90-90-90

An ambitious treatment target to help end the AIDS epidemic

UNAIDS

UNAIDS / JC2684 (English original, October 2014)

Ending the AIDS epidemic is more than a historic obligation to the 39 million people who have died of the disease. It also represents a momentous opportunity to lay the foundation for a healthier, more just and equitable world for future generations. Ending the AIDS epidemic will inspire broader global health and development efforts, demonstrating what can be achieved through global solidarity, evidence-based action and multisectoral partnerships.

Although many strategies will be needed to close the book on the AIDS epidemic, one thing is certain. *It will be impossible to end the epidemic without bringing HIV treatment to all who need it.*

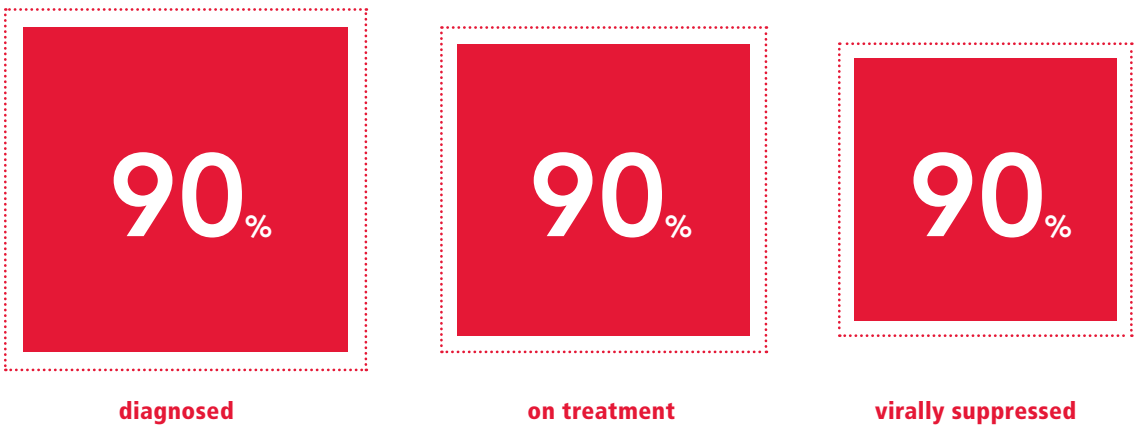
As the world contemplates the way forward following the 2015 deadline for the targets and commitments in the 2011 Political Declaration on HIV and AIDS, a final target is needed to drive progress towards the concluding chapter of the AIDS epidemic, promote accountability and unite diverse stakeholders in a common effort. Whereas previous AIDS targets sought to achieve incremental progress in the response, the aim in the post-2015 era is nothing less than the end of the AIDS epidemic by 2030.

In December 2013, the UNAIDS Programme Coordinating Board called on UNAIDS to support country- and region-led efforts to establish new targets for HIV treatment scale-up beyond 2015. In response, stakeholder consultations on new targets have been held in all regions of the world. At the global level, stakeholders assembled in a variety of thematic consultations focused on civil society, laboratory medicine, paediatric HIV treatment, adolescents and other key issues.

Powerful momentum is now building towards a new narrative on HIV treatment and a new, final, ambitious, but achievable target:

- By 2020, 90% of all people living with HIV will know their HIV status.
- By 2020, 90% of all people with diagnosed HIV infection will receive sustained antiretroviral therapy.
- By 2020, 90% of all people receiving antiretroviral therapy will have viral suppression.

THE TREATMENT TARGET



When this three-part target is achieved, at least 73% of all people living with HIV worldwide will be virally suppressed – a two- to three-fold increase over current rough estimates of viral suppression. Modelling suggests that achieving these targets by 2020 will enable the world to end the AIDS epidemic by 2030, which in turn will generate profound health and economic benefits.

The only way to achieve this ambitious target is through approaches grounded in principles of human rights, mutual respect and inclusion. Coercive approaches not only violate fundamental human rights norms, but they will also hamper hopes for ending the AIDS epidemic. As experience throughout the world has repeatedly and conclusively demonstrated, coercive approaches drive people away from the very services they need.

HIV treatment is a critical tool towards ending the AIDS epidemic, but it is not the only one. While taking action to maximize the prevention effects of HIV treatment, urgent efforts are similarly needed to scale up other core prevention strategies, including elimination of mother-to-child transmission, condom programming, pre-exposure antiretroviral prophylaxis, voluntary medical male circumcision in priority countries, harm reduction services for people who inject drugs, and focused prevention programming for other key populations. To put in place a comprehensive response to end the epidemic, concerted efforts will be needed to eliminate stigma, discrimination and social exclusion.

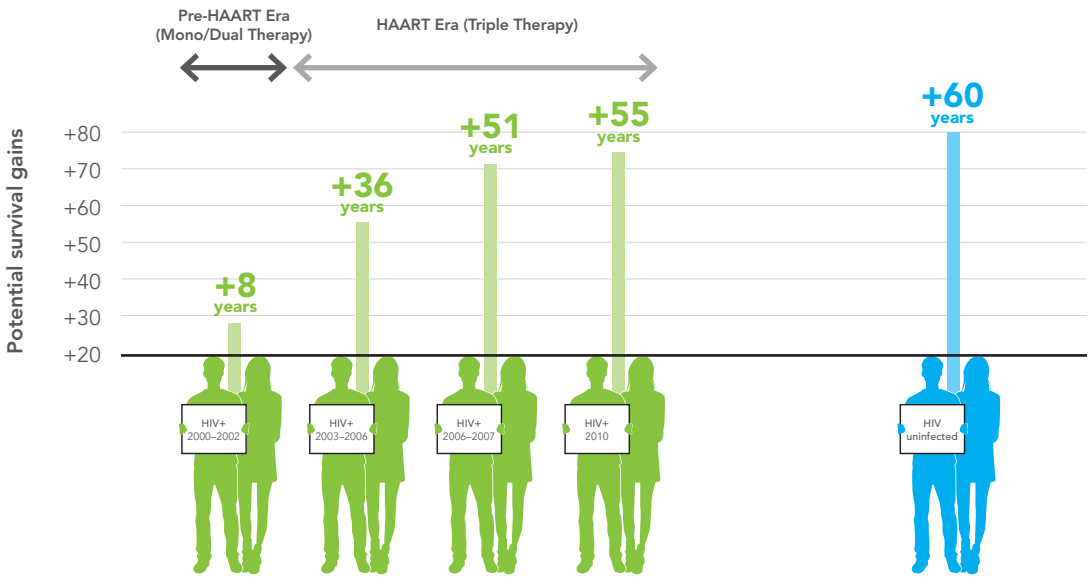
Ending AIDS will require uninterrupted access to lifelong treatment for tens of millions of people, necessitating strong, flexible health and community systems, protection and promotion of human rights, and self-replenishing financing mechanisms capable of supporting treatment programmes across the lifespan of people living with HIV. As new technologies arise – including simpler, more affordable diagnostics; simpler, better tolerated antiretrovirals; and ultimately longer-lasting and more affordable antiretrovirals that obviate the need for daily dosing – political will, system preparedness and timely adoption and implementation of global normative guidance will be needed to bring these new tools to scale. Just as prophylaxis for *pneumocystis carinii pneumonia* served in the early years of AIDS as a life-saving bridge to the antiretroviral treatment era for millions of people living with HIV, the world needs to maximize the effectiveness of existing tools in order to extend lives towards the era when a cure or substantially simpler treatment approaches will be available.

HIV TREATMENT: CRITICAL TO ENDING THE AIDS EPIDEMIC AND MAKING HIV TRANSMISSION RARE

HIV treatment is a unique tool in the AIDS response, preventing illness and death, averting new infections and saving money. As hopes for ending the AIDS epidemic depend in large measure on the world's ability to provide HIV treatment to all who need it, in a rights-based approach, final targets for universal treatment access are critical.

Fig. 1

HIV TREATMENT CAN NORMALIZE SURVIVAL



Expected impact of HIV treatment in survival of a 20 years old person living with HIV in a high income setting (different periods)

Source: Samji H et al., PLoS ONE, 2013.

HIV treatment prevents HIV-related illness

In 2013, in recommending an increase in the CD4 count threshold for initiation of HIV treatment from 350 to 500 cells/mm^3, WHO cited growing evidence of the clinical benefits of earlier treatment initiation.[1] Since the launch of the guidelines, additional analysis of the HPTN 052 results found that study participants randomized to the early treatment arm (CD4 count 250-500) had higher median CD4 counts during two years of follow-up, were 27% less likely to experience a primary clinical event, 36% less likely to experience an AIDS-defining clinical event and 51% less likely to be diagnosed with tuberculosis.[2]

HIV treatment averts AIDS-related deaths

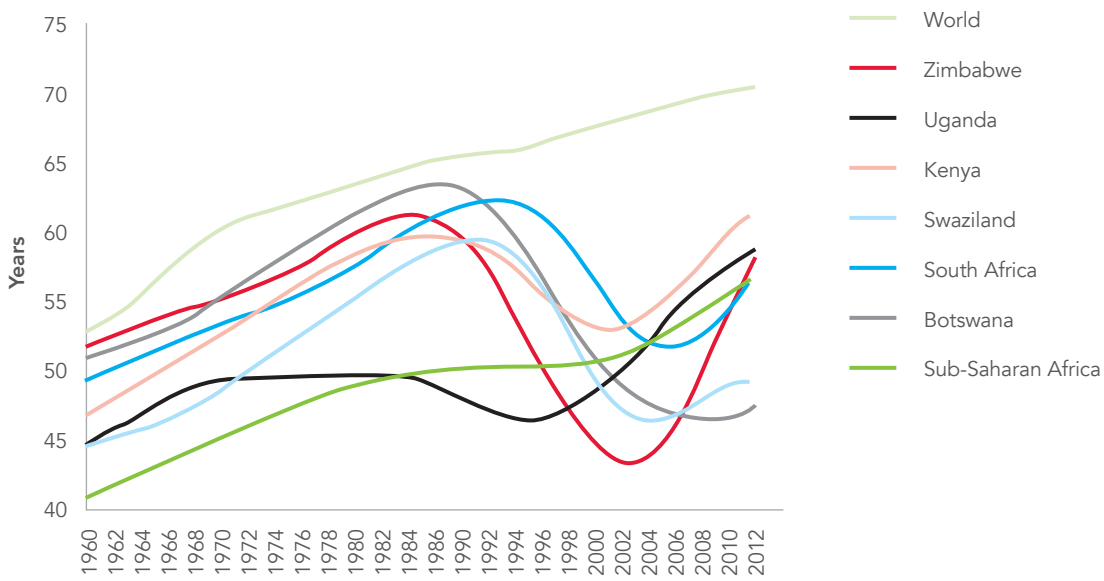
Whereas someone who acquired HIV in the pre-treatment era could expect to live only 12.5 years[3], a young person in industrialized countries who becomes infected today can expect to live a near normal lifespan (or an additional five decades) with the use of lifelong, uninterrupted HIV treatment (Fig. 1).[4] A rapidly expanding body of evidence indicates that comparable results are achievable in resource-limited settings.[2]

Low- and middle-income countries have seen AIDS-related deaths plummet upon introduction of widespread HIV treatment. As treatment

access expanded over the last decade in high-prevalence countries, the devastating health effects of the epidemic were reversed, with life expectancy rising markedly in countries where HIV treatment was brought to scale (Fig. 2). The fact that life expectancy has yet to return to pre-1990 levels underscores the need for continued scale-up of HIV treatment services.

Fig. 2

TRENDS IN LIFE EXPECTANCY DURING THE AIDS EPIDEMIC



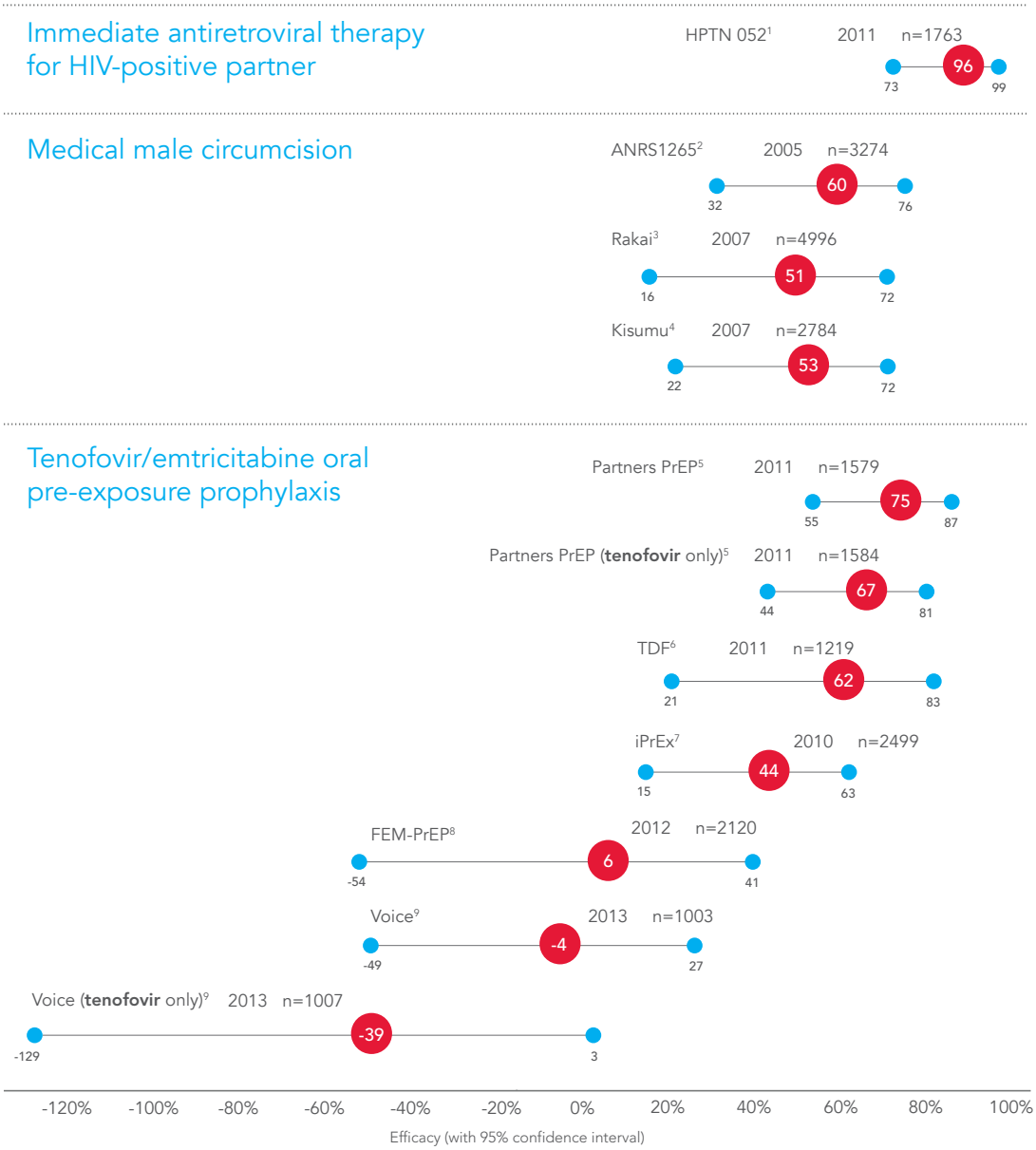
Source: The World Bank life expectancy data. http://data.worldbank.org/indicator/SP.DYN.LE00.IN. Accessed 15 September 2014.

HIV treatment prevents new HIV infections

Among prevention interventions evaluated to date in randomized, controlled trials, HIV treatment has demonstrated by far the most substantial effect on HIV incidence (Fig. 3).[5] Interim findings from the PARTNER study indicate that among 767 serodiscordant couples, no case of HIV transmission occurred when the person living with HIV had suppressed virus – after an estimated 40 000 instances of sexual intercourse.[6] As a prevention tool, HIV treatment should be seen as a critical component of a combination of evidence based approaches (known as 'combination prevention').

Fig. 3

EFFICACY OF AVAILABLE BIO-MEDICAL PREVENTION INTERVENTIONS DERIVED FROM RANDOMIZED CLINICAL TRIALS. MODIFIED WITH PERMISSION FROM MARRAZZO ET AL, JAMA, IN PRESS, 2014.*



Sources: 1. Cohen M, Chen Y, McCauley M, Gamble T, Hosseinipour MC, et al. (2011). Prevention of HIV-1 infection with early antiretroviral therapy. N Engl J Med, 2011;365:493–505. DOI:10.1056/NEJMoa1105243 2. Auvert B, Taljaard D, Lagarde E, Sobngwi-Tambekou J, Sitta R, et al. (2005) Randomized, controlled intervention trial of male circumcision for reduction of HIV infection risk: The ANRS 1265 trial. PLoS Med 2(11):e298. DOI:10.1371/journal.pmed.0020298. 3. Gray RH, Kigozi G, Serwadda D, Makumbi F, Watya S, et al. Male circumcision for HIV prevention in men in Rakai, Uganda: a randomised trial. The Lancet, 369(9562): 657–666, 24 February 2007. DOI:10.1016/S0140-6736(07)60313-4. 4. Bailey RC, Moses S, Parker CB, Agot K, Maclean I, et al. Male circumcision for HIV prevention in young men in Kisumu, Kenya: a randomised controlled trial. The Lancet, 369(9562):643–656, 2007 Feb 24. DOI:10.1016/S0140-6736(07)60312-2. 5. Baeten JM, D. Donnell D, Ndase P, Mugo NR, Campbell JD, et al. Antiretroviral Prophylaxis for HIV Prevention in Heterosexual Men and Women. N Engl J Med 2012;367:399–410. DOI:10.1056/NEJMoa1108524. 6. Thigpen MC, Kebaabetswe PM, Paxton LA, Smith DK, Rose CE, et al. Antiretroviral Pre-exposure Prophylaxis for Heterosexual HIV Transmission in Botswana. N Engl J Med 2012;367:423-34. DOI:10.1056/NEJMoa1110711. 7. Grant RM, Lama JR, Anderson PL, McMahan V, Liu AY, et al. Preexposure Chemoprophylaxis for HIV Prevention in Men Who Have Sex with Men. N Engl J Med 2010;363:2587–99. DOI:10.1056/NEJMoa1011205. 8. Van Damme L, Corneli A, Ahmed K, Agot K, Lombaard J, et al. Pre-exposure Prophylaxis for HIV Infection among African Women (FEM-PrEP). N Engl J Med 2012;367:411–22. DOI:10.1056/NEJMoa1202614. 9. J Marrazzo, G Ramjee, G Nair, et al. Pre-exposure prophylaxis for HIV in women: daily oral tenofovir, oral tenofovir/emtricitabine or vaginal tenofovir gel in the VOICE study (MTN 003). 20th Conference on Retroviruses and Opportunistic Infections. Atlanta, GA, March 3-6, 2013. Abstract 26LB.

The prevention benefits of HIV treatment are apparent at the population level. In KwaZulu-Natal, South Africa, every 1% increase in coverage has been found to yield a 1.1% reduction in HIV incidence.[7] These findings are similar to those reported in the Canadian province of British Columbia, where every 1% increase in the number of people with suppressed virus has been associated with a 1.2% reduction in estimated HIV incidence.[8] While the prevention effects of HIV treatment are likely to vary based on the stage and nature of the epidemic and may not continue indefinitely in such a linear manner, the evidence is plain that treatment scale-up generates robust population-level benefits. In short, HIV treatment is a cornerstone of combination HIV prevention.

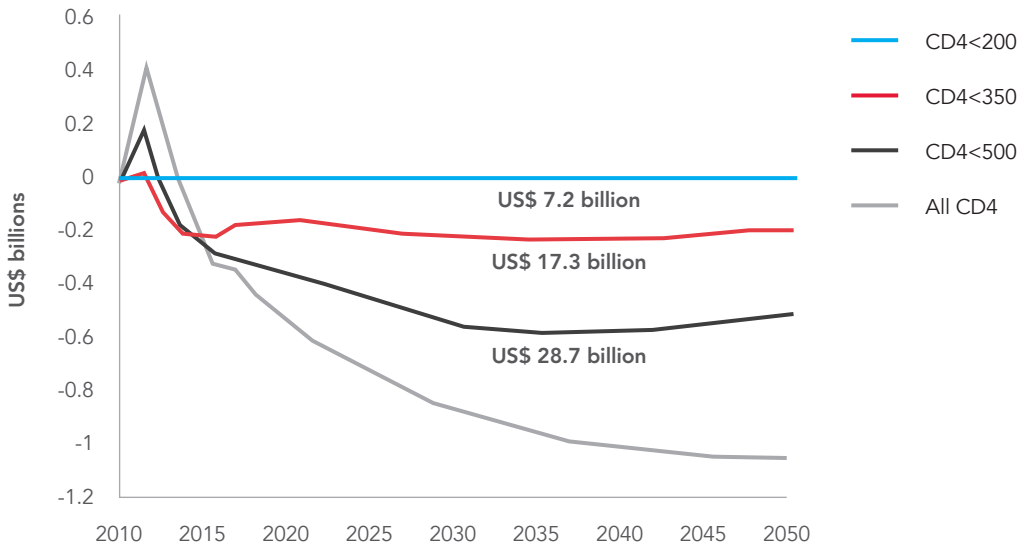
HIV treatment saves money

Early initiation of treatment enhances both health and economic gains. In South Africa, for example, all treatment expansion scenarios based on higher CD4 thresholds for treatment initiation have been estimated by models to generate simultaneous health and economic benefits, but the most substantial benefits occur when treatment is available to all people living with HIV, regardless of CD4 count (Fig. 4). Rapid expansion of HIV treatment to all people living with HIV is projected to avert 3.3 million new HIV infections in South Africa through 2050 and save US$30 billion.[9]

According to another modelling exercise, investments in HIV treatment scale-up generate returns more than two-fold greater when averted medical costs, averted orphan care and labour productivity gains are taken into account.[10] Nor will it be necessary to wait decades to see the economic benefits of early investments in rapid treatment scale-up. In some countries, savings from investments in HIV treatment scale-up would be immediately felt.[11] Actual costs savings would emerge somewhat later in countries with high HIV prevalence. Yet even in South Africa, home to more people living with HIV than any other country, estimates indicate that the country would reach the break-even point within a decade after scaling up treatment to all people, regardless of CD4 count.[12 13]

Fig. 4

EXPANDING ACCESS TO ANTIRETROVIRAL TREATMENT IS A SMART INVESTMENT: CASE OF SOUTH AFRICA

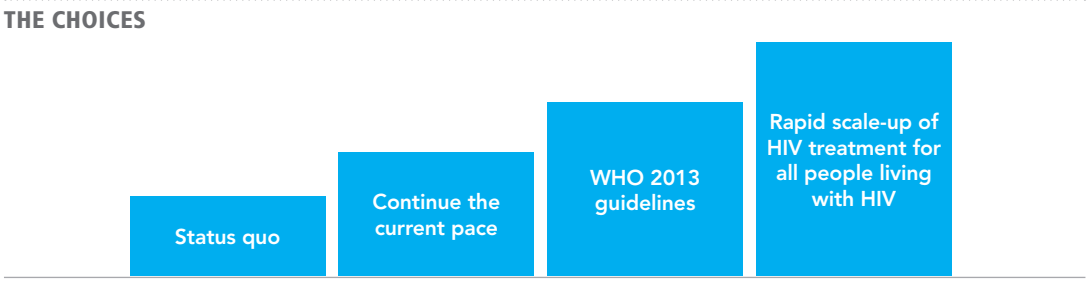


Source: Granich R et al. Expanding ART for treatment and prevention of HIV in South Africa: Estimated cost and cost-effectiveness 2011-2050. PLoS ONE , 2012, 7:e30216.

HIV treatment and the post-2015 era: The choices the world faces

As the deadline for the 2015 targets approaches and as the world contemplates benchmarks to guide and drive progress beyond 2015, several possible ways forward are possible with respect to treatment scale-up (Fig. 5):

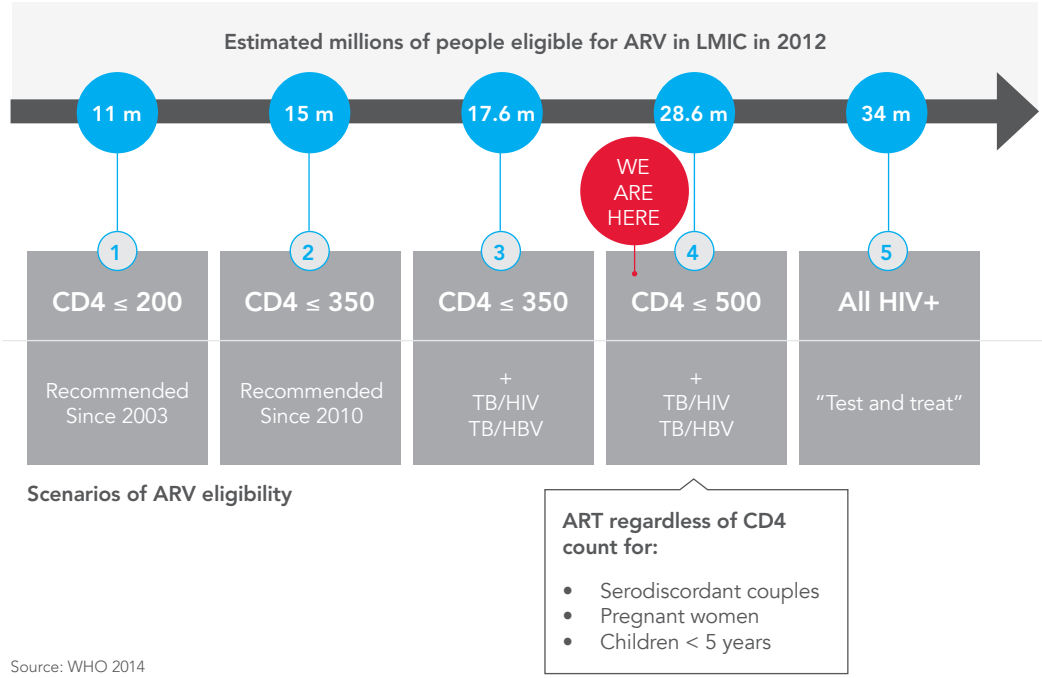
Fig. 5



- Maintain the status quo: One option would be to rest on current laurels, effectively continuing levels of treatment coverage achieved thus far but failing to invest in further expansion of treatment access. Maintenance of the status quo would be associated with the persistence of drug stockouts as well as extremely low coverage in several countries with high HIV burden, such as Nigeria, Russian Federation and Democratic Republic of Congo. This approach would lead to a progressive expansion of the global AIDS burden, diminishing or nullifying altogether the gains achieved to date.
- Continue the current pace of scale-up: Through continued investment in treatment programmes, treatment coverage would continue to steadily increase in this scenario. Over time, however, continuation of current scale-up strategies would likely yield increasingly meagre results, as more labour-intensive efforts will be required to link the hardest-to-reach with testing and treatment services. For children and key populations, as well as for the dozens of countries where HIV treatment coverage remains low, the goal of universal access would remain unfulfilled in 2030 under this scenario.
- Intensify scale-up under the WHO 2013 guidelines: Rapid implementation of the 2013 guidelines, including for adolescents and key populations, would represent a major strengthening of global treatment efforts, as an estimated 85% of all people living with HIV are now eligible for treatment under current WHO recommendations. However, it would leave millions of people living with HIV with CD4 counts above 500, including many members of key populations, without eligibility for immediate treatment.
- Rapidly scale up HIV treatment for all people living with HIV, regardless of CD4 count: This scenario calls for countries to use the total population of people living with HIV as the denominator for treatment coverage. Taking into account the clear trend towards earlier initiation of HIV treatment, including the fact that national guidelines in more than a dozen countries either specifically call for or allow initiation of antiretroviral therapy regardless of CD4 count, this scenario assumes that international guidelines will eventually recommend a voluntary, human rights based test-and-offer approach for all people living with HIV (Fig. 6).

Fig. 6

SCENARIOS OF ANTIRETROVIRAL TREATMENT ELIGIBILITY: WHO VISION



Source: WHO 2014

A status report on HIV treatment scale-up

The world is now on track to reach its goal of providing HIV treatment to at least 15 million people by 2015. As of December 2013, almost 12.9 million people were receiving antiretroviral therapy worldwide. This is an extraordinary achievement – one that should inspire the global community as planning begins for the post-2015 era. The ability of countries to overcome enormous challenges to treatment scale-up now enables the global community to contemplate what was once barely imaginable – ending the AIDS epidemic.

However, while gains that countries have made to date are nothing short of historic, the bulk of the work involved in bringing HIV treatment to those who need it remains ahead. As of December 2013, only 37% of people living with HIV were receiving HIV treatment, leaving more than 22 million people living with HIV without treatment. It is likely that those already receiving HIV treatment in many countries are the easiest to reach, suggesting that the road to universal access for all populations will pose major challenges.

Global progress in scaling up HIV treatment also masks considerable variation in access to life-saving treatment services. Substantial coverage gaps exist within and among regions; on the African continent, for example, treatment coverage in 2013 ranged from 41% in Eastern and Southern Africa to 19% in North Africa (Fig. 8). Outside Africa, little if any regional progress has been made since 2005 in reducing AIDS-related deaths in the Middle East, Eastern Europe, Central Asia and some Asian countries due to persistently inadequate treatment coverage.

Fig. 7

TOTAL ANTIRETROVIRAL TREATMENT COVERAGE BY REGION IN 2013

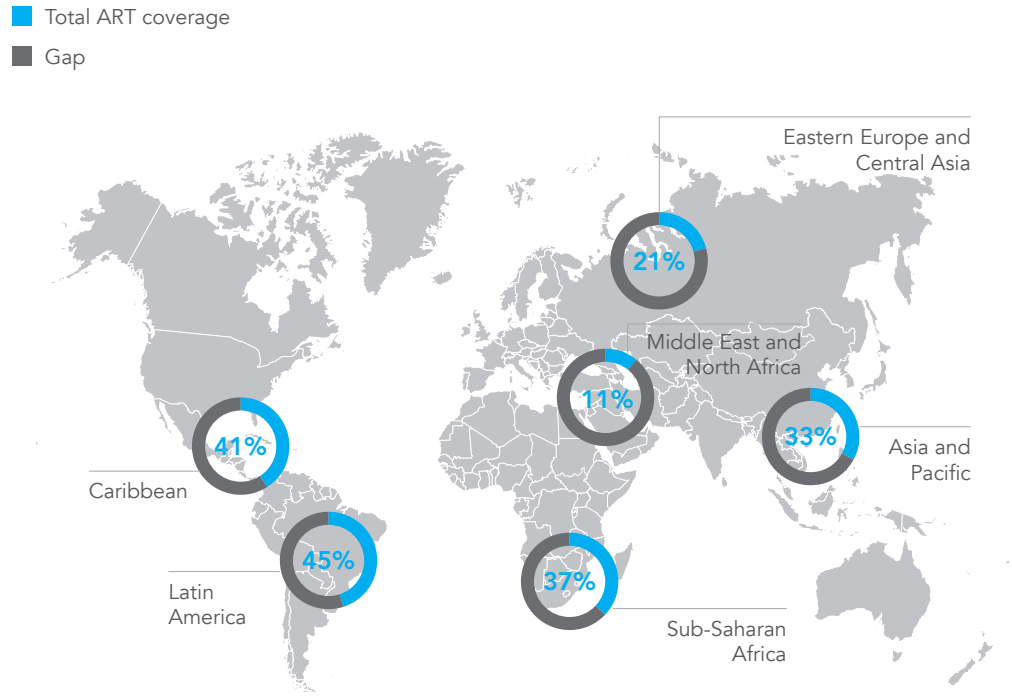
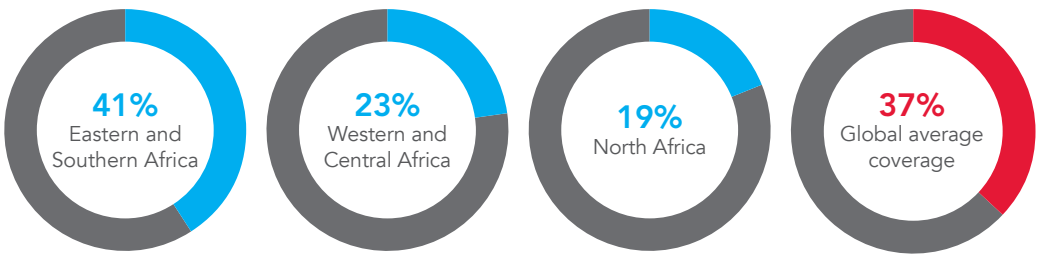


Fig. 8

ANTIRETROVIRAL TREATMENT COVERAGE VARIES WITHIN AFRICA



Source: UNAIDS estimates 2013.

In 2013, while 37% of adults living with HIV worldwide received antiretroviral therapy, only 24% of children living with HIV obtained HIV treatment. As children who acquire HIV confront 50% odds of dying before their second birthday in the absence of treatment[14], the widespread failure to employ the diagnostic and therapeutic tools at our disposal represents a profound and intolerable shortcoming in the AIDS response. In 2013, an estimated 190 000 children died of AIDS-related causes.

90-90-90: A NEW HIV TREATMENT NARRATIVE THAT LAYS THE GROUNDWORK TO END THE AIDS EPIDEMIC

Since the current HIV treatment target of reaching 15 million people with treatment by 2015 was endorsed at the 2011 High-Level Meeting on AIDS, emergence of powerful evidence regarding the preventive and therapeutic benefits of early treatment has transformed understanding of optimal treatment approaches. Accumulated programmatic experience (most notably, evidence of patient loss across the treatment cascade) has also reshaped perspectives about HIV treatment, emphasizing the critical role of service quality in capturing the health potential of antiretroviral therapy and reinforcing the pivotal importance of a rights based approach. This evidence from both clinical trials and substantial country experience reinforced the wisdom of calls issued as early as 2006 by leading experts to leverage the prevention benefits of HIV treatment.[15]

It is increasingly clear that the world needs a new evidence based HIV treatment narrative that effectively captures the extraordinary expansion of treatment-related knowledge. The new 90-90-90 treatment target reflects essential paradigm shifts in the approach to treatment scale-up:

- Rather than focus on a single number (i.e. those receiving HIV treatment), the new target recognizes the need to focus on the *quality and outcomes* of antiretroviral therapy as treatment services are scaled up. These new targets address progress along the HIV cascade of engagement in care, measuring the degree to which programmes are meeting their ultimate goal of viral suppression.
- In contrast to earlier targets, which focused exclusively on the direct morbidity and mortality gains from scaled-up treatment, the new target captures both the *therapeutic and preventive benefits* of HIV treatment. As the new target reflects, efforts will be needed to explain to individuals, communities, decision-makers and society at large that antiretroviral therapy not only keeps people alive but also prevents further transmission of the virus.
- The new target prioritizes *equity.* The world will not end the AIDS epidemic unless *all* communities affected by HIV have full and equitable access to life-saving treatment and other prevention services. In particular, the ambitious 90-90-90 target demands dramatic progress in closing the treatment gap for children, adolescents and key populations, using rights based approaches.
- The new target emphasizes *speed* in scale-up and early initiation of HIV treatment in a manner consistent with human rights. Earlier scale-up enables the response to begin to outpace the epidemic itself and enhances long-term economic savings. In order to reach the goal of ending the AIDS epidemic by 2030, expedited scale-up by 2020 will be required.

WHY A NEW TREATMENT TARGET IS NEEDED

A new treatment target is urgently needed to accelerate progress towards ending the AIDS epidemic in the post-2015 era.

- *Targets drive progress*. Many were sceptical when countries in 2003 embraced the "3 by 5 initiative" and then again in 2011 when the world committed to provide HIV treatment to 15 million people by 2015. Yet the existence of these targets focused global resolve and spurred unprecedented expansion of treatment access. Despite these great successes, more than 60% of all people living with HIV lacked HIV treatment as of December 2013, underscoring the need for intensified efforts to bring HIV treatment to all those who need it. Setting a new target is vital for renewing global resolve to close the treatment access gap.
- *A new 2020 target is needed to guide action beyond 2015*. Although the epidemic is far from over, no target is in place for treatment scale-up after December 2015. Ending the epidemic will require new milestones to guide and accelerate progress in the post-2015 era.
- *Targets promote accountability.* A clearly articulated goal enables diverse stakeholders to identify respective roles and responsibilities and critically assess shortcomings in order to accelerate progress towards the agreed benchmark. Regular progress reports under the "3 by 5" initiative, for example, pushed stakeholders to tackle barriers slowing scale-up towards the 2005 target, such as weak procurement and supply management systems, human resource shortages, and the high costs of antiretroviral medicines. A new target, based on new scientific knowledge and implementation evidence, will help drive progress in addressing still-persistent challenges, including patient loss across the HIV continuum of care and intolerable access gaps still experienced by children, key populations and other groups.
- *A bold new target underscores that ending the AIDS epidemic is achievable.* Previously, treatment targets, while reflecting the latest treatment guidelines, were understood as interim steps in the long process of expanding HIV treatment access in resource-limited settings. Today, with much better understanding of the full potential of available tools, actions need to be specified for reaching the AIDS response's ultimate target – ending the AIDS epidemic by saving lives and making HIV transmission a rare event. Boldly grasping this challenge demonstrates to the world that ending the AIDS epidemic is both achievable and an outcome that will serve not only as a fitting coda to the long AIDS struggle but also as an inspiration to the broader global health and international development fields.

MAKING 90-90-90 A REALITY FOR ALL POPULATIONS

The 90-90-90 target is an ambitious one – in any setting or for any population. For some, though, particularly focused action will be required to overcome impediments to treatment scale-up. This is especially true for populations that are currently being left behind in the AIDS response.

Key populations

In 2014, the UNAIDS *Gap report* highlighted the ways in which many populations are being left behind. Experiencing disproportionate risk and vulnerability, key populations warrant a prioritized, rights based response. However, due to the persistence of stigma, discrimination and social exclusion, members of key populations experience inequitable access to care and sub-optimal health outcomes. The 90-90-90 targets cannot be reached without overcoming the many factors that undermine effective responses for key populations.

Throughout the world, the epidemic's burden on key populations is typically several orders of magnitude greater than among adults as a whole. In 74 countries reporting pertinent HIV prevalence data to UNAIDS in 2014, people who inject drugs were 28 times more likely to be living with HIV than the adult population generally.[16] Men who have sex with men worldwide are 19 times more likely to be living with HIV than adult men overall[17], while HIV prevalence among female sex workers is 13.5 times greater than among women as a whole.[18] Globally, HIV prevalence among transgender women is 49 times higher than for all adults of reproductive age.[19]

Although key populations are at higher risk for HIV acquisition, they are often least likely to access HIV services. For example, in many countries, HIV testing and treatment access is substantially lower for people who inject drugs than for other people living with HIV.[20] A global survey found that only 14% of men who have sex with men living in low-income countries reported having meaningful access to HIV treatment services.[21]

Stigma and discrimination, in the broader social environment but especially in health care settings, deter many members of key populations from learning their HIV status or accessing life-saving prevention and treatment services. Surveys through the People Living with HIV Stigma Index indicate that members of key populations commonly experience disapproval, rejection and sub-optimal services in health care settings. Transgender individuals commonly confront hostile, judgmental or dismissive attitudes when they attempt to access health services.[22] In Bangkok, 25% of drug users surveyed reported avoiding health care due to the fear of compulsory treatment.[23] Similarly, the above-noted global survey of men who have sex with men found that experience of homophobia was the single most important factor diminishing health care utilization for this population.[21]

The exclusion of key populations is often institutionalized in national laws and policy frameworks. Sex work and drug use are routinely criminalized throughout the world, with compulsory detention a common practice in many countries; 78 countries criminalize same-sex sex; and transgender individuals routinely struggle to obtain legal recognition of their gender identity or protection from violence and employment discrimination.[16]

The harmful effects of these discriminatory policy frameworks are evident. In countries with serious epidemics primarily driven by injecting drug use, prohibitions on opioid substitution therapy often undermine capacity to respond effectively to HIV. Likewise, enactment of anti-gay legislation can trigger extensive abuse and violence against men who have sex with men, a climate that is fundamentally incompatible with community empowerment, robust service uptake, and the development of a relationship of trust and mutual respect between individuals and their health care providers.

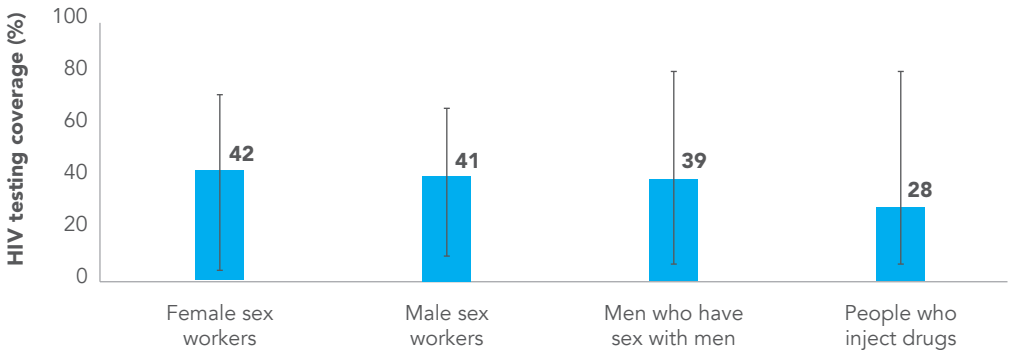
The association of punitive laws and poor health outcomes for key populations is vividly evident in Asia and the Pacific. Across the region, 37 countries criminalize some aspect of sex work; 11 have compulsory detention centres

for people who use drugs; 16 provide for the death penalty for drug-related offenses; and 19 criminalize same-sex relations. In a region of epidemics concentrated among key populations, these punitive approaches coincide with notably inadequate outcomes for the most heavily affected groups. Less than half of people living with HIV among key populations in the region know their HIV status (Fig. 9).

Fig. 9

ASIA PACIFIC: LESS THAN HALF OF KEY POPULATIONS KNOW THEIR HIV STATUS

HIV testing coverage among key populations, regional median, 2007–2012



Source: Country progress reports to UNAIDS, 2007-2012.

Removing laws and policies that impede testing and treatment efforts for key populations is essential to achieving the 90-90-90 target. A recent analysis by a team of health experts determined that decriminalization of sex work would reduce by 33-46% the number of new HIV infections among sex workers over the coming decade.[24]

In many parts of the world, it will not be possible to achieve the 90-90-90 target for key populations solely by looking to mainstream service systems. Tailored approaches and strategies, developed collaboratively with key populations themselves, will be needed to achieve treatment goals for the populations most heavily affected by the epidemic. Investments in community infrastructure will also be required.

Adolescents

Although the annual number of AIDS-related deaths worldwide fell by 35% from 2005 to 2013, deaths among adolescents (ages 10-19) living with HIV have sharply risen, increasing by 50% from 2005 to 2012. In the era of antiretroviral therapy, AIDS remains the second leading cause of death among adolescents globally and the leading cause of death among adolescents in sub-Saharan Africa.[25]

As a global consultation convened by UNAIDS on the adolescent treatment challenge found, adolescents living with HIV confront numerous obstacles to meaningful treatment access and favourable health outcomes. These challenges include stigma, discrimination and problematic laws and policies, including parental consent laws that limit young people's ability to access HIV testing and other health care services on their own. Like adults and younger children, adolescents often struggle with health care linkage and retention, with particular challenges experienced as adolescents transition from paediatric to adult services. Young people often have no access to sexuality education and limited information regarding sexual and reproductive health and rights. Many adolescents living with HIV struggle with disclosure of their HIV status, in part because they are frequently left on their own to navigate the complexities of living with HIV as a young person.

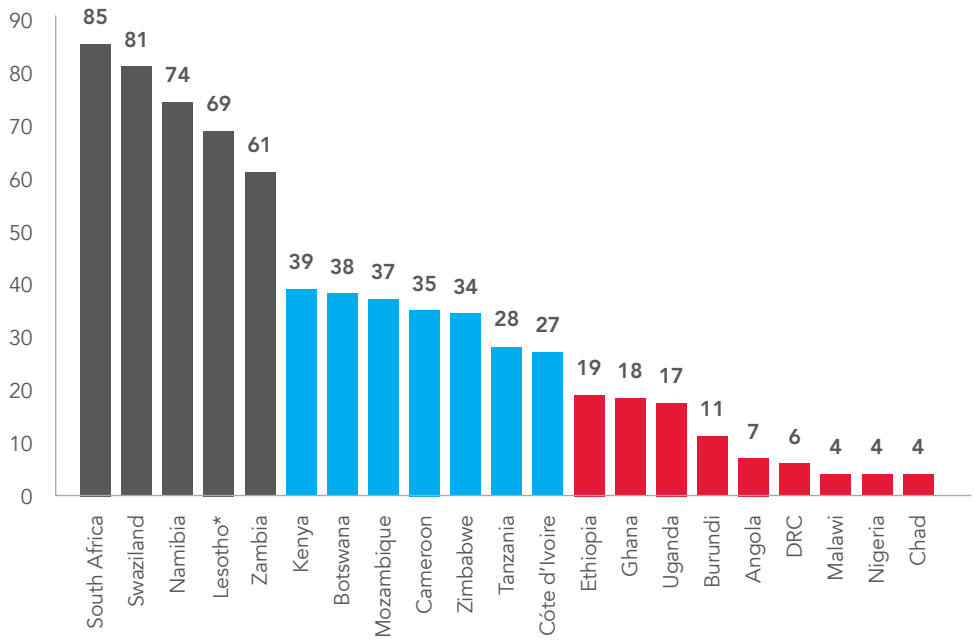
The global consultation on adolescent treatment access generated numerous recommendations for action with respect to new treatment targets. These include enhanced age-disaggregated data collection and reporting, as well as development of robust surveillance strategies to monitor trends and outcomes for children and adolescents. It was agreed that a new movement is needed to address the HIV treatment needs of young people, including efforts to engage youth actors as HIV treatment leaders. The consultation also recommended specific steps to increase HIV testing for young people, expand treatment options for adolescents, adapt health services to adolescents' needs, mobilize social support, and empower young people.

Children

In June 2014, UNAIDS, WHO, the Elizabeth Glaser Pediatric AIDS Foundation (EGPAF), and UNICEF convened a global consultation to discuss operational treatment targets for children in the post-2015 era. Although historic gains have been made in preventing children from acquiring HIV, the treatment crisis among children will not disappear, as children newly infected (240 000 in 2013 alone) face 15 years before transitioning to adulthood – if they survive their early years. Without HIV treatment, half of children living with HIV will die by age two.[26] Even with continued progress in prevention of mother-to-child transmission, WHO and UNICEF project that 1.9 million children will require HIV treatment in 2020.

Fig. 10

ACCESS TO VIROLOGIC HIV TESTING (EARLY INFANT DIAGNOSIS) 2012



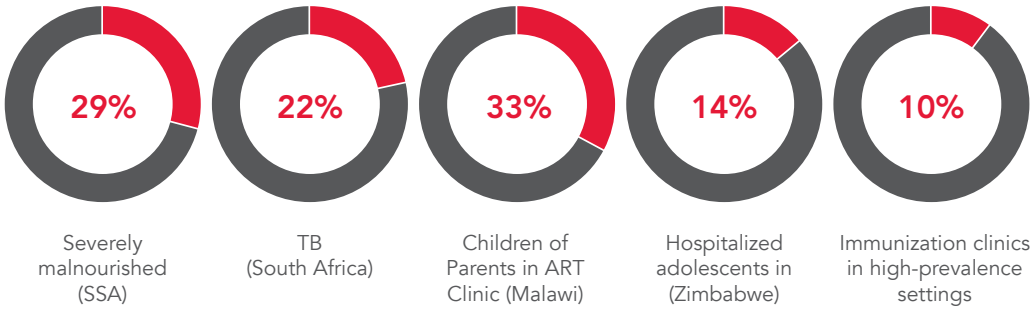
*Lesotho data represents 2011 coverage data

Source: UNAIDS 2013 GARPR and UNAIDS modeling (Spectrum) HIV and AIDS 2012 estimates.

With peak mortality occurring at 2-3 months for newborns who acquire HIV infection, early diagnosis is essential. However, only 40% of children born to mothers living with HIV received early infant diagnostic testing in 21 priority countries in 2012 (Fig. 10). In five priority countries (Angola, Chad, Democratic Republic of Congo, Malawi and Nigeria), less than one in 10 HIV-exposed children obtained early infant diagnostic services.

Fig. 11

FINDING THE CHILDREN: POTENTIAL OPPORTUNITIES TO OFFER HIV TESTING



Sources: Fergusson et al., 2008; Hesseling et al. 2009; Ferrand et al. 2010; Cohen et al. 2010.

For children born to women living with HIV who are not effectively linked to diagnostic services through systems to prevent mother-to-child transmission, HIV testing is not routinely offered in child-focused programmes. This failure represents a major missed opportunity, as there is often very high prevalence among children with needs addressed by other service systems (Fig. 11). For example, 29% of malnourished children in sub-Saharan Africa are living with HIV, making nutritional services an ideal venue for case-finding and linkage to care.[27] Likewise, 22% of children with TB in South Africa are living with HIV[28], highlighting the need to leverage TB service systems to promote HIV testing for children.

For those children who receive a timely diagnosis of HIV infection, a limited array of treatment options is available. Most of the antiretroviral medicines approved for use in adults are not approved for use in children.[29] The few medicines available for use in very young children tend to be unpalatable and require regimens than are more complicated than those for adults. There is an urgent need for paediatric-specific fixed-dose combinations that reduce medication burdens and help improve treatment adherence. For children who are enrolled in HIV treatment services, there is considerable loss to follow up, underscoring the need for interventions to enable retention in care.[30]

WHO is leading global efforts to optimize HIV treatment for children. In collaboration with partners, WHO has identified key research and development priorities, including the development of age-appropriate fixed dose combinations for children and prioritized development of fixed dose combinations that include especially promising new antiretroviral drugs, such as dolutegravir or TAF.[31] To support treatment optimization, WHO recommends additional steps, including improved demand forecasting and patent-sharing to enhance the affordability of paediatric medicines.

Recognizing the urgent need for substantially greater attention to children's HIV treatment needs, stakeholders at the global consultation warmly endorsed the 90-90-90 approach for children, including confirmation of the current goal of ensuring timely testing and treatment of 100% of all HIV-exposed newborns. It was urged that the push to reach the 90-90-90 target for children leverage and build on existing HIV initiatives for children, including the *Global plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive*, the Inter-Agency Task Team for the Global Plan, and the Double Dividend initiative involving EGPAF, UNICEF and WHO.

90-90-90 CAN HAPPEN: THE BASIS FOR THE NEW ACHIEVABLE TARGETS

A UNAIDS advisory panel of global treatment experts originally conceptualized the 90-90-90 targets. These experts based the targets on documented achievements of regional and national programmes in diverse regions of the world.

At a national level, a growing number of countries are either on track to achieve the 90-90-90 target or have approached, met or exceeded one or more of the elements of the target. What is needed now is to link lessons learnt across each and every stage of the treatment cascade, and to transfer best practices in high-achieving countries and programmes to those that lag behind.

REACHING TARGET 1:

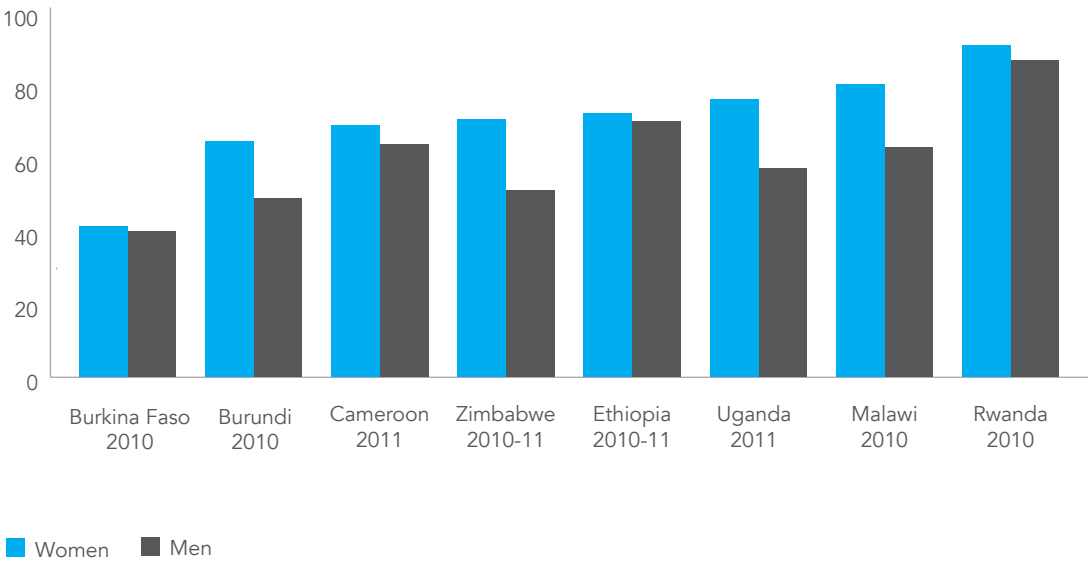
90% of all people living with HIV will know their HIV status (90% diagnosed)

Several African countries are either approaching or within striking distance of having at least 90% of people living with HIV tested at least once (Fig. 12). Although these figures represent substantial improvement over earlier years, it is estimated that only about 45% of people living with HIV in sub-Saharan Africa know their status. The gap between current results and the 90% target underscores the need for more frequent testing and more focused, strategic targeting of testing services to ensure 90% knowledge of HIV status on an ongoing basis, including among adolescents, key populations and other groups who are currently being left behind.

Sharply increasing the proportion of people living with HIV who know their HIV status will require moving beyond a passive approach to testing, which relies on individuals to recognize their own risk and come forward on their own to learn their status, often without meaningful education or support. More proactive, rights based testing initiatives will be needed, including focused testing promotion for key geographic and population hotspots, investments in strategies to increase demand for testing services, and utilization of a broader array of HIV testing and counselling approaches, including self-testing, provider-initiated counselling and testing and community-based approaches. Studies in Kenya and Uganda suggest that inclusion of HIV testing in multi-disease health campaigns has already driven testing coverage levels up to 86% and 72%, respectively, at a population level; for such campaigns to be effective, extensive community consultations, strong logistics, and effective marketing are essential.[32]

Fig. 12

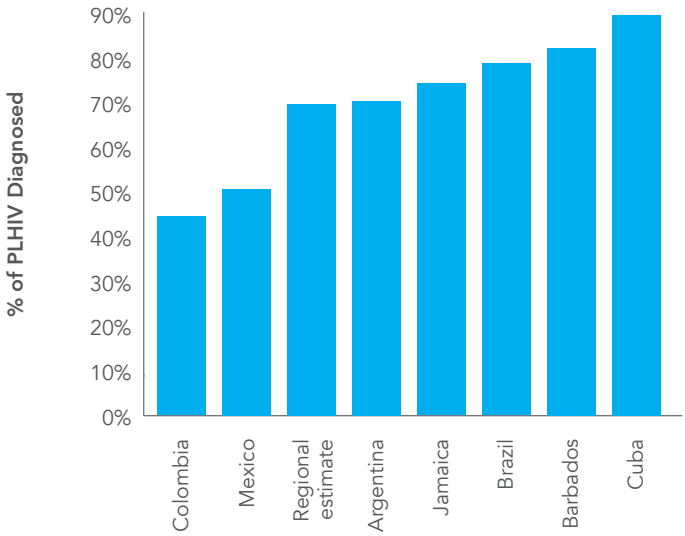
PROPORTION OF PEOPLE LIVING WITH HIV TESTED AT LEAST ONCE



Source: Staveteig et al., 2013. Demographic Patterns of HIV Testing Uptake in Sub-Saharan Africa. DHS Comparative Reports No. 30. ICF International.

Fig. 13

PROPORTION OF PEOPLE LIVING WITH HIV WHO KNOW THEIR STATUS, LATIN AMERICA AND THE CARIBBEAN



Estimated that 70% of people living with HIV in Latin America and the Caribbean know their HIV status.

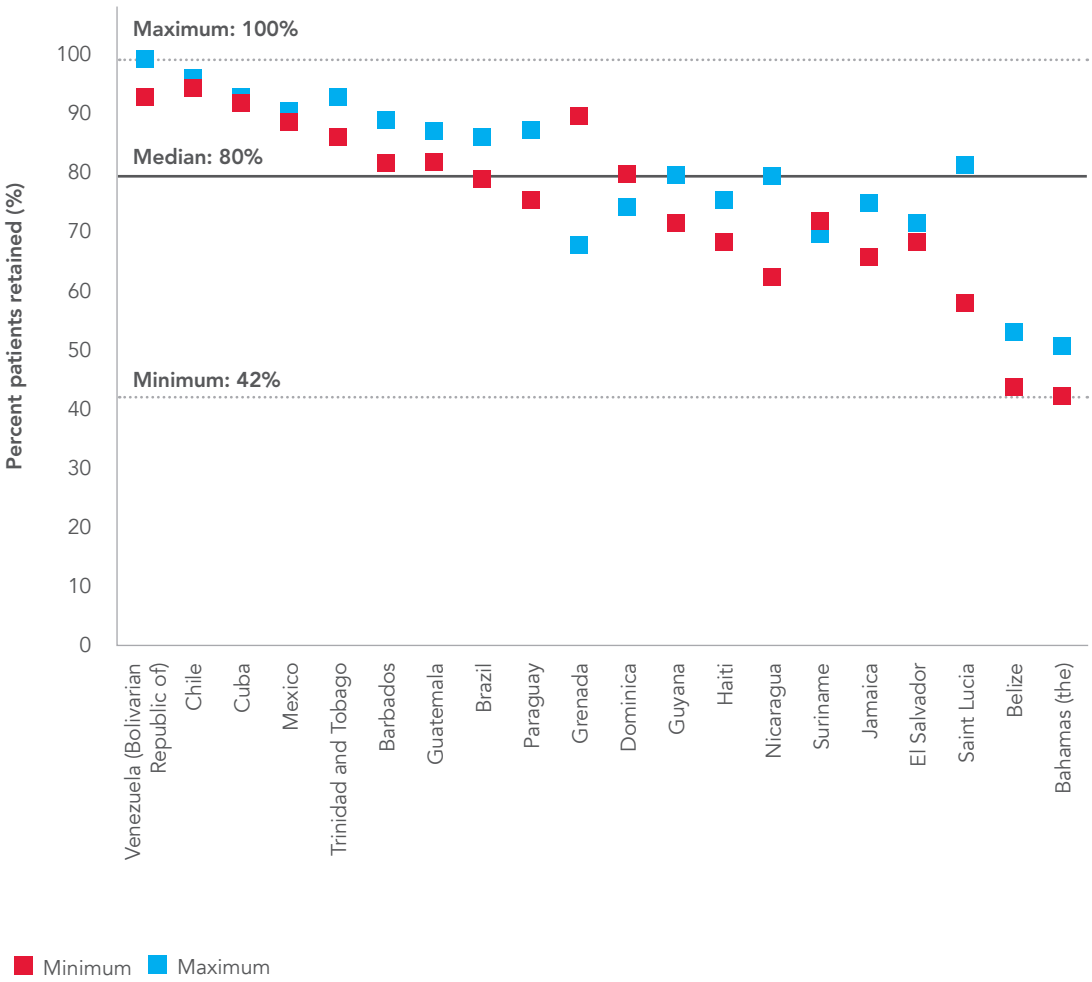
Source: Data from Ministries of Health 2012-2013. The numerator is from the HIV case-based surveillance data and is the number of persons diagnosed with HIV and still alive. The denominator is the estimated number of people living with HIV. The regional coverage value is the weighted average for these 7 countries.

Outside sub-Saharan Africa, many countries already appear to be on track to achieving 90% knowledge of HIV status by 2020. In Barbados, more than 90% of all people living with HIV know their HIV status, while at least 80% of people living with HIV in Brazil are aware of their infection.[33] For Latin America and the Caribbean as a whole, an estimated 70% of all people living with HIV have been diagnosed (Fig. 13). Across the region, home to 1.75 million people living with HIV, current trajectories suggest that it is entirely feasible to ensure that 90% of all people living with HIV will have been diagnosed by 2020 in a manner consistent with human rights principles.

Similarly encouraging evidence is available in Asia that some settings are within reach of the 90% target; in Viet Nam in 2012, for example, it was estimated that 79% of all people living with HIV knew their HIV status.[34] In the United States, where inadequate rates of knowledge of HIV status have long posed a challenge in the national AIDS response, an estimated 86% of all people living with HIV now know they are living with HIV.[35]

Fig. 14

12 AND 24 MONTH RETENTION ON TREATMENT IN LATIN AMERICA AND THE CARIBBEAN, 2013



Source: UNAIDS GARPR 2013 and WHO, Country universal access reports 2014.

REACHING TARGET 2:

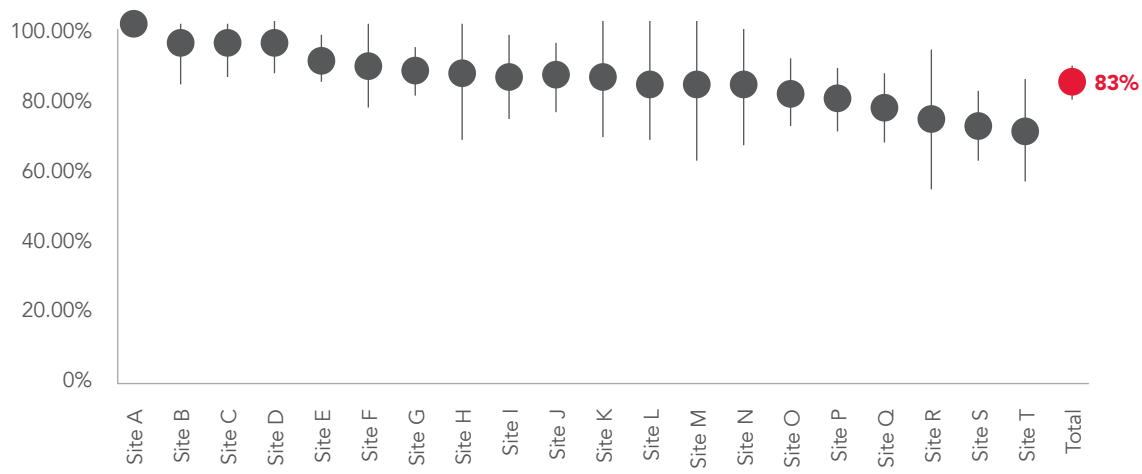
90% of all people with diagnosed HIV infection will receive sustained antiretroviral therapy (90% on HIV treatment)

High treatment coverage levels have been achieved regionally and nationally in multiple settings, putting them on pace to reach the second prong of the 90-90-90 target if progress continues. In countries as diverse as Botswana and Colombia, more than 70% of people diagnosed with HIV infection are currently receiving antiretroviral therapy. In Brazil, more than 60% of people diagnosed with HIV infection were receiving antiretroviral therapy in 2013.[36]

Strategic action will be needed to achieve and sustain high treatment coverage. Countries will need to align national treatment guidelines with evidence documenting the clear benefits of early treatment initiation and ensure use of preferred, optimized regimens. Recommending antiretroviral therapy to all people with diagnosed HIV infection, without the requirement of a prior CD4 test, has the potential to enhance treatment uptake by reducing loss to follow up. To achieve and maintain high treatment coverage levels, countries will need to ensure that HIV treatment and care, including diagnostic tests and other treatment-related items, is free to the individual. Countries will also need to address implementation issues that have often slowed scale-up, including frequent drug stockouts, barriers to procurement of optimally affordable medicines and diagnostics, and inadequate availability of second- and third-line regimens.

Fig. 15

PROPORTION (95% CI) OF PATIENTS WITH UNDETECTABLE VIRAL LOAD IN A NATIONALLY REPRESENTATIVE SAMPLE OF HIV-INFECTED ADULTS ON ART IN RWANDA

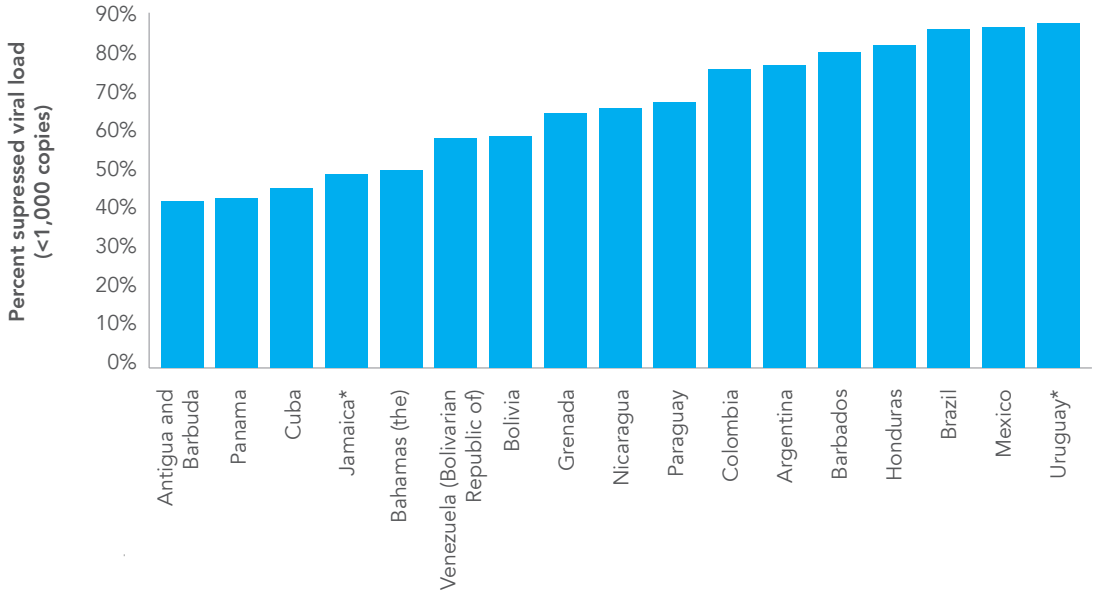


Source: Basinga P et al. (2013) PLoS

Fig. 16

PROPORTION OF PEOPLE ON ART WITH VIRAL SUPPRESSION IN LATIN AMERICA AND THE CARIBBEAN, 2013

Data from 17 countries representing 400,000 patients from the region in 2013



Source: WHO, Country universal access reports 2014 (Unpublished data).
* Uruguay figure represents only 35% of patients on ART, Jamaica data from 2012.

REACHING TARGET 3:

90% of all people receiving antiretroviral therapy will have viral suppression (90% suppressed)

Countries and programmes have also succeeded in achieving high levels of viral suppression, demonstrating the feasibility of a target of 90% viral suppression among all people receiving antiretroviral therapy by 2020. Nationally in Rwanda, for example, 83% of people receiving antiretroviral therapy were found to be virally suppressed after 18 months of therapy in 2008-2009 (Fig. 15).[37]

Experience demonstrates that high rates of viral suppression are attainable not only in individual countries and provinces, but across entire regions. According to data from 17 countries in Latin America and the Caribbean, the median rate of viral suppression among recipients of HIV treatment is 66%, with more than 80% of individuals receiving antiretroviral therapy having achieved viral suppression in at least five countries (Barbados, Brazil, Honduras, Mexico and Uruguay) (Fig. 16).

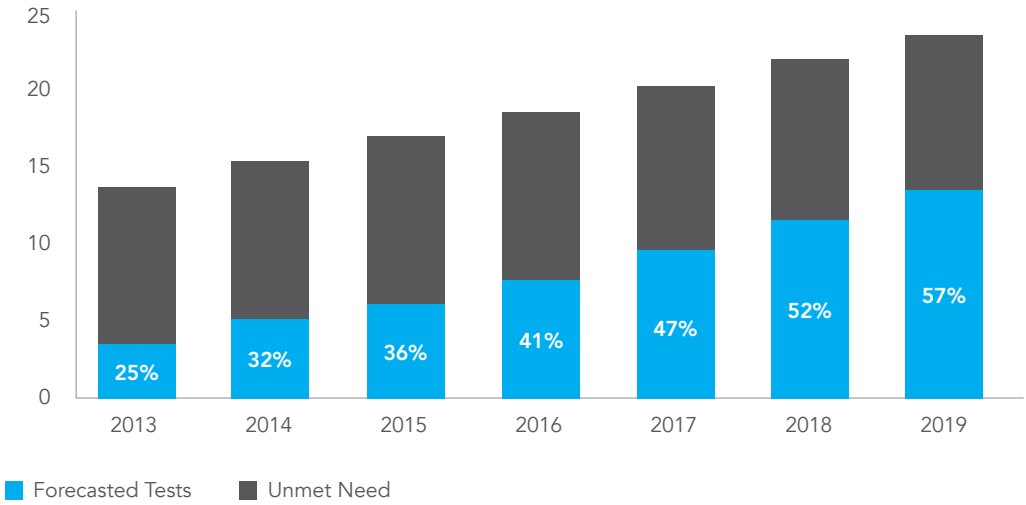
These impressive rates of viral suppression are encouraging. However, they do not account for AIDS-related mortality or loss to follow up, highlighting the essential need for intensified efforts to ensure long-term retention in care among those who enrol in HIV treatment. Consistent with a cascade approach to treatment targeting, the third target requires sustained use of HIV treatment and ongoing virologic monitoring to verify treatment success and to intervene to support treatment adherence and re-engage those who fall out of care. Although retention in care remains an important challenge, countries have already demonstrated the feasibility of achieving high retention rates. For Latin America and the Caribbean as a whole, for example, median retention after 24 months was 83% in 2013 (Fig. 14).

Operationalization of the third component of the new treatment target will require concerted efforts to improve access to viral load testing technologies. To meet the 90-90-90 target and thereby lay the foundation to end the AIDS epidemic, every person starting HIV treatment will need to have access to viral load testing. Viral load monitoring is essential for HIV treatment optimization, and every person living with HIV has the right to know her or his viral load.

Fig. 17

PREDICTED VIRAL LOAD TESTING SCALE UP WILL NOT MEET THE NEED

This scenario assumes expected rates of viral load scale-up based on previously observed rates of test adoption



Source: HIV Viral Load Forecast: Low and Middle-Income Countries. Clinton Health Access Initiative, 2014.

Note: This forecast projects access to viral load testing, comparing anticipated test volumes to the overall need in 21 high-burden countries. To estimate coverage, a bottom-up analysis of existing testing capacity and scale-up plans was conducted on a country-by-country basis. Assumptions regarding scale-up were generated using available country guidelines and viral load implementation plans. Growth rates are tied to historical volumes for the scale-up of early infant diagnosis and viral load across countries. The unmet need is defined by the total number of patients expected to receive ART monitoring in a country and the country's guidelines.

In addition to optimizing treatment outcomes, viral load testing may also help lower treatment costs. Where viral load tests are unavailable, clinicians are unable to identify early treatment failure and intervene to support patients who are having difficulty adhering to prescribed regimens. As a result, individuals whose less expensive first-line regimens might have been preserved with effective adherence support interventions may be prematurely switched to more expensive second- and third-line regimens.

Unfortunately, projections by the Clinton Health Access Initiative indicate that the current pace of viral load diagnostic scale-up is unlikely to meet future demand (Fig. 17). There is an active pipeline of point-of-care viral load technologies, which may help accelerate access to diagnostic tools and improve outcomes across the HIV treatment cascade. Ensuring universal access to viral load testing in all settings, urban and rural, will likely require a combination of centralized laboratories and point-of-care tools.

In June 2014, UNAIDS, WHO, the African Society of Laboratory Medicine, and the US Centers for Disease Control and Prevention jointly convened a global consultation on the role of laboratory medicine in meeting the 90-90-90 target. More than 130 specialists from across the world endorsed a call by the US Centers for Disease Control and Prevention to explore a global Diagnostics Access Initiative to build the robust, sustainability laboratory capacity that will be needed to meet global treatment goals. This new initiative was launched at the International AIDS Conference in Melbourne in July.

REACHING 90-90-90: PROJECTED IMPACT

To estimate the impact in 2030 of a scaled-up response, UNAIDS commissioned a team of globally recognized health modellers to project the health and economic consequences of ambitious new targets. The modelling team drew on published peer-reviewed literature on intervention effectiveness, specifically taking account of intervention effects documented in 56 published studies.

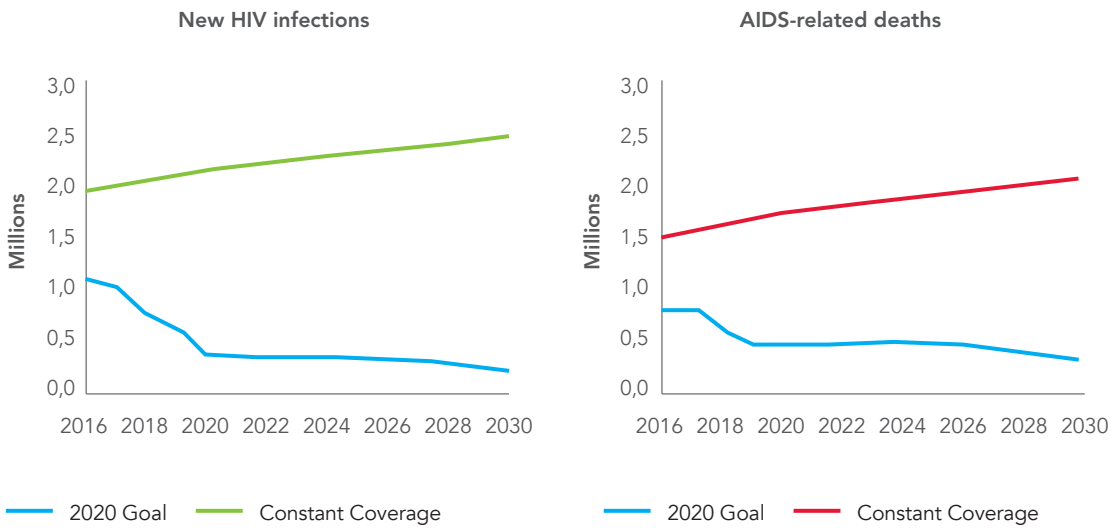
Recognizing the importance of a comprehensive response, the modelling work included not only the ambitious 90-90-90 treatment target but also similarly visionary goals for HIV prevention. For the treatment cascade, the model assumed achievement of the 90-90-90 target by 2020, with levels of antiretroviral coverage and viral suppression rising to 95% by 2030.

The model's prevention targets varied by intervention, but were in all cases ambitious. It was also assumed that programmatic uptake and outcomes will be enhanced by scaled-up community mobilization and other critical enablers.

The model found that achieving these ambitious targets, including rapid treatment scale-up by 2020, would end the AIDS epidemic as a major global health threat by 2030 (Fig. 18). Reaching the 90-90-90 target, when complemented by scale-up of other prevention tools, would reduce the annual number of new HIV infections by nearly 90% by 2030. The number of AIDS-related deaths would fall by 80% by 2030 with achievement of these new post-2015 targets based on available diagnostic and treatment technologies, with the expectation that the likely emergence and uptake of additional medical innovations (such as improved diagnostic tools and longer-acting antiretrovirals) will ensure at least a 90% reduction in AIDS-related deaths by 2030. For both HIV incidence and AIDS-related deaths, the envisaged rapid scale-up would result in the sharpest declines between now and 2020, with continued reductions occurring the following decade as the epidemic's momentum is progressively depleted.

Fig. 18

IMPACT OF THE 90-90-90 TARGET ON HIV INFECTIONS AND AIDS-RELATED DEATHS, 2016-2030



Source: The Gap Report, UNAIDS, 2014.

THE ROAD TOWARDS 90-90-90: KEY CHALLENGES TO OVERCOME

The countries in which progress towards the 90-90-90 target has been most pronounced have found ways to overcome challenges that slow HIV treatment scale-up and worsen treatment outcomes. Extending these successes worldwide will require application of best practices and lessons learnt from high-achieving settings as well as tailored approaches to address the unique challenges in diverse settings and populations.

Catching up in settings with low service coverage

Notwithstanding the historic progress that has been achieved in expanding access to HIV treatment in low- and middle-income countries over the last decade, treatment coverage remains extremely low in some countries. In 19 countries, HIV treatment coverage was less than 20% in 2013, including eight countries with HIV treatment coverage lower than 10%.

Enormous treatment coverage gaps persist in several countries with sizable HIV burdens. In Nigeria, home to 3.2 million people living with HIV, adult treatment coverage was only 21% in 2013. In Chad, the Democratic Republic of Congo, and South Sudan – home to 210 000, 440 000 and 150 000 people living with HIV – adult treatment coverage was 24%, 20% and 5%, respectively.

While experiences to date indicate that the 90-90-90 target is achievable in many countries, intensive, highly focused efforts will be required to unblock progress in countries where few people currently have access to HIV treatment. In response to a call by MSF for tailored, milestone-driven "catch-up plans" for countries where progress lags, UNAIDS has committed to lead efforts to assist national partners in developing treatment acceleration plans in the 15 countries that together account for 75% of new HIV infections, as well as in other countries with heavy HIV burden. These plans will include annual progress targets for treatment scale-up and viral suppression; focused action steps to address political, logistical, financial and other implementation challenges; and clarification of roles and responsibilities among key stakeholders.

Societal challenges

Stigma and discrimination continue to undermine effective responses. For example, in one study of HIV-infected children lost to follow-up in Malawi, 30% of caregivers cited fear of disapproval among families or communities as the reason their children were no longer engaged in care.[38]

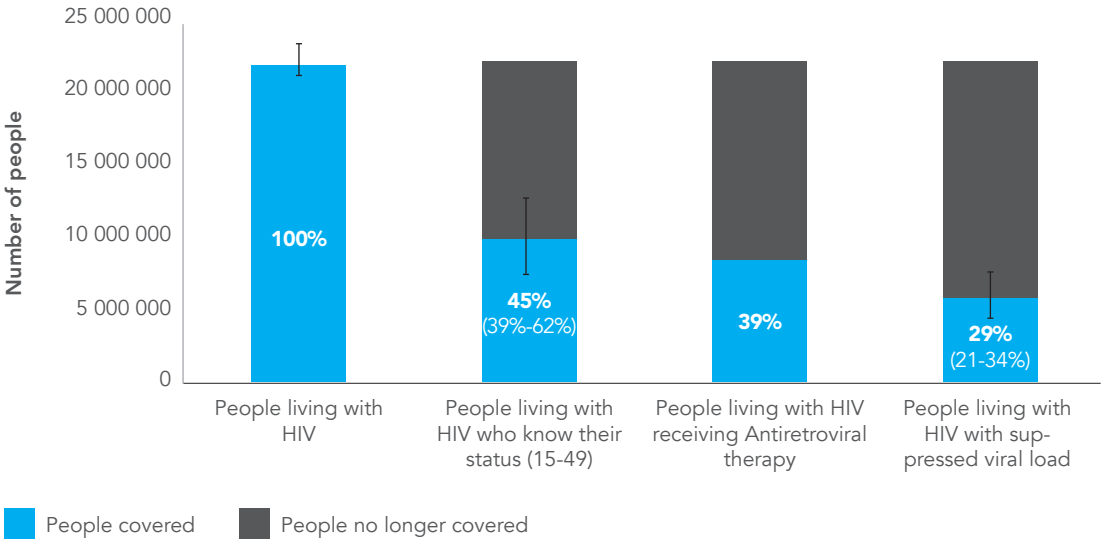
Punitive laws reflect and reinforce stigmatizing and discriminatory attitudes regarding people living with HIV and key populations. As of 2014, 61 countries had adopted legislation criminalizing HIV exposure, transmission or non-disclosure, with prosecutions against people living with HIV having occurred in an additional 49 countries.[16] Punitive laws targeting key populations make it more difficult to monitor epidemics among key populations, which in turn perpetuates the neglect of key populations' needs, as decision-makers lack the strategic information that might persuade them to prioritize testing and treatment services for key populations. To achieve the 90-90-90 target, punitive frameworks must be repealed and replaced with national responses that recognize people living with HIV and members of key populations as essential partners in the development and implementation of rights-based programmes and policies.

At a societal level – whether broadly defined for high-prevalence countries, or at a population level for key populations – knowledge of HIV status has often yet to be established as a fundamental social norm. While working to leverage every available strategy – community-centered testing campaigns, full implementation of provider-initiated HIV counseling and testing, social marketing, self-

testing and the like – specific efforts are needed to educate communities regarding the HIV testing imperative. For HIV testing, as for all other elements of the 90-90-90 target, a rights-based approach that rejects coercion and stigmatization is essential to success.

Fig. 19

ABBREVIATED HIV TREATMENT CASCADE FOR ADULTS IN SUB-SAHARAN AFRICA AGED 15 YEARS OR MORE, 2013

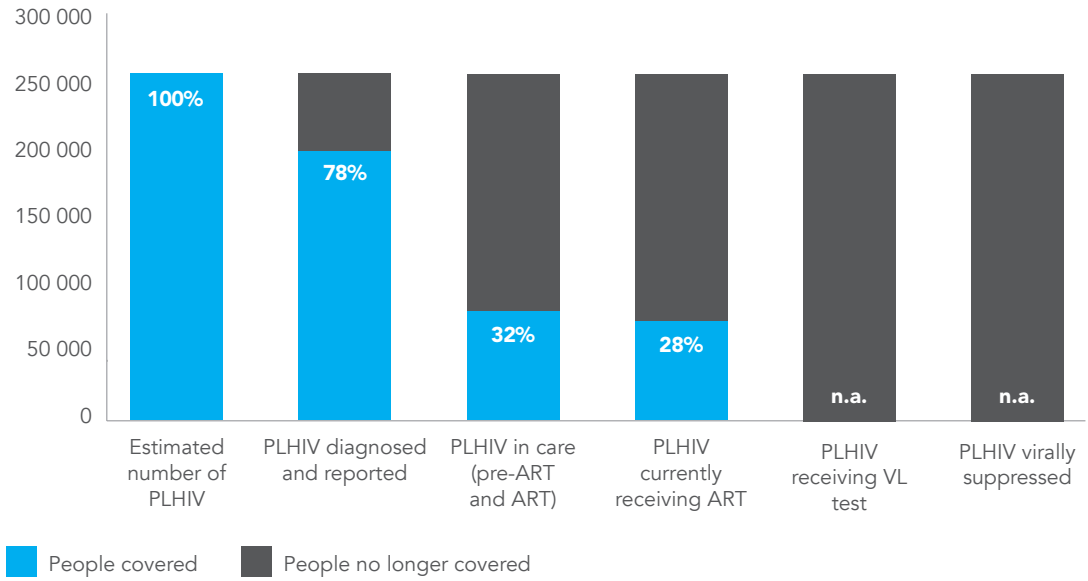


Sources:
UNAIDS 2013 estimates.
Demographic and Health Surveys, 2007-2012 and Shisana, O, Rehle, T, Simbayi LC, Zuma, K, Jooste, S, Zungu N, Labadarios, D, Onoya, D et al. (2014) South African National HIV Prevalence, Incidence and Behaviour Survey, 2012. Cape Town, HSRC Press. 45% is the mid-point between the low and high bounds. The low bound (33%) is the percentage of people living with HIV who are very likely to know ther status (tested positive in the survey and report receiving the results of an HIV test in the previous twelve months). The high bound (57%) is calculated as the percentage who tested positive in the survey who self-report ever being tested for HIV (the test conducted in the survey is not disclosed to the recipients). Those persons who report never having been tested for HIV do not know their HIV status and make up the remaining 43%.
Barth RE, van der Loeff MR, et al. (2010). Virological follow-up of adult patients in antiretroviral treatment programmes in sub-Saharan Africa: a systematic review. Lancet Infec Disease 10(3):155-166 and Kenya AIDS Indicator Survey 2012: National AIDS and STI Control Programme, Ministry of Health, Kenya. September 2013. Kenya AIDS Indicator Survey 2012: Preliminary Report. Nairobi, Kenya., giving 50% weight to the work by Barth and 50% weight to KAIS 2012. Proportional bounds from Barth et al. were applied.

Recognizing the critical need to focus on quality as well as uptake, a growing number of countries and sub-national settings are developing their own estimates for outcomes across the treatment cascade. In every setting where cascade estimates have been made, a substantial gap has been documented between the number of people living with HIV and the proportion of this population with viral suppression. Gaps are even greater for certain populations, such as children, adolescents and key populations. In Uganda, only 12% of the estimated 110 000 adolescents living with HIV obtained antiretroviral therapy in 2013.[39]

Fig. 20

TREATMENT CASCADE FOR VIETNAM 2012

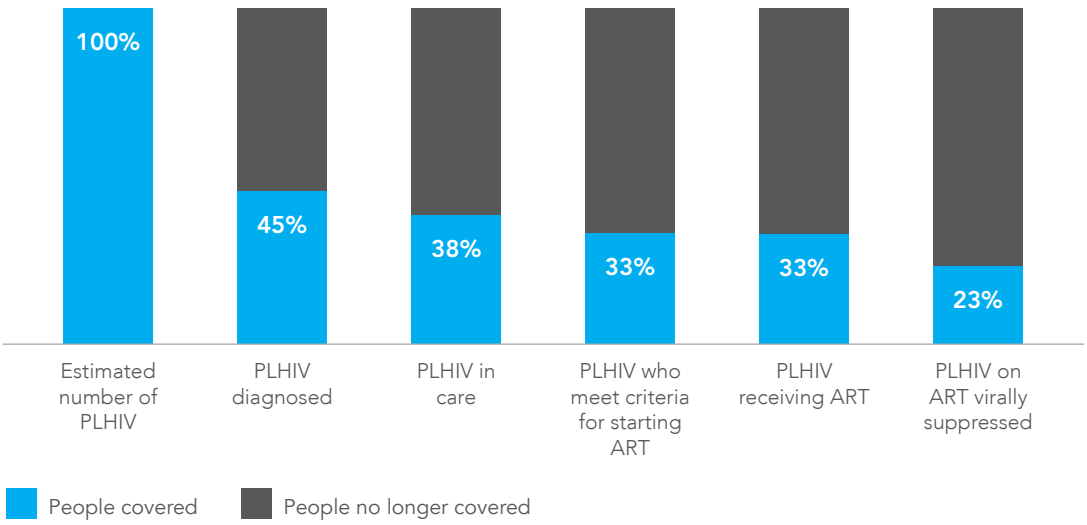


Source: Estimates by Ministry of Health, Viet Nam, Administration for HIV/AIDS Control.

In sub-Saharan Africa, for example, UNAIDS estimates that only 29% people living with HIV have achieved viral suppression (Fig. 19). This rate of viral suppression is comparable to results reported for such countries as Colombia (23%) and the U.S. (24%), but higher than in Jamaica, where only an estimated 13% of people living HIV are virally suppressed. However, evidence indicates that higher rates of viral suppression are already being achieved in some countries, with 39% of people living with HIV in Barbados having viral suppression in 2013.

Fig. 21

HIV TREATMENT CASCADE OUTCOMES, COLOMBIA, 2013



Source: Government of Colombia, Ministry of Health and Social Protection, 2014.

While a minority of people living with HIV are virally suppressed in every country where treatment cascades have been developed, the factors that diminish treatment outcomes vary among countries. For example, while most people living with HIV in Viet Nam know their HIV status, people living with HIV in Viet Nam appear to experience considerable barriers to health care access following an HIV diagnosis (Fig. 20). By contrast, evidence indicates that Colombia has achieved high rates of HIV treatment access and retention once individuals reach the health care system, but that most people living with HIV remain undiagnosed (Fig. 21). Insights derived from experiences in diverse settings now need to be brought together in a single whole, in which successful testing promotion strategies are combined with lessons learnt in facilitating early and continuous health care access.

Recognizing that quality assurance needs to proceed at the same time that treatment is scaled up, if viral suppression is to be maximized, Malawi has implemented quarterly national reporting that is based on quarterly monitoring visits and evaluations at every clinical site that provides HIV treatment. National and district health staff, supplemented by private sector partners in settings where health staff are inadequate, undertake the site reviews. In 2013, for example, site reviews at 668 public and private clinics involved 1 799 working hours. At each visit, clinic performance is assessed, with a Certificate of Excellence issued to those that demonstrate excellent outcomes.[40]

Delivery challenges

In all settings, programme planners and implementers, in collaboration with community partners, will need to identify those in need of treatment services who remain unengaged and then develop strategies that are locally tailored and that leverage available community resources to engage people in care.

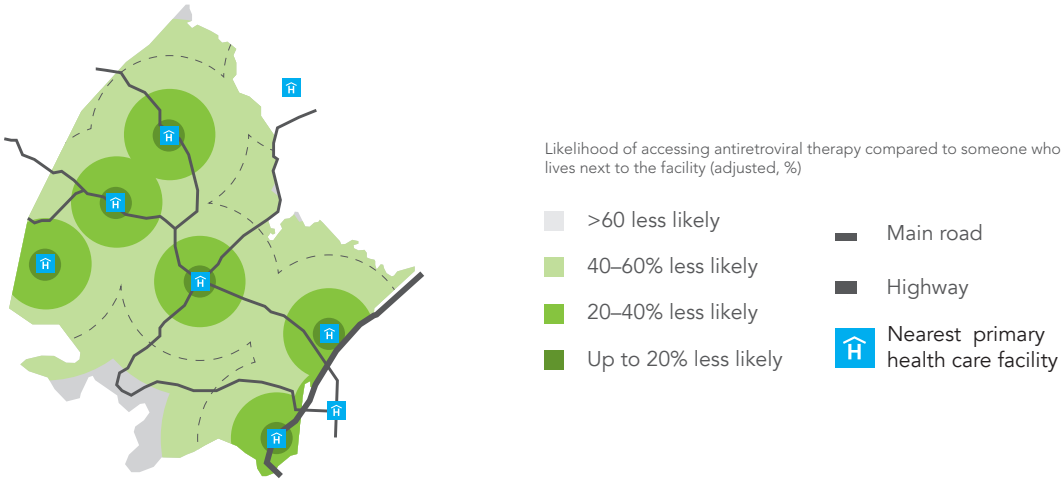
The persistent centralization of HIV treatment services in many settings reduces the success of treatment programmes. In KwaZulu-Natal, South Africa, rates of treatment utilization decline as the distance an individual needs to travel to obtain treatment services increases (Fig. 22), highlighting the pivotal need to bring services closer to those who need them. To facilitate further decentralization, treatment services urgently need to make optimal use of task-shifting, including appropriately compensated community resources, to extend the reach of antiretroviral therapy.[1] Investments in community systems strengthening will be essential to realizing the promise of decentralized, community-based treatment delivery.

Delivery strategies that are tailored for the needs and circumstances of individual populations and settings also help encourage scale-up and retention in care. In the case of adult men, who are less likely than women to obtain HIV treatment in sub-Saharan Africa, flexible evening and weekend clinic hours, workplace programmes, partnerships with the private sector and service systems specifically tailored to men may be needed. In Uganda, adoption of a family-centred service delivery model was associated with a marked increase in paediatric HIV treatment uptake (Fig. 23).[41] Similarly tailored approaches are critical to address the needs of key populations, people living in remote areas, migrants, prisoners and others whose needs are not effectively addressed by mainstream service systems.

WHO has convened stakeholders in efforts to optimize both HIV treatment regimens and service delivery approaches, including use of point of care diagnostics where appropriate. Action steps include immediate implementation of WHO 2013 guidelines that address simplified regimens, community based treatment delivery, and scale-up of point-of-care diagnostic tools in appropriate settings as they become available.[1]

Fig. 22

LIKELIHOOD OF ACCESSING ANTIRETROVIRAL THERAPY, RELATIVE TO DISTANCE FROM HEALTHCARE FACILITY, KWAZULU NATAL, SOUTH AFRICA

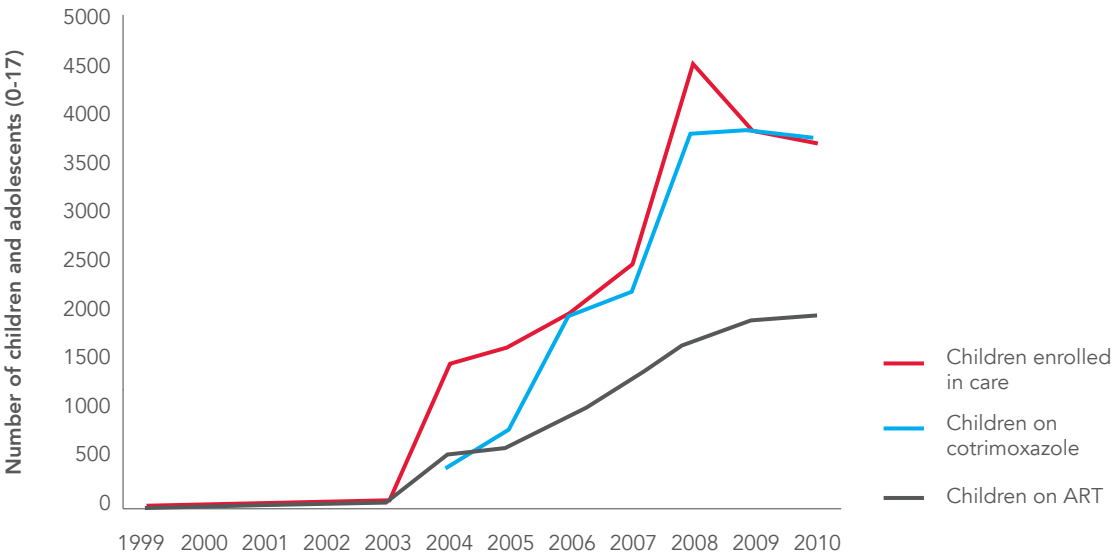


Relative likelihood of HIV-positive adults (15-49 years) accessing antiretroviral therapy due to the distance from their nearest primary healthcare facility.

Source: Location, Location: Connecting people faster to HIV services, UNAIDS; Geneva, 2013.

Fig. 23

UPTAKE OF PAEDIATRIC HIV SERVICES AFTER INTRODUCTION OF FAMILY-BASED APPROACH, UGANDA



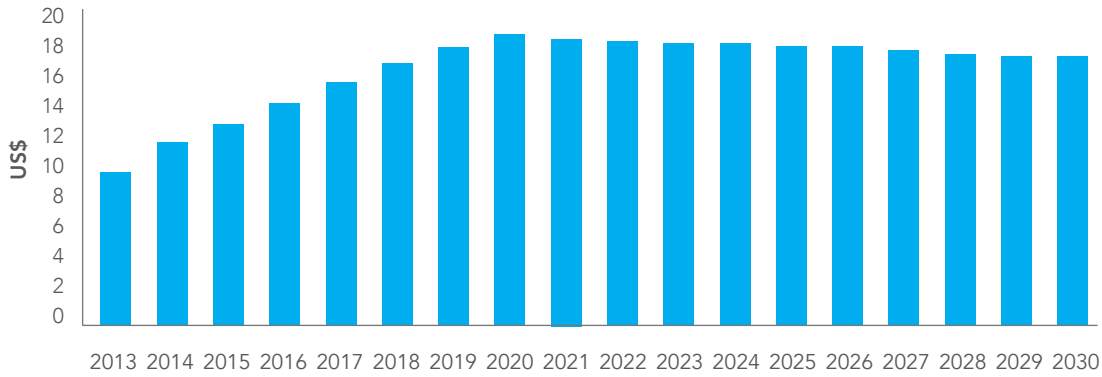
Source: Luyirika et al., PloS ONE, 2013.

Costs of achieving the 90-90-90 target

Increased funding will be needed to end the AIDS epidemic by 2030, although the resources required for rapid scale-up towards the 90-90-90 target are manageable. To reach the 90-90-90 target, HIV treatment, including drug costs, service delivery, community mobilization to ensure access to testing and retention in treatment, and pre-ART costs, will require a total US$14 billion by 2016. In 2016-2020, funding will need to ramp up incrementally each year, reaching US$18 billion by 2020. From peak spending in 2020, it is projected that treatment costs will modestly decline through 2030, when treatment costs will total US$16.9 billion (Fig. 24).

Fig. 24

RESOURCE NEEDS FOR THE 90-90-90 TREATMENT TARGET, 2016-2030 (DRUGS, SERVICE DELIVERY, TESTING AND COUNSELLING, COMMUNITY MOBILIZATION AND PRE-ART COSTS)

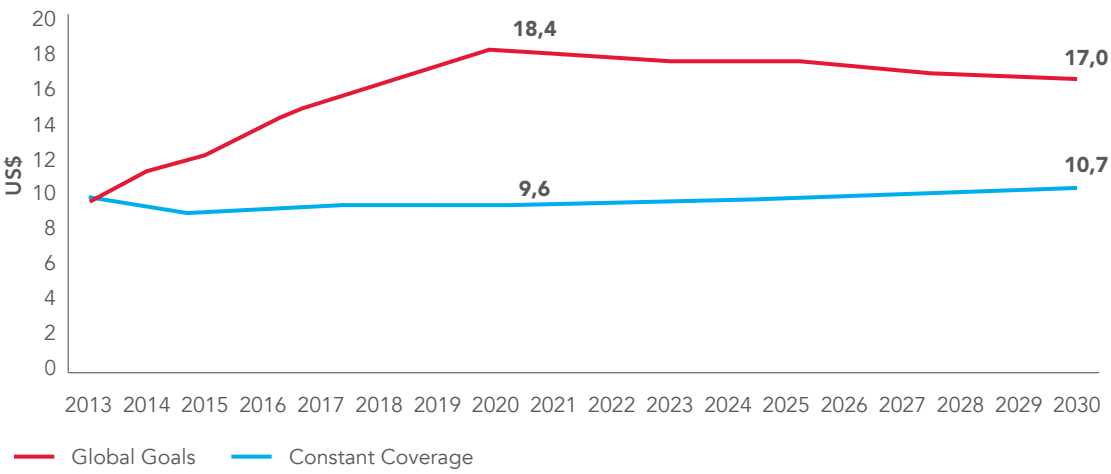


Source: UNAIDS Global Price Tag Estimates, September 2014. Unpublished results.

The combined health and financial advantages of the 90-90-90 target become even clearer when outcomes are compared with those that would occur if current scale-up trends are continued. In 2030, the cost of 90-90-90 would be comparable (US$ 17 billion) and for continuation of current scale-up (US$ 10.7 billion) (Fig.25). However, with achievement of the 90-90-90 target by 2020, it is projected that nearly 350 000 people will die of AIDS-related causes in 2030, compared to 2.1 million deaths with continuation of current coverage (Fig. 18).

Fig. 25

RESOURCE NEEDS FOR TREATMENT COSTS FOR CONSTANT COVERAGE AS OF 2013 AND FOR THE 90-90-90 TARGET



Source: UNAIDS Global Price Tag Estimates, September 2014. Unpublished results.

To mobilize the resources needed to finance and sustain the push to achieve the 90-90-90 target, principles of global solidarity and shared responsibility will need to prevail. In addition, substantial efforts will be required to maximize the efficiency of programmes.

Fig. 26

PARTNERING FOR SUCCESS

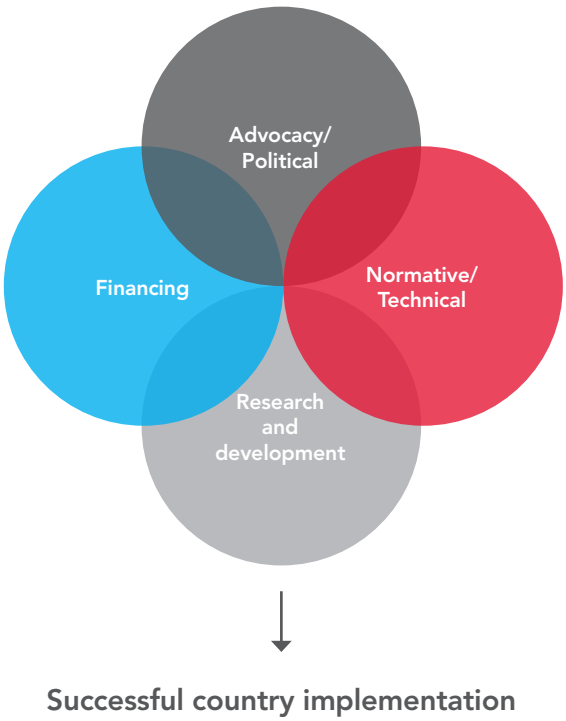
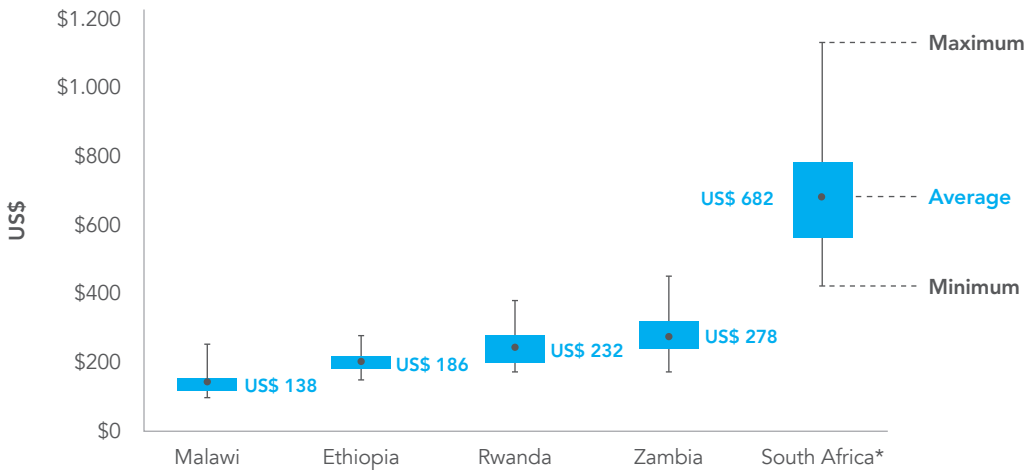


Fig. 27

FACILITY LEVEL COSTS VARY AMONG COUNTRIES



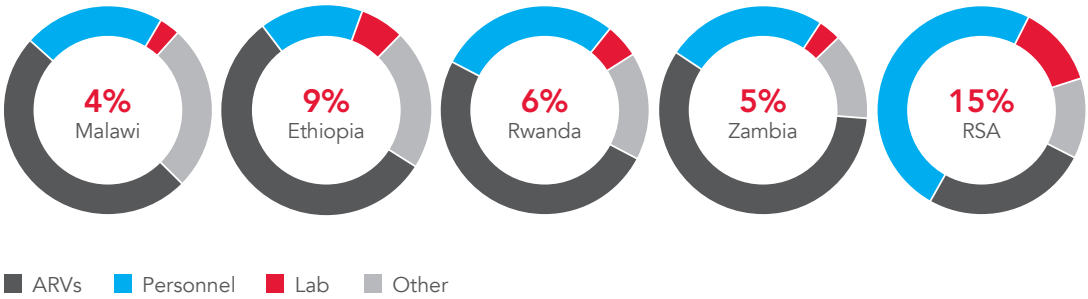
* Republic of South Africa: costs include updated antiretroviral prices, which were renegotiated by the RSA government in early 2010 and are 53% lower than those observed during the costing period.

Sources: Clinton Health Access Initiative (CHAI) presentation 2014, Data from country reports (Ministries of Health).

Evidence suggests that there is considerable room for efficiency gains, as treatment-related facility level costs are often substantially higher in some settings than in others (Fig. 27). While a host of factors may influence per-patient facility level costs, including higher salaries and other health care costs in more developed economies, available data indicate that inefficiencies may also explain some of the variation in facility costs.

Fig. 28

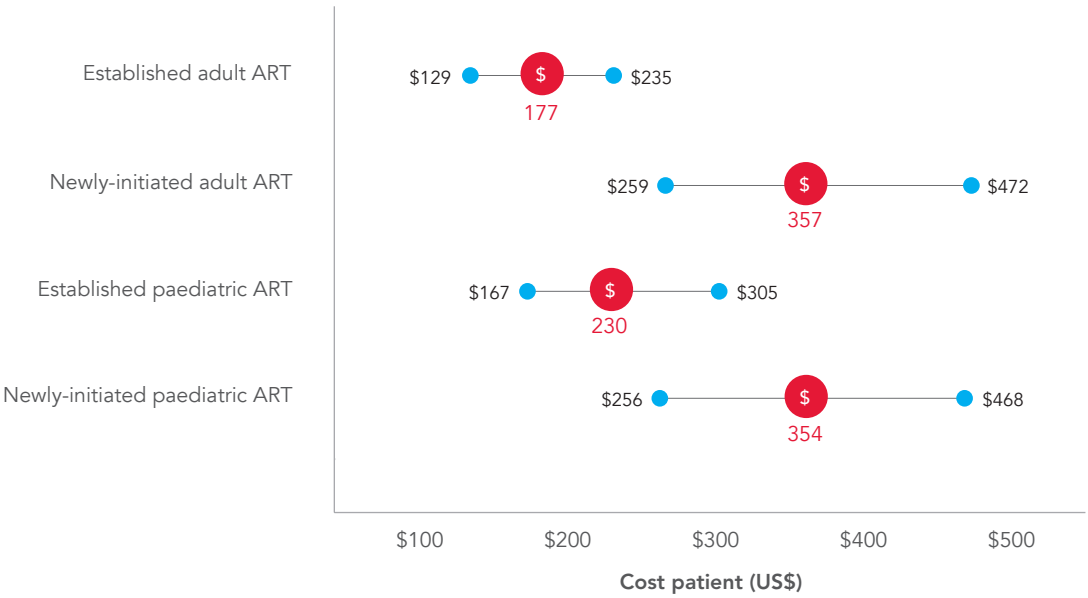
COMPONENTS OF HIV TREATMENT SPENDING: THE SHARE OF LAB PORTFOLIO VARIES BY COUNTRY



Among national treatment programmes, the share of HIV treatment spending allocated to laboratory services also varies widely (Fig. 28). Likewise, National AIDS Spending Assessments indicate that the share of resources dedicated to programme management differs substantially among countries.

Fig. 29

AVERAGE ANNUAL PER-PATIENT HIV TREATMENT COSTS, BY PATIENT TYPE



Source: UNAIDS 2011 estimates.

Source: Nicolas A. Menzies, Andres A. Berruti, John M. Blandford, The Determinants of HIV Treatment Costs in Resource Limited Settings, PLoS ONE November 2012 Vol.7, Issue 11, e48726

Brokering of South-South information-sharing, pooled procurement and focused technical support should aid settings with higher facility costs bring expenses down. For national programmes, leadership is required to allocate resources in a way to maximize funding for high-value, high-impact interventions, such as HIV testing and treatment. Enhanced coordination among donors and between donors and national coordinating bodies would also help ensure most efficient use of finite resources.

While scaling up involves up-front costs, per-patient costs decline as individuals initiating antiretroviral therapy are stabilized and require less intensive clinical intervention over time. Excluding the costs of antiretroviral therapy, service delivery costs are more than twice as high for patients newly started on HIV treatment than for established treatment patients (Fig. 29).

ENDING THE AIDS EPIDEMIC

Achieving the 2015 target of 15 million receiving antiretroviral therapy – an increasingly likely scenario – is but a first, albeit important, step towards the ultimate goal of ending the AIDS epidemic. In the post-2015 era, it is now clear that the goal of ending the AIDS epidemic is achievable – but only if the world strategically uses the enormous human, technical and financial resources at its disposal.

Only a partnership approach will enable the world to the AIDS epidemic. The world will need to combine political will, evidence-based normative guidance, continued generation of critical evidence for action, and sufficient financial resources to reach the 90-90-90 target and to sustain lifelong HIV treatment for tens of millions worldwide.

UNAIDS is committed to working in partnership with the full array of essential stakeholders – including but not limited to national governments; WHO, the Global Fund, PEPFAR and other donors; civil society, including people living with HIV and key populations; the private sector; professional medical groups; and others – to make the 90-90-90 target a reality. While new thinking and new ways of operating will be needed to achieve these ambitious targets, the partnerships that have enabled the AIDS response to make history provide a firm foundation on which to embark on a worldwide effort to end the AIDS epidemic by 2030.

In particular, UNAIDS commits to leverage its convening role to collaborate with partners in developing a roadmap for implementation of the 90-90-90 target. Establishing annual benchmarks for knowledge of HIV status, antiretroviral therapy utilization and viral suppression – and having robust systems in place to monitor results across the treatment continuum – will be critical to drive progress towards the ambitious new targets.

The tools and strategies now exist to end the AIDS epidemic by 2030. However, getting there requires unprecedented action now to scale up early antiretroviral therapy, as delay will merely allow the epidemic to continue to outpace the response. Inspired by what has been achieved to date and undaunted by the challenges ahead, the entire global community should resolve not to allow this historic opportunity to pass by.

REFERENCES

1. WHO, Consolidated guidelines on the use of antiretroviral drugs for preventing and treating HIV infection, 2013.
2. Grinsztejn B et al. Effects of early versus delayed initiation of antiretroviral treatment on clinical outcomes of HIV-1 infection: results from the phase 3 HPTN 052 randomised controlled trial. Lancet Infect Dis, 2014, DOI:10.1016/S1473-3099(13)70692.3.
3. Collaborative Group on AIDS Incubation and HIV Survival. Time from HIV-1 seroconversion to AIDS and death before widespread use of highly-active antiretroviral therapy: a collaborative re-analysis. Lancet, 2000, 355:1131-1137.
4. Samji H et al. Closing the Gap: Increases in Life Expectancy among Treated HIV-Positive Individuals in the United States and Canada. PLoS ONE, 2013, 8: e81355.
5. Karim SAS, Karim QA. Antiretroviral prophylaxis: a defining moment in HIV control. Lancet, 2011, 378:e23-e25.
6. Rodger A et al. HIV transmission risk through condomless sex if HIV+ partner on suppressive ART: PARTNER study. 21st Conference on Retroviruses and Opportunistic Infections, Abstrract 153LB, Boston, USA, 2014.
7. Tanser F et al. High Coverage of ART Associated with Decline in Risk of HIV Acquisition in KwaZulu-Natal, South Africa. Science, 2013, 339:966-971.
8. Montaner JSG et al., 2014. Expansion of HAART coverage is associated with sustained decreases in HIV/AIDS morbidity, mortality and HIV transmission: the "HIV treatment as prevention" experience in a Canadian setting. PLoS ONE, 2014, 9:e87872.
9. Granich R et al. Expanding ART for treatment and prevention of HIV in South Africa: Estimated cost and cost-effectiveness 2011-2050. PLoS ONE , 2012, 7:e30216.
10. Resch S et al. Economic returns to investment in AIDS treatment in low and middle income countries. PLoS One, 2011, 6:e25310.
11. Ventelou B et al. The macroeconomic consequences of renouncing to universal access to antiretroviral treatment for HIV in Africa: a micro-simulation model. PLoS ONE, 2012, 7:e34101.
12. Granich R et al. Expanding ART for treatment and prevention of HIV in South Africa: estimated cost and cost-effectiveness 2011-2050. PLoS ONE, 2012, 7:e30216.
13. Walensky RP et al., Cost-effectiveness of HIV treatment as prevention in serodiscordant couples, New Eng J Med, 2013, 369:1315-1325.
14. Newell ML et al. Mortality of infected and uninfected infants born to HIV-infected mothers in Africa: a pooled analysis. Lancet, 2004, 364:1236–43.
15. Montaner JSG et al. The case for expanding access to highly active antiretroviral therapy to curb the growth of the HIV epidemic. Lancet, 2006, 368:531-536.
16. UNAIDS, The gap report, Geneva: UNAIDS, 2014.
17. Baral S et al. Elevated Risk for HIV Infection among Men Who Have Sex with Men in Low- and Middle-Income Countries 2000-2006: A Systematic Review, PLoS Med, 2007, 4:e339.
18. Baral S et al. Burden of HIV among female sex workers in low-income and middle-income countries: a systematic review and meta-analysis. Lancet Infect Dis, 2012, doi:10.1016/S1473-3099(12)70066-X.
19. Baral SD et al. Worldwide burden of HIV in transgender women: a systematic review and meta-analysis, Lancet Infect Dis, 2013, 13:214-222.

20. Wolfe D et al. Treatment and care for injecting drug users with HIV infection: a review of barriers and way forward. Lancet, 2010, 376:355-366.

21. Arreola A et al., Access to HIV prevention and treatment for men who have sex with men: Findings from the 2012 Global Men's Health and Rights Study (GMHR), Global Forum on MSM & HIV, 2012.

22. Gender Dynamix, amfAR, Transgender access to sexual health services in South Africa: findings from a key informant survey, 2012.

23. Kerr T et al., The impact of compulsory drug detention exposure on the avoidance of healthcare among injection drug users in Thailand, Int J Drug Policy, 2014, 25:171-174.

24. Shannon K et al., Global epidemiology of HIV among female sex workers: influence of structural determinants, Lancet, 2014, doi:10.1016/S0140-6736(14)60931-4.

25. WHO, Health for the world's adolescents, 2014. http://apps.who.int/adolescent/second-decade/.

26. Newell ML et al. Mortality of infected and uninfected infants born to HIV-infected mothers in Africa: a pooled analysis. Lancet, 2004, 364:1236–43.

27. Fergusson P, Tomkins A, HIV prevalence and mortality among children undergoing treatment for severe acute malnutrition in sub-Saharan Africa: a systematic review, Trans R Soc Trop Med Hyg, 2008, doi:10.1016/jtrstmh.2008.10.029.

28. Hesseling AC et al., High incidence of tuberculosis among HIV-infected infants: Evidence from a South African population-based study highlights the need for improved tuberculosis control strategies, Clin Infect Dis, 2009, 48:108-114.

29. UNITAID, HIV/AIDS medicines market and technology landscape, 2014.

30. McNairy ML et al. Identifying Optimal Models of HIV Care and Treatment in Sub-Saharan Africa Consortium. Retention of HIV-infected children on antiretroviral treatment in HIV care and treatment programs in Kenya, Mozambique, Rwanda, and Tanzania. J Acquir Immune Defic Syndr, 2013, 62:e70-e81.

31. WHO, March 2014 supplement to the 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection, Geneva: WHO, 2014.

32. Althorp K. Multi-disease prevention campaigns (part 2): case studies from Kenya and Uganda. 013. Available: http://www.aidsmap.com/Multi-disease-prevention-campaigns-part-2/page/2811299/.

33. Government of Brazil, Ministry of Health of Brazil- STI-AIDS-Viral Hepatitis, 2014.

34. Information provided by UNAIDS Regional Support Team for Asia and the Pacific, June 2014.

35. US Centers for Disease Control and Prevention, HIV Surveillance Supplemental Report, 2013.

36. Data from Ministries of Health of Brazil and Colombia, reported at a HIV treatment retargeting consultation, Buenos Aires, Argentina, April 2014.

37. Elul B et al. High levels of adherence and viral suppression in a nationally representative sample of HIV-infected adults on antiretroviral therapy at 6, 12 and 18 months in Rwanda. PLoS ONE, 2013, 8:e53586.

38. Cohen D et al. HIV testing coverage family members of adult antiretroviral therapy patients in Malawi. AIDS Care, 2010, 22:1346-1349.

39. Uganda AIDS Control Programme, Ministry of Health, Laying the ground for scaling up ART for adolescents: Experience from Uganda, International Conference on AIDS and STIs in Africa, 2013.

40. Malawi Ministry of Health. Integrated HIV program report – January – March 2013.

41. Luyirika E et al. Scaling up paediatric HIV care with an integrated, family-centred approach: an observational case study from Uganda. PLoS ONE, 2013, 8:e69548.

NOTES

UNAIDS
Joint United Nations
Programme on HIV/AIDS

UNHCR
UNICEF
WFP
UNDP
UNFPA
UNODC
UN WOMEN
ILO
UNESCO
WHO
WORLD BANK

20 Avenue Appia
1211 Geneva 27
Switzerland

+41 22 791 3666
distribution@unaids.org

unaids.org