

# AMBITIOUS TREATMENT TARGETS:

WRITING THE FINAL CHAPTER  
OF THE AIDS EPIDEMIC



Ending AIDS is more than a historic obligation to the 39 million people who have died of AIDS-related illnesses. It also represents a momentous opportunity to lay the foundation for a healthier, more just and equitable world. Ending AIDS 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, it will be impossible to end the AIDS epidemic without bringing HIV treatment to all who need it.

As we contemplate the way forward following the 2015 deadline for the targets and commitments in the 2011 Political Declaration on HIV and AIDS, a final set of targets 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, our 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, countries across the world have launched national processes to develop new treatment targets for 2020. 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.

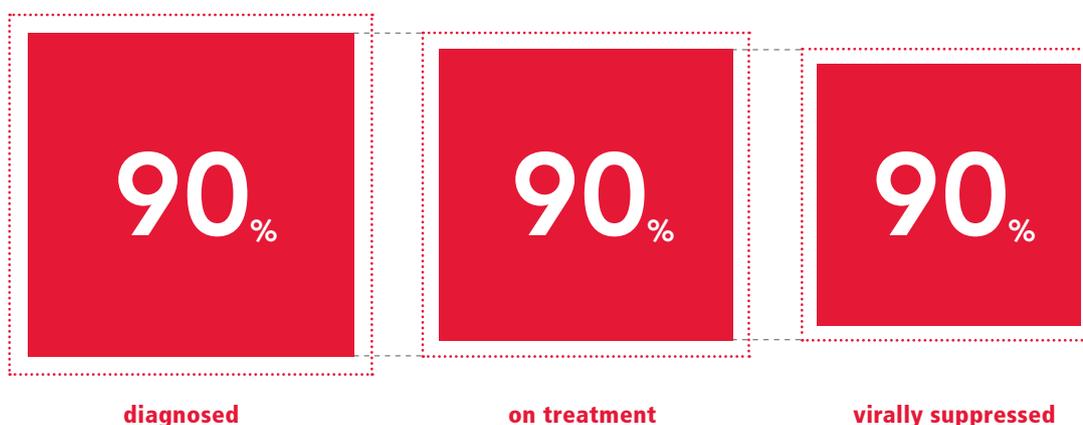
These diverse consultative processes have generated powerful momentum towards a new narrative on HIV treatment and a set of ambitious, but achievable targets:

- 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 durable viral suppression.

When these targets are achieved, at least 73% of all people living with HIV worldwide will be virally suppressed—a three-fold increase over current estimates of viral suppression. Modelling demonstrates that achieving these targets by 2020 will enable us to end the AIDS epidemic by 2030.

Overcoming the epidemic is a generations-long struggle that will require uninterrupted access to lifelong treatment for tens of millions of people, necessitating strong, flexible health and community systems and self-replenishing financing mechanisms capable of supporting treatment programmes across the lifespan of

## THE TREATMENT TARGET



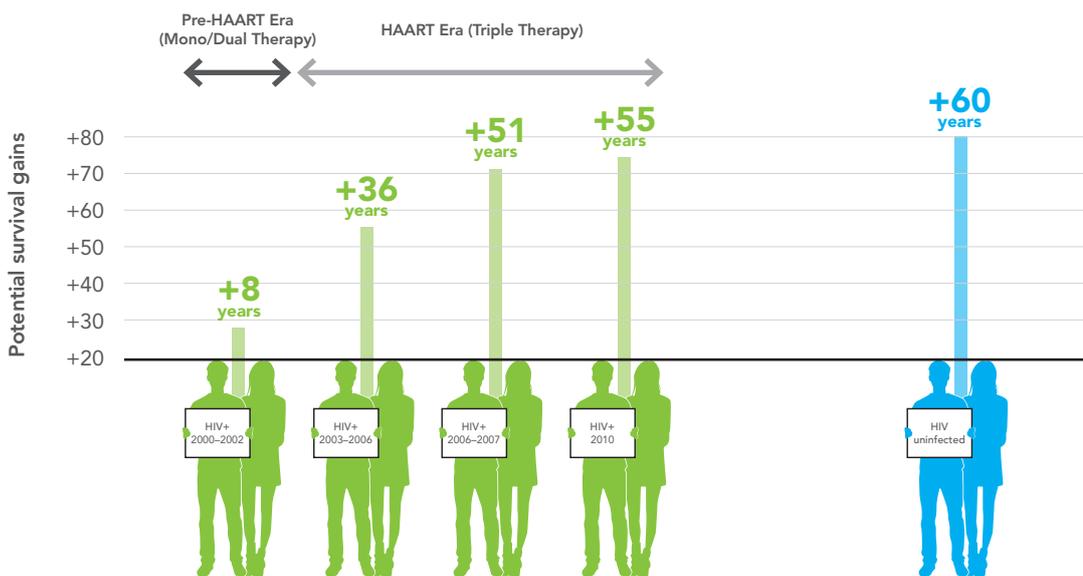
people living with HIV. As new technologies arise—including simpler, cheaper diagnostics and longer-lasting antiretrovirals that obviate the need for daily dosing—political will, system preparedness and timely normative guidance will be needed to bring these new tools to scale. Just as prophylaxis for *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, we need to maximize the effectiveness of existing tools in order to extend lives towards the era when a cure or substantially more patient-friendly treatment approaches will be available.

## HIV TREATMENT: CRITICAL TO ENDING AIDS 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 AIDS depend in large measure on our ability to provide HIV treatment to all who need it, 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)

## HIV treatment prevents HIV-related illness and disability

In 2013, in recommending an increase in the CD4 count threshold for initiation of HIV treatment from 350 to 500 cells/mm<sup>3</sup>, WHO cited growing evidence of the clinical benefits of earlier treatment initiation.<sup>1</sup> Since the launch of the guidelines, additional analysis of the HPTN 052 results found that trial participants randomized to early treatment arm had higher median CD4 counts during the trial, 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.<sup>2</sup>

## HIV treatment averts AIDS-related deaths

Whereas someone who acquired HIV in the pre-treatment era could expect to live only 12.5 years<sup>3</sup>, 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 HIV treatment (Fig. 1).<sup>4</sup>

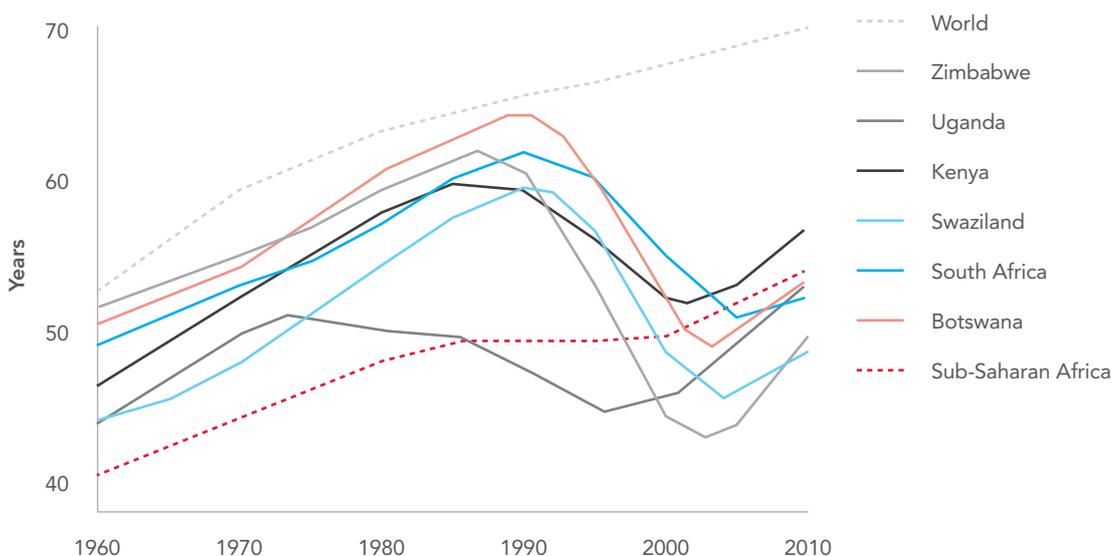
Low- and middle-income countries have also seen AIDS-related deaths plummet upon introduction of widespread HIV treatment. As treatment access expanded over the last decade in high-prevalence countries, the devastating health effects of the epidemic were reversed, with life expectancy rising markedly in countries where HIV treatment was brought to scale (Fig. 2).

## 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).<sup>5</sup> 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.<sup>6</sup>

Fig. 2

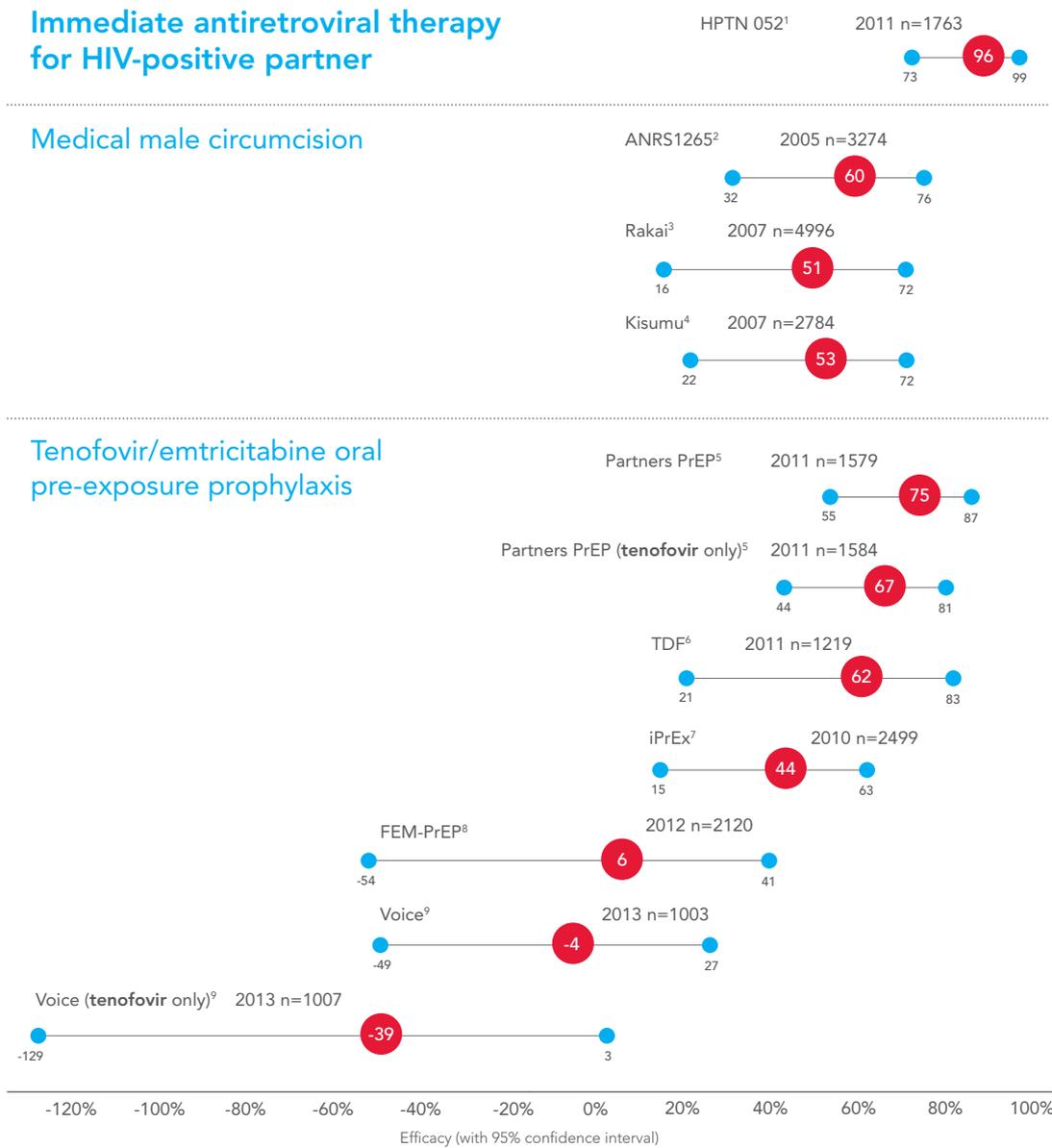
### DRAMATIC IMPACT OF HIV RESPONSE ON LIFE EXPECTANCY



Source: World Bank life expectancy data

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. 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.<sup>7</sup> 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.<sup>8</sup>

### HIV treatment saves money

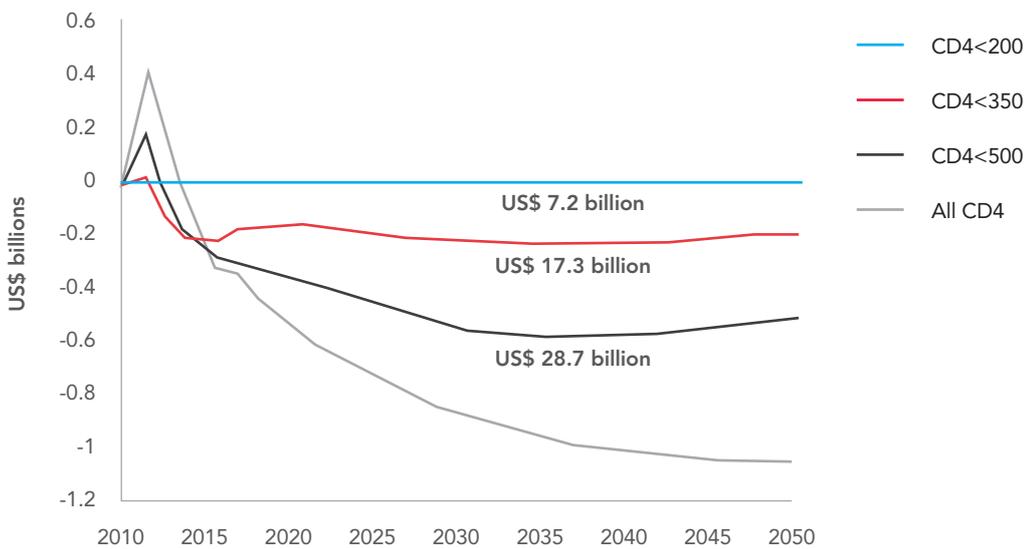
Early initiation of treatment maximizes both health and economic gains. In South Africa, for example, all treatment expansion scenarios based on higher CD4 thresholds for treatment initiation have been estimated to generate simultaneous health and economic benefits, but the most substantial benefits 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 would avert 3.3 million new HIV infections in South Africa through 2050 and save US\$ 30 billion.<sup>9</sup>

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.<sup>10</sup> 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.<sup>11</sup> 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.<sup>12</sup>

Fig. 4

#### EXPANDING ACCESS TO ART 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 we face

As we approach the expiration of the 2015 targets and contemplate benchmarks to guide and drive progress beyond 2015, several possible ways forward are possible (Fig. 5):

Fig. 5

### THE CHOICES

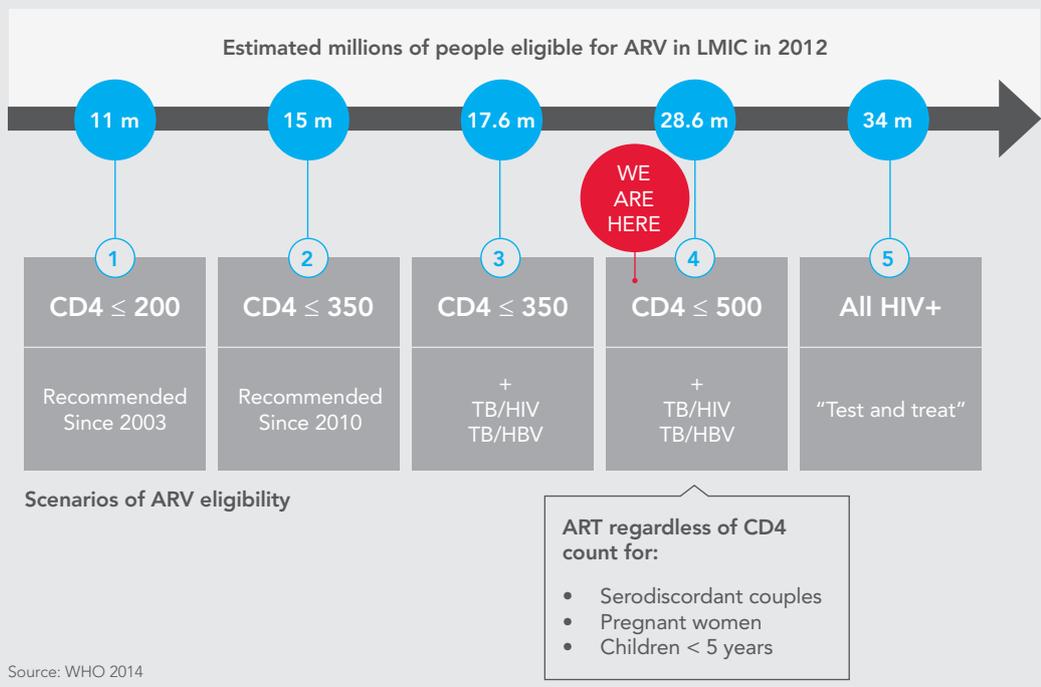


- Maintain the status quo: an option that all in the AIDS field would reject would be to rest on our current laurels, effectively continuing levels of treatment coverage achieved thus far but failing to invest in further expansion of treatment access. This would lead to a progressive expansion of the 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 would represent a major strengthening of global treatment efforts, although it would leave millions of people with diagnosed HIV infection ineligible for therapy. As overburdened but underserved key populations are not eligible under the 2013 guidelines for immediate antiretroviral therapy if their CD4 count is either undocumented or above 500, sole reliance on the WHO guidelines is likely to perpetuate inequities in the AIDS response.<sup>1</sup>
- Rapidly scale up HIV treatment for all who need it: this scenario calls for countries to use the total population of people living with HIV as the denominator for treatment coverage. Beginning in 2014, UNAIDS is using this measure to calculate treatment access, a critical step to harmonize metrics at a time when treatment guidelines are rapidly evolving. This approach also recognizes the clear trend towards the earliest possible initiation of HIV treatment (Fig. 6).

<sup>1</sup> Under the 2013 WHO consolidated antiretroviral guidelines, populations for whom antiretroviral therapy is recommended, regardless of CD4 count, include pregnant women, children under five years, HIV-positive partners in serodiscordant couples, and people with HIV-related tuberculosis or hepatitis B.

Fig. 6

**SCENARIOS OF ARV ELIGIBILITY: WHO VISION**



**A status report on HIV treatment scale-up: the end of the beginning**

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 us as we begin planning for the post-2015 era.

However, the bulk of the work involved with bringing HIV treatment to those who need it remains ahead of us. As of December 2013, only 37% of people living with HIV were receiving HIV treatment. It is likely that those currently enrolled in HIV treatment in many countries are the easiest to reach, suggesting that the road to universal access will pose considerable 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, treatment coverage in 2013 ranges from 37% in sub-Saharan Africa to 11% in the Middle East and North Africa (Fig. 7). Outside Africa, little if any progress has been made in reducing AIDS-related deaths in the Middle East, eastern Europe, central Asia and some Asian countries due to the persistent failure to expand treatment access.

Fig. 7

**TOTAL ART COVERAGE BY REGION IN 2013**

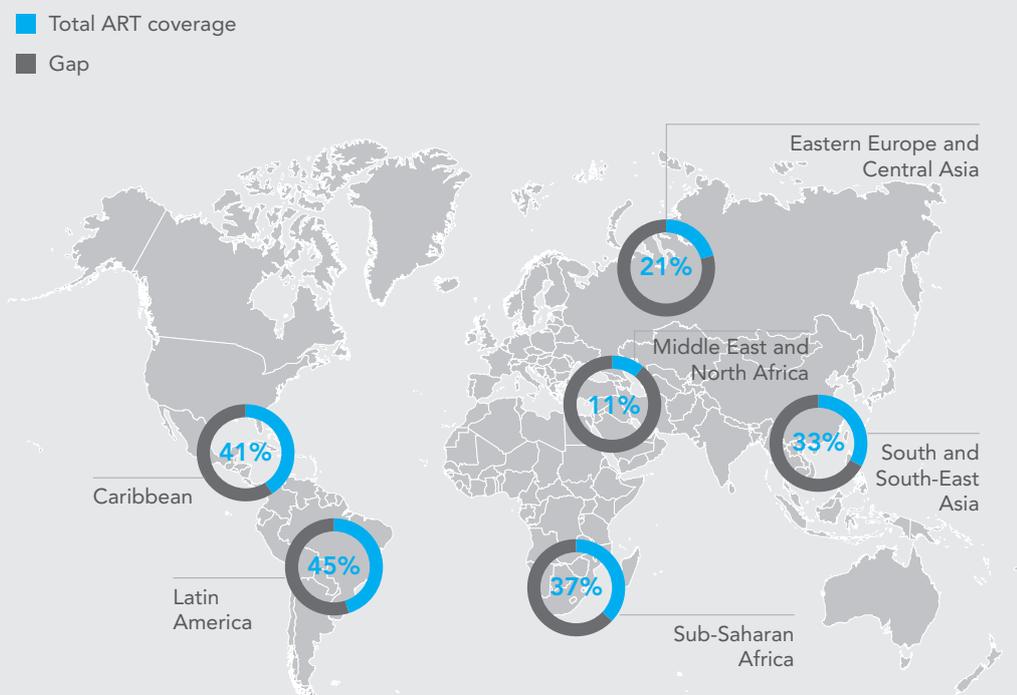
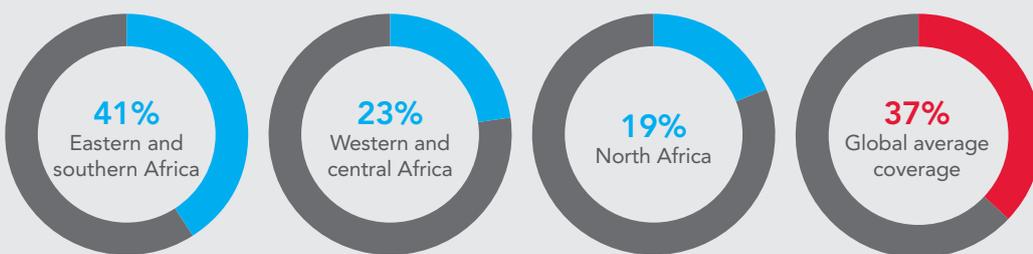


Fig. 8

**ANTIRETROVIRAL TREATMENT COVERAGE VARIES WITHIN AFRICA**



Source: UNAIDS estimates 2013.

In 2013, while 37% of people 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, the widespread failure to employ the diagnostic and therapeutic tools at our disposal represents a profound and intolerable shortcoming in the AIDS response. In 2012, an estimated 210 000 children died of AIDS-related causes.<sup>13</sup>

Throughout the world, key populations at higher risk are least likely to obtain HIV treatment. In many cases, these key populations—including men who have sex with men, people who inject drugs, sex workers and transgender communities—are socially marginalized and have limited community resources with which to respond. In scores of countries, the behaviours of key populations are criminalized, reinforcing stigma, effectively inviting violence and deterring individuals from seeking essential testing and treatment services. In diverse countries, HIV treatment access is disproportionately lower for people who inject drugs.<sup>14</sup> Such barriers not only impede achievement of universal treatment access and prevent equitable enjoyment of the fruits of modern science, but they also fatally undermine national HIV responses, as key populations represent a major share of new infections in diverse regions.

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

Since the current HIV treatment targets were endorsed at the 2011 High-Level Political Meeting, emergence of powerful evidence regarding the preventive and therapeutic benefits of early treatment has transformed our understanding of optimal treatment approaches. Accumulated programmatic experience has also reshaped perspectives about HIV treatment, emphasizing the critical role of service quality in capturing the health potential of antiretroviral therapy. This evidence from both clinical trials and substantial country experience confirmed calls issued as early as 2006 to leverage the prevention benefits of HIV treatment.<sup>15</sup>

It is increasingly clear that the world needs a new HIV treatment narrative. These new targets reflect essential paradigm shifts in the approach to treatment scale-up:

- Rather than focus on a single number (i.e. those who start HIV treatment), the new targets recognize that we should also 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.

- The new targets aim to capture both the therapeutic and preventive benefits of HIV treatment. As these new targets reflect, efforts will be needed to explain to individuals and communities that antiretroviral therapy not only keeps people alive but also prevents further transmission of the virus to sexual partners of people living with HIV and from mother to child.
- The new targets prioritize equity. We will not end AIDS unless all communities affected by HIV have full and equitable access to life-saving treatment and prevention services. A cascade approach for targets invites the development of data strategies to monitor treatment outcomes for specific populations, such as children, adolescents and key populations.
- The new targets emphasize speed in scale-up and early initiation of HIV treatment. Earlier scale-up enables the response to begin to outpace the epidemic itself and enhances long-term economic savings.

## Why new treatment targets are needed

- Targets drive progress. Many were sceptical when countries in 2011 embraced the target of reaching 15 million people with HIV treatment by 2015, yet the existence of this target focused global resolve and spurred unprecedented expansion of treatment access. Today, the world appears on track to achieve the target of 15 million on HIV treatment in low- and middle-income countries by December 2015. With more than 60% of all people living with HIV lacking HIV treatment as of December 2013, efforts need to be expanded in order 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.
- New 2020 targets are 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. As the HIV-related Millennium Development Goal will remain unfulfilled when the current target expires, a new target is needed for the world to meet the MDG goal of reversing the HIV epidemic.
- 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 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.
- Bold new targets demonstrate that AIDS is a winnable fight. Previously, treatment targets, while reflecting the latest treatment guidelines, were understood as interim steps in the long process of bringing HIV treatment to those who need it. Today, as we better understand the full potential of available tools, we must specify the actions needed to reach our ultimate targets—ending AIDS and making HIV transmission a rare event. Boldly grasping this challenge demonstrates to the world that AIDS is winnable, 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.

## 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 90-90-90 or have approached, met or exceeded one or more of these targets. 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.

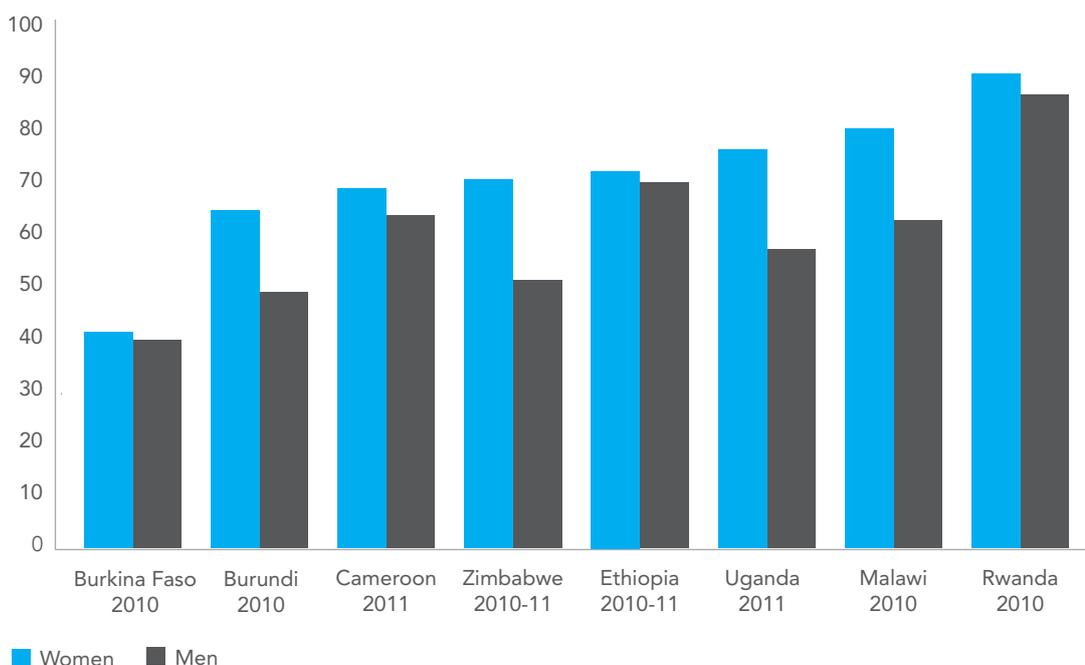
## REACHING TARGET 1:

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

Although UNAIDS estimates that only about one-half of all people living with HIV in sub-Saharan Africa have tested HIV-positive, several African countries are either approaching or within striking distance of having at least 90% of the population having been tested at least once (Fig. 9). Although these figures represent substantial improvement over earlier years, more frequent testing will be needed to ensure 90% knowledge of HIV status on an ongoing basis. Studies in Kenya and Uganda suggest that inclusion of HIV testing in multi-disease health campaigns has already driven coverage levels up to 86% and 72%, respectively, at a population level.<sup>16</sup>

Fig. 9

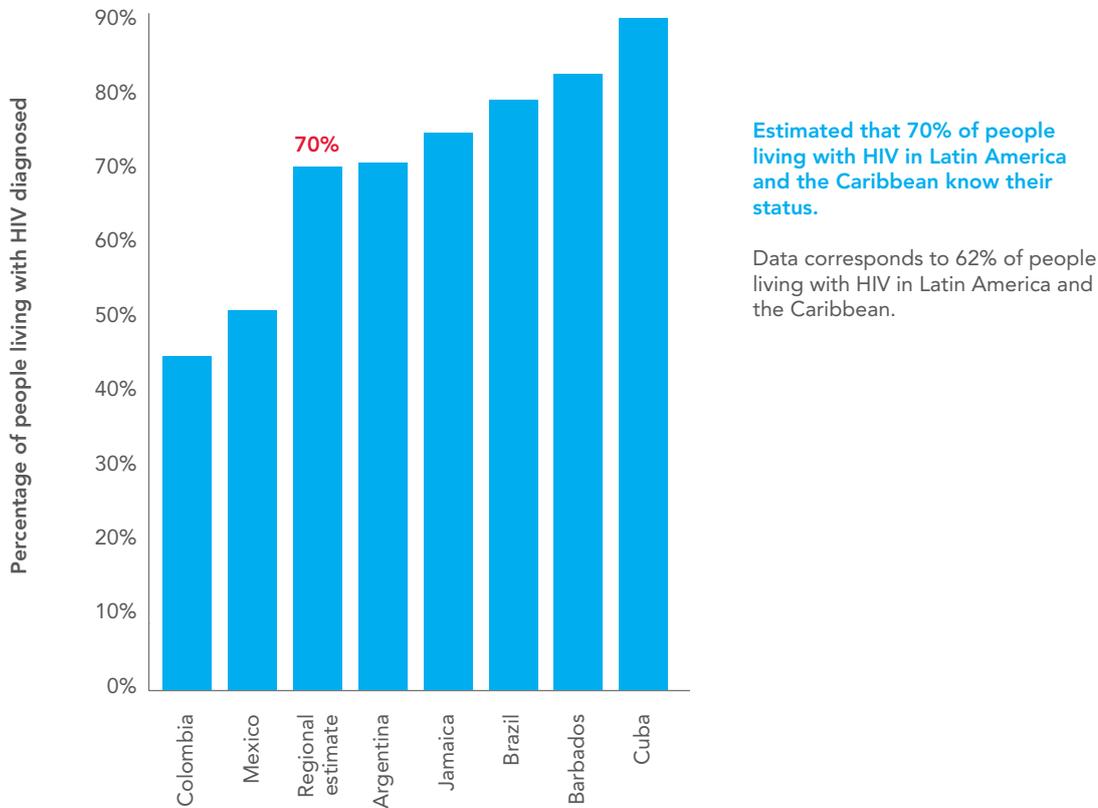
### HIV+ POPULATION TESTED AT LEAST ONCE



Source: Demographic and Health Surveys

Fig. 10

SHOULD BE HIV TESTING COVERAGE IN LATIN AMERICA AND THE CARIBBEAN, 2014



Fuente: Communication with countries, UNAIDS/WHO meetings in Argentina and Trinidad for retargeting 2014. For Cuba: PAHO, ART Under the Spotlight- Washington DC 2013

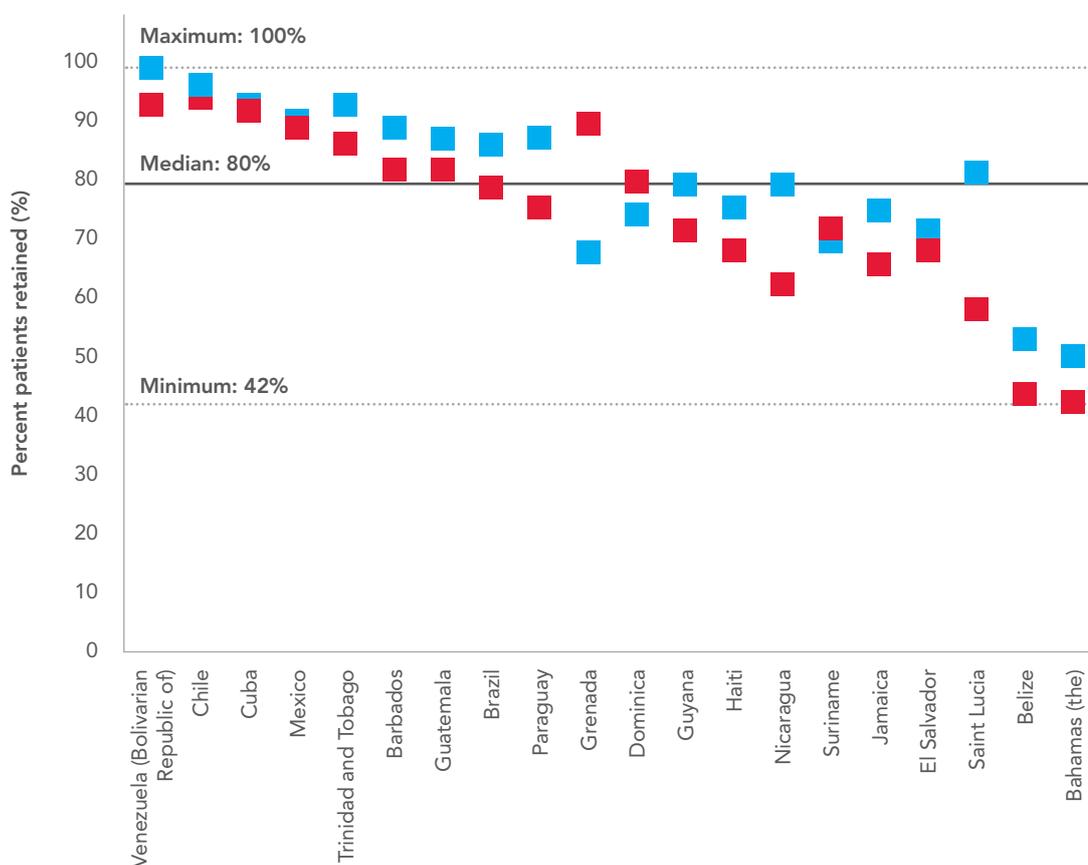
In Barbados, more than 90% of all people living with HIV know their HIV status, while at least 80% of people living with HIV in Brazil are aware of their infection. For Latin America and the Caribbean as a whole, an estimated 70% of all people living with HIV have been diagnosed (Fig. 10). Across the 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 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 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.<sup>17</sup>

Fig. 11

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



Source: UNAIDS GARPR 2014 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 ART)**

High treatment coverage levels have been achieved regionally and nationally in multiple settings, putting them on pace to reach the second target by 90% if progress continues. In countries as diverse as Botswana and Colombia, more than 70% of people with diagnosed HIV are currently receiving antiretroviral therapy. In Brazil, more than 60% of people with diagnosed HIV infection were receiving antiretroviral therapy in 2013.<sup>18</sup>

The traditional approach to HIV treatment initiation, which has reserved antiretroviral therapy for individuals with demonstrable immune suppression (as demonstrated by CD4 count), complicated treatment scale-up by requiring clinical staging prior to starting treatment. This additional early stage in the treatment cascade may have enhanced loss to follow-up by delaying clinical intervention. In addition, to achieve and maintain high treatment coverage levels, countries will need to ensure that HIV treatment, including diagnostic tests and other treatment-related items, is free to the individual.

### REACHING TARGET 3:

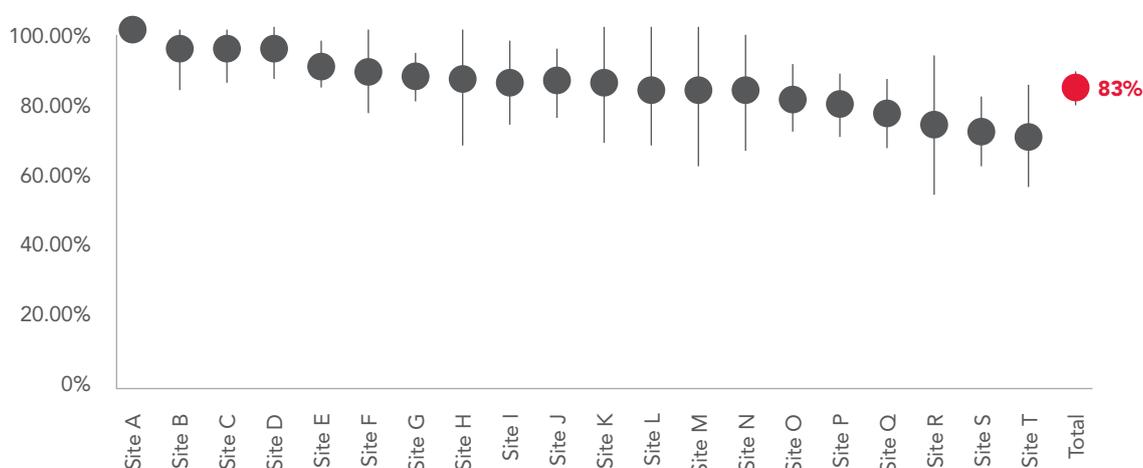
**90% of all people receiving antiretroviral therapy will have durable viral suppression (90% suppressed)**

Countries and programmes have also succeeded in achieving high levels of viral suppression, demonstrating the feasibility of aiming for 90% viral suppression among all people receiving

antiretroviral therapy by 2020. Nationally in Rwanda, 83% of people receiving antiretroviral therapy were found to be virally suppressed after 18 months of therapy in 2008-2009 (Fig. 12).<sup>19</sup> In a four-clinic survey in rural Viet Nam, 91% of people on HIV treatment had less than 250 copies/ml at 12 months, with 95% having a viral load under 1000.<sup>20</sup>

Fig. 12

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

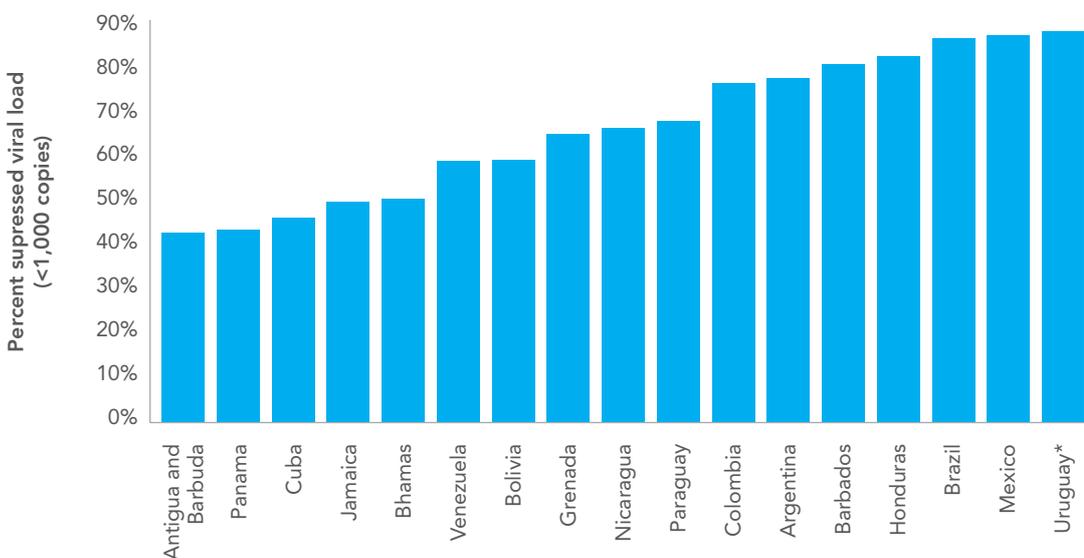


Source: Basinga P et al. (2013) PLoS

Fig. 13

#### PROPORTION OF PATIENTS WITH VIRAL SUPPRESSION IN LATIN AMERICA AND THE CARIBBEAN, 2013

Data from 17 countries representing 400,00 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.

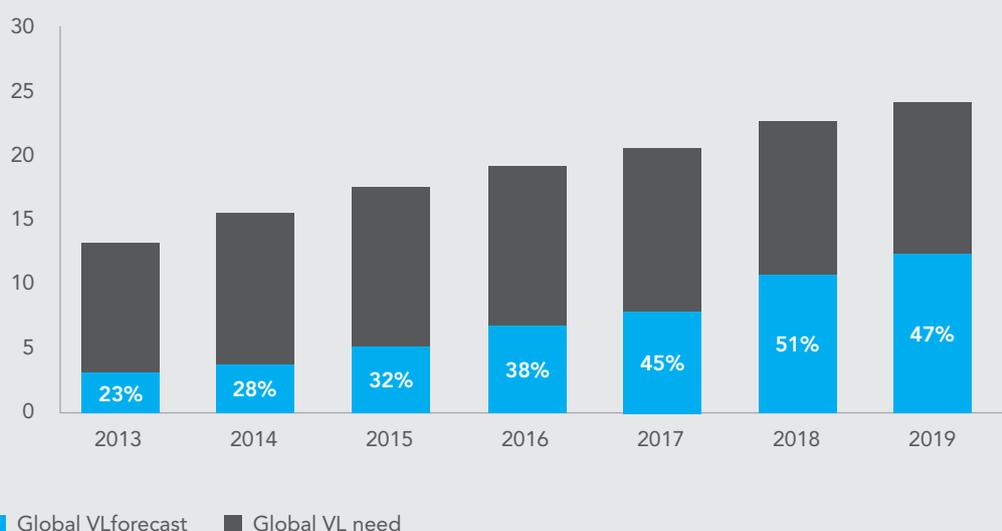
Experience demonstrates that high rates of viral suppression are attainable not only in individual countries and provinces, but across entire regions. According to data from 17 countries in Latin America and the Caribbean, the median rate of viral suppression among recipients of HIV treatment is 66%, 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. 13).

Consistent with a cascade approach to treatment targeting, the third target requires sustained use of HIV treatment and ongoing clinical 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. 11).

### A global push to build laboratory capacity to achieve the 90–90–90 targets

Fig. 14

#### PREDICTED VL SCALE UP WILL NOT MEET THE NEED



Source: Clinton Health Access Initiative, 2013.

To meet the 90–90–90 targets and thereby lay the foundation to end the AIDS epidemic, every person living with HIV 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.

In addition to optimizing treatment outcomes, viral load testing also helps 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 much 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. 14). There is an active pipeline of point-of-care viral load technologies, which can help accelerate access to diagnostic tools and improve outcomes across the HIV treatment cascade. Ensuring universal diagnostic access in all settings, urban and rural, will likely require a combination of centralized laboratories and point-of-care tools.

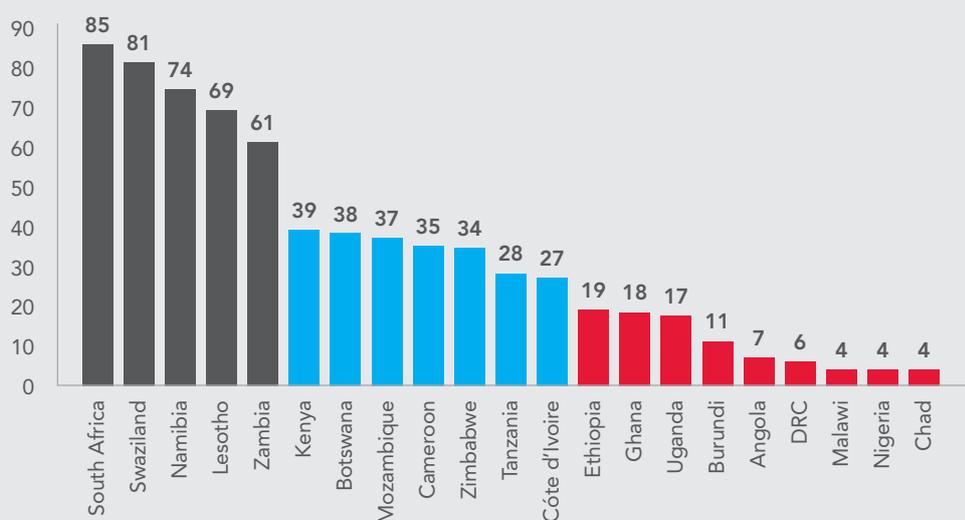
In June 2014, UNAIDS and the African Society of Laboratory Medicine jointly convened a global consultation on the role of laboratory medicine in meeting the 90–90–90 targets. More than 130 specialists from across the world endorsed a call by the US Centres for Disease Control and Prevention to explore a Global Diagnostic Access Initiative to build the robust, sustainability laboratory capacity that will be needed to meet global treatment goals.

### Closing the treatment gap for children

In June 2014, UNAIDS, the Elizabeth Glaser Paediatric AIDS Foundation (EGPAF), UNICEF and WHO convened a global consultation to discuss new treatment targets for children. 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, 80% of children living with HIV will die by age five. Even with continued progress in prevention of mother-to-child transmission, WHO and UNICEF project that 1.9 million people will require HIV treatment in 2020.

Fig. 15

#### ACCESS TO VIROLOGIC HIV TESTING (EARLY INFANT DIAGNOSIS) 2012

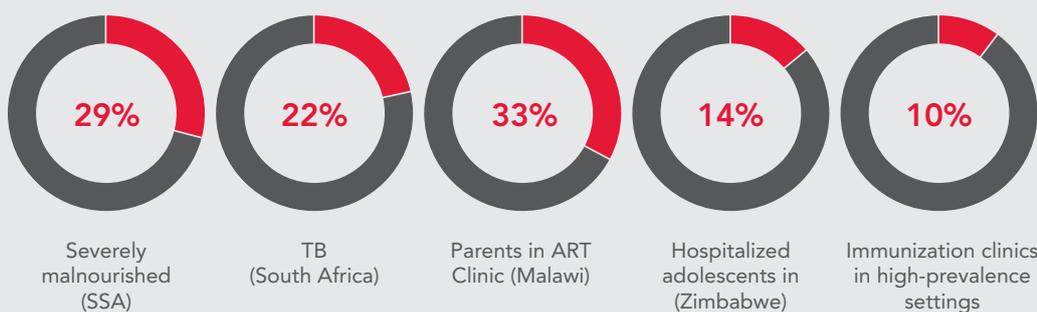


\*Lesotho data represents 2011 coverage dataSource: UNAIDS, UNICEF and WHO, 2013 Global AIDS. Response Progress Reporting, and UNAIDS modeling2012 HIV and AIDS estimates.

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. 15). In five priority countries (Angola, Chad, Democratic Republic of the Congo, Malawi and Nigeria), less than one in 10 HIV-exposed children obtained life-saving diagnostic services.

Fig. 16

**FINDING THE CHILDREN**



Sources: Fergusson et al. 2007; Hesselting et al. 2009; Ferrand et al. 2010; Cohen et al. 2010.

If children born to women living with HIV are not effectively linked to diagnostic services through systems to prevent mother-to-child transmission, there are typically few subsequent opportunities to reach them. HIV testing is not routinely offered in child-focused programmes, even though there is often very high prevalence among children with needs addressed by other service systems (Fig. 16). 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. Likewise, 22% of children with TB in South Africa are living with HIV, 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. Only 10 of the 29 antiretroviral medicines approved for use in adults have also been approved for use in children.<sup>21</sup> The few medicines available for use in children tend to be unpalatable and require regimens that are more complicated than those for adults. There is an urgent need for fixed-dose combinations that reduce medication burdens associated with reduced HIV treatment adherence.

As with adults, there is substantial loss to follow-up among children who initiate HIV treatment. In a pooled analysis of results from 16 paediatric HIV care programmes in sub-Saharan Africa, a trend towards increasing loss-to-follow-up over time was observed.

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. 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.

## THE ROAD TOWARDS 90–90–90: KEY CHALLENGES TO OVERCOME

The countries in which progress towards the 90–90–90 outcomes have 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.

### Societal challenges

Stigma and discrimination continue to undermine effective responses. For example, in Asia and the Pacific, 10 countries impose some form of restriction on the entry, stay and residence of people living with HIV based on their HIV status; 37 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.

Stigma and discrimination deters service scale-up. 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.<sup>22</sup>

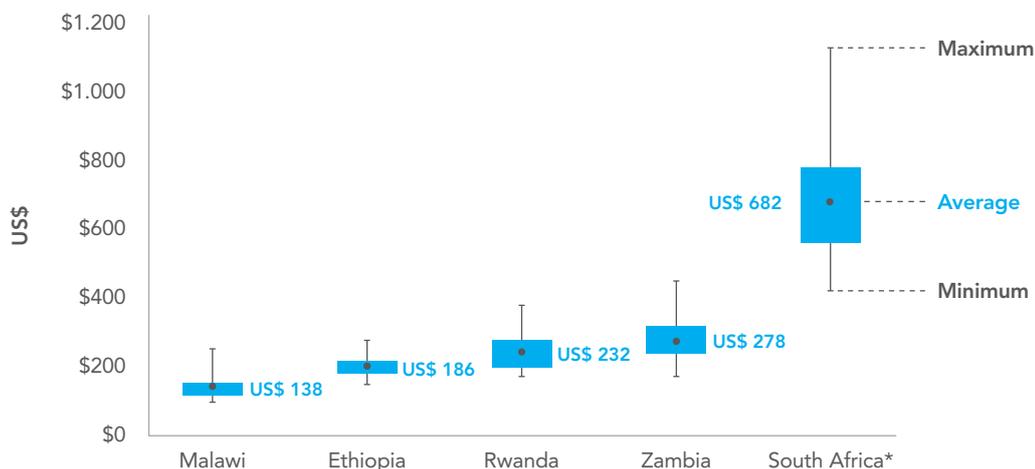
The deterrent effects of stigma, discrimination and punitive legal frameworks are well documented for key populations. In Asia and the Pacific, a region where national epidemics are largely concentrated among key populations and where punitive laws are common, HIV testing rates for the most heavily affected groups remain sub-optimal (Fig. 17). In addition to diminishing service access, punitive laws also make it more difficult to monitor epidemics among key population, 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.

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-centred 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.

## Diversity of facility level costs

Fig. 17

### 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.

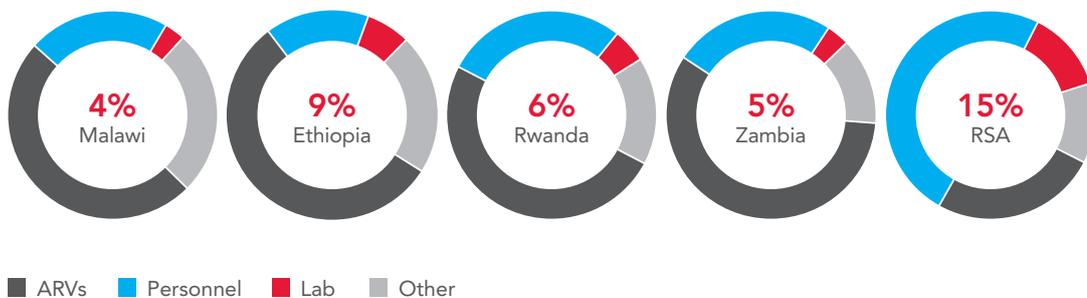
Sources: Clinton Health Access Initiative (CHA) presentation 2014, Data from country reports (Ministries of Health).

In a world of finite resources for health, available financing needs to be used as efficiently and effectively as possible. However, evidence suggests that treatment-related facility level costs are often substantially higher in some settings than in others (Fig. 16). 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. 18

### 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. 18). Likewise, National AIDS Spending Assessments indicate that the share of resources dedicated to programme management differs substantially among countries.

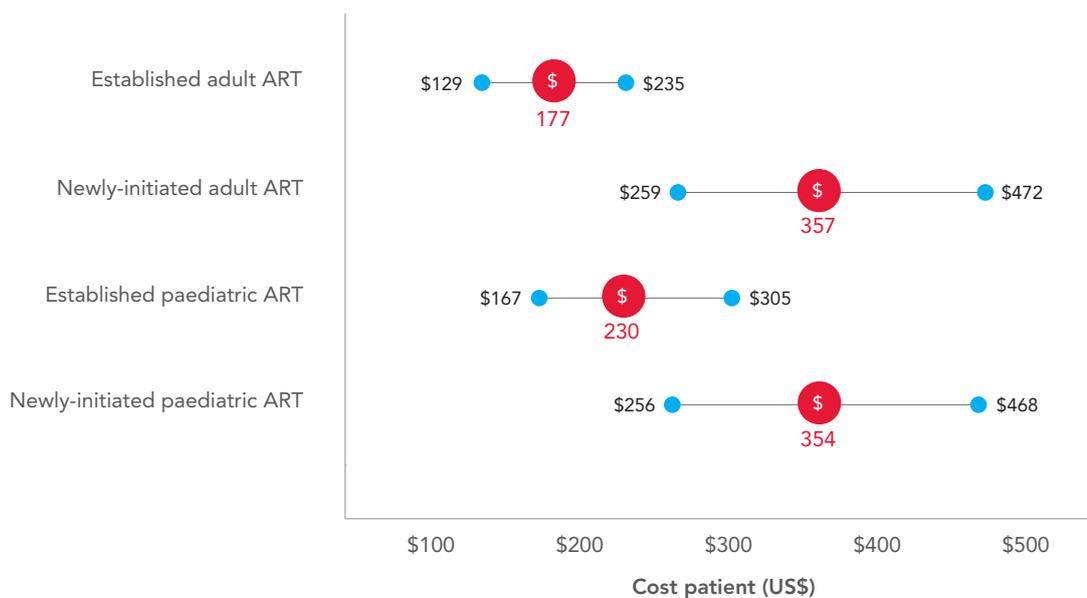
Brokering of South-South information-sharing, pooled procurement and focused technical support should aid settings with higher facility costs bring expenses down. For national programmes, leadership is required to

allocate resources in a way to maximize funding for high-value, high-impact interventions, such as HIV testing and treatment.

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. 19).

Fig. 19

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



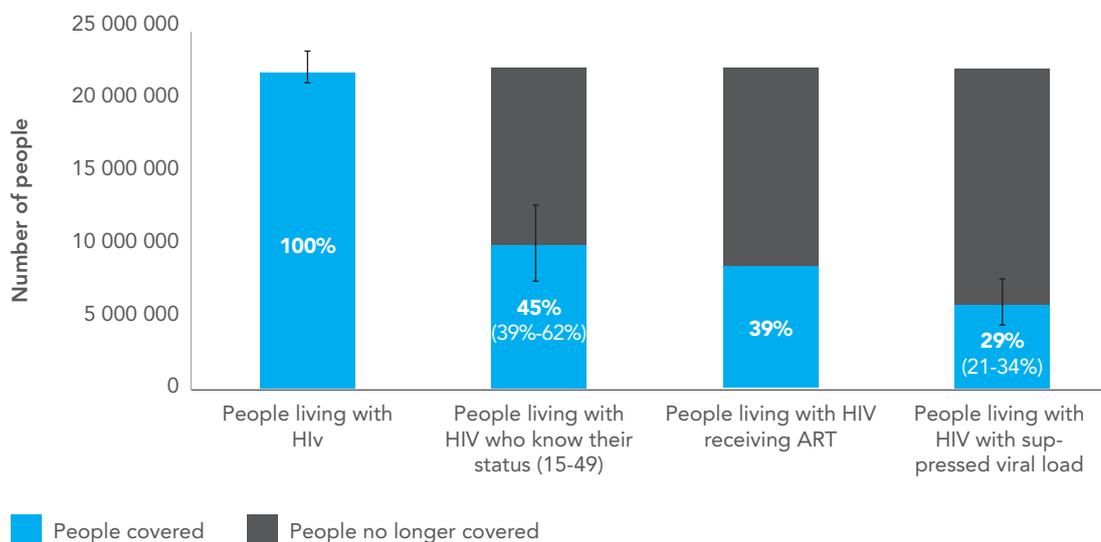
Source: UNAIDS 2011 estimates.

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

## Gaps in the HIV treatment cascade

Fig. 20

### 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 their 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%.

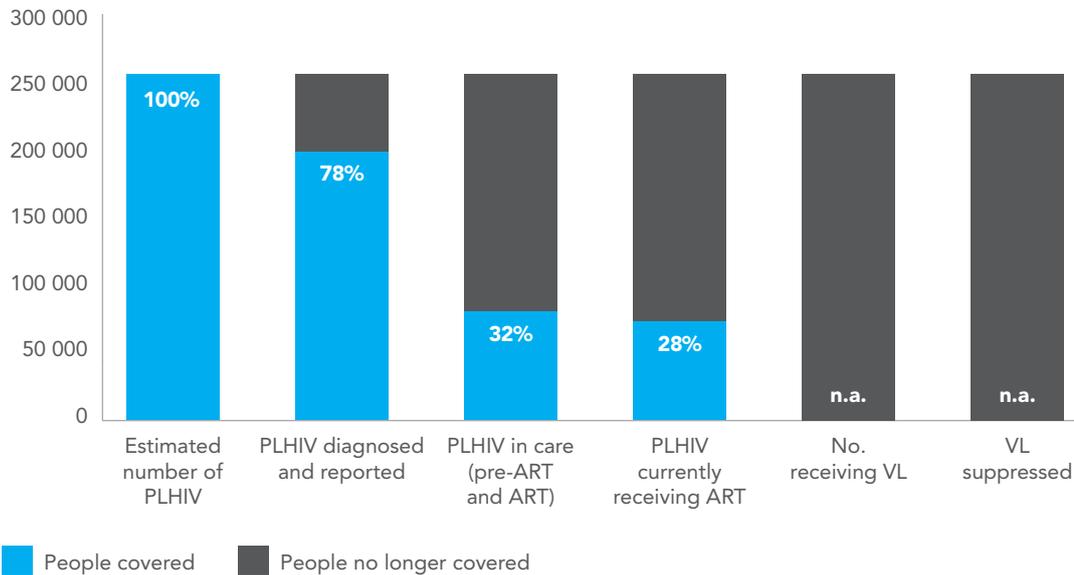
Barth RE, van der Loeff MR, et al. (2010). Virological follow-up of adult patients in antiretroviral treatment programmes in sub-Saharan Africa: a systematic review. *Lancet Infect Disease* 10(3):155-166 and Kenya AIDS Indicator Survey 2012: National AIDS and STI Control Programme, Ministry of Health, 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.

Fig. 21

**TREATMENT CASCADE FOR VIET NAM 2012**



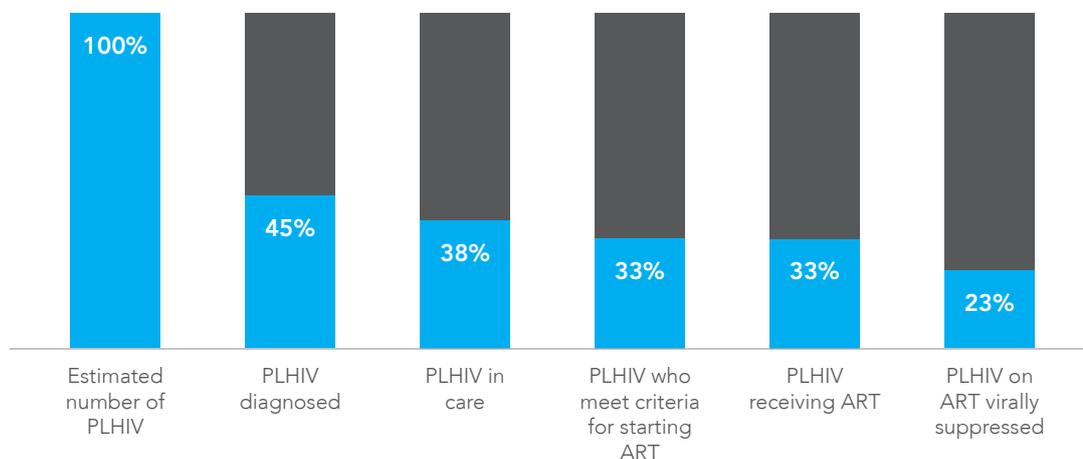
Sources: UNAIDS estimates 2013. WHO-UNAIDS National AIDS Programme Managers Meeting, Beijing, Feb 2013.

In sub-Saharan Africa, for example, UNAIDS estimates that less than one in four people living with HIV have achieved viral suppression in sub-Saharan Africa (Fig. 20). This rate of viral suppression is comparable to results reported for such countries as Colombia (23%) and the United States (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, with 39% of people living with HIV in Barbados having viral suppression in 2013.

Fig. 22

**HIV TREATMENT CASCADE OUTCOMES, COLOMBIA, 2013**



### Strategic action by Malawi to close gaps in the treatment continuum

Recognizing that quality assurance needs to proceed at the same time that treatment is scaled up, 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.<sup>23</sup>

While a minority of people living with HIV is virally suppressed in every country where treatment cascades have been developed, the factors that diminish treatment outcomes vary among countries. For example, Viet Nam has made substantial strides in promoting knowledge of HIV status, but people living with HIV in Viet Nam appear to experience considerable barriers to health care access following an HIV diagnosis (Fig. 21). 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. 22). These experiences 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.

#### Delivery challenges

Just as WHO has convened stakeholders in efforts to optimize HIV treatment regimens, it is increasingly clear that treatment delivery methods also need to be optimized. Action steps include immediate implementation of simplified regimens and scale-up of point-of-care diagnostic tools as they become available. 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 them in care.

In particular, the persistent centralization of HIV treatment services in secondary and tertiary health facilities 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. 23). Treatment services urgently need to be decentralized and brought closer to the individuals who need them, making optimal use of task-shifting, including appropriately compensated community resources, to extend the reach of antiretroviral therapy.

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 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. 24).<sup>24</sup>

Fig. 23

**CHALLENGES AHEAD: 4- DELIVERY SYSTEMS**

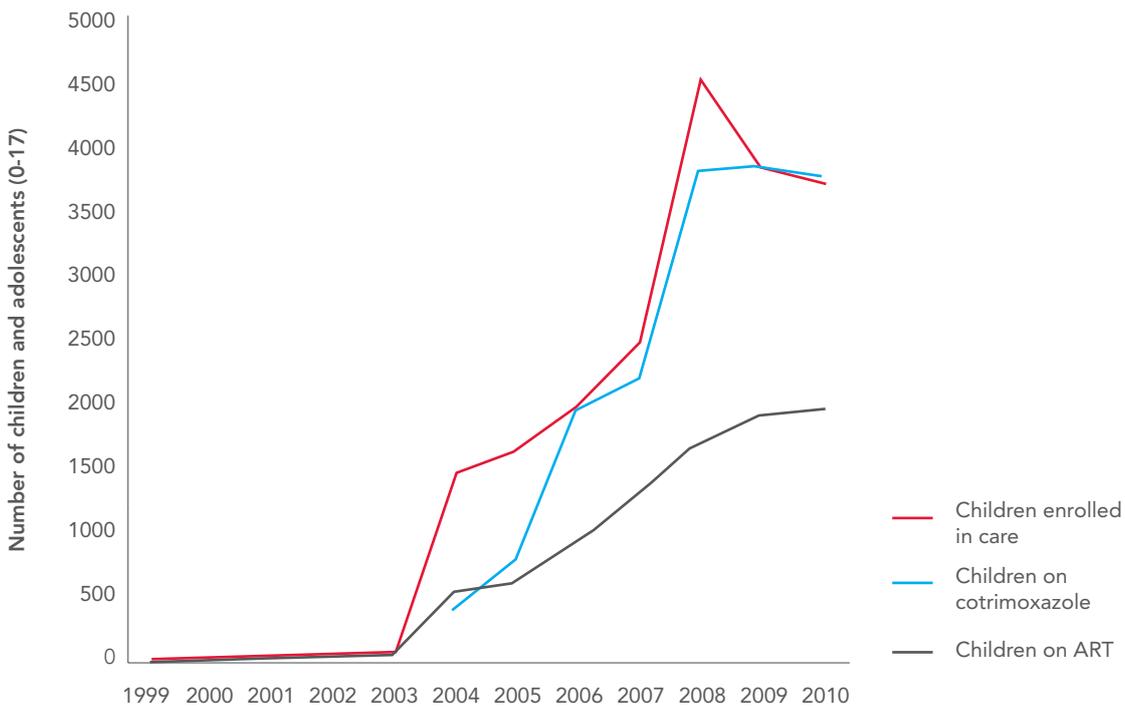


Relative likelihood of HIV-positive adults (15-49 years) accessing antiretroviral therapy due to the distance from their nearest primary healthcare facility.

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

Fig. 24

**UPTAKE OF PEDIATRIC HIV SERVICES AFTER INTRODUCTION OF FAMILY-BASED APPROACH**



Luyirika et al. PLoS ONE, 2013

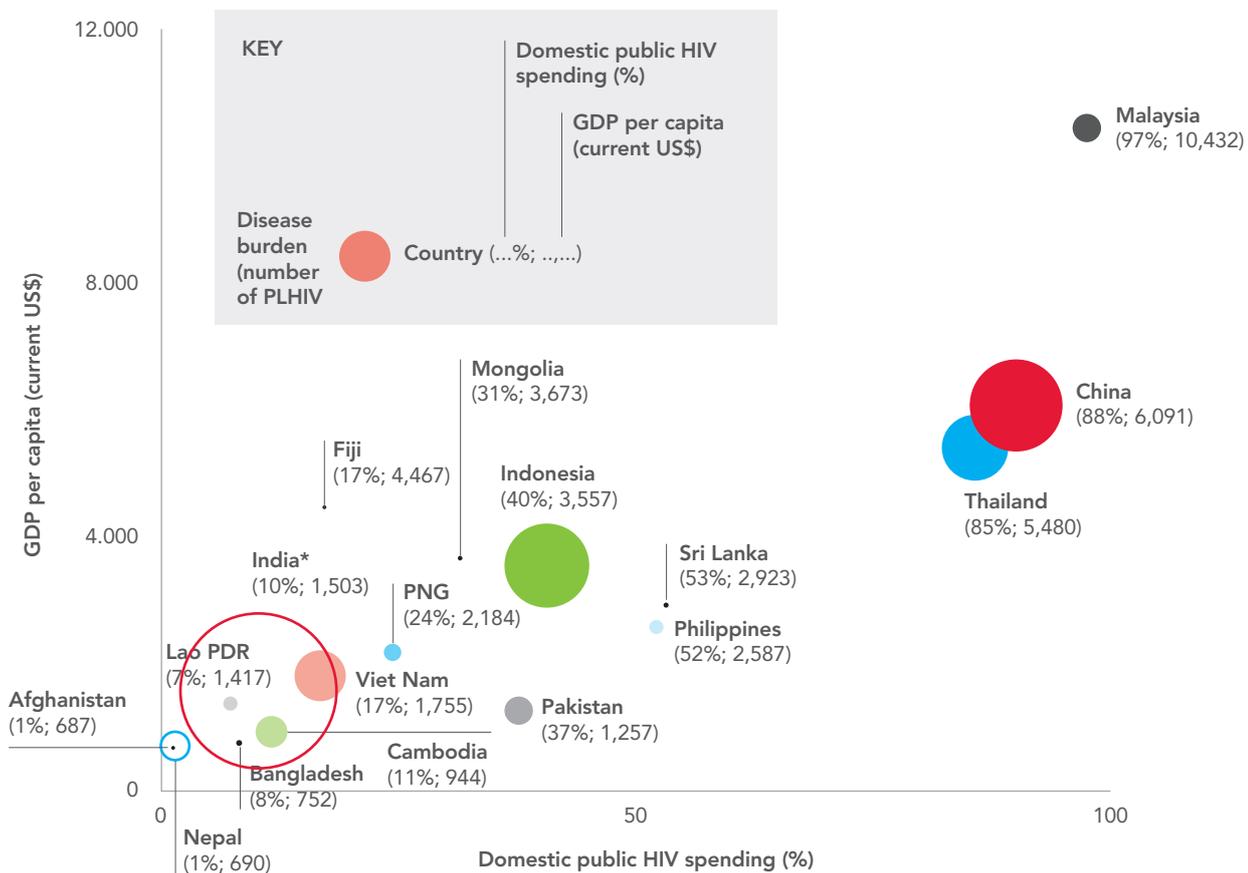
## Financing

To mobilize the resources needed to finance and sustain the push to achieve the 90–90–90 targets, principles of global solidarity and shared responsibility will need to prevail. Many countries have already taken steps to increase domestic funding for HIV treatment. South Africa has embarked on a major effort to self-finance a scaled-up HIV treatment programme. At least

13 countries in Latin America finance at least 80% of their national response, with 11 of those countries covering at least 99% of HIV-related costs with domestic funding. In Asia, there is clear evidence that domestic financing increases as economies grow and per capita GDP increases (Fig. 25).

Fig. 25

### COUNTRIES IN ASIA AND THE PACIFIC ARE SHARING RESPONSIBILITY AS GDP PER CAPITA RISES...



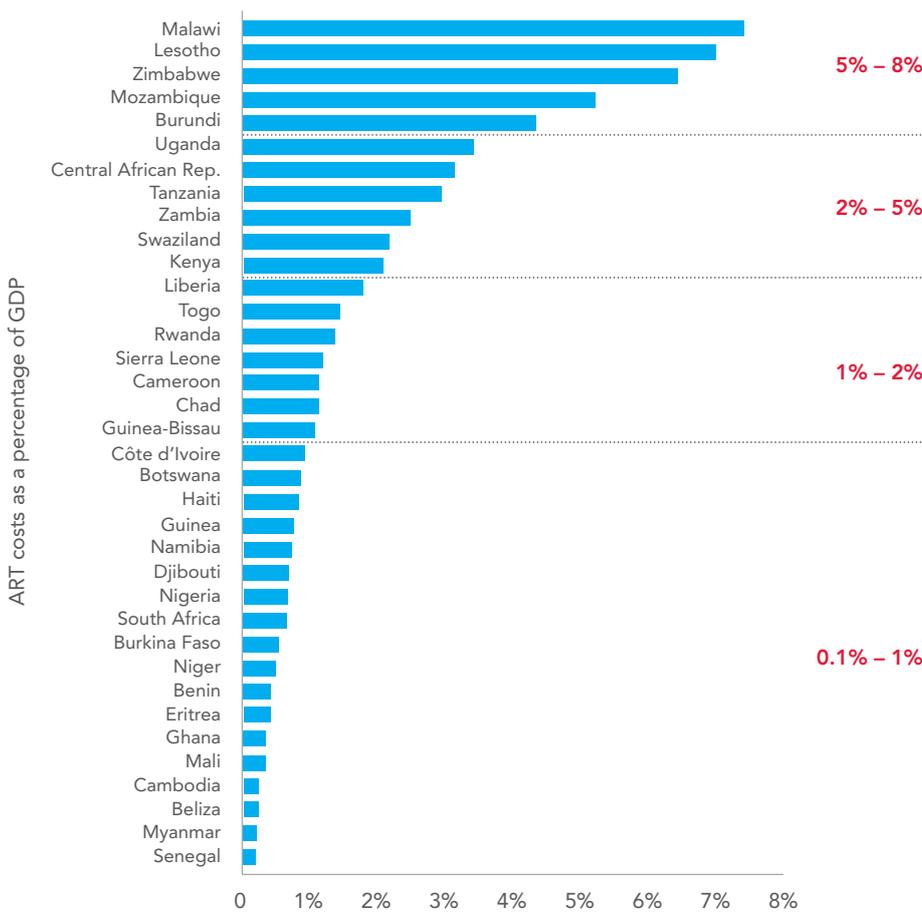
Globally, dozens of countries have embarked on the development of national HIV investment cases. By adopting an investment approach, countries couple strategies to maximize the efficiency and impact of national responses while identifying new sources of sustainable financing. In sub-Saharan Africa, several countries are actively exploring steps to leverage innovative financing options, such as dedicated tax levies, multi-ministerial budgetary mandates and national HIV or health trust funds.

However, while all countries should allocate domestic resources commensurate with national

wealth and epidemic burden, the option of fully self-financing the push towards the 90–90–90 targets is not available to all countries. In at least 12 countries in sub-Saharan Africa, HIV treatment costs amount to at least 2% of national GDP, with treatment costs exceeding 5% of GDP in five countries, according to analyses by Brian Williams and colleagues (Fig. 26). For such countries, where limited resources and competing priorities diminish the feasibility of complete self-financing of treatment scale-up, the availability of robust and dependable international assistance will remain critical.

Fig. 26

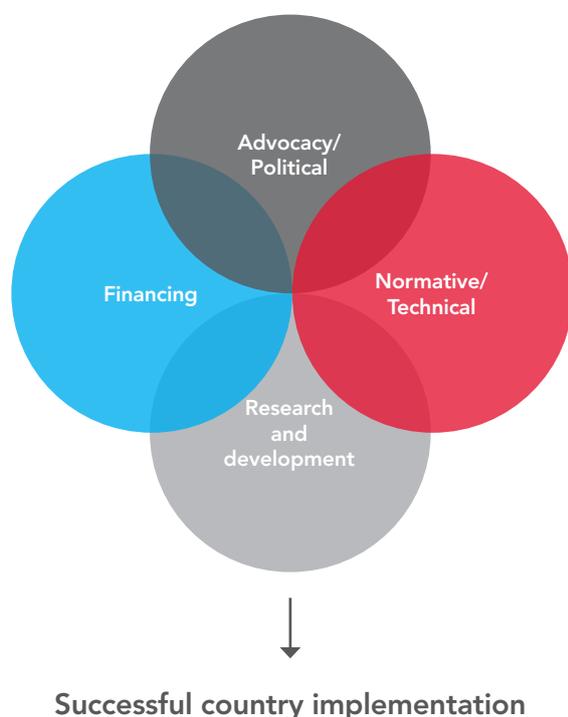
**ANTIRETROVIRAL TREATMENTS COSTS, % OF GDP**



Source: Williams et al., Affordability, cost and cost-effectiveness of universal anti-retroviral therapy for HIV, 2012. <http://arxiv.org/abs/1206.6774>.

Fig. 27

**PARTNERING FOR SUCCESS**



**Making the vision of ending the AIDS epidemic a reality**

Achieving the 2015 target of 15 million receiving antiretroviral therapy—an increasingly likely scenario—is but a first, albeit important, down payment towards the ultimate goal of ending AIDS. In the post-2015 era, the goal can be achieved—but only if the world strategically uses the enormous human, technical and financial resources at its disposal.

Only a partnership approach will get us to our ultimate goal of ending AIDS. We will need to combine political will, timely evidence-based normative guidance, continued generation of critical evidence for action, and sufficient financial resources to reach 90–90–90 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; 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 90–90–90 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.

The tools and strategies now exist to overcome the AIDS epidemic for good 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 we have achieved to date and undaunted by the challenges ahead of us, let us resolve not to allow these historic opportunity to pass us by.

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## NOTES

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