

POLICY BRIEFS ON

ECONOMIC IMPACT OF HIV



9.

DISEASE BURDEN ACROSS POPULATION SUB-GROUPS

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DISEASE BURDEN ACROSS POPULATION SUB-GROUPS

KEY POINTS

- The population living with HIV is ageing – owing to the scaling-up of treatment and hence longer survival (especially for women), success in reducing mother-to-child transmission of HIV, and (in most countries) a decline in HIV incidence.
- HIV prevalence has been higher among women, mainly because of higher incidence. The share of women among people living with HIV is increasing in the region, driven by higher treatment coverage and hence longer survival among women.
- Within countries, the epidemic is often distributed unevenly. Understanding the distribution of HIV and of gaps in service coverage is crucial for devising effective and cost-effective prevention and treatment strategies.
- HIV prevalence and transmission are higher among key populations (such as sex workers, people who inject drugs, and men who have sex with men). HIV prevention measures targeting key populations are among the most effective HIV prevention interventions, but their effectiveness and reach is often hampered by stigma and criminalisation.

Prevalence and incidence of HIV are distributed highly unevenly across the population. To identify the most effective and cost-effective approaches to extending treatment access and HIV prevention efforts, it is essential to understand this distribution. In which age groups is HIV transmission most concentrated, and how does the effectiveness of

HIV prevention interventions differ by age? Where are the “hotspots” where the epidemic is most intense, and which areas feature the most pervasive gaps in service coverage? And what is the role of “key populations” at high risk of contracting HIV, who often also face barriers in access to effective HIV services?

Changing age structure of population living with HIV

The age structure of the population living with HIV is changing, owing to longer survival and a shift in HIV incidence to older age brackets.

The composition of the population living with HIV is changing, with implications for the needs of people living with HIV (PLHIV) and HIV prevention. The best-known aspect

is the “greying of AIDS” – the ageing of the population living with HIV owing to longer survival, following the scale-up of treatment. As a consequence, the share of people at ages 50 or higher among PLHIV is increasing, e.g., in sub-Saharan Africa from 10 percent in 2008 to 17 percent in 2018 (Figure 9.1), and this share continues to increase at a rate of about one percentage point annually.

A less well-known aspect of the changing composition of the population living with HIV is the declining share of young adults. This trend is not only a mirror image of the longer survival, but also reflects two factors specific to the young population.

First, the “youth bulge” is receding. The “youth bulge” occurred because of the demographic transition, as steep increases in child survival and ongoing high birth rates

result in large cohorts of young people. However, birth rates (number of births/total population) in countries facing high HIV prevalence have been declining for a long time, e.g., from 4.7 percent in 1980 to 4.2 percent in 2000 and 3.5 percent in 2019 for sub-Saharan Africa overall. Because of these developments, the young population, and the cohorts becoming sexually active and susceptible to sexual transmission of HIV, now grow more slowly than the population overall.

Figure 9.1. State of HIV across sub-Saharan Africa, by sex and age group, 1990–2019

Figure 9.1.1: Women living with HIV

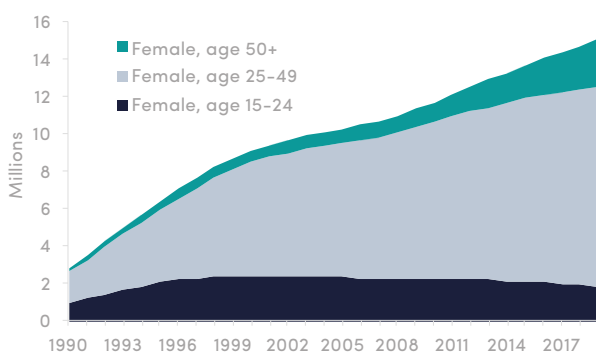


Figure 9.1.2: Men living with HIV

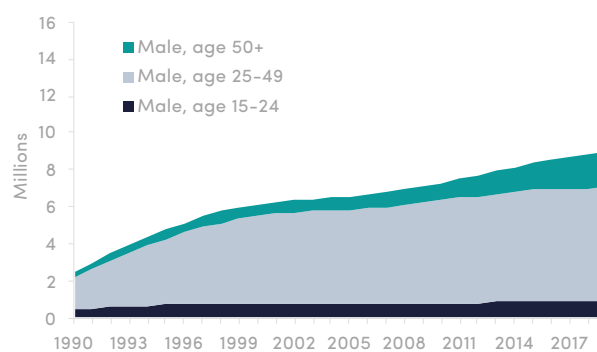


Figure 9.1.3: New HIV infections among women

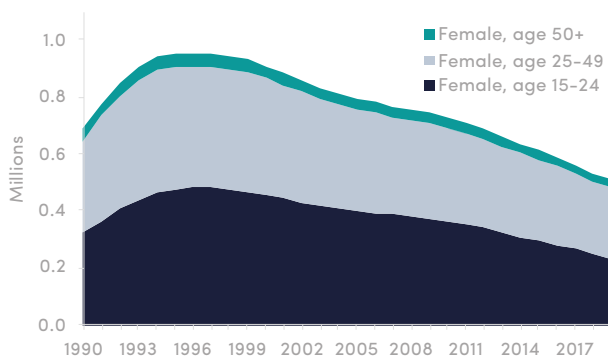
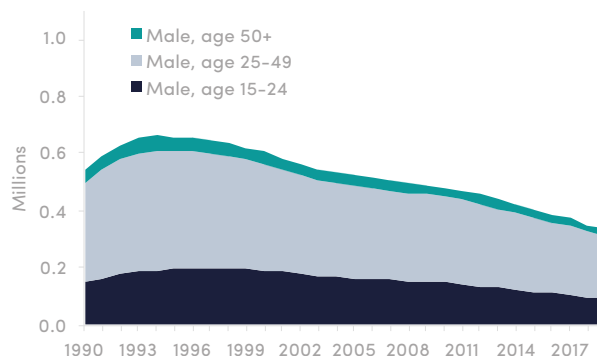


Figure 9.1.4: New HIV infections among men



Source: UNAIDS (2020).

Second, while ongoing high HIV transmission rates among the young population, and especially among young women, have been and remain a major concern, the picture is slowly evolving. Since 2008, efforts to reduce HIV incidence have been more effective for young adults. For example, between 2008 and 2018, HIV incidence across sub-Saharan Africa declined by 45 percent among young adults (ages 15–24), and by 41 percent among adults aged 25 and above.

Reflecting these differences in population growth and HIV incidence by age group, the number of HIV infections among young adults (ages 15–24) across sub-Saharan Africa declined by 28 percent between 2008 and 2018 (for both women and men), much faster than the number of HIV infections among adults aged 25 and above, which declined by 19 percent.

Gender differences in HIV prevalence and incidence

As is well known, HIV affects women disproportionately across sub-Saharan Africa, reflecting the predominantly heterosexual transmission of HIV in the region, the higher risk for women than for men of contracting HIV from heterosexual intercourse, and differences in the age profile of sexual activity, with women on average initiating sexual activity earlier. The share of women among adults (ages 15+) living with HIV in sub-Saharan Africa has been increasing steadily, from 60.0 percent in 2000 to 62.7 percent in 2019.

Over this period, HIV incidence has declined by nearly the same rate (about two-thirds) for both men and women – from 11.6/1,000 annually to 3.8/1,000 annually for women, and from 7.9/1,000 annually to 2.5/1,000 annually for men (Figure 9.2.1). Consequently, the contribution of the risk of contracting HIV to differences in the health outlook between women and men has been greatly diminished, as the excess risk of contracting HIV for women (i.e., the difference in incidence between men and women) is now (as of 2019) down to 1.3/1,000.

Figure 9.2. HIV Incidence and AIDS-related mortality across sub-Saharan Africa, by sex

Figure 9.2.1: HIV incidence, ages 15+

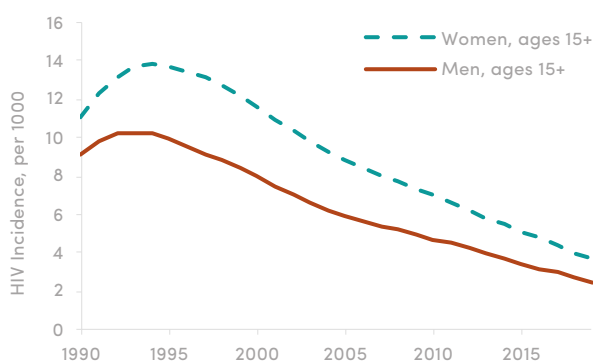
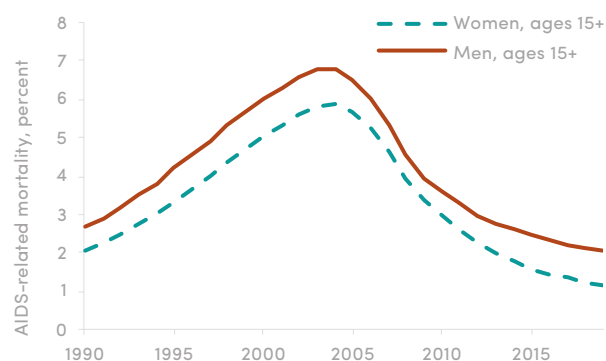


Figure 9.2.2: AIDS-related mortality among people living with HIV, ages 15+



Source: UNAIDS (2020).

Meanwhile, AIDS-related mortality across sub-Saharan Africa has declined steeply for both women and men (Figure 9.2.2), a well-known consequence of the scaling-up of treatment. For women, it dropped from its peak of 5.8 percent annually (2004) to 1.2 percent annually in 2019, a relative decline of 80 percent. Men have experienced higher AIDS-related mortality, peaking at 6.9 percent in 2004, and this declined to 2.0 percent annually by 2019, a relative decline of 70 percent. This steeper relative decline in mortality among women is consistent with higher coverage for women across stages of the treatment cascade, especially in the awareness of HIV status (Green et al., 2020). Estimated treatment coverage reached 76 percent of women living with HIV as of 2019, but only 62 percent for men.

This means that the role of HIV as a cause of gender differences in health and life prospects has diminished greatly across sub-Saharan Africa. The excess risk of

contracting HIV is at its lowest for 30 years, and the current increase in the share of women among people living with HIV in sub-Saharan Africa is a consequence of higher treatment coverage and therefore an improved health and life outlook for women living with HIV.

These population-level modelled estimates complement and build on direct empirical evidence on the distribution of HIV across the population and gender differences as a contributor to HIV. A systematic review by Birdthistle et al. (2019) of studies on HIV incidence across Africa concludes that HIV incidence among women and girls declined in most locations, but that the relative risk (compared to HIV incidence among men) persisted.

In light of very high HIV incidence observed among young women, one important channel of HIV transmission is the presence of age-disparate sexual relationships between young women and older men. Population surveys show

higher HIV prevalence among young women in age-disparate sexual relationships (Evan et al., 2016; Maughan-Brown et al., 2018). However, the picture regarding HIV incidence is more complex. While Stoner et al. (2019) find that age-disparate partnerships are associated with an HIV incidence among women that is 1.9 times higher than for women in age-concordant partnerships in South Africa,

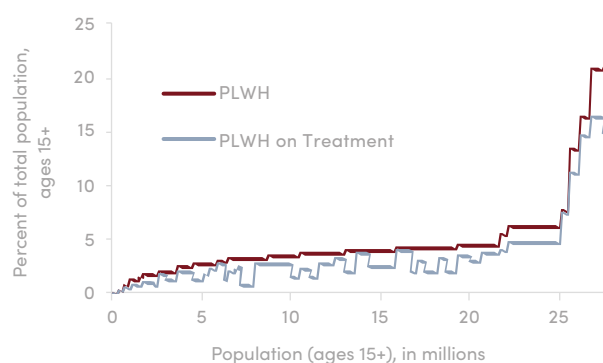
Harling et al. (2014) did not find such an effect. For Zimbabwe, Schaefer et al. (2017) also find higher HIV incidence among women in age-discordant relationships, but much of this is driven by relationships with age differences exceeding 10 years and by male partners having multiple sexual partnerships.

HIV and state of the HIV response across sub-national regions and locations

National-level estimates of the state of HIV and the HIV response may mask large differences in HIV prevalence, treatment access, and other factors and accomplishments across the nation. By now, there is substantial evidence on the distribution of HIV within countries. The geospatial analysis by Dwyer-Lindgren et al. (2019) builds on 134 surveys across sub-Saharan Africa, observing differences in HIV prevalence exceeding a factor of at least five across major regions within 14 out of 47 countries. In South Africa, estimated HIV prevalence (ages 15–49) differs by a factor of 2.5 between the provinces KwaZulu-Natal (25.8 percent) and Western Cape (10.3 percent), but also by a median factor of 1.5 between districts within the same province (Eaton, 2021). Such findings show that within countries, HIV epidemics with very different intensity and modes of transmission co-exist, and effective HIV control policies would have to take into account these different circumstances. Such national data are complemented by more localised data, illustrating the importance of local “hotspots” of intense HIV transmission and their role in disseminating HIV.

As an illustration of the implications of within-country differences in the state of HIV and of the HIV response, consider the example of treatment access in Kenya, where HIV prevalence across counties differs widely, ranging from over 20 percent in 2018 around Lake Victoria to less than 0.2 percent. This is illustrated in Figure 9.3, in which the total population is lined up by county, ordered by county-level HIV prevalence (yellow curve). Such differences have implications for policy design. For example, the government may focus its efforts in scaling up treatment on areas where HIV prevalence is highest, where HIV transmission is most intense, where the share of the total population living with HIV but not yet receiving treatment is highest, or where treatment coverage is lowest. Relevant decision factors include the unit cost of extending treatment access (usually lower in areas with high HIV prevalence), and local or regional treatment coverage (the lower the treatment coverage, the more pressing the immediate health needs of people living with HIV tend to be).

Figure 9.3: Kenya: PLHIV, with and without treatment (percent of total population)



Source: NACC & NASCOP (2018).

Notes: Population is grouped by county and ordered by county-level HIV prevalence.

In this example, with the exception of two counties with very high HIV prevalence (Homa Bay and Siaya), many of the counties with the highest need for treatment relative to the size of the total population were not among the counties with the highest prevalence. For example, in Turkana, 2.5 percent of the total population were people living with HIV who were not receiving treatment – one of the highest rates in the country – even though HIV prevalence, at 3.2 percent, was relatively low. This reflects that only about one-quarter of PLHIV were receiving treatment in that county, a much lower rate than in counties with high HIV prevalence (Figure 9.4). More systematically, the majority of people living with HIV but not receiving treatment were located in counties with relatively low HIV prevalence. To the extent that treatment in these low-access counties is initiated later, the immediate health needs of people not receiving treatment in those counties are more pressing than the needs of those in counties with high HIV prevalence and high treatment access. A policy to expand treatment access across counties thus needs to balance the immediate health gains from initiating treatment, the HIV prevention gains from earlier treatment, and the marginal costs of expanding access.

Figure 9.4. Kenya: Unmet need for treatment across counties

Figure 9.4.1: Unmet need (percent of total population)

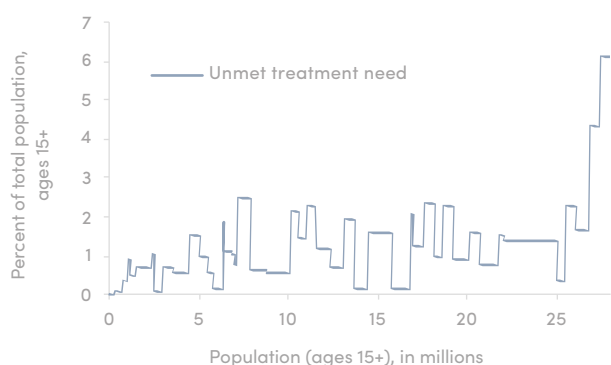
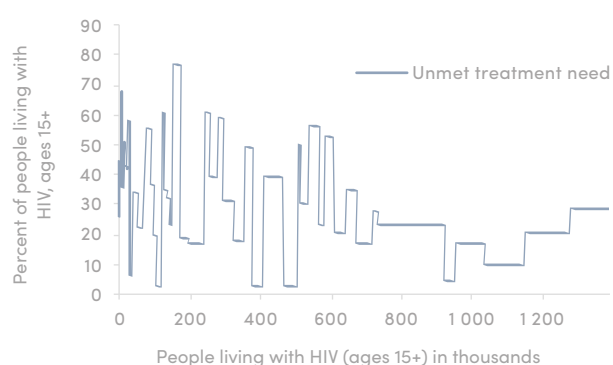


Figure 9.4.2: Unmet need (percent of population living with HIV)



Source: NACC & NASCOP (2018).

Note: Total population (overall or living with HIV) is grouped by county and in ascending order by county-level HIV prevalence.

These and other differences in the state of the HIV epidemic across a country's sub-regions are considered in studies and reflected in policies on adapting HIV prevention and treatment to local circumstances. Anderson et al. (2014) found that fine-tuning HIV treatment and prevention policies in line with county circumstances in Kenya would reduce HIV incidence by one-quarter, relative to spending the same amount on a uniform national policy. This analysis was closely reflected in Kenya's HIV "prevention revolution" strategy of 2014 (NACC & NASCOP, 2014). McGillen et al. (2016) evaluated the potential of aligning HIV strategies with sub-national epidemiology across sub-Saharan Africa (among other strategies), finding that sub-national targeting could reduce HIV incidence by 7 percent, relative

to uniform national strategies. Compared with the Kenya results, the lower potential for incidence reduction reflects the fact that sub-national differences in Kenya are unusually large, but also that the administrative/geographical sub-divisions are much coarser in the work by McGillen et al., compared with the Kenya study.

A principal constraint to optimising HIV strategies across sub-national regions is lack of data on modes of transmission. Especially for key populations like female sex workers or men who have sex with men (see below), few data are available which could support sub-nationally differentiated priority-setting.

Key populations

Key populations at higher HIV risk include men who have sex with men, transgender people, sex workers and their clients, and people who inject drugs – all of which are most exposed to HIV and play a disproportionate role in HIV transmission – as well as other populations particularly vulnerable to HIV acquisition, such as prisoners, partners of people living with HIV, fishermen around some African lakes, long-distance drivers and other mobile populations (UNAIDS, 2015). Reaching key populations is critical in effective HIV service delivery, not only because they are particularly vulnerable to contracting HIV, but also because of their indirect role in onward transmission of HIV. For example, sex between female sex workers and paying clients is not only a direct cause of HIV incidence, but it additionally contributes

indirectly to HIV incidence through HIV transmission between clients and their non-paying partners (Stone et al., 2021).

Key populations play a dominant role in some "concentrated" HIV epidemics. For example, in Jamaica, men who have sex with men are estimated to account for about 4 percent of the adult male population (UNAIDS, 2019). Since HIV prevalence among men who have sex with men (estimated at 33 percent) is much higher than for the adult population overall, they account for 35 percent of PLHIV and contribute 0.6 percentage points to the total adult HIV prevalence of 1.8 percent (ages 15+, as of 2018). Meanwhile, in Ukraine, people who inject drugs account for 0.9 percent of the adult population but make up 33 percent of people living

with HIV, as HIV prevalence among people who inject drugs (estimated at 23 percent) is more than 50 times higher than the prevalence rate of 0.4 percent for the adult population who do not inject drugs (UNAIDS, 2020b). These numbers on the share of key populations among people living with HIV understate their role in the transmission of HIV, however, because of spillovers of HIV into other population groups. For example, in Jamaica and Zimbabwe one new HIV infection among men who have sex with men was estimated to cause an additional three HIV infections later on – among men who have sex with men and across the general population (Haacker, 2016), though this similarity in total effects reflects very different transmission patterns.

Beyond the dominant role of key populations in concentrated epidemics, they play a critical role in generalised epidemics as well, where, despite higher overall prevalence levels, HIV prevalence among key populations is often higher still. One overview focusing on the countries with highest HIV prevalence overall observes that “concentrated sub-epidemics exist within all generalized epidemic contexts, and addressing the subpopulations within these constituent epidemics will likely be key to substantially reducing population-level incidence” (Tanser et al., 2014). Moreover, as HIV incidence overall has been declining steeply in countries facing generalised epidemics, it has been argued

that understanding and targeting HIV transmission involving key populations becomes even more important (Garnett, 2021).

In light of their role in HIV transmission, interventions focusing on key populations are considered critical and often among the most cost-effective interventions in reducing HIV incidence (Garnett et al., 2017), and have formed part of basic programme activities under the UNAIDS investment framework (Schwartländer et al., 2011). However, effective interventions reaching key populations are often hampered by stigma and discrimination, particularly for men who have sex with men – for example through legal constraints that impede the delivery of health services, or through other barriers in access to and by such populations. And the effectiveness of population-level interventions is compromised if coverage in sub-populations with the most intense HIV transmission is lower – Baral et al. (2019) argue that such heterogeneity contributes to the gap between the effectiveness of HIV treatment as prevention in clinical studies and the observed population-level effects following scaling-up of treatment. This implies that HIV epidemics become more concentrated as generalised epidemics recede, and HIV strategies need to be adapted to account for the increasing weight of key populations (Ortblad et al., 2019).

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