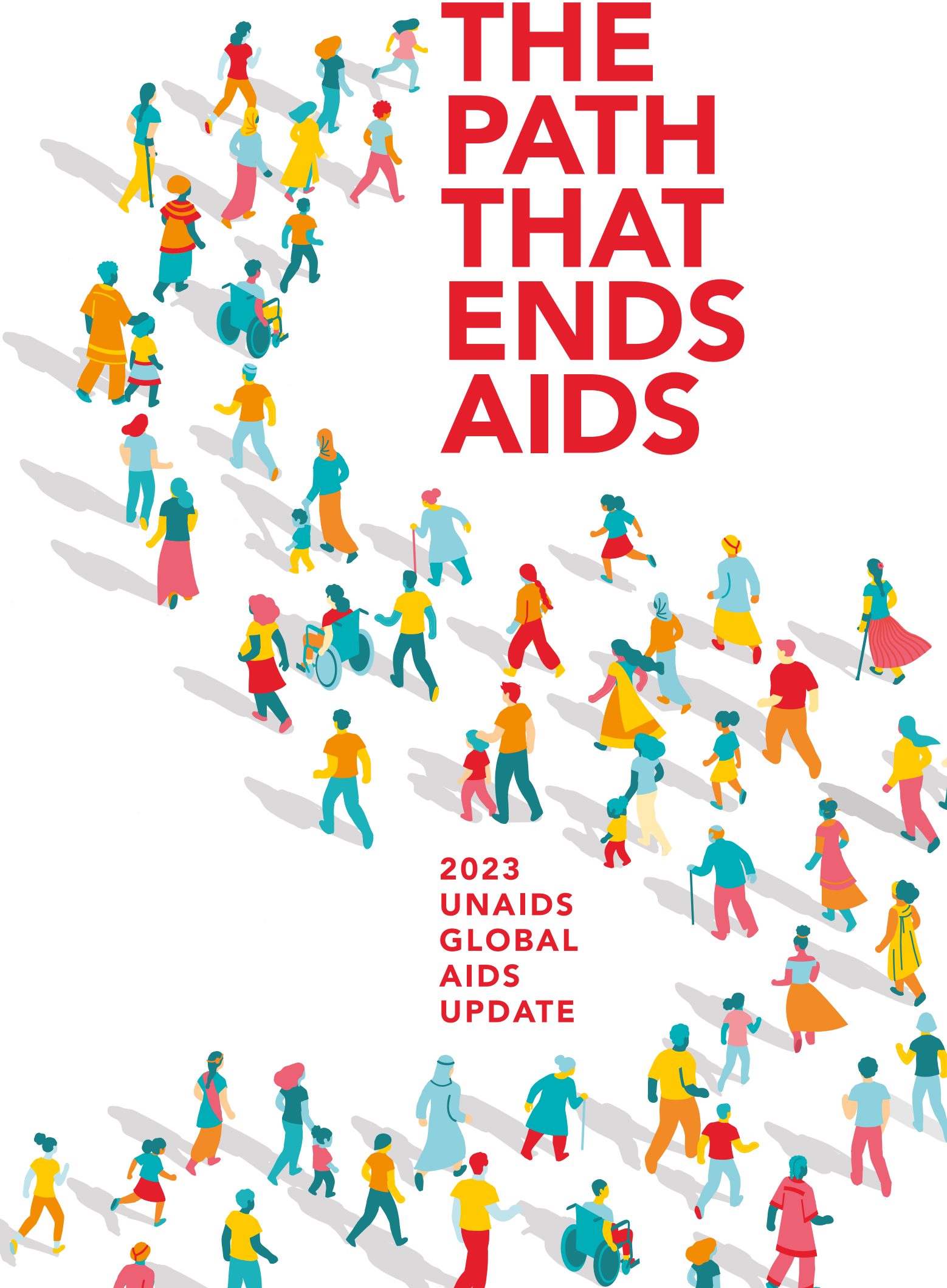
# THE PATH THAT ENDS AIDS



## 2023 UNAIDS GLOBAL AIDS UPDATE

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2023
UNAIDS
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AIDS
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# Foreword

**Winnie Byanyima**
UNAIDS Executive Director

This report makes clear that there is a path to end AIDS. Taking that path will help ensure preparedness to address other pandemic challenges, and advance progress across the Sustainable Development Goals.

The data and real-world examples in the report make it very clear what that path is. It is not a mystery. It is a choice. Some leaders are already following the path—and succeeding. It is inspiring to note that Botswana, Eswatini, Rwanda, the United Republic of Tanzania and Zimbabwe have already achieved the 95–95–95 targets, and at least 16 other countries (including eight in sub-Saharan Africa) are close to doing so.

HIV responses succeed when they are anchored in strong political leadership to follow the evidence; to tackle the inequalities holding back progress; to enable communities and civil society organizations in their vital roles in the response; and to ensure sufficient and sustainable funding.

This report describes in detail how countries that put people and communities first in their policies and programmes are already leading the world on the journey to end AIDS by 2030. We need all leaders to get on that path.

Ending AIDS is an opportunity for a uniquely powerful legacy for today's leaders. They have the chance to be remembered by future generations as those who ensured the policies, programmes and investments that put a stop to the world's deadliest pandemic. They can save millions of lives and protect the health of us all. They can show what leadership can do.

None of this will come automatically, however. AIDS claimed a life every minute in 2022. Millions of people still miss out on treatment, including 43% of children living with HIV.

The path that ends AIDS requires collaboration—south and north, governments and communities, the United Nations and Member States together. And it requires bold leadership. The route map in this report shows how success is possible, in this decade.

Progress has been strongest in the countries and regions that have the most financial investments, such as in eastern and southern Africa.

Progress has been strengthened by ensuring legal and policy frameworks do not undermine but, instead, enable rights. Several countries have removed harmful laws in 2022 and 2023, including five (Antigua and Barbuda, Barbados, Cook Islands, Saint Kitts and Nevis, Singapore) that have decriminalized same-sex sexual relations. Existing laws to protect the rights of vulnerable people have been strengthened in other countries (Central African Republic, Ghana, India, Kazakhstan, Kuwait, Spain). This courage is what generates the opportunity for success.

We are hopeful, but it is not the relaxed optimism that might come if all was heading as it should be. It is, instead, a hope rooted in seeing the opportunity for success—an opportunity dependent on action. The facts and figures in this report do not show that we, as a world, are already on the path—but they show that we can be. The way is clear.

We join with communities around the world in urging leaders to demonstrate the will to lead us along the right path.

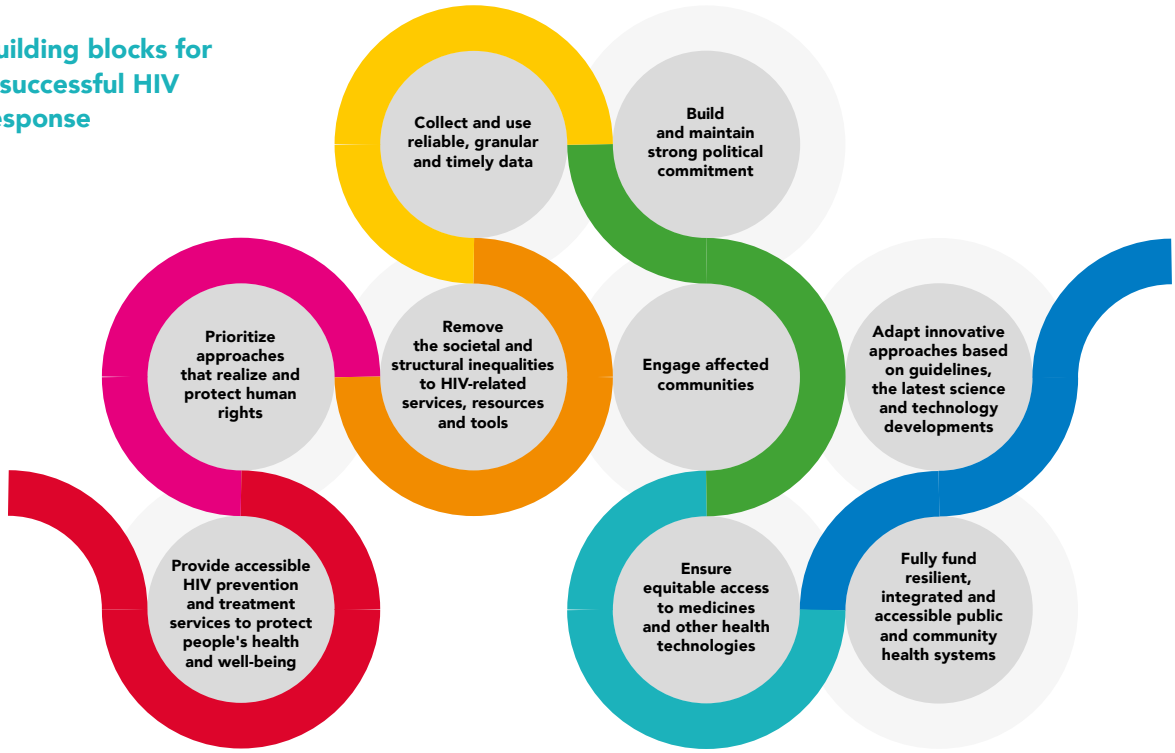
# Executive summary

Two decades ago, the global AIDS pandemic seemed unstoppable. More than 2.5 million people were acquiring HIV each year, and AIDS was claiming 2 million lives a year. In parts of southern Africa, AIDS was reversing decades of gains in life expectancy. Effective treatments had been developed but were available only at prohibitively expensive prices, limiting their use to a privileged few people.

UNAIDS data show that today, 29.8 million of the 39 million [33.1 million–45.7 million] people living with HIV globally are receiving life-saving treatment.[1] An additional 1.6 million people received HIV treatment in each of 2020, 2021 and 2022. If this annual increase can be maintained, the global target of 35 million people on HIV treatment by 2025 will be within reach *(1)*. Access to antiretroviral therapy has expanded massively in sub-Saharan Africa and Asia and the Pacific, which together are home to about 82% of all people living with HIV.

The path to ending AIDS is clear. We have a solution if we follow the leadership of countries that have forged strong political commitment to put people first and invest in evidence-based HIV prevention and treatment programmes. The building blocks of a successful AIDS response come together through partnerships between countries, communities, donors including the United States President's Emergency Plan for AIDS Relief (PEPFAR), the Global Fund to Fight, AIDS, Tuberculosis and Malaria (the Global Fund) and the private sector.

**Building blocks for a successful HIV response**




[1] See Annex 2 Methods for more information on UNAIDS data in this report.

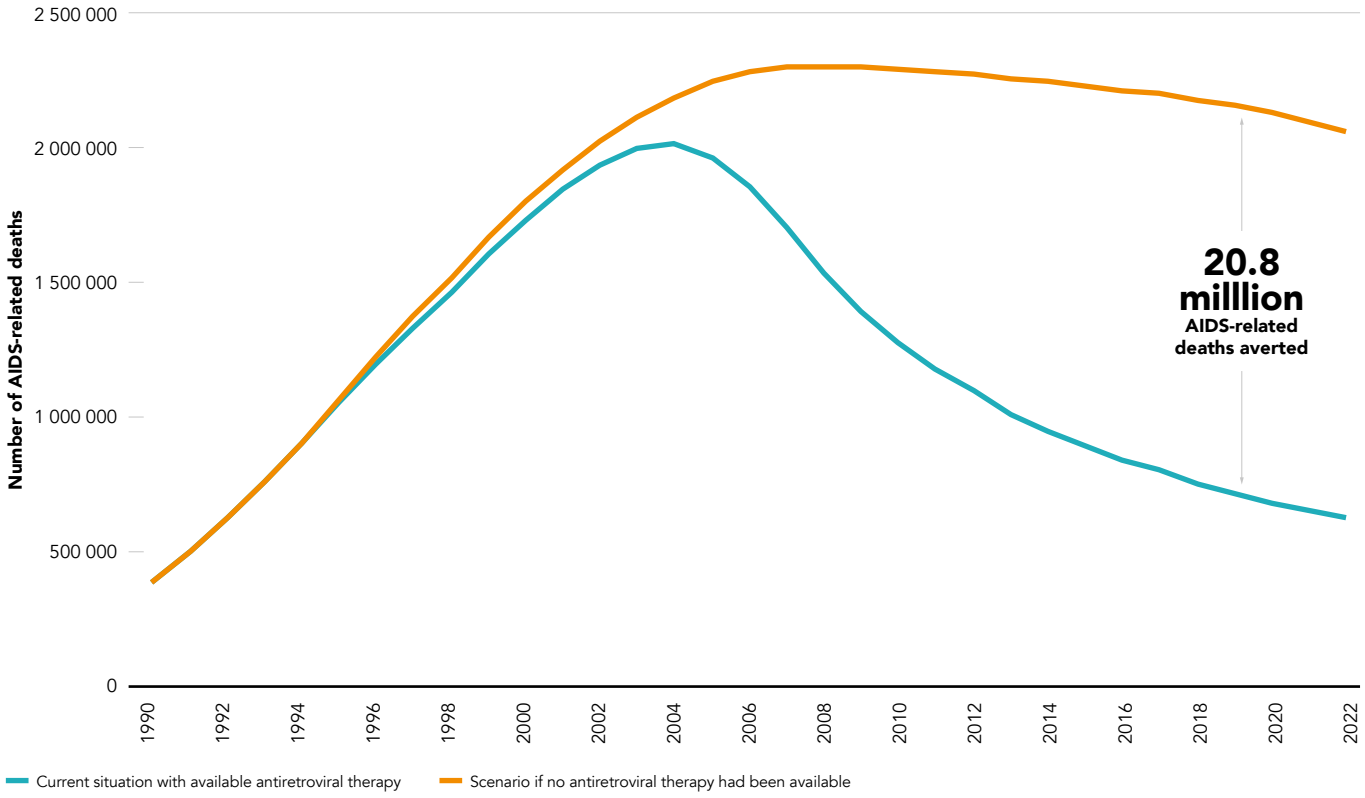
# Treatment and prevention are saving millions of lives

Freed-up access to HIV treatment has averted almost 20.8 million AIDS-related deaths in the past three decades (Figure 0.1).[2] Overall, numbers of AIDS-related deaths have been reduced by 69% since the peak in 2004. Botswana, Eswatini, Rwanda, the United Republic of Tanzania and Zimbabwe, all in sub-Saharan Africa, have already achieved the 95–95–95 targets, and at least 16 other countries (eight in sub-Saharan Africa) are close to doing so (see Chapter 1).

Globally, almost three-quarters (71%) of people living with HIV in 2022 (76% of women and 67% of men living with HIV) had suppressed viral loads. Viral suppression enables people living with HIV to live long, healthy lives and to have zero risk of transmitting HIV sexually. Viral load suppression in children, however, was only 46%.

**HIV treatment averted almost 21 million AIDS-related deaths between 1996 and 2022**

**Figure 0.1** Number of AIDS-related deaths: current situation versus scenario without available antiretroviral therapy, 1990–2022




Source: UNAIDS special analysis of epidemiological estimates, 2023.

[2] In April 2023, PEPFAR reported 25 million lives saved with antiretroviral therapy. The difference is accounted for because PEPFAR includes child infections averted as a life saved. Similarly, PEPFAR's calculation of infections averted among children incorporates indirect prevention of vertical HIV transmission, captured in adult prevention programmes *(2)*.

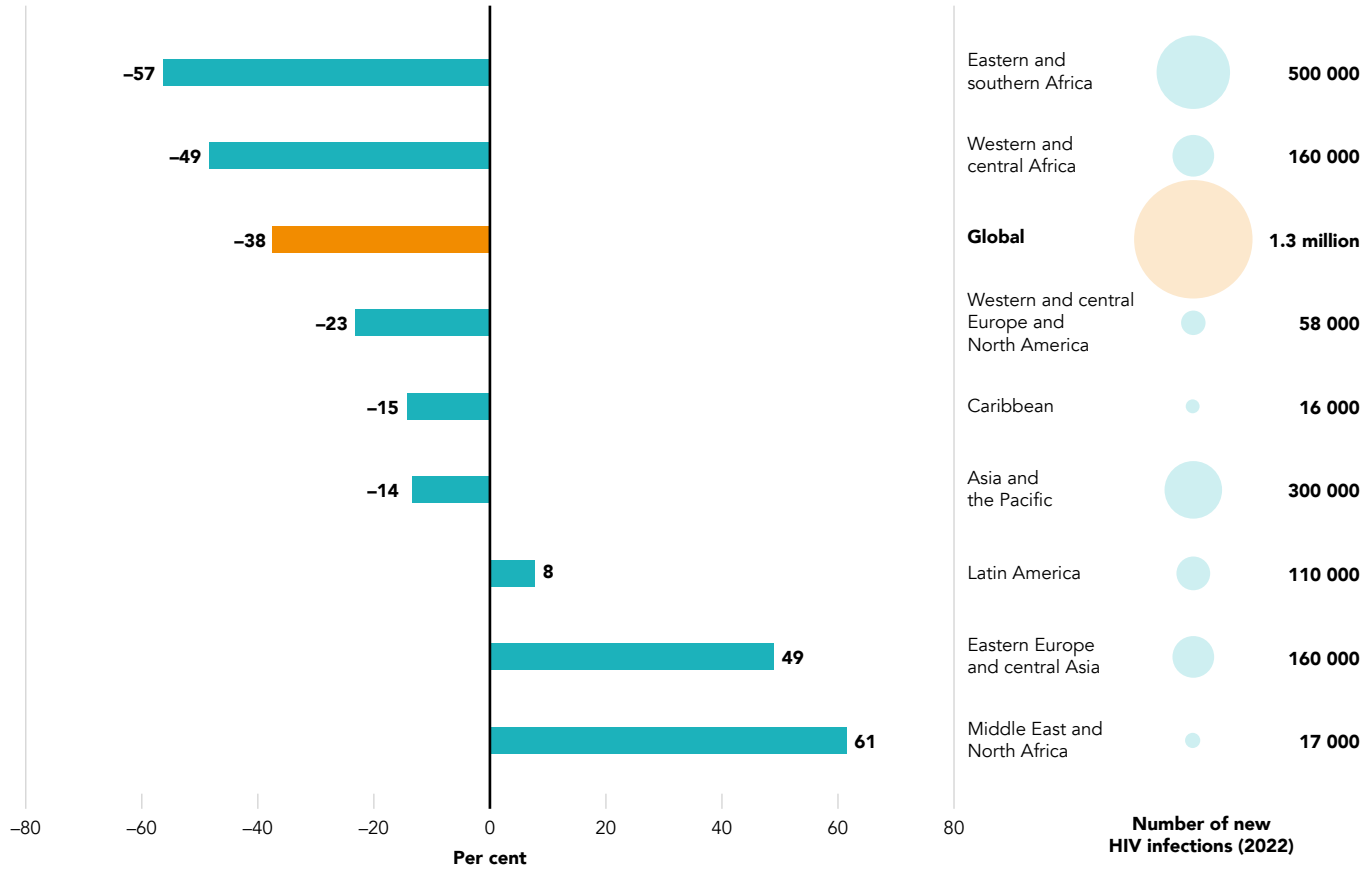
The estimated 1.3 million [1.0 million–1.7 million] new HIV infections in 2022 were the fewest in decades, with the declines especially strong in regions with the highest HIV burdens (Figure 0.2).

The steepest drops in numbers of new infections have been among children (aged 0–14 years) and young people (aged 15–24 years), who in recent years have been targeted with effective interventions. Globally, in 2022, approximately 210 000 [130 000–300 000] adolescent girls and young women (aged 15–24 years) acquired HIV, half as many as in 2010. In the same year, 140 000 [67 000–210 000] adolescent boys and young men (aged 15–24 years) acquired HIV, a 44% reduction since 2010.

Fewer new HIV infections in women and higher coverage of treatment among people living with HIV have led to a 58% drop in the annual number of new infections in children globally between 2010 and 2022, to 130 000 [90 000–210 000], the lowest since the 1980s. Vertical transmission programmes have averted 3.4 million new HIV infections in children since 2000.[2]

**Declines in numbers of new HIV infections are strongest in sub-Saharan Africa**

**Figure 0.2** Change in number of new HIV infections, 2010–2022, and number of new HIV infections, 2022, global and by region




Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).

# Many countries are doing the right things—and reaping the benefits ...

The biggest breakthroughs are occurring in countries that have forged and maintained strong political commitment to put people first and invest sufficiently in proven strategies. They have prioritized inclusive approaches that respect people's human rights, and they have engaged affected communities across the HIV response. They have acted to remove or defuse the societal and structural factors that put people in harm's way and prevent them from protecting their health and well-being—including criminalizing laws and policies, gender and other inequalities, stigma and discrimination, and human rights violations.

HIV programmes succeed when public health priorities prevail, as experiences in multiple countries attest. In Botswana and Cambodia, evidence-based polices and scaled up responses have paid off in reducing new HIV infections and AIDS-related deaths. Cameroon, Nepal and Zimbabwe have achieved major reductions in new HIV infections due to focused prevention programmes. The number of people on pre-exposure prophylaxis (PrEP) in Latin America has increased by over 55% since 2021, with 10 countries providing PrEP to people from key populations in 2022.[3] Thailand is well on its way to achieving the 95–95–95 targets and has successfully integrated a response to addressing stigma and discrimination into its national HIV response.

The achievements of the global HIV response have more general relevance and impact too. The improvements, and the strengthened health and community systems underpinning them, are bringing benefits that spill over beyond the public health realm and add to progress towards several other Sustainable Development Goals (SDGs). By protecting the lives and livelihoods of millions of people, HIV programmes are shielding them against poverty and food insecurity, enabling them to financially support the schooling of their children, and contributing to the ongoing reduction in deaths in children and maternal mortality.

[3] UNAIDS considers gay men and other men who have sex with men, sex workers, transgender people, people who inject drugs, and people in prisons and other closed settings as the five main key populations that are particularly vulnerable to HIV and frequently lack adequate access to services.

# ... but barriers, including a widening funding gap, hold back quicker progress

The gains made against AIDS are a major public health achievement, particularly in the absence of a vaccine capable of protecting against infection or a cure. But in a world marked by intersecting inequalities, not everyone is benefiting yet.

## There is untapped potential for stronger HIV prevention

Adolescent girls and young women still have to contend with extraordinarily high risks of HIV infection in many parts of sub-Saharan Africa, as do people from key populations everywhere. Gender and other inequalities, along with violence, stigma, discrimination and harmful laws and practices, sabotage their abilities to protect themselves from HIV *(3–6)*.

Every week 4000 adolescent girls and young women acquired HIV. In 2022, in sub-Saharan Africa, women and girls (of all ages) accounted for 63% of all new HIV infections. Only about 42% of districts with very high HIV incidence in sub-Saharan Africa are currently covered with dedicated prevention programmes for adolescent girls and young women. Closing these gaps and making it easier for sexually active girls and women to access female-friendly biomedical prevention tools, such as oral PrEP and the dapivirine vaginal ring, would greatly reduce their risks of acquiring HIV.

Beyond sub-Saharan Africa, reductions in numbers of new HIV infections have been modest. Almost a quarter of new HIV infections (23%) were in Asia and the Pacific, where numbers of new HIV infections are rising alarmingly in some countries. Steep increases in numbers of new HIV infections have continued in eastern Europe and central Asia since 2010 (49% increase) and the Middle East and North Africa (61% increase). These trends are due primarily to a lack of prevention services for people from marginalized and key populations and to the barriers posed by punitive laws, violence and social stigma and discrimination.

HIV and other health services for people from key populations are scarce, inaccessible or entirely absent in many countries. Despite some positive changes, laws that criminalize people from key populations or their behaviours remain on statute books across much of the world. The vast majority of countries (145) still criminalize the use or possession of small amounts of drugs; 168 countries criminalize some aspect of sex work; 67 countries criminalize consensual same-sex intercourse; 20 countries criminalize transgender people; and 143 countries criminalize or otherwise prosecute HIV exposure, non-disclosure or transmission.

Consequently, the HIV pandemic continues to impact key populations more than the general population. In 2022, compared with adults in the general population (aged 15-49 years), HIV prevalence was 11 times higher among gay men and other men who have sex with men, four times higher among sex workers, seven times higher among people who inject drugs, and 14 times higher among transgender people.

Failure to protect people within key and other priority populations, including in humanitarian settings, against HIV will prolong the pandemic indefinitely, at huge cost to the affected communities and societies.

## Millions still miss out on treatment

Despite the progress made, AIDS claimed a life every minute in 2022. Globally, in 2022, about 9.2 million people living with HIV were not receiving HIV treatment and about 2.1 million people were getting treatment but were not virally suppressed. Treatment progress is especially slow in eastern Europe and central Asia and the Middle East and North Africa, where only about half of the over 2 million people living with HIV were receiving antiretroviral therapy in 2022.

Men living with HIV were still significantly less likely than women living with HIV to be on treatment in sub-Saharan Africa, the Caribbean and eastern Europe and central Asia. Ridding health-care facilities of stigma and discrimination is crucial, along with removing laws and practices that make people, especially those from key populations, distrustful or fearful of health services.

Treatment coverage lags for children (aged 0–14 years) and adolescents. Some 660 000 children living with HIV—about 43% of the 1.5 million [1.2 million–2.1 million] children living with HIV—were not receiving treatment in 2022. Numbers of AIDS-related deaths among children were reduced by 64% in 2010–2022, but the HIV pandemic still claimed the lives of approximately 84 000 children in 2022.

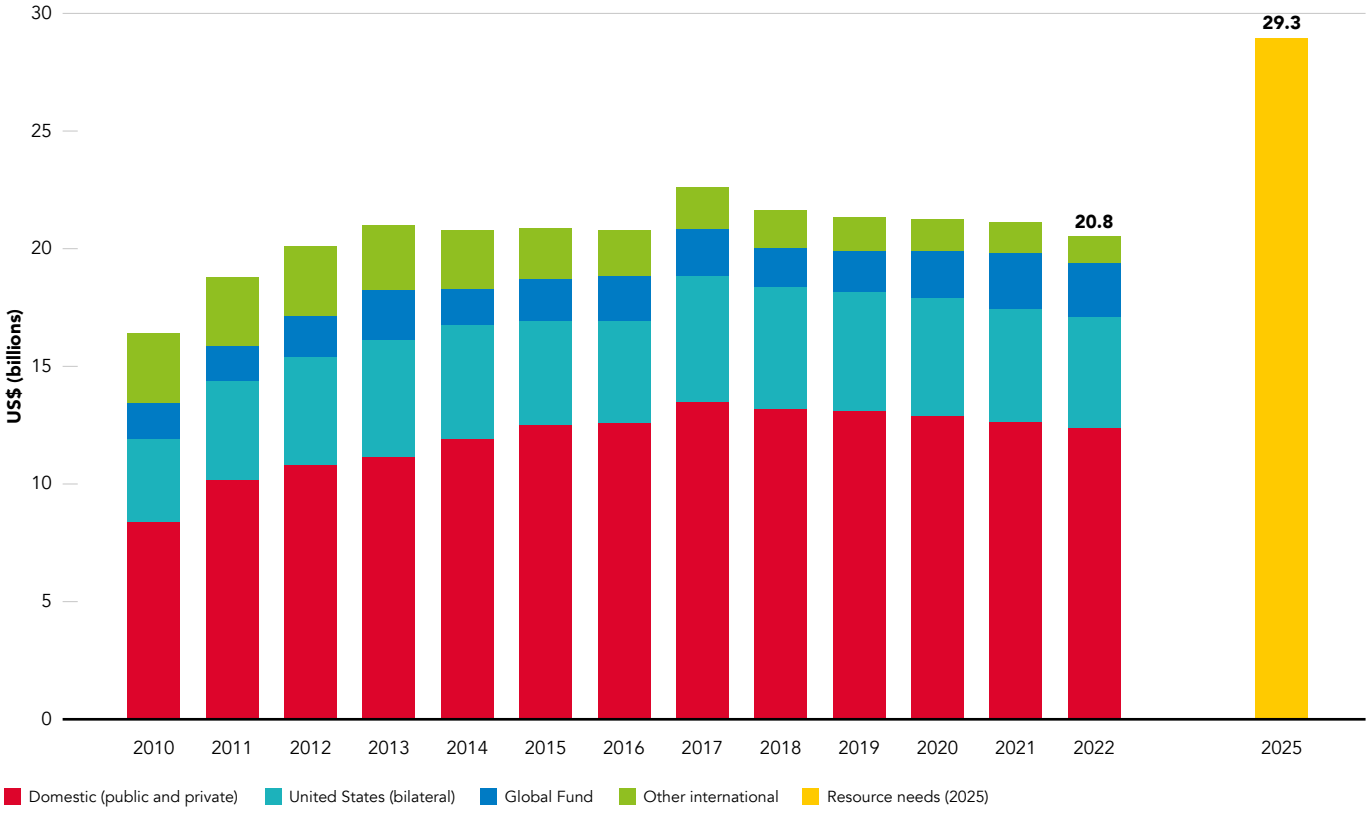
# The funding gap is widening

A backdrop to many of the remaining challenges is the widening funding gap for the global HIV response. A total of US$ 20.8 billion (constant 2019 US$) was available for HIV programmes in low- and middle-income countries in 2022—2.6% less than in 2021 and well short of the US$ 29.3 billion needed by 2025 (Figure 0.3). Having increased substantially in the early 2010s, HIV funding has fallen back to the same level as in 2013.

UNAIDS analysis shows that where HIV prevention funding has increased, HIV incidence has declined. Currently, the regions with the biggest funding gaps—eastern Europe and central Asia and the Middle East and North Africa—are making the least headway against their HIV epidemics. Some countries where HIV incidence is declining, including the Dominican Republic, India, Kyrgyzstan and Togo, are putting between 3% and 16% of HIV spending towards prevention programmes for people from key populations. More funding for prevention programmes, especially among key populations, is badly needed—as is smarter, more cost-effective use of those funds.

**The global HIV funding gap is widening**

**Figure 0.3** Resource availability for HIV in low- and middle-income countries by source, 2010–2022 and 2025 target




Source: UNAIDS financial estimates and projections, 2023 (http://hivfinancial.unaids.org/hivfinancialdashboards.html); Stover J, Glaubius R, Teng Y, et al. Modelling the epidemiological impact of the UNAIDS 2025 targets to end AIDS as a public health threat by 2030. PLoS Med. 2021;18(10):e1003831.
Note: The resource estimates are presented in constant 2019 US dollars (billions). The countries included are those that were classified by the World Bank in 2020 as being low- or middle-income countries.

# Programmes and policies that put people first have the most impact

Doing the right things drastically improves the health and well-being of societies, reduces HIV vulnerability and risk, and averts large numbers of HIV infections.

The most successful HIV responses are following principles very similar to those that anchor the United Nations Common Agenda and that serve as compass points for the SDGs. They put people first, confront inequalities, uphold human rights, and forge trust between public authorities and affected communities. There are huge opportunities to advance on all these fronts. Seizing them now will take the world to within reach of ending the AIDS pandemic, and it will add fresh momentum towards achieving a range of SDGs.

The removal or non-enforcement of laws that target people from key populations and concerted efforts to end HIV-related stigma and discrimination are high priorities. Stronger accountability for health-care providers can help stop stigmatizing behaviours at health facilities.

Promoting gender equality and confronting sexual and gender-based violence will make a difference. Across six high-burden countries in sub-Saharan Africa, women exposed to physical or sexual intimate partner violence in the previous year were 3.2 times more likely to have acquired HIV recently than those who had not experienced such violence.

Community-led organizations have long been the backbone of the HIV response. They raise the alarm about rights violations and service failings *(7)*, propose improvements *(8, 9)*, and hold health systems accountable *(10)*. Even in hostile conditions, they excel at providing people-centred services to underserved populations *(11–13)*. Their work is undermined, however, by funding shortages, policy and regulatory hurdles, capacity constraints, and crackdowns on civil society. If these obstacles are removed, community-led organizations can add even greater impetus to the global HIV response *(14)*.

# Greater equity will unlock new opportunities

Affordability of new health technologies is an ongoing challenge, with long-acting injected PrEP one of several current examples. A voluntary licensing deal struck in 2022 allows about 90 countries to purchase less expensive generic versions of this powerful prevention tool. But it could take years before generic manufacturing of the medicine is in full swing, and several upper-middle-income countries with substantial HIV epidemics were not included in the licensing deal. Removing these hurdles would give HIV prevention a major boost.

The COVID-19 pandemic exposed wide gaps in social protection coverage across all countries—the result of underinvestment in social protection, especially in Africa and Asia. Some four billion people currently lack any form of reliable social protection—even though a wealth of evidence shows that social protection programmes can reduce poverty and help meet multiple needs of people who are poor and excluded and boost HIV responses *(15–20)*. Free HIV testing and treatment in many dozens of countries across the world—a form of in-kind social protection—has already saved millions of lives and is helping to reduce numbers of new HIV infections. New evidence confirms that cash transfer programmes have wide-ranging health and social benefits, including the reduction of HIV vulnerability and risk *(15)*. Stronger social safety nets would add impetus to HIV efforts and bring the world closer to achieving numerous other SDGs.

Deeper integration of HIV and other health services—including noncommunicable disease and mental health services—would help improve the uptake of non-HIV services (by making them more convenient and responsive to people's needs), enhance HIV treatment outcomes, and support the achievement of universal health coverage *(21)*.

The path to ending AIDS is clear. HIV responses succeed when they are anchored in strong political leadership, have adequate resources, follow the evidence, use inclusive and rights-based approaches, and pursue equity. Countries that are putting people first in their policies and programmes are already leading the world on the journey to ending AIDS by 2030.

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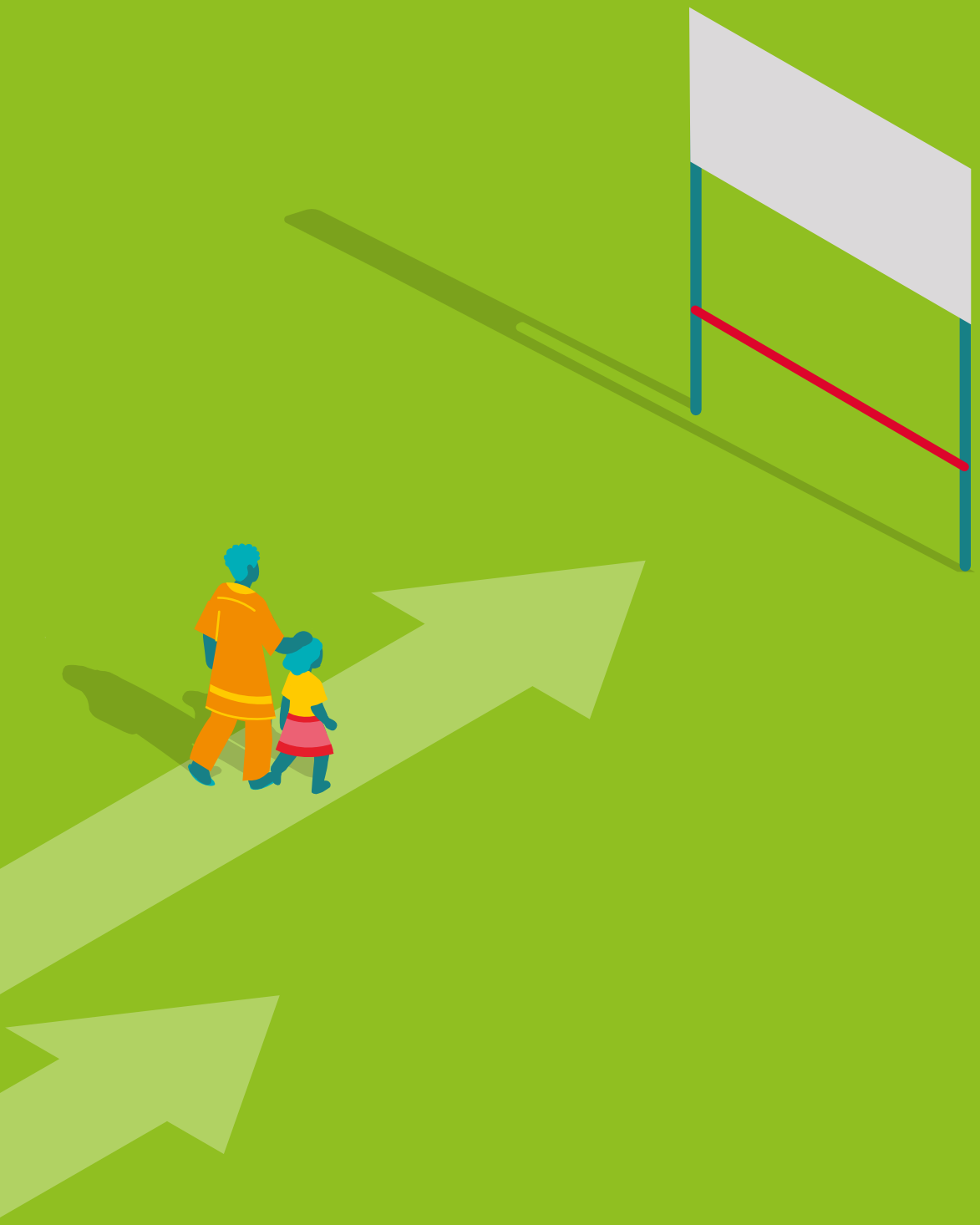
# PATHWAYS TO SUCCESS IN THE HIV RESPONSE

# 1.



## Many countries are demonstrating that the HIV pandemic can be overcome

Numbers of new HIV infections and AIDS-related deaths have continued to decrease globally, bringing the AIDS response closer to achieving SDG 3.3 of ending AIDS as a public health threat by 2030.

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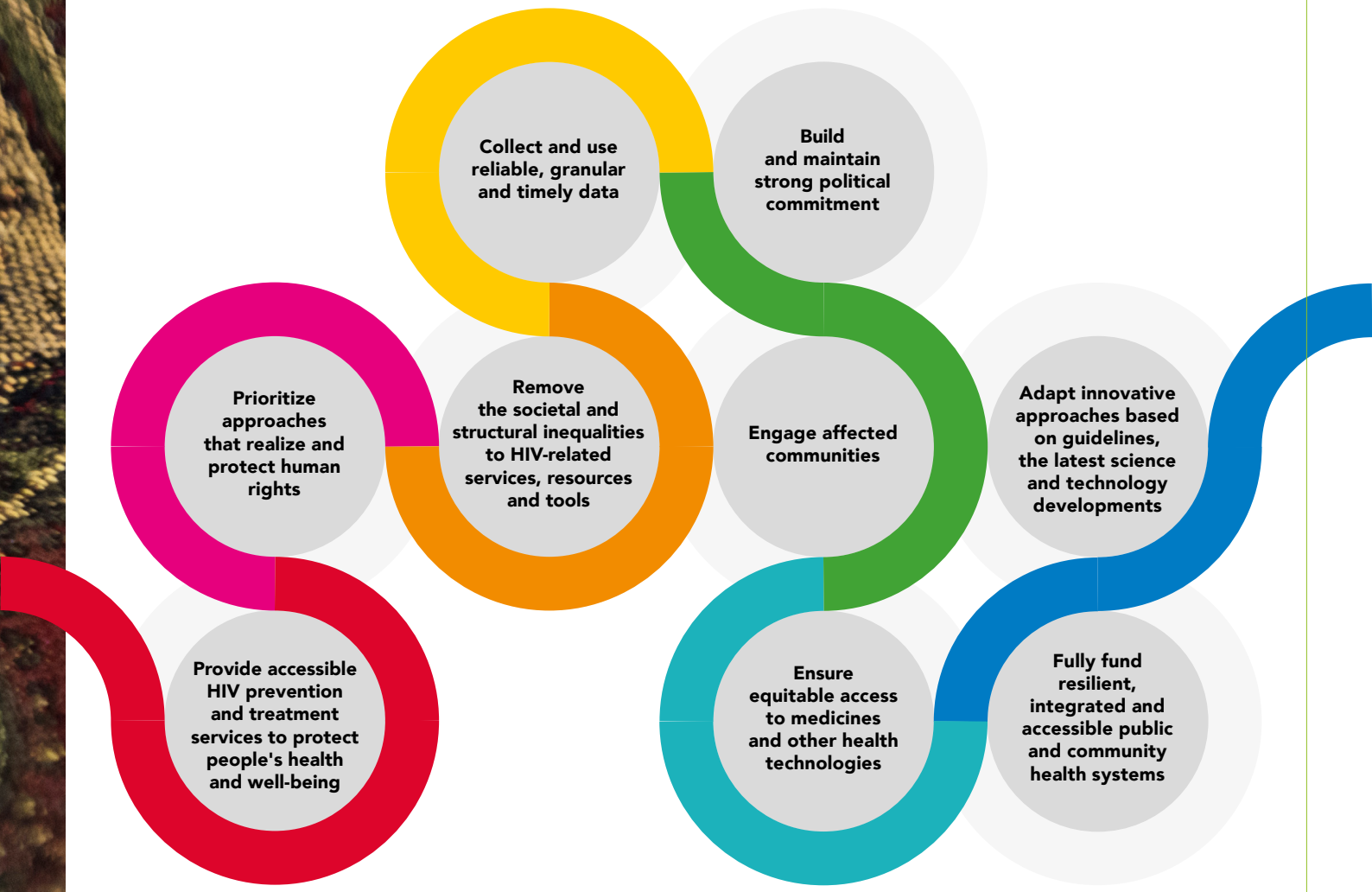
Numbers of new HIV infections and AIDS-related deaths have continued to decrease globally, bringing the AIDS response closer to achieving Sustainable Development Goal (SDG) 3.3 of ending AIDS as a public health threat by 2030. Many countries with diverse epidemics and economic means are demonstrating that the HIV pandemic can be overcome. Their successes offer lessons for countries and regions where progress is slower, and for broader efforts to improve global public health and advance development (Figure 1.1).

**Figure 1.1** Building blocks for a successful HIV response




Efforts to end AIDS as a public health threat are linked closely to wider efforts to remove inequalities and injustices, forge institutions that serve the public good and uphold fundamental human rights, and build dynamic and resilient communities.

# Almost 21 million lives saved with antiretroviral therapy

Two decades ago, life-saving HIV treatment was almost unobtainable in low- and middle-income countries. The provision of effective treatment has reduced numbers of AIDS-related deaths globally by 52%—from 1.3 million [970 000–1.8 million] in 2010 to 630 000 [480 000–880 000] in 2022. Improved access to treatment has averted an estimated 20.8 million deaths globally *(1)*.

Access to antiretroviral therapy has expanded in all regions, but especially in sub-Saharan Africa and in Asia and the Pacific, which together are home to 82% of all people living with HIV. In 2022, AIDS claimed fewer lives in those regions than at any point since the early 1990s.

Globally in 2022, out of the 39.0 million [33.1 million–45.7 million] people living with HIV, 86% [73%–>98%] knew their HIV status, 76% [65–89%] were receiving antiretroviral therapy, and 71% [60–83%] were virally suppressed. These are marked improvements since 2015 (Figure 1.2). The latter statistic is of paramount importance: viral suppression enables people living with HIV to live long, healthy lives and to have zero risk of transmitting HIV to other people.

**THE PROVISION OF EFFECTIVE TREATMENT HAS REDUCED NUMBERS OF AIDS-RELATED DEATHS GLOBALLY BY 52% SINCE 2010**

The biggest gains have been among adults, particularly women, and in sub-Saharan Africa, the region with the largest epidemic. The proportions of people living with HIV who know their HIV status, who are on antiretroviral therapy and who are virally suppressed in eastern and southern Africa are almost the same as in the mostly high-income countries of western and central Europe and North America.

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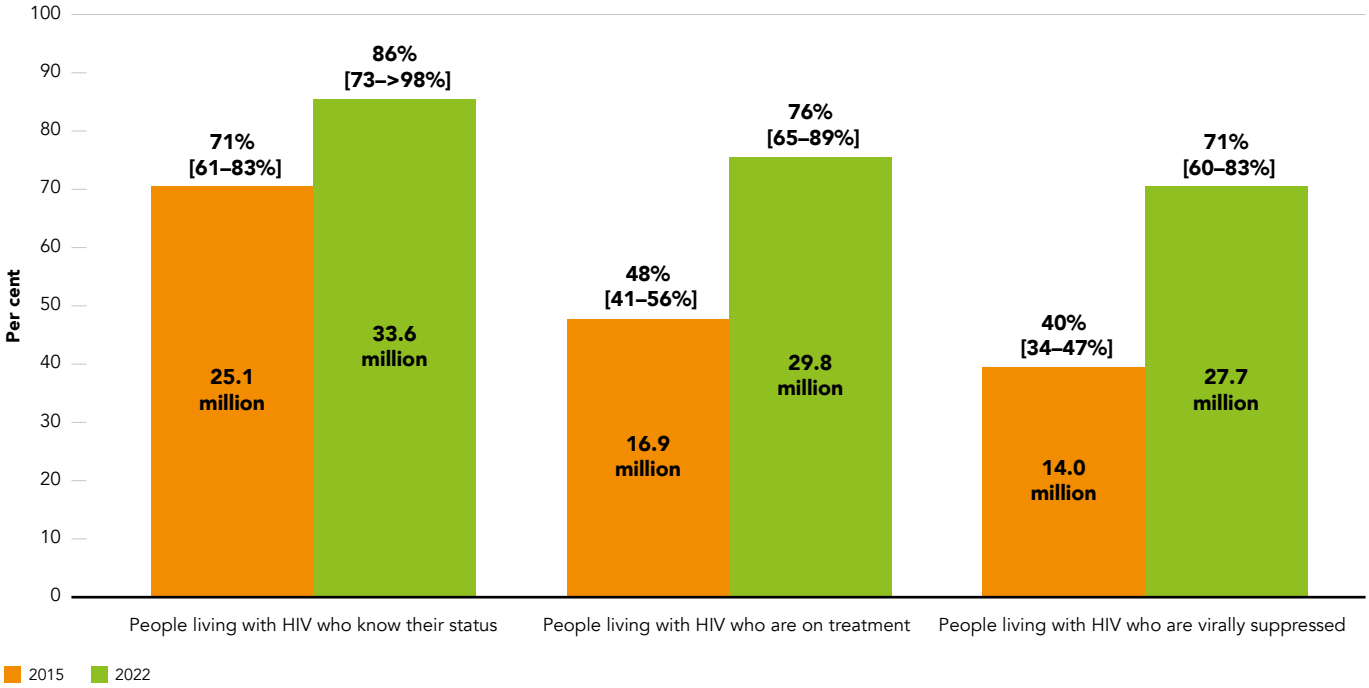
## Remarkable treatment successes are under way in several regions

Five countries have achieved the 95–95–95 targets overall in 2022. At least 16 other countries (8 in sub-Saharan Africa) are within reach of those targets.

## Knowledge of HIV status, treatment and viral load suppression levels have risen substantially

**Figure 1.2** Percent and number of people living with HIV who know their HIV positive status, are receiving antiretroviral treatment and are virally suppressed, global, 2015 and 2022




Source: UNAIDS special analysis of epidemiological estimates, 2023.

Rates of viral load suppression among people on treatment in eastern and southern Africa have risen impressively and reached 93% [78%–>98%] in 2022. Across western and central Africa overall, viral suppression rates have increased even more steeply. At least 95% of people receiving antiretroviral therapy in Botswana, Cambodia, Denmark, Eswatini, Iceland, Lebanon, Lesotho, Luxembourg, Nepal, Rwanda, Saudi Arabia, Slovenia, Thailand, the United Republic of Tanzania, Zambia and Zimbabwe in 2022 were virally suppressed.

Botswana, Eswatini, Rwanda, the United Republic of Tanzania and Zimbabwe have already achieved the 95–95–95 targets overall,[1] and at least 16 other countries (eight in sub-Saharan Africa) are within reach of those targets (Table 1.1). Among the latter are low-income countries such as Malawi, which has targeted improvements and introduced tailored interventions in districts where testing and treatment coverage were lagging. As a result, in 2022 an estimated 94% of people living with HIV in Malawi knew their HIV status, 98% of people who knew their HIV-positive status were receiving antiretroviral therapy, and 94% of people on treatment were virally suppressed. Comparable progress has been made in other regions, with countries such as Cambodia, Denmark and Togo within reach of the 95–95–95 targets.

[1] 95% of people living with HIV know their HIV status, 95% of people who know their status are receiving antiretroviral therapy, and 95% of people on antiretroviral therapy have achieved viral load suppression.

## Remarkable treatment successes are under way in several regions

**Table 1.1** HIV testing and treatment cascade by age and sex, selected countries, 2022

| Country | Total population living with HIV | Men (aged 15+ years) living with HIV | Women (aged 15+ years) living with HIV | Children (aged 0–14 years) living with HIV |
|---|---|---|---|---|
| **Eswatini** | 97–94–93 | 96–91–90 | 97–96–95 | 95–88–83 |
| **United Republic of Tanzania** | 95–94–92 | 93–91–89 | 98–97–95 | 72–72–66 |
| **Botswana** | 96–93–92 | 94–87–87 | 98–97–97 | 58–58–56 |
| **Zimbabwe** | 95–94–89 | 96–92–88 | 97–97–93 | 69–69–59 |
| **Rwanda** | 95–92–90 | 94–91–89 | 95–93–91 | 76–75–73 |
| **Denmark** | 95–88–87 | 95–88–87 | 96–89–88 | |
| **Kenya** | 94–94–89 | 93–89–84 | 95–95–92 | 84–84–74 |
| **Kuwait** | 94–93–92 | 94–94–93 | 92–86–86 | |
| **Malawi** | 94–92–86 | 90–86–80 | 98–98–93 | 70–70–55 |
| **Namibia** | 94–91–86 | 91–86–80 | 97–94–90 | 76–76–68 |
| **Lesotho** | 93–85–84 | 92–80–79 | 95–89–88 | 81–81–75 |
| **Zambia** | 92–89–86 | 92–90–86 | 94–91–88 | 67–67–62 |
| **Luxembourg** | 92–89–85 | 92–88–85 | 94–90–86 | |
| **Saudi Arabia** | 90–89–89 | 92–91–91 | 80–79–78 | 81–75–75 |
| **Slovenia** | 90–83–82 | 90–84–82 | 86–79–78 | |
| **Thailand** | 90–81–79 | 89–80–78 | 90–83–80 | …–76–67 |
| **Uganda** | 89–84–79 | 88–80–75 | 92–87–83 | 71–71–60 |
| **Sao Tome and Principe** | 88–88–75 | 89–89–75 | 95–95–84 | 35–35–17 |
| **Iceland** | 87–84–82 | 85–82–80 | 92–89–86 | |
| **Burundi** | 86–84–79 | 87–86–80 | 94–92–86 | 36–36–31 |
| **Togo** | 84–81–73 | 74–67–61 | 92–91–83 | 60–60–43 |

Reached the 95–95–95 testing and treatment targets (equivalent to 95–90–86 in this table)
Reached the 90–90–90 testing and treatment targets (equivalent to 90–81–73 in this table)
Data not available

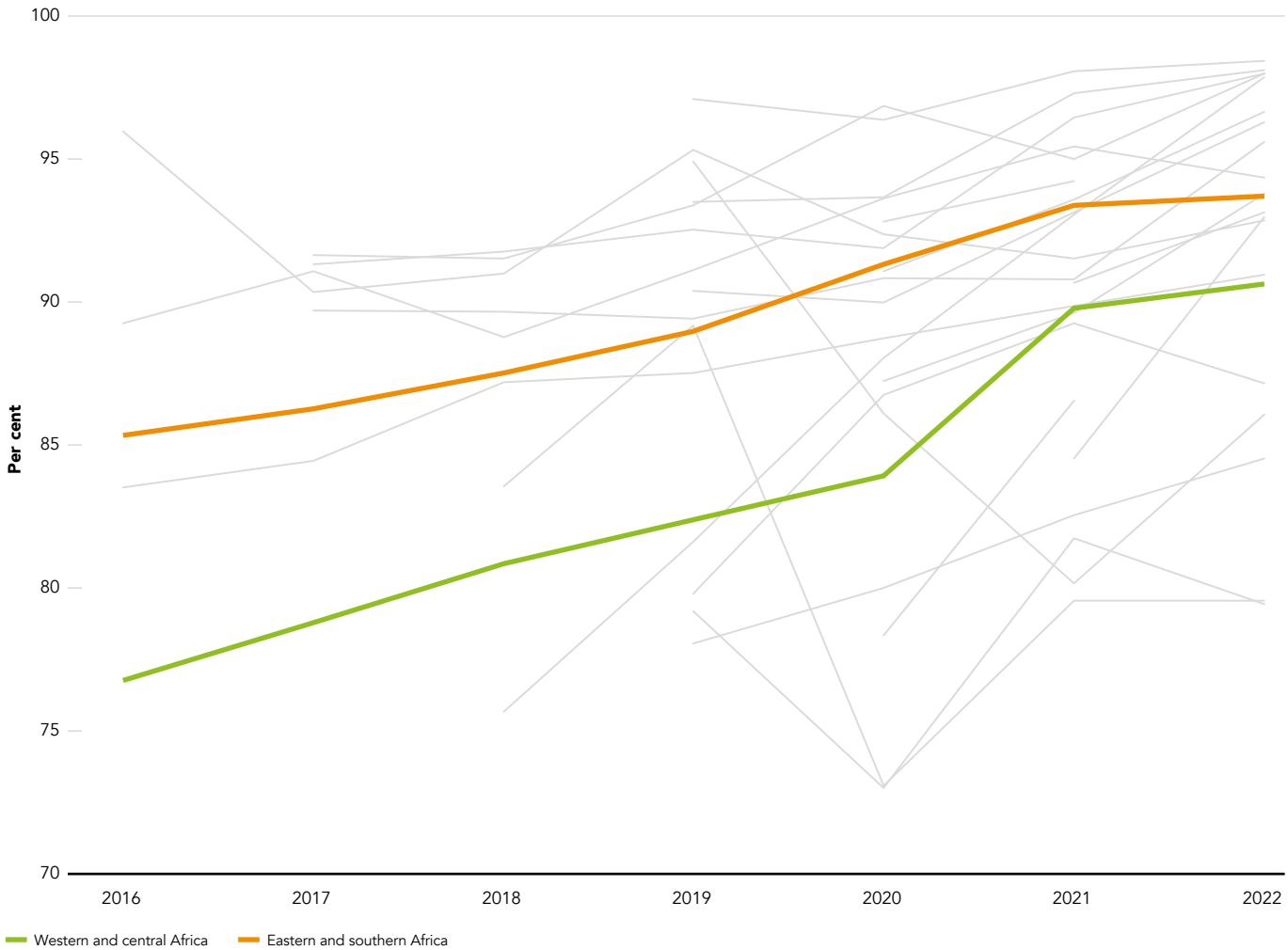
Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).
Note: achieving the 95–95–95 targets requires that 95% of people living with HIV knowing their HIV status (indicator 1); 95% of people who know their status receiving antiretroviral therapy (indicator 2); and 95% of people on antiretroviral therapy have suppressed viral loads (indicator 3). In HIV testing and treatment cascade figures, indicators 2 and 3 are expressed as a percentage of all people living with HIV. Achieving the 95–95–95 targets thus translates to 95% of people living with HIV knowing their HIV status; 90% of people living with HIV receiving antiretroviral therapy; and 86% of people living with HIV have suppressed viral loads. Achieving the 90–90–90 targets translates to 90% of people living with HIV knowing their HIV status; 81% of people living with HIV receiving antiretroviral therapy; and 73% of people living with HIV have suppressed viral loads.
Note: all values in this table were rounded down to the nearest whole number. Countries have been assessed as reaching the 95–95–95 targets if coverage is ≥95.0% (for the 90–90–90 targets if coverage is ≥89.9%). Thus, coverage of 94.9% (or 90.0%) is not considered as reaching the target. Please see the Annex 2 on Methods for a description of how estimates of the testing and treatment targets are calculated.

Extensive adoption of the Treat All model and treatment guidelines and wider use of improved antiretroviral medicines, notably dolutegravir *(2)*, in preferred first-line regimens are boosting treatment outcomes, including for children. More than 95% of countries were implementing the Treat All approach in 2022, and rapid initiation of antiretroviral therapy (less than seven days after confirmed diagnosis) was occurring in three-quarters of those countries. As of July 2022, 108 of 123 reporting countries had adopted dolutegravir as part of preferred first-line antiretroviral therapy, an 80% increase compared with 2020 *(3)*.

The impact of the shift to improved regimens includes greater viral load suppression among people living with HIV on treatment (Figure 1.3). The absolute number of people routinely tested for viral load suppression increased from 6 million in 2015 to 21 million in 2022. Receiving viral load test results provides important information for care providers and programme managers and, more importantly, provides considerable reassurance to people living with HIV that their treatment is working.

**Viral load suppression levels are high and still rising in sub-Saharan Africa**

**Figure 1.3** Percentage of adults (aged 15+ years) living with HIV on antiretroviral therapy with viral load suppression (<1000 copies/mL), western and central Africa and eastern and southern Africa, 2016–2022




Source: UNAIDS special analysis of epidemiological estimates, 2023.

## The transformative impact of PEPFAR on the global HIV response

This year marks the twentieth anniversary of the United States President's Emergency Plan for AIDS Relief (PEPFAR). PEPFAR has had a transformative impact on the global HIV response. As demonstrated through UNAIDS data, it is driving progress across populations, countries and regions, demonstrating that ending AIDS by 2030 is possible.

**Country progress in preventing new HIV infections and reducing AIDS-related deaths is strongest in PEPFAR-supported countries**

PEPFAR has made a decisive, continued impact in reducing the number of new HIV infections. Between 2010 and 2022, numbers of new HIV infections decreased by 57% in PEPFAR-supported countries, compared with 38% globally.[2] Numbers of new child HIV infections in these countries decreased from 1.7 million in 2010 to 820 000 in 2022, which accounts for 94% of all child HIV infections averted globally through vertical transmission programmes.

Between 2010 and 2022, numbers of AIDS-related deaths decreased by 59% in PEPFAR-supported countries, compared with 51% globally. PEPFAR-supported countries have reported significant progress towards the global 95–95–95 targets. Five have already achieved these targets, and the majority of other low- and middle-income countries within reach of these targets are also PEPFAR-supported countries (see Figure 1.3). In partnership with national governments, the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), UNAIDS and local partners, PEPFAR has enabled partner countries to minimize delays across the cascade.

**The positive impact of PEPFAR on domestic financing for HIV is putting the world on track to end AIDS as a public health threat by 2030**

While annual funding for PEPFAR has remained largely unchanged over the last decade, PEPFAR continues to have a positive impact on mobilizing growing domestic financing for HIV. In the majority of PEPFAR-supported countries that provided data to UNAIDS, the increase in funding from PEPFAR and the Global Fund triggered an increase in their domestic HIV funding. This is particularly important at a time when overall domestic funding for health and development in low- and middle-income countries is declining.

These and other data demonstrate the positive impact of PEPFAR's political, programmatic and financial support. PEPFAR-supported countries are furthest ahead in ending AIDS—on a par with countries in Europe and North America, which have a significantly lower HIV burden. PEPFAR works in 55 countries, and 78% of people living with HIV reside in these countries. The continued progress and success of PEPFAR is having a systemic impact, supporting global efforts to end AIDS as a public health threat.

[2] For a list of PEPFAR-supported countries see: https://www.state.gov/pepfar-supported-countries-and-regions/.

**IN 2021, TB-RELATED DEATHS GLOBALLY AMONG PEOPLE LIVING WITH HIV HAD DECREASED BY 67% SINCE 2010**

# Integrated services are boosting both HIV and tuberculosis (TB) outcomes

Widening access to antiretroviral therapy and improvements in integrated delivery of HIV and TB services have led to a steep drop in TB-related deaths among people living with HIV. There were an estimated 190 000 [160 000–220 000] TB-related deaths globally in 2021 among people living with HIV, a 67% reduction since 2010.[3] Although within reach of the 2025 target, the current trajectory has levelled out since 2019 (see Figure 3.7 in Chapter 3). A little over half of TB-related deaths were among men, about 38% among women and 11% among children.

There is still much room for improvement. Among people living with HIV who develop TB, both TB and HIV treatment are required to prevent TB- and AIDS-related deaths. Only 46% of the estimated 703 000 people living with HIV who developed TB in 2021 were receiving antiretroviral therapy (the same level as in 2020)—this is much lower than treatment coverage among people living with HIV overall. The low coverage is likely due to failures in detecting and reporting TB among people living with HIV *(4)*.

The annual number of people living with HIV who received TB preventive treatment rose from fewer than 30 000 in 2005 to 2.8 million in 2021. Services were disrupted by the COVID-19 pandemic in 2020, but they subsequently recovered somewhat. Between 2005 and the end of 2021, a total of 16 million people living with HIV were initiated on TB preventive treatment. However, compared to the 38.4 million people who were estimated to be living with HIV, the target of 90% is not yet within reach.

In 2022, the World Health Organization (WHO) intensified its technical support to address advanced HIV disease including with a focus on key comorbidities and infections in addition to TB. This support recognizes the importance of communities to continue encouraging people who are unwell to seek health care, supporting people who are recovering following acute illness and focusing on ongoing adherence and retention in care.

[3] The latest available TB data are for 2021. Data for 2022 will be available later in 2023.

# Not everyone is benefiting equally

Not everyone is benefiting equally from the expanded provision of HIV testing and treatment (see Chapter 2). Treatment coverage among people from key populations[4] continues to be generally lower than among people living with HIV overall. Men living with HIV are significantly less likely than women living with HIV to access testing and treatment services in sub-Saharan Africa, the Caribbean, and eastern Europe and central Asia. Testing and treatment coverage and viral suppression rates also lag among children and adolescents.

Treatment progress is especially slow in eastern Europe and central Asia and the Middle East and North Africa. About half of the almost 2.2 million people living with HIV in these two regions were receiving antiretroviral therapy in 2022. HIV treatment coverage in Asia and the Pacific was below the global average, while it has improved little in Latin America in recent years. Levels of viral load suppression in these regions were also below the global average. The epidemics in these regions differ in size, but they share a central feature: new HIV infections are occurring primarily among people from marginalized and criminalized populations and their sex partners. In the majority of regions, these key populations tend to have worse access to treatment services than other people living with HIV.

Overall, in 2022, about 9.2 million people living with HIV globally were not receiving antiretroviral therapy, and about 2.1 million people were receiving treatment but were not virally suppressed. This means that, despite the progress made, AIDS claimed a life every minute in 2022, and it remains the fourth-leading cause of death in sub-Saharan Africa.

[4] UNAIDS considers gay men and other men who have sex with men, sex workers, transgender people, people who inject drugs, and people in prisons and other closed settings as the five main key populations that are particularly vulnerable to HIV and frequently lack adequate access to services.

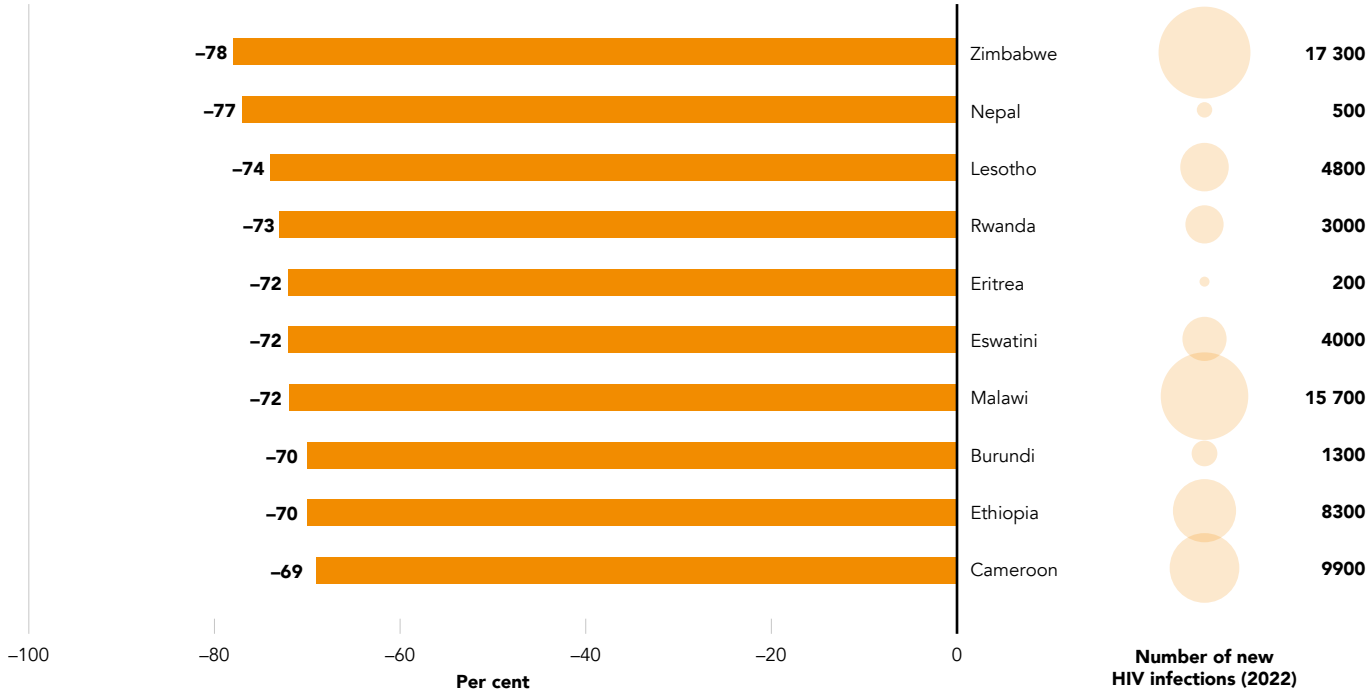
# Fewest new HIV infections in decades

Fewer people acquired HIV in 2022 than at any point since the late 1980s. The estimated 1.3 million [1.0 million–1.7 million] new HIV infections globally in 2022 were over one third (38%) fewer than in 2010. The biggest declines in annual new HIV infections in that period have been in eastern and southern Africa (57% reduction) and western and central Africa (49% reduction). In 2022, 660 000 people in these two regions acquired HIV, compared with 1.2 million in 2015 and 1.5 million in 2010.

Alongside the overall reduction in numbers of new HIV infections in sub-Saharan Africa, there are a few countries where new infections have risen since 2010, including Congo, Madagascar and Mauritania. Generally across the region, however, countries with diverse epidemics and economic means are combining proven prevention options—including expanding the use of treatment as prevention—to bring about large reductions in new HIV infections. Outside sub-Saharan Africa, a few other countries have achieved major reductions in new infections (Figure 1.4).

**Declines in new HIV infections are most pronounced in the countries and regions with the highest HIV burdens**

**Figure 1.4** Change in number of new HIV infections, 2010–2022, and number of new HIV infections, 2022, selected countries among those with the biggest decline in new HIV infections




Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).

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## The biggest declines in new HIV infections have been in sub-Saharan Africa

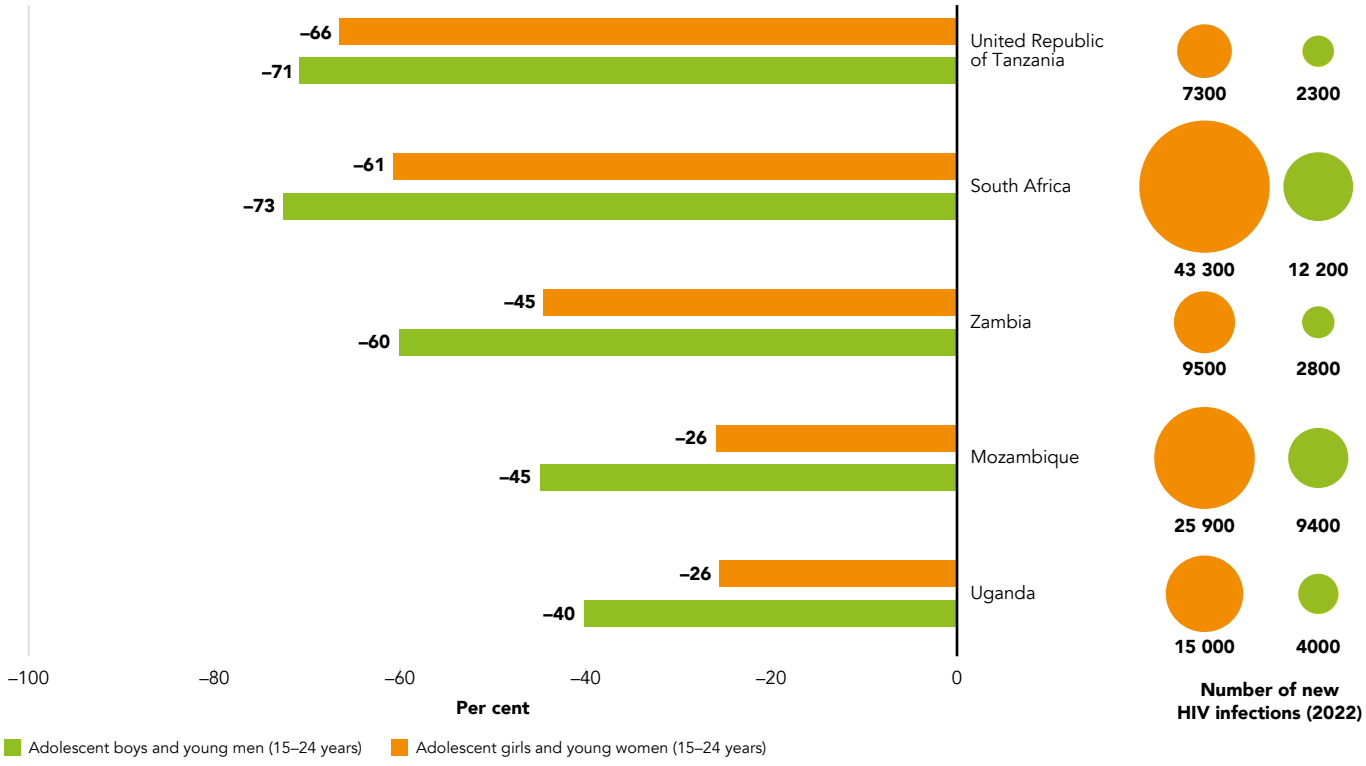
Countries with diverse epidemics and economic means are combining proven prevention options to bring about large reductions in new HIV infections.

The countries with the largest reductions are using refined data to focus their prevention programmes strategically for maximum impact, tailoring services to fit people's needs, and integrating community-led interventions with public health programmes. Overall, the AIDS response tends to be most successful when it includes efforts to remove the underlying barriers (e.g. discriminatory criminal laws and policies, gender and other inequalities, stigma and discrimination, and human rights violations) that hold back progress and when there are public institutions strong enough to sustain those efforts.

Notably, the steepest drops in new infections have been among young people aged 15–24 years. It is especially important to make progress in averting new infections in adolescent girls and young women in sub-Saharan Africa, where they account for about 66% of new infections among people aged 15 years and more than 77% of new infections among people aged 15–24 years. Greater emphasis on reaching adolescent girls and young women with HIV interventions has seen HIV incidence among them decline substantially in most countries with high HIV burdens, although at a slower rate than among adolescent boys and young men (Figure 1.5). In sub-Saharan Africa in 2022, approximately 160 000 [93 000–230 000] adolescent girls and young women aged 15–24 years acquired HIV, half as many (53%) as in 2010, compared with 47 000 [9300–75 000] of their male counterparts, a 66% reduction since 2010.

**New HIV infections among adolescent girls and young women are declining, but not as quickly as among their male counterparts**

**Figure 1.5** Change in number of new HIV infections, 2010–2022, and number of new HIV infections, 2022, among adolescents and young people (aged 15–24 years), by sex, selected countries, eastern and southern Africa




Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).

**THE COUNTRIES WITH THE LARGEST REDUCTIONS ARE USING REFINED DATA TO FOCUS THEIR PREVENTION PROGRAMMES STRATEGICALLY FOR MAXIMUM IMPACT**

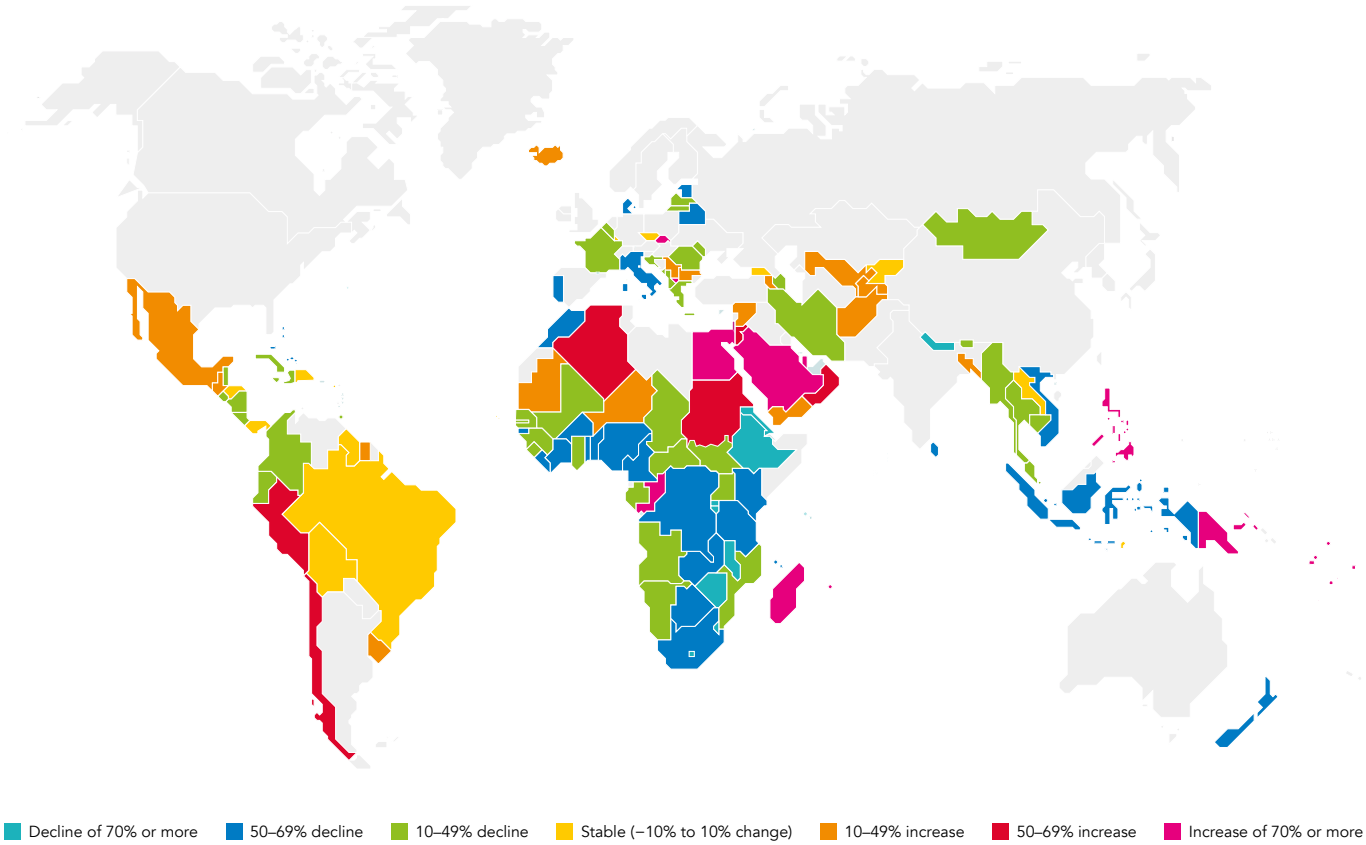
Adolescent girls and young women continue to be at very high risk of acquiring HIV, especially in eastern and southern Africa (see Chapter 2). Gaps still exist in combination prevention programmes and in supportive programmes that promote biomedical, behavioural and structural interventions for adolescent girls and young women, and for men generally, in most countries with high HIV burdens.

## Prevention progress is slower outside sub-Saharan Africa

Beyond sub-Saharan Africa, progress in preventing new HIV infection is much slower (Figure 1.6). Eastern Europe and central Asia is experiencing steep increases in annual HIV infections (49% rise since 2010), as is the Middle East and North Africa (61% rise since 2010). Numbers of new infections have decreased somewhat in the Caribbean and levelled off in Latin America (see regional profiles). In Asia and the Pacific, which accounted for almost a quarter (23%) of all new HIV infections in 2022, there have been steep reductions in many countries, but the number of new infections is rising alarmingly in some other countries.

**New HIV infections are increasing in some countries with sizeable epidemics**

**Figure 1.6** Change in number of new HIV infections, countries with available data, 2010–2022




Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).

Stalled and irresolute prevention efforts, among other things, have failed to remove the societal and structural barriers that create vulnerability and prevent access to services. This has left the global HIV response a long way short of achieving the reductions in new infections that would put the world on-track to end AIDS by 2030.

The majority of new HIV infections in these regions are among people from key populations. The violence, discrimination and social exclusion they experience increases their vulnerability to HIV and reduces access to health-care services and prevention tools and information. In sub-Saharan Africa, people from key populations are important but often-neglected groups affected by HIV (see Chapter 2).

There has been uneven progress in reducing new HIV infections among people from key populations. Preliminary UNAIDS analysis based on countries with available trend estimates suggest that sex workers and clients experienced decreases in new infections from 2010 to 2022, often in line with overall national trends, whereas gay men and other men who have sex with men, transgender people and, in some regions, people who inject drugs have not benefited equally from HIV prevention and treatment services.

Those trends point to a glaring blind spot in HIV responses. More than four decades into the global AIDS epidemic, necessary HIV prevention services for people from key populations are still insufficiently available or entirely absent in many countries, and punitive laws and social stigma and discrimination remain rife. These are among the key reasons why the global HIV response is not yet on track to reduce new HIV infections to the levels needed to end AIDS as a public health threat.

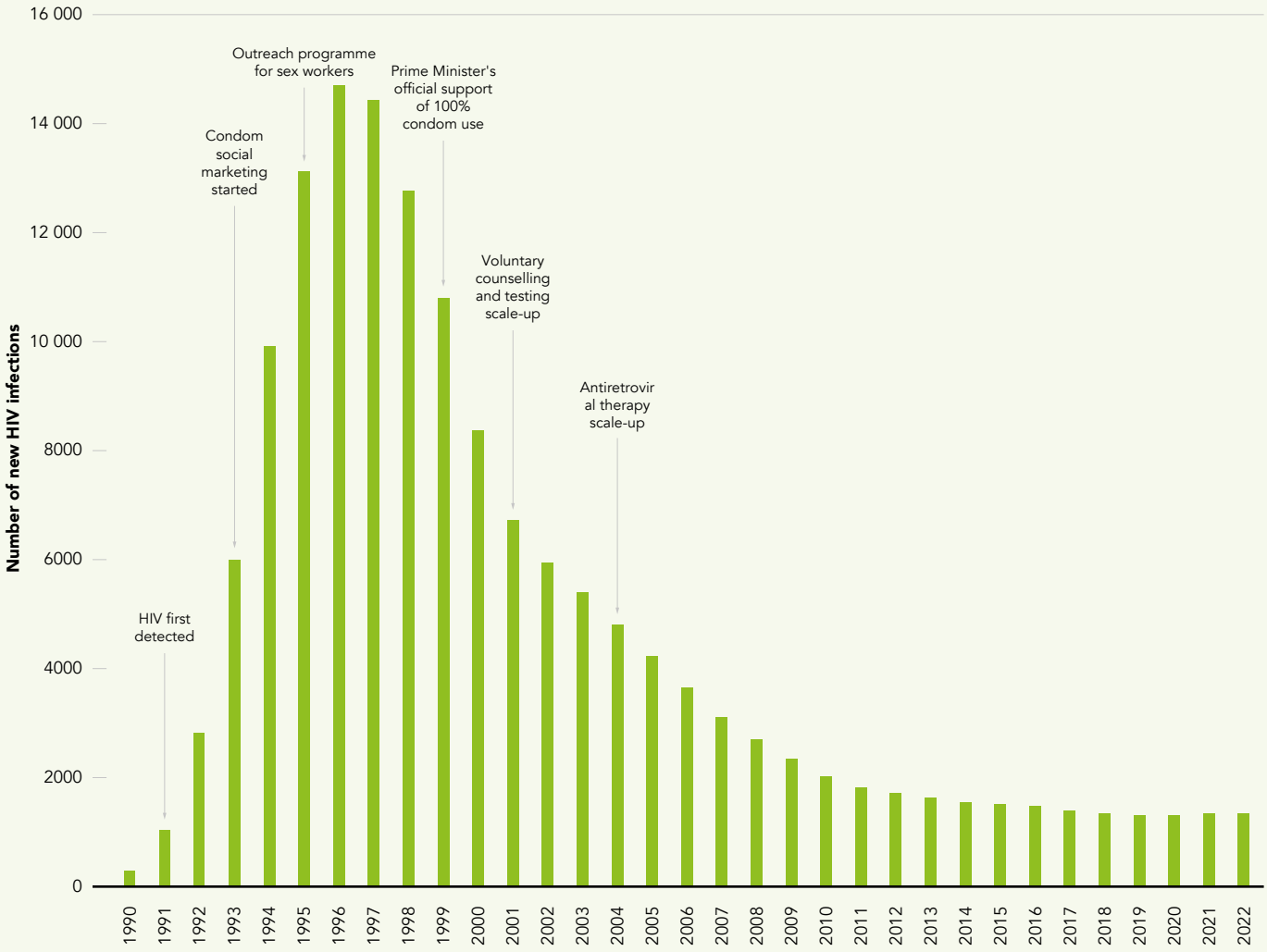
## Strong leadership and effective key population programmes led to Cambodia's steep reductions in HIV infections

Cambodia's HIV response has experienced steady improvement over the past 20 years, having reduced the annual number of new HIV infections by 91% since the peak of its epidemic in 1996. The country's achievements in attaining high levels of linkage to treatment services along with high levels of viral load suppression among people living with HIV are exemplary. They can be attributed to strong political commitment and effective outreach programmes for people from key populations, including large-scale condom programmes (Figure 1.7) *(5)*.

The annual number of new infections has levelled off in recent years, however. Cambodia's HIV response will have to address the inequalities and the stigma and discrimination that affect children and people from key populations, particularly gay men and other men who have sex with men, transgender women and sex workers *(6, 7)*. Data reported to UNAIDS show, for example, that almost one in five sex workers (18%) said they avoided seeking health care because of stigma and discrimination.

### Cambodia has made strong progress towards ending its AIDS epidemic

**Figure 1.7** New HIV infections and major programmatic improvements, Cambodia, 1990–2022




Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).
[UPDATED FROM: Achieving universal access and moving towards elimination of new HIV infections in Cambodia - PMC (nih.gov)]

# Over 3 million children protected against HIV since 2000

Fewer new HIV infections in women and high treatment coverage among women living with HIV have led to a steep drop in the annual number of new vertical infections in children (aged 0–14 years), which fell by 58% between 2010 and 2022. There were 130 000 [90 000–210 000] new infections among children globally in 2022, the lowest number since the 1980s.

**ABOUT 82% OF PREGNANT OR BREASTFEEDING WOMEN LIVING WITH HIV WERE RECEIVING TREATMENT IN 2022**

About 82% [64–98%] of pregnant or breastfeeding women living with HIV were receiving antiretroviral therapy in 2022, up from 48% [37–57%] in 2010. Coverage is even higher in eastern and southern Africa, at 93% [71%–>98%], where Botswana has achieved a milestone in the pathway towards eliminating vertical HIV transmission. Programmes for preventing the transmission of HIV during pregnancy, birth and breastfeeding have averted an estimated 3.4 million infections in children (aged 0–14 years) since 2000 (Figure 1.8).

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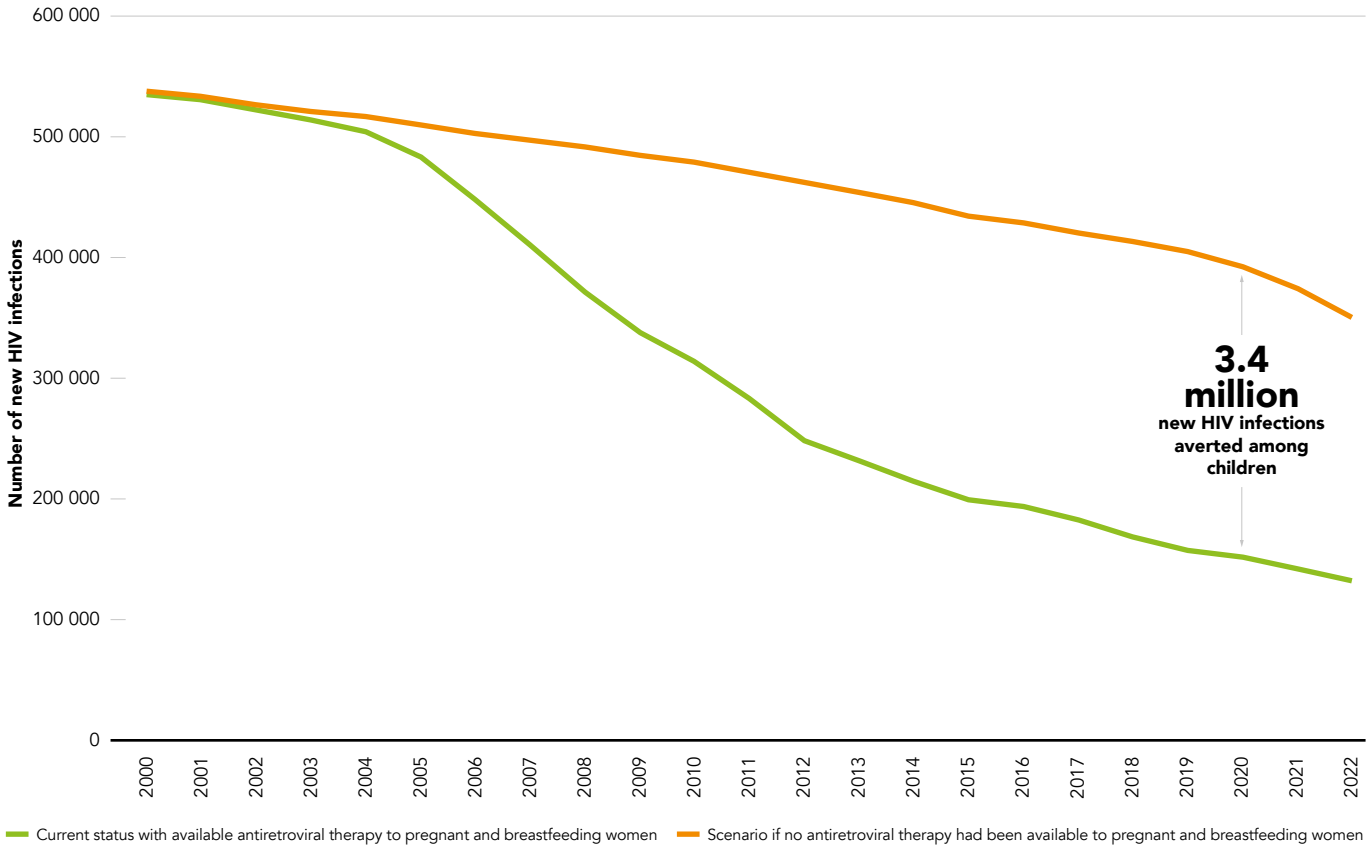
## 2022 saw the lowest number of new infections among children globally since the 1980s

Programmes for preventing the transmission of HIV during pregnancy, birth and breastfeeding have averted an estimated 3.4 million infections in children (aged 0–14 years) since 2000.

**Over 3 million HIV infections in children were averted with programmes for preventing vertical HIV transmission since 2000**

**Figure 1.8** Number of new HIV infections among children (aged 0–14 years) versus scenario without available antiretroviral therapy to pregnant and breastfeeding women, global, 2000–2022




Source: UNAIDS special analysis of epidemiological estimates, 2023.

The WHO Triple Elimination Initiative encourages countries to simultaneously commit to eliminating vertical HIV infections, syphilis and hepatitis B virus as part of a broader push towards integrated health services *(8)*. It is the only elimination programme of its kind that recognizes the importance of addressing underlying societal factors, and that includes requirements to act against gender inequality, stigma and discrimination.

Since 2015, when Cuba became the first country to eliminate new vertical HIV infections among children, 14 other countries and territories[5] have matched that feat and several others are on track to do so in the next few years. But emulating those achievements in countries with large epidemics is proving difficult—as seen in the tens of thousands of children who still acquire HIV each year.

The number of new infections in children fell steeply until the early 2010s, as antiretroviral therapy coverage among pregnant and breastfeeding women living with HIV increased. For the past seven to eight years,

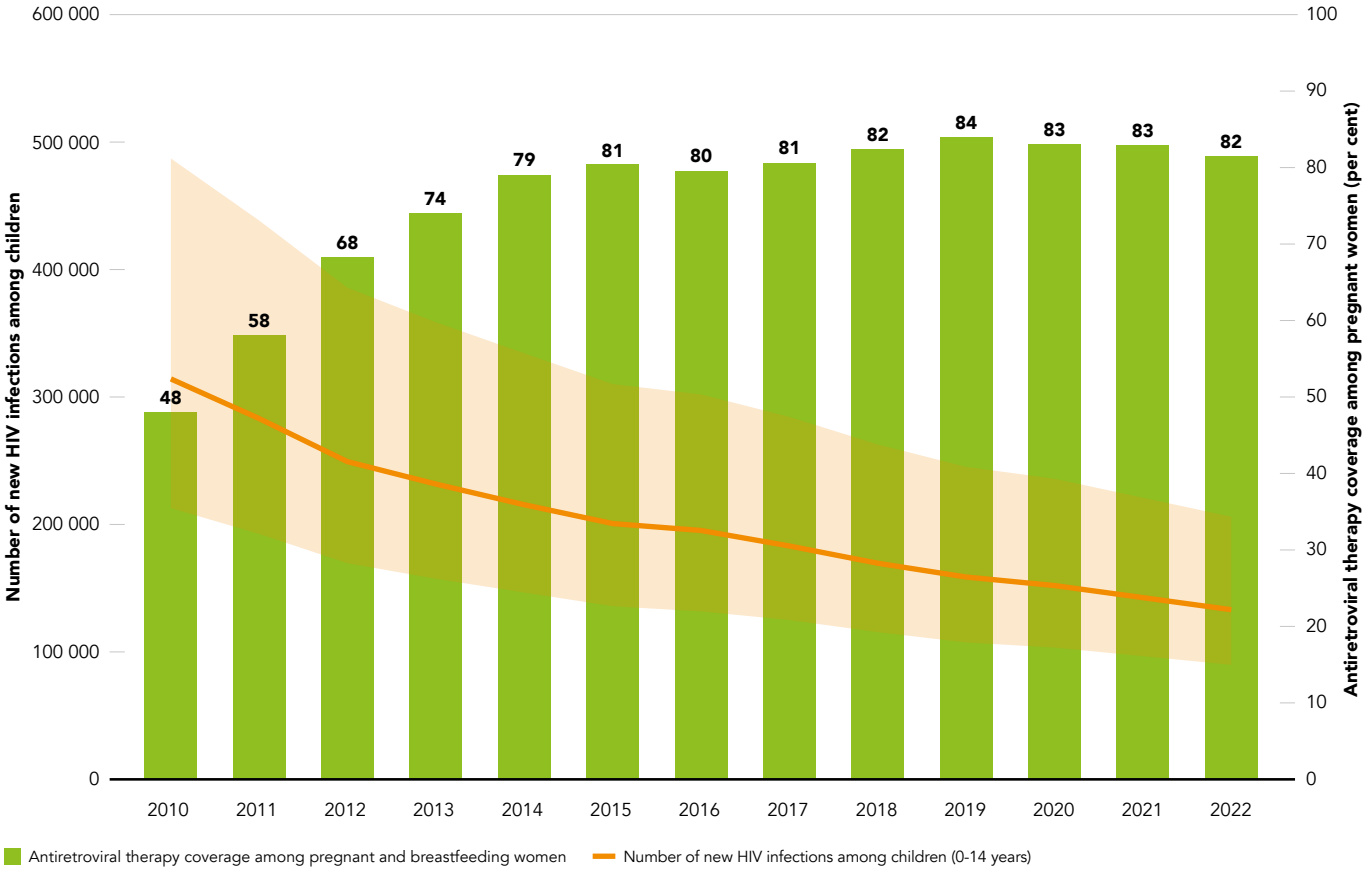
[5] Anguilla (2017), Antigua and Barbuda (2017), Armenia (2016), Belarus (2016), Bermuda (2017), Cayman Islands (2017), Cuba (2015), Dominica (2020), Malaysia (2018), Maldives (2019), Montserrat (2017), Oman (2022), Saint Kitts and Nevis (2017), Sri Lanka (2019), Thailand (2016).

however, antiretroviral therapy coverage among pregnant women has changed little and the decline in new infections in children has slowed considerably (Figure 1.9). This trend is especially concerning in western and central Africa, where programmes to eliminate vertical HIV transmission reached only about 53% [42–64%] of pregnant or breastfeeding women living with HIV in 2022.

As advocated by the Global Alliance to End AIDS in Children, focused efforts and markedly stronger commitment are needed to address the unequal HIV service access and outcomes experienced by children. It will take significant shifts in service delivery and the creation of a more supportive environment to recover the earlier momentum. That includes making integrated antenatal and postnatal care and HIV services more affordable and convenient, especially for adolescent girls and women who are stigmatized and marginalized, or who require parental consent to access services. Programmes need to become smarter at finding the "missing" women who are living with HIV but not receiving antiretroviral therapy (see Chapter 2).

**Antiretroviral therapy coverage for pregnant and breastfeeding women and numbers of new HIV infections in children have levelled off**

**Figure 1.9** New HIV infections among children (0–14 years) and antiretroviral coverage among pregnant and breastfeeding women, global, 2010–2022




Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).

# 2022 saw progress in the removal of harmful laws within a divided world

Laws that criminalize people from key populations are major obstacles for the HIV response. Recent years have seen positive changes on this front, but they are shadowed by regressive and sometimes draconian steps in some countries.

Several countries removed such harmful laws in 2022 and 2023, including Antigua and Barbuda, Barbados, Cook Islands, Saint Kitts and Nevis and Singapore, which decriminalized same-sex sexual relations. Belgium and the Australian state of Victoria decriminalized sex work in 2022, and a number of other countries have initiated processes to do the same. Zimbabwe and the state of Nayarit in western Mexico have removed laws criminalizing HIV exposure, non-disclosure and transmission *(9)*. Punitive laws affecting people living with HIV have been removed in the Central African Republic and Kazakhstan *(10, 11)*. The Government of Belize in June 2023 approved an amendment that would remove the criminalization of vertical transmission of HIV from its statute books *(12)*.

Existing legal instruments to protect the rights of people from vulnerable groups were strengthened in other countries. In Ghana, the Government committed to ensure that drug laws and policies are consistent with the country's obligations under ratified international human rights treaties *(13)*. A landmark court ruling in India recognized the right of sex workers to equal protection under the law. In 2022, 105 countries reported that they included supportive references to harm reduction in national policy documents, compared with 87 in 2020 *(14)*. Also in 2022, transgender rights were strengthened in Kuwait and Spain *(15, 16)*. There have, however, been troubling setbacks in some countries, including Indonesia, Nigeria, Pakistan, Uganda and Zimbabwe (see Chapter 2).

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## Positive changes in removing harmful laws

Several countries removed such harmful laws in 2022 and 2023, yet there have been troubling setbacks in some countries.

# How HIV successes are contributing to the SDGs

The core principles and demands that have propelled the HIV response for decades are echoed in a central theme of the SDGs: the insistence that no one shall be left behind. Since the earliest days of the AIDS epidemic, activists have linked the spread of HIV to social inequalities and discrimination, and to failures to uphold human rights.

Those understandings came to typify the global HIV response and have been vital for the progress made towards SDG target 3.3, which includes ending the AIDS epidemic. They have also resulted in an HIV response that is generating effects that spill over beyond the public health realm and that contribute to progress towards other SDGs. The gains being made, and the health and community systems that are being strengthened, are triggering extensive health, social, economic and developmental benefits.

Before the massive expansion of HIV treatment, AIDS-related illnesses and deaths were especially concentrated among people in the prime of their lives, which severely destabilized the livelihoods and financial security of lower-income households. The evidence shows that households affected by HIV are especially vulnerable to falling into and remaining in poverty *(17, 18)*. Successful HIV programmes are supporting, as well as increasing, the incomes of households affected by HIV *(19)*. A review found that spillover effects of HIV treatment in households included improvements in wealth, labour market outcomes, health outcomes and schooling *(20)*. In countries where HIV is highly prevalent, particularly in eastern and southern Africa, this could add up to a cumulative, poverty-reducing effect (SDG 1). By protecting the livelihoods of individuals and households, successful HIV programmes are also helping safeguard their food security and their ability to financially support the schooling of their children (SDGs 2 and 4).

**SUCCESSFUL TREATMENT PROGRAMMES SUPPORT HOUSEHOLDS IMPACTED BY HIV AND ALSO IMPROVE THEIR ABILITY TO GENERATE INCOME**

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## Leaving no one behind

The HIV response is generating effects that spill over beyond the public health realm and that contribute to progress towards other SDGs.

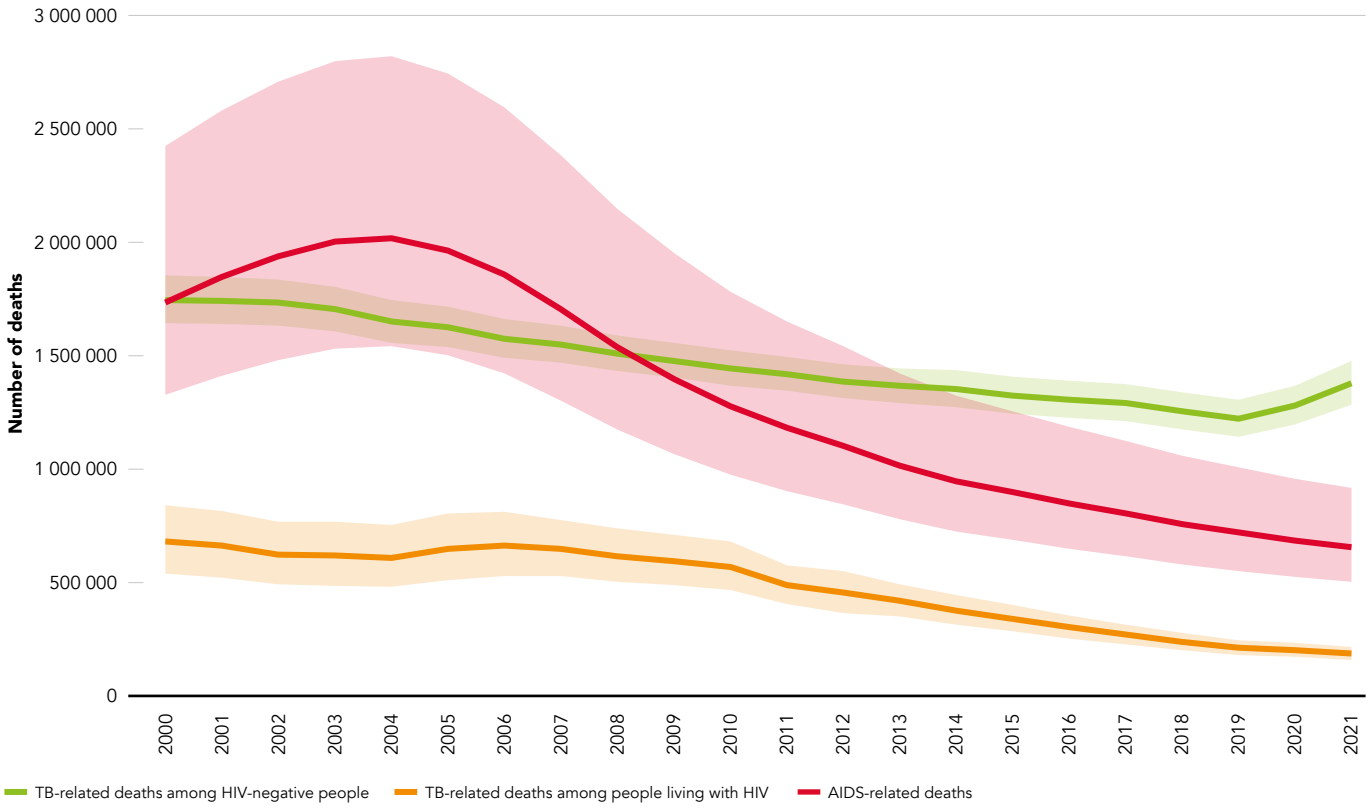
The integration of HIV testing and treatment with maternal and child care is a hallmark of HIV programmes. Together, these services have prevented over 3.4 million HIV infections in children since 2000, and they have drastically reduced numbers of AIDS-related deaths in children since the peak in 2004, when there were 360 000 AIDS-related deaths, to 84 000 in 2022. This has contributed to a decrease in overall deaths in children, especially among children aged 5–14 years, in whom the proportion of deaths that are AIDS-related has declined considerably (SDG 3). Most of these deaths have been averted in sub-Saharan Africa, the region with the highest mortality rates among children.

The effect of HIV on maternal mortality has been reduced since the peak of the epidemic in 2005. HIV-related indirect maternal deaths accounted for less than 1% of all maternal deaths in 2020, compared with approximately 2% in 2005 (SDG 3) *(21)*. This impact is especially evident in eastern and southern Africa.

Numbers of TB-related deaths have decreased the most among people living with HIV (Figure 1.10), thanks to the deeper integration of HIV and TB services, especially over the past decade. An estimated 13 million [11 million–14 million] TB-related deaths were averted among people living with HIV between 2000 and 2021, 8.8 million of them in sub-Saharan Africa and 2.9 million in south-east Asia (SDG 3) *(4)*.

**The steepest reduction in TB-related deaths has been among people living with HIV**

**Figure 1.10** Tuberculosis-related deaths among people living with HIV and HIV-negative people, and AIDS-related deaths, global, 2000–2021




Source: Global tuberculosis report 2022. Geneva: World Health Organization; 2022 (https://apps.who.int/iris/rest/bitstreams/1474924/retrieve)

**STRONG PREVENTION OF VERTICAL TRANSMISSION AND CHILD TREATMENT PROGRAMMES REDUCED AIDS-RELATED DEATHS IN CHILDREN LEADING TO REDUCED OVERALL CHILD MORTALITY**

The HIV response has contributed substantially to building health security, especially through strengthening health systems and community systems. This was evident, for example, when HIV laboratory systems, health workforces and service delivery facilities were some of the first to respond to the COVID-19 pandemic in many countries. Community organizations also kept basic HIV treatment and prevention services running during COVID-19 lockdowns and directly assisted COVID-19 responses by providing multi-disease services to communities.

Research and development of ways to prevent and treat HIV infection have had numerous spin-off benefits. Efforts to develop an HIV vaccine, including networks of trial sites set up for the clinic research, laid the foundation for the eventual development of the COVID-19 mRNA vaccines that have proved so successful in protecting people against severe illness due to SARS-Cov-2 infection (SDG 3) (*22, 23*).

The routine provision of HIV treatment that is free at the point of care in many countries constitutes a significant expansion of social protection and saves millions of people living with HIV the expense of having to pay for potentially life-saving services (SDG 3). This central feature of the HIV response exemplifies the principle that affordable access to essential health care is a basic human right.

HIV programmes are showing that the empowerment of women and protection of their rights are essential for having healthy societies and developmental progress (SDG 5). Comprehensive sexuality education and integrated HIV and sexual and reproductive health services are gateways to the information, support and tools all adolescent girls and young women need to make their own decisions about their bodies and protect their health, whether or not they are living with HIV *(24)*. The holistic care and advocacy led by networks of women living with HIV have led to the realization of rights for many women and their families.

In countries across the world, the HIV response has been characterized by struggles to uphold the rights and dignity of LGBTQI+ people and people from other ostracized communities, resist their persecution and harassment, and protect their health (SDG 10). This has spawned hundreds of community-led organizations and networks that provide legal, health and other and support services; run rights literacy projects; and campaign for discrimination-free laws, policies and practices.

The HIV response has excelled at building innovating partnerships and placing communities at the centre (SDG 17). Among its hallmarks are its action-oriented partnerships—between community organizations and public health authorities (especially at local levels), academic researchers and policy-makers, and activists and health practitioners. The multisectoral character of the Joint Programme—which brings together the expertise and assets of 11 United Nations agencies and organizations—also typifies the partnership-for-development approach of the SDGs.

In addition to saving millions of lives, HIV programmes have strengthened health systems in many countries, through enhanced and integrated laboratory systems, human resources, health information systems, strengthened procurement and supply chain management systems,

governance, policies and revived community health systems. The two largest HIV funders—the Global Fund to Fight AIDS, Tuberculosis and Malaria and the United States President's Emergency Plan for AIDS Relief (PEPFAR), invest approximately US$ 2.5 billion per year in health systems strengthening *(25)*.

The HIV movement has successfully challenged intellectual property laws and regulations that block equitable access to essential medicines and other health commodities. The successes in securing affordable HIV medicines and other products, and making them available free of charge in many countries, has created a template for broader health equity, including for TB, hepatitis C and noncommunicable diseases (SDG 17).

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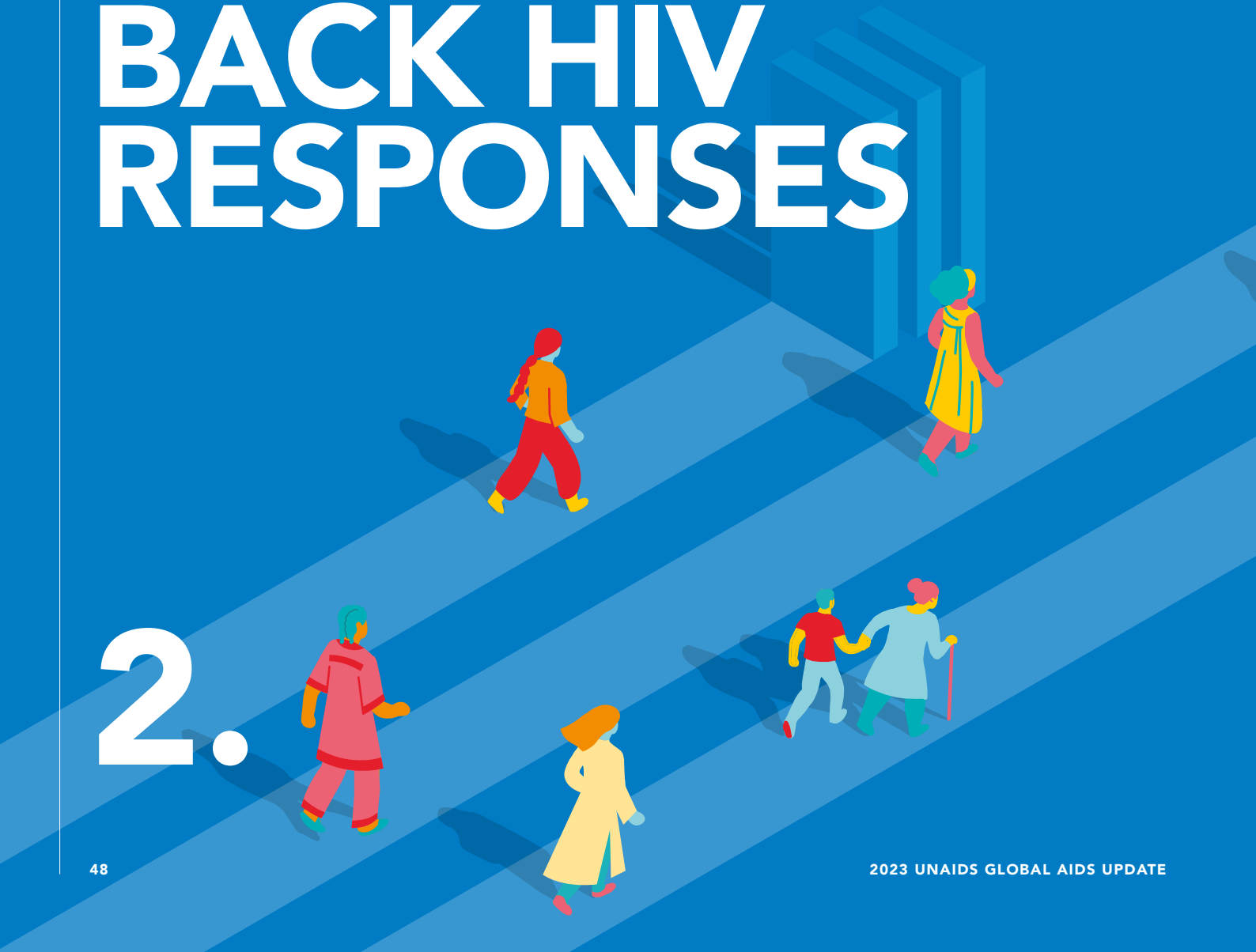
# 2. BREAKING DOWN BARRIERS: REMOVING THE OBSTACLES THAT HOLD BACK HIV RESPONSES



## Not everyone is benefiting from progress made towards ending AIDS

Vulnerability to and risk of HIV infection vary between populations and places, as does people's access to HIV prevention and treatment services. If we identify the barriers that prevent people from protecting their health and well-being, we can act more effectively to remove those obstacles.

The gains made against HIV are a major public health achievement, particularly in the absence of a cure or a vaccine that protects against infection. But in a world marked by multiple intersecting inequalities, not everyone is benefiting from this achievement.

Vulnerability to and risk of HIV infection vary between populations and places, as does people's access to HIV prevention and treatment services. As people advance from childhood to adolescence, adulthood and advanced age, their lives and circumstances change and they are confronted with shifting health issues, including the risk of acquiring HIV. If we can identify the barriers that prevent people from protecting their health and well-being, we can act more effectively to remove those obstacles. HIV, like other viruses, can also take hold in communities where health infrastructure is weakened.

This chapter surveys the latest evidence on the constraints and HIV-related inequalities that affect people from specific populations, including adolescent girls and young women, children exposed to HIV, people from key populations of different ages, and ageing people living with HIV. It also reviews the current status of key interventions, including antiretroviral therapy, pre-exposure prophylaxis (PrEP), condom use and voluntary medical male circumcision (VMMC).

# Adolescent girls and young women are at high risk of HIV

Fewer adolescent girls and young women (aged 15–24 years) are acquiring HIV than a decade ago, but many of them still face such high HIV risks that 210 000 [130 000–300 000] acquired HIV in 2022. Long-standing gender inequalities, and discrimination and poverty deny many women and adolescent girls economic autonomy, deprive them of control over their sexual lives, and expose them to constant risk of emotional and bodily harm *(1–3)*. All these factors can increase their risk of HIV, particularly in sub-Saharan Africa, where HIV prevalence among adolescent girls and young women is more than three times higher than among their male counterparts. For adolescent girls and young women living with HIV, programmes must do better to ensure they can access convenient HIV and sexual and reproductive health services and can live well.

Research shows that women and girls with poor school attendance *(4)* and lower education attainment *(5–7)* tend to be at higher risk of acquiring HIV, as are women and girls exposed to intimate partner violence in some settings *(8)* (see below), those who experience severe food insecurity *(9)*, and those with older male partners *(10, 11)*. A lack of basic knowledge about sex and sexuality, and limited access to sexual and reproductive health services for both boys and girls add to these vulnerabilities *(12)*.

Programmes need to draw together biomedical tools and behavioural, cultural and structural interventions. Providing women with an enabling environment, the information and services they need and social support is essential *(13)*. Programmes should be focused with greater precision on the settings where adolescent girls and young women are at highest risk of acquiring HIV *(14, 15)*. Women-friendly biomedical prevention tools, such as oral PrEP and the dapivirine vaginal ring, must be easier to access and use. These prevention efforts are most likely to succeed when young women and their networks are actively engaged in shaping and implementing them.

## Providing women with an enabling environment, the information and services they need and social support is essential

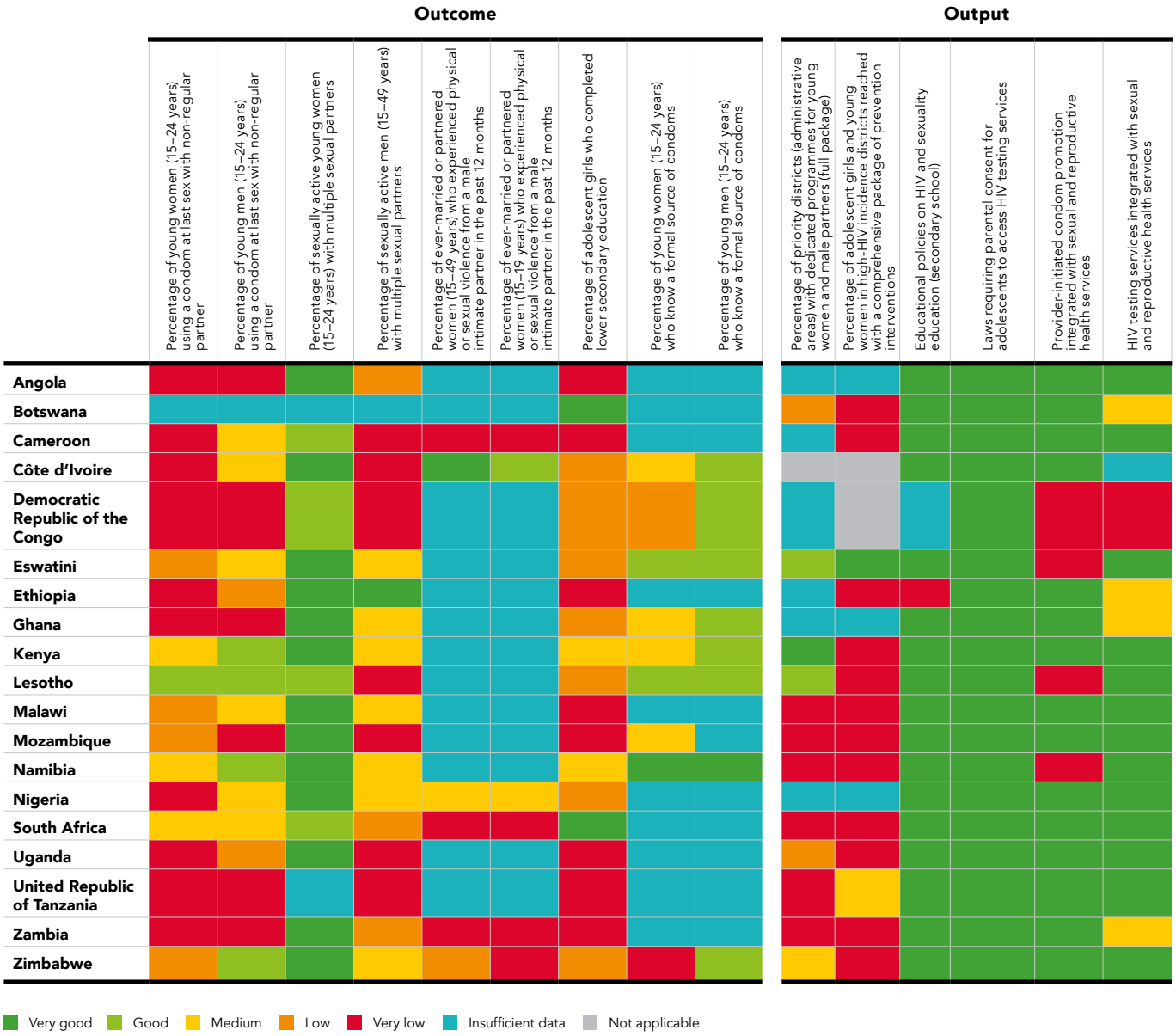
Long-standing gender inequalities, and discrimination and poverty deny many women and adolescent girls economic autonomy, deprive them of control over their sexual lives, and expose them to constant risk of emotional and bodily harm.

# Intensified prevention where HIV risk is highest

There are still major gaps in basic HIV prevention programmes and in supportive programmes for adolescent girls and young women in most of the countries with high HIV burdens. Analysis by the Global HIV Prevention Coalition shows that in sub-Saharan Africa, only about 42% of districts with very high HIV incidence are currently covered with dedicated prevention programmes for adolescent girls and young women in 2021 (Table 2.1). Programmes are also missing many adolescent girls who are not in school *(16)*.

**Despite progress, there are still major gaps in prevention programmes for adolescent girls and young women**

**Table 2.1** Scorecard for HIV prevention among adolescent girls and young women, Global Prevention Coalition countries, 2021

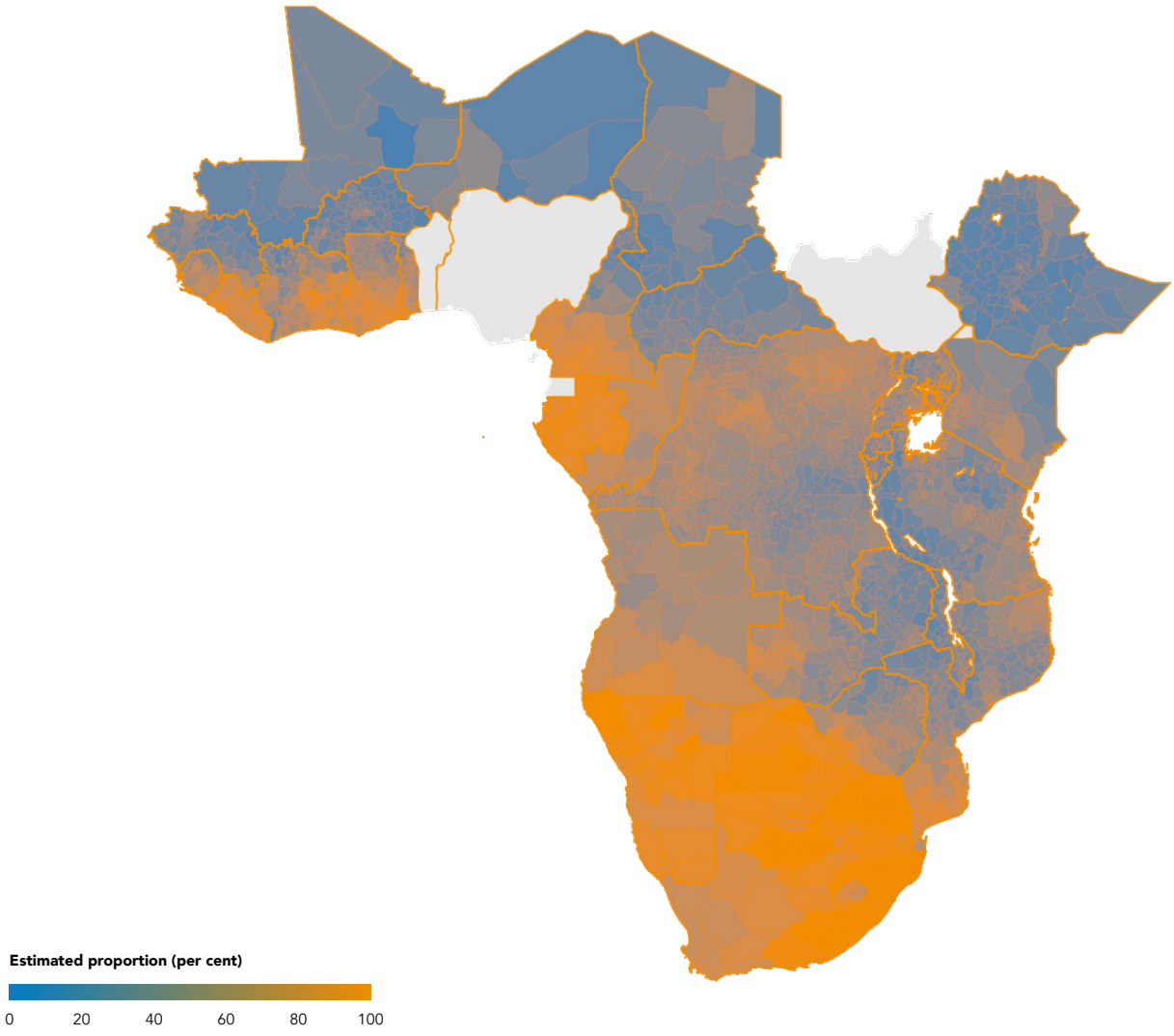



Source: Global HIV Prevention Coalition country scorecards, 2022; Population-based surveys 2017–2021; UNAIDS Global AIDS Monitoring, 2022; National Commitments and Policy Instrument, 2017–2022.

There is great variation in HIV incidence among adolescent girls and young women in sub-Saharan Africa. Subnational-level data show that estimated HIV incidence is moderately high (0.3–1.0 infections per 100 person-years) in 15% of the subnational areas in sub-Saharan Africa, and high (1.0–3.0 infections per 100 person-years) in 4% of the subnational areas in sub-Saharan Africa. In 81% of the subnational areas in sub-Saharan Africa, and in most countries in the world, HIV incidence among adolescents and young women (aged 15–24 years) is estimated to be below 0.3 infections per 100 person-years. Analysis of HIV and household survey data from 30 countries in sub-Saharan Africa indicates that prioritizing HIV prevention according to risk, age and location would significantly boost the effectiveness of programmes at preventing new HIV infections (Figure 2.1) *(17)*.

**HIV prevention programmes must be tailored to local patterns of relationships, which vary substantially by age and between places**

**Figure 2.1** Spatial distribution of women (20–24 years) with non-regular or multiple partners, 30 sub-Saharan African countries, 2022




Source: updated from Howes A, Risher KA, Nguyen VK, et al. Spatio-temporal estimates of HIV risk group proportions for adolescent girls and young women across 13 priority countries in sub-Saharan Africa. PLOS Glob Public Health. 2023;3(4):e0001731.

# Women and adolescent girls still lack basic information and services to protect their sexual well-being

Many women and adolescent girls lack sufficient decision-making power about their sexual relations, contraceptive use and health care. According to data from 68 countries, in 2023 a median of only 56% of women (aged 15–49 years) who were married or in a union reported making their own informed decisions regarding sexual relations, contraceptive use and their own health *(18)*. That power tends to be most compromised among women and girls with lower education levels and in the lowest wealth quintile.[1] Girls often do not have control over their first sexual experiences. In surveys conducted in 9 sub-Saharan Africa countries in 2007–2018, the prevalence of forced sexual initiation among girls and young women aged 13–24 years ranged from 15% in Zimbabwe to 39% in Malawi *(19)*.

These experiences are related to HIV and other sexually transmitted infections and unintended pregnancies among adolescent girls and young women in many countries, especially in sub-Saharan Africa. The United Nations Population Fund (UNFPA) estimates that nearly half of all pregnancies—totalling 121 million each year across the world—are unintended *(20)*. Rates of unintended pregnancy tend to be highest among the poorest and most marginalized women and girls *(21)*.

Comprehensive sexuality education, both in and out of school, and sexual and reproductive health services must do better at reaching women and girls and men and boys. These programmes are gateways to the information and support adolescent girls and young women need to make their own decisions about their bodies and to protect their health, regardless of whether or not they are living with HIV *(22)*. When comprehensive sexuality education was linked to access to sexual and reproductive health services (e.g. in a randomized control trial in Zambia), there were significantly fewer adolescent pregnancies, compared with in schools that offered only comprehensive sexuality education (*23*). Expanding and improving integrated programmes can also foster more positive gender relations, help reduce stigma and discrimination, and contribute to reducing unintended pregnancies for all women *(24)*. United Nations Educational, Scientific and Cultural Organization (UNESCO) data indicate that at least 85% of 155 reporting countries have policies or laws that cater for the provision of comprehensive sexuality education in schools *(25)*.

[1] Based on 17 Demographic and Health Surveys, 2018–2022.

# Gender-based violence: an epidemic within a pandemic

An estimated 16% of adolescent girls and young women (aged 15–24 years) who were ever married or partnered have experienced physical or sexual violence by an intimate partner at least once in their lifetime (based on data from 156 countries) *(2)*. Transgender people are also disproportionately affected by gender-based violence *(27)*. A median of 29% of transgender people had experienced physical or sexual violence in the past 12 months (11 reporting countries). A median of 8.2% gay men and other men who have sex with men had experienced physical or sexual violence in the past 12 months (19 reporting countries).

In addition to the trauma and other harm done, this gender-based violence is an impediment to ending AIDS. It has been shown to increase the risk of acquiring HIV in countries with high HIV prevalence, impede use of HIV services and prevention tools (such as condoms and PrEP) *(28)*, and worsen treatment outcomes. Across 6 high-burden countries in sub-Saharan Africa, women exposed to physical or sexual intimate partner violence in the previous year were 3.2 times more likely to have acquired HIV recently, compared with those who had not experienced such violence *(8)*. Similar aggravating effects have been observed among transgender women and gay men and other men who have sex with men *(29)*.

Women living with HIV who had experienced such violence are less likely to achieve viral suppression than other women living with HIV, according to analysis of data from seven surveys in sub-Saharan African countries *(8)*. A study among women living with HIV at a clinic in Zambia found that having experienced intimate partner violence was associated with decreased odds of adherence to prevention of vertical HIV transmission during and after pregnancy *(30)*. In a study from South Africa, adolescent girls who had experienced sexual and intimate partner violence were about half as likely to adhere to HIV treatment than girls without such experiences *(31)*. Another study from Zambia also found lower odds of engagement in care and antiretroviral therapy initiation among sex workers who had experienced intimate partner violence, compared with sex workers who had not experienced such violence *(32)*.

**ACCORDING TO A RECENT ESTIMATE, THE GLOBAL SCALE-UP OF PROGRAMMES TO PREVENT INTIMATE PARTNER VIOLENCE COULD AVERT ABOUT 5% OF NEW HIV INFECTIONS BY 2030**

Interventions that reduce gender-based violence, including parenting and school- and community-based programmes, can have an impact *(33)*. According to a recent estimate, the global scale-up of programmes to prevent intimate partner violence could avert about 5% of new HIV infections by 2030 *(34)*. Good practices for changing gender norms and harmful forms of masculinity, and for reducing violence against women and HIV must become more commonplace. A World Health Organization (WHO) study found that less than half of the countries surveyed globally (42%) were allocating funding for implementing policies that address violence against women *(35)*.

More needs to be done to protect people against high rates of sexual and gender-based violence in prisons and other closed settings and to provide survivors and witnesses with the support they need *(36)*. People in prisons, particularly people from key populations that are criminalized, are disproportionally affected by HIV. Imprisoned transgender people for example are estimated to be up to 13 times more likely to be sexually assaulted than cisgender people in prisons. Transgender people also have a higher prevalence of HIV and other sexually transmitted infections but often lack or are denied access to HIV and other necessary medical treatment *(37)*.

In the closed environments of prisons, women are especially vulnerable to sexual abuse by male staff and male prisoners. They are susceptible to sexual exploitation and may engage in sex for exchange of goods *(38)*. Although data are limited due to underreporting, sexual violence against men and boys in closed settings is believed to be common. All survivors of sexual violence—women and girls, men and boys, and people from key populations—require a multisectoral survivor-centred response, with access to medical, psychosocial and counselling services that respond to trauma, including mental health, sexual and reproductive health services *(39)*.

**IMPRISONED TRANSGENDER PEOPLE ARE ESTIMATED TO BE UP TO 13 TIMES MORE LIKELY TO BE SEXUALLY ASSAULTED THAN CISGENDER PEOPLE IN PRISONS**

States have an obligation to protect against violence, including in prisons *(40)*. Prison authorities are responsible for combating gender-based sexual violence, the exploitation of vulnerable people in prisons, and all forms of victimization in prisons. An increasing number of countries provide some HIV-related services in prisons and other closed settings, but much stronger action is needed to protect against sexual violence in prisons and other closed settings. Discriminatory and harmful criminal laws that lead to the over-incarceration of people living with and at risk of HIV should also be reformed or removed.

## An overlooked group in the pandemic: women from key populations

The importance of HIV prevention and treatment for women from key populations is sometimes overshadowed by other priorities, even though HIV infection rates among them tend to be much higher than among women and girls overall.

Even in countries with a high burden of HIV, significant proportions of new HIV infections are among female sex workers—many of whom are young—and their clients *(41)*. Extremely high prevalence of HIV has been reported among female sex workers: as high as 62% across a wide range of ages in a study from South Africa *(42)* and 50% across several surveys in Zimbabwe *(43)*, and 16% in Nigeria. HIV prevalence is very high among sex workers' clients, many of whom also have regular or other casual sex partners. Data from population-based surveys in 35 countries in sub-Saharan Africa indicate that at least 1 in 10 sexually active men have paid for sex at some point and they are 50% more likely to be living with HIV than their peers who have not paid for sex *(44)*.

New analysis of data from 13 sub-Saharan African countries suggests that prevention interventions can be made even more effective if they prioritize reaching young adult sex workers *(17)*. But female, transgender, male and gender-diverse sex workers—especially those who are young—face many constraints when trying to access HIV and related health services. Limitations include criminalizing laws, harassment and violence from the police and clients, harmful gender norms that perpetuate gender-based discrimination and violence, severe social stigma, and discrimination by health-care staff. Supportive legal and policy changes can reduce some of these barriers, as can interventions that protect sex workers against violence and promote safer behaviours among their clients *(42)*.

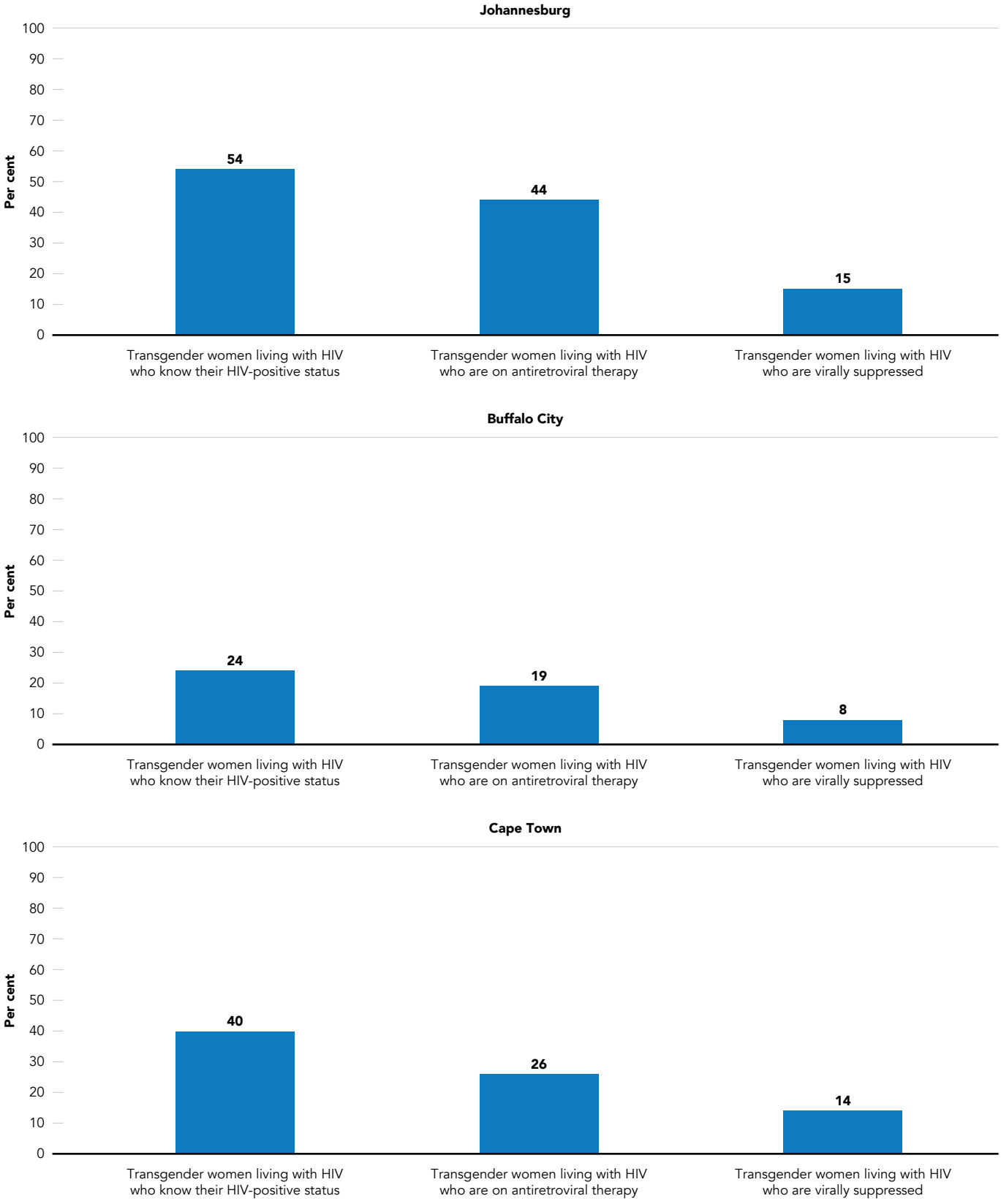
Community-led or -based interventions among female sex workers have been shown to increase access to and use of services, including HIV testing and use of antiretroviral therapy, and to reduce HIV infection rates. Among young sex workers (aged under 25 years) using HIV and other services at sex worker outreach clinics in Nairobi, for example, HIV prevalence fell from 17.5% in 2008–2009 to 4.8% in 2016–2017. The women reported increased condom use and more frequent HIV testing across the period *(45)*. In South Africa, several nongovernmental organizations are running district-level sex worker projects, broadly in line with the National Sex Worker HIV Plan. A review of 12 such project sites reported that 92% of female sex workers living with HIV stated that they knew their HIV status, 87% of the participants living with HIV and with available treatment history said they were on antiretroviral therapy, and 74% of those on antiretroviral therapy were virally suppressed *(46)*.

Women who inject drugs experience many of the same service barriers as other women from key populations. Programmes for people who use drugs, however, seldom deal with these constraints because the vast majority of people who inject drugs globally are men *(47)*. Fear of having their children removed from their care is an additional barrier for women who use drugs to accessing HIV and sexual and reproductive health services *(48)*.

The small proportions of transgender women on HIV treatment with suppressed viral loads are of particular concern given the high prevalence of HIV in this population. According to data reported in recent years by 16 countries, antiretroviral therapy coverage was a median 44%. Data from three cities in South Africa show poor rates of retention in HIV treatment and especially poor rates of viral suppression among transgender women living with HIV (Figure 2.2).

**Rates of retention in antiretroviral therapy and viral suppression tend to be poor among transgender women**

**Figure 2.2** Testing and treatment cascade for transgender women living with HIV in three metropolitan areas in South Africa, 2018–2019




Source: Cloete, A. The HIV care continuum for sexually active transgender women in three metropolitan municipalities in South Africa: findings from a biobehavioural survey 2018–2019.

# New insights can help unlock HIV prevention in high-burden settings

The increased use of phylogenetic analysis is greatly enrichening our understanding of why so many adolescent girls and young women are still acquiring HIV, particularly in eastern and southern Africa *(50–52)*.[2]

Deep-sequence phylogenetic analysis can be used to reconstruct HIV-1 transmission networks and infer the direction of transmission in those networks. This allows researchers to picture in detail the patterns and the demographic and geographical history of HIV transmission in a given setting *(52)*. Error rates are maintained to protect confidentiality and ensure that the phylogenetics cannot be used against individuals in legal contexts, while being kept sufficiently low to achieve population-level analysis of HIV spread.

These phylogenetic studies are yielding new insights that may be crucial for achieving more drastic reductions of HIV infections, including among women and girls.

First, they suggest that targeting small demographic groups with prevention services may not be a very efficient strategy in generalized epidemics with high rates of HIV infection. In two recent studies from Botswana and Zambia *(50, 51)*, there was little to no evidence of HIV transmission being driven by small clusters of people: many individuals were transmitting HIV to a few people, not the other way around. This means that instead of small "hubs" of people who transmit HIV to many others (e.g. small groups of people with multiple partners), in these settings HIV is transmitted from many people to the smaller numbers of people who eventually acquire it. Focusing intensified prevention on settings where HIV incidence is high seems the more rewarding approach.

Second, the studies indicate that in places with high HIV prevalence in sub-Saharan Africa, the heterosexual HIV epidemic is sustained by transmission of HIV from young and middle-aged men to slightly (but not dramatically) younger women. The Zambia study, one of the largest phylogenetic studies yet, confirmed that men were much more likely than women to be the source of HIV transmission: twice as many instances of HIV transmission were attributable to men than to women. Most instances of HIV transmission involved men in their thirties and women in their twenties, with the age gaps often narrower than previously thought *(50)*. Phylogenetic analysis of data from the 30-community BCPP/Ya Tsie trial in Botswana arrived at similar findings *(51)*. The findings confirm the importance of intensified combination prevention for women and girls, including access to PrEP, along with efforts to enhance their economic independence and bodily autonomy, and reduce the gender inequalities, stigma and discrimination that constrain their ability to avoid acquiring HIV.

[2] Caution is required with respect to rights and ethical issues when using phylogenetics, which must be addressed if it is to be used. Communities of people living with HIV and people from key populations should be involved in the development of the studies or systems, including in terms of confidentiality and privacy of data. The limits of phylogenetics must be recognized. It should not, for example, be used to determine sources of transmission on an individualized basis *(49)*.

Third, the analysis shows that the prevention successes in eastern and southern Africa hinge on improving coverage and outcomes of antiretroviral therapy among men, especially those in their twenties and thirties *(50, 51)*. Analysis of 15 years of HIV surveillance and phylogenetic data from Uganda (2003–2018) shows that gender disparity in HIV transmission is increasing, and the growing contribution of men to HIV transmission is associated with lower antiretroviral therapy coverage and lower rates of viral load suppression in men than with women. Men were much less likely (1.5–2.0 times) than women to be virally suppressed, which increased the odds of men transmitting HIV to their partners *(53)*.

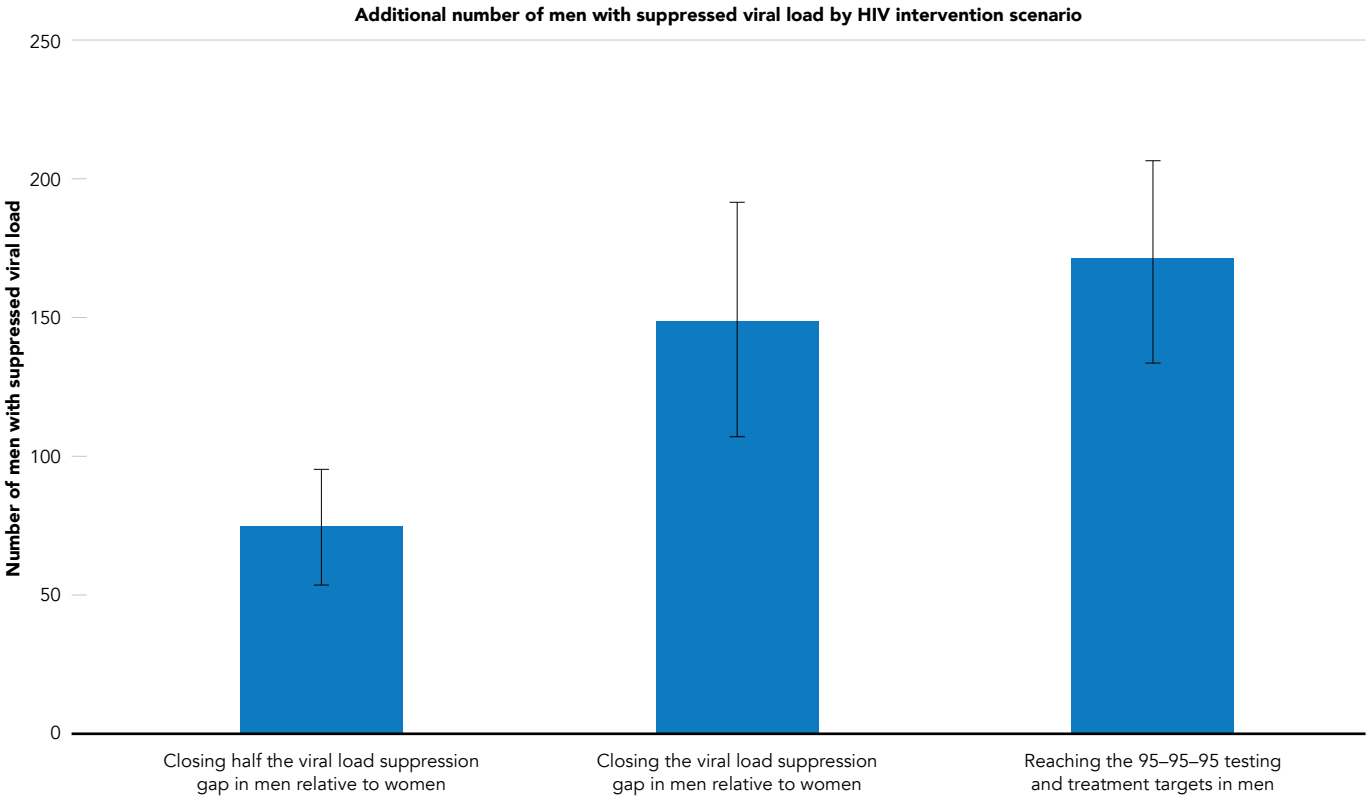
The authors of the Uganda study estimate that interventions that bring viral suppression rates among men on par with those among women could improve men's health outcomes and reduce HIV incidence in women by half, closing the gender disparities in new infections (see Figure 2.3). Overall, this analysis emphasizes that achieving and sustaining very high levels of antiretroviral therapy coverage and sustained viral load suppression among people of all genders is an ongoing priority if the cycles of HIV transmission are to be broken *(53)*.

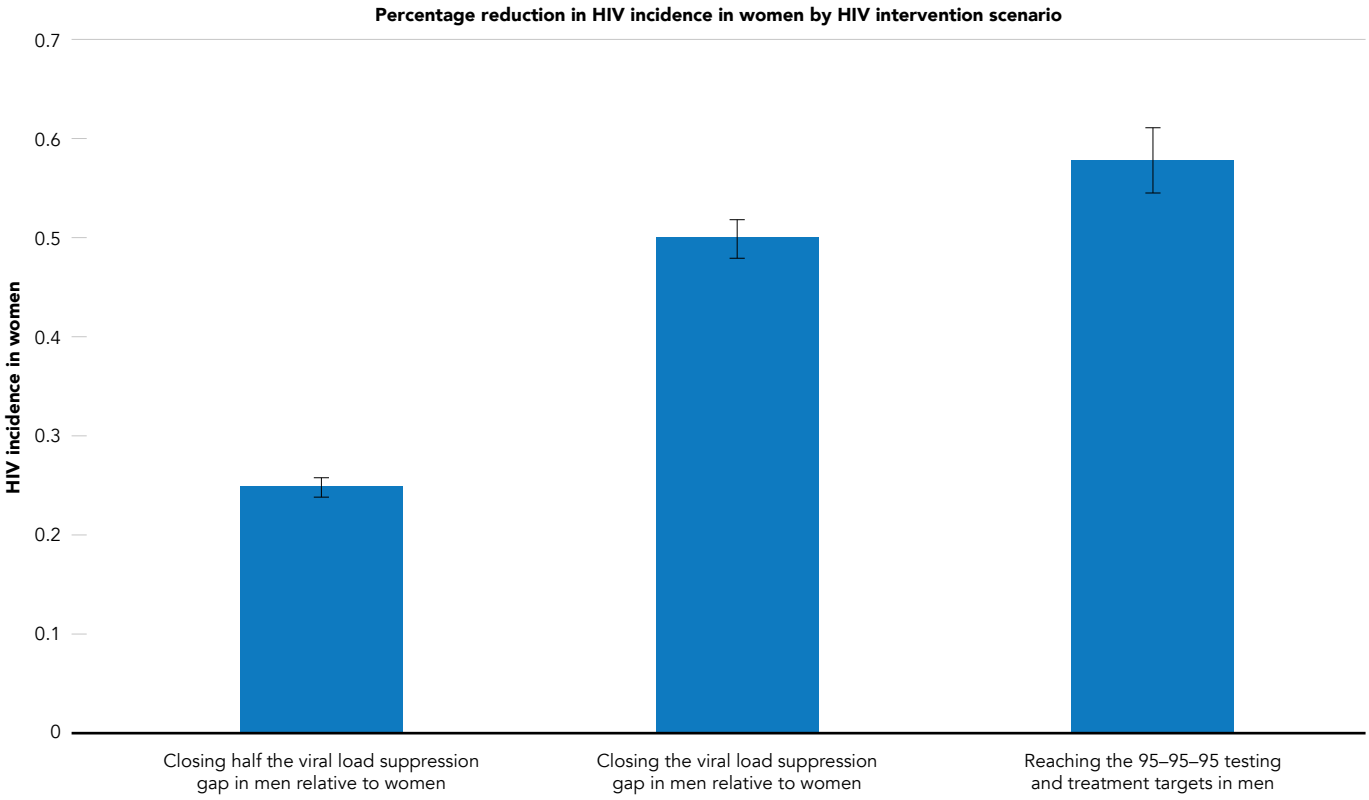
Recent modelling of the AIDS epidemic suggests that progress across four societal enablers—reducing stigma and discrimination and gender inequality, removing obstructive policies and laws, and improving overall socioeconomic development—can enhance HIV programmes and their outcomes *(54)*. This underscores the need to change unfavourable societal environments, alongside strengthened efforts to promote condom use and increase access to PrEP, and diagnose and rapidly link people living with HIV to antiretroviral therapy, and enable them to suppress their HIV viral loads to undetectable levels.

Addressing these enablers also means investing in programmes that fight gender inequality and harmful gender norms, reduce violence against women and girls, and empower women and girls to control their own sexual lives, access sexual and reproductive health services, and access respectful maternity care.

**Closing the treatment gap among men to match viral suppression among women can have multiple benefits**

**Figure 2.3** Modelling scenarios predicting the impact on HIV incidence in women of improved treatment coverage and outcomes in men, Rakai, Uganda




Source: Monod M, Brizzi A, Galiwango RM, et al. Growing gender disparity in HIV infection in Africa: sources and policy implications. medRxiv. 2023; preprint. doi: 10.1101/2023.03.16.23287351.

# Mothers and children are being left behind

The means for eliminating new HIV infections in children (aged 0–14 years) exist, but gaps in services to prevent vertical transmission of HIV still leave hundreds of thousands of children at high risk of HIV each year. Children who do acquire HIV—130 000 [90 000–210 000] in 2022—are also much less likely than adults living with HIV to be treated successfully.

## Targeted efforts are needed to reduce vertical HIV transmission

Since peaking in the early 2000s, annual numbers of new HIV infections in children (aged 0–14 years) have fallen markedly—but that decline has almost stalled in recent years. Reviving the earlier momentum requires an understanding of why so many children are still acquiring HIV.

The overarching reason is that coverage of antiretroviral therapy among pregnant or breastfeeding women living with HIV has levelled off at a little over 80%. This means that about 220 000 pregnant or breastfeeding women living with HIV were not receiving antiretroviral therapy in 2022, which endangers their own health and prevents them from protecting their children against HIV.

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## Over 1.2 million newborns are exposed to HIV each year

Since peaking in the early 2000s, annual numbers of new HIV infections in children (aged 0–14 years) have fallen markedly—but that decline has almost stalled in recent years.

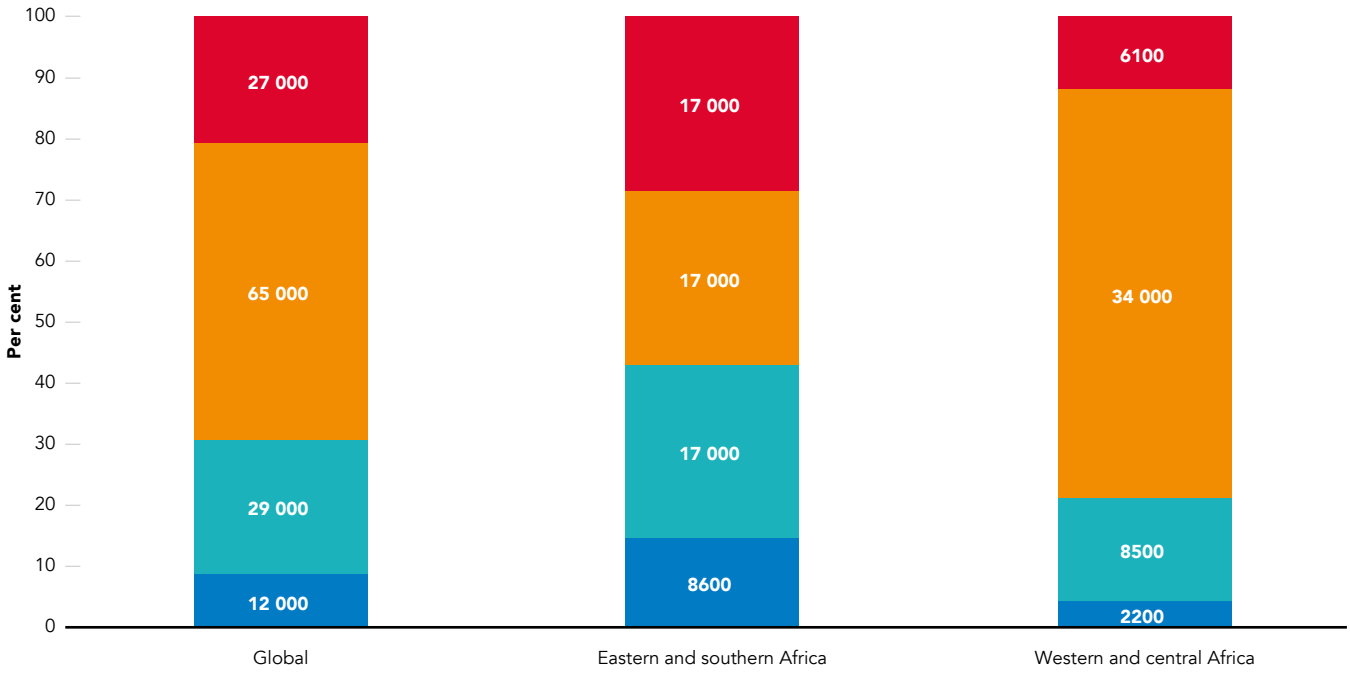
Closer analysis reveals several main causes of new HIV infections in children (Figure 2.4); their respective contributions to new infections in children have changed little in recent years. In western and central Africa in 2022, almost two-thirds of new infections in children were due to their mothers not receiving antiretroviral therapy, including during the pregnancy or breastfeeding periods.

In eastern and southern Africa, no single factor dominates, although a substantial share of new infections in children are attributable to their mothers not being able to avoid acquiring HIV during pregnancy or breastfeeding. More effective combination prevention services should be reaching these women, including condom promotion, HIV screening and self-testing for their partners, and greater access to PrEP *(55)*. Services should also offer trauma-aware care and referrals to gender-based violence services to ensure a positive HIV test does not leave women or children at risk of intimate or familial violence.

Recovering momentum also requires reducing HIV-related stigma and making it easier for women to have safer sex. Several studies have demonstrated the prevention potential of the monthly dapivirine vaginal ring, with the MTN-025/HOPE trial showing high uptake and adherence and with HIV incidence among users of the ring about half the expected rate *(56)*. Adverse pregnancy outcomes appear to be uncommon during the third trimester among people who use the ring, and studies are under way to investigate safety of its use earlier in pregnancy *(57)*.

**The main causes of new HIV infections in children vary between regions**

**Figure 2.4** Percentage of new vertical HIV infections by cause of transmission, global and selected regions, 2022




Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).

# Reaching all women with services

Botswana's success in reducing vertical transmission of HIV stems from achieving very high coverage of HIV testing and treatment among women overall, as part of its drive to "treat all". This is enabling women living with HIV to start antiretroviral therapy well before becoming pregnant and to achieve and sustain viral load suppression. However, staying on antiretroviral therapy during the pregnancy and breastfeeding period can be challenging. Mothers and pregnant women must be able to access HIV and other health services safely and conveniently, and they have to be protected against intimate partner violence, which is especially common among women who are living with HIV *(30)*. Further integration of HIV and antenatal care services and respectful experiences at health-care facilities could make it easier for women to remain in care and adhere to treatment *(58)*.

Also needed are other shifts in service delivery, including making integrated antenatal care and HIV services—and sexual and reproductive health services generally—more accessible and convenient, especially for adolescent girls and women who are stigmatized and marginalized. Programmes can become smarter at finding the "missing" women who are living with HIV but not receiving antiretroviral therapy.

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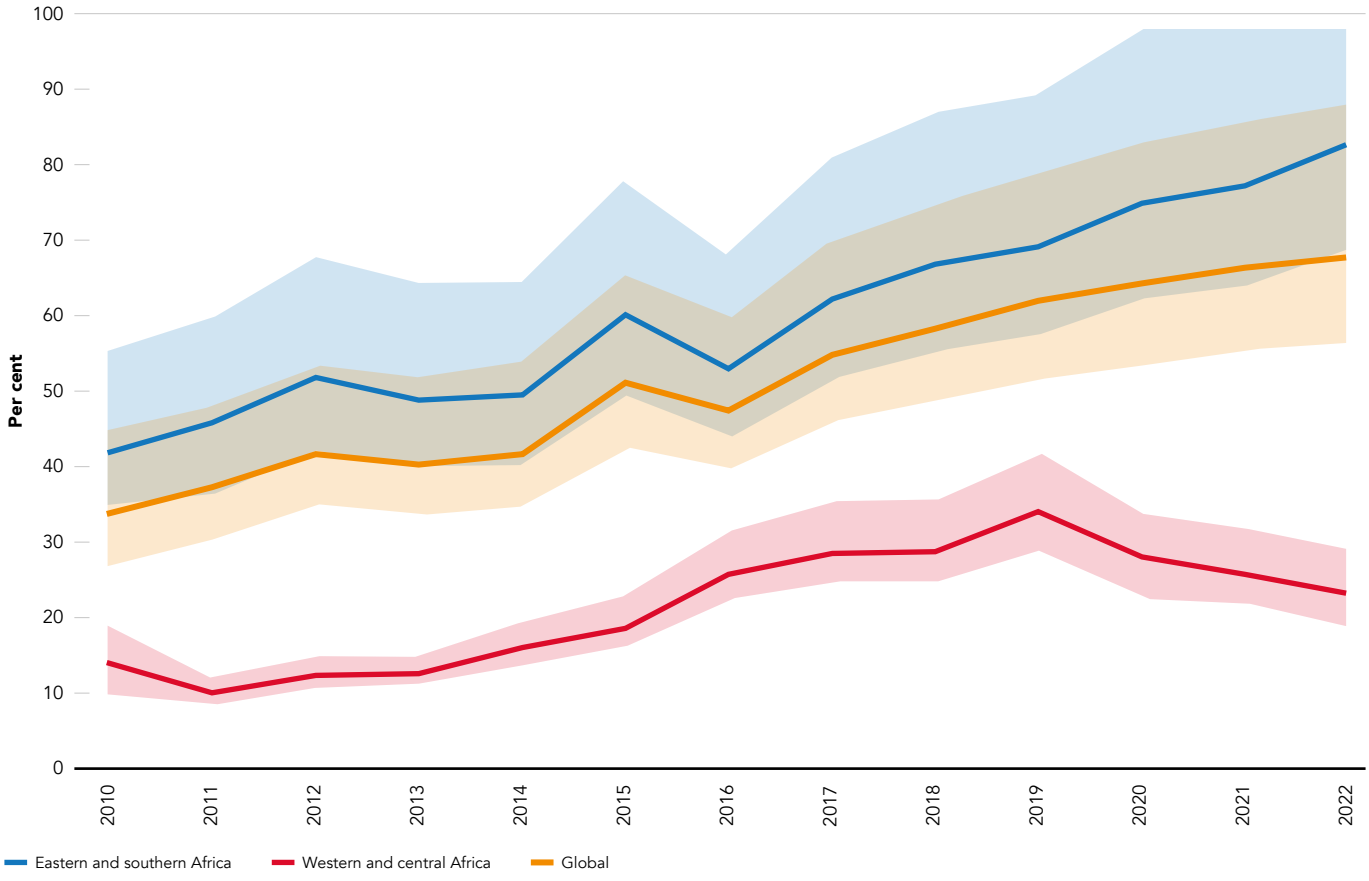
### For children living with HIV, the treatment gaps are still wide

Children (aged 0–14 years) are still much less likely than adults to receive antiretroviral therapy. Coverage among children living with HIV was 57% [44–78%] in 2022, compared with 77% [65–89%] among adults—and that gap is widening. Approximately 660 000 children living with HIV were not receiving antiretroviral therapy in 2022. As a result, children accounted for 13% of AIDS-related deaths in 2022, even though they comprise only about 4% of people living with HIV.

Wider adoption of point-of-care early infant diagnosis will help close that gap. WHO recommends that all infants exposed to HIV receive a virological HIV test within two months of birth. In a randomized study (*n*=6605) in Mozambique and the United Republic of Tanzania, AIDS-related deaths among infants in their first 6 months of life were reduced by 73% when point-of-care diagnosis was provided and rapid linkage to antiretroviral therapy was achieved *(59)*. Early infant diagnosis coverage has risen in eastern and southern Africa (to 83% [69–98%]) but remains very low in western and central Africa (23% [19–29%]) (Figure 2.5).

**Early infant diagnosis within the first two months of life has to increase further, especially in western and central Africa**

**Figure 2.5** Percentage of HIV-exposed children who were tested for HIV by two months of age, global and selected regions, 2010–2022




Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/)

Even when infants exposed to HIV are tested for the virus in the first two months of life, many care givers do not receive their test results. This can be changed with integrated person-centred procedures that track mother–infant pairs and ensure mothers receive the test results. Testing strategies that go beyond early infant diagnosis are also essential: 62% of children living with HIV but not on treatment are estimated to be aged between 5 and 14 years. If outpatient testing and family index testing increase, more undiagnosed children and adolescents living with HIV can be linked to treatment and care.

The health outcomes of children who do receive HIV treatment remain worse than for adults. Approximately 81% [63–>98%] of children living with HIV had a suppressed viral load in 2022, compared with 93% [79–>98%] of adults (aged 15+ years). This is partly due to suboptimal paediatric HIV medicines and challenges in retaining children in care. The situation is likely to improve if more countries use dolutegravir-based regimens, an optimal treatment protocol for children. In 2022, 73 countries were using those regimens, up from 33 at the end of 2021.

## New commitments to end AIDS in children

Twelve African countries have set out fresh plans to end AIDS in children by 2030.[3] The first ministerial meeting of the Global Alliance to End AIDS in Children in early 2023 issued the Dar-es-Salaam Declaration,[4] which focuses on both the parental and childhood factors that contribute to HIV transmission, missed diagnoses, and morbidity and mortality.

The declaration sets out 10 commitments that can clear the way towards ending AIDS in children:

- Provide access to universal testing and treatment for all children and adolescents living with HIV and support them to remain virally suppressed.
- Ensure access to treatment and care for all pregnant and breastfeeding women and support them to stay in care.
- Harness digital technologies to reach adolescents and young people.
- Implement comprehensive, integrated HIV services.
- Work with and for men, women and adolescent girls to ensure mothers are protected from acquiring HIV during pregnancy and breastfeeding.
- End the stigma, discrimination and gender inequities experienced by women, children and adolescents affected by HIV.
- Work with communities, including men, to prevent gender-based violence and counter harmful gender norms.
- Ringfence budgets for ending AIDS in children.
- Partner with people living with HIV and communities in all this work.
- Monitor and share progress and learning for joint accountability and for the benefit of all.

[3] The 12 countries are Angola, Cameroon, Côte d'Ivoire, Democratic Republic of the Congo, Kenya, Mozambique, Nigeria, South Africa, Uganda, United Republic of Tanzania, Zambia, Zimbabwe.
[4] The Dar es Salaam Declaration for Action to End AIDS in Children. Geneva: Joint United Nations Programme on HIV/AIDS; 2023 (https://www.unaids.org/en/topic/alliance-children/dar-es-salaam-declaration, accessed 5 July 2023).

# Prevention and treatment services are missing millions of people

HIV risk and incidence vary substantially by population, risk behaviours, age and place. HIV responses, especially prevention programmes, have to be much better at combining and focusing proven interventions where rates of HIV infection are especially high, and at fostering social and legal environments that will make it easier for people to use and benefit from those services.

Similarly, for all the remarkable gains made over the past two decades, testing and treatment services are still missing millions of people, many of whom belong to marginalized key populations.

## The full potential of PrEP is not being realized

PrEP is a potentially crucial tool for HIV prevention for people who are at high risk of acquiring HIV, including people from key populations, and women and adolescent girls in eastern and southern Africa.

The total number of people using oral PrEP globally has risen from a little over 233 000 in 2019 to over 2.5 million in 2022, with the steepest increases occurring in eastern and southern Africa (Figure 2.6). Overall, however, the expanded provision of PrEP is limited to a small number of countries. The biggest gaps are among people from key populations in low- and middle-income countries, especially in Asia and the Pacific, where almost a quarter of new HIV infections occurred in 2022. Data reported through the Global AIDS Monitoring system indicate that women slightly outnumbered men among people who use PrEP.

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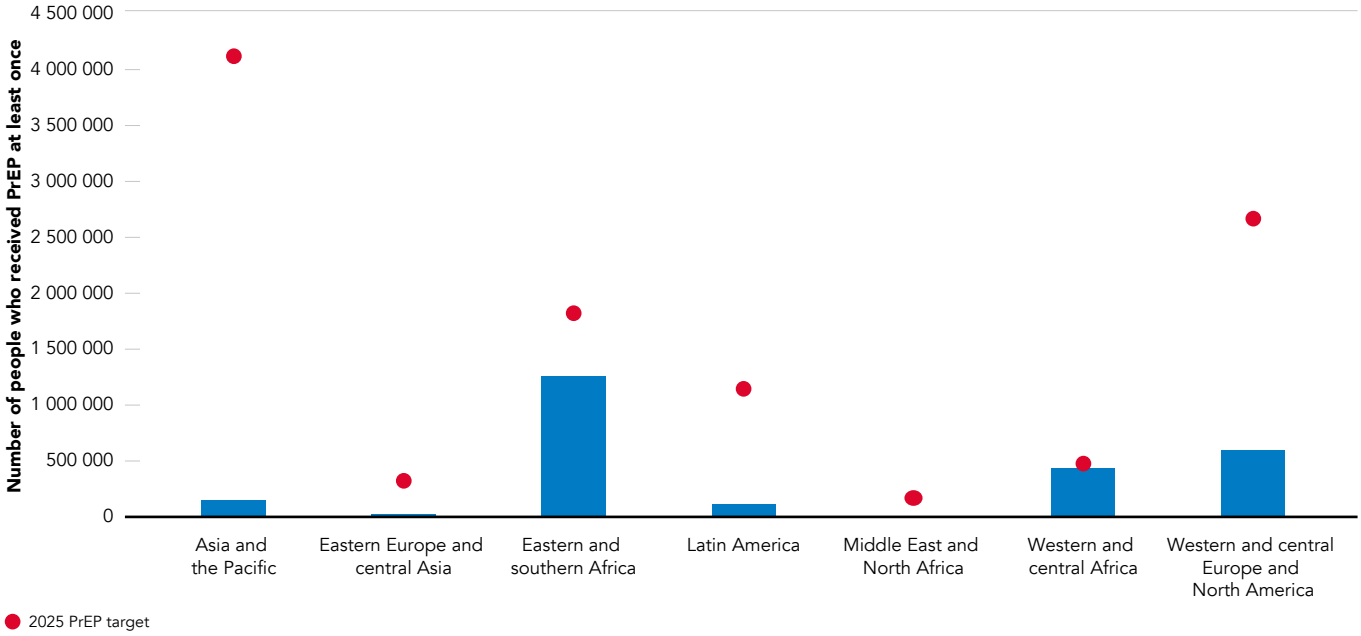
## HIV risk and incidence vary substantially by population, risk behaviours, age and place

HIV responses have to be much better at combining and focusing proven interventions where rates of HIV infection are especially high, and at fostering social and legal environments that will make it easier for people to use and benefit from those services.

**Except for one region, PrEP use trails very far behind the estimated need**

**Figure 2.6** Number of people who received pre-exposure prophylaxis (PrEP) at least once during the reporting period, by region, 2022, and 2025 target




Source: UNAIDS Global AIDS Monitoring, 2023 (https://aidsinfounaids.org/); Stover J, Glaubius R, Teng Y, Kelly S, Brown T, Hallett TB et al. Modelling the epidemiological impact of the UNAIDS 2025 targets to end AIDS as a public health threat by 2030. PLoS Med. 2021;18(10):e1003831.

It is vital to increase awareness of PrEP and normalize it as a prevention option among potential users, including through social media and outreach programmes *(60, 61)*. PrEP can be made available in more flexible and convenient ways (e.g. via community drop-in centres, mobile clinics and pharmacies) *(62)*, while removing or reducing associated out-of-pockets costs could also increase uptake *(63)*. Multimonth dispensing, use of virtual service platforms, removal of parental consent and encouraging larger roles for community-led organizations can further increase use of this powerful prevention tool.

Effective use of PrEP is a challenge in some respects. Evidence from the HPTN 084 trial indicated that taking two oral PrEP tablets a week provides almost complete protection against HIV acquisition *(64)*. For cisgender women, similar levels of protection require taking PrEP tablets at least four to six times a week *(65)*. In studies and demonstration projects, adherence to oral PrEP tends to be low. For example, only 18% of women participating in the HPTN 084 trial took 4 or more doses per week *(64)*, and a study from Kenya reported that less than 10% of people who started taking PrEP returned for a refill 3 months later *(66)*. Fear of stigma, a low sense of HIV risk, incomplete knowledge about PrEP, and concerns about side-effects are among the reasons cited for interrupting or halting its use *(67–69)*. In a study from Seattle in the United States of America, a substantial proportion of gay and other men who have sex with men began and then stopped using oral PrEP, with affordability, side-effects and perceived low risk being the main reasons cited for stopping *(70)*. This highlights the need for additional prevention options, including long-acting PrEP (see Chapter 3) and vaginal rings.

Increasing knowledge and acceptance of PrEP through awareness campaigns could foster a more supportive social environment for effective use of PrEP (71). The prevention successes achieved in Australia with PrEP have relied on concerted efforts by clinics and community organizations to increase awareness and make services more accessible and convenient. The lack of discriminatory laws and presence of a mature and well-resourced LGBTQI+ movement have underpinned this work (72). It is also important to share detailed information about side-effects with people who use PrEP and to offer strategies for shifting from daily use to event-based PrEP.

The dapivirine vaginal ring is a promising option. Although high, the current effectiveness of the ring in preventing HIV infection does not yet match that of optimal use of oral PrEP *(73)*. Studies show, however, that women tend to favour this discreet and long-lasting prevention tool (as do male partners) *(74)*, and both retention and adherence levels are high *(75)*. Currently, the ring has been licensed for use only in Africa, with Kenya, South Africa, Uganda, Zambia and Zimbabwe having approved its rollout *(76)*.

# Antiretroviral medicines for HIV prevention

In most cases, when effective HIV treatment is taken regularly and consistently, it leads to suppression of the virus to a point where it becomes undetectable. The evidence shows that there is zero risk for people living with HIV with an undetectable viral load to transmit HIV sexually.

Findings from the 2011 HPTN 052 clinical trial, which tracked more than 1600 heterosexual couples over 10 years, showed that consistent suppression of HIV with antiretroviral therapy prevents sexual transmission of the virus *(77, 78)*. Two additional studies—PARTNER 1&2 *(79)* and Opposites Attract *(80)*—extended those findings to male–male couples and provided conclusive evidence that these finding are as applicable to gay, bisexual and other men who have sex with men as they are to male–female couples.

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**IN 2022, 21 MILLION PEOPLE WERE TESTED FOR ROUTINE VIRAL LOAD, COMPARED WITH ONLY 6 MILLION PEOPLE IN 2015**

In 2022, 93% [79–100%] of people living with HIV on antiretroviral therapy were virally suppressed globally. This is an estimated 71% [60–83%] of the 39.0 million [33.1 million–45.7 million] people living with HIV. There has been significant progress—in 2022, 21 million people were tested for routine viral load, compared with only 6 million people in 2015. Today, the majority of people living with HIV who are aware of their HIV-positive status and are taking their treatment as prescribed are not at risk of transmitting HIV sexually.

Effective scale-up of the use of antiretroviral medicines for HIV prevention requires that differentiated people-centred approaches and systems are in place to provide an enabling environment for people living with HIV. This means ensuring that medicines can be taken freely and on time without exposure to stigma and discrimination, that treatment literacy is prioritized, and that health systems are both robust (no stockouts of effective medications) and people-centred, so that viral load can be monitored for all. Strong community engagement and well-established networks are essential to ensure full access to viral load testing and sharing of results so there is knowledge of viral load status. Barriers hindering access to affordable HIV services for people from key and vulnerable populations, including migrants and refugees, need to be removed.

Estimated rates of viral suppression globally are lower among children living with HIV (46% in 2022) and men living with HIV (67% in 2022), compared with women living with HIV (76% in 2022). Antiretroviral therapy coverage is lower among people from key populations than among the general population, with an estimated global median of 44% among transgender people (16 reporting countries), 65% among sex workers (33 reporting countries), 69% among people who inject drugs (22 reporting countries), and 78% among gay men and other men who have sex with men (44 reporting countries). Inequalities in treatment outcomes arise when services are inaccessible and do not meet the needs of underserved populations who are not well served by mainstream health services *(81)*.

The findings on the efficacy of antiretroviral medicines for HIV prevention have given rise to the uptake of the community slogan Undetectable = Untransmissible, or U = U. This is an important public health message for the HIV response. A range of barriers must still be lifted to make U = U a reality for all people living with HIV, but the U = U message is gaining appeal across the world as a rallying call for increased access to HIV treatment, better services for people living with and affected by HIV, and less stigma and discrimination.

# Condom programmes are falling off the agenda

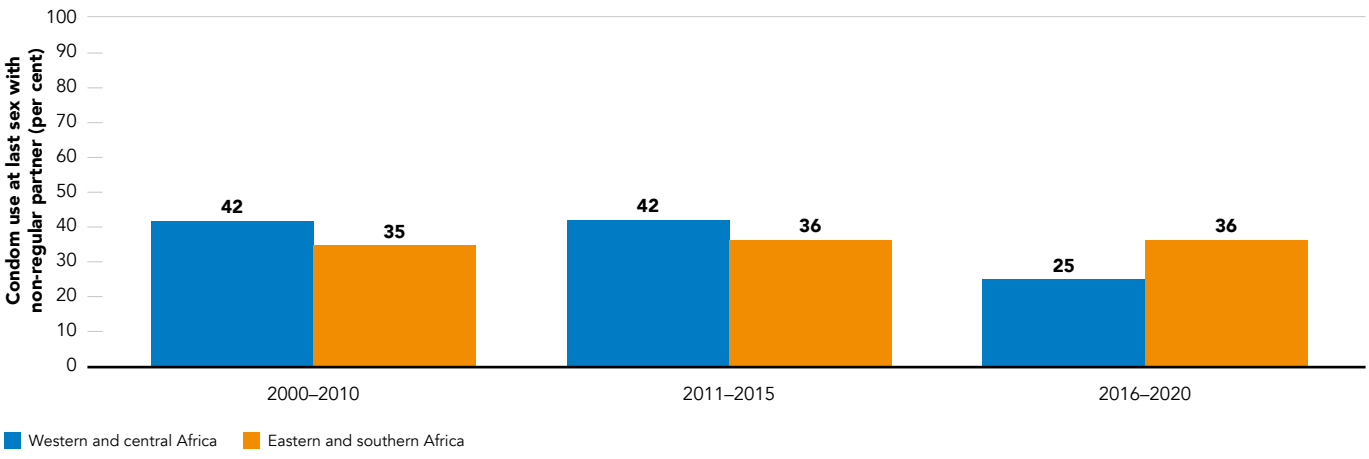
Inexpensive and familiar to most people, condoms remain an integral part of a comprehensive prevention package and are important for triple protection. They are the only method for simultaneously preventing HIV, other sexually transmitted infections, and unintended pregnancy. By combining various prevention methods, such as condoms alongside PrEP or antiretroviral therapy, people can achieve added protection against HIV and sexually transmitted infections. Gaps persist, however, in both the availability and use of condoms, against a background of reduced investments in social marketing programmes.

The Global Fund to Fight, AIDS, Tuberculosis and Malaria, UNFPA and the United States Agency for International Development (USAID) continue to play major roles in the supply of male and female condoms and lubricants to low- and middle-income countries. Five billion male and female condoms were procured by UNFPA and partners from 2018 through 2022, most of which were provided to countries in sub-Saharan Africa. It has been estimated that condoms had the potential to avert 24.9 million sexually transmitted infections, 570 000 HIV infections and 16.3 million unintended pregnancies *(82)*.

Recent years, however, have seen the defunding of condom programmes and reduced emphasis on demand-generation activities in some countries *(83)*. As a result, new generations of young people are lacking adequate information about condoms and access to them. A 2020 systematic review reported that condom promotion programmes were generally effective in changing attitudes, social norms and beliefs in favour of condom use *(84)*. Low levels of consistent condom use during risky sex (Figure 2.7) point to a need to revive sustained demand generation.

### Condom use during risky sex remains low in sub-Saharan Africa

**Figure 2.7** Consistent condom use by adolescent girls and young women (15–24 years) at last sex with non-regular partner, eastern and southern Africa and western and central Africa, 2000–2020




Source: Demographic and Health Surveys, 2000–2020.
Note: data are based on countries with available data during the time period and do not necessarily reflect trends.

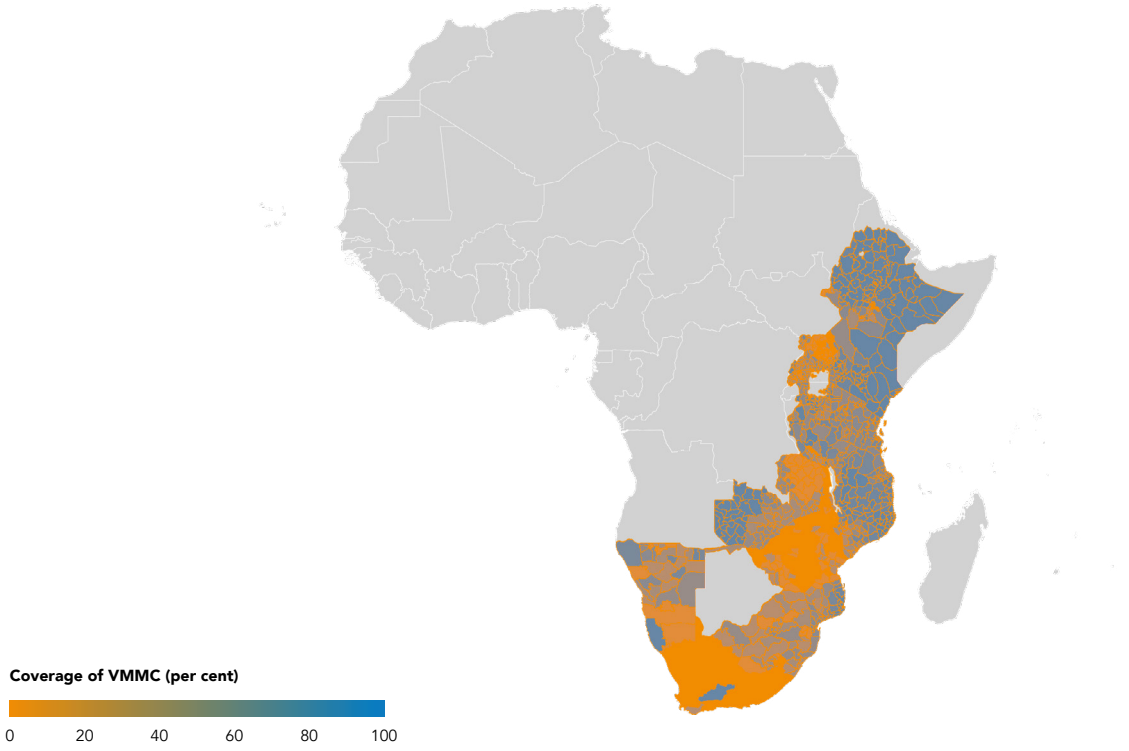
# Voluntary medical male circumcision (VMMC) can make an even bigger contribution in eastern and southern Africa

VMMC is contributing significantly to reducing numbers of new HIV infections in the 15 priority countries in eastern and southern Africa where the service is recommended as a core element of HIV prevention. VMMC reduces a man's risk of heterosexual HIV acquisition by up to 60% and is an evidence-based, cost-effective, once-off intervention that provides lifelong individual benefit without requiring any subsequent behaviour or action on the part of the person or health-care system.

By the end of 2022, almost 35 million men and boys had opted for VMMC in the priority countries since 2008. The potential of this cost-effective prevention tool is not yet fully realized, however. Coverage differed markedly between countries and at subnational levels and was below the targeted 90% in almost two-thirds of districts in those 15 countries (Figure 2.8). Uptake of VMMC has generally not returned to pre-COVID-19 levels.

**VMMC coverage is still well below the 90% target in most provinces and districts in the 15 priority countries**

**Figure 2.8** Coverage of voluntary medical male circumcision (VMMC) among boys and men (aged 15–49 years), subnational level (administrative level 2), eastern and southern Africa, 2022




Source: special analysis by Avenir Health using the DMPPT2 tool and by Imperial College London using the 3MC tool; UNAIDS Global AIDS Monitoring, 2023 (https://aidsinfo.unaids.org/).
Note: VMMC priority countries with available data: Eswatini, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Namibia, South Africa, United Republic of Tanzania, Uganda, Zambia, Zimbabwe. Data were not available for Botswana, Rwanda and South Sudan.
Note: VMMC coverage was determined using a geospatial model incorporating self-reported household survey data and national programme data on VMMC. For more information see the VMMC Implementation Planning Toolkit (vmmcipt.org).

VMMC programmes face two major challenges—a funding squeeze, and the need to reach more men in their twenties and older (services have focused especially on adolescents so far). A few countries, Malawi among them, are having some success in focusing their VMMC programmes on younger men. However, funding has diminished. The United States President's Emergency Plan for AIDS Relief (PEPFAR) funding for VMMC programmes in the 15 priority countries has declined by almost half since 2020 (from about US$ 285 million to US$ 147 million).

VMMC services have tended to miss men with lower incomes and men living in rural areas. Data from Population-based HIV Impact Assessments from 2015 to 2019 indicate that uptake of VMMC tends to be poorer among men in lower wealth quintiles. Services at schools and in workplace settings are not ideal for reaching those men, while services at health facilities can involve costly transport expenses *(85)*. Programmes can also do better at convincingly addressing men's concerns about possible adverse effects and community stigma, and at highlighting the broad HIV and other health benefits of VMMC *(86, 87)*.

## A road map towards boosted HIV prevention

The HIV 2025 Prevention Road Map, developed by the Global HIV Prevention Coalition, sets out 10 key actions that can lay the basis for high-impact prevention programmes for people from key and priority populations that ensure wide availability of proven HIV prevention tools (such as condoms, VMMC in eastern and southern Africa, harm reduction services and antiretroviral therapy) alongside new tools (such as vaginal and oral or long-acting injectable PrEP) *(88)*. The road map stresses that HIV prevention services should be delivered alongside stepped-up efforts to deliver rights-based sexual and reproductive health services, provide good-quality secondary education that includes comprehensive sexuality education, eliminate gender-based violence and harmful gender norms, and empower women and girls.

## People-centred approaches can close many of the treatment gaps

The reach of HIV testing and treatment services must increase, and barriers blocking access to them—such as user fees, stigma, discrimination and criminalization—must be removed. The aim is to ensure that everyone living with HIV is diagnosed, rapidly linked to life-saving antiretroviral therapy, and able to achieve the sustained viral suppression that will protect their health and remove the risk of transmitting HIV to their sex partners.

## Children and adolescents with HIV are losing out

Even though numbers of AIDS-related deaths among children (aged 0–14 years) were reduced by 64% in 2010–2022, the epidemic still claimed the lives of an estimated 84 000 [56 000–120 000] children in 2022. This was due largely to the failure to diagnose and provide life-saving treatment to some 660 000 children living with HIV—close to half of the 1.5 million children living with HIV.

It is estimated that only about 65% of adolescents (aged 10–19 years) living with HIV were receiving antiretroviral therapy in 2022—much lower than the 77% antiretroviral therapy coverage among adults (aged 15+ years) overall. HIV-related stigma, including from health-care providers, unsupportive school environments *(89)*, and the emotional and behavioural challenges associated with adolescence make it difficult for many adolescents living with HIV to remain in care and adhere to treatment.

Age-of-consent laws for HIV testing, poverty and lack of financial autonomy are additional barriers. Stronger social support (including via digital platforms) *(90)* and legal, health facility- and school-based interventions can improve treatment outcomes for adolescents. Adolescent girls living with HIV may face the additional challenge of pregnancy, which also calls for peer and other tailored support *(91)*.

## Treatment gaps between men and women are wide

Along the HIV testing and treatment cascade, adult men are significantly less likely than women to be receiving treatment in sub-Saharan Africa, the Caribbean, and eastern Europe and central Asia. Analysis of population-based surveys from 16 sub-Saharan Africa countries, for example, found that over time, men became less likely than women to take an HIV test *(92)*. It is estimated that in 2022, 89% of adult men living with HIV in that region knew their HIV-positive status, 78% were accessing treatment and 73% were virally suppressed. Among women, the corresponding coverage levels were 93%, 86% and 80%.

**IT IS ESTIMATED THAT IN 2022 IN SUB-SAHARAN AFRICA, 78% OF ADULT MEN LIVING WITH HIV WERE ACCESSING TREATMENT COMPARED TO 86% OF ADULT WOMEN**

When men living with HIV are diagnosed and start antiretroviral therapy, however, they tend to be as successful as women in suppressing their viral loads. Globally, about 93% of women and men on treatment had suppressed viral loads in 2022, although men fared considerably worse than women in eastern Europe and central Asia and in western and central Africa. Closing the treatment gap is vital for protecting people's health and for breaking cycles of HIV transmission. If more people living with HIV know their HIV-positive status, start and stay on antiretroviral therapy, and reach sustained viral suppression, fewer of their sex partners will acquire HIV.

The causes of these treatment disparities are complex. They include gender norms that emphasize male fortitude and resilience, as well as financial and other costs that can deter people from seeking health care, confidentiality concerns and fear of stigma, inconvenient opening hours and long waiting times at clinics, and the design of health systems themselves *(93–97)*. A review of 56 studies noted that many health facilities in sub-Saharan Africa have been geared for easing access and use for women, especially mothers, and that this may contribute to men's generally poor engagement with health services, including HIV services *(98)*.

Many of the changes that can improve the coverage and outcomes of HIV treatment among men would make it easier and more convenient for everyone to use HIV testing and treatment services. These include greater use of HIV self-testing *(99)*, partner-engagement approaches for testing, workplace-based interventions, social network strategies, provision of convenient HIV services at outpatient departments, and targeting of venues frequented by people who are more likely to be exposed to HIV *(100–103)*. As of July 2022, 52 countries were implementing self-testing policies, mostly in eastern and southern Africa and western and central Europe *(104)*.

Ridding health-care facilities of stigma and discrimination is crucial, along with reducing cost and other financial barriers and removing laws that make people, including members of key populations, distrustful or fearful of health services. When client-centred training and mentoring were introduced at 24 clinics in Lusaka, Zambia, retention rates improved, especially among younger people (aged <25 years) *(105)*. Flexible opening hours and shorter waiting times at clinics, reliable supplies of medicines and fewer routine clinic visits can make it easier for people to start and stay on treatment. Digital platforms and virtual meeting spaces offer news ways to access counselling and support.

Tailored support at health facilities and from community-led organizations would enable people of all genders, ages and populations to remain in HIV care. A large study from South Africa found good long-term clinical outcomes in adults who remain in community antiretroviral therapy programmes. They were more likely to be retained in care and achieve viral suppression than those who moved to a clinic-based care *(106)*.

A variety of differentiated service delivery approaches are being used for HIV treatment, many of them combining clinic-based and community-based services *(107)*. Community-led interventions are especially crucial for ensuring people from key populations can access and fully benefit from HIV treatment, and they can have the added benefit of reducing the burden on clinics *(106)*. Community-led monitoring has also been shown to be a valuable source of information for improving HIV services *(108)*.

**WHEN CLIENT-CENTRED TRAINING AND MENTORING WERE INTRODUCED AT 24 CLINICS IN LUSAKA, ZAMBIA, RETENTION RATES IMPROVED, ESPECIALLY AMONG YOUNGER PEOPLE**

Experiences during the COVID-19 pandemic have dispelled concerns about entrusting people with greater responsibility for managing the routine aspects of their own HIV care. There continues to be strong evidence to support such approaches. Studies from Kenya, Nigeria, South Africa and Uganda have confirmed the benefits of multimonth dispensing *(106, 110)*. Analysis of data from observational studies and randomized controlled trials found that retention in HIV care was similar when the number of routine clinical consultations was reduced (from twice to once a year) and antiretroviral medicine refills were dispensed for longer periods (six rather than three months) *(110)*.

# Advanced HIV disease is posing new challenges

Despite successes in expanding the availability of HIV testing and treatment worldwide, advanced HIV disease remains a major reason for the continuing, high numbers of AIDS-related deaths.[5] People, women and men, who present with advanced HIV disease are especially susceptible to severe illness and death, even after starting antiretroviral therapy *(111)*. The most common causes of death among adults with advanced HIV disease are tuberculosis (TB), cryptococcal meningitis and severe bacterial infections *(112–115)*.

The proportion of people who start antiretroviral therapy with advanced HIV disease has been diminishing. Recent estimates suggest that 30–40% of people starting antiretroviral therapy in low- and middle-income settings have advanced HIV disease *(116)*, but up to half of people in some settings still present to care with advanced HIV disease *(117)*.

The profile of people with advanced HIV disease is changing, however. Previously, most cases of advanced HIV disease were seen among people starting antiretroviral therapy for the first time. There is now growing concern about the prevalence of advanced HIV disease and mortality among people who started and then stopped HIV treatment but are now returning to HIV care.

Overall, it has been estimated that about a quarter of people interrupt treatment at some point after starting antiretroviral therapy, for periods that range from a few days to more than six months *(120)*. A study from South Africa found that about one in five people admitted to hospital with advanced HIV disease had previously initiated and interrupted their antiretroviral therapy, and a further 21% of people admitted to hospital were on antiretroviral therapy but with an unsuppressed viral load *(119)*. The underlying reasons are likely to include stigma and discrimination, side-effects of the medicines, affordability issues and unreliable service provision *(114)*.

There are several ways to deal with these troubling developments. A first priority is to reduce late HIV diagnosis with more efficient HIV testing strategies and ensure that people who test positive for HIV are rapidly initiated on treatment and able to remain in care. More effective support, including social and mental health support from health-care providers and community organizations, would make it easier for people to remain in HIV care and achieve sustained viral load suppression *(120)*. That includes strengthening referral systems so people can continue to receive and fill their antiretroviral medicine prescriptions if they change residence. Also needed is the removal of factors that make it more difficult to stay in care. They include stigma and discrimination, especially at health-care facilities, distant facilities, transport and opportunity costs, and long waiting times. Further increasing the use of dolutegravir-based first-line antiretroviral therapy regimens should also improve treatment adherence.

[5] Advanced HIV disease is defined by WHO as having a CD4 cell count below 200 cells/mm3 or symptomatic HIV disease *(112)*.

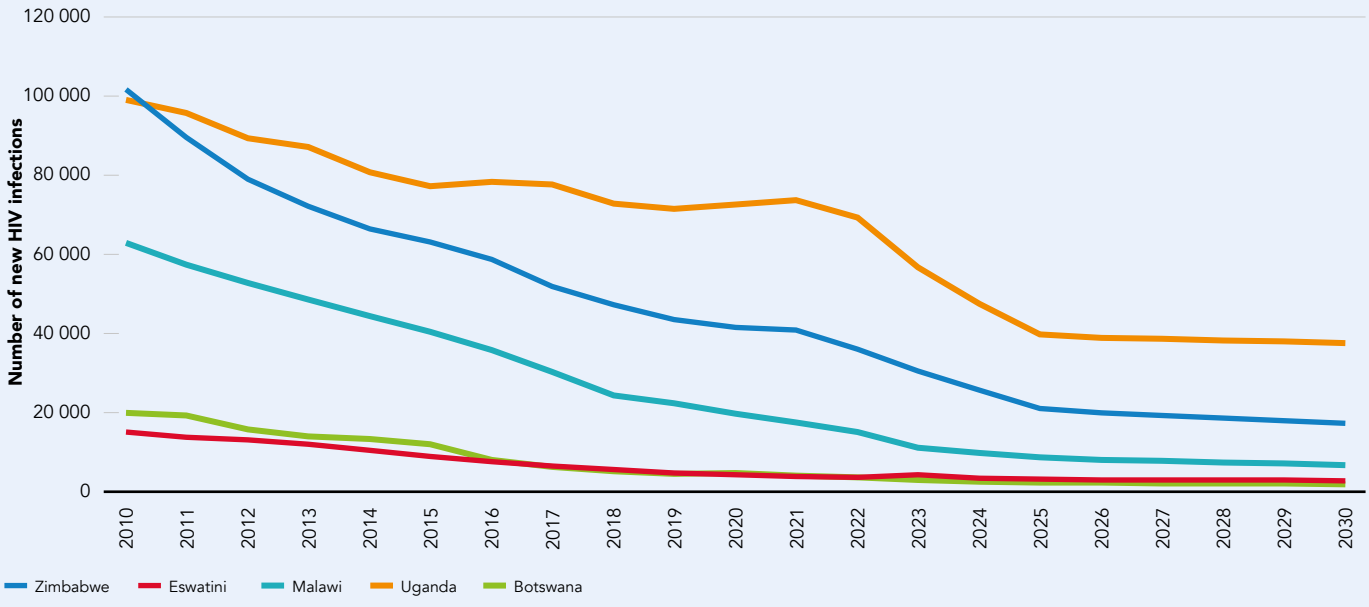
Effective procedures to re-engage people who drop out of care are needed. People who re-engage with care after treatment interruption and who have advanced HIV disease should be offered a comprehensive clinical assessment. WHO recommends that a package of screening, prophylaxis, rapid antiretroviral therapy initiation and intensified adherence interventions should be offered to everyone living with HIV who presents with advanced disease. The package includes interventions for preventing, diagnosing and treating common opportunistic infections, including TB, cryptococcal meningitis and severe bacterial infections, and for ensuring rapid initiation on antiretroviral therapy and intensified adherence support *(111)*. There is also a need to improve HIV literacy at the community level so that people living with HIV are aware of the services and support that could help them adhere to treatment.

## A long tail of new HIV infections

New modelling points to a sobering outlook for countries with large numbers of people living with HIV. In Uganda, for example, even if the 2025 targets for testing and treatment (95–95–95) are met, almost 40 000 people would still acquire HIV each year (Figure 2.9). Although this is considerably fewer than the number of new infections in 2015, these new infections will steadily add to the ranks of people who require lifelong HIV treatment and, if not virally suppressed, are at risk of transmitting HIV to others. It is imperative to intensify combination prevention and put in place enabling factors that boost prevention and treatment effectiveness. As clearly stated in the Global AIDS Strategy 2021–2026: End Inequalities, End AIDS, the full set of targets, including the 95–95–95 testing and treatment targets are required to end AIDS as a public health threat by 2030.

**In the absence of constant improvements, even steep reductions in new HIV infections can leave countries with ongoing lingering epidemics**

**Figure 2.9** Number of new HIV infections, selected countries, eastern and southern Africa, 2010–2022 and projected number of new HIV infections without scale-up of HIV prevention efforts, 2023–2030




Source: UNAIDS special analysis of epidemiological estimates, 2023.

# As people with HIV grow older, new challenges are emerging

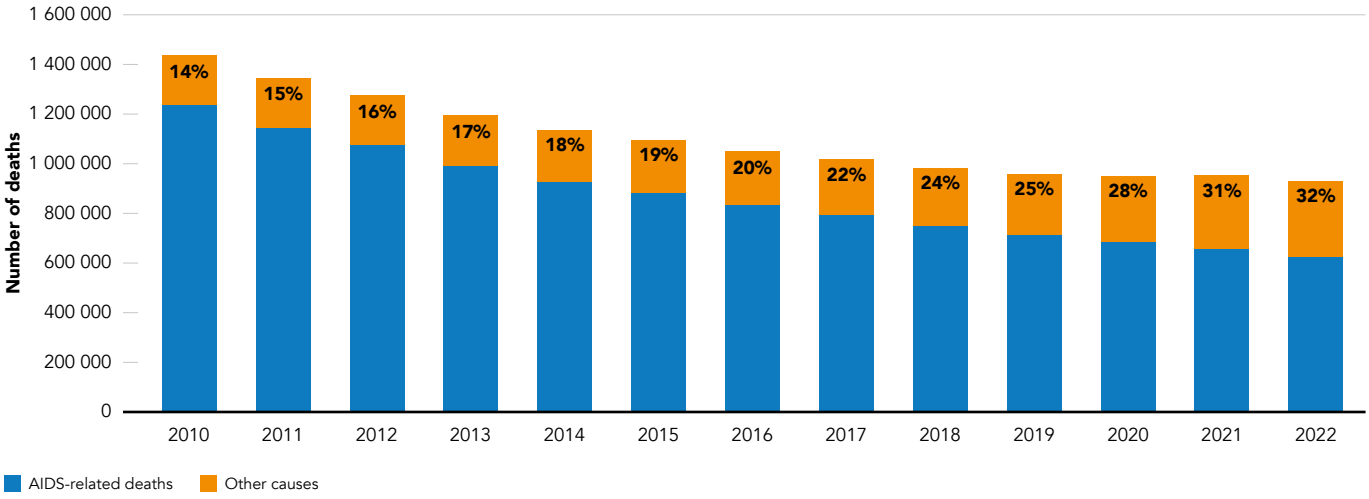
As the provision of life-saving HIV treatment continues, people are living longer with HIV. In 2022, an estimated 24% of people living with HIV globally were aged 50 years and older. In western and central Europe and North America, almost half of adults living with HIV are at least 50 years old. A recent study in Europe and North America concluded that for people with HIV who were on treatment and had high CD4 cell counts, life expectancy was only a few years less than for people in the general population, irrespective of when antiretroviral therapy was started *(123)*.

As people living with HIV live longer, they also contend with other health complications, in particular noncommunicable diseases, such as heart disease, cancer and diabetes. Women ageing with HIV experience menopause and may struggle to access appropriate information and care for these combined conditions *(122, 123)*. Noncommunicable diseases can complicate HIV treatment and threaten people's health and lives *(124)*. HIV also increases some of the risks associated with ageing. Some studies have reported a higher prevalence of comorbidities in people living with HIV than in people without HIV *(125)*. Among persons living with HIV, deaths are increasingly due to causes other than AIDS (Figure 2.10).

Systems in some countries are evolving to meet the complicated and shifting needs of ageing people living with HIV, but the adjustments tend to be piecemeal and are undermined by a lack of integration between ageing-related and HIV-related services and support *(126)*. Differentiated service approaches might have to adapt—for example, by shifting antiretroviral therapy outside of clinical settings, because many settings are not ideal for older adults with comorbidities and who require different types of clinical monitoring and support *(126)*.

**People with HIV are increasingly likely to die of causes that are not AIDS-related**

**Figure 2.10** Deaths among people living with HIV, by cause, 2010–2022




Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).

# HIV responses still neglect people from key populations

Globally, the HIV response among people from key populations has stalled. In many places it never really got off the ground, and in some places it is regressing. Weak political will, social conservatism, insufficient funding, rampant stigma and discrimination, and the ongoing use of punitive laws and policies that restrict access to HIV and other health-care services are blocking progress.

Preliminary UNAIDS analysis based on countries with available trend estimates suggest that sex workers and clients experienced decreases in new infections from 2010 to 2022, often in line with overall national trends, whereas gay men and other men who have sex with men, transgender people and, in some regions, people who inject drugs have not benefited equally from HIV prevention and treatment services. Failure to protect people from key populations against HIV will prolong the pandemic indefinitely, at great cost to the affected communities and societies.

In addition to wilful neglect, denial and apparent ignorance about the epidemiological situation are major obstacles to effective prevention and treatment for people from key populations. A surprising number of countries lack programmes, size estimates and HIV data for key populations. In some cases, this absence of data serves as an alibi for inaction.

**FAILURE TO PROTECT PEOPLE FROM KEY POPULATIONS AGAINST HIV COMES AT GREAT COST TO THE AFFECTED COMMUNITIES AND SOCIETIES**

UNAIDS analysis shows there are many millions more people from key populations globally than indicated in country-reported size estimates. Countries are either undercounting key populations or, in many cases, providing no data for them. In the Middle East and North Africa, for example, many countries have collected barely any data for key populations that can be used for HIV responses. The biggest size estimate gaps overall are for people who inject drugs and transgender women.

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## Little progress in reducing new HIV infections in key populations over the past decade

Weak political will, social conservatism, insufficient funding, rampant stigma and discrimination, and the ongoing use of punitive laws and policies that restrict access to HIV and other health-care services are blocking progress.

# Higher risk, less protection, more HIV infections

People from key populations face much higher risks of acquiring HIV than other members of society, including in regions where HIV prevalence is also high in the general population. In 2022, compared with adults in the general population (aged 15–49 years), HIV prevalence was 11 times higher among gay men and other men who have sex with men, 4 times higher among sex workers, 7 times higher among people who inject drugs, and 14 times higher among transgender people.

Large prevention gaps remain the norm in most regions, often in the context of punitive laws, police harassment, and harsh stigma and discrimination. In sub-Saharan Africa, HIV incidence among gay men and other men who have sex with men was estimated to be almost 5 per 100 person-years in 2020, which is 27–150 times higher (depending on the country) than among adult men (aged 15+ years) overall in the region *(127)*.

Young people from key populations are highly vulnerable and struggle to stay healthy and safe in contexts marked by stigma, discrimination and harassment, punitive laws and social taboos *(128)*. In Asia and the Pacific, HIV prevalence among young gay men and other men who have sex with men more than doubled in Indonesia (from 6% to 13% between 2011 and 2019) and it almost tripled in Malaysia (from 6% to 15% between 2012 and 2022) and in Viet Nam (from 3% to 11% between 2011 and 2022).

Chemsex is a growing phenomenon in which people engage in sexual activity while taking primarily stimulant drugs, typically involving multiple participants and over a prolonged time *(130)*. There have been increasing reports of chemsex in some communities of gay men and other men who have sex with men—most often in high-income settings in Europe and North America, although a recent qualitative scoping review of sexualized drug use and chemsex among gay men and other men who have sex with men and transgender women found it to be increasingly common in Asia *(131, 132)*. Addressing chemsex, especially for people from key populations and their sexual partners, requires a comprehensive, nonjudgemental, person-centred approach. This can include integrated sexual and reproductive health, mental health services, needle-syringe programmes and opioid agonist maintenance treatment services, with linkages to other evidence-based prevention, diagnostic and treatment interventions *(132)*.

Intersecting discrimination and vulnerability lead to certain groups within key populations facing even higher levels of exclusion. According to a recent systematic review, the estimated prevalence of HIV among people who inject drugs ranged from about 5% in western Europe and North America, to 15–17% in Asia, to over 30% in eastern Europe and Latin America *(133)*. HIV prevalence is especially high among women who inject drugs, due in part to gender norms and inequalities, the added vulnerability to sexual violence and other violence *(134)*, and engagement in unsafe sex work. The median HIV prevalence among men who inject drugs was 9%, while it was nearly double (15%) among women who inject

drugs (16 reporting countries). Data for Europe show HIV prevalence is much higher among sex workers who inject drugs and among transgender sex workers than among non-injecting and cisgender female sex workers *(135)*. Global median HIV prevalence among sex workers is about 2.5% (85 reporting countries), but prevalence is close to 30% in eastern and southern Africa (13 reporting countries).

Depending on the key population, programmes to prevent HIV among people from key populations tend to be piecemeal and too far away, too inconvenient, or too small to shift HIV trends in these populations. Often, programmes are entirely absent. Income poverty furthers limit access *(136)*. In some cases, countries focus programmes on certain key populations but ignore others. Very often, young people from key populations, especially adolescents, have great difficulty accessing HIV and related services.

PrEP coverage among people from key populations is very low, typically under 5%, including among sex workers and gay men and other men who have sex with men. Studies show a high willingness to use HIV prevention, including PrEP, among gay men and other men who have sex with men *(137)*. In the absence of PrEP or sustained viral load suppression, condoms remain a vital prevention tool. Condom use at last sex among gay men and other men who have sex with men varies widely, ranging from more than 70% (25 of 73 reporting countries) to less than 50% (16 countries of 73 reporting countries). Among transgender people, it varies from more than 70% (14 of 33 reporting countries) to less than 50% (8 of 33 reporting countries). Only 39 countries reported providing condoms and lubricants to at least some people in prisons and other closed settings.

Among people from key populations, condom use at last sex tends to be most common among sex workers (more than 90% in 24 of 74 reporting countries), but it remains infrequent in some places (less than 50% in 10 of 74 reporting countries). A recent meta-analysis of survey data from sub-Saharan Africa among men who reported paying for sex in the past year reported that a little over 60% said they had used a condom the last time they had paid for sex. Encouragingly, condom use at last paid sex was higher in surveys done after 2010 (68%) than in those done earlier (47%) *(44)*.

In 2022, HIV programmes were further challenged by the mpox outbreak, which disproportionately affected gay men and other men who have sex with men, many of whom sought care in sexual health clinics. WHO reported over 87 000 confirmed cases of mpox between January 2022 and May 2023 *(138)*. It is estimated that 38–50% of those affected by the mpox outbreak in 2022 were people living with HIV, who in many communities face stigma and discrimination *(139)*. Current evidence indicates that mpox-related deaths during that period occurred only in people living with HIV *(140)*. Researchers continue to investigate the links between HIV and mpox and their potential implications for HIV services, and governments and vaccine manufacturers have been urged to ensure wide and equitable access to available vaccines.

HIV programmes that adopt non-dogmatic approaches and put people first are having an impact, especially when they engage people from

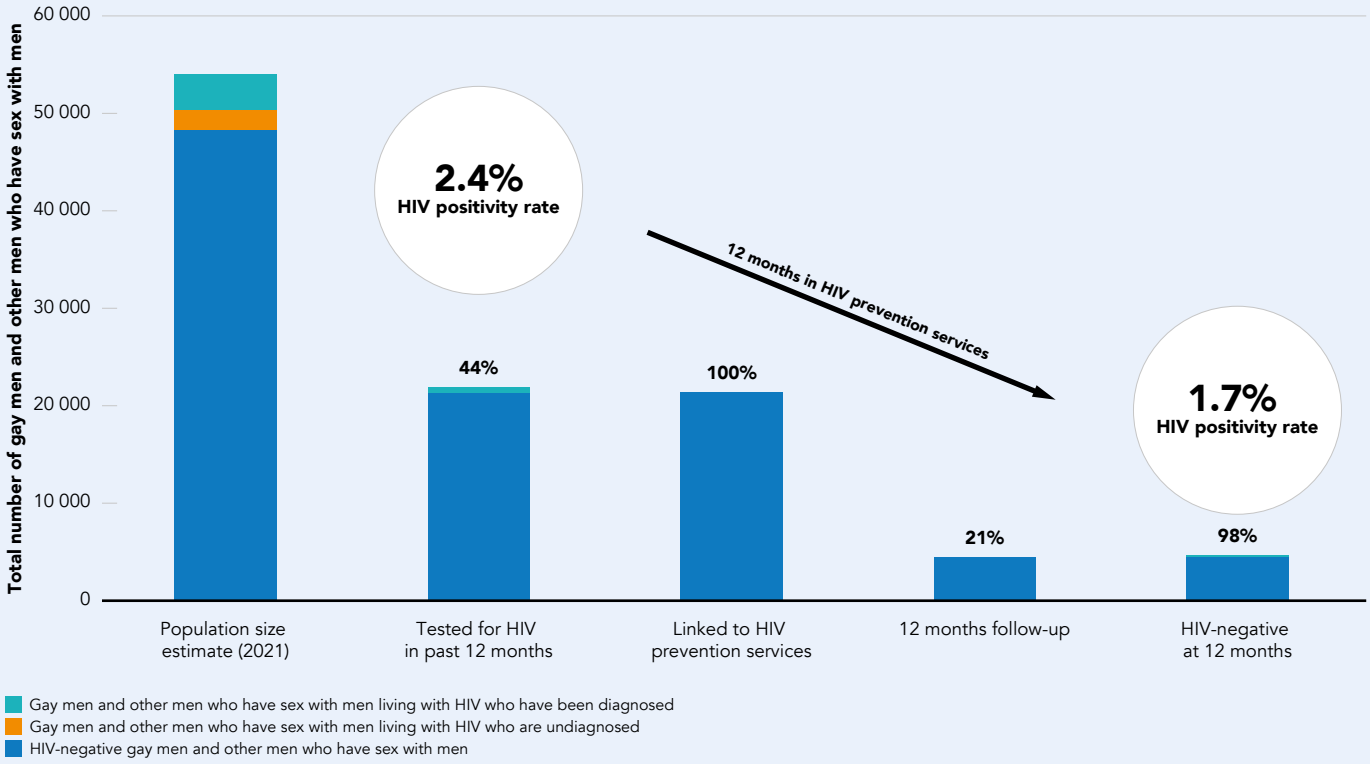
key populations and their organizations in crafting and carrying out effective interventions. Programmes that favour public health priorities over punitive and discriminatory approaches are making progress in different aspects of their HIV response (e.g. in Australia with PrEP roll out, Cambodia with prevention services for sex workers, Estonia and Portugal with services for persons who inject drugs, and Thailand and the United Kingdom of Great Britain and Northern Ireland with inclusive policies for gay men and other men who have sex with men)—but those success stories are far from being the norm.

## Prevention gains in a challenging context

When reliable data are available and appropriate prevention services are provided, gains can be made, even in a challenging context—as seen in El Salvador (Figure 2.11). Using a robust size estimate for gay men and other men who have sex with men, the Ministry of Health developed a nationwide programme that provided HIV testing to almost half of that key population. The men were linked to appropriate HIV services and asked to take another test after a year—one in five of the HIV-negative men returned for that test, and 98% of them had remained HIV-negative. The HIV-positivity rate among the men who stayed in contact with prevention services fell from 2.4% to 1.7%. This suggests the prevention services had an effect, even though there is much room for further improvement.

**Prevention services work when they are accessible and convenient**

**Figure 2.11** HIV prevention cascade for gay men and other men who have sex with men, El Salvador, 2021




Source: Ministry of Health, Spectrum Estimates of El Salvador, 2021; and Single System for Monitoring, Evaluation and Epidemiological Surveillance of HIV-AIDS (SUMEVE) Cascade at the closing of 31 January 2023.

# Harm reduction services are too scattered and too small

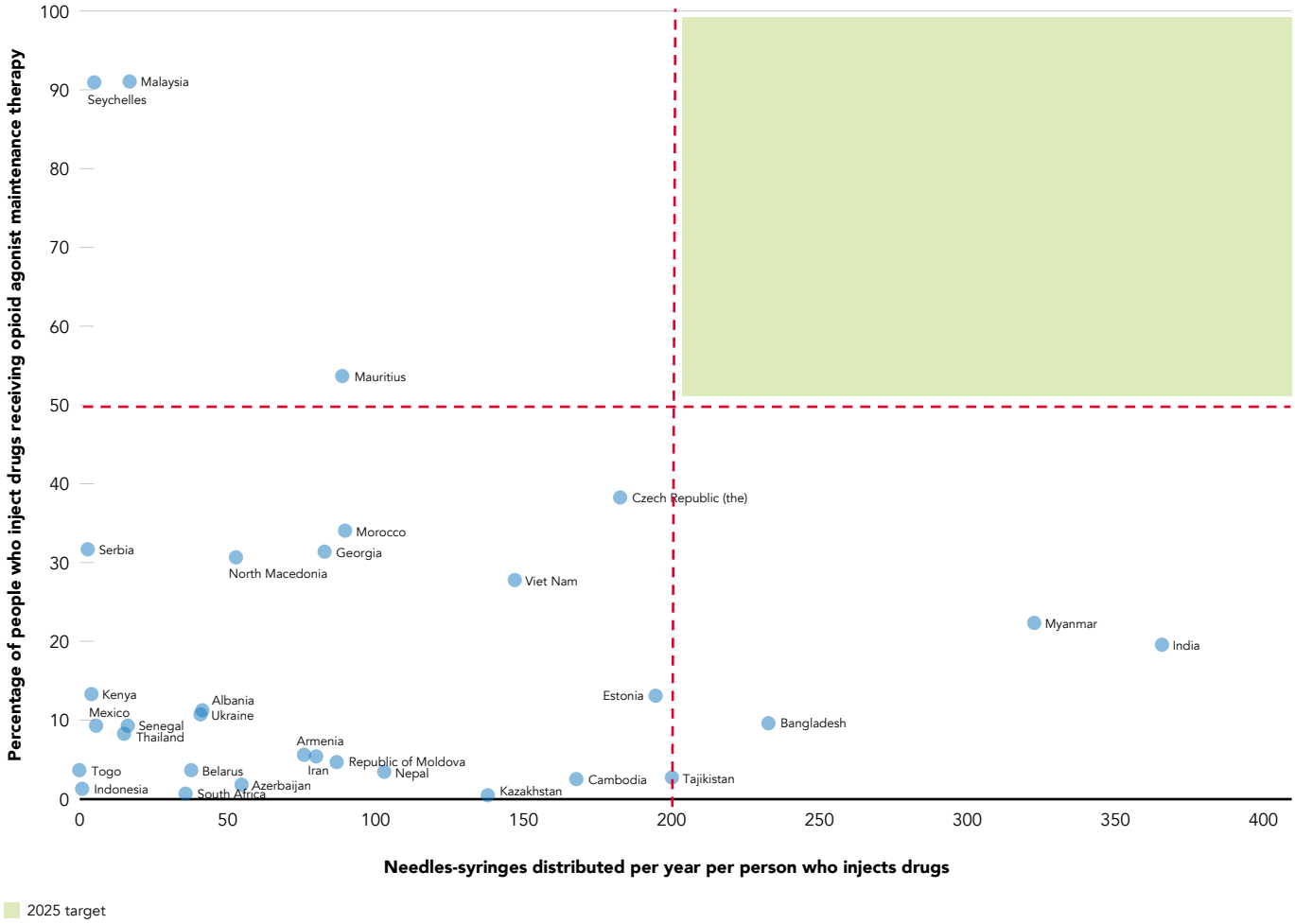
The positive public health impact of comprehensive harm reduction—including needle–syringe programmes, opioid agonist therapy and overdose treatment—is well established in the scientific literature (*141, 142*). Opioid agonist maintenance therapy was reported to be operational in 87 countries in 2022, but mostly on a small scale and often in the context of counterproductive law enforcement practices. Data reported to UNAIDS show that, since 2018, only 12 of the 28 reporting countries have achieved the 90% target for coverage of safe injecting practices.

Some countries are showing that prevention targets can be achieved if appropriate harm reduction policies are adopted, and sufficient funding is provided. Malaysia, Mauritius and Seychelles have achieved the 2025 target of reaching at least half of people who inject drugs with opioid agonist maintenance therapy. At the global level, however, there has been little change in the availability of opioid agonist maintenance therapy, with coverage still extremely low in all but a few countries. With some important exceptions, opioid agonist maintenance therapy reached less than 10% of people who inject drugs in six of 11 reporting countries in Asia and the Pacific and in seven of 11 reporting countries in eastern Europe and central Asia, regions where injecting drug use is an important driver of national HIV epidemics (see Figure 2.12). Seventy per cent of the estimated global need for opioid agonist maintenance therapy is in Asia and the Pacific.

The HIV-related needs of people in prisons and other closed settings continue to be neglected. Between 2018 and 2022, only seven countries had needle–syringe programmes for people in prisons and 27 countries provided opioid agonist therapy to people in prisons. These programmes are mostly small, with very limited coverage. Much stronger political will is needed to apply a public health approach to drug use and dependence.

**Very few countries are on track to reach the 2025 needle–syringe and opioid agonist maintenance therapy targets**

**Figure 2.12** Coverage of needle-syringe programmes and opioid agonist maintenance treatment among people who inject drugs and targets, countries with available data, 2018–2022



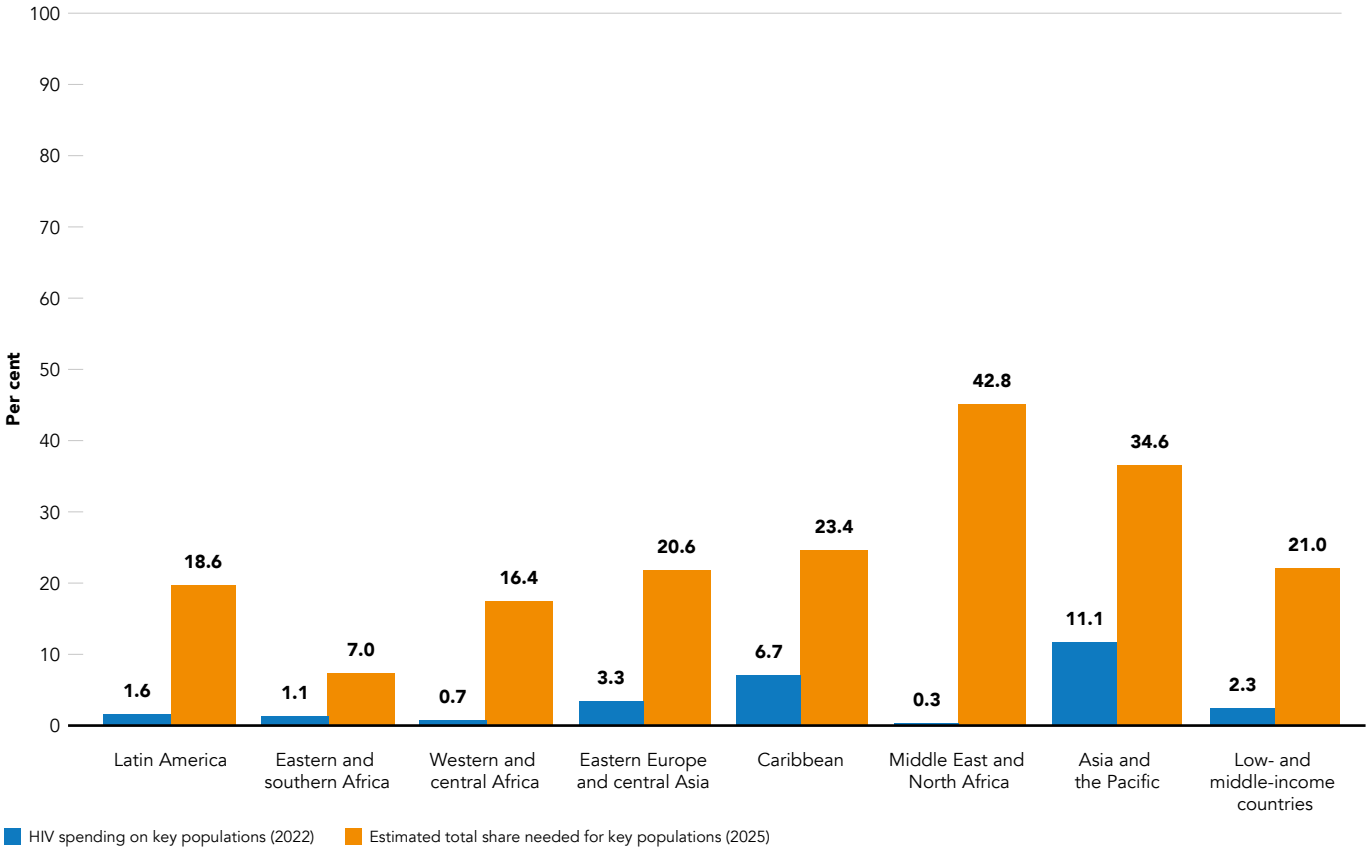

Source: UNAIDS Global AIDS Monitoring, 2023 (https://aidsinfo.unaids.org/).

# Funding increases will make a big difference

Stronger political will and greater domestic funding for key population-focused programmes, including for key population-based organizations, should be core priorities, but few countries are heeding this advice. Financial investments in key population programmes lag far behind needs. In 2022, there was an estimated 90% funding gap for prevention programmes among people from key populations, compared with the funding needed by 2025 in low- and middle-income countries (Figure 2.13). The biggest gaps were in western and central Africa and in the Middle East and North Africa.

**Key population programmes are underfunded in all regions**

**Figure 2.13** The percentage of total HIV spending spent on prevention and societal enablers for key populations, 2022, and the projected share needed, 2025, low- and middle-income countries, by region




Source: UNAIDS financial estimates and projections, 2023; UNAIDS Global AIDS Monitoring, 2023; Stover J, Glaubius R, Teng Y, Kelly S, Brown T, Hallett TB et al. Modelling the epidemiological impact of the UNAIDS 2025 targets to end AIDS as a public health threat by 2030. PLoS Med. 2021;18(10):e1003831.
Note: Data are from 80 countries that reported their latest expenditures on prevention and societal enabler interventions for key population interventions. Testing and treatment services are not included.

# Laws that put people in harm's way

Punitive laws and policies, human rights violations and discrimination continue to greatly increase the risk of HIV transmission, limit access to services, and sabotage efforts to decrease the impact of the epidemic among people from key populations *(143)*.

A recent 10-country study in sub-Saharan Africa showed that HIV prevalence among gay men and other men who have sex with men was 5 times higher in countries that criminalized same-sex relationships than in non-criminalized settings. Where there were recent prosecutions based on those laws, HIV prevalence in this key population was 12 times greater than in countries without prosecutions. Where civil society organizations faced barriers to operating, prevalence was more than nine times higher than in countries without such obstacles *(144)*. Other research has shown that repressive policing of sex workers almost doubled their risk of HIV or other sexually transmitted infections *(145)*, and there is strong evidence linking the criminalization of drug use with negative effects on HIV prevention and treatment among people who inject drugs *(146)*.

Laws that criminalize people from key populations or their behaviours remain on statute books across much of the world. The vast majority of countries in 2023 still criminalized the use or possession of small amounts of drugs, 168 countries criminalized some aspect of sex work, 67 countries criminalized consensual same-sex sexual intercourse, 20 countries criminalized transgender people, and 143 countries criminalized or otherwise prosecuted HIV exposure, non-disclosure or transmission (see Figure A1.4 in Annex 1).

There have been some positive changes (see Chapter 1). Fewer countries now criminalize consensual same-sex relations than a decade ago *(147)*. Some countries have restricted the scope of or removed laws criminalizing HIV transmission, exposure or non-disclosure and drug use. A few jurisdictions have decriminalized sex work. An alarming shift in the opposite direction is also under way, however. Uganda's new Anti-Homosexuality Act (2023), signed into law in May 2023, provides for severe punishments against LGBTQI+ people and organizations *(148)*, and Indonesia's new criminal code contains articles that violate the rights of women and people from sexual minorities *(149, 150)*. In Pakistan, a federal court has struck down parts of the Transgender Persons (Protection of Rights) Act *(151)*. Harmful policies limiting freedom of association, including for LGBTQI+ organizations, have been passed in Niger and Zimbabwe; anti-transgender legislation was introduced in the United States of America; and attempts are under way in the Russian Federation to expand laws banning so-called "LGBTI propaganda" *(152)*. If allowed to proceed, this turn towards criminalization and punishment will set back the HIV response badly.

**THE EVIDENCE IS CLEAR: ENDING MISGUIDED AND UNJUST CRIMINALIZATION IS GOOD FOR PUBLIC HEALTH AND REQUIRED AS A MATTER OF HUMAN RIGHTS OBLIGATION *(142)***

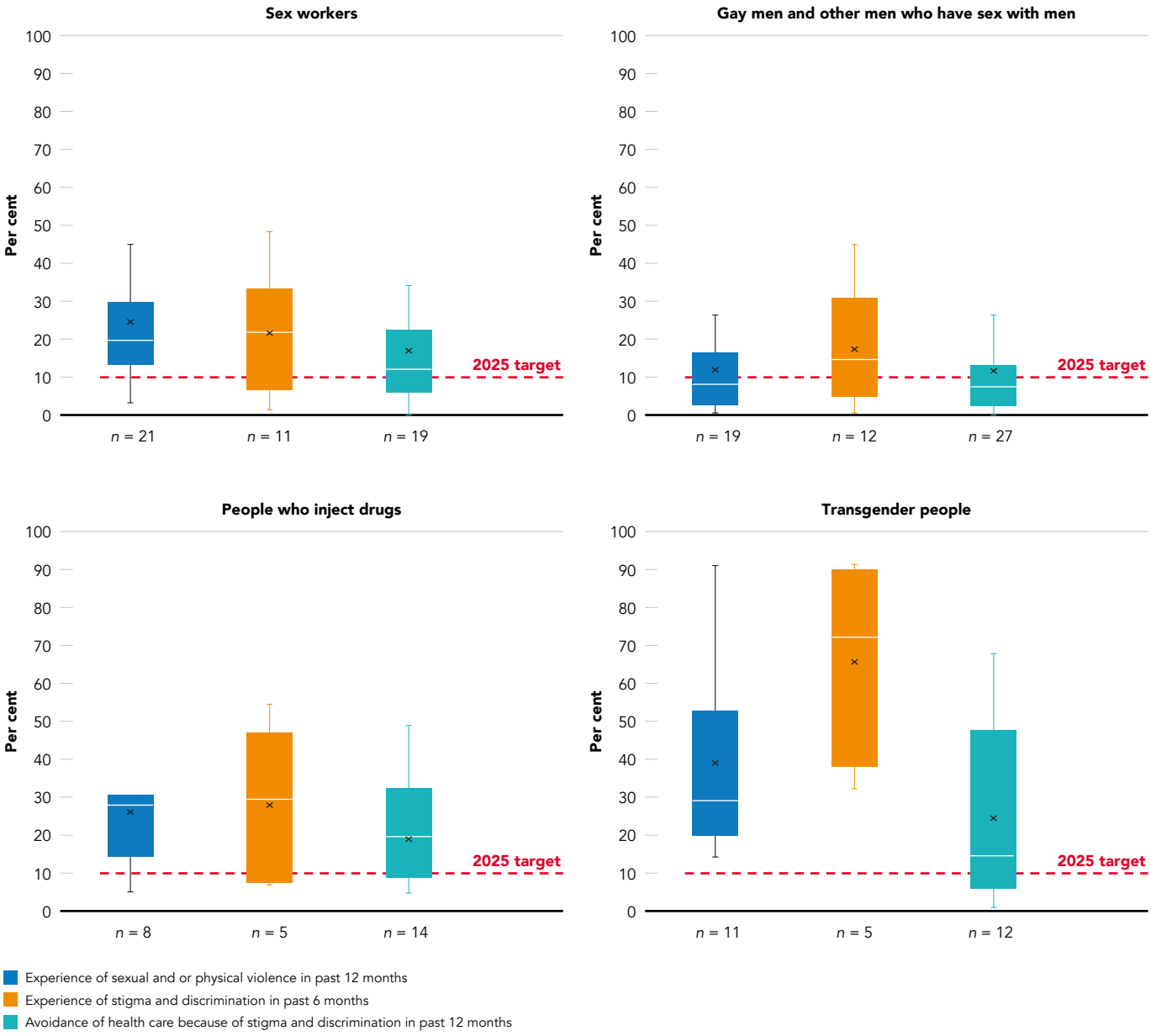
## Stigma and discrimination still block progress

Discriminatory attitudes towards people living with HIV remain alarmingly common in all regions, and stigma is discouraging people from seeking HIV prevention services, testing for HIV, and starting and staying on HIV treatment *(153, 154)*. Across 54 countries with recent survey data, a median of 59% of people reported discriminatory attitudes towards people living with HIV—a level that is nearly 6 times higher than the 2025 global target. In 13 countries, more than 75% of those surveyed reported holding discriminatory attitudes.

It is especially important for health-care services to be free of stigma and discrimination. There is a wealth of evidence describing the extent to which stigma and discrimination undermine HIV prevention and treatment programmes (Figures 2.15 and 2.16). Recent survey data show that more than 10% of people living with HIV experienced stigma and discrimination in health-care settings in 10 of 12 countries. People from key populations are especially affected with recent survey data reported that more than 10% of respondents avoided accessing health-care services due to stigma and discrimination in nine of 27 reporting countries for gay men and other men who have sex with men, 16 of 29 for sex workers, eight of 14 for people who inject drugs and seven of 12 for transgender people (Figure 2.14).

## People from key populations continue to face pervasive violence, stigma and discrimination

**Figure 2.14** Experience of sexual and or physical violence, stigma and discrimination and avoidance of health care among key populations, countries with available data, 2018–2022

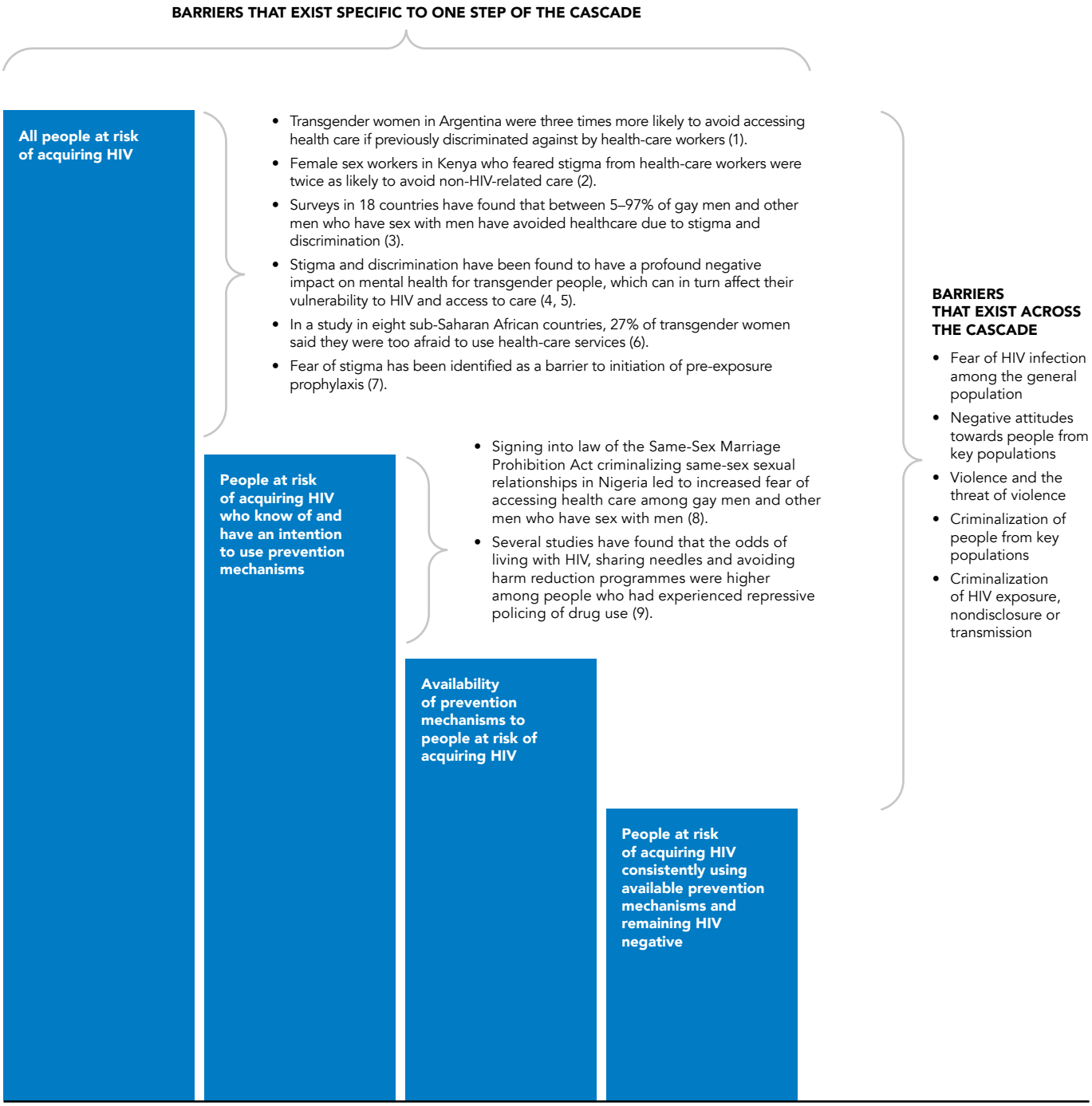



Source: UNAIDS Global AIDS Monitoring, 2023 (https://aidsinfo.unaids.org/).
Note: *n* refers to the number of countries

Hard-won advances for LGBT communities are increasingly under threat. In 2022, a record number of countries overturned laws that criminalize same-sex relationships, while other countries have removed laws that criminalize gender expression, or have introduced laws protecting gender diversity. However, at the same time homophobia and transphobia remain a constant threat, with continuing reports of violence towards LGBT persons and/or the introduction or strengthening of legislation restricting the rights of LGBT persons, as seen in Hungary, Peru, the Russian Federation, the United Kingdom and the United States—and remain well-entrenched in many other countries *(155, 156)*.

## Examples of stigma and discrimination continue to be major barriers for HIV prevention and treatment

**Figure 2.15** Study evidence of the effects of stigma and discrimination on people's abilities to avoid acquiring HIV infection

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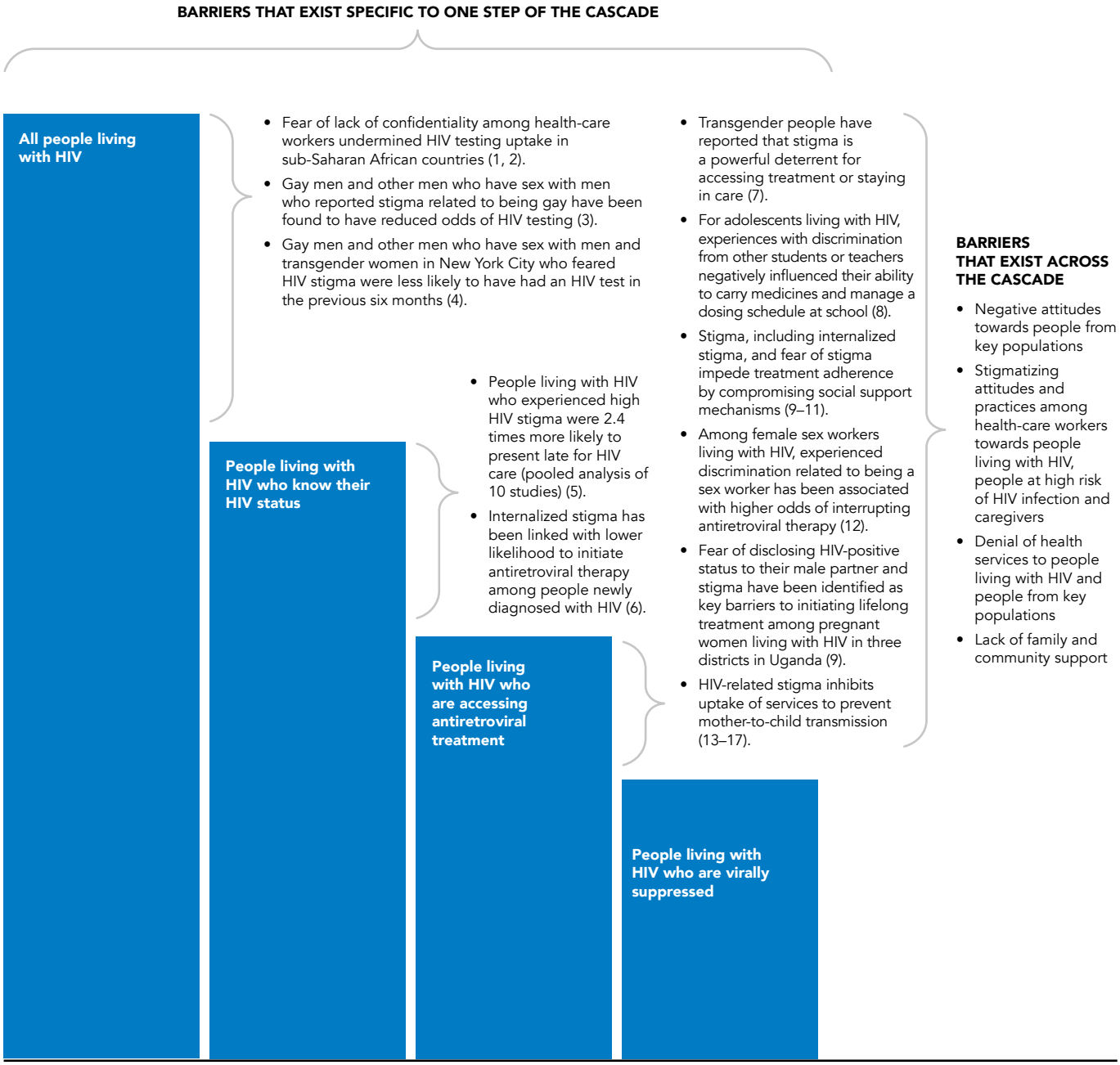
## Examples of stigma and discrimination are major barriers for HIV testing and treatment

**Figure 2.16** Study evidence of the effects of stigma and discrimination on people's abilities to access and benefit from HIV testing and treatment services. Examples of stigma and discrimination as barriers to the testing and treatment cascade

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# 3. OPPORTUNITIES FOR QUICKER PROGRESS TOWARDS ENDING AIDS

## Investing in a sustainable response will render health, social and economic returns

HIV responses succeed when they are anchored in strong political commitment, follow the evidence, have reliable and adequate funding, and reduce the inequalities and discrimination that deny people the services and tools that can protect their health and well-being.

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For all the gains made against AIDS, it still claims 630 000 [480 000–880 000] lives each year, most of them in disadvantaged communities and among people from marginalized and vulnerable populations. HIV remains a pandemic that feeds on injustice and reinforces inequalities. But HIV responses also have the tools, evidence and means to end this pandemic—and if those assets are equitably available and used effectively, countries can rapidly close the remaining gaps.

Now is not the time to lose momentum. Seizing the opportunity to invest in a sustainable response will render extraordinary health, social and economic returns. Investing in the HIV pandemic could enhance educational outcomes, especially for young women and girls, reduce gender inequalities and support economic growth in heavily affected parts of sub-Saharan Africa *(1)*. Expanding HIV prevention and advancing health systems integration, gender equality and institutionalized community services will lay the foundations for long-term future gains.

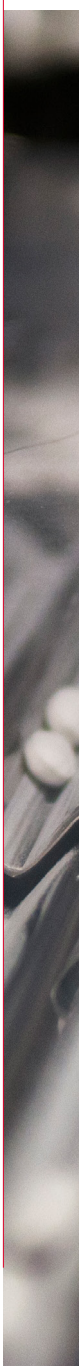
History shows that HIV responses succeed when they are anchored in strong political commitment, follow the evidence, have reliable and adequate funding, and reduce the inequalities and discrimination that deny people the services and tools that can protect their health and well-being. It also underscores the importance of community-led interventions, and of delivering health-care services in ways that are more convenient and sensible. These are the same themes and approaches that anchor the United Nations Our Common Agenda and that guide actions towards achieving the Sustainable Development Goals (SDGs). There are huge opportunities to advance on all those fronts. Seizing them now will take the world to within reach of ending AIDS, and will add fresh momentum towards achieving a range of SDGs and building the foundations of a sustainable AIDS response beyond 2030.

**SEIZING THE OPPORTUNITIES WILL ADD FRESH MOMENTUM TOWARDS ACHIEVING A RANGE OF SDGS**

Many countries have already succeeded in dramatically reducing their numbers of new HIV infections and AIDS-related deaths by implementing strong, well-funded responses coupled with firm political commitment and leadership, strengthened health systems, and engagement of communities. Following these successes and the achievement of the AIDS targets, the long-term strategies required to sustain low and constantly declining numbers of new HIV infections and AIDS-related deaths will evolve. Reaching SDG 3 to end AIDS as a public health threat will not signal the end of the multisectoral response to HIV but rather the achievement of a status that will have to be sustainably maintained and monitored *(2)*.

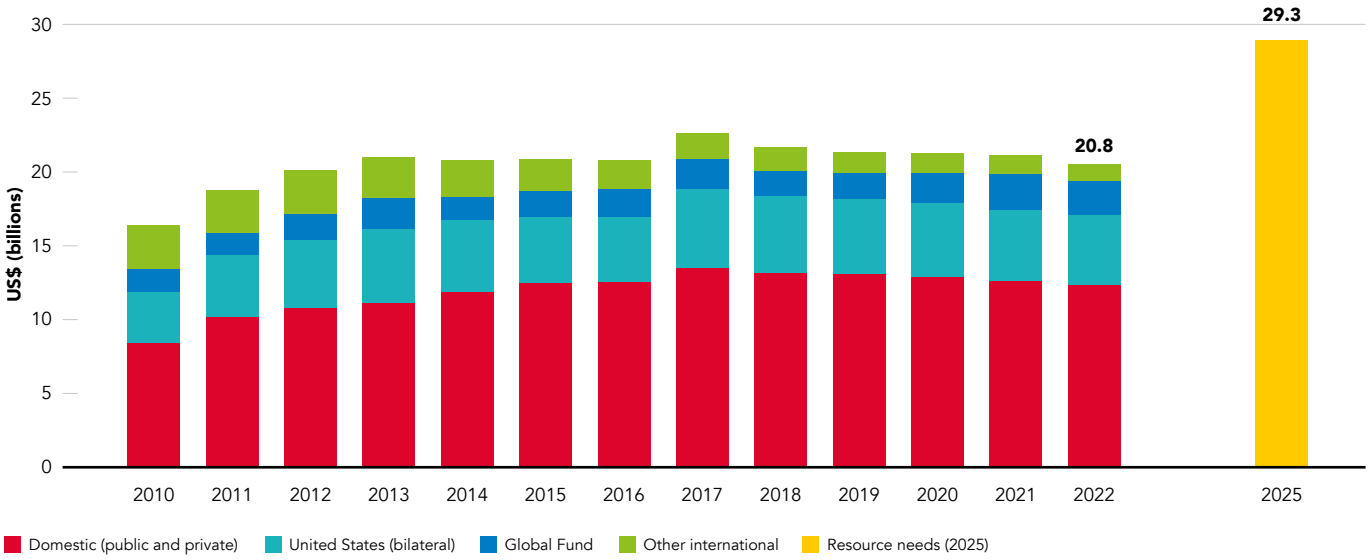
# The HIV funding gap is widening and must match the need

The HIV funding gap in low- and middle-income countries is widening. A total of US$ 20.8 billion (constant 2019 US$) was available for HIV programmes in low- and middle-income countries in 2022—2.6% less than in 2021 and well short of the US$ 29.3 billion needed by 2025 (Figure 3.1). HIV resources increased substantially in the early 2010s, but they are currently at the same level as in 2013.



### The global HIV funding gap is widening

**Figure 3.1** Resource availability for HIV in low- and middle-income countries by source of funding, 2010–2022 and 2025 target




Source: UNAIDS financial estimates and projections, 2023 (http://hivfinancial.unaids.org/hivfinancialdashboards.html); Stover J, Glaubius R, Teng Y, Kelly S, Brown T, Hallett TB et al. Modelling the epidemiological impact of the UNAIDS 2025 targets to end AIDS as a public health threat by 2030. PLoS Med. 2021;18(10):e1003831.
Note: The resource estimates are presented in constant 2019 US dollars (billion). The countries included are those that were classified by the World Bank in 2020 as being low- and middle-income.

In eastern and southern Africa and Latin America, the resources available in 2022 were close to the total amounts needed in 2025. In other countries, however, the shortfalls were large: a 82% gap in the Middle East and North Africa, 60% in eastern Europe and central Asia, 57% in Asia and the Pacific, and 31% in western and central Africa.

The reduction in resources available for HIV in 2022 is due to declines in both international and domestic funding. The US$ 8.3 billion of external HIV funding in 2022 was 3% lower than in 2021. At the same time, domestic funding is diminishing.

The decline in HIV funding must be reversed. Progress against AIDS has been strongest in the countries and regions that have invested sufficiently in their HIV responses, notably eastern and southern Africa. Conversely, regions with the largest resource gaps—eastern Europe and central Asia and the Middle East and North Africa—are making the least headway against their HIV epidemics.

## The HIV funding gap is widening

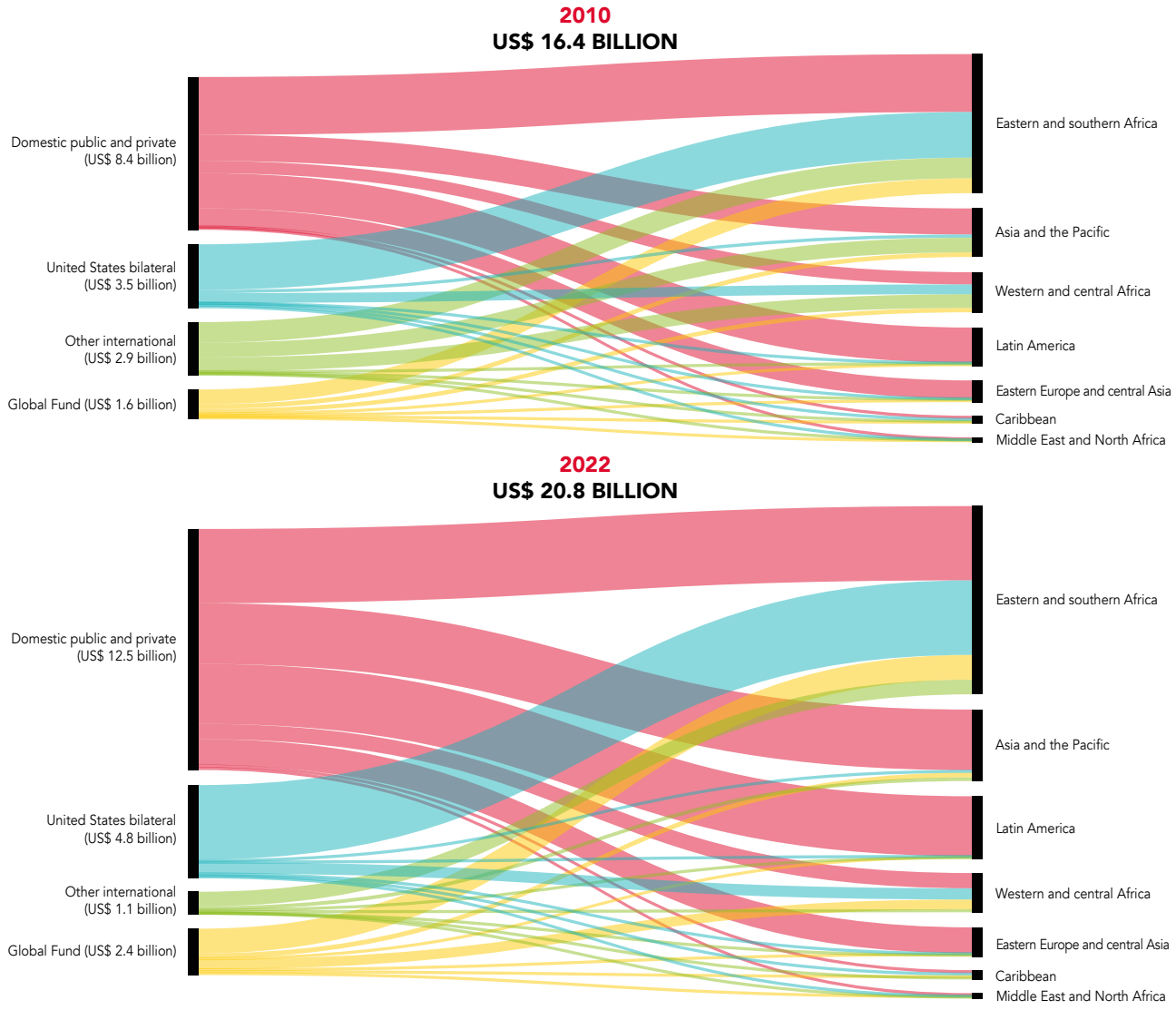
A total of US$ 20.8 billion was available for HIV programmes in low- and middle-income countries in 2022—2.6% less than in 2021.

# Domestic HIV funding is vital but under stress

Domestic HIV funding in low- and middle-income countries increased appreciably after 2000 and continued to rise after 2010, including in countries with high HIV burdens. About 60% of resources available in 2022 were sourced domestically, compared with about 50% in 2010 (Figure 3.2). Of the 73 reporting countries that reported most recent domestic HIV funding data, 42 (including most high-burden countries) have increased their domestic funding since 2015. Underpinning these funding decisions was the realization that delays and half-measures are ultimately much costlier than prompt, decisive action.

### The shift to domestic funding for HIV continued after 2010

**Figure 3.2** Domestic and international resources for HIV by source of funding, by region, 2010 and 2022




Source: UNAIDS financial estimates, 2023 (http://hivfinancial.unaids.org/hivfinancialdashboards.html).
Note: The resource estimates are presented in constant 2019 US dollars.

**ALMOST HALF OF THE REPORTING 62 COUNTRIES ANTICIPATE THAT THEIR 2024 ANNUAL HIV BUDGETS WILL BE AT 2023 LEVELS OR LOWER**

The rising trend has shifted since the COVID-19 pandemic emerged. Fiscal constraints and growing debt repayment obligations across countries are putting additional pressure on all domestic health investments *(3)*. Domestic HIV funding available in 2022 was over 2% lower than in 2021, the third annual decrease in a row.

Competing claims on public spending and the vulnerable macroeconomic situations in many low- and middle-income countries, including towering debt burdens, are affecting domestic HIV funding. In these circumstances, many countries will struggle to increase their domestic HIV funding, and so external financing support remains vitally important. Almost half of the 62 countries that reported trends in their public budget allocations for HIV for 2024 anticipate that their annual HIV budgets will be at 2023 levels or lower.

The ongoing reliance on external financing for HIV responses in many countries is at odds with financing patterns for health spending overall in low- and middle-income countries. Their total health spending is financed almost exclusively from domestic coffers, but HIV funding in low- and lower-middle-income countries comes mainly from external sources. Despite increases in domestic funding for HIV in the past decade, the share is relatively small compared with the share of domestic funding going towards health programmes overall.[1]

[1] Globally, HIV spending represents about 1.5% of total health spending in low- and lower-middle-income countries.

Across low-income countries, about 71% of total health spending but only 26% of HIV funding came from domestic resources in 2020 (most recent available data) (Figure 3.3). In lower-middle-income countries, 96% of total health spending was domestically sourced, compared with 32% of HIV funding. This suggests that, at least in the short term, external financing will continue to be key for low- and lower-middle-income countries to end AIDS. At the same time, it is necessary for low- and lower-middle-income countries to maintain or even increase the domestic resources they allocate to their HIV responses in order to foster sustainability, strengthen their health systems, and consolidate country ownership of their HIV programmes.

**Ongoing reliance on external financing for HIV responses is at odds with patterns for health spending overall in low- and lower-middle-income countries**

**Figure 3.3** Percentage of public spending for health overall and for HIV, by source of funding and by country income classification, 2020

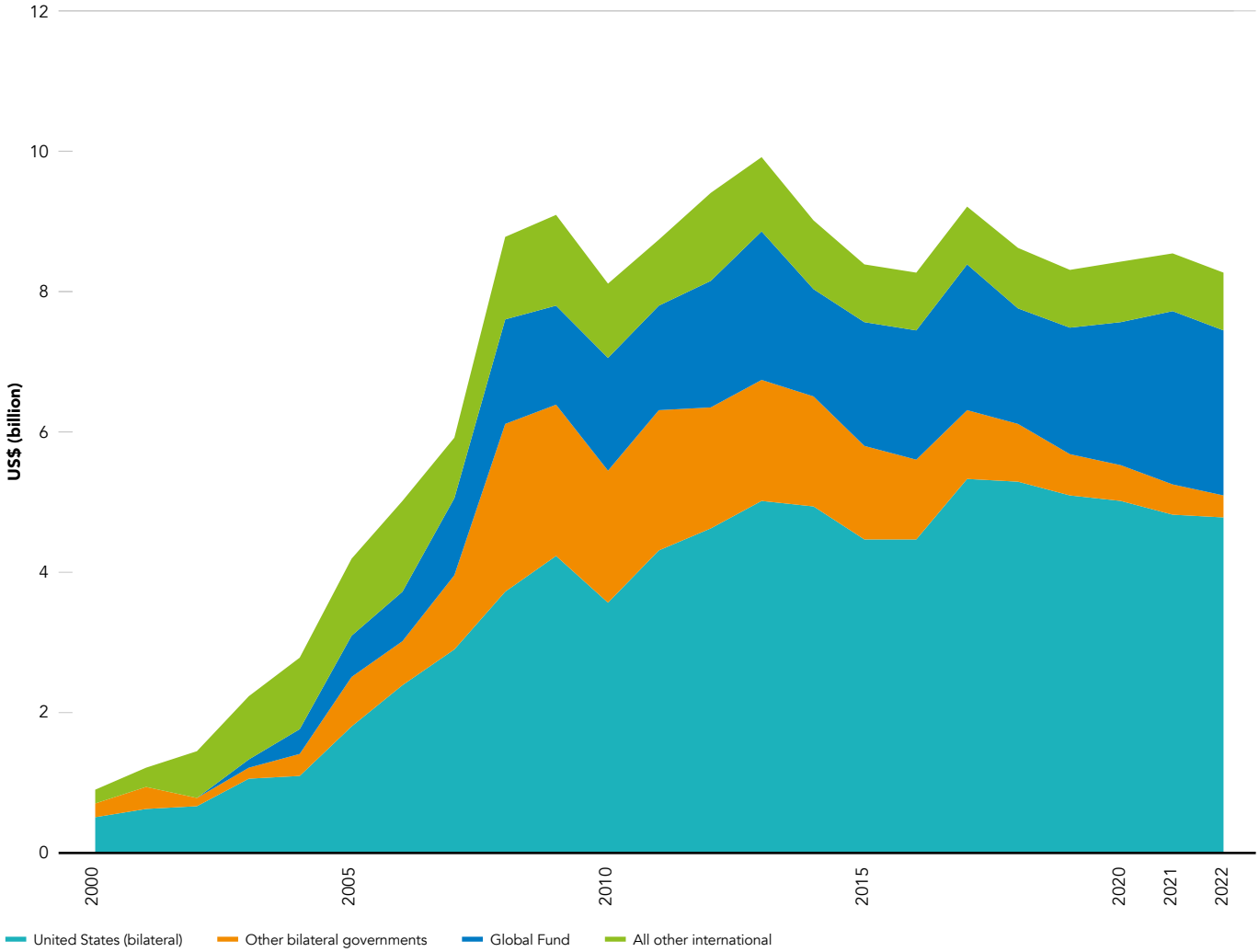
Source: UNAIDS financial estimates, 2023 (http://hivfinancial.unaids.org/hivfinancialdashboards.html); WHO Global Health Expenditure Database (https://apps.who.int/nha/database).

# International HIV financing remains crucial in many countries

About 40% of HIV funding in low- and middle-income countries in 2022 was sourced internationally. Bilateral funding from the United States Government constituted 58% of all international assistance for HIV, while disbursements from the Global Fund to Fight AIDS, Tuberculosis and Malaria accounted for about 29%. Other international donors contributed the remainder, but that share has diminished considerably, from approximately US$ 3 billion in 2010 to US$ 1.2 billion in 2022, a 61% decrease (Figure 3.4).[2]

**Most international funding for HIV comes from the Global Fund and PEPFAR**

**Figure 3.4** Resource availability for HIV in low- and middle-income countries by source of funding, 2000–2022




Source: UNAIDS financial estimates, 2023 (http://hivfinancial.unaids.org/hivfinancialdashboards.html).
Note: The resource estimates are presented in constant 2019 US dollars.

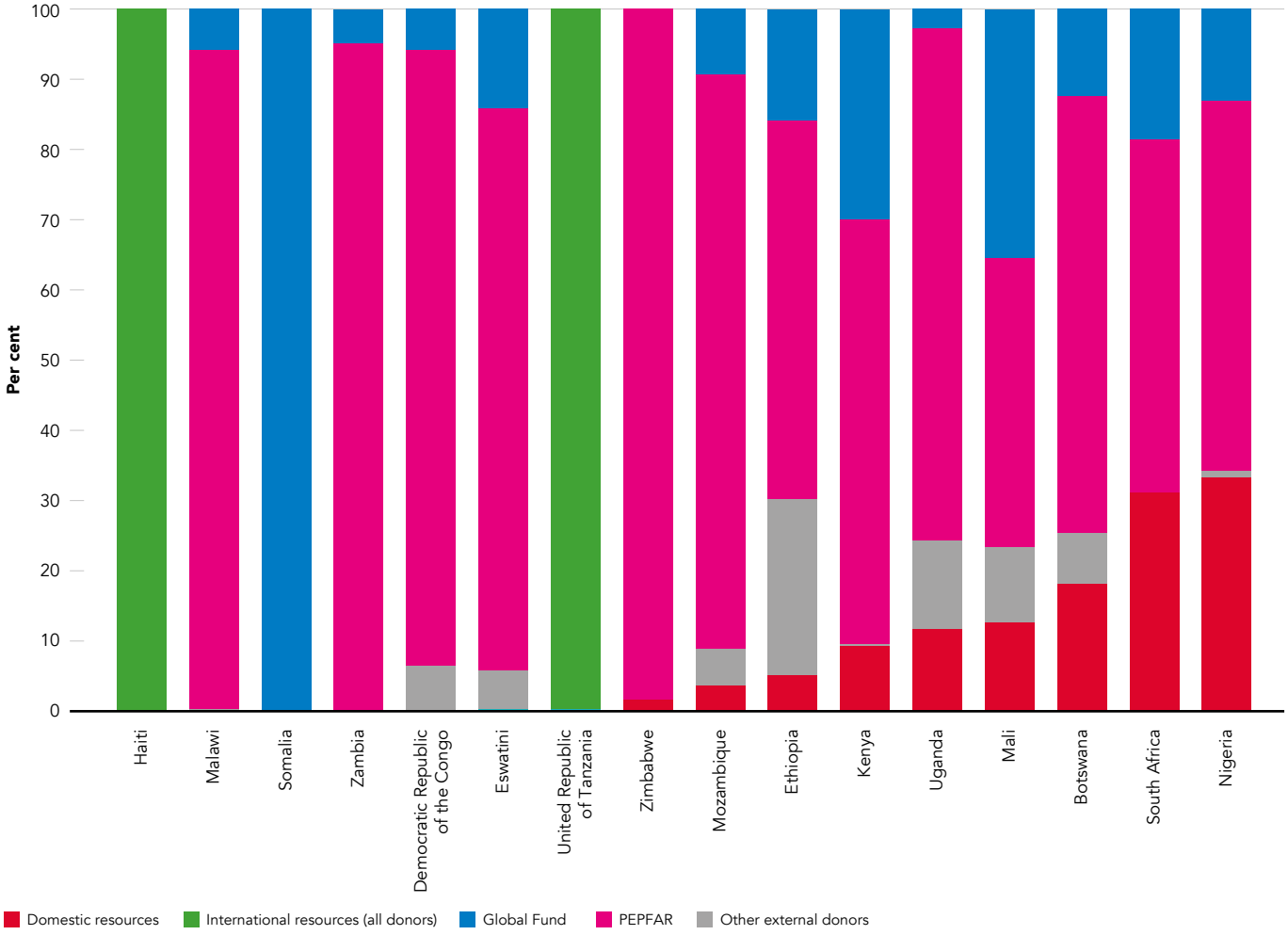
[2] These other international donors include members of the Organisation for Economic Co-operation and Development, multilateral institutions such as the United Nations system, development banks, and philanthropic institutions such as the Bill & Melinda Gates Foundation, the Ford Foundation and the Wellcome Trust.

Development assistance for HIV has been—and will continue to be—crucial. The Global Fund and the United States President's Emergency Plan for AIDS Relief (PEPFAR) play crucial roles and are also the largest funders of grants for health systems generally. The ripple effects of these investments are visible in other developmental outcomes, including falling child mortality rates, expanding tuberculosis (TB) prevention, screening and treatment, and strengthened community systems and partnerships.

These financing patterns have additional implications for the HIV response. In many countries, HIV prevention absorbs a small percentage of overall HIV funding. Despite substantial progress, new HIV infections are not decreasing at the rates needed to end AIDS by 2030. More funding for prevention programmes, especially among people from key populations, is vitally needed—as is smarter, more cost-effective use of funds. HIV prevention programmes typically depend heavily on international resources (principally the Global Fund and PEPFAR) (Figure 3.5). That reliance is especially heavy for programmes that focus on women and girls and people from key populations.

**The Global Fund and PEPFAR are the main sources of funding for HIV prevention programmes**

**Figure 3.5** Percentage of funding for HIV prevention by source, selected countries with high-burden of HIV, 2022




Source: UNAIDS Global AIDS Monitoring, 2023 (https://aidsinfounaids.org/).

UNAIDS analysis shows that where HIV prevention funding has been prioritized, HIV incidence has declined. Some countries where HIV incidence is declining, including the Dominican Republic, India, Kyrgyzstan and Togo, are targeting 3–16% of HIV spending towards prevention programmes for people from key populations. In contrast, countries with stagnating or increasing HIV incidence among key populations are steering a mere 0.5% or less of total HIV spending towards such programmes.

Yet, across low- and middle-income countries overall, spending on key population programmes is not increasing and a large funding gap persists. More funding on prevention programmes, especially for people from key populations, is needed, regardless of the source.

The global targets call for spending about US$ 3.1 billion (or about 11% of total estimated total resource needs) per year on societal enablers by 2025, including programmes addressing human rights; policy dialogue; reduction of stigma, discrimination and gender-based violence; and HIV-related legal services[3]. In 2022, an estimated 5% of total HIV resources was spent on societal enablers.

## Innovations for sustainable financing of the AIDS response

Several positive developments have emerged during the past decade in the HIV financing landscape, leading to increased resources and improved access to essential services. It is important to keep the momentum going on these developments.

Domestic resource mobilization has been the key driver of sustained financial resources in low- and middle-income countries, enabling them to generate more funds to their HIV responses. To maintain this positive trend, there is a need for increased domestic revenue mobilization, both through progressive tax reforms and control of tax evasion, and through the introduction of targeted health taxes (such as "sin taxes" for alcohol or tobacco use or excessive carbon emissions).

**GLOBAL TARGETS CALL FOR SPENDING ABOUT 11% OF TOTAL ESTIMATED TOTAL RESOURCE NEEDS PER YEAR ON SOCIETAL ENABLERS; IN 2022, COUNTRIES ONLY SPENT AN ESTIMATED 5%**

Multilateral organizations, governments and philanthropic foundations have joined forces, committing substantial funds towards the HIV response. Innovative financing mechanisms such as trust funds, social impact bonds and blended financing have also mobilized investments for HIV programmes. Despite the threatening external context, these kinds of positive steps towards sustainable financing have strengthened the global commitment and developed pathways to ending AIDS.

[3] With the right investment, AIDS can be over — A US$ 29 billion investment to end AIDS by the end of the decade (unaids.org)

# Programmes that put people first have the biggest impact

The removal of criminalizing laws, ending police harassment and violence, reducing stigma and discrimination, and increasing support for community and structural interventions would shift the HIV trajectory and help protect the health and human rights of people from marginalized populations *(4)*.

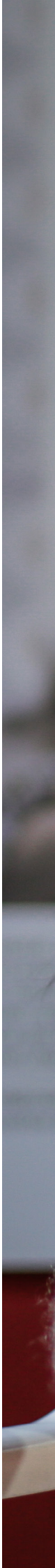
## Eliminating stigma, discrimination and punitive approaches would reboot HIV programmes

Laws that criminalize people from key populations and HIV non-disclosure, exposure or transmission drive people away from the support and services that can help them protect their health *(5, 6)*.

Such laws, together with stigma and discrimination, combine to increase the risk of HIV, as concluded by a systematic review of studies across 10 sub-Saharan African countries, which showed that punitive and non-protective laws on sex work were associated with prevalent HIV infection *(5)*. Criminalization of same-sex sexual behaviour has been found to be associated with higher HIV prevalence among gay men and other men who have sex with men based on data from 10 countries in sub-Saharan Africa *(7)*. Criminalization of drug use has a similarly negative effect on HIV prevention and treatment *(8)*. HIV criminalization undermines effective HIV prevention, treatment, care and support by dissuading people from seeking and using those services for fear of arrest and prosecution *(9)*.

**A SYSTEMATIC REVIEW OF STUDIES ACROSS 10 SUB-SAHARAN AFRICAN COUNTRIES SHOWED THAT PUNITIVE AND NON-PROTECTIVE LAWS ON SEX WORK WERE ASSOCIATED WITH PREVALENT HIV INFECTION**

In contrast, decriminalization of drug use and possession for personal use is associated with greater access to harm reduction services, and reductions in violence, arrest or harassment by law enforcement agencies *(8)*.



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## Harmful laws, stigma and discrimination, combine to increase the risk of HIV among key populations

Increasing support for community and structural interventions would shift the HIV trajectory and help protect the health and human rights of people from marginalized populations.

Relatively straightforward changes could drastically improve the health and safety of people from key populations, including people living with HIV, reducing their HIV vulnerability and risk, and averting large numbers of HIV infections. The removal or, at the very least, non-enforcement of punitive and obstructive laws should be a high priority. A modelling study from 2015 reported that the decriminalization of sex work could avert 33–46% of new HIV infections over the course of a decade. Other changes, such as more supportive policing practices and increased access to safer work environments, would also avert substantial numbers of new infections. Modelling based on studies from Canada and Kenya has indicated that rapid elimination of violence by police, clients and strangers could avert 17–20% of new infections among female sex workers and their clients in those countries within a decade *(10)*.

Similarly, people have to feel safe when using health-care services or they will tend to shun them. At least one in three of 27 reporting countries have data indicating that more than 10% of gay men and other men who have sex with men avoided using health-care services due to concerns about stigma, confidentiality or other issues. These numbers increase to more than one in two for sex workers (16 of 29 reporting countries), people who inject drugs (eight of 14 reporting countries) and transgender people (seven of 12 reporting countries). People living with HIV who anticipate high levels of HIV-related stigma are 2.4 times more likely to delay enrolment in care until they are very ill, compared with people who do not expect to encounter stigma *(11)*.

An obvious way forward is for countries to repeal laws that sanction or perpetuate HIV-related stigma and discrimination, as the Global Commission on HIV and the Law has urged, and to act with greater resolve against stigma and discrimination *(12)*.

Stronger accountability for health-care providers and HIV-related legal services can make stigma and discrimination a less common ordeal and reduce the disrespect and abuse some people experience at health-care facilities. Some countries, including Thailand and Viet Nam, have been introducing new training and protocols to reduce stigmatizing and discriminatory behaviours by health-care providers *(13, 14)*. The use of peer supporters to help people navigate HIV and related services can protect against the fear of stigma, an approach that is being used in Kazakhstan *(15)*.

**AT LEAST 1 IN 3 REPORTING COUNTRIES INDICATED THAT OVER 10% OF KEY POPULATIONS AVOIDED USING HEALTH-CARE SERVICES DUE TO CONCERNS ABOUT STIGMA, CONFIDENTIALITY OR OTHER ISSUES**

Countries that have signed up to the Global Partnership for Action to Eliminate all Forms of HIV-related Stigma and Discrimination have committed to these and a range of other steps to reduce and respond to stigma and discrimination. The Central African Republic, with support from the Global Partnership, has revised its HIV law to decriminalize HIV transmission and lower the age of consent for HIV testing. In Argentina, new legislation on HIV, hepatitis and TB features a strong human rights perspective and emphasizes the rights of people living with HIV, TB and other sexually transmitted infections. Jamaica is also taking steps to improve the legal environment for people living with HIV and key populations.

# Community-led services can make an even bigger difference

Organizations of communities living with, at risk of or affected by HIV have long been the backbone of the HIV response, with the Greater Involvement of People Living with HIV (GIPA) principle formalized since 1994. It is largely due to their activism that affordable HIV medicines and prevention tools are now the norm across most of the world. They routinely raise the alarm about inequalities and gaps, monitor rights violations and service failings *(16)*, propose improvements (e.g. community-led monitoring) *(17)*, and hold health systems accountable *(18)*. Recent country examples illustrate the improvements that can be achieved when community-led monitoring activities complement public health information systems to identify service deficiencies and solutions *(17, 19, 20)*.

In an epidemic that especially affects people from vulnerable and ostracized populations, often alienated from standard health services, it is crucial that those people can trust, access and use the services they need for their health and well-being. Working mostly from the margins, many community-led organizations excel at providing people-centred, differentiated services for the people who need them *(21, 22)*. In many countries, community-led organizations are leading HIV service providers for people from key and marginalized populations *(23)*. Their resilience and adaptability proved crucial during the COVID-19 pandemic, when they kept core HIV services operating in many countries and took on COVID-19-related responsibilities *(24)*.

Even in hostile conditions, community-led organizations are providing support and services that help people from key populations protect their health *(25)*. Often, these organizations are more effective than standard health facility-based platforms at reaching underserved populations with services and support, especially where stigma and discrimination are rife. They also function as adjunct public health infrastructure, bringing services and information to poorly served communities, linking them with standard health services, and supporting them as they navigate those services. Among gay and other men who have sex with men, for example, community engagement and the presence of strong community-led organizations are associated with greater self-reported use of HIV and other health services *(26)*.

Community-led responses are most effective when they link effectively with public health systems. These mutually supportive roles require favourable legal and regulatory environments and funding and capacity-building support for community-led organizations. However, the work of these organizations is commonly undermined by funding shortages, policy and regulatory hurdles, capacity constraints, and crackdowns on civil society. If these obstacles are removed, community-led organizations can add even greater impetus to the global HIV response.

# Steer more support to community-led HIV activities

Community organizations need sustainable funding and technical support to play their unique roles fully. Many of these organizations, however, find themselves adrift in a frugal and unstable HIV funding environment.

Current funding for community-led organizations does not match the commitments made in the Political Declaration and in many national HIV strategies.[4] The bulk of funding comes from external donors, and reliable domestic funding for organizations that represent and serve vulnerable, marginalized communities is rare. Where domestic HIV expenditure has risen, little of it has been directed to community-led organizations, especially those working with people from key populations and adolescent girls and women *(28)*. A resurgent conservatism that targets marginalized populations and attacks rights-based practices is making it more difficult to secure domestic funding for programmes and organizations that serve ostracized communities.

Community-led HIV activities in low- and middle-income countries are being funded largely by external donors such as the Global Fund or PEPFAR, and by various philanthropic and bilateral donors. The Global Fund Breaking Down Barriers to Access initiative has led to some key population-led organizations receiving financial and technical support for the first time, according to its 2022 mid-term assessment *(29)*.[5] The PEPFAR 3.0 Sustainable Action Agenda includes support to local organizations to deliver HIV services.

Social contracting—whereby governments contract civil society organizations to provide certain services—can increase the reach and impact of HIV programmes and allow governments to support (at arm's length) possibly controversial services for people from marginalized populations. They can also nurture pragmatic partnerships between community organizations and national health programmes and offer access to predictable funding *(25)*.

In addition to erratic funding, inhospitable legal and regulatory contexts encumber community-led organizations. In many countries, there is a reluctance to collaborate with or support civil society organizations, especially those representing young girls and women and people from ostracized populations. Often that unwillingness is formalized by regulatory hurdles that make it difficult for organizations to receive funding and operate *(30)*.

[4] The 2021 Political Declaration on Ending AIDS commits United Nations Member States to increase the proportion of HIV services delivered by community-led organizations to reach 30% of HIV testing and treatment services, 80% of HIV prevention services for people from high-risk populations, and 60% of programmes to achieve societally enabling environments by 2025 *(27)*.

[5] The Breaking Down Barriers initiative provides financial and technical support to 20 countries to remove gender- and human rights-related barriers to HIV, TB and malaria services. Investments in these 20 countries have risen from around US$ 9 million in 2014–2016, to US$ 78 million in 2017–2019, to over US$ 130 million in 2020–2022.

A lack of institutional arrangements linking the activities of these organizations into overarching health systems and weak technical and managerial capacities further inhibit the current work and future contributions of community-led organizations. Trusted partnerships between public health systems and community-led organizations are important, and they can contribute to greater effectiveness, cost savings and efficiencies to national HIV responses.

A UNAIDS study found that social contracting arrangements were operating in 18 of the 59 countries reviewed and were being introduced gradually in 16 others. Little evidence was found of functional integration of services provided by contracted community-led organizations and those provided by government facilities, although it is likely that some integration was occurring or planned but had not yet been documented *(31)*.

# Greater equity will unlock new opportunities and build a sustainable response

The inequities and inequalities that fuelled the spread of HIV have not been eliminated. In some places, they are triggering rising numbers of new infections. In many places, inequities and inequalities are blocking quicker and wider success in protecting people against HIV and advancing towards ending the pandemic. But there are great opportunities to rapidly remove some of these obstacles. Investing in a response that supports equitable access to new technologies, along with strong social protection, education and gender equality programmes, will lay the foundations for a sustainable AIDS response.

## Equitable access to new technologies and other innovations

**ON AVERAGE THE UNIT PRICES FOR ANTIRETROVIRAL REGIMENS ARE ALMOST 2.5 TIMES HIGHER IN EASTERN EUROPE AND CENTRAL ASIA AND LATIN AMERICA THAN IN WESTERN AND CENTRAL AFRICA**

Essential health-care technologies should be affordable and available to all, but they are not—a fact driven home by the highly unequal access to COVID-19 vaccines and treatments.

Some of the biggest breakthroughs against the AIDS pandemic have been due to successful demands for affordable and equitable access to antiretroviral medicines and other HIV tools. Steep price reductions—achieved through voluntary licensing deals, generic production and pooled procurement, for example—have made it possible to provide highly effective HIV treatment for free or at low cost in low- and lower-middle-income countries across the world. Similar demands have been carried over to other public health priorities, such as TB, cervical cancer and viral hepatitis.

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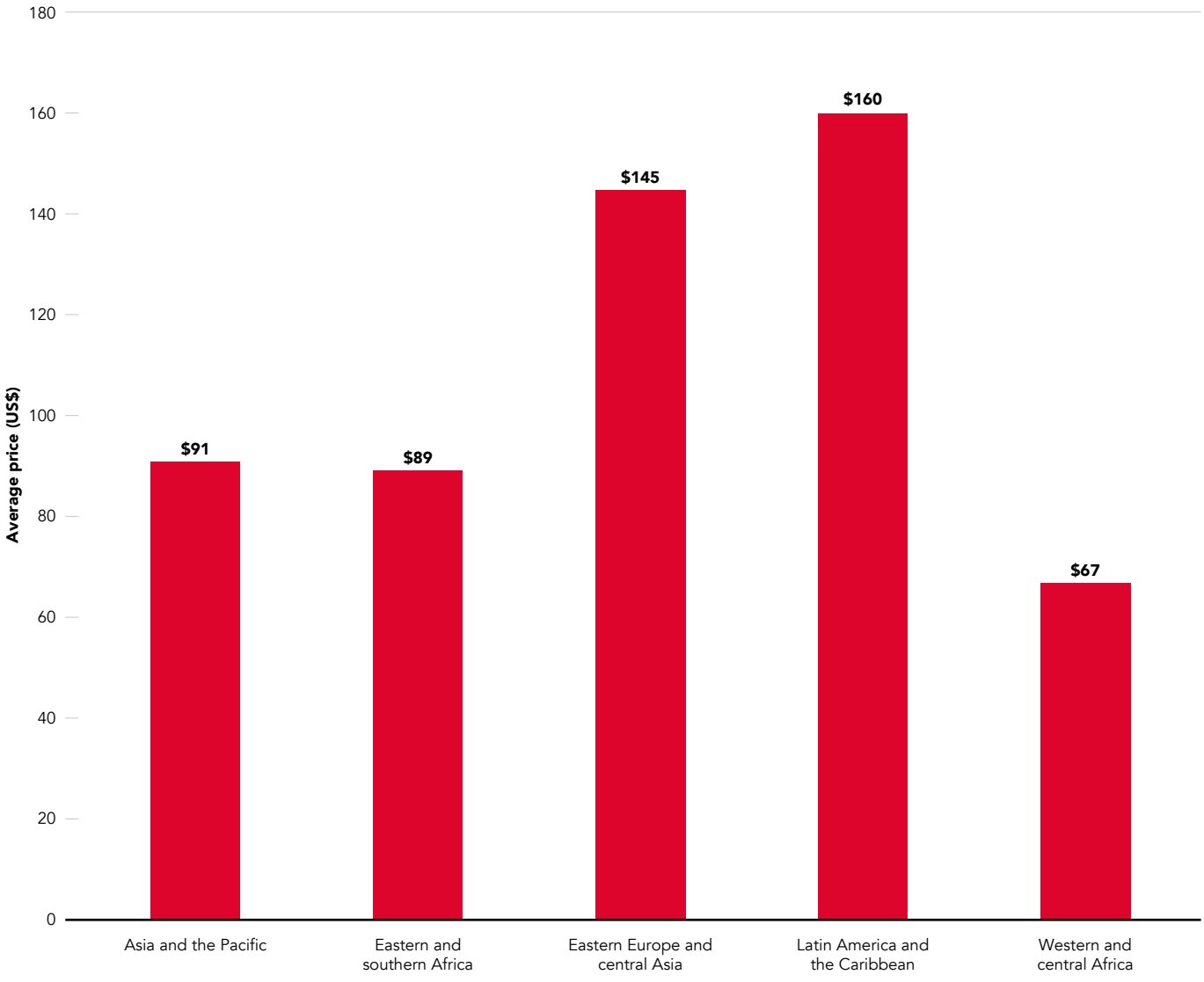
## Inequities and inequalities are blocking quicker and wider success in protecting people against HIV

Investing in a response that supports equitable access to new technologies will lay the foundations for a sustainable AIDS response.

Affordability of new health technologies is an ongoing challenge—and an ongoing priority involving advocacy, activism and legal challenges. For example, the Make Medicines Affordable campaign, a consortium of 13 community-based organizations, has filed almost 70 challenges in 13 countries against patents aimed at maintaining monopolies for antiretroviral medicines, TB medicines and COVID-19 treatments. A quarter of the oppositions have succeeded, resulting in budget savings of an estimated US$ 473 million in Argentina, Brazil, Thailand and Ukraine *(32)*. On average, though, the unit prices for main first-line antiretroviral regimens are still almost 2.5 times higher in eastern Europe and central Asia and Latin America than in western and central Africa (Figure 3.6). Significant cost savings could be made if countries can achieve further reductions in the prices of these medicines.

### Prices of antiretroviral medicines still vary widely

**Figure 3.6** Average price (US$) per person-year for antiretroviral regimen (dolutegravir/lamivudine/tenofovir), by region, 2021




Source: UNAIDS Global AIDS Monitoring, 2022 (https://aidsinfo.unaids.org/); government customs data accessed through seair.co.in.
Note: data are for 64 countries that reported to UNAIDS Global AIDS Monitoring 2022.

Long-acting injectable pre-exposure prophylaxis (PrEP) is a pressing example of pricing inequalities. In clinical trials, people receiving long-acting cabotegravir were 70–90% less likely to acquire HIV than people taking daily oral PrEP *(33, 34)*. There is new evidence that quarterly injections with cabotegravir could offer women sufficient protection against HIV infection *(35)*. This has huge potential to offer people, and women in particular, an additional option and greater autonomy to protect themselves against HIV infection.

The initial pricing for long-acting cabotegravir was prohibitively expensive. In the United States of America, it exceeded US$ 22 000 per year. A voluntary licensing deal struck in 2022 between the manufacturer ViiV Healthcare and the Medicines Patent Pool allows about 90 countries to purchase less expensive generic versions of the medicine once generic manufacturing begins. The deal covers all of Africa (except Libya) and other low- and lower-middle-income countries *(36, 37)*. Injectable cabotegravir PrEP remains very expensive in many countries, however, including upper-middle-income countries such as Argentina, Brazil, Mexico and Thailand. It has been estimated that countries excluded from the voluntary licensing deal account for about 8% of total new HIV infections per year (about 120 000 new infections) *(38)*.

**IN CLINICAL TRIALS, PEOPLE RECEIVING LONG-ACTING CABOTEGRAVIR WERE 70–90% LESS LIKELY TO ACQUIRE HIV THAN PEOPLE TAKING DAILY ORAL PREP**

As part of the arrangement with the Medicines Patent Pool, three generic producers will be able to manufacture long-acting cabotegravir, and additional producers may be added at a later stage. Generic production should dramatically lower prices. Analysis by the United States Food and Drug Administration has found that the entry of three or more generic manufacturers in the market reduced the price of a medicine by up to 95% *(39)*, while voluntary licensing of other HIV medicines in low- and middle-income countries is estimated to have saved about US$ 830 million *(40)*.

The Indian company Cipla announced in May 2023 that it would produce a generic version of long-acting cabotegravir at its plants in South Africa. It could take three to five years before production starts, however, and ViiV Healthcare is expected to remain the sole producer for the next few years *(41)*. This has led to concerns that it may take time for production volumes to match the anticipated increase in demand for injectable PrEP at reduced prices. Upfront purchasing commitments, perhaps financed through social investment funds, may be necessary to ramp up production so this potentially powerful prevention tool can reach more people *(42)*.

## Vaccine hopes suffer a blow

In contrast to the rapid progress achieved in developing vaccines against the SARS-Cov-2 virus, HIV continues to bedevil efforts to craft an effective vaccine. The only remaining phase III efficacy trial for a HIV vaccine was shut down in January 2023 after the candidate vaccine failed to reach preset standards of efficacy.

The Mosaico (HPX3002/HVTN706) study was the latest of several halted vaccine trials—a reminder of how unusual HIV is and how difficult it is to vaccinate against *(43)*. Two other trials, Uhambo and Imbokodo, closed in February 2020 and August 2021, respectively, after failing to demonstrate sufficient efficacy. This did not mean that the candidate vaccines generated no immunity to HIV, but the response was too weak and idiosyncratic to constitute useful efficacy *(44)*.

Thus far, some efficacy for a candidate vaccine has been found only in RV144, the so-called "Thai Trial", where a 31% lower infection rate was observed among people who received the vaccine. However, the efficacy of that vaccine waned quickly over time.

Attention has now shifted to mRNA approaches, using technologies honed during the development of COVID-19 vaccines. These approaches allow for quick modification *(45)*. mRNA platforms are being used in two international clinical trials—one in Rwanda and South Africa and one in the United States *(46)*. Also promising are the recent results from an early-phase clinical study that indicate an experimental HIV nanoparticle vaccine is safe in humans, although its efficacy is yet to be determined. That vaccine itself would not offer protection, but it could form part of a broader vaccination regimen *(47)*. The hope is to eventually develop a multistep HIV vaccination regimen that can guide the immune response to provide greater protection against HIV infection *(48)*.

A successful vaccine would dramatically shift the outlook for ending AIDS, and the search for an HIV vaccine should remain a priority. At the same time, the lack of success thus far underscores the need to unlock the full potential of combination HIV prevention.

# Social safety nets should reach everyone in need and reduce gender inequality

The COVID-19 pandemic exposed wide gaps in social protection coverage across all countries—the result of significant underinvestment in social protection, especially in Africa and Asia. As of 2020, only 47% of the global population was effectively covered by at least one social protection benefit. Coverage in sub-Saharan Africa, the region with the largest burden of HIV and many other health challenges, was only 17%. In 2020, many dozens of countries in all regions augmented their social protection systems as part of their responses to COVID-19. Many of these interventions, however, have been cut back or halted. Some 4 billion people lack any form of reliable social protection *(49)*.

These gaps exist despite strong evidence that social protection programmes can reduce poverty and help to meet multiple needs of poor and excluded people, as well as benefit people living with, at risk of or affected by HIV *(50–52)*.

Social protection programmes can potentially contribute to the HIV response in several ways. The provision of free HIV treatment in many countries across the world—a form of in-kind social assistance—has saved millions of lives and is helping to reduce new HIV infections.

**THE PROVISION OF FREE HIV TREATMENT IN MANY COUNTRIES ACROSS THE WORLD HAS SAVED MILLIONS OF LIVES**

Other in-kind assistance, such as free or subsidized school fees, has been shown to increase school enrolment, attendance and completion rates, especially for girls *(53–55)*. Increased school attendance and more years of secondary schooling are associated with a lower risk of acquiring HIV, especially among adolescent girls and young women *(56, 57)*. Numerous campaigns and programmes are under way to improve education attainment levels in low- and middle-income countries, among them the Education Plus initiative, which is supporting 13 countries to explore law and policy reforms that can increase educational opportunities and attainment for girls and young women.

A wealth of international evidence testifies to the benefits of income support in relation to maternal and child health, children's nutritional status, increased use of health-care services and contraception by women *(58)*, school enrolment (for boys and girls) and attendance (for girls), and unintended pregnancies among young women *(59)*. In South Africa, child support grants have been credited with reducing poverty levels, especially in provinces with very high poverty rates and in female-headed households *(60, 61)*. Crucially, these income support schemes seem to be most effective when they form part of broader strategies to achieve more equitable access to good-quality public goods *(62)*.

Analysis of data from populations-based surveys in 42 countries found that in countries with cash transfer programmes covering at least 5% of impoverished populations, women had a lower probability of having acquired sexually transmitted infections in the previous 12 months and were more likely to have taken an HIV test in the past 12 months. Income transfers were also associated with slight reductions in numbers of new HIV infections and AIDS-related deaths *(52)*.

To strengthen the contribution that social protection can make in the AIDS response, programmes should aim to be "inclusive of populations who are at risk of HIV infection or are susceptible to the consequences of HIV infection" *(63)*. A new study of the HIV-inclusivity of social protection programmes in 20 low- and middle-income countries and across Latin America and the Caribbean found that none explicitly discriminated against people living with, at risk of or affected by HIV *(64)*. Stigma and discrimination—towards people living with HIV, and towards ostracized and marginalized populations generally—were important hindrances to access in all the countries, however, underscoring the need to eliminate stigma and discrimination from social protection and health-care services in order to reap their full benefits.

# Integrated services can have an even bigger impact

There are major opportunities to build on the impact of integrated HIV and other health services. Deeper and effective integration can help health services become more convenient and responsive to people's needs and can accelerate progress towards ending AIDS. At the same time, integration can support the achievement of universal health coverage and enhance health outcomes *(65)*.

The scale-up of high-quality people-centred services through a primary health care approach can be a critical step for achieving HIV targets and broader health aims *(66)*. Members of all populations must be able to access health services and benefit from health system resources free from stigma and discrimination *(67)*. Better integration of HIV services within the health sector and further leveraging of health systems can be an important step towards greater cohesion within the World Health Organization (WHO) primary health-care approach to achieving universal health coverage.

**INTEGRATION OF HIV AND TB SERVICES AVERTED APPROXIMATELY 13 MILLION DEATHS AMONG PEOPLE LIVING WITH HIV BETWEEN 2000 AND 2021**

The most common forms of integration involve HIV services and services for TB, maternal and child health, sexual and reproductive health, and primary care services *(65)*. Services for HIV, syphilis, viral hepatitis and other sexually transmitted infections are becoming more functionally integrated with antenatal and postnatal services. There is also greater recognition of the need for closer integration with noncommunicable disease programmes, especially for older people with HIV (see Chapter 2), and mental health services and support.

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## Integration can support the achievement of universal health coverage

Deeper and effective integration can help health services become more convenient and responsive to people's needs and can accelerate progress towards ending AIDS.

These adaptations are having a positive impact. Integration of HIV and TB services has contributed to steep reductions in numbers of AIDS-related deaths, and integration of HIV testing and treatment with maternal and child care has prevented almost 3.4 million HIV infections in children since 2000. Integrated family planning and HIV services contribute to reducing unintended pregnancies and pregnancy-related maternal mortality among women living with HIV *(68)*.

A large meta-analysis of 114 studies, mostly from sub-Saharan Africa, found that HIV treatment and care outcomes, including viral suppression rates, were better when integrated services were delivered, while treatment success for non-HIV-related diseases and conditions and uptake of non-HIV services were commonly higher in integrated services *(65)*. In addition to improving health outcomes, successful integration can boost cost-effectiveness, bring cost savings for service providers (through increased coverage and reduced costs, if services can be delivered simultaneously and using the same platforms), and save costs for people using the services (by reducing the transport and opportunity costs of repeat clinic visits). An economic analysis in Cambodia, for example, found that integrated approaches for the elimination of vertical HIV transmission, hepatitis B and syphilis were highly effective and cost-effective *(69)*. Similarly, a systematic review of 19 studies, mostly from Asia, found that providing integrated HIV and sexual and reproductive health and rights services to sex workers was highly cost-effective *(70)*.

The advantages of integration can be exploited more fully—for example, through further integration of health information, procurement, supply management and financing systems. There are also opportunities for the multiuse of clinical and laboratory platforms, and for instituting more routine linkages, capacity-building and referrals between HIV, TB, sexual and reproductive health services, cervical cancer, noncommunicable diseases, mental health, gender-based violence and social protection programmes.

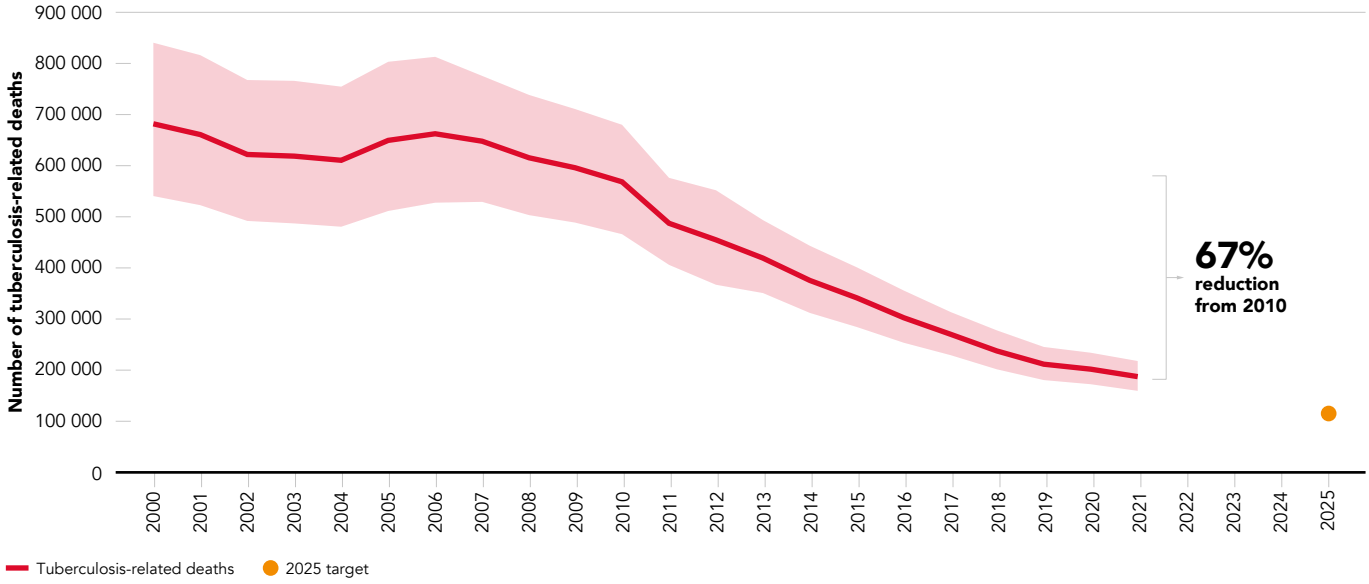
These integration efforts have to address stigma, discrimination and abuse within health-care services, and they must serve efforts to reach the people who are least likely to access the services and get the support they need. Deeper and effective integration—including within the context of universal health coverage—must strengthen, not weaken, the emphasis on people-centred approaches, equity and human rights protections. Resources will be required to ensure the truly meaningful engagement of people living with or affected by HIV in mainstreaming their perspectives into the health sector at all levels—engagement is not a cost-neutral activity.

## Integrated TB and HIV services can save millions more lives

Increased access to antiretroviral therapy and improvements in the integrated delivery of HIV and TB services averted approximately 13 million [11–14 million] deaths among people living with HIV between 2000 and 2021 (8.5 million in Africa, 2.9 million in south-east Asia). There were 67% fewer TB-related deaths globally in 2021 among people living with HIV, compared with 2010 (see Chapter 2) *(71)*.

**The target of an 80% decline in numbers of TB-related deaths by 2025 is within reach**

**Figure 3.7** Number of tuberculosis-related deaths among people living with HIV, global, 2000–2021 and 2025 target




Source: Global tuberculosis report. Geneva: World Health Organization; 2022.

Such is the scale of the overlapping TB and HIV epidemics, however, that TB still claimed the lives of 190 000 [160 000–220 000] people living with HIV in 2021. There is a huge need and opportunity for integration to make an even bigger impact. TB treatment success rates are slightly lower for people living with HIV (77%) than for all people with a new episode of TB (86%). The success rates among people living with HIV are highest in sub-Saharan Africa (>80%).

Coverage of antiretroviral therapy among people living with HIV estimated to have TB continues to vary widely in the 30 countries with a high burden of both TB and HIV—from as low as 9% in the Philippines to 81% in Uganda in 2021. Only 12 of these 30 countries achieved treatment coverage of at least 50% for both HIV and TB *(71)*.

The annual number of people living with HIV who receive TB preventive treatment has risen steeply but is still well short of the 90% coverage target set for 2025. Services were disrupted in 2020 by the COVID-19 pandemic but recovered somewhat the next year in the WHO African and Eastern Mediterranean regions. The vast majority of people living with HIV receiving TB preventive treatment were in Africa (2.5 million) *(71)*.[6]

An even greater impact can be achieved with integrated HIV and TB services if persistent hindrances are removed, including stigmatization by health-care staff, shortages of medical supplies and staff, and erratic adherence to treatment guidelines. These can be addressed with strengthened procurement and supply chains, improved staffing levels and training, and provision of psychosocial support *(72)*.

[6] Nigeria, South Africa, Uganda, the United Republic of Tanzania, Zambia and Zimbabwe accounted for over 2.1 million of these people.

# Making greater use of other integration opportunities

Cervical cancer is the most common cancer among women living with HIV, who have a six-fold higher risk of developing invasive cervical cancer compared with women without HIV *(73)*. Worldwide, cervical cancer is the fourth most frequent cancer in women, with an estimated 604 000 new cases in 2020. Approximately 35 000 of these were among women living with HIV, the vast majority in eastern and southern Africa *(74)*. Integration of HIV and cervical cancer primary prevention, screening, treatment and care services could provide further, much-needed protection against cervical cancer, and ultimately its elimination.

To achieve the elimination of cervical cancer globally, countries must aim by 2030 to vaccinate 90% of girls against human papilloma virus (HPV; which causes cervical cancer) by the age of 15 years, ensure 70% of women receive two high-performing screening tests (including testing for HPV) at the ages of 35 and 45 years, and provide treatment for 90% of women with precancerous lesions or cervical cancer *(73)*.

The Go Further partnership for ending AIDS and cervical cancer in sub-Saharan Africa, which brings together the George W. Bush Institute, PEPFAR, UNAIDS, and the Roche and Merck pharmaceutical corporations *(75)*, has supported more than 5.7 million cervical cancer screenings for women living with HIV since 2018 *(76)*. The screenings were done in HIV care settings that have integrated cervical cancer services. Of the precancerous lesions identified, 76% were treated, resulting in the provision of over 285 000 treatments in 12 eastern and southern African countries with the highest HIV burdens of and cervical cancer *(76)*. Such integrated services are still unevenly available in and across countries in Africa and beyond, however. Sixteen of the 19 evaluated countries in Latin America have already implemented HPV vaccination programmes, but Mexico is the only country that has met the target of having 90% of girls fully vaccinated for HPV by age 15 years *(77, 78)*.

There are reports that some women living with HIV feel coerced into undergoing cancer screening and do not receive sufficient information and choice about the service. As with all health services, it is vital for people to be meaningfully engaged in decisions regarding their use of services in ways that respect their rights, choices and confidentiality. Furthermore, even where screening is free of charge for women living with HIV, the cost of treatment and the burden of paying for transport and arranging child care put cervical cancer treatment out of reach for many women *(79)*.

Integrated HIV and sexual and reproductive health services have been found to improve access to and quality of antenatal care, while reducing stigma *(80)*. In addition to HIV-specific care and support, they contribute to reducing unintended pregnancies and pregnancy-related maternal mortality among women living with HIV *(68)*.

The integration of HIV testing and treatment with maternal and child care has been central to the massive expansion of antiretroviral therapy coverage among women living with HIV and their male partners, and in preventing millions of HIV infections in children. A recent investigation found that HIV care and antiretroviral therapy initiation were fully integrated in about 80% of maternal and child health services in southern Africa and 76% in eastern Africa. Integration is still much less common in western and central Africa (30–40%) *(81)*. Efforts towards the triple elimination of mother-to-child transmission of HIV, syphilis and hepatitis B virus are further advancing integrated service delivery for mothers and children *(71)*. Integration efforts also need to address the widespread occurrence of maltreatment of women and girls by health-care providers. A systematic review in sub-Saharan Africa found that 44% of women experienced some form of disrespect and abuse during the process of childbirth at health facilities *(82)*.

There are other missed opportunities. A new meta-analysis of studies, mostly from the Americas and Africa, found that only about a third (35%) of people diagnosed with another sexually transmitted infection were also tested for HIV, although dual testing was much more common in countries with a high burden of HIV *(83)*. Meanwhile, the decentralization and integration of viral hepatitis C care with harm reduction services or primary care is showing some evidence of improved access to testing and linkages to care and treatment *(84)*.

In many low- and middle-income countries, the increasing prevalence of noncommunicable diseases is intersecting with their HIV epidemics, partly because people living with HIV (especially older people) face increased risks of noncommunicable diseases *(85–87)*. A cohort study in Latin America in 2015 found that around half of people on HIV treatment aged 50 years or older had at least 1 noncommunicable disease *(88)*.

**A STUDY IN LATIN AMERICA FOUND THAT AROUND HALF OF PEOPLE ON HIV TREATMENT AGED 50 YEARS OR OLDER HAD AT LEAST 1 NONCOMMUNICABLE DISEASE**

The integration of prevention and treatment services for HIV and noncommunicable diseases could enable countries to expand health-care coverage for people living with or affected by HIV and noncommunicable diseases, and improve their health outcomes and well-being. It could also address some of the risks of developing noncommunicable diseases among people living with or at risk of HIV. Although countries have been adopting integration policies *(89)*, actual integration is still nascent and uneven. A recent meta-analysis of 26 studies from sub-Saharan Africa found that approximately one in five people living with HIV had hypertension, but that screening and treatment for hypertension were infrequent in most HIV clinics *(87)*.

The need to link or integrate HIV and mental health services has gained increased recognition, in light of evidence that people living with or at risk of HIV experience mental health conditions at higher rates than people in the general population *(90–92)*. Successful integration would enhance HIV and wider physical and mental health outcomes *(93, 94)*. It presents both a challenge for the overstretched health systems of many low- and middle-income countries (where mental health services can be scarce and of poor quality), and an opportunity in places where specialized mental health services are limited but where some of those services could be provided by lay and other nonspecialized health workers.

There is a concerted push towards integrating HIV services for people in humanitarian settings, with HIV funding requests to the Global Fund increasingly including programmes for refugee and internally displaced populations *(95)*. The growth in climate change-induced and conflict-related humanitarian emergencies is cause for great concern: in 2022, the number of people displaced by war, violence, persecution or human rights abuses exceeded 100 million for the first time *(96)*.

In some regions, these populations include significant numbers of people living with HIV whose access to HIV treatment and other services is often destabilized. In addition, HIV-related stigma, poverty, fear of deportation and language barriers deter many people from seeking and using available services. An estimated 30 000–40 000 Venezuelan migrants and displaced people are living with HIV and a substantial proportion of the 240 000 people living with HIV in Ukraine are among the 5 million people driven from their homes by the war in that country.

The civil war in Sudan has displaced at least one million people, over 220 000 of whom have sought refuge in neighbouring countries *(97)*. Many hospitals and health facilities have been damaged or forced to shut, and medical supply lines have been badly disrupted. In Khartoum, where at least 4600 people were living with HIV, less than half of HIV treatment centres were still operating in May 2023.[7] The integration of HIV and related services as part of humanitarian responses is an ongoing priority.

**THE INTEGRATION OF HIV AND RELATED SERVICES AS PART OF HUMANITARIAN RESPONSES IS AN ONGOING PRIORITY**

More extensive integration holds great promise, but success depends on a wide range of factors, including the capacity, structure and financing of health systems, and adequate training and coordination of health workforces *(98)*. It is essential to involve the affected communities, including people from key populations, in the design and delivery of integrated programmes so the services meet the needs of the people who use them.

[7] Personal communication with UNAIDS Country Office, Khartoum, 19 June 2023.

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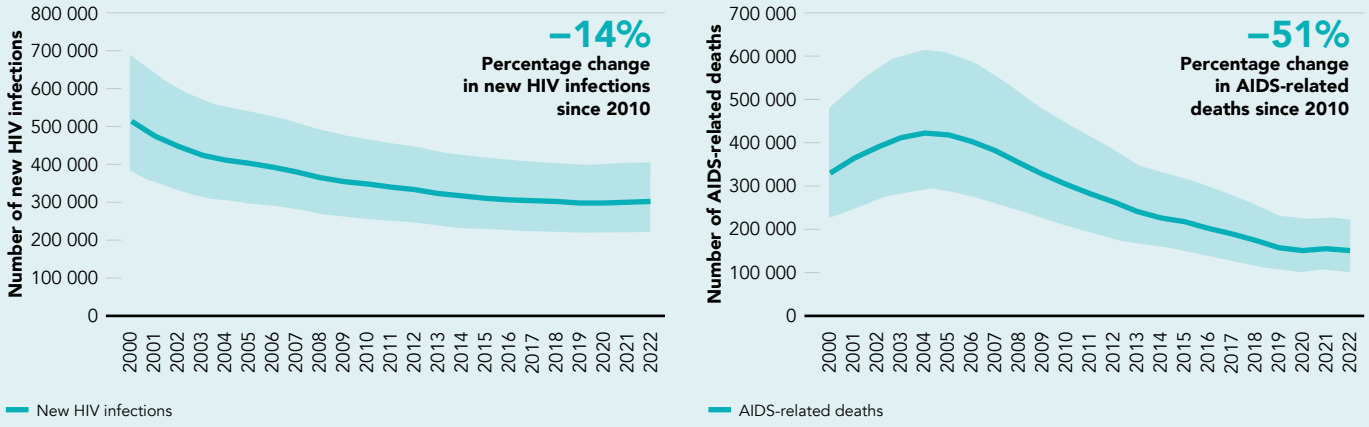
# Asia and the Pacific

Marked inequalities and diverse epidemic trends affect progress in the HIV response in Asia and the Pacific. The HIV epidemic in the region disproportionately affects people from key populations, especially young people (15–24 years), and their sexual partners. Young people accounted for around a quarter of new HIV infections in the region in 2022. In Cambodia, Indonesia, the Lao People's Democratic Republic, Myanmar, the Philippines and Thailand, nearly half of new HIV infections occurred among young people. Although the numbers of new HIV infections and HIV-related deaths have declined overall at the regional level since 2010 (Figure 4.1), some countries have experienced an expansion of their epidemics in recent years.[1]

Median HIV prevalence among people from key populations remains much higher than among the general population (Figure 4.2). Since 2010, estimated numbers of new HIV infections among gay men and other men who have sex with men increased by six times in the Philippines, tripled in Cambodia and almost doubled in the Lao People's Democratic Republic. The increasing use of stimulants and synthetic opioids exacerbates the risks of HIV transmission among people who use drugs *(1)*.

## Rising epidemics in several countries are stalling regional progress

**Figure 4.1** Number of annual new HIV infections and AIDS-related deaths, Asia and the Pacific, 2000–2022




Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).

[1] Countries in the region with increasing numbers of new HIV infections in 2022 include Afghanistan, Bangladesh, Fiji, Papua New Guinea, Philippines and Timor Leste.

## 2022 DATA

- **14%** decrease in new HIV infections since 2010
- **51%** decrease in AIDS-related deaths since 2010
- People living with HIV:
  **6.5 million [5.3 million–7.8 million]**
- New HIV infections:
  **300 000 [220 000–400 000]**
- AIDS-related deaths:
  **150 000 [110 000–220 000]**

### Testing and treatment cascade (all ages):

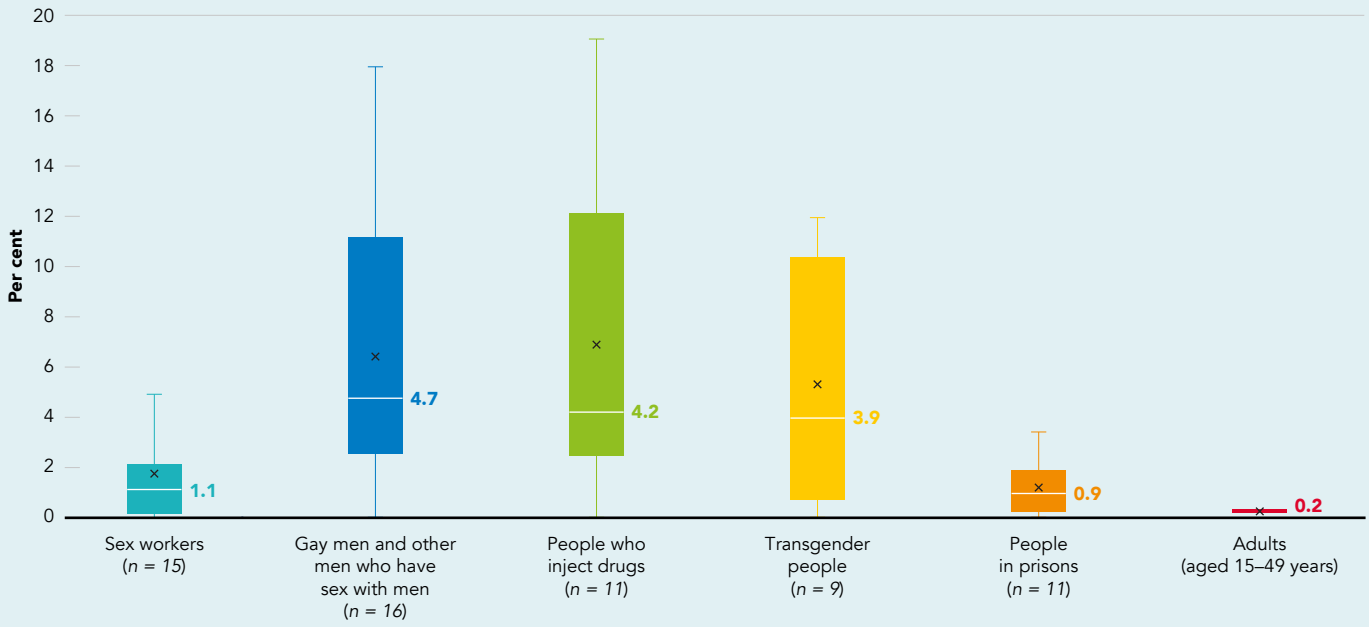
- % of people living with HIV who know their status:
  **78 [64–94]**
- % of people living with HIV who are on treatment:
  **65 [54–78]**
- % of people living with HIV who are virally suppressed:
  **62 [51–74]**

### Financing of the HIV response:

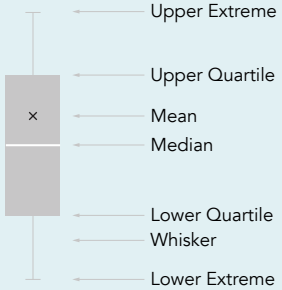
- Resource availability for HIV:
  **US$ 3.7 billion [60% gap to meet the 2025 target]**

**Median HIV prevalence among people from key populations is much higher than among the general population**

**Figure 4.2** HIV prevalence among key populations compared with adults (aged 15–49 years), reporting countries in Asia and the Pacific, 2018–2022




**How to read?**




The median HIV prevalence among countries that reported these data in Asia and the Pacific was:

**1.1%** among sex workers.
**4.7%** among gay men and other men who have sex with men.
**4.2%** among people who inject drugs.
**3.9%** among transgender people.
**0.9%** among people in prisons.

The estimated HIV prevalence among adults (aged 15–49 years) is **0.2% [0.2–0.3%]**.

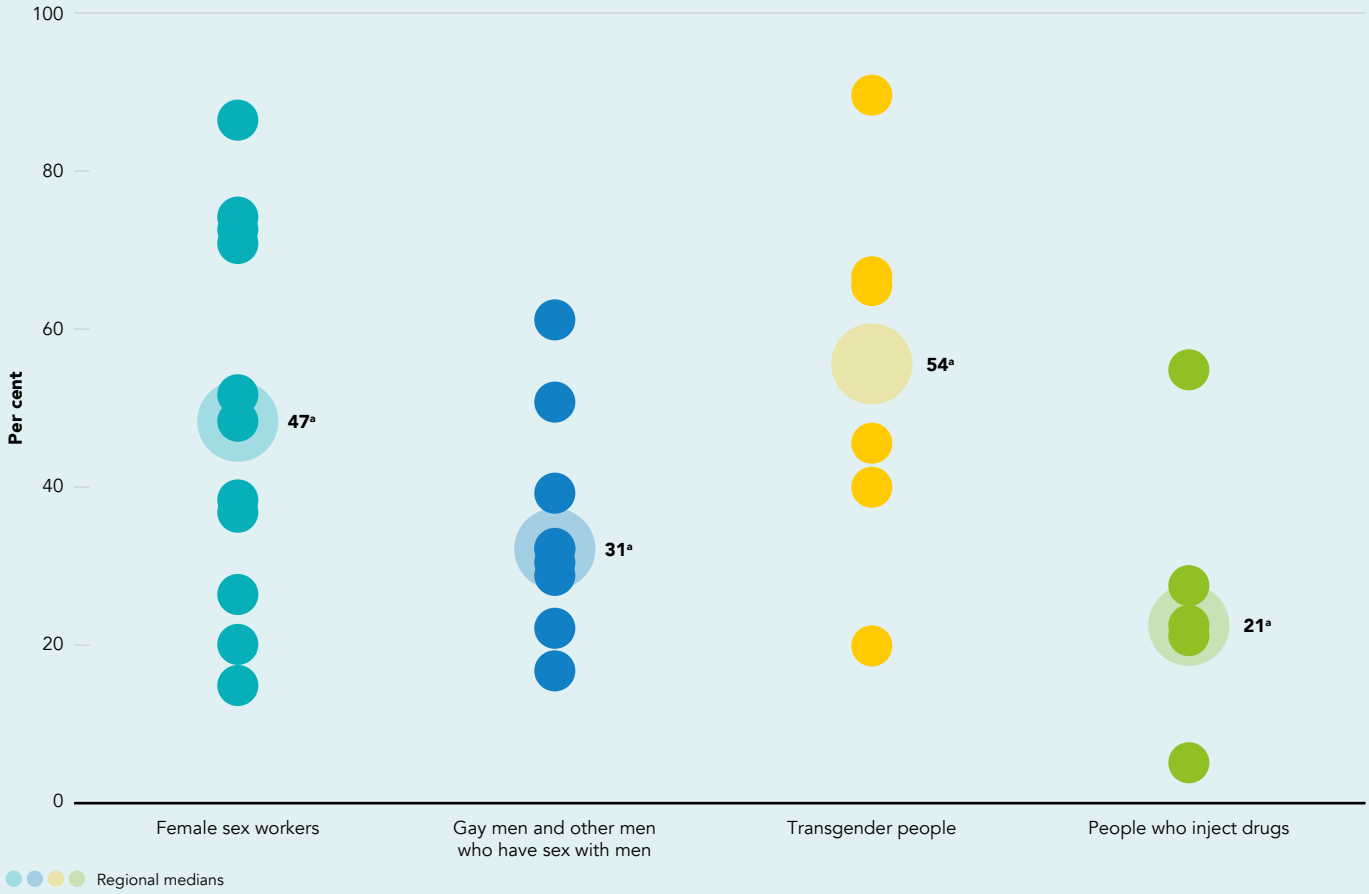
Sources: UNAIDS Global AIDS Monitoring, 2023; UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).
Notes: *n* = number of countries. Total number of reporting countries = 42.
The adult prevalence uncertainty bounds define the range within which the true value lies (if it can be measured). Narrow bounds indicate that an estimate is precise, while wide bounds indicate greater uncertainty regarding the estimate.

Efforts are under way to expand access to combination HIV prevention services, including harm reduction services, self-testing and virtual interventions, along with greater provision of pre-exposure prophylaxis (PrEP). Several countries reported significant increases in the uptake of PrEP, including Viet Nam, which saw a 59% increase in PrEP use in 2022. Significant gaps in prevention service coverage remain (Figure 4.3), however, particularly among young people from key populations.

Progress towards the 95–95–95 targets has been uneven across countries and populations in the region, reflecting difficulties in reaching people from key populations and their sexual partners with testing and treatment. Antiretroviral therapy coverage over 80% has been achieved only in Cambodia, New Zealand and Thailand. In about a third of countries (eight of 22 countries with published data), antiretroviral therapy coverage is below 50%. The scale-up of dolutegravir-based regimens as the primary treatment option is progressing in the region and is expected to improve treatment outcomes.

### Coverage of HIV prevention programmes is low across key populations

**Figure 4.3** Coverage of HIV prevention interventions among key populations, select countries with available data, Asia and the Pacific, 2018–2022




[a] Calculated based on 11 reporting countries for female sex workers, 9 for gay men and other men who have sex with men, 6 for transgender people and 5 for people who inject drugs.
Source: UNAIDS Global AIDS Monitoring, 2023 (https://aidsinfo.unaids.org/).
Note: prevention coverage is measured as the percentage of people in a key population who report having received a combined set of HIV prevention interventions in the past three months (at least two out of three services: given condoms and lubricants; received counselling on condom use and safe sex; tested for sexually transmitted infections for transgender people, sex workers and gay men and other men who have sex with men, or received sterile needles or syringes for people who inject drugs).

Stigma and discrimination against people living with HIV and people from key populations continue to pose significant barriers. All countries in the region, except New Zealand and some states in Australia, criminalize sex work. Seventeen countries criminalize same-sex sexual acts in private. Of note, in November 2022 and April 2023 respectively, the Parliaments of the Cook Islands and Singapore removed colonial laws prohibiting consensual sex between men. Transgender rights are under further threat with the recent decision of the Federal Shariat Court to strike down portions of the groundbreaking and progressive Pakistan Transgender Act 2018. Overcrowding in prisons and other closed settings remains rampant in most countries in Asia, with many offences linked to harsh punishment of drug use and possession for personal use *(2)*. The death penalty is in place for drug offences in at least 14 countries in Asia and the Pacific.

Committed national political leadership and collaboration are essential. The Association of Southeast Asian Nations (ASEAN) adopted the Leaders' Declaration on Ending Inequalities and Getting on Track to End AIDS by 2030 *(3)*, which is being translated into a road map for action *(4)*.

Community-led responses remain vital elements of the HIV response. Community-led monitoring is being implemented across the region, and efforts to harmonize approaches and provide technical assistance to community-led organizations are proceeding. Indonesia, Nepal and Papua New Guinea have already completed a full cycle of community-led monitoring, but meaningful engagement of young people from key populations in decision-making platforms remains limited *(5)*.

The key priorities for the HIV response in Asia and the Pacific include modernizing and scaling up HIV prevention, testing, treatment and care services; leveraging innovative solutions such as PrEP and virtual interventions; removing barriers to access services; prioritizing key populations; empowering community leadership; and implementing legal and policy reforms.

Domestic resources for HIV in the region, which comprised 85% of all resources available for HIV in 2022, decreased by 3% compared with 2021. Pursuing equitable and sustainable financing should be prioritized to close the 60% funding gap in estimated annual resource needs to meet the 2025 targets.

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4 ASEAN countries chart path toward ending inequalities and ending AIDS. Bangkok: Association of Southeast Asian Nations; 2023 (https://unaids-ap.org/2023/06/13/asean-countries-chart-path-toward-ending-inequalities-and-ending-aids/).

5 Engagement of youth in the Country Coordinating Mechanism and Global Fund processes in the Asia Pacific. Bangkok: Youth LEAD; 2022 (https://www.youthleadap.org/news-updates/meaningful-engagement-youth-ccm).

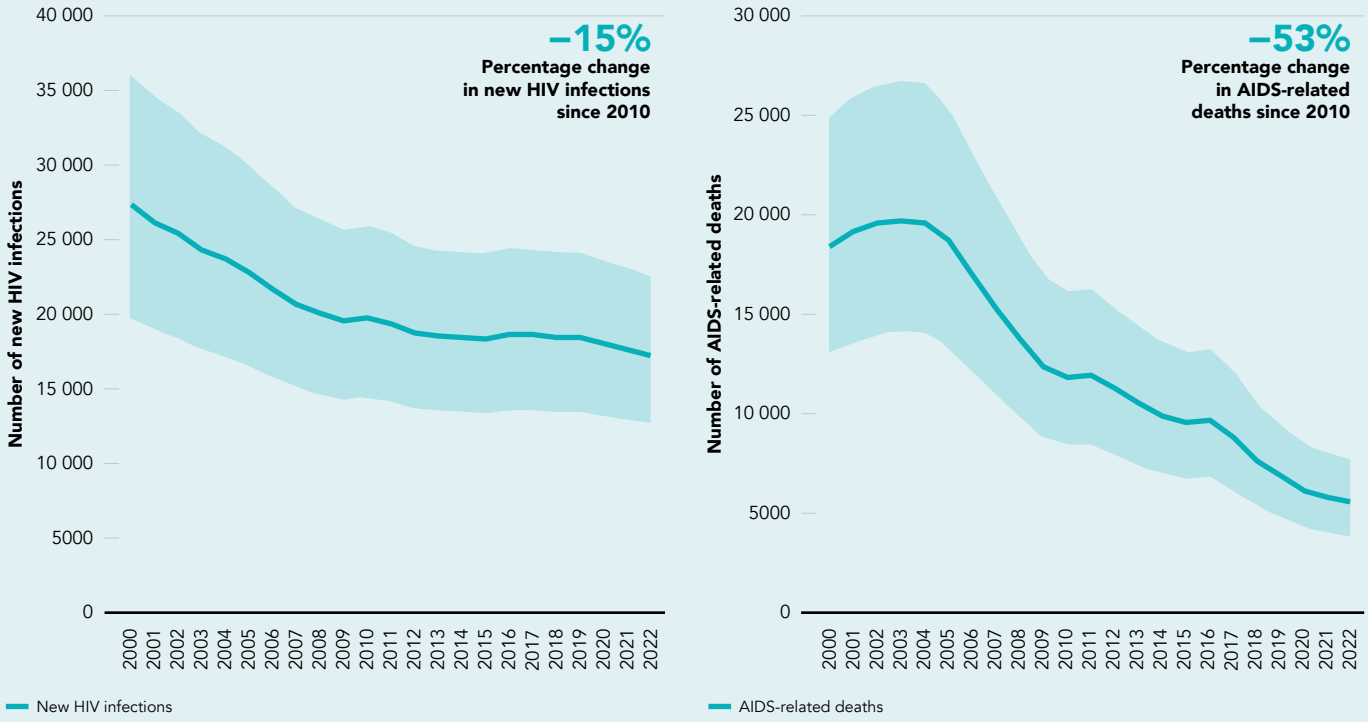
# Caribbean

Number of new HIV infections in the Caribbean reduced by 15% between 2010 and 2022 (Figure 5.1). This trend was slightly stronger among men (18%) than women (10%). Widening coverage of HIV treatment saw numbers of AIDS-related deaths decrease by 53% between 2010 and 2022, although the rate of decline varied across countries. This trend was instead slightly stronger among women (56%) than men (51%).

HIV prevalence is 1.2% among the general population, but it is much higher among key populations (Figure 5.2). Regional median HIV prevalence is 39.4% among transgender people (data from two countries), 11.8% among gay men and other men who have sex with men (data from four countries), 3.6% among people in prisons (data from six countries), and 2.6% among sex workers (data from 2 countries).

**The Caribbean is making significant progress in curbing numbers of new HIV infections and AIDS-related deaths**

**Figure 5.1** Number of new annual HIV infections and AIDS-related deaths, Caribbean, 2000–2022




Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).

## 2022 DATA

- **15%** decrease in new HIV infections since 2010
- **53%** decrease in AIDS-related deaths since 2010
- People living with HIV:
  **330 000 [290 000–380 000]**
- New HIV infections:
  **16 000 [11 000–21 000]**
- AIDS-related deaths:
  **5600 [4100–7500]**

**Testing and treatment cascade (all ages):**

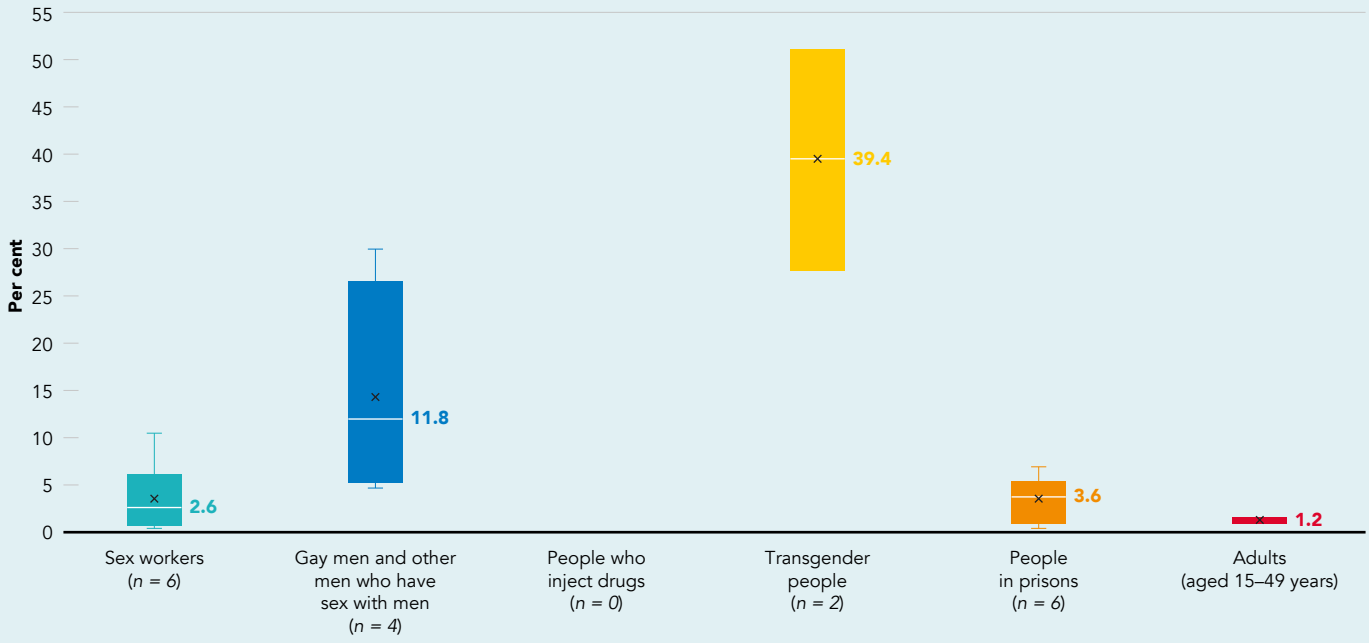
- % of people living with HIV who know their status:
  **83 [72–96]**
- % of people living with HIV who are on treatment:
  **68 [59–78]**
- % of people living with HIV who are virally suppressed:
  **57 [49–66]**

**Financing of the HIV response:**

- Resource availability for HIV:
  **US$ 390 million**

### Median HIV prevalence among people from key populations is much higher than among the general population

**Figure 5.2** HIV prevalence among key populations compared with adults (aged 15–49 years), reporting countries in the Caribbean, 2018–2022

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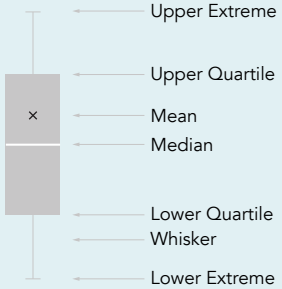



The median HIV prevalence among countries that reported these data in the Caribbean was:

**2.6%** among sex workers.
**11.8%** among gay men and other men who have sex with men.
**39.4%** among transgender people.
**3.6%** among people in prisons.

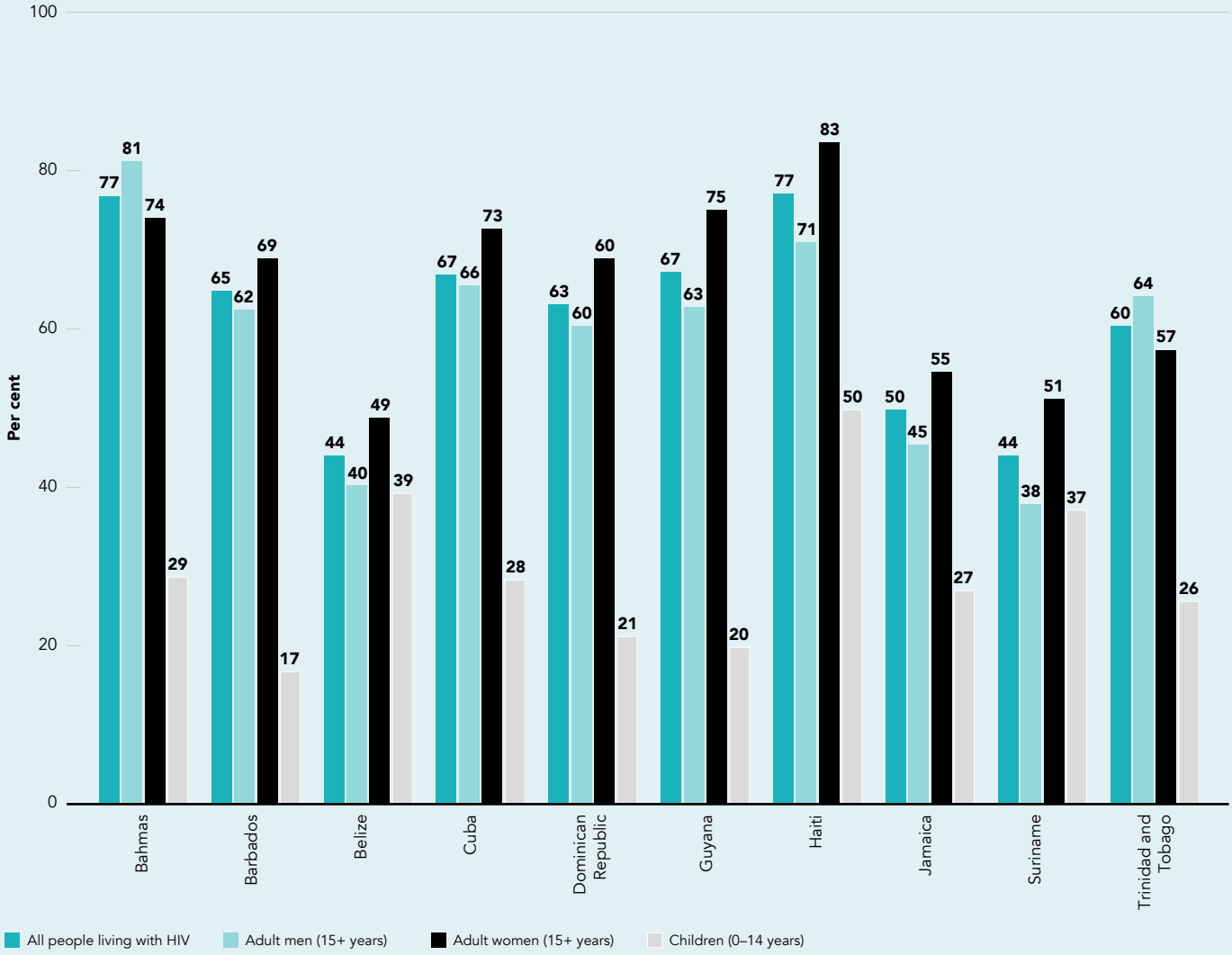
The estimated HIV prevalence among adults (aged 15–49 years) is **1.2% [1.0–1.3%]**.

Sources: UNAIDS Global AIDS Monitoring, 2023; UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).
Notes: *n* = number of countries. Total number of reporting countries = 17.
The adult prevalence uncertainty 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.

Since 2010, antiretroviral therapy coverage has increased from 19% to 63% among men, and from 21% to 74% among women. Coverage in 2022 continues to be much lower among children (39%) across the region (Figure 5.3).

## Coverage of antiretroviral therapy is lower among children and men

**Figure 5.3** Antiretroviral coverage by age and sex, selected countries, Caribbean, 2022




Source: UNAIDS epidemiological estimates 2023 (https://aidsinfo.unaids.org/).

Presentation or diagnosis with advanced HIV disease remains a challenge in the region. Although the percentage of people living with HIV with suppressed viral loads has risen from 39% in 2018 to 57% in 2022, viral load testing coverage (74%) was below pre-COVID-19 levels. If underlying HIV-related inequalities and barriers, including HIV-related stigma, are addressed, treatment coverage and outcomes are likely to improve further.

Coverage of programmes to prevent vertical transmission of HIV rose from 45% to 65% between 2010 and 2022. Eight countries and territories in the Caribbean[1] have been validated by the World Health Organization (WHO) for the elimination of vertical transmission of HIV and syphilis since 2015 *(1)*. Belize, Jamaica and Saint Vincent and the Grenadines are on track for validation in 2023–2024.

In 2022, Antigua and Barbuda, Barbados and Saint Kitts and Nevis struck down colonial-era laws that criminalized sex between consenting adult same-sex partners. Several other countries, however, still uphold harmful laws and policies that deny human rights and undermine the response to the HIV epidemic.

HIV responses in the Caribbean continue to rely heavily on external funding, with international financing comprising over 70% of all available resources for HIV in 2022—this is despite most countries in the region being classified as upper-middle-income and domestic resources increasing by 15% since 2021. High national debts are a significant constraint in some countries *(2)*. The region also includes low-income countries with a high HIV burden, such as Haiti, which require sustained external financing for the HIV response. Transitioning to sustainable financing for HIV is crucial to build on the current progress and address the structural factors that limit access to services and increase HIV vulnerability in the region.

[1] Anguilla, Antigua and Barbuda, Bermuda, Cayman Islands, Cuba, Dominica, Montserrat, Saint Kitts and Nevis.

## References


1 Greater efforts needed to accelerate the elimination of syphilis and congenital syphilis in the Americas. Washington, DC: Pan American Health Organization; 2023 (https://www.paho.org/en/news/12-5-2023-greater-efforts-needed-accelerate-elimination-syphilis-and-congenital-syphilis).

2 Macro poverty outlook: country-by-country analysis and projections for the developing world. Washington, DC: World Bank; 2023 (https://thedocs.worldbank.org/en/doc/e408a7e21ba62d843bdd90dc37e61b57-0500032021/related/mpo-lac.pdf).

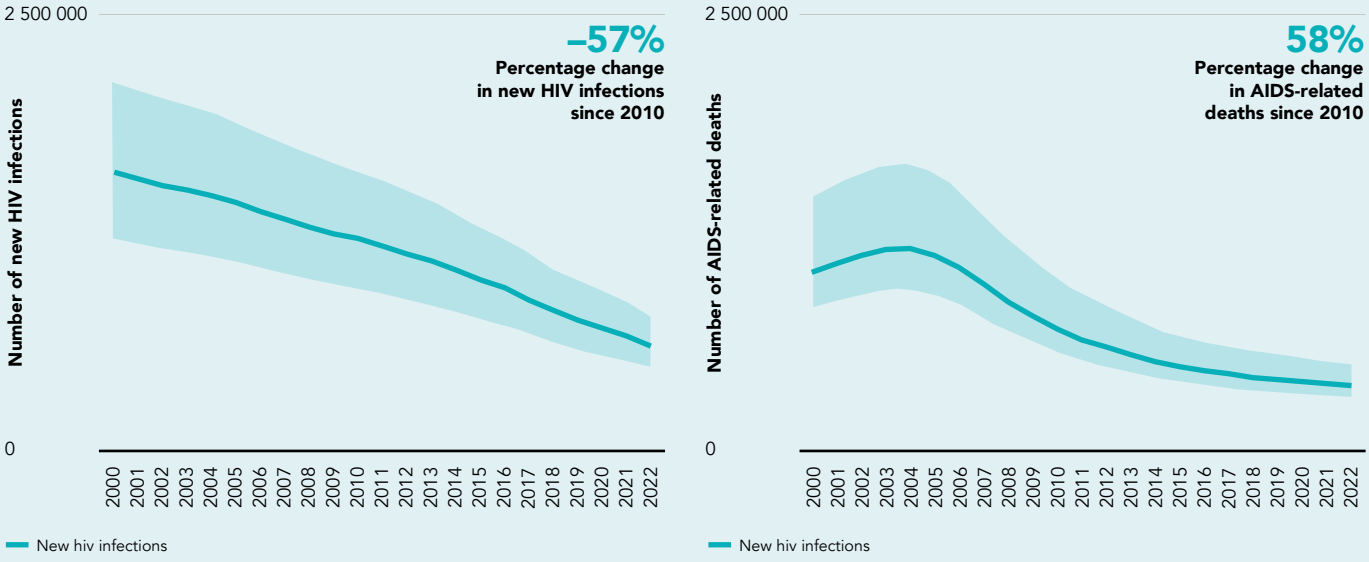
# Eastern and southern Africa

Eastern and southern Africa, the region most heavily impacted by HIV, has made significant progress in reducing numbers of new HIV infections and AIDS-related deaths (Figure 6.1). The decline in incidence differs markedly between countries and populations, however, and the overall decline is not yet rapid enough to achieve the 2025 targets.

HIV incidence among women and girls has reduced by 65% since 2010. Women aged 15 years and over, however, still accounted for 61% of all people living with HIV in the region in 2022, with adolescent girls and young women aged 15–24 years at inordinate risk of HIV infection. Many adolescent girls and young girls lack sufficient decision-making power about their sexual relations, contraceptive use and health care.

**Steady reductions in numbers of new HIV infections and AIDS-related deaths in eastern and southern Africa lead global progress**

**Figure 6.1** Number of new HIV infections and AIDS-related deaths, eastern and southern Africa, 2000–2022




Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).

## 2022 DATA

- **57%** decrease in new HIV infections since 2010
- **58%** decrease in AIDS-related deaths since 2010
- People living with HIV:
  **20.8 million [17.4 million–24.5 million]**
- New HIV infections:
  **500 000 [370 000–670 000]**
- AIDS-related deaths:
  **260 000 [200 000–370 000]**

**Testing and treatment cascade (all ages):**

- % of people living with HIV who know their status:
  **92 [77–>98]**
- % of people living with HIV who are on treatment:
  **83 [69–97]**
- % of people living with HIV who are virally suppressed:
  **77 [65–91]**

**Financing of the HIV response:**

- Resource availability for HIV:
  **US$ 9.8 billion**

As well as ensuring access to effective HIV prevention tools and services, programmes must address the underlying gender and other inequalities that generate this high risk among adolescent girls and young women, including through prevention of gender-based violence and increasing access to good-quality comprehensive sexuality education and sexual and reproductive health services. Reducing the vulnerability of women and girls also requires strong and resilient social protection systems that effectively meet the needs of women and girls, who are most heavily affected by economic shocks and other emergencies.

Numbers of new HIV infections have levelled off in South Sudan but increased in Madagascar. HIV incidence has reduced substantially (by 73% since 2010) among adult men aged 15–49 years, but it is not declining among gay men and other men who have sex with men *(1)*. Greater investment in intensified and more precise prevention efforts is a priority.

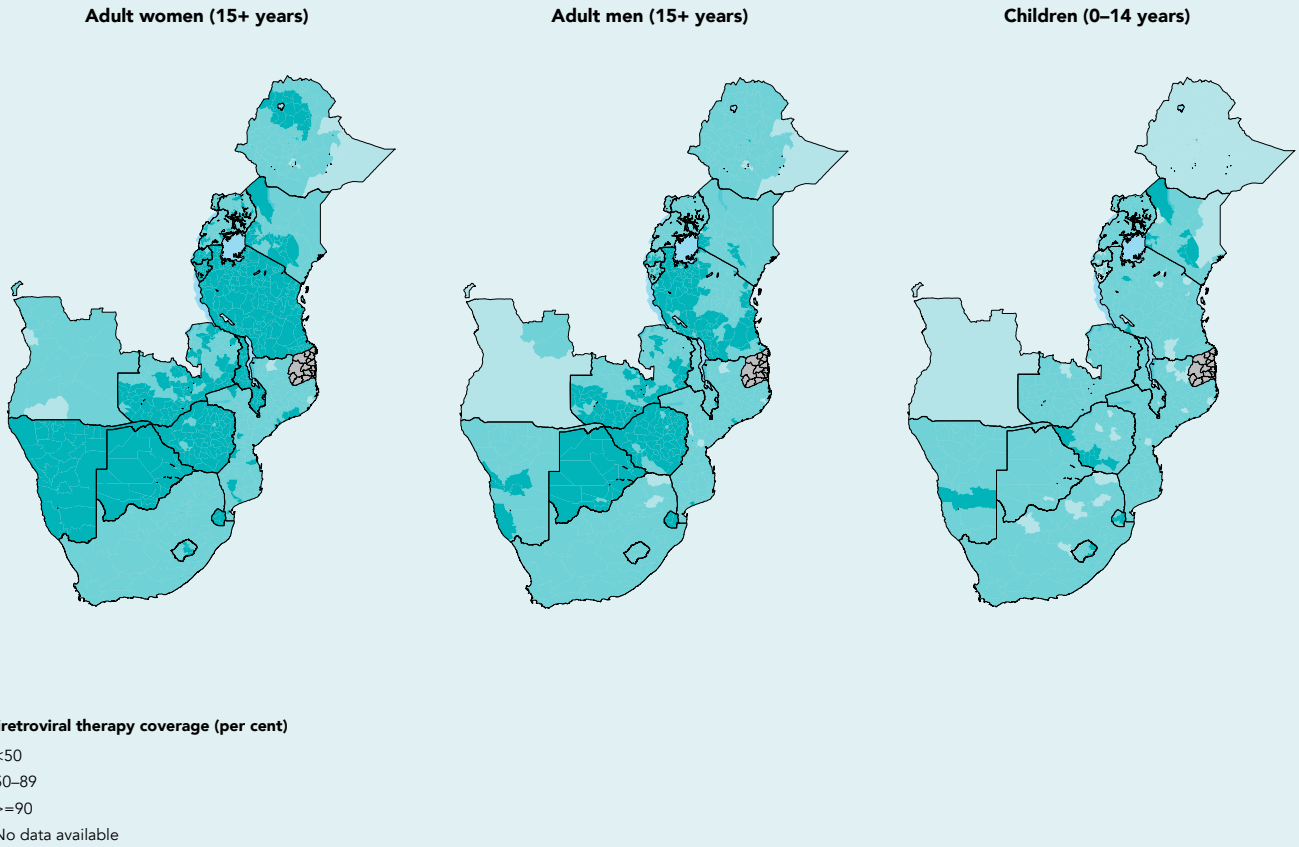
The successes of Botswana and Malawi in reducing their vertical HIV transmission rates by 83% and 74%, respectively, offer inspiration and practical lessons. Strong partnerships with other health programmes (e.g. child immunization, sexual and reproductive health services) and community engagement can ensure all pregnant women are screened for HIV and syphilis, and that the children of women living with HIV are reached with HIV services.

In the region, HIV treatment coverage continues to expand, with 83% of people aged 15 years and over living with HIV on antiretroviral therapy in 2022. An estimated 93% of people receiving treatment were virally suppressed—roughly the same level as in Europe and North America. Botswana, Eswatini, Rwanda, the United Republic of Tanzania and Zimbabwe have achieved the 95–95–95 targets overall, although coverage lags in several other countries.

The achievements are shadowed by low coverage of treatment among children (64% in the region overall). Coverage among adult men (78%) is significantly lower than among adult women (86%) (Figure 6.2). People from key populations are not benefiting equally from the rollout of treatment. Disaggregated data can be used more effectively to identify populations that are being missed. Stronger action against stigma and discrimination, including at health-care facilities, can increase access to and use of testing and treatment services.

## HIV treatment coverage varies widely across populations and locations

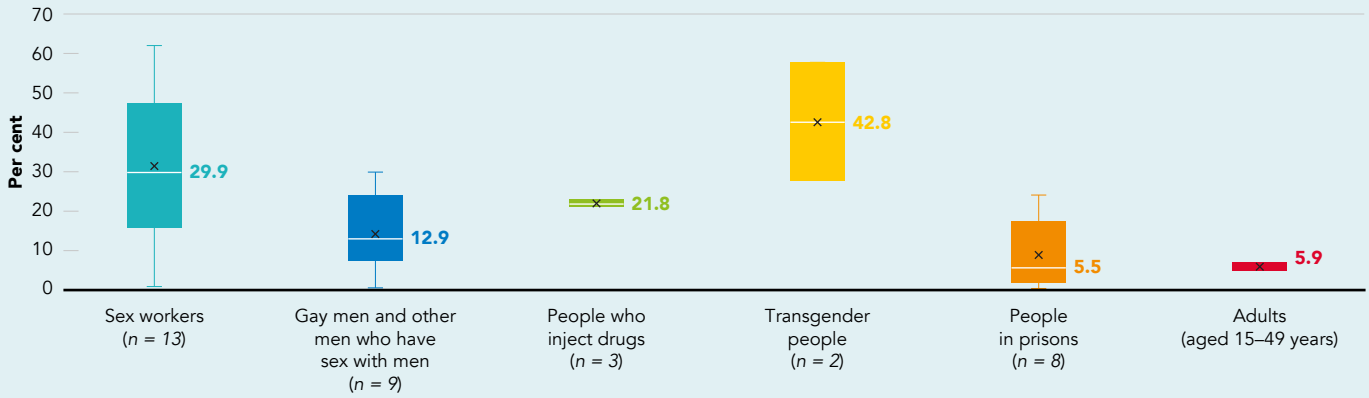
**Figure 6.2** Antiretroviral treatment coverage among children (0–14 years), adult men and adult women (15+ years), subnational levels, eastern and southern Africa, 2022




Source: UNAIDS epidemiological estimates, 2023.
Note: Analysis available for 16 countries in eastern and southern Africa with required data at the subnational level. Countries in the region not included are Comoros, Eritrea, Madagascar, Mauritius, Seychelles, and South Sudan.

**Median HIV prevalence among people from key populations is much higher than among the general population**

**Figure 6.3** HIV prevalence among key populations compared with adults (aged 15–49 years), reporting countries in eastern and southern Africa, 2018–2022

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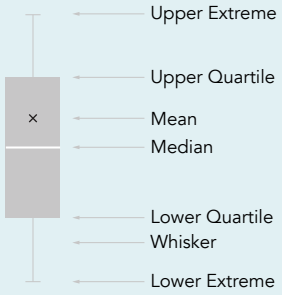



The median HIV prevalence among countries that reported these data in eastern and southern Africa was:

**29.9%** among sex workers.
**12.9%** among gay men and other men who have sex with men.
**21.8%** among people who inject drugs.
**42.8%** among transgender people.
**5.5%** among people in prisons.

The estimated HIV prevalence among adults (aged 15–49 years) is **5.9% [4.9–6.9%]**.

Sources: UNAIDS Global AIDS Monitoring, 2023; UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).
Notes: *n* = number of countries. Total number of reporting countries = 21.
The adult prevalence uncertainty 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.

The majority of countries in the region retain laws that criminalize same-sex sexual relations, sex work or drug use. Together with high levels of stigma and discrimination, those laws block equitable HIV care, particularly for people from key populations. Removal or reform of these laws, in line with public health evidence, would boost the HIV response and the human rights of people from marginalized populations, in particular key populations who continue to have much higher HIV prevalence than the general population (Figure 6.3).

Resources available for HIV in eastern and southern Africa in 2022 totalled US$ 9.8 billion. Botswana, Kenya and South Africa account for a large share of that funding. The rest of the region experienced a 5% funding gap, measured against the 2025 target. In 2022, domestic financing in the region represented 39% of total HIV resources. In light of competing priorities globally and regionally, efficiency gains and political commitment to sustain or increase domestic funding levels are needed.

## References

1 Stannah J, Soni N, Lam J, et al. Trends in HIV testing, the treatment cascade, and HIV incidence among men who have sex with men in Africa: a systematic review and meta-regression analysis. medRxiv 2022.11.14.22282329 (https://doi.org/10.1101/2022.11.14.22282329).

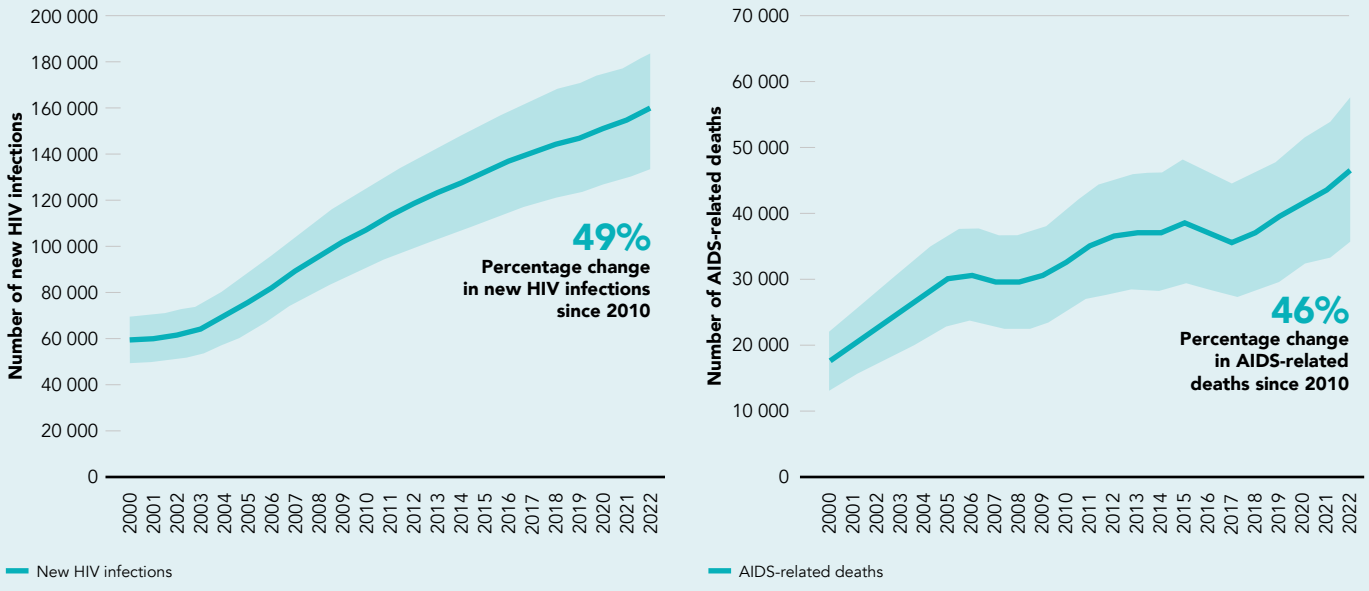
# Eastern Europe and central Asia

A challenging legal environment, human rights violations and military conflict are hindering the HIV response. The region is experiencing the sharpest rise in numbers of new HIV infections in the world (49% increase since 2010) and a continuing increase in numbers of AIDS-related deaths (46% increase since 2010) (Figure 7.1). Median HIV prevalence ranges from an estimated 1.2% among adults (aged 15–49 years), in the general population to 7.2% among people who inject drugs (data from 13 countries) (Figure 7.2).

At the regional level, coverage of HIV prevention and treatment services remains insufficient, with only 51% of people living with HIV receiving antiretroviral therapy in 2022. Median coverage of HIV prevention services (receiving at least two HIV prevention services from a specific list of services) was 66.3% among sex workers (8 reporting countries), 51.2% among gay men and other men who have sex with men (seven reporting countries), 49.3% among people who inject drugs (nine reporting countries), and 77.0% among transgender people (three reporting countries).

**Eastern Europe and central Asia has the fastest-growing HIV epidemic in the world**

**Figure 7.1** Number of new annual HIV infections and AIDS-related deaths, eastern Europe and central Asia, 2000–2022




Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).

## 2022 DATA

- **49%** increase in new HIV infections since 2010
- **46%** increase in AIDS-related deaths since 2010
- People living with HIV:
  **2.0 million [1.8 million–2.1 million]**
- New HIV infections:
  **160 000 [140 000–180 000]**
- AIDS-related deaths:
  **48 000 [38 000–58 000]**

**Testing and treatment cascade (all ages):**

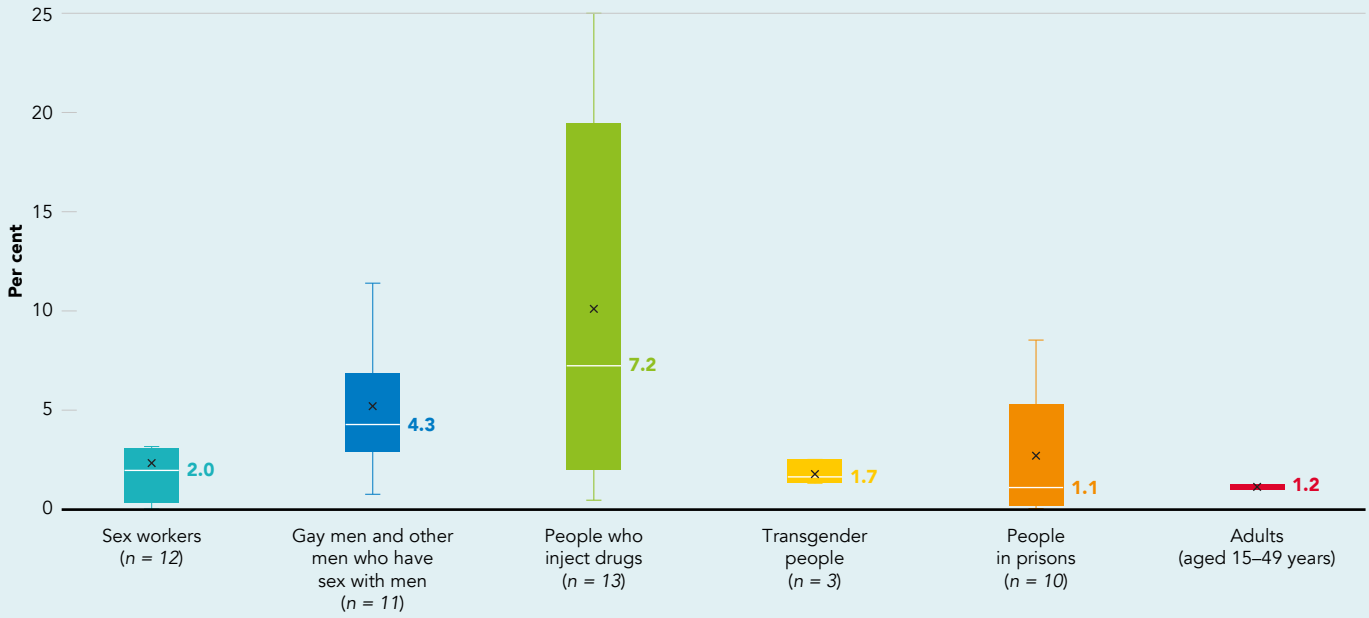
- % of people living with HIV who know their status:
  **62 [56–68]**
- % of people living with HIV who are on treatment:
  **51 [46–56]**
- % of people living with HIV who are virally suppressed:
  **48 [43–53]**

**Financing of the HIV response:**

- Resource availability for HIV:
  **US$ 1.5 billion [60% gap to meet the 2025 target]**

### The highest HIV prevalence in the region is among people who inject drugs

**Figure 7.2** HIV prevalence among key populations compared with adults (aged 15–49 years), reporting countries in eastern Europe and central Asia, 2018–2022

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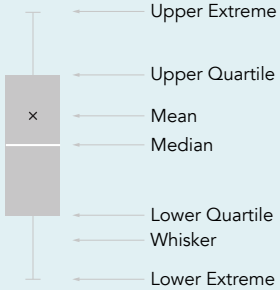



The median HIV prevalence among countries that reported these data in eastern Europe and central Asia was:

**2.0%** among sex workers.
**4.3%** among gay men and other men who have sex with men.
**7.2%** among people who inject drugs.
**1.7%** among transgender people.
**1.1%** among people in prisons.

The estimated HIV prevalence among adults (aged 15–49 years) is **1.2% [1.1–1.3%]**.

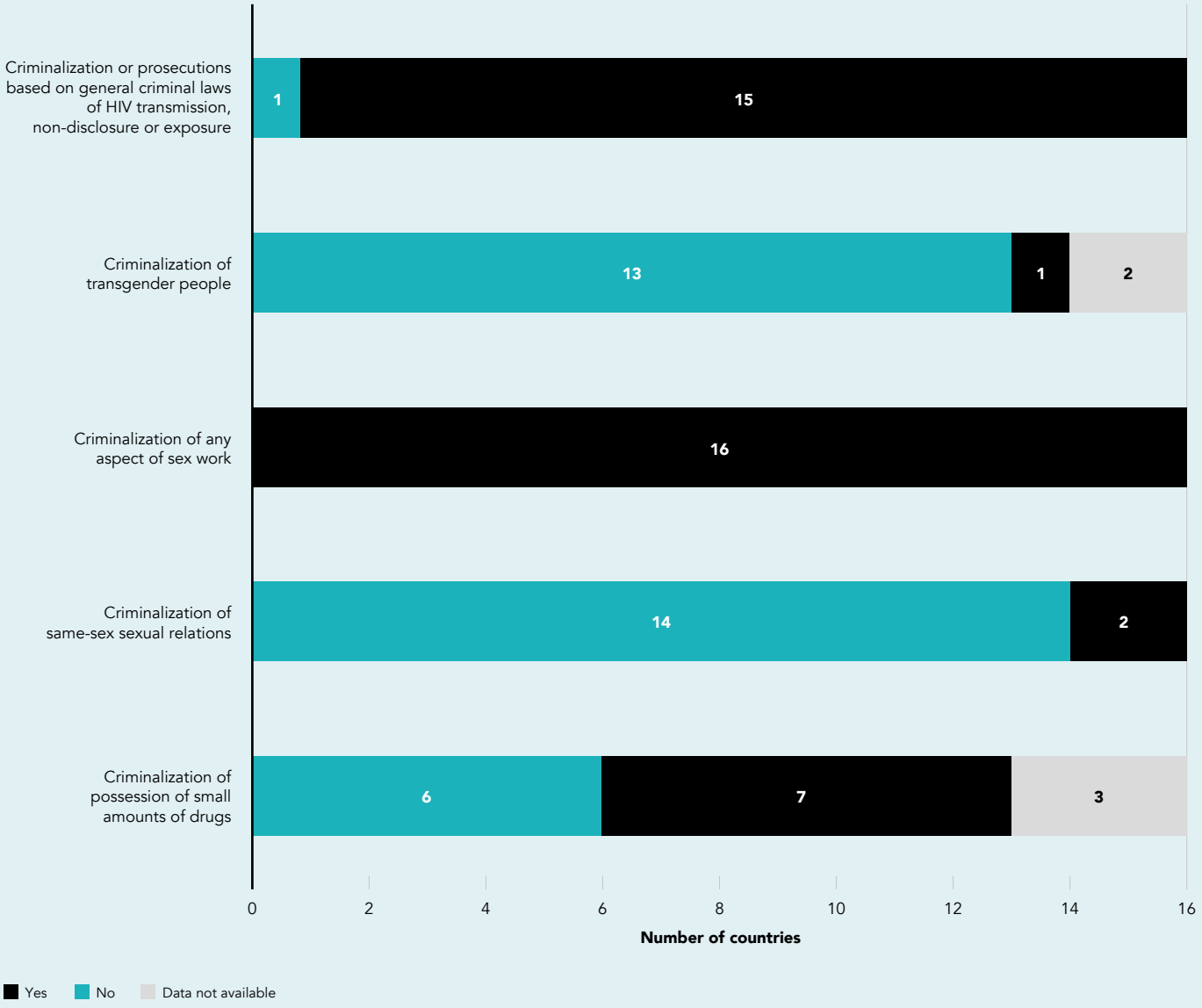
Sources: UNAIDS Global AIDS Monitoring, 2023; UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).
Notes: *n* = number of countries. Total number of reporting countries = 16.
The adult prevalence uncertainty bounds define the range within which the true value lies (if it can be measured). Narrow bounds indicate that an estimate is precise, while wide bounds indicate greater uncertainty regarding the estimate.

Unsafe injecting practices are a key factor in the region's epidemic. Despite harm reduction programmes being widely integrated into national AIDS plans across the region, no country provides more than 50% opioid agonist maintenance programmes, and no country achieved the recommendation of distributing more than 200 needles and syringes per person who injects drugs. Importantly, the Republic of Moldova has expanded comprehensive harm reduction services across all of its 17 prisons.

Existing punitive laws and policies targeting people living with HIV and people from almost all key populations continue to be barriers. Recent legislative changes, including those in the Russian Federation that restrict human rights and civic space *(1)*, have further jeopardized the provision of essential HIV services (Figure 7.3).

**Eastern Europe and central Asia is off track to ensure less than 10% of countries have punitive legal and policy environments**

**Figure 7.3** Countries with discriminatory and punitive laws, eastern Europe and central Asia, 2023




Source: UNAIDS National Commitments and Policy Instrument 2017–2022 (see http://lawsandpolicies.unaids.org/); supplemented by additional sources (see references in Annex).

The impact of military conflict and the related humanitarian crisis has profoundly affected HIV response efforts in Ukraine and neighbouring countries, with over eight million refugees fleeing across Europe *(2)*. A resilient partnership of governments, civil society and donors has ensured continuing access to HIV services in countries hosting refugees and migrants. Since the beginning of the conflict, for example, about 8500 refugees affected by or living with HIV from Ukraine have had full access to public HIV, TB and harm reduction services in the Republic of Moldova.1

The sustainability of the HIV response remains a major concern. A range of challenges, including the threat of an energy crisis, rising living costs, widening inequalities and a restrictive fiscal environment, have presented additional barriers to an effective HIV response and have strained the already limited domestic resources available for the AIDS response in the region. An economic downturn, insufficient domestic spending, and decreasing availability of civic space for communities have further emphasized the need for additional funding to reverse the region's HIV epidemic. Although HIV treatment is funded mostly with domestic sources, prevention services rely heavily on donor support and are not financially sustainable in the long term.

Legislative change and reform of discriminatory laws, closing the treatment gap, scaling up access to new technologies and modern medicines at lower prices, supporting community-led responses, and advocating for increased domestic funding are crucial to curb the region's growing HIV epidemic.

[1] Personal communication with UNAIDS Country Office in the Republic of Moldova, 29 June 2023.

## References


1 Latest updates. Geneva: ILGA World (https://database.ilga.org/latest-updates).
2 Ukraine situation flash update #46. Geneva: United Nations High Commissioner for Refugees (https://data.unhcr.org/en/documents/details/100493).

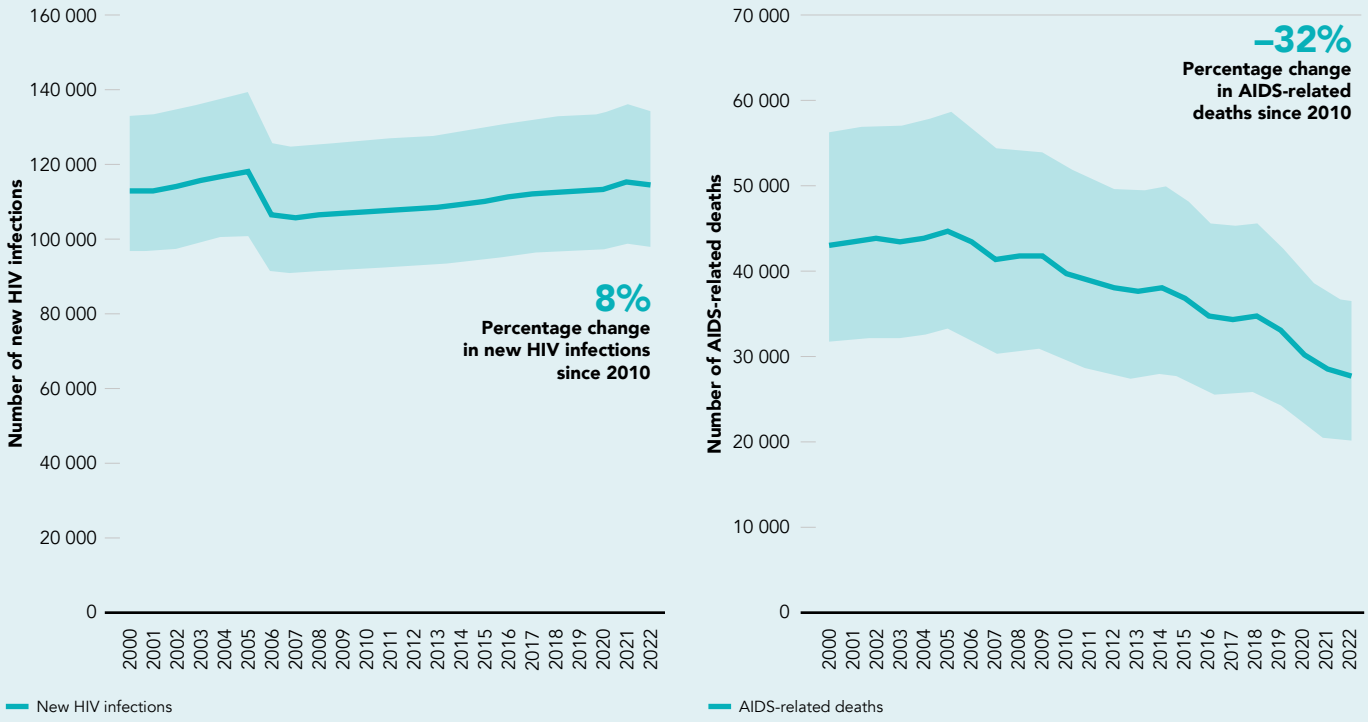
# Latin America

Latin American countries have achieved important progress in expanding access to HIV treatment, but they have made fewer gains in prevention. Numbers of AIDS-related deaths have decreased by 32% since 2010, but annual numbers of new HIV infections have increased by 8% (Figure 8.1). Ten countries in the region have seen increases in numbers of new infections since 2010.

There are marked disparities in HIV prevention. Numbers of new HIV infections decreased by 14% among women but increased by 17% among men in 2010–2022. Median HIV prevalence among people from key populations is significantly higher than in the general population, reaching 9.5% among gay men and other men who have sex with men (data from 12 countries) and 14.7% among transgender people (data from nine countries) (Figure 8.2).

**Latin America has made little progress in reducing numbers of new HIV infections since 2000**

**Figure 8.1** Number of new HIV infections and AIDS-related deaths, Latin America, 2000–2022




Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).

## 2022 DATA

- **8%** increase in new HIV infections since 2010
- **32%** decrease in AIDS-related deaths since 2010
- People living with HIV:
  **2.2 million [2.0 million–2.5 million]**
- New HIV infections:
  **110 000 [94 000–130 000]**
- AIDS-related deaths:
  **27 000 [21 000–35 000]**

**Testing and treatment cascade (all ages):**

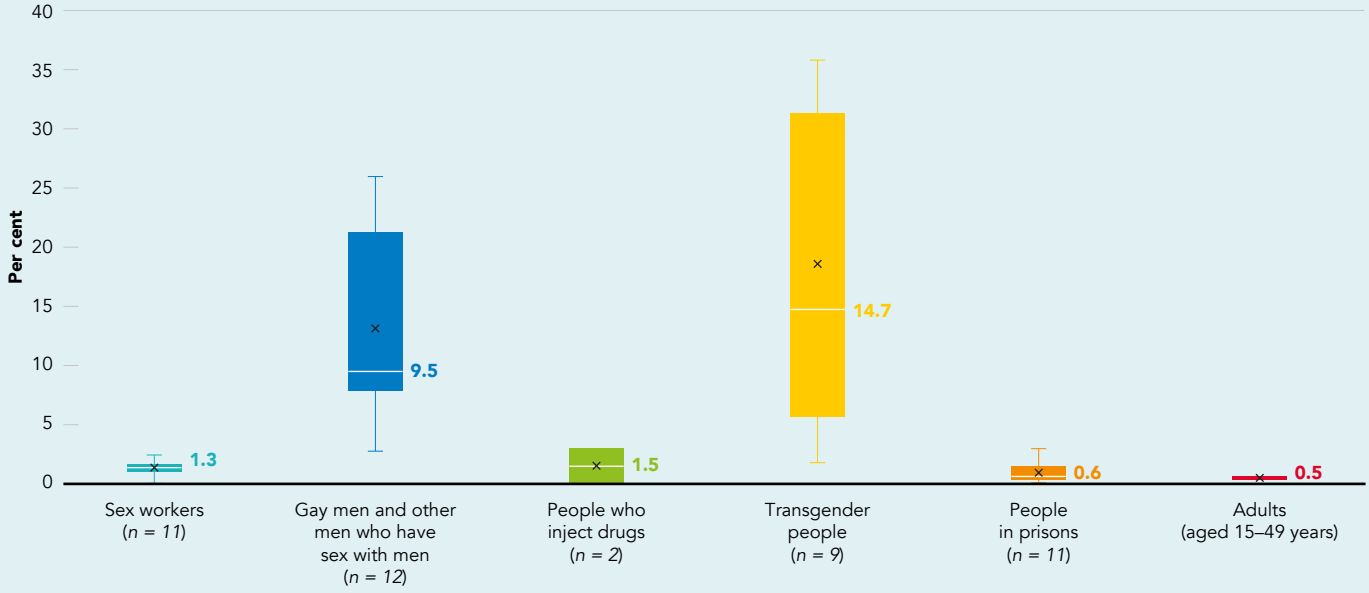
- % of people living with HIV who know their status:
  **85 [76–95]**
- % of people living with HIV who are on treatment:
  **72 [64–80]**
- % of people living with HIV who are virally suppressed:
  **66 [59–74]**

**Financing of the HIV response:**

- Resource availability for HIV:
  **US$ 3.2 billion [16% gap to meet the 2025 target]**

### HIV prevalence among people from key populations in Latin America remains considerably higher than in the general population

**Figure 8.2** HIV prevalence among key populations compared with adults (aged 15–49 years), reporting countries in Latin America, 2018–2022

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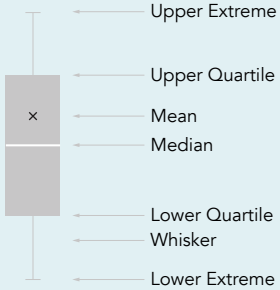



The median HIV prevalence among countries that reported these data in Latin America was:

**1.3%** among sex workers.
**9.5%** among gay men and other men who have sex with men.
**1.5%** among people who inject drugs.
**14.7%** among transgender people.
**0.6%** among people in prisons.

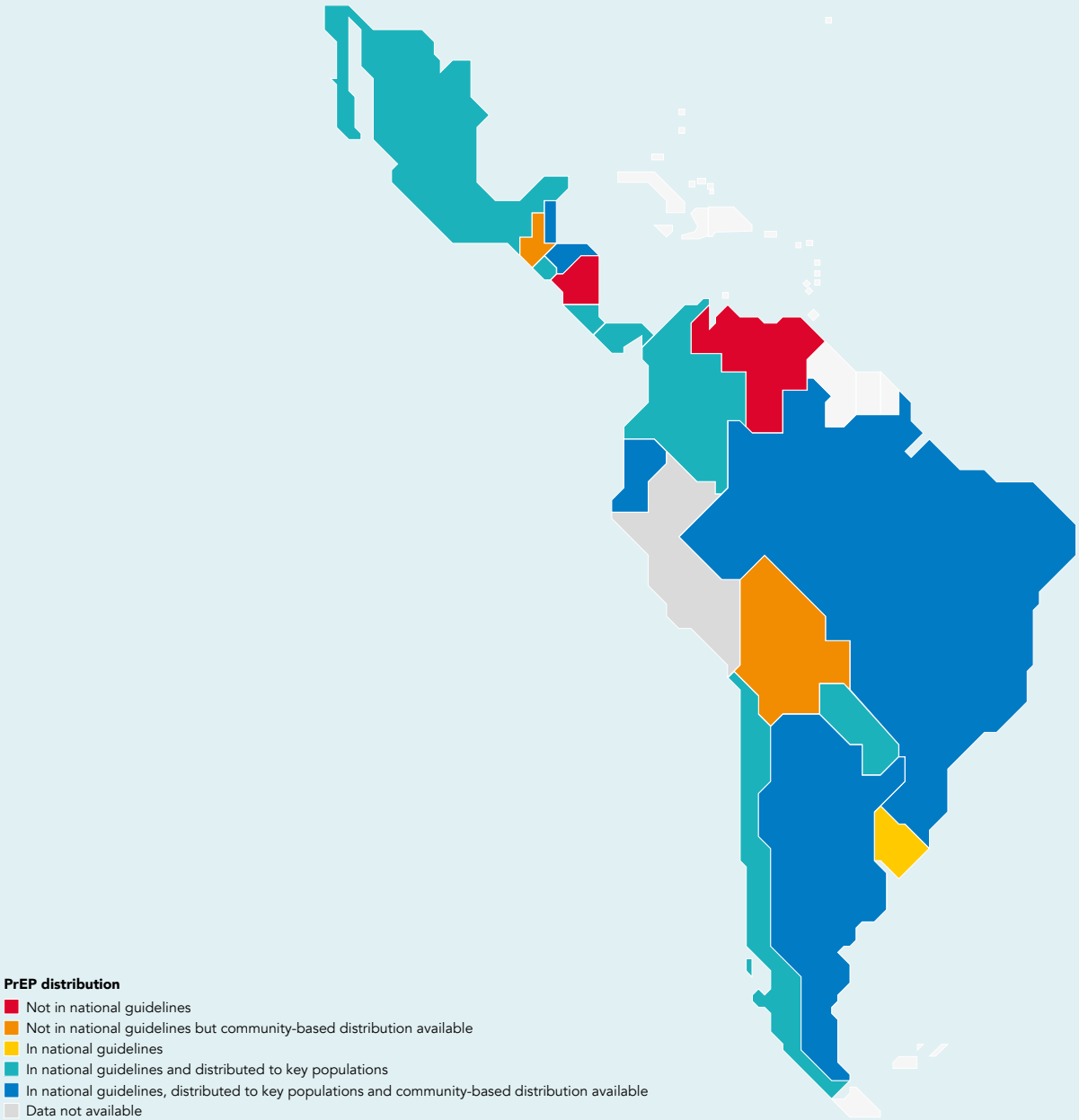
The estimated HIV prevalence among adults (aged 15–49 years) is **0.5% [0.4–0.5%]**.

Sources: UNAIDS Global AIDS Monitoring, 2023; UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).
Notes: (*n* = number of countries). Total number of reporting countries = 17.
The adult prevalence uncertainty 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 2022, the percentage of people living with HIV on antiretroviral therapy increased to 72%, but service gaps hamper access to treatment and care programmes in many countries in the region. Due to failure to achieve timely diagnosis of HIV infection (which is associated with better outcomes for people living with HIV, decreased risk of ongoing HIV transmission and lower health-care costs) *(1)*, advanced HIV disease remains common among people newly diagnosed with HIV. In 13 countries in the region, at least 25% of new diagnoses are classified as advanced HIV infection, with CD4 counts below 200/mm$^3$.

**Only nine countries in Latin America provide oral and on-demand PrEP to people from key populations**

**Figure 8.3** Countries with pre-exposure prophylaxis (PrEP) in national guidelines by type of distribution, Latin America, 2022




Source: UNAIDS Global AIDS Monitoring, 2023 (https://aidsinfo.unaids.org/).

Coverage of prevention of vertical HIV transmission has declined to 64% from a pre-COVID estimate of 67% in 2019, with 3 countries reporting coverage below 50%. Coverage of antiretroviral therapy for children (0–14 years) lags far behind coverage for adults. Only 39% of children living with HIV were receiving treatment in 2022, compared with 72% of people aged 15 years or over.

Thirteen countries in the region include pre-exposure prophylaxis (PrEP) in national guidelines, but only ten provide oral and on-demand PrEP to people from key populations, and only five allow for community-based distribution (Figure 8.3). Nevertheless, due to the expansion of targeted prevention services, the number of people on PrEP has increased by over 55% since 2021.

The region continues to experience humanitarian crises, with approximately six million Venezuelan migrants now living in other Latin American countries (primarily Brazil, Chile, Colombia, Ecuador and Peru) *(2)*, and an estimated two million people having fled worsening poverty and unrest in Central America (especially from El Salvador, Guatemala and Honduras) *(3)*. Among Venezuelan migrants and displaced people, high levels of HIV-related stigma, fear of deportation, and limited access to services have led to insufficient engagement with HIV programmes. Service coverage gaps between migrants and local people are aggravated when health insurance systems in host countries do not grant uninsured people access to health and laboratory services. The internal displacement of people in Colombia has negatively affected people's access to preventive and health services *(4)*.

Domestic spending on HIV comprised 97% of all resources available for HIV in the region, although there is considerable variation between countries. The HIV programmes in larger countries in South America are financed almost entirely from domestic resources, but HIV prevention programmes in some countries in Central America, including programmes for people from key populations, still rely on donor funding for an estimated 14–57% of total HIV prevention expenditure.

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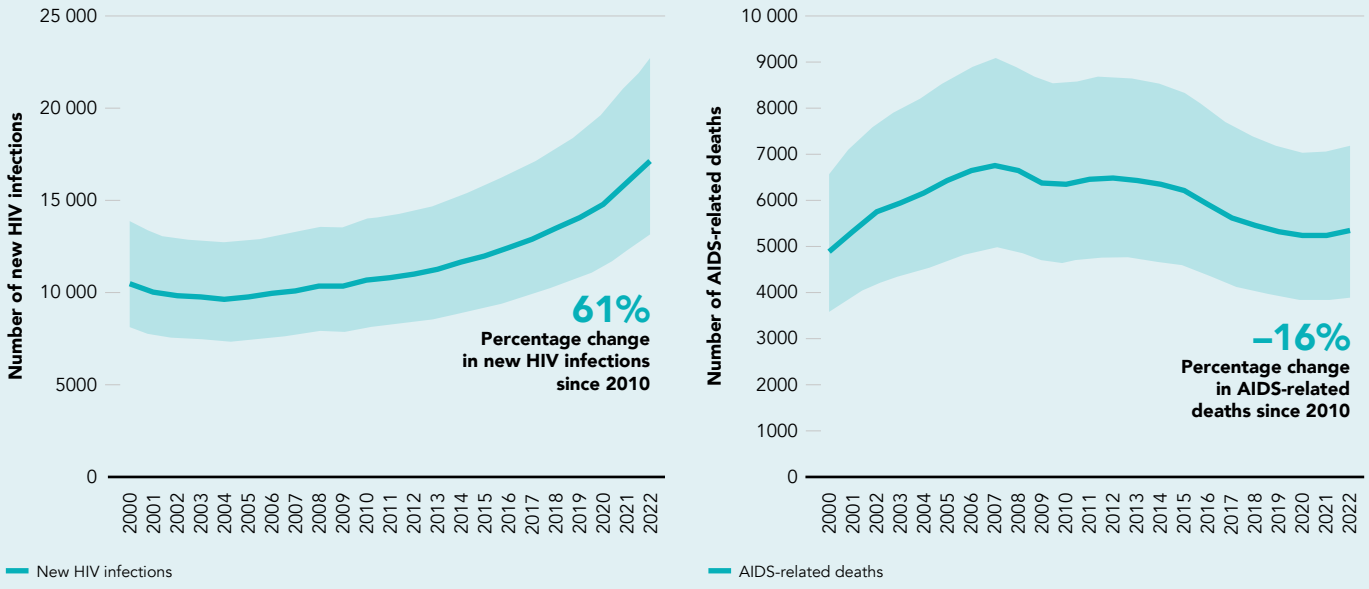
# Middle East and North Africa

The Middle East and North Africa faces significant challenges in achieving the 2025 HIV targets. While having the lowest HIV prevalence in the world, the Middle East and North Africa is one of few regions where new HIV infections are increasing at a rapid rate. Concerted action is needed to reverse current epidemic trends, avert HIV outbreaks and reach prevention and treatment targets.

The region has the lowest HIV treatment coverage globally (50%), with delayed HIV diagnoses contributing to poor HIV outcomes and a comparatively slow decline in AIDS-related deaths (Fig. 9.1). In 2022, only 67% of people living with HIV knew their HIV-positive status, and an even smaller percentage had access to treatment (50%), with treatment coverage lowest among women (49%) (Fig. 9.2). Only 34% of children living with HIV were on treatment in 2022.

**New HIV infections continue to rise, while AIDS-related deaths are declining very slowly**

**Figure 9.1** Number of new HIV infections and AIDS-related deaths, Middle East and North Africa, 2000–2022




Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).

## 2022 DATA

- **61%** increase in new HIV infections since 2010
- **16%** decrease in AIDS-related deaths since 2010
- People living with HIV:
  **190 000 [160 000–220 000]**
- New HIV infections:
  **17 000 [13 000–23 000]**
- AIDS-related deaths:
  **5300 [4000–7100]**

**Testing and treatment cascade (all ages):**

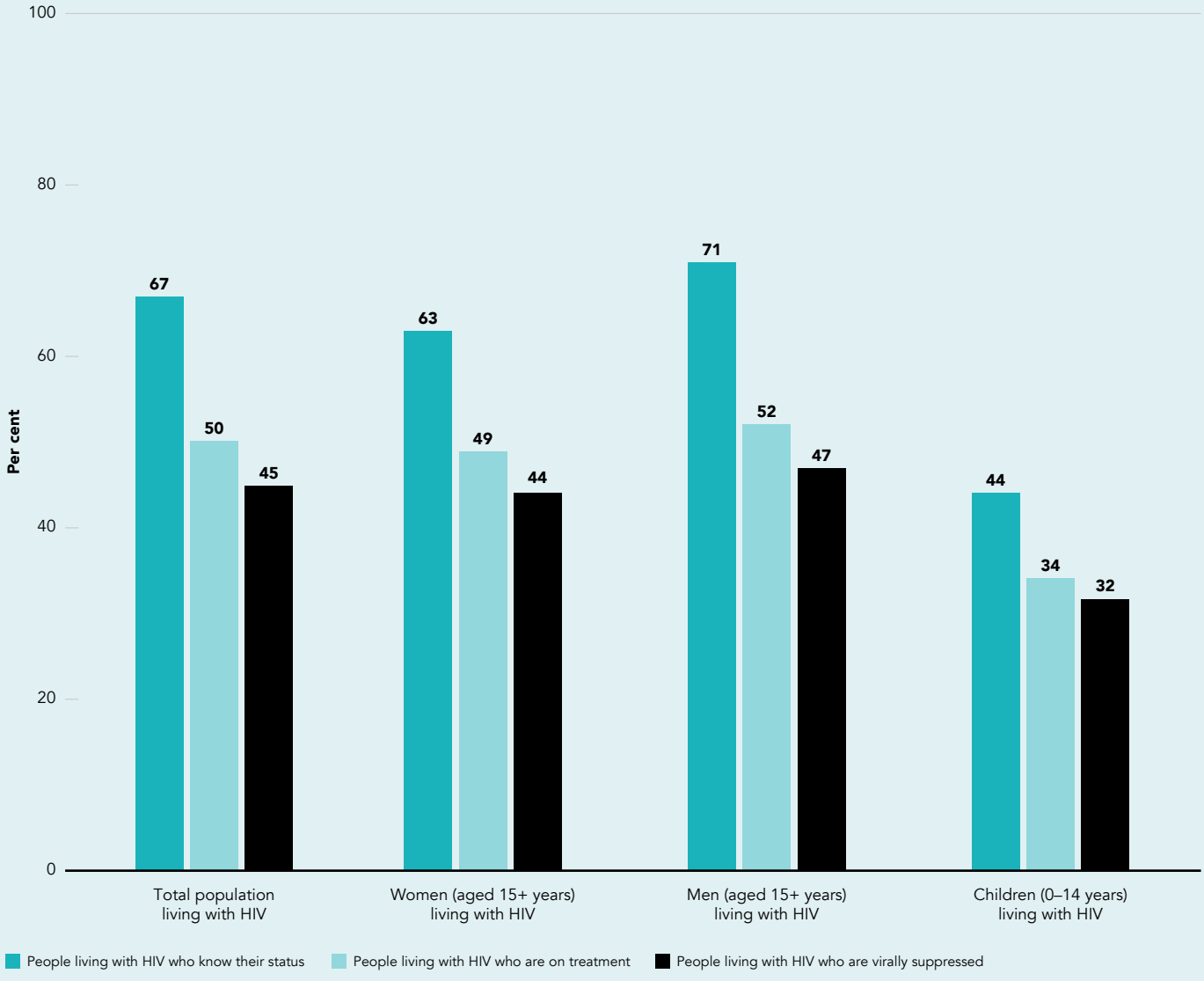
- % of people living with HIV who know their status:
  **67 [58–79]**
- % of people living with HIV who are on treatment:
  **50 [43–59]**
- % of people living with HIV who are virally suppressed:
  **45 [39–53]**

**Financing of the HIV response:**

- Resource availability for HIV:
  **US$ 200 million [82% gap to meet the 2025 target]**

**Only a third of children and half of adults living with HIV are on treatment in the Middle East and North Africa**

**Figure 9.2** HIV testing and treatment cascade, by age and sex, Middle East and North Africa, 2022



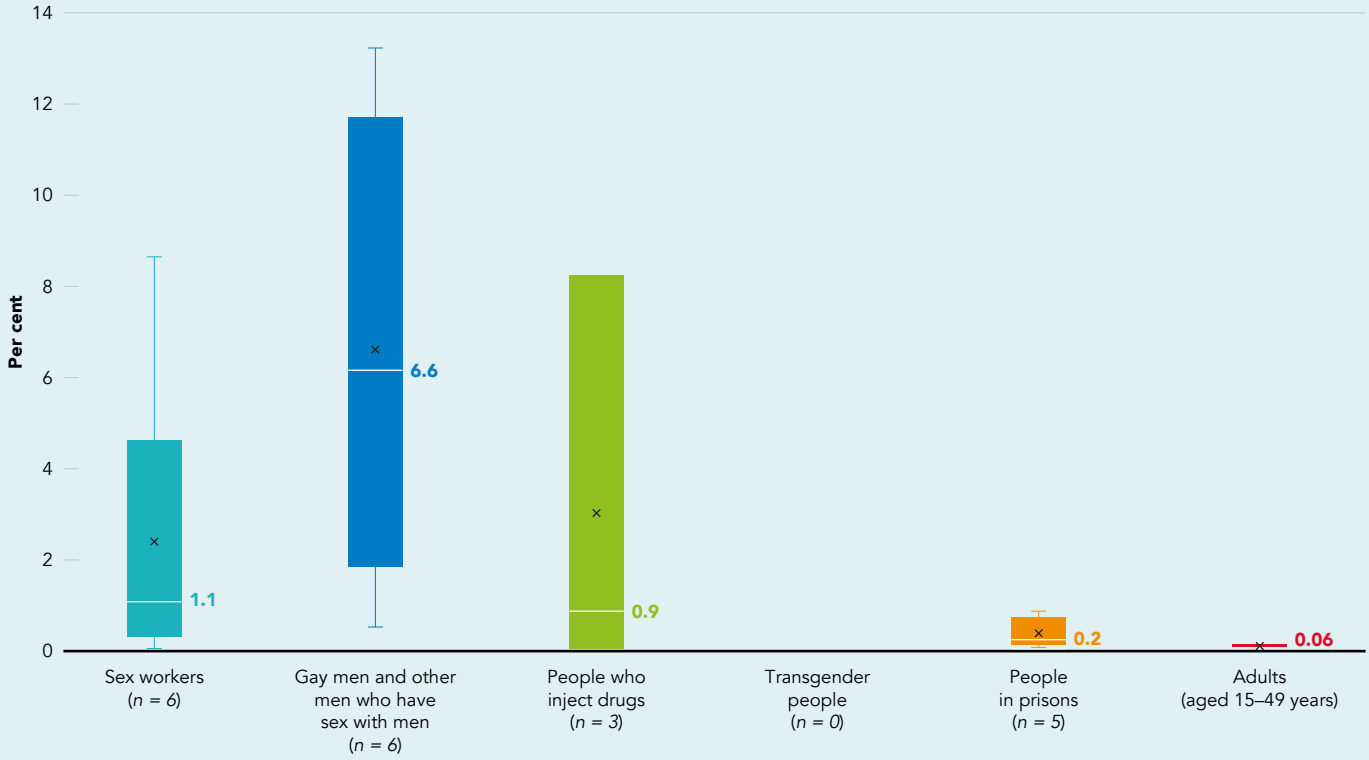

Source: UNAIDS special analysis of epidemiological estimates, 2023.

Marginalized and criminalized populations bear the brunt of the HIV epidemic in the region, and accounted for the majority of new HIV infections in 2022. Regional median HIV prevalence is 6.6% among gay men and other men who have sex with men (data from six countries), 1.1% among sex workers (data from six countries) and 0.9% among people who inject drugs (data from three countries) (Fig. 9.3).

A lack of political will, limited funding, inadequate data, and severe stigma and discrimination towards people from key populations present major barriers, which are further compounded by ongoing conflicts and humanitarian crises in many countries in the region.

## Highest HIV prevalence in the region is reported among gay men and other men who have sex with men

**Figure 9.3** HIV prevalence among key populations compared with adults (aged 15–49 years), reporting countries in Middle East and North Africa, 2018–2022

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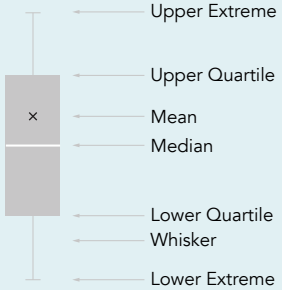


The median HIV prevalence among countries that reported these data in Middle East and North Africa was:

**1.1%** among sex workers.
**6.6%** among gay men and other men who have sex with men.
**0.9%** among people who inject drugs.
**0.2%** among people in prisons.

The estimated HIV prevalence among adults (aged 15–49 years) is **0.06% [0.05–0.07%]**.

Sources: UNAIDS Global AIDS Monitoring, 2023; UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).
Notes: *n* = number of countries. Total number of reporting countries = 20.
The adult prevalence uncertainty 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.

Extensive sociopolitical and economic crises, including armed conflicts and forced displacements, have affected the Middle East and North Africa over the past two decades and have had implications for the HIV response in the region. Countries affected by humanitarian emergencies, such as Somalia, Sudan, the Syrian Arab Republic and Yemen, are showing lower service coverage compared with more stable countries in the region. Although the direct impact on HIV incidence and related morbidity and mortality has not been estimated, the effects on determinants of HIV risk and infection are evident *(1)*.

Notably, recent conflicts, such as that in Sudan, have severely disrupted access to HIV services, with many health-care centres unable to operate. As of May 2023, 70% of hospitals in Khartoum have closed. Countries affected by humanitarian emergencies must prioritize HIV within the humanitarian agenda and develop evidence-informed, rights-based and resilient HIV responses.

The Global Fund launched the Middle East Response Initiative in 2017 to better respond to the complex and acute emergency situations in many countries in the Middle East by providing essential HIV, TB and malaria services to people from key and vulnerable populations, including refugees, internally displaced people, women and children in Iraq, Jordan, Lebanon, the Occupied Palestinian Territory, the Syrian Arab Republic and Yemen *(2)*. The aim of combining multiple programmes is to bring greater value for money, reach more people from vulnerable populations, and support stronger regional partnerships that can deliver health services in conflict-affected and hard-to-reach areas.

Improved data are crucial for achieving a more effective HIV response in the region *(3)*. A few countries, notably Morocco, have made substantial investments in data generation and use. Enhanced biobehavioural survey and programme data, focused on key and priority populations, are needed to provide robust strategic information for programme and policy design, and for effective and sustainable resource mobilization and allocation. To get on track to achieve the 2025 targets, the HIV response in the region has to be tailored to the needs of key populations, including through community-led initiatives, and the complex structural and operational barriers to service provision have to be reduced.

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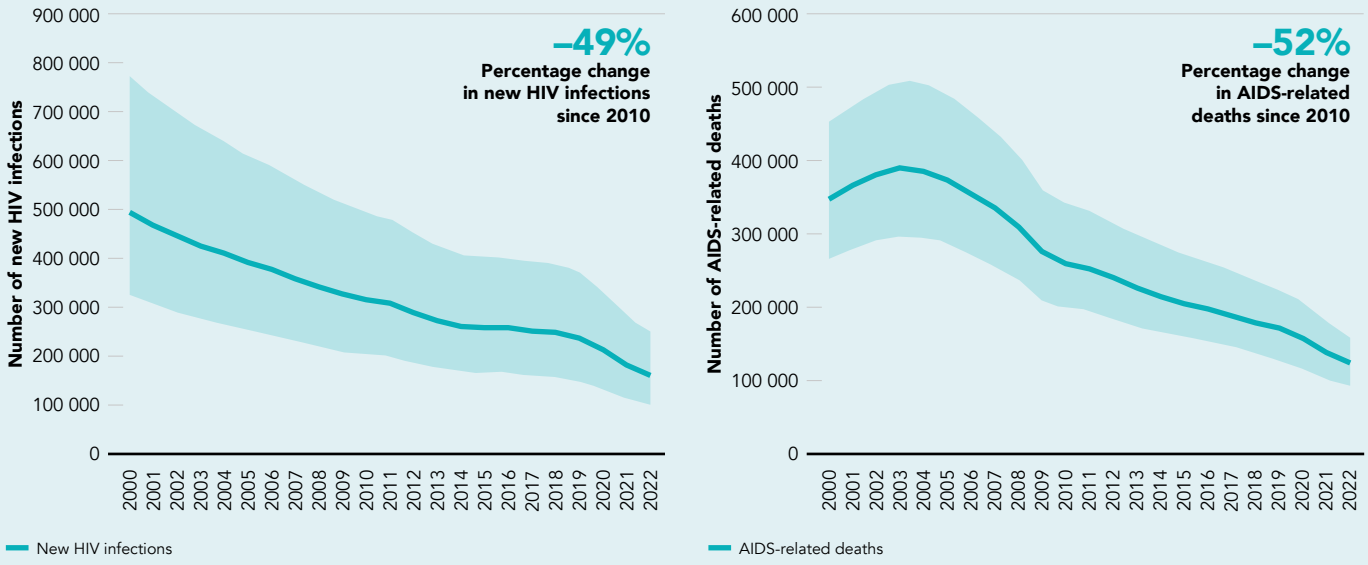
# Western and central Africa

Numbers of new HIV infections in western and central Africa declined by 49% between 2010 and 2022 (Figure 10.1). Coverage of antiretroviral therapy among adults living with HIV has more than doubled since 2015 (from 36% to 82%), due to changes in policy and implementation, including the scale-up of differentiated testing and treatment strategies, particularly at the community level, and the mobilization of resources to accelerate programmes.

Treatment coverage exceeded 80% in nine of 25 countries, but it was less than 50% in five countries. Antiretroviral therapy coverage remained lower among men (78%) than women (84%), and it was especially low among people from key populations and children, with only 37% of children living with HIV receiving treatment in 2022 (Figure 10.2).

**A steep decline in numbers of new HIV infections and AIDS-related deaths continues in western and central Africa**

**Figure 10.1** Number of new HIV infections and AIDS-related deaths, western and central Africa, 2000–2022




Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).

## 2022 DATA

- **49%** decrease in new HIV infections since 2010
- **52%** decrease in AIDS-related deaths since 2010
- People living with HIV:
  **4.8 million [4.2 million–5.5 million]**
- New HIV infections:
  **160 000 [110 000–250 000]**
- AIDS-related deaths:
  **120 000 [96 000–160 000]**

**Testing and treatment cascade (all ages):**

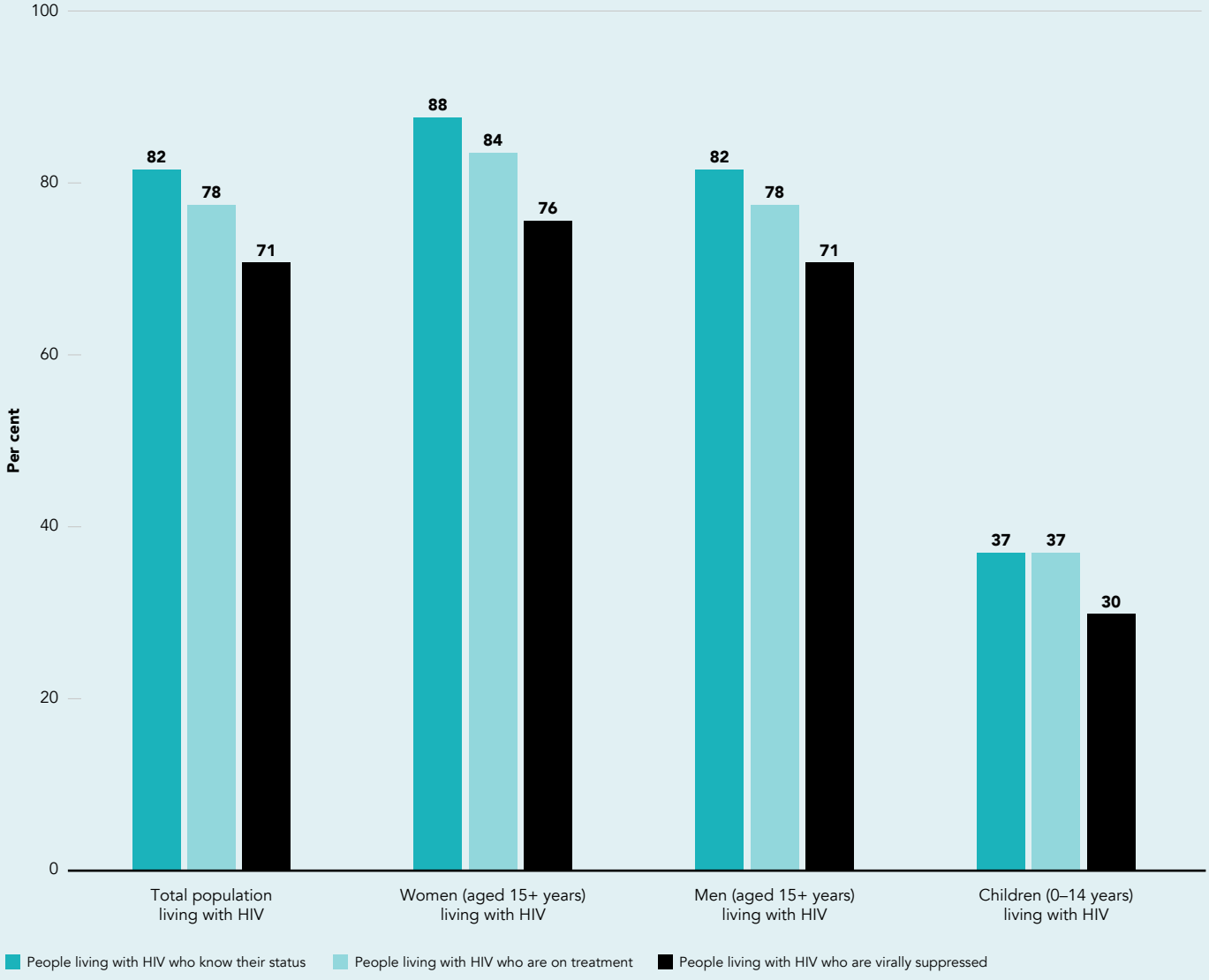
- % of people living with HIV who know their status:
  **82 [72–94]**
- % of people living with HIV who are on treatment:
  **78 [69–90]**
- % of people living with HIV who are virally suppressed:
  **71 [62–82]**

**Financing of the HIV response:**

- Resource availability for HIV:
  **US$ 2.0 billion [24% gap to meet the 2025 target]**

**Nearly two in three children living with HIV are not on life-saving treatment**

**Figure 10.2** HIV testing and treatment cascade, by age and sex, western and central Africa, 2022




Source: UNAIDS special analysis of epidemiological estimates, 2023.

Coverage of prevention of vertical HIV transmission programmes increased from 29% in 2010 to 53% in 2022. Progress has been stagnant in recent years, with coverage remaining in the range 53–61% since 2016. The region is home to 20% of pregnant women living with HIV globally, but it accounts for 52% of all pregnant women living with HIV who are not on treatment. A significant number of pregnant women living with HIV in the region are not receiving antiretroviral therapy.

Efforts are under way to improve the legal environment in the region, with some countries adopting new laws to address barriers to HIV prevention and treatment *(1)*. HIV prevalence among people from all key populations is significantly higher than in the general population, ranging from 2.8% among people in prisons to 21.9% among transgender people (Figure 10.3).

More than one in 10 people from key populations living with HIV report avoiding accessing health care due to stigma linked to their HIV-positive status *(2)*. A median of 15.6% of sex workers (six reporting countries) and 10.4% of gay men and other men who have sex with men (seven reporting countries) report avoiding accessing health care due to stigma and discrimination in the past 12 months.

Adolescent girls and women (aged 15–49 years), who represent 43% of new HIV infections in the region in 2022, continue to face legal and societal barriers, such as age-of-consent limitations for access to HIV testing. These barriers hinder their access to HIV and other vital services, including for gender-based violence and fighting discrimination.

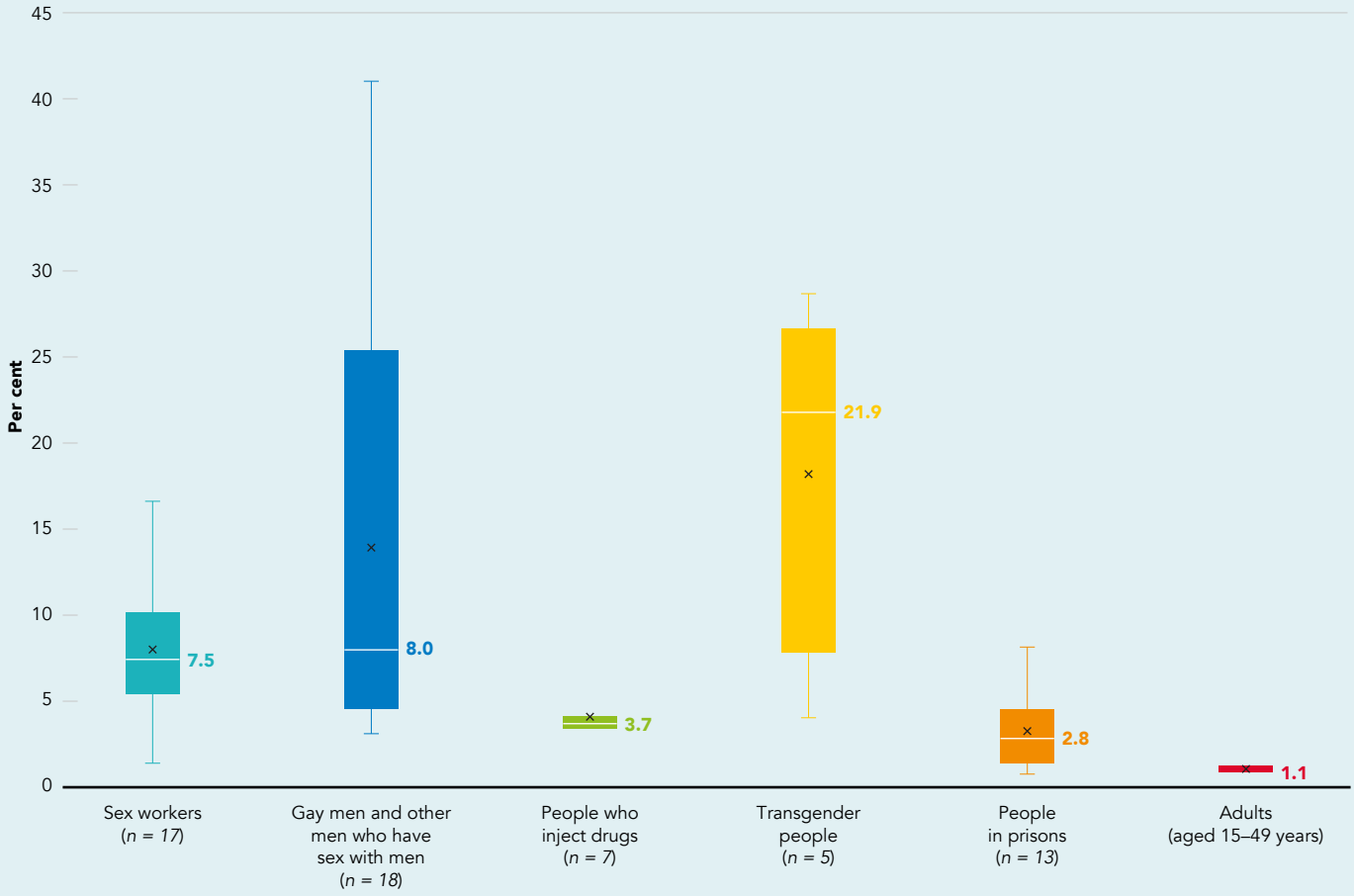
There is a substantial funding gap in the region's HIV response. Total HIV resources were 8% lower in 2022 than 2021, with heavy reliance on external donors.1 An additional major concern is the decline in domestic HIV funding, which was 7% lower in 2022 than 2018.

The complex epidemiological context of the region calls for sustained efforts to increase coverage among people from key populations, adolescent girls and young women and children; end vertical HIV transmission; address legal and societal barriers; secure adequate funding; and enhance high-quality, disaggregated data collection and use for evidence-based interventions.

[1] Resource estimates are presented in constant 2019 US$.

## HIV prevalence among people from key populations in the region remains considerably higher than among the general population

**Figure 10.3** HIV prevalence among key populations compared with adults (aged 15–49 years), reporting countries in western and central Africa, 2018–2022

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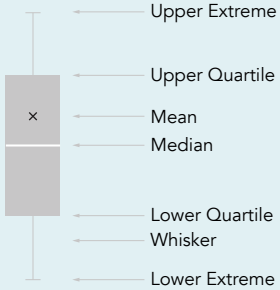


The median HIV prevalence among countries that reported these data in western and central Africa was:

**7.5%** among sex workers.
**8.0%** among gay men and other men who have sex with men.
**3.7%** among people who inject drugs.
**21.9%** among transgender people.
**2.8%** among people in prisons.

The estimated HIV prevalence among adults (aged 15–49 years) is **1.1% [1.0–1.3%]**.

Sources: UNAIDS Global AIDS Monitoring, 2023; UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).
Notes: *n* = number of countries. Total number of reporting countries = 25.
The adult prevalence uncertainty 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.

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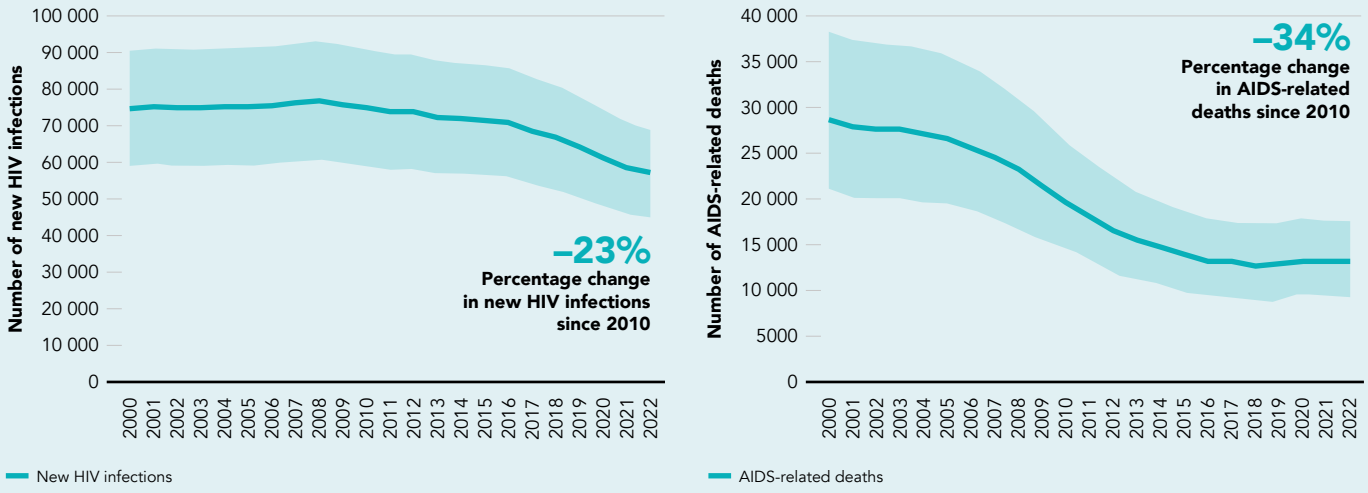
# Western and central Europe and North America

Numbers of new HIV infections in western and central Europe and North America decreased by 23% between 2010 and 2022, and numbers of AIDS-related deaths decreased by 34% (Figure 11.1). Median HIV prevalence in the region remains much higher among people from key populations than adults in the general population (Figure 11.2).

Median HIV prevalence among people from key populations in the region is significantly higher than in the general population, reaching 7.6% among transgender people (data from two countries), 5.5% among gay men and other men who have sex with men (data from 11 countries) and 5.0% among people who inject drugs (data from 11 countries).

**Numbers of new HIV infections and AIDS-related deaths have decreased in western and central Europe and North America**

**Figure 11.1** Number of new annual HIV infections and AIDS-related deaths, western and central Europe and North America, 2000–2022




Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).

## 2022 DATA

- **23%** decrease in new HIV infections since 2010
- **34%** decrease in AIDS-related deaths since 2010
- People living with HIV:
  **2.3 million [1.9 million–2.6 million]**
- New HIV infections:
  **58 000 [46 000–69 000]**
- AIDS-related deaths:
  **13 000 [9300–17 000]**

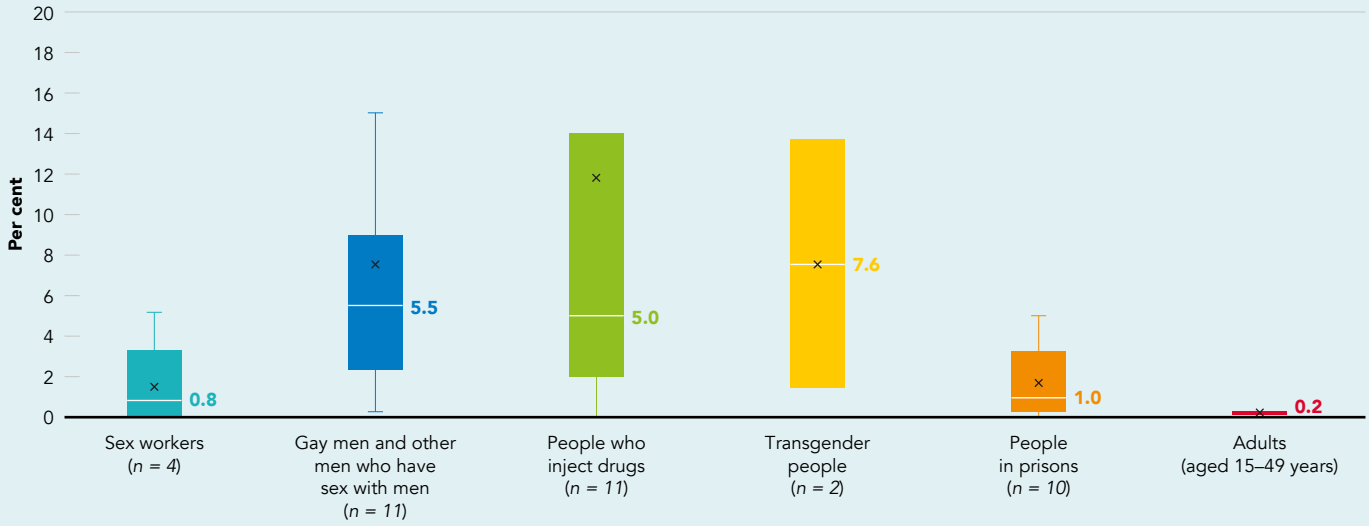
**Testing and treatment cascade (all ages):**

- % of people living with HIV who know their status:
  **89 [75–>98]**
- % of people living with HIV who are on treatment:
  **76 [64–87]**
- % of people living with HIV who are virally suppressed:
  **71 [60–82]**

About 67% of new HIV diagnoses in the United States of America in 2021 were among gay men and other men who have sex with men *(1)*, as were about 40% of new diagnoses in the European Union and the European Economic Area *(2)*.

### Median HIV prevalence among key populations is much higher than among the general population

**Figure 11.2** HIV prevalence among key populations compared with adults (aged 15–49 years), reporting countries in western and central Europe and North America, 2018–2022

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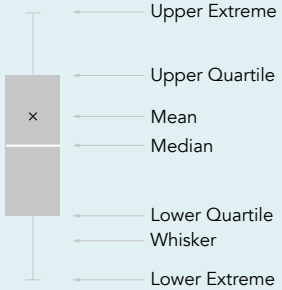



The median HIV prevalence among countries that reported these data in western and central Europe and North America was:

**0.8%** among sex workers.
**5.5%** among gay men and other men who have sex with men.
**5.0%** among people who inject drugs.
**7.6%** among transgender people.
**1.0%** among people in prisons.

The estimated HIV prevalence among adults (aged 15–49 years) is **0.2% [0.2–0.3%]**.

Sources: UNAIDS Global AIDS Monitoring, 2023; UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).
Notes: *n* = number of countries. Total number of reporting countries = 40.
The adult prevalence uncertainty 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.

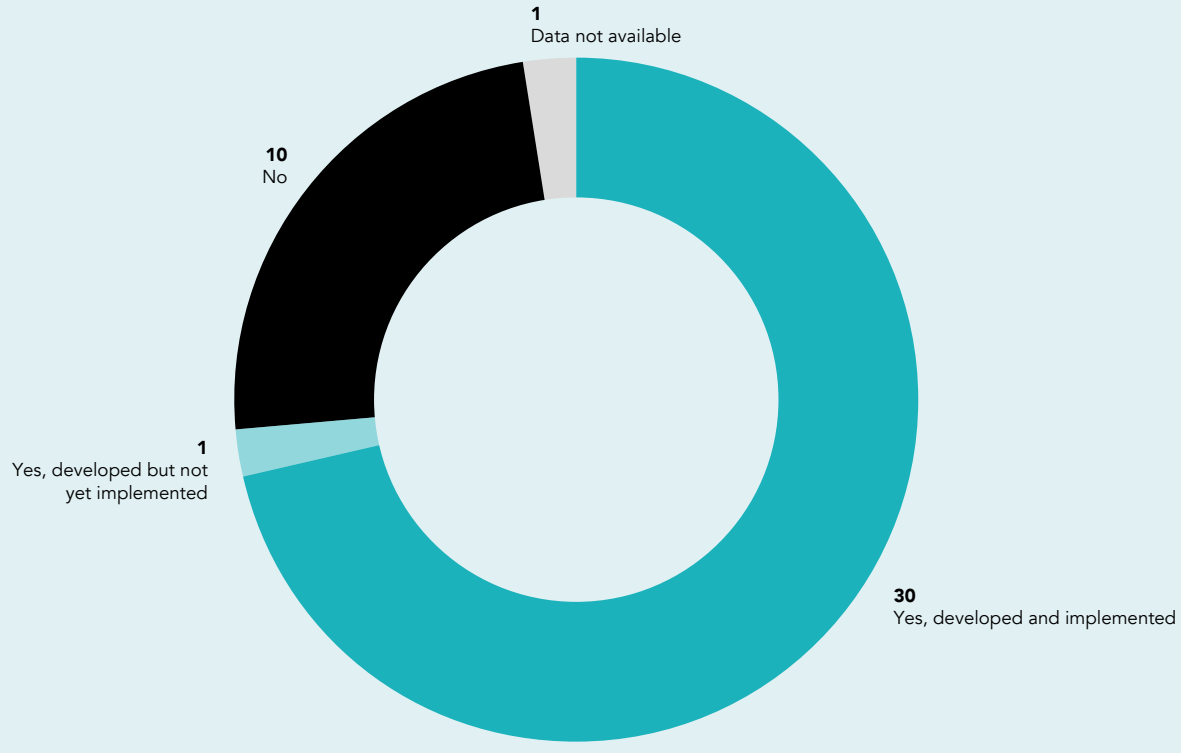
Efforts to end AIDS in western and central Europe and North America are undermined by social and other inequalities that undermine the health and well-being of marginalized communities. In the United States, for example, rates of new HIV diagnoses among Black adults are four times higher than among people from other racial or ethnic groups and highest in the communities classified as "socially vulnerable" *(3)*. Numbers of new HIV diagnoses in the United States increased by 18% in 2021, which likely reflects the identification and reporting of HIV diagnoses missed in 2020 *(1)*.

In the European Union and the European Economic Area, 22% fewer HIV diagnoses were recorded in 2021 than in 2019 *(2)*. Late HIV diagnosis remains a challenge across much of the region. In Europe in 2021, the percentage of late diagnoses (CD4 cell count <350/mm3) was highest among women (57%) and people aged 50 years or older (65%) *(2)*. Extensive access to treatment has kept numbers of AIDS-related deaths low across the region, although an estimated 13 000 people still died due to AIDS in 2022.

Overall, in the European Union and the European Economic Area in 2022, around 92% of people living with HIV knew their HIV status, 92% of people who knew their HIV-positive status received antiretroviral therapy, and 97% of people on treatment had suppressed viral loads. Antiretroviral therapy coverage and levels of viral load suppression are comparatively low in central Europe, however.

**There has been progress in adoption of PrEP in western and central Europe and North America**

**Figure 11.3** Adoption of WHO recommendations on oral PrEP in national guidelines, western and central Europe and North America, 2023




Source: National Commitments and Policy Instrument 2019–2020; ECDC 2023.

The majority of countries in western and central Europe and North America region have adopted World Health Organization recommendations on oral PrEP in national guidelines (Figure 11.3), but inequalities in access to services persist, particularly for Black and Hispanic people in the United States *(3)*.

In the European Union and the European Economic Area in 2021, 42% of new HIV diagnoses were in migrant or immigrant populations, with high rates of post-migration HIV acquisition as many people experience discrimination and socioeconomic deprivation *(2, 5)*. In 2021, only a minority of countries in western and central Europe reported that pre-exposure prophylaxis (PrEP) was available for undocumented migrants, people who inject drugs and people in prisons *(6)*. A recent review called for greater effort to reduce the inequalities in health care experienced by migrant women *(7)*.

The Ending the HIV Epidemic in the United States (EHE) initiative aims to reduce numbers of new HIV infections by 90% by 2030. It includes four pillars: diagnose, treat, prevent and respond. For each pillar, the EHE initiative scales up science-based strategies that can end the epidemic. On 20 May 2021, the European Parliament adopted a new resolution reiterating the commitment of the region to ending AIDS by 2030 *(8)*.

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ANNEX 1

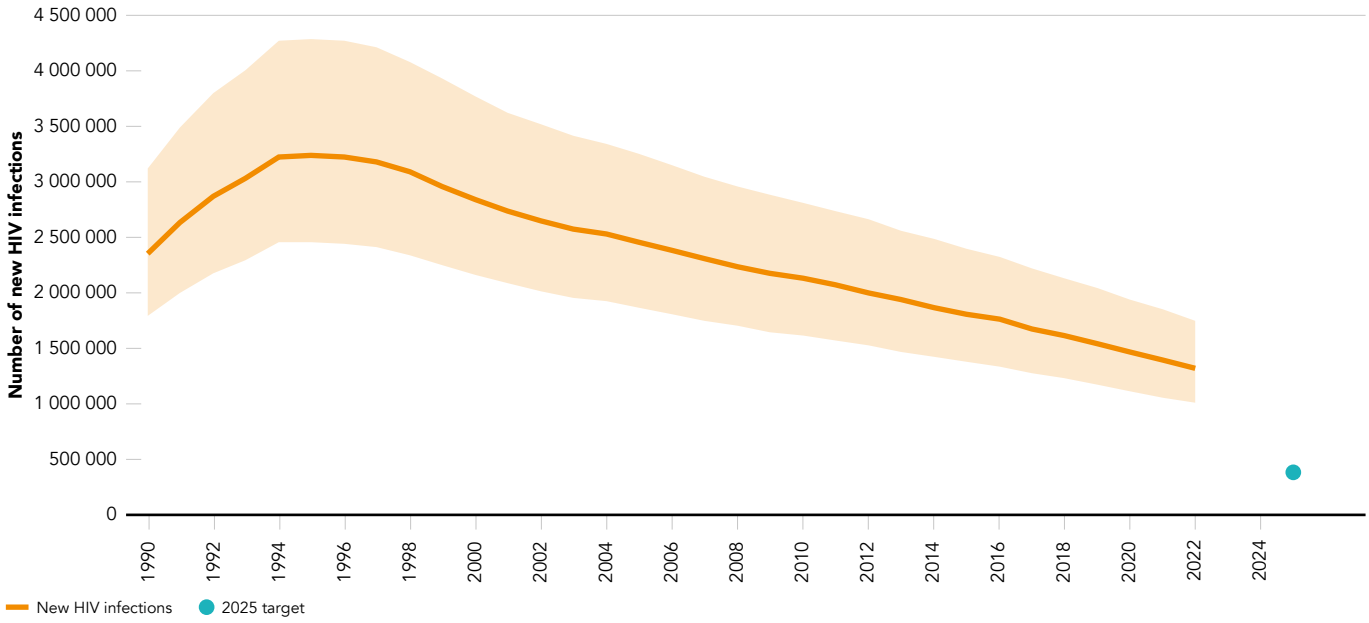
# Progress towards the 2025 targets

The 2021 Political Declaration on HIV and AIDS: Ending Inequalities and Getting on Track to End AIDS by 2030 commits governments to a set of ambitious, achievable targets for 2025 that reinforce the evidence-informed targets in the Global AIDS Strategy 2021–2026: End Inequalities, End AIDS.

The latest data from countries indicate that important progress has been made, such as in reducing number of AIDS-related deaths and scaling up pre-exposure prophylaxis (PrEP) in some regions. Yet the world is not on track to reach the majority of the 2025 targets. Combination prevention interventions are not reaching the most vulnerable people, progress on societal enablers remains inadequate, and the funding gap for the HIV response is widening. Urgent action is needed to remove HIV-related inequalities so that the world can achieve the HIV targets set out in the 2021 Political Declaration and regain the momentum required to follow the path to end the AIDS pandemic.

## Combination HIV prevention for all

**Figure A1.1** Number of new HIV infections, global, 1990–2022, and 2025 target



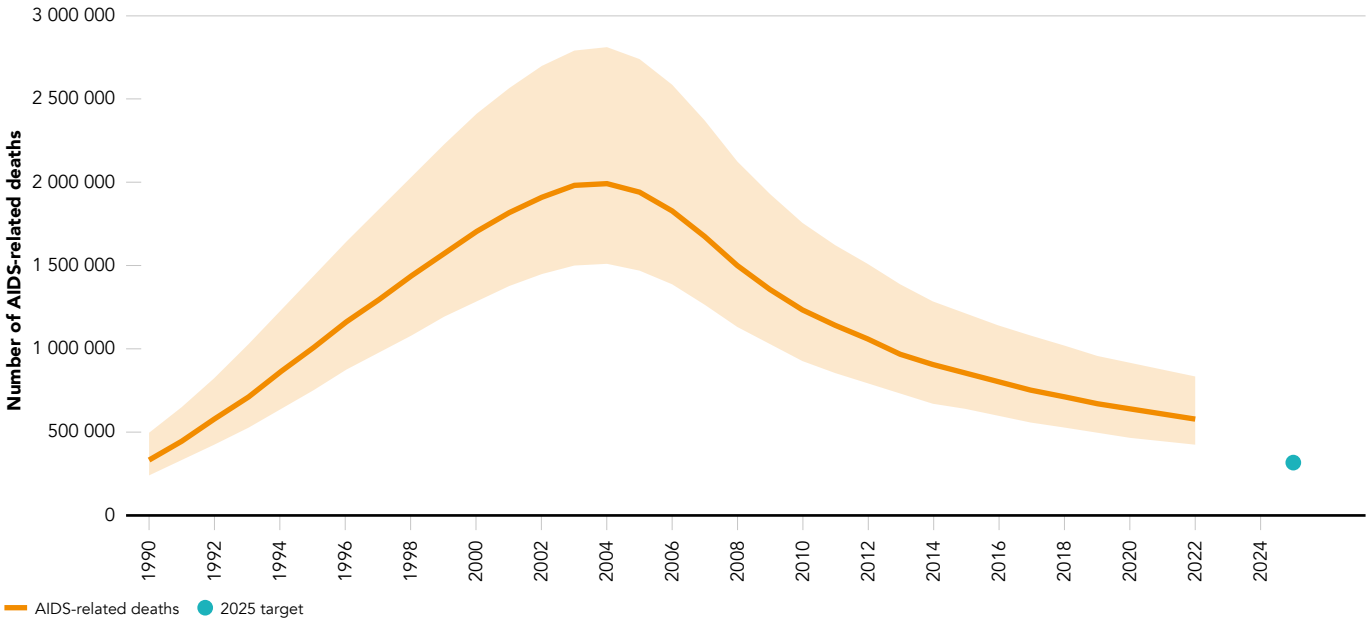

Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).

| 2025 TARGET | INDICATOR AND DATA SOURCE | CURRENT STATUS |
|---|---|---|
| Reduce the number of new HIV infections to fewer than 370 000 | Number of new HIV infections, global, 2022<br>Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/) | 1.3 million [1.0 million–1.7 million] (Figure A1.1) |
| Reduce the number of new HIV infections among adolescent girls and young women to fewer than 50 000 | Number of new HIV infections among adolescent girls and young women (aged 15–24 years), global, 2022<br>Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/) | 210 000 [130 000–300 000] |
| Ensure 95% of people at risk of HIV infection, within all epidemiologically relevant groups, age groups and geographical settings, have access to and use appropriate, prioritized, person-centred and effective combination prevention options | Condom use at last higher-risk sex among people from key populations, 2022<br>Coverage of HIV prevention programmes among key populations, 2022<br>Screening for sexually transmitted infections in past three months, 2022<br>People who received PrEP, 2022<br>Coverage of opioid agonist maintenance therapy, 2022<br>Safe injecting practices among people who inject drugs, 2022<br>Source: UNAIDS Global AIDS Monitoring, 2023 (https://aidsinfo.unaids.org/) | The coverage of combination HIV prevention among people from key populations reported as receiving at least two HIV prevention services from a list remains off target, ranging from a reported global median of 37% among people who inject drugs (20 reporting countries) to a global median of 55% among transgender people (16 reporting countries) (see factsheets on key populations) |
| Ensure availability of PrEP for 10 million people at substantial risk of HIV and PEP for people recently exposed to HIV by 2025 | Number of people who received PrEP at least once during reporting period, global, 2022<br>Source: UNAIDS Global AIDS Monitoring, 2023 (https://aidsinfo.unaids.org/) | 2.5 million |
| Ensure 50% coverage of opioid agonist therapy among people who are dependent on opioids | Coverage of opioid agonist maintenance therapy, 2022<br>Source: UNAIDS Global AIDS Monitoring, 2023 (https://aidsinfo.unaids.org/) | Use of opioid agonist therapy among people who inject drugs does not reach the 50% target in any region (see Figure 3.14 in Chapter 3) |
| Ensure 90% sterile injecting equipment use during last injection among people who inject drugs and people in prisons and other closed settings | Safe injecting practices among people who inject drugs, 2022<br>Source: UNAIDS Global AIDS Monitoring, 2023 (https://aidsinfo.unaids.org/) | Since 2018, among the 44 countries that reported the number of needles and syringes distributed per person who injects drugs per year by needle–syringe programmes, only five reported achieving the recommended more than 200 needles and syringes distributed per person who injects drugs<br>Only 12 of 28 reporting countries achieved the 90% target on coverage of safe injecting practices |
| Ensure 90% of adolescent boys and men in 15 priority countries have access to voluntary medical male circumcision (VMMC) integrated with a minimum package of services | Prevalence of VMMC, 15 priority countries, 2022<br>Source: Demographic Health Surveys (DHS) and Population Health Impact Assessments (PHIA) (2023); UNAIDS Global AIDS Monitoring, 2023 (https://aidsinfo.unaids.org/) | The number of men undergoing VMMC was consistently over 4 million per year in 2017–2019, it declined by 40% in 2020 and it was 2.8 million in 2021<br>In 2022, the number of men undergoing VMMC fell to 2.3 million, with only Ethiopia, the United Republic of Tanzania and Zambia meeting annual targets<br>VMMC programmes require renewed focus to meet the 90% target |

## 95–95–95 targets for HIV testing and treatment

| 2025 TARGET | INDICATOR AND DATA SOURCE | CURRENT STATUS |
|---|---|---|
| Reduce annual numbers of AIDS-related deaths to fewer than 250 000 | Number of AIDS-related deaths, global, 2022<br>Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/) | 630 000 [480 000–880 000] (Figure A1.2) |

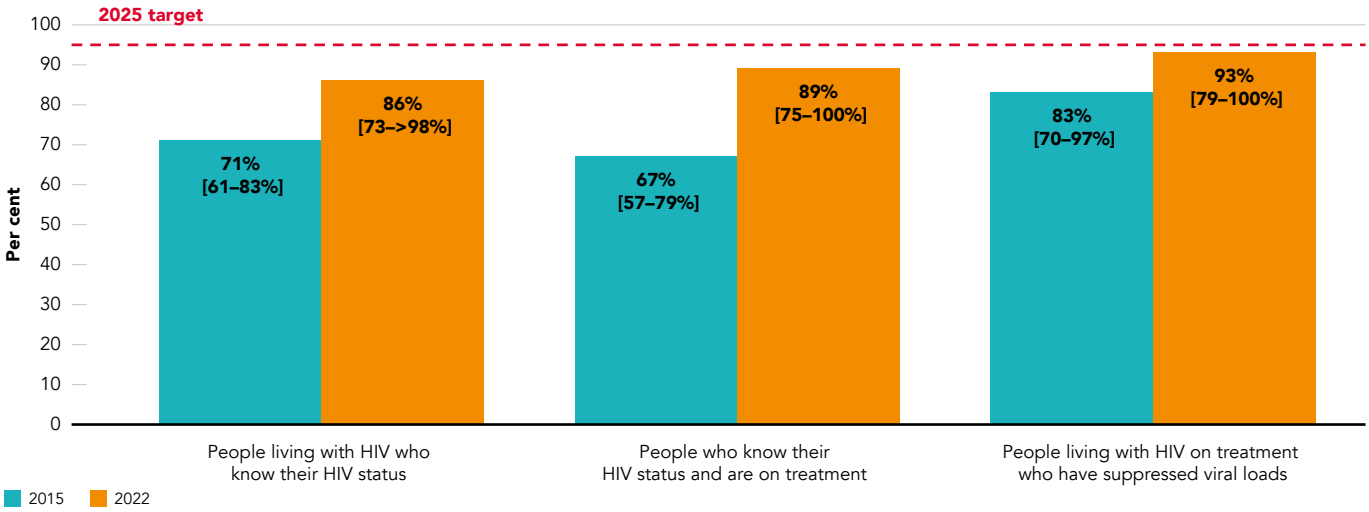
**Figure A1.2** Number of AIDS-related deaths, global, 1990–2022, and 2025 target




Source: UNAIDS epidemiological estimates, 2023 (https://aidsinfo.unaids.org/).

| 2025 TARGET | INDICATOR AND DATA SOURCE | CURRENT STATUS |
|---|---|---|
| Ensure 34 million people living with HIV are on treatment by 2025 | Number of people living with HIV on treatment, 2022<br>Source: UNAIDS special analysis of epidemiological estimates, 2023 | 29.8 million |
| Achieve the 95–95–95 testing, treatment and viral suppression targets within all demographics and groups and geographical settings, including children and adolescents living with HIV | HIV testing and treatment cascade, global, 2022<br>Source: UNAIDS special analysis of epidemiological estimates, 2023 | Percentage of people living with HIV know their HIV status (Indicator 1), percentage of people who know their status and are receiving antiretroviral therapy (Indicator 2), percentage of people on antiretroviral therapy who have achieved viral load suppression (Indicator 3)<br>All ages: 86–89–93<br>Women (15+ years): 90–91–93<br>Men (15+ years): 83–86–94<br>(Figure A1.3) |

**Figure A1.3** Progress towards the 95-95-95 testing, treatment and viral load suppression targets, global, 2015 and 2022




Source: UNAIDS special analysis of epidemiological estimates, 2023.

| 2025 TARGET | INDICATOR AND DATA SOURCE | CURRENT STATUS |
|---|---|---|
| Ensure 90% of people living with HIV receive preventive treatment for tuberculosis (TB) by 2025 | People living with HIV who received preventive treatment for TB, 2021<br>Source: 2022 Global AIDS Monitoring; Global tuberculosis report. Geneva: World Health Organization; 2022 | 2.8 million people<br>Between 2005 and the end of 2021, a total of 16 million people living with HIV were initiated on TB preventive treatment. Given that 38.4 million people were estimated to be living with HIV, this is still much lower than the 90% target set for 2025 |
| Reduce numbers of tuberculosis-related deaths among people living with HIV by 80% by 2025 (compared with 2010 baseline) | Number of TB-related deaths among people living with HIV, global, 2021<br>Source: Global tuberculosis report. Geneva: World Health Organization; 2022 | 190 000 [160 000–220 000]<br>Between 2010 and 2021 there has been a 67% reduction in numbers of TB-related deaths globally among people living with HIV |

## End paediatric AIDS and eliminate vertical transmission

| 2025 TARGET | INDICATOR AND DATA SOURCE | CURRENT STATUS |
|---|---|---|
| Ensure 75% of all children living with HIV have suppressed viral loads by 2023 and 86% by 2025, in line with 95–95–95 HIV treatment targets | HIV testing and treatment cascade, children (aged 0–14 years) compared with adults (aged 15+ years), global, 2022<br>Source: UNAIDS special analysis of epidemiological estimates, 2023 | In 2022, 63% [49–86%] of children living with HIV globally knew their HIV status, 57% [44–78%] of children living with HIV received antiretroviral therapy (representing 91% of those who knew their HIV-positive status), and 46% [36–63%] of children living with HIV had a suppressed HIV viral load (representing 81% of children on treatment) |
| Ensure all pregnant and breastfeeding women living with HIV are receiving lifelong antiretroviral therapy, with 95% achieving and sustaining viral suppression before delivery and during breastfeeding by 2025 | Percentage of pregnant women receiving treatment to prevent vertical transmission of HIV, 2022<br>Source: UNAIDS epidemiological estimates, 2022 (https://aidsinfo.unaids.org/) | 82% [64–>98%] |

## Gender equality and empowerment of women and girls

| 2025 TARGET | INDICATOR AND DATA SOURCE | CURRENT STATUS |
|---|---|---|
| Global AIDS Strategy sub-target: reduce to no more than 10% the number of women and girls who experienced physical or sexual violence from a male intimate partner in the past 12 months by 2027 | Percentage of ever-married or partnered women (aged 15–49 years) who experienced physical or sexual violence by an intimate partner in the past 12 months, countries with available data, 2018–2022<br>Source: population-based surveys, 2018–2022 | Across 18 countries with available data from 2018 to 2022, the percentage of ever-married or partnered women (aged 15–49 years) who experienced intimate partner sexual or physical violence in the past year ranged from 3.8% in the Philippines to 40% in Sierra Leone<br>In 14 of the 18 countries with data, more than 10% of ever-married or partnered women experienced intimate partner violence in the past 12 months |
| Global AIDS Strategy sub-target: reduce to no more than 10% the number of people from key populations who experienced physical or sexual violence in the past 12 months by 2025 | Physical or sexual violence experienced by people from key populations, 2022<br>Source: UNAIDS Global AIDS Monitoring, 2023 (https://aidsinfo.unaids.org/) | A median of 29% of transgender people (in 11 reporting countries), 28% of people who inject drugs (eight reporting countries), 20% of sex workers (21 reporting countries), and 8% of gay men and other men who have sex with men (19 reporting countries) experienced violence in the past 12 months (see factsheets on key populations) |
| Global AIDS Strategy sub-target: reduce to no more than 10% the number of people who support inequitable gender norms by 2025 | Percentage of men and women (aged 15–49 years) who agree that a husband is justified in hitting or beating his wife for a specific reason, countries with available data, 2018–2022<br>Source: population-based surveys, 2018–2022 | According to survey data from 18 countries, a median of 39.9% of women and 26.0% of men said a husband is justified in hitting or beating his wife for a specific reason |
| Ensure 95% of women and girls of reproductive age have their HIV and sexual and reproductive health-care service needs met, including antenatal and maternal care, information and counselling | Percentage of women (aged 15–49 years) who are currently married or in union who make their own informed decisions about sexual relations, contraceptive use and their own health care, countries with available data, 2018–2022<br>Source: UNFPA global database, 2022 (https://www.unfpa.org/data) | Based on data from 68 countries, 56% of women currently married or in union make their own decisions regarding sexual relations, contraceptive use and their own health care |

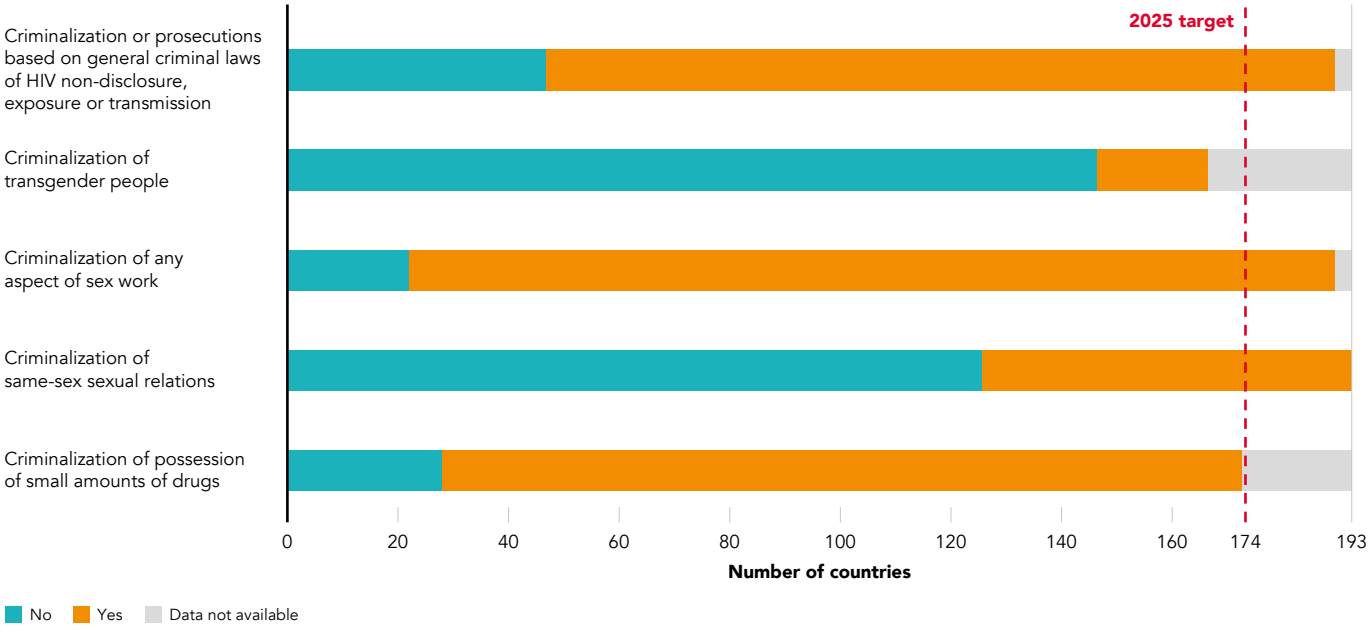
## Community leadership

| 2025 TARGET | CURRENT STATUS |
|---|---|
| Ensure community-led organizations deliver 30% of testing and treatment services, with a focus on HIV testing, linkages to treatment, adherence and retention support, and treatment literacy by 2025 | As existing monitoring systems generally do not track the proportion of services and programmes delivered by community-led organizations, UNAIDS is currently examining options for developing metrics to track progress towards the 30–80–60 targets<br>An expert advisory group has been convened to guide development of a monitoring framework and identification of relevant proxy measures or development of new metrics |
| Ensure community-led organizations deliver 80% of HIV prevention services for people from populations at high risk of HIV infection, including for women within those populations by 2025 | |
| Ensure community-led organizations deliver 60% of programmes to support the achievement of societal enablers by 2025 | |

## Realize human rights and eliminate stigma and discrimination

| 2025 TARGET | INDICATOR AND DATA SOURCE | CURRENT STATUS |
|---|---|---|
| Global AIDS Strategy sub-target: less than 10% of countries criminalize sex work, possession of small amounts of drugs, same-sex sexual behaviour and HIV transmission, exposure or non-disclosure by 2025 | Countries with discriminatory and punitive laws, global, 2023<br><br>Source: UNAIDS National Commitments and Policy Instrument 2017–2022 (http://lawsandpolicies.unaids.org/), supplemented by additional sources (see references in laws and policies scorecards in regional factsheets) | The world is not on track to ensure less than 10% of countries have punitive legal and policy environments (Figure A1.4) |

**Figure A1.4** Countries with discriminatory and punitive laws, global, 2023

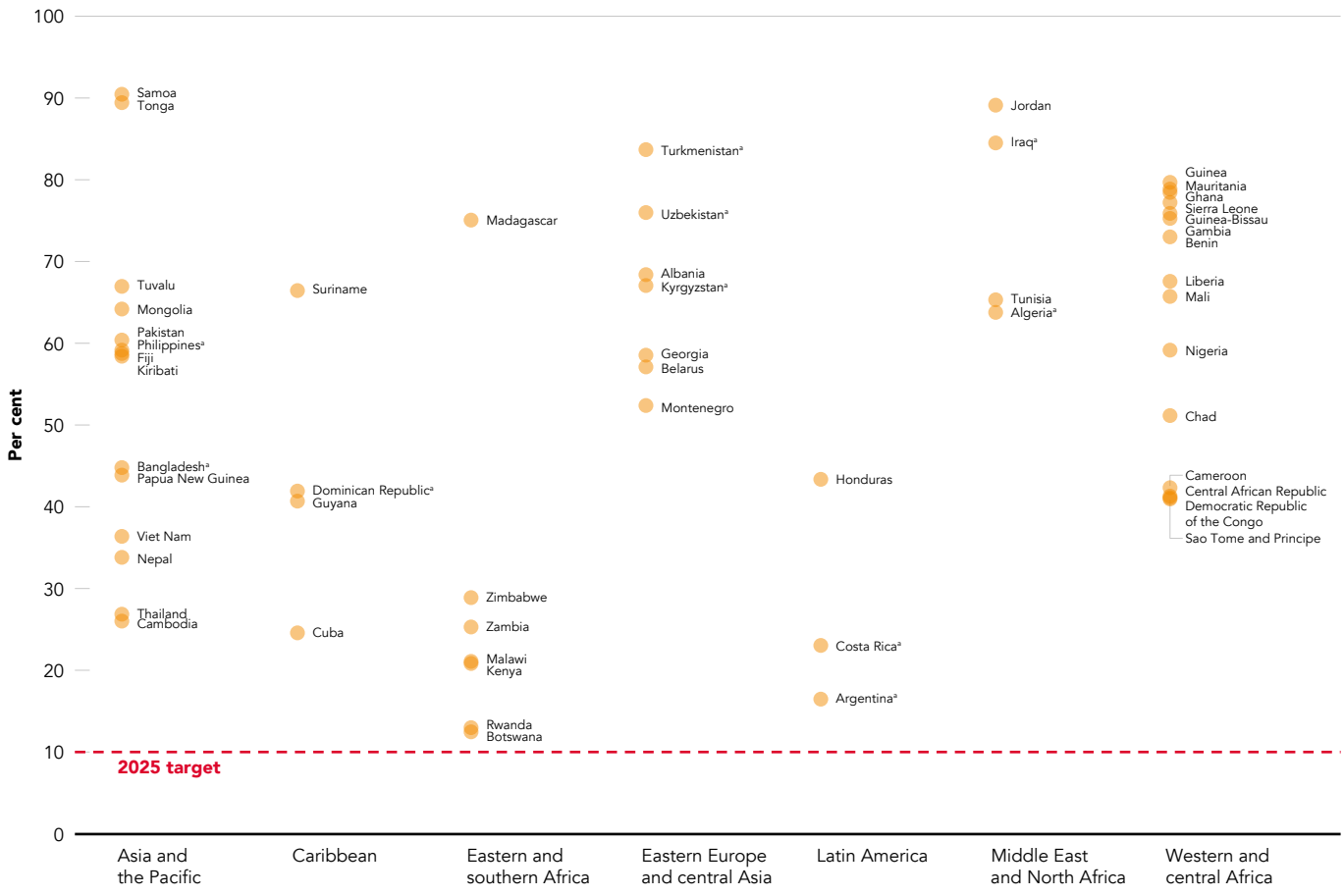



Sources: UNAIDS National Commitments and Policy Instrument 2017–2022 (http://lawsandpolicies.unaids.org/), supplemented by additional sources (see references in Annex).

| 2025 TARGET | INDICATOR AND DATA SOURCE | CURRENT STATUS |
|---|---|---|
| Global AIDS Strategy sub-target: less than 10% of countries lack mechanisms for people living with HIV and people from key populations to report abuse and discrimination and seek redress by 2025 | Countries with mechanisms in place to record and address HIV-related discrimination cases, 2017–2022<br><br>Source: UNAIDS National Commitments and Policy Instrument, 2017–2022 | In 2022, 107 countries (61%) had mechanisms established by either the government or community or nongovernmental organizations to assist people to complain and seek redress for discrimination based on perceived HIV status or belonging to any key population<br><br>Ninety-four countries (54%) have government-established mechanisms and 65 countries (37%) have mechanisms established by the community or nongovernmental organizations for reporting instances of discrimination and seeking redress |
| Global AIDS Strategy sub-target: less than 10% of people living with HIV and people from key populations lack access to legal services by 2025 | Countries with mechanisms in place for accessing affordable legal services, 2017–2023<br><br>Source: National Commitments and Policy Instrument, 2017–2022 | In 2018–2022, 41% of countries (containing approximately 78% of all people living with HIV in 2021) reported having mechanisms in place for people living with HIV or people from key populations to access legal services |

| 2025 TARGET | INDICATOR AND DATA SOURCE | CURRENT STATUS |
|---|---|---|
| Global AIDS Strategy sub-target: more than 90% of people living with HIV who experienced rights abuses have sought redress by 2025 | Percentage of people living with HIV who have experienced rights abuses in the past 12 months who have sought redress, countries with available data, 2020–2023<br>Source: People Living with HIV Stigma Index surveys, 2020–2022 | In 12 of 13 countries with available data from People Living with HIV Stigma Index surveys conducted in 2020–2023, less than 50% of people living with HIV who experienced rights abuses in the past 12 months sought redress<br>In eight countries, less than one in four people living with HIV sought redress |
| Global AIDS Strategy sub-target: less than 10% of the general population reports discriminatory attitudes towards people living with HIV by 2026 | Percentage of people aged 15–49 years who report discriminatory attitudes towards people living with HIV, countries with available data, 2018–2022<br>Source: population-based surveys, 2018–2022 | Across 54 countries with recent survey data, a median of 58.6% of people reported discriminatory attitudes—this level is nearly six times higher than the 2025 global target<br>In 32 of the 54 countries, more than 50% of people reported discriminatory attitudes towards people living with HIV (Figure A1.5)<br>In 13 of the 54 countries, more than 75% of people reported discriminatory attitudes |

**Figure A1.5** Percentage of men and women aged 15–49 years with discriminatory attitudes towards people living with HIV, countries with available data, 2018–2022




Note: discriminatory attitudes are measured through "No" responses to either of two questions: (1) Would you buy fresh vegetables from a shopkeeper or vendor if you knew this person had HIV?; and (2) Do you think children living with HIV should be able to attend school with children who are HIV-negative?
[a]Data are for women only. Source: Population-based surveys, 2018–2022.

| 2025 TARGET | INDICATOR AND DATA SOURCE | CURRENT STATUS |
|---|---|---|
| Global AIDS Strategy sub-target: less than 10% of people living with HIV report internalized stigma by 2025 | Percentage of people living with HIV who report internalized stigma, countries with available data, 2020–2023<br><br>Source: People Living with HIV Stigma Index surveys, 2020–2023 | The prevalence of internalized stigma among people living with HIV (feeling ashamed of living with HIV) remains high in many countries<br><br>In all 18 countries with pertinent information from People Living with HIV Stigma Index surveys in 2020–2023, the percentage of people living with HIV who reported internalized stigma exceeded the 10% target for 2025<br><br>In four of 18 countries, more than half of people living with HIV surveyed reported internalized stigma |
| Global AIDS Strategy sub-target: less than 10% of people from key populations report experiencing stigma and discrimination by 2025 | Stigma and discrimination experienced by people from key populations, 2022<br><br>Source: UNAIDS Global AIDS Monitoring, 2023 (https://aidsinfo.unaids.org/)<br><br>Avoidance of health care among people from key populations because of stigma and discrimination, 2022<br><br>Source: UNAIDS Global AIDS Monitoring, 2023 (https://aidsinfo.unaids.org/) | A median of 15% of gay men and other men who have sex with men (12 reporting countries) and 22% of sex workers (11 reporting countries) say they have experienced stigma and discrimination in the past six months. A median of 30% of people who inject drugs (five reporting countries) and 72% of transgender people (five reporting countries) report similar experiences<br><br>Across key populations, at least 33% of countries with recent survey data reported that more than 10% of respondents avoid accessing health care due to stigma and discrimination; this is particularly concerning among sex workers (29 reporting countries), people who inject drugs (14 reporting countries) and transgender people (12 reporting countries), where more than half of the reporting countries stated it was the case (see factsheets on key populations) |
| Global AIDS Strategy sub-target: less than 10% of people living with HIV experience stigma and discrimination in health-care and community settings by 2027 | Percentage of people living with HIV who experienced stigma and discrimination in health-care and community settings, countries with available data, 2020–2023<br><br>Source: People Living with HIV Stigma Index surveys, 2020–2023 | According to People Living with HIV Stigma Index surveys in 2020–2023, more than 10% of people living with HIV experienced stigma and discrimination in community settings in 12 of 17 countries with available data and in health-care settings in 10 of 12 countries (see societal enablers factsheet) |

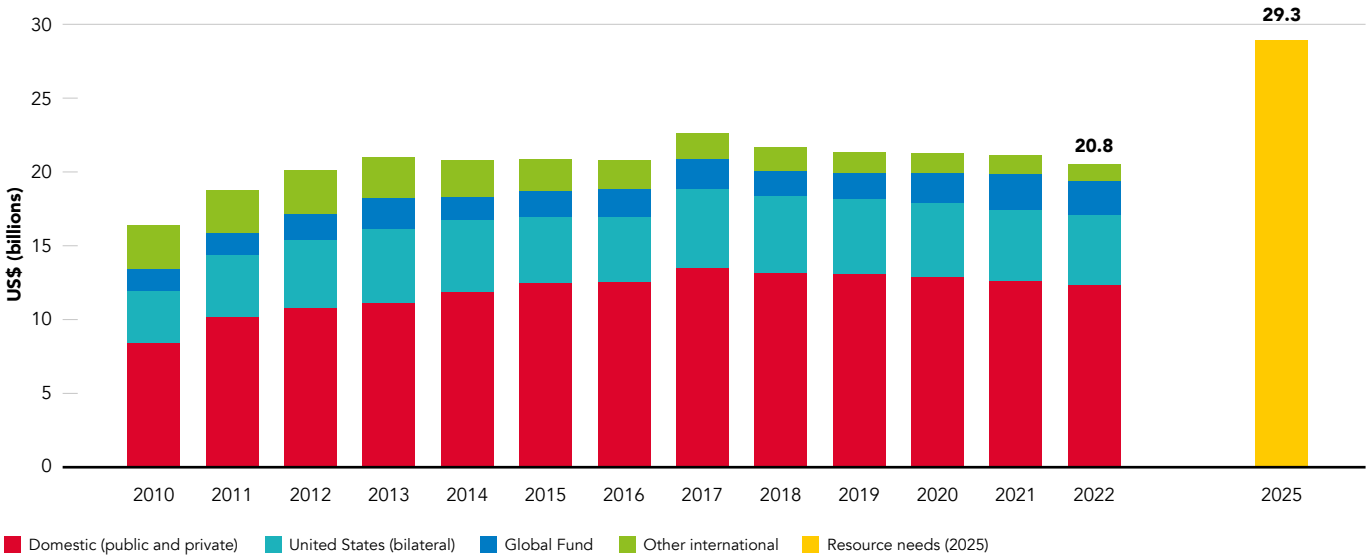
## Universal health coverage and integration

| 2025 TARGET | INDICATOR AND DATA SOURCE | CURRENT STATUS |
|---|---|---|
| Invest in robust, resilient, equitable and publicly funded systems for health and social protection that provide 90% of people living with, at risk of or affected by HIV with people-centred and context-specific integrated services for HIV | See details on progress against this target in Chapter 3 (section "Integrated services can have an even better impact") | |
| Ensure 90% of people in humanitarian settings have access to integrated HIV services | The lack of available data does not permit an up-to-date assessment of access to integrated HIV services among people in humanitarian settings | |
| Ensure that by 2025, 45% of people living with, at risk of or affected by HIV have access to social protection benefits | Estimated household prevalence of any external economic support in the past 12 months, by country and population group, 2015–2017<br><br>Source: PHIA surveys, 2015–2017 | According to PHIA surveys across 12 high HIV burden countries in 2015–2018, only two populations in Eswatini (adolescent girls and young women, orphans and vulnerable children) and two populations in Namibia (female sex workers, women living with HIV) have at least 45% coverage of external economic support |

## Investments and resources

| 2025 TARGET | INDICATOR AND DATA SOURCE | CURRENT STATUS |
|---|---|---|
| Fully fund the HIV response by increasing annual HIV investments in low- and middle-income countries to US$ 29 billion by 2025 | Resource availability for HIV in low- and middle-income countries, 2022<br><br>Source: UNAIDS financial estimates and projections, 2023 (http://hivfinancial.unaids.org/hivfinancialdashboards.html); Stover J, Glaubius R, Teng Y, Kelly S, et al. Modelling the epidemiological impact of the UNAIDS 2025 targets to end AIDS as a public health threat by 2030. PLoS Med. 2021;18(10):e1003831 | In 2022, US$ 20.8 billion was available from all sources, 2.6% less than in 2011 and well below the US$ 29.3 billion resource mobilization target for 2025 (Figure A1.6) |

**Figure A1.6** Resource availability for HIV in low- and middle-income countries by source of funding, 2010–2022 and 2025 target




Source: UNAIDS financial estimates and projections, 2023 (http://hivfinancial.unaids.org/hivfinancialdashboards.html); Stover J, Glaubius R, Teng Y, Kelly S, et al. Modelling the epidemiological impact of the UNAIDS 2025 targets to end AIDS as a public health threat by 2030. PLoS Med. 2021;18(10):e1003831.
Note: the resource estimates are presented in constant 2019 US dollars. The countries included are those that were classified by the World Bank in 2020 as being low- or middle-income.

ANNEX 2

# Methods

## Methods for deriving UNAIDS HIV estimates

### Introduction

Every year UNAIDS 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 not possible 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 infeasible and ethically problematic. Modelled estimates—and the lower and upper bounds around these estimates—provide a rigorous representation of the HIV pandemic in terms of levels and trends.

Country teams use UNAIDS-supported software to develop estimates annually. The country teams are comprised primarily of national monitoring and evaluation specialists, programme officers, epidemiologists, demographers and other experts from the national ministry of health, national AIDS bodies and technical partners.

The software used to produce the estimates is Spectrum (developed by Avenir Health[1]) and its AIDS Impact Model (AIM). Most countries use an incidence model that runs within the AIM module of Spectrum. A few countries use an external model whose incidence estimate is imported into AIM (Table A2.1). The UNAIDS Reference Group on Estimates, Modelling and Projections[2] provides technical guidance on the development of the AIM module in Spectrum.

[1] www.avenirhealth.org
[2] www.epidem.org

**Table A2.1** Incidence models used for national HIV estimates collated in the Spectrum software and UNAIDS 2023 estimation round

| INCIDENCE MODEL | COUNTRIES | HIV PREVALENCE (AGED 15–49 YEARS) (MEDIAN) | REGIONS |
|---|---|---|---|
| Estimation and Projection Package (EPP), generalized epidemic | 38 | 1.9% | • Asia and the Pacific<br>• Caribbean<br>• Eastern and southern Africa<br>• Western and central Africa |
| EPP, concentrated epidemic | 37 | 0.31% | • Asia and the Pacific<br>• Caribbean<br>• Eastern Europe and central Asia<br>• Latin America<br>• Middle East and North Africa |
| AIDS Epidemic Model | 13 | 0.33% | • Asia and the Pacific |
| Case Surveillance and Vital Registration (CSAVR) or European Centre for Disease Prevention and Control (ECDC) model, fitting deaths or case reports | 72 | 0.12% | • Asia and the Pacific<br>• Caribbean<br>• Eastern Europe and central Asia<br>• Latin America<br>• Middle East and North Africa<br>• Western and central Europe and North America |
| Other | 12 | 0.28% | • Asia and the Pacific<br>• Eastern and southern Africa<br>• Latin America<br>• Western and central Europe and North America |
| **All models** | **172** | **0.3%** | |

# Methods and models used by UNAIDS and countries to create estimates[3]

Countries where HIV transmission sustains an epidemic in the general population use the Estimation and Projection Package (EPP) module of the Spectrum modelling tool, which fits a trend to HIV prevalence data 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. In recent years, most countries have stopped conducting sentinel surveillance among pregnant women and are now using data from the routine HIV tests conducted when pregnant women attend antenatal clinics and are tested for HIV. These data avoid the need to conduct a separate surveillance effort, and they provide a complete set of data from all clinics across the country instead of samples from selected sites.

The trends from pregnant women at antenatal clinics, whether measured 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 include men and ensure coverage of all people, regardless of whether they use health-care services—are representative of national HIV prevalence levels and, if

[3] The methods are described in detail in Volume 33 (Suppl 3) of AIDS (2019); and Advancing methods for global HIV estimates. Maheu-Giroux M, Ciaranello AL, Salomon JA, Sohn AH, guest editors. J Int AIDS Soc. 2021;24(S5).

repeated, also inform trends. Data from these surveys also contribute to estimating age- and sex-specific HIV prevalence and incidence levels and trends. A few countries in sub-Saharan Africa that have not conducted population-based surveys adjusted HIV prevalence levels based on comparisons of antenatal clinic surveillance and population-based survey data from other countries in the region. The resulting HIV prevalence trends, in addition to numbers of people on antiretroviral therapy, are then used to estimate the national HIV incidence trend, accounting for effects of antiretroviral therapy on survival.

Countries where HIV transmission occurs largely among people from key populations at higher risk of HIV and the epidemic is low-level or concentrated use the AIDS Epidemic Model—a variant of the EPP model that fits to high-quality surveillance prevalence data and population size estimates for each of several key populations and the lower-risk general population.

To estimate HIV prevalence in the remaining lower-risk general population, these countries generally input surveillance data from pregnant women and account for people who cease behaviours that put them at increased risk for HIV acquisition—for example, women who cease selling sex will be included among the remaining population of people living with HIV. The resulting HIV prevalence curve and number of people on antiretroviral therapy are then used to derive a national HIV incidence trend.

Most countries in western and central Europe and North America use AIDS-related mortality data from vital registration and HIV case reports and the delay from infection to diagnosis to estimate national HIV prevalence and incidence trends. These countries use the Case Surveillance and Vital Registration (CSAVR) model within Spectrum, or the European Centre for Disease Prevention and Control (ECDC) model or, in a few instances, a country-specific model. The CSAVR model is also used by some countries in Latin America, the Caribbean, and the Middle East and North Africa that have robust disease reporting systems but limited HIV surveillance or survey data.

All countries that use UNAIDS-supported methods for their estimates share common assumptions about the effectiveness of HIV treatment and disease progression by sex and age. These assumptions are based on systematic literature reviews and meta-analyses of study data by scientific experts.

Demographic population data, including fertility, mortality and migration, are derived from the United Nations Population Division World Population Prospects 2022 estimates or recent census data and reflect the de facto population (current residents, regardless of nationality) of each country.

Country teams update the data in their Spectrum files every year with the latest available data on numbers of people receiving antiretroviral therapy, pregnant women receiving antiretroviral therapy, and HIV surveillance data, among other data. The model is run and results are reviewed by country teams before sharing with UNAIDS.

Final country-submitted files containing the modelled outputs are reviewed at UNAIDS to ensure results are comparable across regions and countries and over time. Selected inputs into the model—including numbers of people on antiretroviral therapy and numbers of women accessing services to prevent vertical transmission of HIV—are further reviewed and validated in partnership with the United Nations Children's Fund (UNICEF), the World Health Organization (WHO), the United States President's Emergency Plan for AIDS Relief (PEPFAR) and its agencies, the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), and other partners.

In the 2023 round of estimates, subnational estimates were created and used by 38 countries (37 in sub-Saharan Africa, one in the Caribbean). Methods for creating these subnational estimates are described later in this annex.

## 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 in 95% of cases (if it could be measured). Narrow bounds indicate that an estimate is precise, while wide bounds indicate greater uncertainty regarding the estimate, given the data and assumptions.

In countries using HIV surveillance data, the quantity and source of the available data 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 one or more national population-based surveys have been conducted generally have smaller ranges around estimates than countries where such surveys have not been conducted. 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 determine 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 that have their own additional uncertainty.

UNAIDS is confident that the actual numbers of people living with HIV, people who are newly infected with HIV and people who have died from AIDS-related causes lie within the reported ranges. With more years of good-quality surveillance data over successive estimation rounds, the uncertainty on a country's estimate will typically decrease.

# Improvements included in the 2023 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 or antiretroviral therapy coverage rates, including for past years. Second, improvements are incorporated into the model based on new science and statistical methods, which lead to the creation of more accurate trends in HIV incidence. Occasionally, countries change the incidence modelling option within Spectrum based on improvements in the data available in the country.

Due to these improvements to the model and the addition of new data to create the estimates, the results from previous estimation rounds cannot be compared with the results from the current round. However, full historical estimates are created at each round, and these enable evaluation of trends over time.

Between the 2022 and 2023 estimates, the following key changes were made to the models, following guidance from the UNAIDS Reference Group on Estimates, Modelling and Projections.

## Demographic projection

The underlying demographic data are now based on the World Population Prospects 2022 version, replacing the 2019 version. This update was accepted in most countries except where a country had evidence to use other demographic sources. Associated with this update, Spectrum results for a given point in time were aligned with the World Population Prospects to represent the end of December instead of mid-year as done in previous rounds. Spectrum results for a year were adjusted to represent the period from January through December instead of July through June.

## Impact of antiretroviral therapy on HIV transmission

Before the 2023 round of estimates, the reduction in HIV transmission from people on treatment was a fixed assumption for all countries (0.80 for each percentage point increase in adult antiretroviral therapy coverage). In the 2023 software, the impact of treatment on transmission is based on each country's viral load suppression data (over the most recent three years), with a stronger reduction in transmission for countries with higher viral load suppression (within a plausible range of 0.70–0.93).

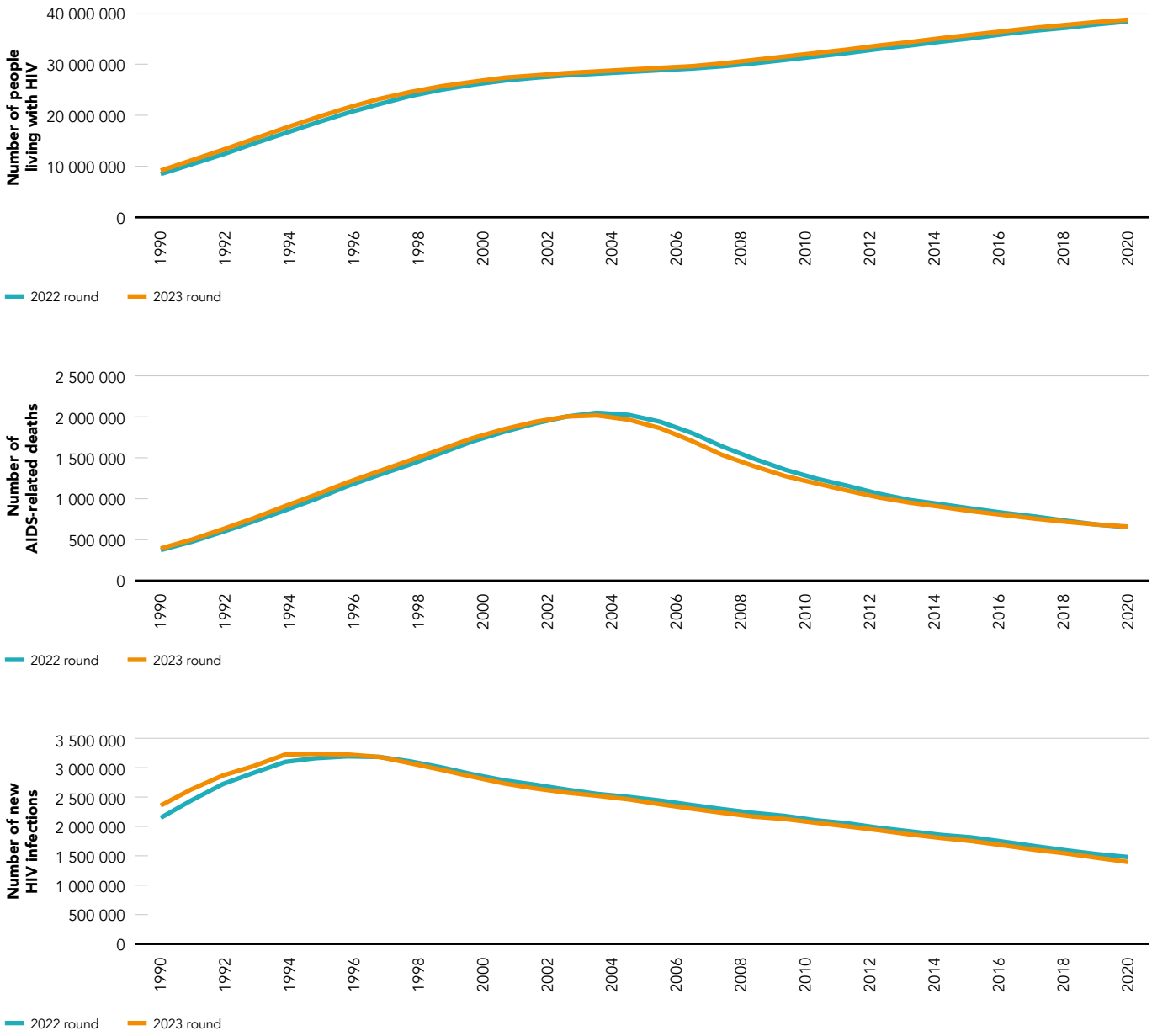
## Mortality among adults on antiretroviral therapy

For high-income countries, the default AIDS-related mortality rates assumed for people on treatment, notably in the category of CD4>500/mL, were reduced to match good-quality cause-of-death data (from IeDEA

multi-site cohort analyses). For Asia and the Pacific, conversely, default rates were increased, such that these two groups of countries now have similar survival patterns in Spectrum.

Figure A2.1 presents the 2023 estimates compared with the 2022 estimates. Shifts in the curves are the combined effect of the updated country data and the changes to model structure and assumptions described above. At the global level, trends in new HIV infections, AIDS-related deaths and people living with HIV are like those estimated in the preceding round, although there are shifts within some regions.

**Figure A2.1** Comparison of 2022 and 2023 UNAIDS estimates: new HIV infections, AIDS-related deaths and people living with HIV, global, 1990–2022




Source: UNAIDS epidemiological estimates, 2022 and 2023 rounds.

# Publication of country-specific estimates

UNAIDS aims to publish estimates for all countries with populations of 250 000 or more people (according to the United Nations Population Division World Population Prospects 2022). For countries with populations of 250 000 or more people that did not submit estimates, UNAIDS developed estimates using the Spectrum software, based on published or otherwise available information. These estimates contributed to regional and global totals but were not published as country estimates on AIDSinfo.

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 use drugs—or they are the sexual partners of people who use drugs, gay men and other men who have sex with men, or sex workers—with possibly different fertility levels than the general population. UNAIDS therefore does not present estimates of vertical HIV transmission or child infections in many countries with concentrated epidemics, unless adequate data are available to inform these estimates. Estimates related to children are not published for countries where the estimated number of pregnant women living with HIV is fewer than 50.

If there are not enough historical data to determine incidence trends, UNAIDS does not publish historical incidence:

- EPP-based incidence trends are published only if there are four or more data points and prevalence data in the past four years for the most important subpopulation.

- For low-level epidemics that rely on case and death surveillance data, incidence trends are published if the input data include at least eight data points on both AIDS-related deaths and new HIV diagnoses within 1990–2022. These incidence estimates are anchored in a back-calculation from reported AIDS-related deaths, and they are not highly sensitive to decreases in testing volumes and new diagnoses that some countries experienced in 2020 or 2021 due to COVID-19-related health service disruptions. Nevertheless, some countries that use an incidence model anchored in case reporting postponed estimates for 2021 and 2022 to address potential COVID-related biases.

In the 2023 round, incidence was not published for seven of 138 countries that published estimated numbers of people living with HIV (and 135 countries that published estimated numbers of adults living with HIV). For another five countries, incidence was published up to 2020 or 2021 only.

UNAIDS does not publish country estimates when available data are insufficient to justify the estimate. In the 2023 round, estimates were not published for 23 countries, either because of insufficient data or because of no country submission.

More information on the UNAIDS estimates and the individual Spectrum files for most countries can be found at http://hivtools.unaids.org. Data from the estimates can be found at http://aidsinfo.unaids.org.

# Methods for deriving the 95–95–95 testing and treatment targets

## Introduction

Since 2015, UNAIDS has reported estimates of global, regional and country-specific progress against the testing and treatment targets. In the United Nations Political Declaration on HIV and AIDS: Ending Inequalities and Getting on Track to End AIDS by 2030, testing and treatment targets were set to reach 95–95–95. These targets refer to three indicators:

- Indicator 1 (the first 95): the percentage of people living with HIV who know their HIV status.
- Indicator 2 (the second 95): the percentage of people living with HIV who know their HIV-positive status and are accessing treatment.
- Indicator 3 (the third 95): the percentage of people living with HIV 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 total numbers of people living with HIV, this is called the HIV testing and treatment cascade.

## Data sources for constructing country measures

Country-level progress against the 95–95–95 targets was constructed using reported data from Spectrum and Global AIDS Monitoring. Estimates are published for all people and separately for children (aged 0–14 years), men (aged 15+ years) and women (aged 15+ years). Corresponding upper and lower bounds were based on uncertainty ranges on estimated numbers of people living with HIV for each country, population group and year. These target-related indicators and their data sources are described in the UNAIDS Global AIDS Monitoring 2023 guidelines *(1)*.

**Table A2.2** Data available for constructing UNAIDS measures of progress against the 95–95–95 targets, 2015–2022

| NUMBER | YEAR | ASIA AND THE PACIFIC | CARIBBEAN | EASTERN AND SOUTHERN AFRICA | EASTERN EUROPE AND CENTRAL ASIA | LATIN AMERICA | MIDDLE EAST AND NORTH AFRICA | WESTERN AND CENTRAL AFRICA | WESTERN AND CENTRAL EUROPE AND NORTH AMERICA | GLOBAL |
|---|---|---|---|---|---|---|---|---|---|---|
| Countries | | 39 | 16 | 21 | 16 | 17 | 19 | 25 | 39 | **193** |
| Countries in UNAIDS global estimates | | 29 | 10 | 20 | 16 | 17 | 19 | 25 | 36 | **172** |
| Countries with published estimate of adults living with HIV in 2022 | | 22 | 10 | 19 | 11 | 16 | 16 | 24 | 20 | **135** |
| Countries with publicly available data on adults living with HIV who know their status | 2015 | 13 | 9 | 16 | 12 | 8 | 14 | 22 | 12 | **106** |
| | 2016 | 16 | 9 | 16 | 12 | 10 | 14 | 22 | 19 | **118** |
| | 2017 | 18 | 9 | 16 | 12 | 11 | 14 | 22 | 19 | **121** |
| | 2018 | 20 | 9 | 16 | 12 | 12 | 14 | 22 | 23 | **128** |
| | 2019 | 20 | 9 | 16 | 12 | 12 | 14 | 22 | 21 | **126** |
| | 2020 | 20 | 9 | 16 | 12 | 12 | 14 | 22 | 19 | **124** |
| | 2021 | 19 | 9 | 16 | 12 | 12 | 14 | 22 | 18 | **122** |
| | 2022 | 17 | 8 | 16 | 12 | 11 | 15 | 22 | 12 | **113** |
| Countries with publicly available data on adults living with HIV who are on treatment | 2015 | 24 | 10 | 19 | 12 | 15 | 19 | 24 | 26 | **149** |
| | 2016 | 24 | 10 | 19 | 12 | 15 | 19 | 24 | 26 | **149** |
| | 2017 | 24 | 10 | 19 | 12 | 15 | 19 | 24 | 26 | **149** |
| | 2018 | 24 | 10 | 19 | 12 | 15 | 19 | 24 | 25 | **148** |
| | 2019 | 24 | 10 | 19 | 12 | 15 | 19 | 24 | 24 | **147** |
| | 2020 | 24 | 10 | 19 | 12 | 15 | 19 | 24 | 22 | **145** |
| | 2021 | 23 | 10 | 19 | 12 | 15 | 19 | 24 | 19 | **141** |
| | 2022 | 22 | 10 | 19 | 12 | 13 | 18 | 24 | 11 | **129** |
| Countries with publicly available data on adults living with HIV who were tested for viral load and found to be virally suppressed | 2015 | 4 | 2 | 3 | 5 | 6 | 7 | | 7 | **34** |
| | 2016 | 5 | 4 | 6 | 6 | 9 | 8 | | 11 | **49** |
| | 2017 | 7 | 8 | 7 | 9 | 10 | 9 | 1 | 13 | **64** |
| | 2018 | 10 | 9 | 12 | 10 | 12 | 10 | 4 | 16 | **83** |
| | 2019 | 13 | 9 | 17 | 11 | 11 | 8 | 7 | 15 | **91** |
| | 2020 | 13 | 8 | 16 | 11 | 11 | 8 | 8 | 15 | **90** |
| | 2021 | 12 | 8 | 15 | 10 | 12 | 9 | 10 | 13 | **89** |
| | 2022 | 12 | 8 | 16 | 11 | 12 | 10 | 10 | 8 | **87** |

Source: UNAIDS epidemiological estimates, 2015–2022.
Note: not counting some countries that published numbers of adults living with HIV who knew their status or were on treatment but missing a corresponding estimate of total numbers of adults living with HIV.

Table A2.2 summarizes the number of countries that have reported each measure in each region over the past seven years.

The final set of country measures of progress against the 95–95–95 targets for 2015 through 2022 are available at http://aidsinfo.unaids.org. Not all countries were able to report against all three targets. In the 2023 estimates round, complete treatment cascades for 2023 were published for 79 countries, an increase from 68 countries in the 2022 estimates round.

# Estimates of people living with HIV

All progress measures in this report are based on national estimates of people living with HIV that used the Spectrum model. In the 2023 round, people living with HIV were estimated for 172 of 193 countries and territories. These 172 countries represent 99% of the total global population. Estimates of adults living with HIV were published for 135 of these 172 countries.

# Knowledge of HIV status among people living with HIV

Numbers of people living with HIV who know their status were estimated over time using HIV case surveillance, programme data and nationally representative population-based survey data. Where data were available separately for children (aged 0–14 years) and adults (aged 15+ years, by sex), age- and sex-specific measures were calculated and then aggregated to national measures.

Countries outside of sub-Saharan Africa without national household surveys estimated the number of people living with HIV who knew their HIV status based on HIV case notification data and programme registers. Some concentrated epidemic countries used notification data directly, if their HIV surveillance system had been functioning since 2015 or longer and they were able to subtract from cumulative diagnosed people those who had died, emigrated or were otherwise lost to follow-up. If this calculation estimated the number of people with HIV who knew their HIV status as fewer than those on antiretroviral therapy, however, the reported value was excluded, as it was potentially incorrect due to one of several common biases. For example, a country may underestimate the number of people living with HIV who are aware of their HIV status if not all people diagnosed are reported to the surveillance system in a timely manner. Conversely, the measure is overestimated if people are registered or reported more than once and such duplicates are not detected, or if people die or emigrate but are not removed from the system. Such overestimation of the number of people living with HIV who are aware of their HIV status was common before 2015.

Alternatively, concentrated epidemic countries could estimate knowledge of status as part of their overall epidemic estimation through the CSAVR model, which estimated incidence of infection, knowledge of status and antiretroviral therapy coverage from case and death notifications.

Most countries in eastern and southern Africa and western and central Africa estimated knowledge of status in adults using the UNAIDS-supported Shiny90 tool *(2)*, which is part of the Spectrum software. This mathematical model fits data from national population-based surveys on proportions of respondents living with and without HIV who had ever tested for HIV, in addition to HIV testing services programme data on the annual number of HIV tests conducted and the number of positive tests, and Spectrum model results *(2)*.

Knowledge of HIV status estimates from Shiny90 have strengths over those drawn directly from population surveys or programme records. By constructing the population's HIV incidence and testing history over time, the resulting trend in HIV status awareness is adjusted for known reporting biases in awareness of HIV status in household surveys and accounts for retesting and repeat diagnoses among routine programme data on annual HIV diagnoses *(3, 4)*. The Shiny90 estimates distinguish people living with HIV who had an HIV test after seroconversion and so are aware of their HIV status from those who seroconverted after their last HIV-negative test. The distinction is informed by the national incidence trend calculated in Spectrum. Shiny90 estimates knowledge of status by sex and age, assuming adult male/female testing rate ratios have remained relatively constant since 2010. Results include additional indicators such as the percentage of people diagnosed within a year and the numbers of people (by HIV status) retesting.

Caution is warranted with knowledge of status estimates if the last population-based survey was conducted more than five years ago, or if there are concerns about the accuracy of self-reported testing history in the survey.

Both Shiny90 and the CSAVR estimate of knowledge of HIV status only cover adults aged 15 years and older. UNAIDS recommends that countries conservatively estimate knowledge of status among children as the proportion of children living with HIV on treatment, unless reliable numbers from case surveillance (cumulative diagnoses and deaths, emigrations and losses to follow-up) are available.

## People accessing antiretroviral therapy

Global and regional measures of antiretroviral therapy numbers are calculated from data entered by country teams into the Spectrum software or the Global AIDS Monitoring reporting tool. In the 2023 round, 129 countries reported treatment numbers for 2022 (covering 82% of the estimated people on treatment). Between 2015 and 2022, 159 countries had at least one publicly available estimate of the number of people on treatment. For a few countries that did not report numbers of people on treatment for all years—primarily high-income countries in western and central Europe and North America, and Asia and the Pacific—people on treatment were estimated either in consultation with the public health agency responsible for monitoring the national treatment programme or from published and online sources.

In partnership with UNICEF, WHO, PEPFAR and its agencies, the Global Fund and other partners that support treatment service delivery in countries, UNAIDS annually reviews and validates treatment numbers that countries have reported to UNAIDS. The number of people on treatment may be overestimated if people who transfer from one facility to another are reported by both facilities, or if people who have died, disengaged from care or emigrated are not identified and removed from treatment registries. Conversely, treatment numbers are sometimes underestimated if not all clinics report the numbers of people on treatment completely or in a timely manner.

UNAIDS and other international partners support countries to verify the accuracy of numbers of people reported to be currently on treatment.

# People who have achieved viral suppression

Progress towards the viral suppression target among people on treatment and as a percentage of all people living with HIV was estimated from data reported in Spectrum and through the Global AIDS Monitoring reporting tool. For the purpose of reporting, the threshold for suppression is a viral load below 1000 copies/mL. Some countries set lower thresholds to identify a person as having achieved an undetectable viral load. Where a country uses a lower threshold, Spectrum applies an adjustment to estimate the percentage suppressed at 1000 copies/mL. The Global AIDS Monitoring guidance describes this adjustment in detail. The guidance also specifies that only routine viral load tests should be reported and only a person's last test result from the reporting year should be submitted, so reported numbers represent people tested and suppressed rather than tests performed *(1)*.

Countries are asked to report viral load suppression outcomes for all years, regardless of testing coverage. However, UNAIDS publishes viral load testing results only for countries and for each year where at least 50% of people treated are tested for viral load. For countries and years with nationally representative but not universal viral suppression data, the reported proportion suppressed among people tested for viral load (the third "95") was multiplied by the total number of people on treatment to estimate overall viral suppression numbers.

Table A2.3 shows numbers of countries with a reliable estimate of viral load suppression. This increased from 64 countries in 2017 to 87 by 2022. Some countries had lower viral load testing coverage for 2020 or 2021 compared with 2019 or 2022, often due to the COVID-19 pandemic and related disruptions or delays in health service provision and reporting.

Some challenges exist in using country-reported data to monitor the viral load suppression target. First, routine viral load testing may not be offered at all treatment facilities. The facilities that do test may not be representative of facilities without viral load testing. Despite this uncertainty, we assume that the percentage of people suppressed among those accessing viral load testing is representative of all people on treatment.

Second, UNAIDS requests countries to only report results from routine viral load testing. If countries report test results primarily performed because of suspected treatment failure, then 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.

Third, UNAIDS guidance recommends reporting viral load test results only for people on antiretroviral therapy. People who are not on treatment and who naturally suppress the virus will not be included in this measure.

# Methods for constructing regional and global results towards the 95–95–95 targets

All programme data submitted to UNAIDS were validated by UNAIDS and its partners before publication. Country-submitted data that did not meet quality standards, either at the indicator level or across the treatment cascade, were not included in the calculation of regional or global estimates. These included, for example, viral load suppression results for years when less than 50% of people on treatment were tested for viral load.

To estimate regional and global progress against the 95–95–95 targets for adults, UNAIDS imputed missing country data for the first and third 95 targets using a Bayesian hierarchical model. This uses regional trends—or global trends, when regional trends are sparse—sex differences and patterns over time from countries with good-quality data and coherent cascade estimates. Upper and lower bounds around global and regional estimates of the HIV testing and treatment cascade reflect uncertainty in the number of people living with HIV and uncertainty from missing country data in numbers of people who know their HIV status or who are virally suppressed. These ranges do not capture uncertainty in country-reported people who know their HIV status, were tested for viral load or are virally suppressed. Details on the model's methods and assumptions are available elsewhere *(5)*.

Table A2.3 shows the proportions of people living with HIV for whom knowledge of HIV status and viral load suppression were imputed, as opposed to reported or estimated by the country, from 2015 to 2022. Generally, the proportion imputed decreased over time, as more countries reported good-quality data. Some regions (e.g. Asia and the Pacific, western and central Europe and North America) have an increased proportion of countries with imputed knowledge of status or viral load suppression in 2022 compared with earlier years, as the latest data were still being reviewed.

Some countries are still not able to report on the testing and treatment cascade or elements of the cascade. Although the percentage of people tested for viral load has increased in many countries, knowledge of status remains difficult to estimate, especially in countries without population-based surveys that measure HIV serostatus alongside respondents' testing history. Limited data are available to inform knowledge of status in Asia and the Pacific, western and central Europe and North America, and Latin America.

**Table A2.3** Proportion of estimated people living with HIV for whom knowledge of status was imputed, and proportion of estimated people on treatment for whom viral suppression was imputed, 2015–2022

| INDICATOR | YEAR | ASIA AND THE PACIFICA | CARIBBEAN | EASTERN AND SOUTHERN AFRICA | EASTERN EUROPE AND CENTRAL ASIA | LATIN AMERICA | MIDDLE EAST AND NORTH AFRICA | WESTERN AND CENTRAL AFRICA | WESTERN AND CENTRAL EUROPE AND NORTH AMERICA | GLOBAL |
|---|---|---|---|---|---|---|---|---|---|---|
| Proportion of estimated people living with HIV for whom knowledge of status was imputed | 2015 | 24 | 4 | <0.02 | 3 | 11 | 8 | – | 24 | **5** |
| | 2016 | 23 | 4 | <0.02 | 2 | 9 | 7 | – | 2 | **4** |
| | 2017 | 24 | 3 | <0.02 | 2 | 5 | 7 | – | 13 | **4** |
| | 2018 | 14 | 3 | – | 2 | 2 | 7 | – | 7 | **2** |
| | 2019 | 15 | 3 | – | 2 | 2 | 7 | – | 16 | **3** |
| | 2020 | 43 | 3 | – | 2 | 1 | 6 | – | 66 | **9** |
| | 2021 | 43 | 3 | – | 2 | 1 | 4 | – | 23 | **7** |
| | 2022 | 37 | 3 | – | 2 | 8 | 2 | – | 80 | **9** |
| Proportion of estimated people on treatment for whom viral suppression status was imputed | 2015 | 62 | 44 | 25 | 50 | 15 | 23 | 51 | 20 | **31** |
| | 2016 | 61 | 21 | 18 | 5 | 14 | 22 | 51 | 9 | **26** |
| | 2017 | 60 | 1 | 12 | 4 | 8 | 23 | 42 | 13 | **20** |
| | 2018 | 31 | 1 | 0 | 3 | 8 | 13 | 8 | 17 | **6** |
| | 2019 | 34 | 1 | 0 | 2 | 9 | 13 | 7 | 6 | **6** |
| | 2020 | 4 | 0 | 0 | 2 | 5 | 6 | 1 | 54 | **4** |
| | 2021 | 1 | 0 | 0 | 2 | 5 | 4 | 1 | 27 | **2** |
| | 2022 | 1 | 1 | 0 | 0 | 12 | 3 | 0 | 77 | **4** |

Source: UNAIDS epidemiological estimates, 2016–2022.

# New infections among key populations

## New HIV infections by subpopulation

New HIV infections among key populations globally and by region were estimated for 172 countries for the years 2010 and 2022. Multiple sources were synthesized to estimate the numbers of new infections among key populations within each country's overall Spectrum estimate of new infections among men and women aged 15–49 years.

For some countries that modelled their historic HIV epidemic based on data from subpopulations including one or more key populations using the EPP-concentrated or Aids Epidemic Model *(6)* or Thembisa *(7)*, new infection trends among key populations were extracted from Spectrum 2023 estimates. This source provided data for sex workers from 33 countries, for people who inject drugs from 20 countries, for gay men and other men who have sex with men from 33 countries, and for transgender people from 24 countries (in Latin America, the Caribbean, western and central Europe and North America, Asia and the Pacific, the Middle East and North Africa, and South Africa).

For most countries in sub-Saharan Africa, and in other countries without a national Spectrum model including all key populations, estimates from the Goals *(8)* and Optima *(9, 10)* transmission dynamics and programme impact models were used. These were calibrated to country-owned 2023 Spectrum models for overall epidemic trends, and results were standardized to these by importing proportions (not numbers) of overall adult infections in each key population. Goals- and Optima-estimated proportions of adult infections were also used to estimate new infections among clients of female sex workers and non-client, non-key population male and female sex partners of people from key populations to complement national estimates of key populations where available.

For countries without a national epidemic model that distinguished key populations, proportions of new infections were approximated from proportions of national new adult case diagnoses if recorded by mode of transmission. This was done for most countries in western and central Europe, and for countries with strong case-based HIV surveillance in eastern Europe and central Asia, Latin America, the Caribbean, and Asia and the Pacific. In these countries, as a proxy for new infection estimates in 2010 we used diagnoses reported in 2012 and 2013, while new infections in 2022 were inferred from diagnoses from 2019–2022, depending on each country's data availability *(11)*.

Some models and some case surveillance systems did not cover all key populations or clients and partner groups. For these, new infections were approximated using median proportions of infections in the group across countries within the region with an estimate. This helped to complete estimates notably for transgender people, clients of sex workers, and other sex partners of people from key populations.

Sex partners were considered to include non-injecting sex partners of people who inject drugs, female sex partners of gay men and other men who have sex with men, and spouses and steady sexual partners of sex workers.

This is the first year UNAIDS has estimated trends in new HIV infections among key populations from 2010, the baseline of the global AIDS strategy, through 2022. The analysis is limited by missing data on some or all key populations from many countries. Results should be interpreted as indicating broad patterns and trends rather than precise estimates. For this reason, the results presented focus on proportional changes over time in new infections among each group rather than on underlying numbers of infection or distributions.

Compared with earlier published estimates of distributions, the new estimated proportions of new infections among key populations are lower. This mainly reflects a change from using outdated static models such as modes of transmission and incidence patterns analyses mostly conducted more than a decade ago, to using transmission-dynamic models.

A technical report with details of the refined multi-source estimation methods and updated results is under development.

# Calculation of pre-exposure prophylaxis (PrEP) coverage for HIV-negative people

Global and regional PrEP targets for gay men and other men who have sex with men, people who inject drugs, and transgender people were set by the UNAIDS Target Setting Group, with support from Avenir Health. Targets were established using available data on the size of key populations and their relative vulnerability for 118 countries. Additional country targets were included to reach a maximum of 166 countries for gay men and other men who have sex with men, 123 for people who inject drugs and 132 for transgender people *(12)*.

Global and regional PrEP targets for sex workers were calculated for 184 countries based on the population size estimates reported through Global AIDS Monitoring in recent years, from which sex workers living with HIV were subtracted. Each size estimate was categorized regarding recency, geographical location and methods adequacy using the criteria described previously *(13)*. Nationally adequate estimates were used to determine median proportions among adults (aged 15–49 years) for each UNAIDS region. The regional median proportions were used to calculate country-specific values that were summed to regional total size estimates. The number of people living with HIV by country was calculated by multiplying the most recently reported HIV prevalence (2018–2022) through Global AIDS Monitoring to each country's population size estimate. For countries that did not report HIV prevalence among sex workers in recent years, a regional median prevalence was applied. The PrEP target for sex workers was calculated by subtracting regional numbers of sex workers living with HIV from the total estimated number of sex workers in the region.

For all key populations, current PrEP coverage was estimated using nationally reported PrEP use for the specific key population (number of people who received any PrEP product at least once during the reporting period) divided by the size of the population that would benefit from PrEP use.

# Quality of population size estimates

The regional sections of this report include tables of the estimated size of key populations. The estimated size of key populations refers to reported values through Global AIDS Monitoring since 2018 only. A comprehensive review of the data was conducted during these reporting rounds, and therefore estimates should not be compared with data presented in previous UNAIDS reports. Submitted estimates are reviewed as they are reported and categorized for appropriate use. The categories are as follows:

- National population size estimate refers to estimates that have been empirically derived since 2018 using one of the following methods: multiplier, capture–recapture, mapping/enumeration, network scale-up method, population-based survey, or respondent-driven

sampling successive sampling. Estimates must be national or from a combination of multiple sites with a clear approach to extrapolating to a national estimate.

- Local population size estimate refers to estimates that have been empirically derived since 2018 using one of the previously mentioned methods, but only for subnational sites that are insufficient for national extrapolation.

- Insufficient data refers either to estimates derived from expert opinions, Delphi, wisdom of crowds, programmatic results or registry, regional benchmarks or unknown methods, or to estimates derived before 2018. Estimates may or may not be national.

## Subnational HIV estimates for sub-Saharan Africa

Subnational HIV estimates were generated using the Naomi model for 37 countries in sub-Saharan Africa and one in the Caribbean that had conducted one or more representative population-based serosurveys (see Table A2.4).

The Naomi model uses small area estimation to jointly model HIV prevalence and people living with HIV, antiretroviral therapy coverage and HIV incidence *(14)*. The model combines subnational-level data about multiple outcomes from several sources in a Bayesian statistical model. It uses national population-based survey data and antiretroviral therapy and antenatal clinic testing data to provide robust indicators of subnational HIV burden. It provides estimates and uncertainty ranges for several indicators (including HIV prevalence, people living with HIV, antiretroviral therapy coverage, HIV incidence and new infections) by sex, five-year age groups and subnational level.

The model produces estimates at three time points: the year of the most recent population-based survey, the year of the last round of HIV national estimates (2022), and short-term projections for HIV programme planning purposes. Subnational population estimates by sex and age group are sourced from consensus sources in each country and adjusted to match the populations used within Spectrum by sex and age group.

Cross-sectional estimates for HIV prevalence, antiretroviral therapy coverage and HIV incidence are produced at the midpoint of the most recent nationally representative household survey. For HIV prevalence, the model is calibrated to survey data on HIV prevalence by subnational level, sex and five-year age group from the most recent population-based survey (Demographic and Health Survey or Population-based HIV Impact Assessment). Since the survey sample size in each subnational area is relatively small, routinely reported data about HIV prevalence among pregnant women attending their first antenatal care visit, extracted from the national health information system, are used to improve estimates of the spatial pattern of HIV.

Antiretroviral therapy coverage by subnational area, age and sex is estimated from population-based survey data about the presence of antiretroviral biomarkers in survey respondents living with HIV. Routinely reported antiretroviral therapy coverage among pregnant women before their first antenatal care visit is used as a covariate for the spatial pattern of antiretroviral therapy coverage. The antiretroviral therapy coverage and HIV prevalence are calibrated so that the total number of people on antiretroviral therapy matches the report in the Spectrum national file.

A challenge for estimating treatment coverage for subnational areas is that people may access antiretroviral therapy services in a different district from their residence (e.g. if facilities are closer or perceived to provide better services). The model allows for a probability that people living with HIV access antiretroviral therapy in a neighbouring subnational area. The prior assumption was that most people living with HIV will access antiretroviral therapy in their area of residence, but this probability can vary based on subnational area data about the number of people receiving antiretroviral therapy compared with HIV prevalence, antiretroviral therapy coverage and population.

Direct estimates of HIV incidence are not available at the subnational level. Although some recent household surveys have measured HIV incidence at the national level based on biomarker measures for recent HIV infections, too few recent infections are observed in any district to make a robust estimate. Therefore, to estimate HIV incidence at the subnational level, the HIV transmission rate from Spectrum estimates is calculated and applied to small area estimates of HIV prevalence and antiretroviral therapy coverage in each subnational area. The sex and age distribution in each subnational area are based on incidence rate ratios from a country's national Spectrum file, applied to the population structure in each area.

The model projects from the most recent household survey to the current period by creating a one-step projection of the population to 2022. Population estimates are updated with official population estimates. The number of people living with HIV is projected forward based on survival estimates by province, sex and age group from Spectrum over the same period (which accounts for HIV disease progression and the effects of antiretroviral therapy coverage reducing AIDS-related mortality). Antiretroviral therapy coverage is updated based on the number of people on treatment in 2022 from service provision data.

**Table A2.4** Countries using the Naomi model to generate subnational estimates

| NO. | COUNTRY |
|---|---|
| 1 | Angola |
| 2 | Benin |
| 3 | Botswana |
| 4 | Burkina Faso |
| 5 | Burundi |
| 6 | Cameroon |
| 7 | Central African Republic |
| 8 | Chad |
| 9 | Congo |
| 10 | Côte d'Ivoire |
| 11 | Democratic Republic of the Congo |
| 12 | Equatorial Guinea |
| 13 | Eswatini |
| 14 | Ethiopia |
| 15 | Gabon |
| 16 | Gambia |
| 17 | Ghana |
| 18 | Guinea |
| 19 | Guinea-Bissau |
| 20 | Haiti |
| 21 | Kenya |
| 22 | Lesotho |
| 23 | Liberia |
| 24 | Malawi |
| 25 | Mali |
| 26 | Mozambique |
| 27 | Namibia |
| 28 | Niger |
| 29 | Rwanda |
| 30 | Sao Tome and Principe |
| 31 | Senegal |
| 32 | Sierra Leone |
| 33 | South Africa |
| 34 | United Republic of Tanzania |
| 35 | Togo |
| 36 | Uganda |
| 37 | Zambia |
| 38 | Zimbabwe |

# Estimates of HIV risk group proportions for adolescent girls and young women

The occurrence of HIV risk behaviours and associated HIV incidence at subnational levels among adolescent girls and young women was estimated for 30 countries in sub-Saharan Africa *(15)*. Geospatially referenced national household survey data from 1999–2019 across 30 countries in sub-Saharan Africa were analysed. Female survey respondents aged 15–24 years were classified into four risk groups (not sexually active, cohabiting, non-regular or multiple partner(s), and female sex workers) based on reported sexual behaviours in a Bayesian spatiotemporal multinomial regression model to estimate the proportion of adolescent girls and young women in each risk group stratified by district, year and five-year age group. Estimates of HIV prevalence and incidence at subnational levels from the Naomi model were used along with incidence rate ratios for each risk group to estimate the number of new infections and incidence rate for each district, age and risk population.

# Laws and policies scorecards

The regional laws and policies scorecards were constructed based on validated data reported by countries through the National Commitments and Policy Instrument, a component of Global AIDS Monitoring *(1)*, between 2017 and 2022 and complementary sources, including national legal and policy documents and other global databases.

Data submitted by countries through the National Commitments and Policy Instrument are reviewed by UNAIDS. During this review process, information reported are compared with available primary sources and other related publicly available information. UNAIDS also liaises with national Global AIDS Monitoring focal points to request clarification or revise data submitted through the tool.

Data reported through the National Commitments and Policy Instrument have been complemented with data available from other sources, including primary sources and other global databases.

# UNAIDS regional definitions

The regional definitions for Asia and the Pacific and the Middle East and North Africa changed in 2022, with the Islamic Republic of Iran being moved from the Middle East and North Africa to Asia and the Pacific. All presentations of data, including historic trends, now use this new regional definition.

| ASIA AND THE PACIFIC |
| --- |
| Afghanistan |
| Australia |
| Bangladesh |
| Bhutan |
| Brunei Darussalam |
| Cambodia |
| China |
| Democratic People's Republic of Korea |
| Fiji |
| India |
| Indonesia |
| Iran (Islamic Republic of) |
| Japan |
| Lao People's Democratic Republic |
| Malaysia |
| Maldives |
| Mongolia |
| Myanmar |
| Nepal |
| New Zealand |
| Pakistan |
| Papua New Guinea |
| Philippines |
| Republic of Korea |
| Singapore |
| Sri Lanka |
| Thailand |
| Timor-Leste |
| Viet Nam |

| CARIBBEAN |
| --- |
| Bahamas |
| Barbados |
| Belize |
| Cuba |
| Dominican Republic |
| Guyana |
| Haiti |
| Jamaica |
| Suriname |
| Trinidad and Tobago |

| EASTERN AND SOUTHERN AFRICA |
| --- |
| Angola |
| Botswana |
| Comoros |
| Eritrea |
| Eswatini |
| Ethiopia |
| Kenya |
| Lesotho |
| Madagascar |
| Malawi |
| Mauritius |
| Mozambique |
| Namibia |
| Rwanda |
| South Africa |
| South Sudan |
| Uganda |
| United Republic of Tanzania |
| Zambia |
| Zimbabwe |

| EASTERN EUROPE AND CENTRAL ASIA |
| --- |
| Albania |
| Armenia |
| Azerbaijan |
| Belarus |
| Bosnia and Herzegovina |
| Georgia |
| Kazakhstan |
| Kyrgyzstan |
| Montenegro |
| North Macedonia |
| Republic of Moldova |
| Russian Federation |
| Tajikistan |
| Turkmenistan |
| Ukraine |
| Uzbekistan |

| LATIN AMERICA |
| --- |
| Argentina |
| Bolivia (Plurinational State of) |
| Brazil |
| Chile |
| Colombia |
| Costa Rica |
| Ecuador |
| El Salvador |
| Guatemala |
| Honduras |
| Mexico |
| Nicaragua |
| Panama |
| Paraguay |
| Peru |
| Uruguay |
| Venezuela (Bolivarian Republic of) |

| MIDDLE EAST AND NORTH AFRICA |
|---|
| Algeria |
| Bahrain |
| Djibouti |
| Egypt |
| Iraq |
| Jordan |
| Kuwait |
| Lebanon |
| Libya |
| Morocco |
| Oman |
| Qatar |
| Saudi Arabia |
| Somalia |
| Sudan |
| Syrian Arab Republic |
| Tunisia |
| United Arab Emirates |
| Yemen |

| WESTERN AND CENTRAL AFRICA |
|---|
| Benin |
| Burkina Faso |
| Burundi |
| Cabo Verde |
| Cameroon |
| Central African Republic |
| Chad |
| Congo |
| Côte d'Ivoire |
| Democratic Republic of the Congo |
| Equatorial Guinea |
| Gabon |
| Gambia |
| Ghana |
| Guinea |
| Guinea-Bissau |
| Liberia |
| Mali |
| Mauritania |
| Niger |
| Nigeria |
| Sao Tome and Principe |
| Senegal |
| Sierra Leone |
| Togo |

| WESTERN AND CENTRAL EUROPE AND NORTH AMERICA |
|---|
| Austria |
| Belgium |
| Bulgaria |
| Canada |
| Croatia |
| Cyprus |
| Czechia |
| Denmark |
| Estonia |
| Finland |
| France |
| Germany |
| Greece |
| Hungary |
| Iceland |
| Ireland |
| Israel |
| Italy |
| Latvia |
| Lithuania |
| Luxembourg |
| Malta |
| Netherlands |
| Norway |
| Poland |
| Portugal |
| Romania |
| Serbia |
| Slovakia |
| Slovenia |
| Spain |
| Sweden |
| Switzerland |
| Turkey |
| United Kingdom of Great Britain and Northern Ireland |
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