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of the study. The first author (JML) was involved in the design of the study, data collection, data analysis and the writing of the paper. The second author (JL) was involved in the design of the study, data collection, data analysis and the writing of the paper. The third author (JG) was involved in the design of the study, data collection, data analysis and the writing of the paper. The fourth author (JL) was involved in the design of the study, data collection, data analysis and the writing of the paper. The fifth author (JL) was involved in the design of the study, data collection, data analysis and the writing of the paper.

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Appendix

The following table provides a summary of the data collected during the study. The data are presented in a table format, with the first column representing the independent variable (Group Size) and the second column representing the dependent variable (Performance).

Group Size	Performance
2	0.85
3	0.75
4	0.65
5	0.55
6	0.45
7	0.35
8	0.25
9	0.15
10	0.05

The data show a clear negative relationship between group size and performance. As the number of group members increases, the performance of the group decreases. This is consistent with the findings of previous research on group size and performance.

The following table provides a summary of the data collected during the study. The data are presented in a table format, with the first column representing the independent variable (Group Size) and the second column representing the dependent variable (Performance).

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ENORMOUS GAINS, PERSISTENT CHALLENGES

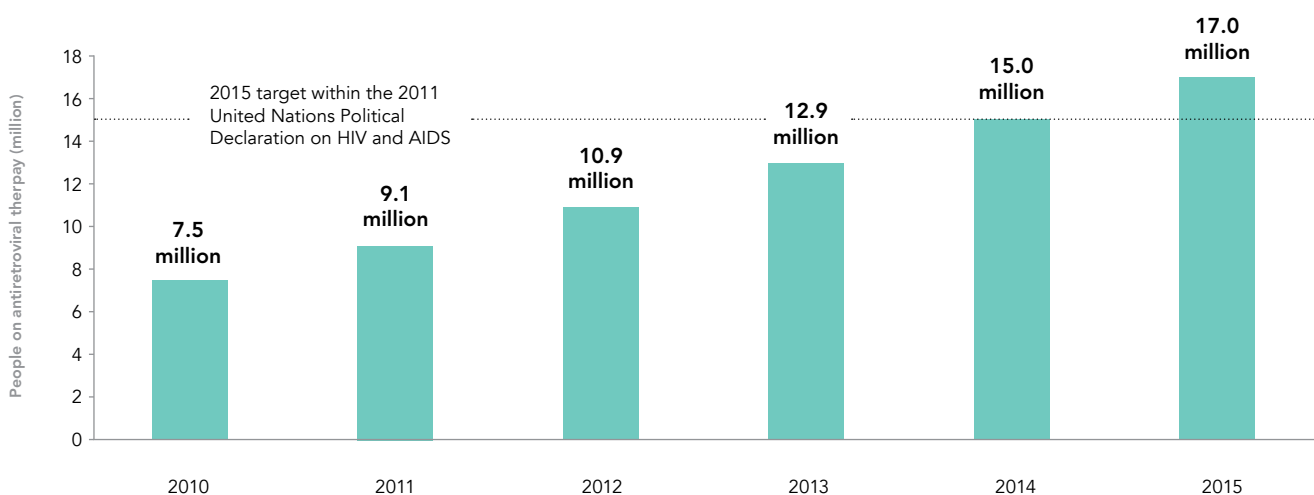
The world has committed to ending the AIDS epidemic by 2030. How to reach this bold target within the Sustainable Development Goals is the central question facing the United Nations General Assembly High-Level Meeting on Ending AIDS, to be held from 8 to 10 June 2016. The extraordinary accomplishments of the last 15 years have inspired global confidence that this target can be achieved.

UNAIDS recommends a Fast-Track approach: substantially increasing and front-loading investment over the next five years to accelerate scale-up and establish the momentum required to overcome within 15 years one of the greatest public health challenges in this generation.

The latest UNAIDS data, covering 160 countries, demonstrate both the enormous gains already made and what can be achieved in the coming years through a Fast-Track approach. In just the last two years the number of people living with HIV on antiretroviral therapy has increased by about a third, reaching 17.0 million people—2 million more than the 15 million by 2015 target set by the United Nations General Assembly in 2011. Since the first global treatment target was set in 2003, annual AIDS-related deaths have decreased by 43%. In the world's most affected region, eastern and southern Africa, the number of people on treatment has more than doubled since 2010, reaching nearly 10.3 million people. AIDS-related deaths in the region have decreased by 36% since 2010.

However, huge challenges lie ahead. In 2015 there were 2.1 million [1.8 million–2.4 million] new HIV infections worldwide, adding up to a total of 36.7 million [34.0 million–39.8 million] people living with HIV.

Number of people living with HIV on antiretroviral therapy, global, 2010–2015



Sources: Global AIDS Response Progress Reporting (GARPR) 2016; UNAIDS 2016 estimates.

HIV epidemic and response estimates, global and by region, 2010 and 2015

	People living with HIV (all ages)		New HIV infections (all ages)	
	2010	2015	2010	2015
Global	33.3 million [30.9 million–36.1 million]	36.7 million [34.0 million–39.8 million]	2.2 million [2.0 million–2.5 million]	2.1 million [1.8 million–2.4 million]
Asia and Pacific	4.7 million [4.1 million–5.5 million]	5.1 million [4.4 million–5.8 million]	310 000 [270 000–360 000]	290 000 [230 000–370 000]
Eastern and southern Africa	17.2 million [16.1 million–18.5 million]	19.1 million [17.7 million–20.5 million]	1.1 million [1.0 million–1.2 million]	960 000 [830 000–1.1 million]
Eastern Europe and central Asia	1.0 million [950 000–1.1 million]	1.5 million [1.4 million–1.7 million]	120 000 [110 000–130 000]	190 000 [170 000–200 000]
Latin America and the Caribbean	1.8 million [1.5 million–2.1 million]	2.0 million [1.7 million–2.3 million]	100 000 [86 000–120 000]	100 000 [86 000–120 000]
Middle East and North Africa	190 000 [150 000–240 000]	230 000 [160 000–330 000]	20 000 [15 000–29 000]	21 000 [12 000–37 000]
Western and central Africa	6.3 million [5.2 million–7.7 million]	6.5 million [5.3 million–7.8 million]	450 000 [350 000–560 000]	410 000 [310 000–530 000]
Western and central Europe and North America	2.1 million [1.9 million–2.3 million]	2.4 million [2.2 million–2.7 million]	92 000 [89 000–97 000]	91 000 [89 000–97 000]

	People living with HIV on antiretroviral treatment (all ages)		AIDS-related deaths (all ages)	
	2010	2015*	2010	2015
Global	7 501 100	17 025 900	1.5 million [1.3 million–1.7 million]	1.1 million [940 000–1.3 million]
Asia and Pacific	907 600	2 071 900	230 000 [200 000–270 000]	180 000 [150 000–210 000]
Eastern and southern Africa	4 087 500	10 252 400	760 000 [670 000–870 000]	470 000 [390 000–560 000]
Eastern Europe and central Asia	112 100	321 800	38 000 [33 000–45 000]	47 000 [39 000–55 000]
Latin America and the Caribbean	568 400	1 091 900	60 000 [51 000–70 000]	50 000 [41 000–59 000]
Middle East and North Africa	13 600	38 200	9 500 [7 400–12 000]	12 000 [8 700–16 000]
Western and central Africa	905 700	1 830 700	370 000 [290 000–470 000]	330 000 [250 000–430 000]
Western and central Europe and North America	906 200	1 418 900	29 000 [27 000–31 000]	22 000 [20 000–24 000]

* Difference in global and regional sums due to rounding.

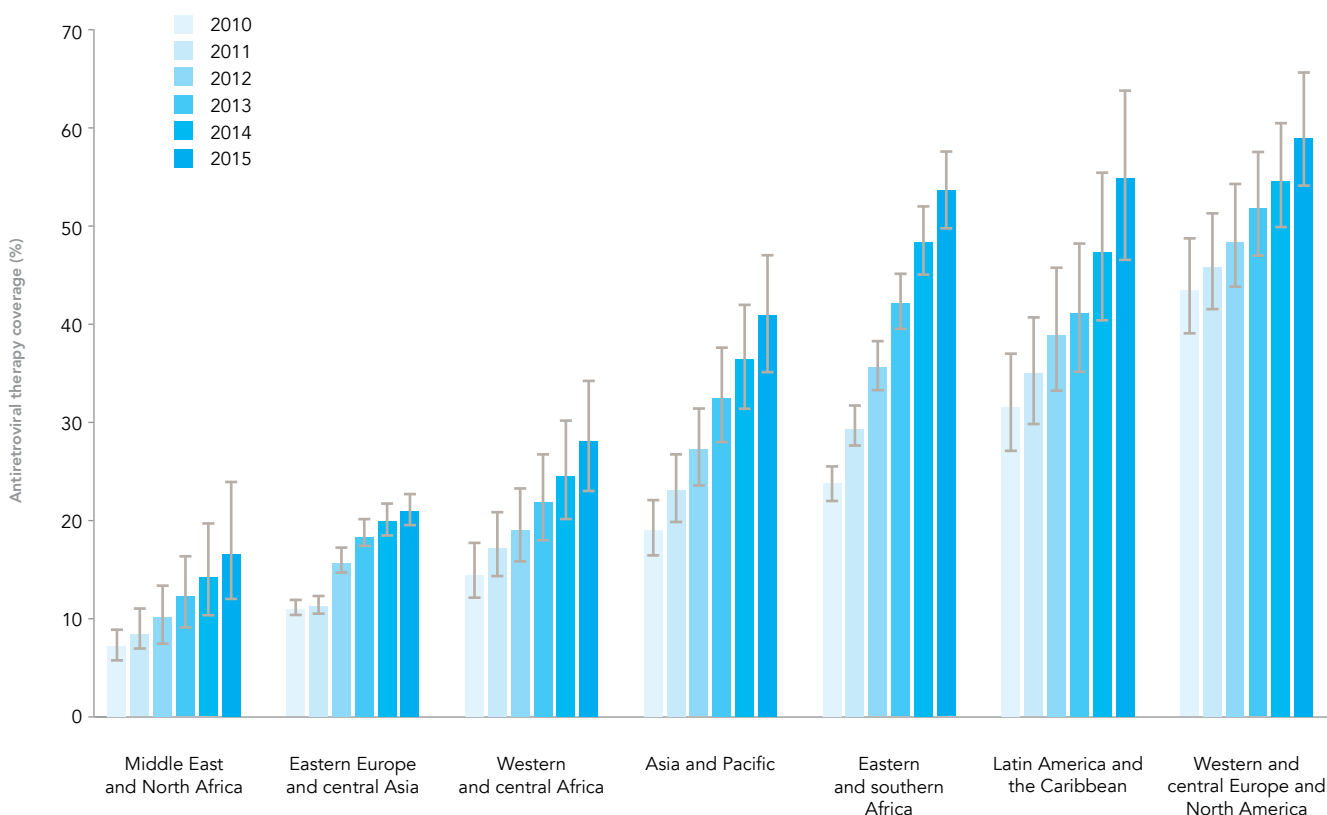
Sources: GARPR 2016; UNAIDS 2016 estimates.

EXPANSION OF LIFE-SAVING TREATMENT

Scale-up of antiretroviral therapy is on a Fast-Track trajectory that has surpassed expectations. Global coverage of antiretroviral therapy reached 46% [43–50%] at the end of 2015. Gains were greatest in the world’s most affected region, eastern and southern Africa. Coverage increased from 24% [22–25%] in 2010 to 54% [50–58%] in 2015, reaching a regional total of 10.3 million people.

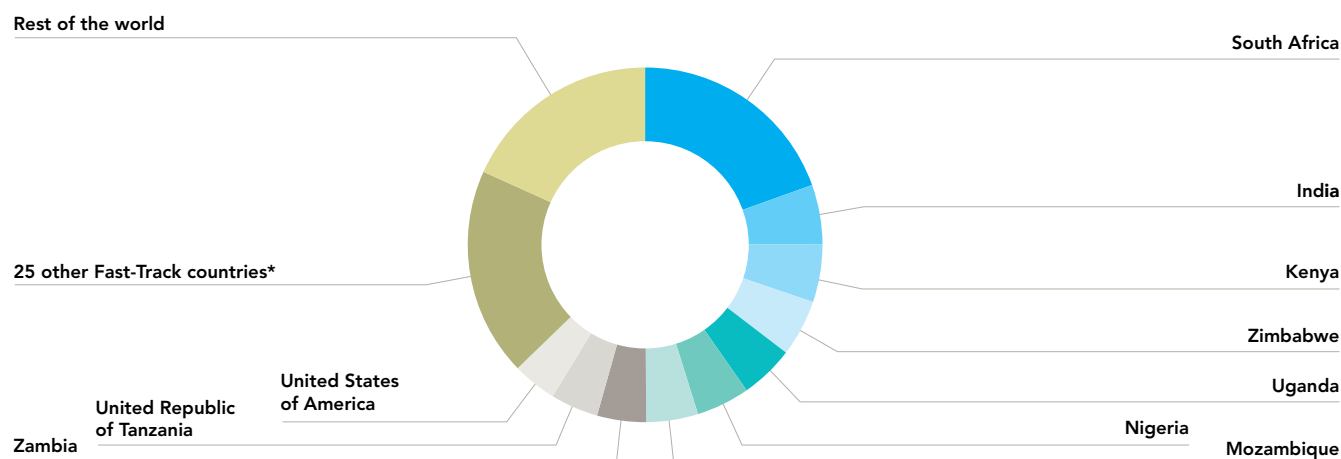
South Africa alone had nearly 3.4 million people on treatment, more than any other country in the world. After South Africa, Kenya has the largest treatment programme in Africa, with nearly 900 000 people on treatment at the end of 2015. Botswana, Eritrea, Kenya, Malawi, Mozambique, Rwanda, South Africa, Swaziland, Uganda, the United Republic of Tanzania, Zambia and Zimbabwe all increased treatment coverage by more than 25 percentage points between 2010 and 2015.

Antiretroviral therapy coverage among people living with HIV, by region, 2010–2015



Sources: GARPR 2016; UNAIDS 2016 estimates.

Distribution of antiretroviral therapy, by country, 2015



* The Fast-Track countries include the 10 displayed on this chart, plus Angola, Botswana, Brazil, Cameroon, Chad, China, Côte d'Ivoire, Democratic Republic of the Congo, Ethiopia, Ghana, Haiti, Indonesia, Iran (Islamic Republic of), Jamaica, Lesotho, Malawi, Mali, Myanmar, Namibia, Pakistan, South Sudan, Swaziland, Russian Federation, Ukraine and Viet Nam.

Sources: GARPR 2016; UNAIDS 2016 estimates.

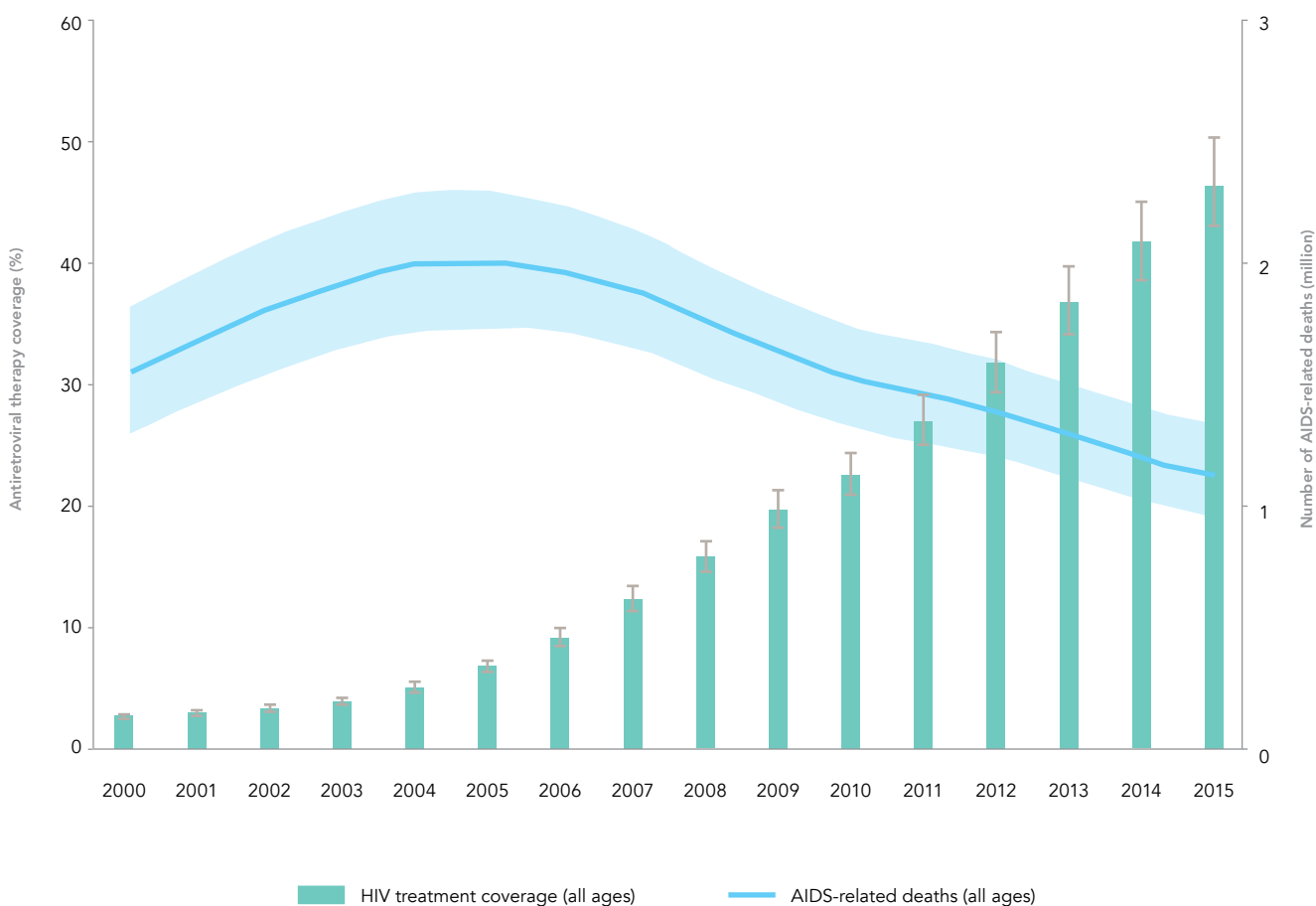
Treatment coverage in Latin American and the Caribbean reached 55% [47–64%] in 2015. In the Asia and Pacific region, coverage more than doubled, from 19% [17–22%] in 2010 to 41% [35–47%] in 2015. Western and central Africa and the Middle East and North Africa also made important gains but achieved lower levels of coverage in 2015, 28% [23–34%] and 17% [12–24%], respectively. In eastern Europe and central Asia, coverage increased by just a few percentage points in recent years to 21% [20–23%]—about one in five people living with HIV in the region.

The gains in treatment are largely responsible for a 26% decline in AIDS-related deaths globally since 2010, from an estimated 1.5 million [1.3 million–1.7 million] in 2010 to 1.1 million [940 000 –1.3 million] in 2015.

The reduction in deaths since 2010 has been greater among adult women (33% decrease) compared with adult men (15% decrease), reflecting higher treatment coverage among women than men, 52% [48–57%] and 41% [33–49%], respectively.

The gender gap for treatment among adults highlights the impact of gender norms that delay initiation of treatment among men, reduce treatment adherence, blunt the preventive effects of treatment, and lead to men accounting for 58% of adult AIDS-related deaths.

Antiretroviral therapy coverage and number of AIDS-related deaths, global, 2000–2015



Sources: GARPR 2016; UNAIDS 2016 estimates.

The Fast-Track approach to HIV treatment is working. Global consensus and leadership have driven greater investment of financial and human capital, and mounting clinical experience and research, improved treatment regimens and diagnostics and reductions in the price of medicines have created gains in efficiency and effectiveness. The continuing momentum reinforces the determination to achieve the 90–90–90 treatment target by 2020, whereby 90% of people living with HIV know their HIV status, 90% of people who know their HIV-positive status are accessing treatment and 90% of people on treatment have suppressed viral loads.

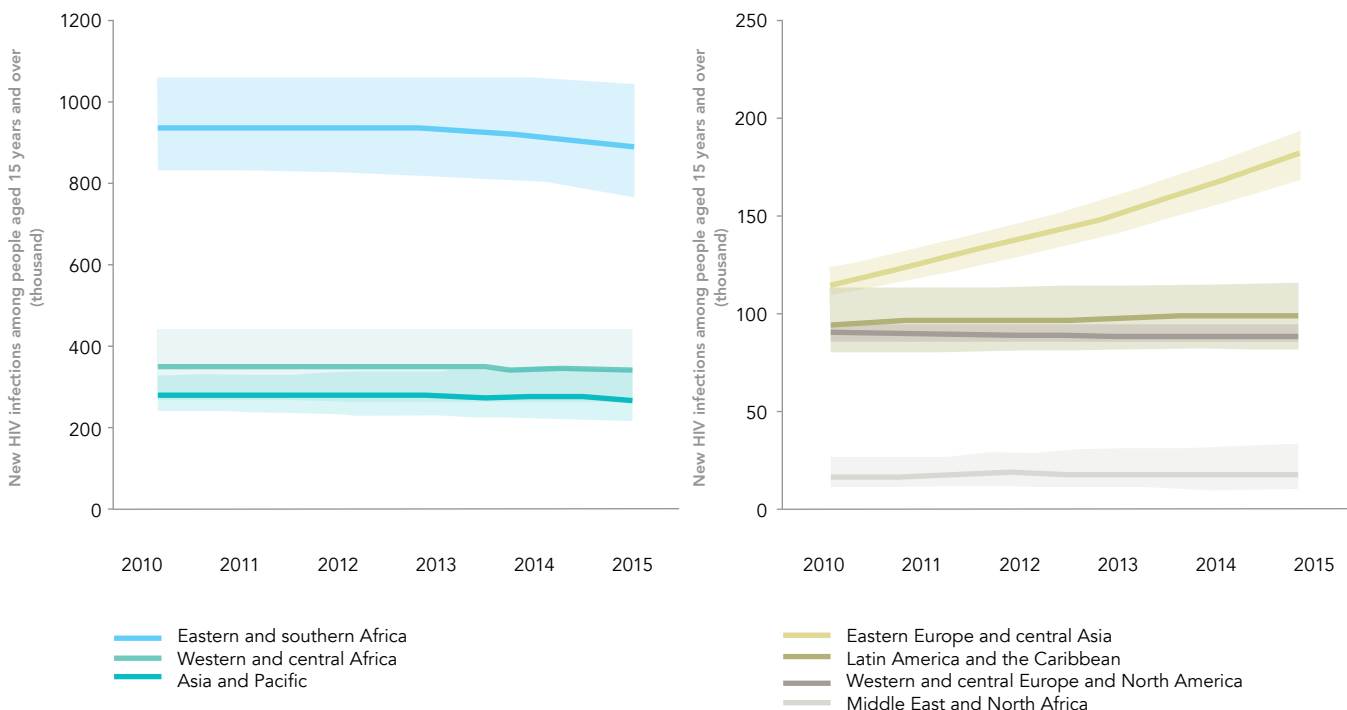
REINVIGORATION OF HIV PREVENTION NEEDED TO QUICKEN THE DECLINE IN ADULT INFECTIONS

Declines in new HIV infections among adults have slowed alarmingly in recent years, with the estimated annual number of new infections among adults remaining nearly static at about 1.9 million [1.7 million–2.2 million] in 2015. Beneath this global figure lie multiple disparities—across regions, within countries, between men and women and young and old, and among specific populations being left behind. These disparities must be addressed in order to achieve the reductions required to end the AIDS epidemic as a public health threat by 2030.

Regional disparities

The largest reduction in new adult HIV infections occurred in eastern and southern Africa. There were about 40 000 fewer new adult HIV infections in the region in 2015 than in 2010, a 4% decline. More gradual declines were achieved in the Asia and Pacific region and western and central Africa. Rates of new adult HIV infections were relatively static in Latin America and the Caribbean, western and central Europe, North America and the Middle East and North Africa, while the annual numbers of new HIV infections in eastern Europe and central Asia increased by 57%.

New HIV infections among people aged 15 years and over, by region, 2010–2015

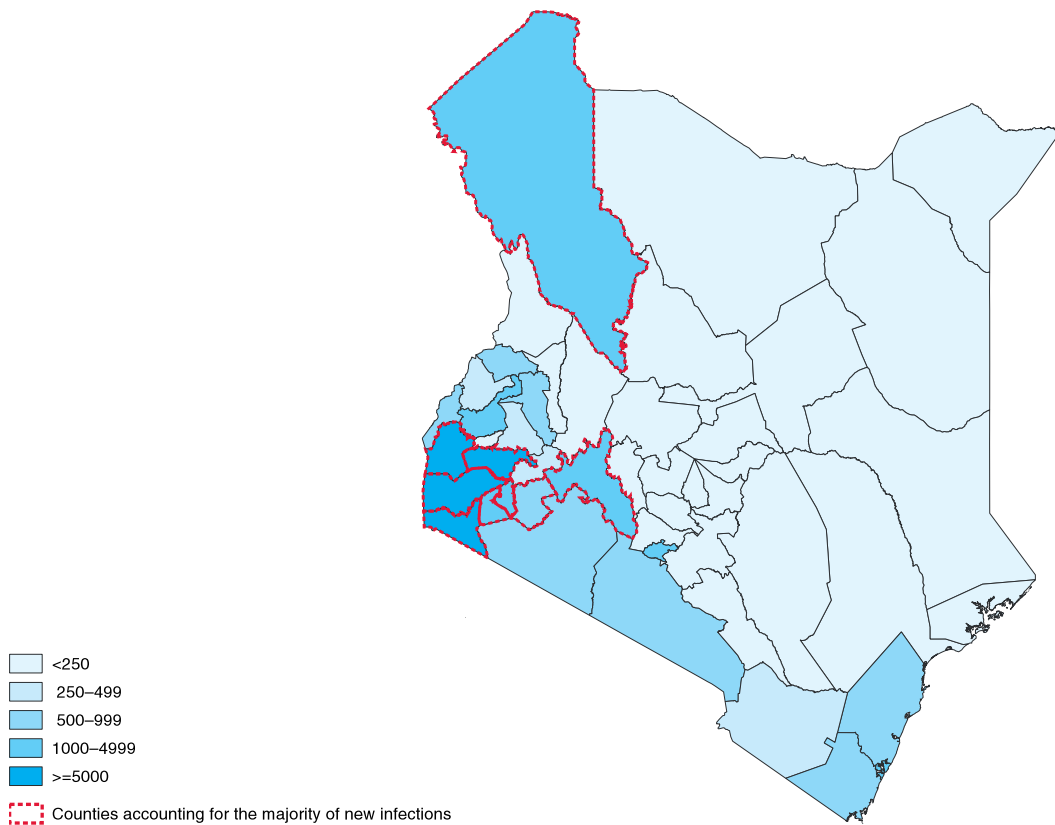


Source: UNAIDS 2016 estimates.

Key locations within countries

Complex and varied social, structural and economic dynamics within countries account for the uneven geographical distribution of HIV. In many countries, HIV prevalence is higher in cities, where the vibrancy, stress and anonymity of urban life, and its bustle of encounters and interactions, provide increased opportunities for behaviours and sexual networking that may increase the risk of HIV infection. Increased efforts to collect and analyse subnational data are revealing where HIV infections are occurring and where there are gaps in the provision of HIV services. In Kenya, for example, an analysis in 2014 found that 65% of new HIV infections occurred in just 9 of the country's 47 counties (1). This analysis contributed to a national HIV prevention "road map" that defines evidence-informed biomedical and structural interventions and targets them to specific populations and geographical zones. The Kenya AIDS Strategic Framework aims to reduce annual new HIV infections among adults by 75% by 2019.

Estimated new HIV infections by county, Kenya, 2014



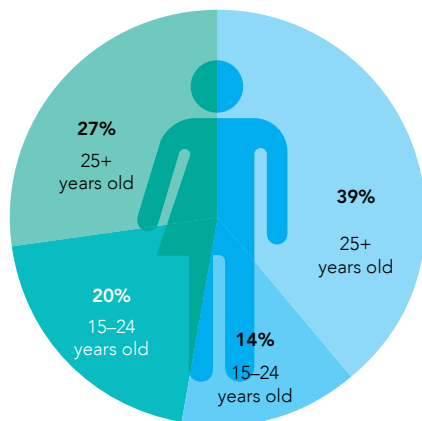
Sources: UNAIDS 2015 estimates; Kenya Ministry of Health.

Advancing the agenda of adolescent girls and young women

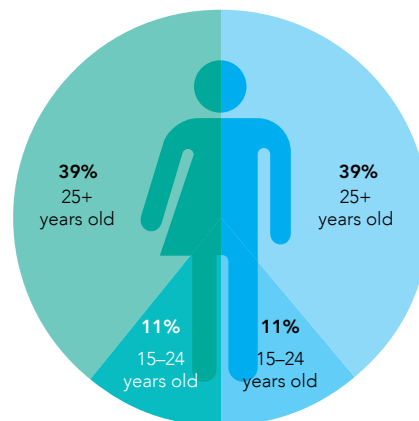
Adolescent girls and young women aged 15–24 years are at particularly high risk of HIV infection, accounting for 20% of new HIV infections among adults globally in 2015, despite accounting for just 11% of the adult population. In geographical areas with higher HIV prevalence, the gender imbalance is more pronounced. In sub-Saharan Africa, adolescent girls and young women accounted for 25% of new HIV infections among adults, and women accounted for 56% of new HIV infections among adults. Harmful gender norms and inequalities, insufficient access to education and sexual and reproductive health services, poverty, food insecurity and violence, are at the root of the increased HIV risk of young women and adolescent girls.

Distribution of new adult HIV infections and population by age and sex, global and in sub-Saharan Africa, 2015

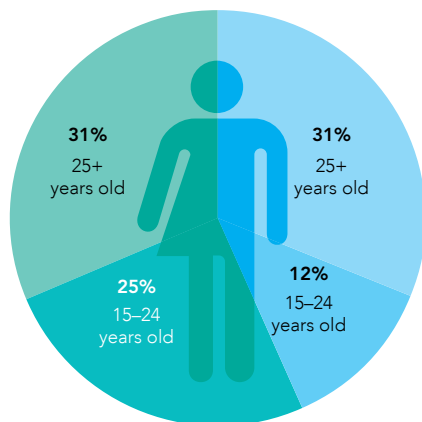
NEW HIV INFECTIONS AMONG ADULTS, BY AGE AND SEX, GLOBAL, 2015



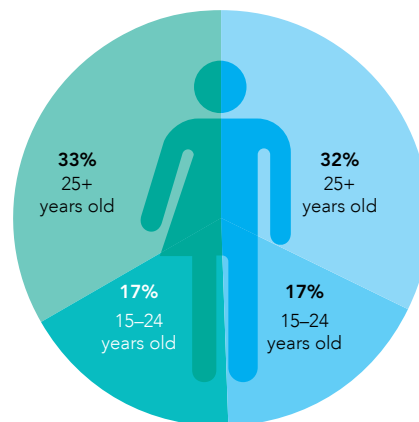
ADULT POPULATION, BY AGE AND SEX, GLOBAL, 2015



NEW HIV INFECTIONS AMONG ADULTS, BY AGE AND SEX, SUB-SAHARAN AFRICA, 2015



ADULT POPULATION, BY AGE AND SEX, SUB-SAHARAN AFRICA, 2015

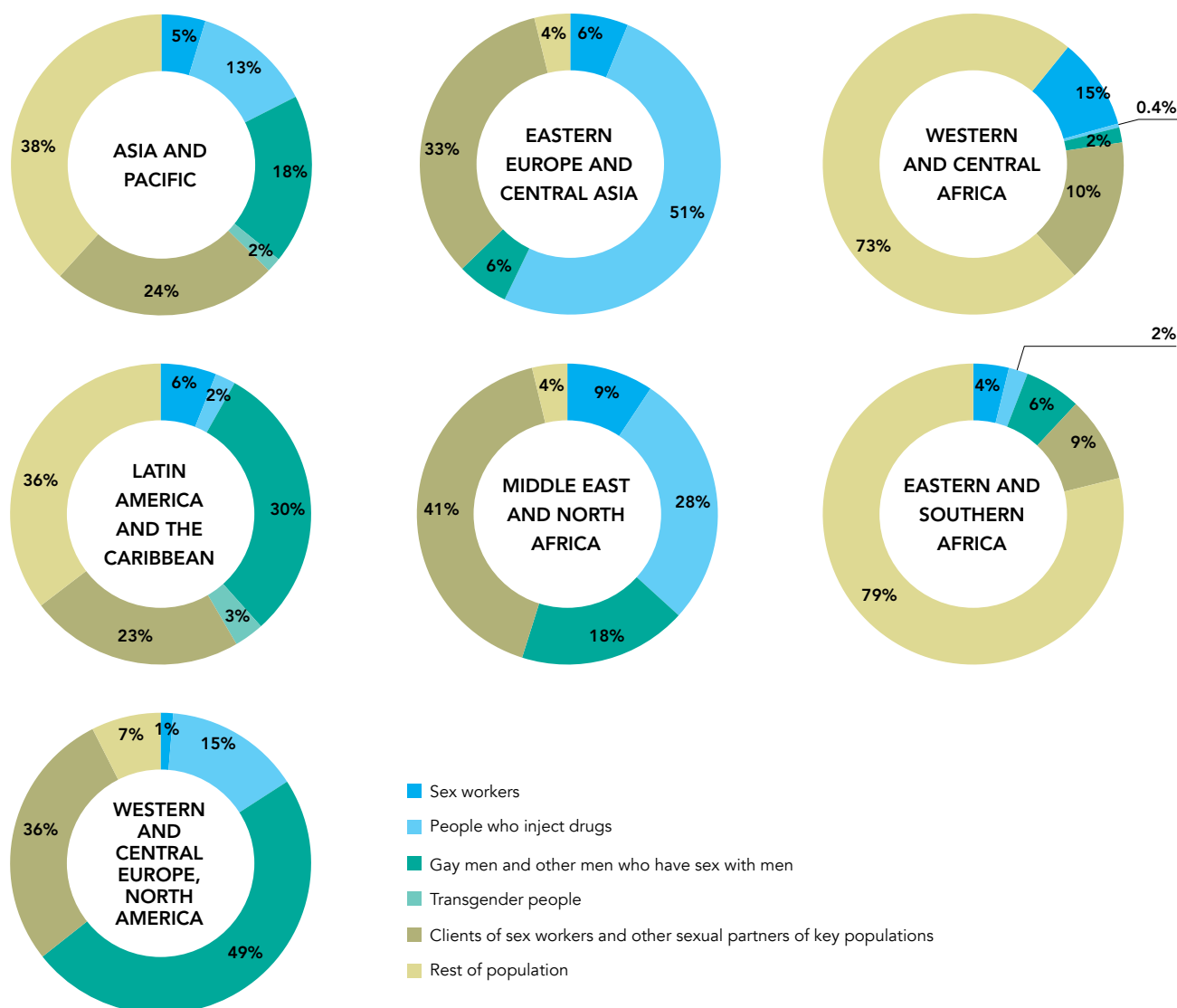


Source: UNAIDS 2016 estimates.

Key populations are being left behind

Key populations at increased risk of HIV infection include sex workers, people who inject drugs, transgender people, prisoners and gay men and other men who have sex with men. Reinvigorating HIV prevention requires additional focus on providing key populations with tools such as condoms, pre-exposure prophylaxis and sterile needles and syringes. However, the design and delivery of HIV prevention services are limited by a reluctance to reach out to key populations. In many countries, they

Distribution of new HIV infections among population groups, by region, 2014



Source: UNAIDS special analysis, 2016.

Methodological note: Estimated numbers of new HIV infections by key population were compiled from country Spectrum files submitted in 2015 to UNAIDS (2014 data), available modes-of-transmission studies and additional sources of data drawn from GARPR reports. Where data were lacking, regional medians were calculated from available data and applied to countries' populations.

are pushed to the fringes of society by stigma and the criminalization of same-sex relationships, drug use and, sex work. This marginalization limits their access to HIV services.

Analysis of data available to UNAIDS suggests that more than 90% of new HIV infections in central Asia, Europe, North America, the Middle East and North Africa in 2014 were among people from key populations and their sexual partners. In the Asia and Pacific region, Latin America and the Caribbean, people from key populations and their sexual partners accounted for nearly two thirds of new infections. In sub-Saharan Africa, key populations accounted for more than 20% of new infections, and HIV prevalence among these populations is often extremely high. For example, in South Africa, surveillance data published in 2015 estimated HIV prevalence among sex workers was 71.8% in Johannesburg, 39.7% in Cape Town and 53.5% in Durban (2).

These data also show that the distribution of new HIV infections among key populations varies by region. People who inject drugs accounted for 51% of HIV infections in eastern Europe and central Asia and 13% of new HIV infections in Asia and the Pacific in 2014. Gay men and other men who have sex with men accounted for 30% of new HIV infections in Latin America, 49% of new infections in western and central Europe and North America and 18% of new infections in Asia and the Pacific. This underscores the urgent need to ensure that key populations are fully included in AIDS responses and services are made available to them. Data show that when services are made available within an environment free of stigma and discrimination, new HIV infections have declined significantly.

ZERO DISCRIMINATION

Ignorance and misunderstanding continue to undermine efforts to end AIDS. In the worst cases, discriminatory attitudes and behaviour are facilitated by punitive laws and policies. In 2016, 72 countries had laws allowing specifically for HIV criminalization (3). Between 1 April 2013 and 30 September 2015, four countries in sub-Saharan Africa passed new HIV criminalization laws: Botswana, Côte d'Ivoire, Nigeria and Uganda (3).

Data from population-based surveys suggest that discriminatory attitudes towards people living with HIV have declined slowly, but progress has been uneven across countries and between women and men (4). In approximately half of countries with available data between 2009 and 2014, over 50% of women and men aged 15–49 years reported they would not buy vegetables from a shopkeeper living with HIV (4).

The People Living with HIV Stigma Index measures stigma and discrimination reported by people living with HIV. Stigma Index surveys have been conducted in more than 65 countries. In 22 of these countries, more than 10% of people living with HIV reported they had been denied health care, and more than 1 in 10 people living with HIV

reported they had been refused employment or a work opportunity because of their HIV status in the 12 months before the survey (5). In 30 countries where surveys were conducted, 1 in 10 people living with HIV reported they had lost a job or another source of income because of their HIV status (5).¹

ENDING AIDS REQUIRES GLOBAL COMMITMENT TO BOLD TARGETS FOR 2020

The progress made in reaching people with HIV treatment and in reducing AIDS-related deaths demonstrates the effectiveness of a Fast-Track approach. These AIDS-response successes show that exceptional results can be achieved when there is broad leadership and consistent financial commitment.

The job is still only half done, however. Approximately 54% [50–57%] of people living with HIV are in need of treatment, many of whom do not know their HIV status. A growing number of countries have committed to achieving the 90–90–90 treatment target by 2020. This coalition of the brave needs to expand to a global commitment, and that commitment must translate quickly into even greater innovation and investment.

A similar foundation of vision and leadership is required to reinvigorate HIV prevention. An array of effective HIV prevention tools is available, including condoms, harm reduction, voluntary medical male circumcision, pre-exposure prophylaxis, cash transfers for girls and structural approaches that promote gender equality and access to secondary education. Community- and peer-based approaches to sharing prevention tools are proven effective.

The key is to combine these tools into combination HIV prevention packages that address the specific needs of populations that are being left behind, and to establish enabling environments that allow these populations to access HIV, health and social services without fear of violence, arrest or persecution. Specific targets on reaching the people at greatest need of these packages are urgently required.

The 2030 Agenda for Sustainable Development is underpinned by the concepts of inclusion, equity and social justice. Consistently applying these concepts to the AIDS response is critical to a Fast-Track approach. Compared with the 2014 coverage of HIV services, a comprehensive Fast-Track approach in line with the UNAIDS 2016–2021 Strategy will avert an additional 17.6 million HIV infections and 10.8 million AIDS-related deaths between 2016 and 2030.

An opportunity to improve the lives of so many people must not be missed.

¹ Due to sampling challenges, the data from People Living with HIV Stigma Index surveys are not representative of all people living with HIV in a country.

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