“15 BY 15”

A GLOBAL TARGET ACHIEVED

UNAIDS

PREFACE

In 2012, our organizations joined together to launch the *Treatment 2015* initiative, which aimed to redouble efforts to achieve the global target of reaching 15 million people with HIV treatment by 2015. Determined to achieve a highly ambitious global treatment target by the agreed deadline, we called for concerted global action to increase the speed of HIV treatment scale-up, enhance the programmatic focus on those most in need, and foster innovation in HIV testing and treatment approaches.

Emerging three years after the launch of *Treatment 2015*, this report celebrates the world's achievement of this historic milestone, which is saving more lives than ever before. As this report reveals, we have indeed learned how to do better in bringing HIV treatment to those who need it. For the first time, a majority of people living with HIV know their HIV status. Antiretroviral regimens are more durable, tolerable and easier to take than ever before. Treatment programmes are becoming even more efficient and focused. In recent years, powerful innovations have emerged to improve the reach and impact of treatment programmes, including new community-based models for delivery of antiretroviral therapy. What was once thought impossible has become possible.

The AIDS response has proven itself a model for global health and development practice. Through shared responsibility, international solidarity and the combination of diverse disciplines and stakeholders, the "15 by 15" success shows that our global community has few limits when we work together towards a common target.

But reaching the "15 by 15" target is one step towards our ultimate goal – ending the AIDS epidemic. Since the "15 by 15" target was launched, much has changed. The scientific evidence regarding HIV treatment has continued to evolve, challenges regarding funding for the AIDS response are growing, and we are increasingly determined to strive to serve the many populations who are not benefiting equitably from AIDS successes. The prominence of the AIDS response on the global political agenda also continues to evolve, underscoring our need to work

with new partners, integrate HIV with other health and development initiatives, and ensure that every penny of funding is used to achieve maximum impact.

There still is much to be done. Although progress has been made, major innovation is still required with regard to antiretroviral regimens including second- and third-line treatments and formulations for children. We also need to build on our achievements thus far to lay the foundation to end the AIDS epidemic by 2030. That means acting swiftly to further scale up HIV testing and treatment programmes, improve the quality of services, address the continuing inequities that exist, substantially increase the proportion of people living with HIV who achieve viral suppression and deliver chronic care that will deal with the multiple coinfections and other comorbidities challenging people living with HIV. It will also require us to redouble our primary prevention efforts and our efforts to eradicate HIV-related stigma and discrimination.

Just as we have new opportunities that only a few years ago would have been inconceivable, we also now face new challenges. If the "15 by 15" success story has taught us anything, it is that we have in our hands the power to make the world healthier, more just and more equitable. We hope that this report not only reminds us of our power to change the world when we remain united, but also inspires us to take the actions needed to end the AIDS epidemic as a public health threat.

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KEY MESSAGES

1

For the first time in global health history, the world has reached a global numerical treatment target prior to the agreed deadline: providing antiretroviral therapy to 15 million people by 2015.

2

Several ingredients combined to make achievement of the ''15 by 15'' target possible: strong and sustained leadership and commitment, community engagement, robust funding, increased knowledge of HIV status, a reliable supply of effective and affordable medicines, improved efficiency and quality of treatment services, innovation, and progress in reducing HIV-related stigma and discrimination.

3

The world now needs to build on these successes and take the lessons learned during the successful ''15 by 15'' global movement into account to reach the ultimate goal–ending the AIDS epidemic as a public health threat through achievement of the 90-90-90 target and ambitious new targets for HIV prevention and non-discrimination.

4

Achieving the 90-90-90 target will require the world to confront and overcome key challenges: uncertainties regarding future financing for the AIDS response and market dynamics that could potentially imperil the availability of affordable antiretroviral medicines.

5

The 90-90-90 target offers a road map for helping to end the AIDS epidemic as a public health threat by 2030. Recognizing that the next five years represent a brief window of opportunity to lay the foundation to end the epidemic, diverse stakeholders should unite in a new global pact to end the AIDS epidemic.

In March 2015, the world provided antiretroviral therapy to the 15 millionth person.

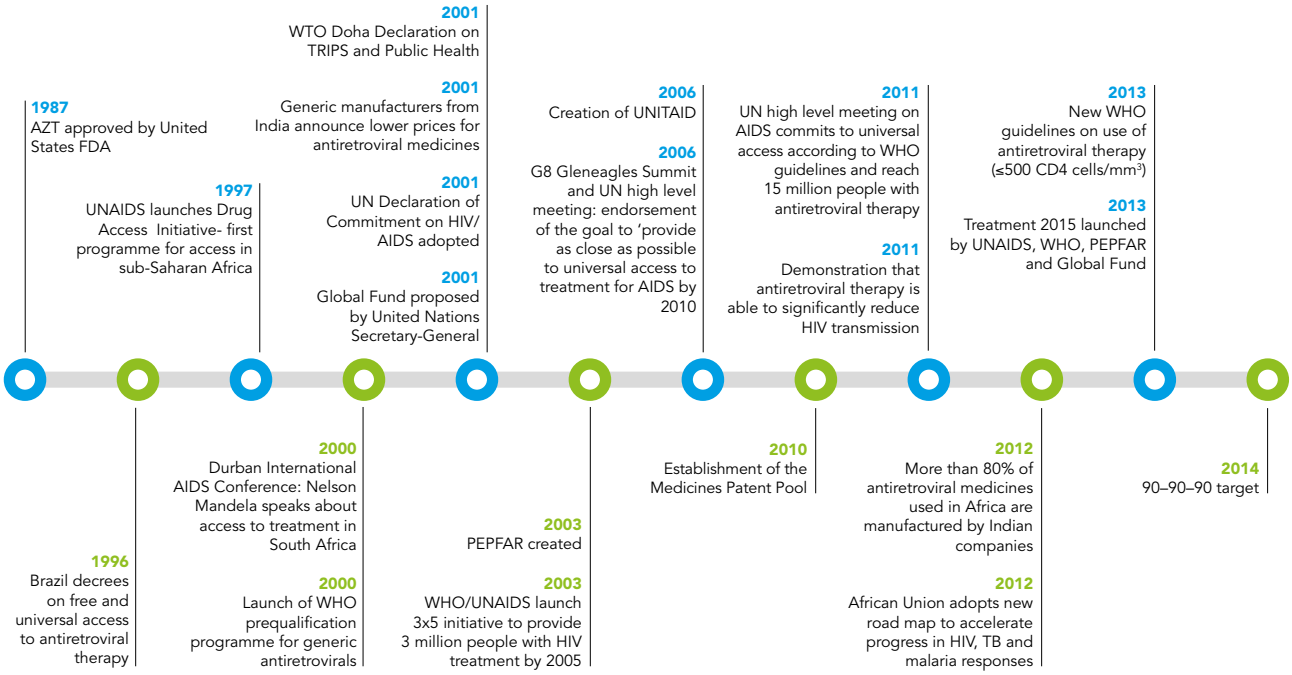
In March 2015, the world crossed a threshold that many doubted could ever be reached. Consistent with pledges made in the 2011 United Nations Political Declaration on HIV and AIDS: Intensifying Our Efforts to Eliminate HIV and AIDS, the world that month provided antiretroviral therapy to the 15 millionth person.

Along with the world's achievement of Millennium Development Goal 6, this is the first time in the history of public health that the world has reached a global numerical treatment target before the agreed deadline. This achievement represents a critical milestone towards the ultimate goal of ending the AIDS epidemic.

Through international solidarity, strong national ownership, inclusive responses, community mobilization and evidence- and human rights-based action, the global push to expand access to HIV treatment has fundamentally changed our world. While many global problems persist—and new ones will continue to emerge—never again will we live in a world that accepts as inevitable the kinds of global health disparities that prevailed prior to the worldwide scale-up of antiretroviral therapy.

The good new from the AIDS response has continued for so long that it is tempting to consider this new paradigm of worldwide access to HIV care and treatment a natural part of the evolving world in which we live. Yet it is worth remembering how improbable the journey to ''15 by 15'' really was. When world leaders gathered at the United Nations in 2001

Fig. 1. Access to treatment: the journey so far



Source: UNAIDS, 2014.

for the first-ever special session of the General Assembly devoted to a single disease, few would have predicted that the world would have achieved what it has.

As the global community embarks on the post-2015 era of sustainable development, including the ultimate goal of ending the AIDS epidemic as a public health threat, it is worth recalling just how profound this achievement truly is. Understanding what has been achieved is important not only for historical purposes, but also to ensure that the international community capitalizes on the lessons learned as it tackles other health and development challenges.

The global movement that united around ''15 by 15'' demonstrates the importance of shared responsibility and the power of clear, time-bound targets.

The global movement that united around ''15 by 15'' demonstrates the importance of shared responsibility and the power of clear, time-bound targets to drive progress and enhance accountability. Achievement of the ''15 by 15'' target also provides powerful momentum as the world embarks on a quest to achieve a new set of targets.To contribute to ending the AIDS epidemic as a public health threat by 2030, the world must ensure that by 2020: (a) 90% of all people living with HIV know their HIV status; (b) 90% of all people diagnosed with HIV infection receive sustained antiretroviral therapy; and (c) 90% of all people receiving antiretroviral therapy achieve sustained viral suppression.

In many respects, the AIDS response, as reflected by the successful "15 to 15" movement, serves as a model for global health and development, uniting such diverse constituencies as governments, scientists, clinicians, economists, the private sector, civil society, bilateral and multilateral cooperation and grass roots community activists. The global "15 to 15" movement recognized the supranational character of the AIDS challenge, taking coordinated steps to build knowledge, mobilizing industrial capacity, involving the people most affected and reflecting the most important values of our era, such as equity and the right to treatment.

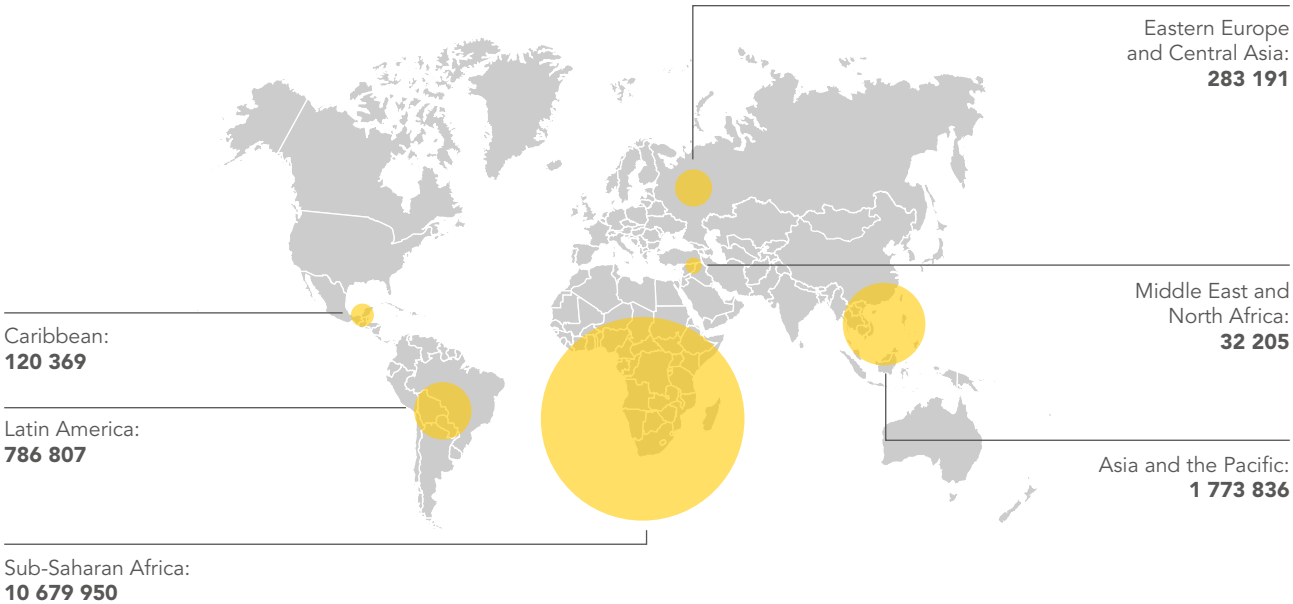
This report celebrates the world's achievement of the "15 to 15" target, describing the ingredients that together made it possible to meet the target and highlighting examples of leadership and innovation that helped accelerate progress towards the treatment target. Looking towards the 90-90-90 target by 2020, this report also draws key lessons from the ''15 by 15'' movement on which the world needs to build to end the AIDS epidemic as a public health threat by 2030.

A STATUS REPORT ON HIV TREATMENT SCALE-UP

Scale-up of HIV treatment is quickly accelerating. While it took over a decade to reach the first 7 million people with antiretroviral treatment, the world placed almost another 8 million in only four years, 2011-2014.

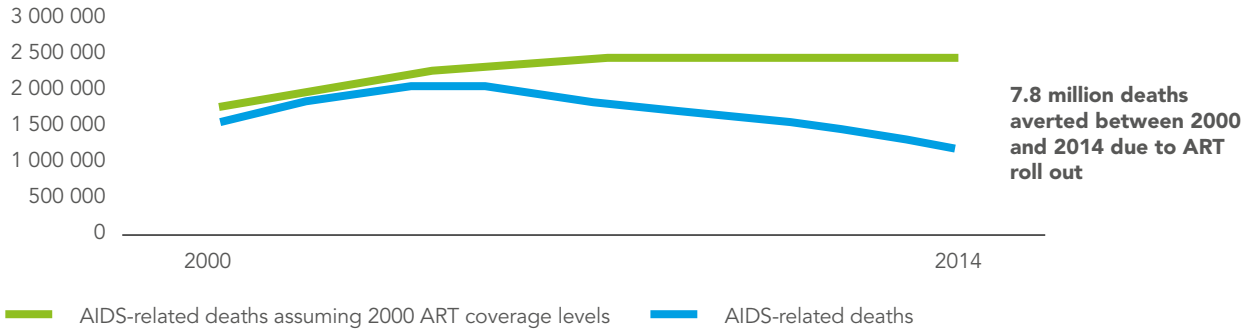
Only 2% (2-3%) of people living with HIV worldwide were receiving antiretroviral therapy in 2000. This rose to 40% (37-45%) in 2014. Globally, 14.9 million people were receiving antiretroviral therapy in December 2014, including almost 10.7 million in sub-Saharan Africa alone (Fig. 2).

Fig. 2. Number of people receiving antiretroviral therapy, by region, 2014



Source: UNAIDS, How AIDS changed everything — MDG6: 15 years, 15 lessons of hope from the AIDS response, Geneva 2015.

Fig. 3. **AIDS deaths, global, 2000–2014**



Source: UNAIDS, How AIDS changed everything — MDG6: 15 years, 15 lessons of hope from the AIDS response, Geneva 2015.

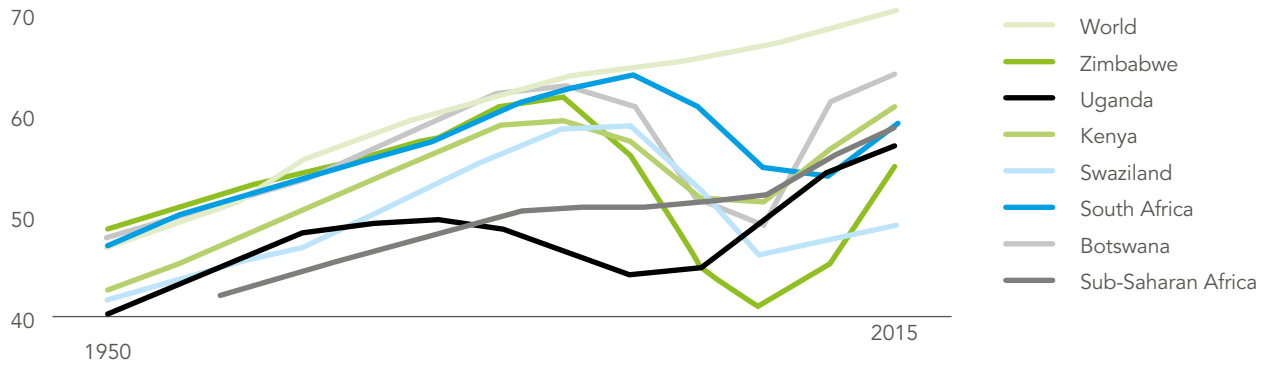
Increasing health benefits

As the pace of treatment scale-up has accelerated, its public health impact has grown as well. Globally, the annual number of AIDS-related deaths decreased by 42% from 2004 to 2014.

AIDS caused life expectancy in the most heavily affected countries to plummet well into the mid-2000s (Fig. 4). Expanded access to HIV treatment, however, has sharply reversed this trend, restoring a large part of the development gains that had taken decades to achieve. In South Africa, home to over one in six people living with HIV, life expectancy rose by a remarkable 8.5 years in less than a decade (2005-2013) in association with the rapid roll out of antiretroviral therapy *(2)*.

HIV treatment scale-up is also yielding massive financial benefits and accelerating economic growth in resource-limited countries. Modelling indicates that every US$ 1 invested in the Fast-Track approach* yields US$ 17 in return on investment, as a result of increased life expectancy, increased labour productivity, averted future medical costs and improved outcomes for children *(2)*.

Fig. 4. **Dramatic impact of HIV response on life expectancy, 1950–2015**



Source: United Nations Population Division, World Population Prospects, 2015 revision.

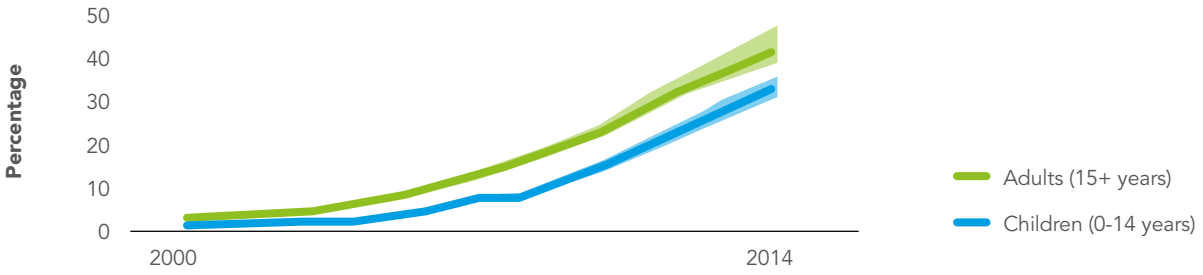
* The Fast-Track approach calls for front-loaded investments and accelerated action to reach ambitious new targets for HIV treatment, prevention and non-discrimination by 2020, with the aim of laying the foundation to end the epidemic as a public health threat by 2030. While the Fast-Track approach is needed in all settings, UNAIDS is prioritizing Fast-Track action in the 30 countries that account for the overwhelming majority of new HIV infections.

The resources mobilized to expand HIV treatment are also buttressing health systems in low- and middle-income countries.

Impact of antiretroviral therapy on broader development efforts

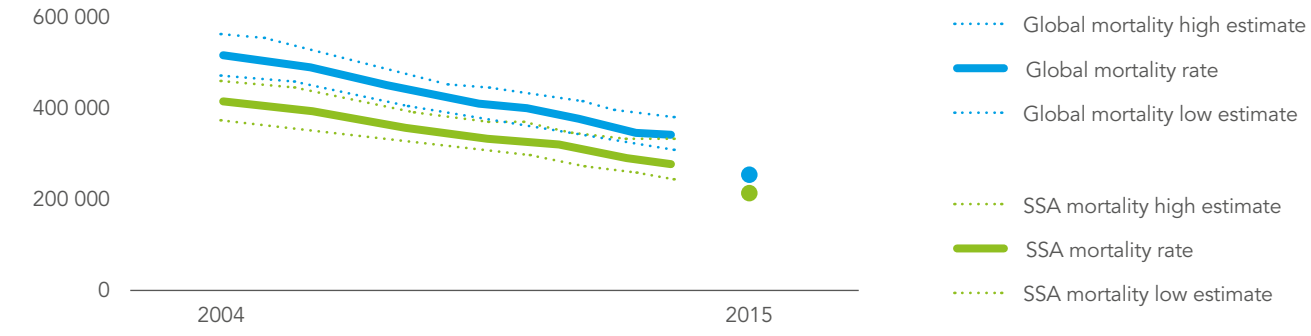
Expanded access to HIV treatment has also contributed to substantial progress towards other development aims. Increases in treatment access for children living with HIV, combined with dramatic gains in prevention coverage for pregnant women living with HIV, has sharply reduced the number of children who die each year of AIDS-related causes, playing an important role in the historic decline in deaths worldwide among children under age five. By protecting the health of mothers and fathers living with HIV, antiretroviral therapy also prevents children from being orphaned as a result of AIDS. HIV treatment scale-up has also strengthened global efforts to reduce the burden of tuberculosis, with tuberculosis-related deaths among people living with HIV falling by 33% globally from 2004 to 2013, including steady declines in sub-Saharan Africa, the most heavily affected region (Fig. 6). The resources mobilized to expand HIV treatment are also buttressing health systems in low- and middle-income countries – building essential health infrastructure, improving data systems and analytical capacity, and supporting massive training programs for health care workers *(4)*.

Fig. 5. Antiretroviral therapy coverage in adults and children, global, 2000–2014



Source: UNAIDS, How AIDS changed everything — MDG6: 15 years, 15 lessons of hope from the AIDS response, Geneva 2015.

Fig. 6. Estimated number of tuberculosis-related deaths among people living with HIV, globally and in sub-Saharan Africa (SSA), 2004–2013



Source: UNAIDS, How AIDS changed everything — MDG6: 15 years, 15 lessons of hope from the AIDS response, Geneva 2015.

"15 BY 15": HOW IT HAPPENED

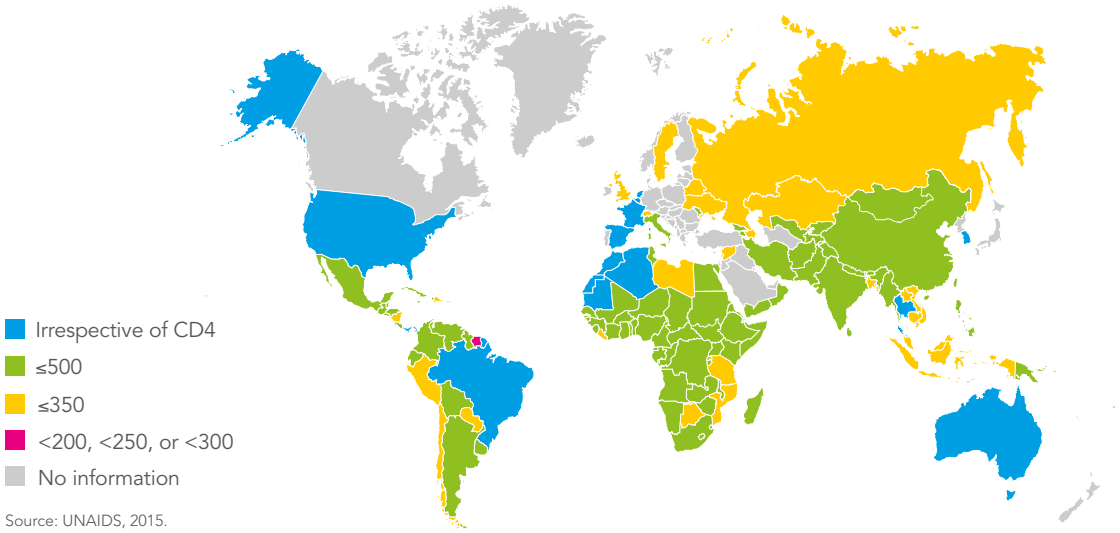
No single sector or set of actors could on its own have reached the "15 by 15" target. Achievement of this target demonstrates the power of a genuinely worldwide movement, uniting the global North and South, drawing on both public and private sectors, linking biomedical science with human rights and social science, and putting the people most affected by HIV and the communities to which they belong at the very centre of the response, ensuring no one is left behind.

LEADERSHIP AND COMMITMENT TO ACHIEVE AN AMBITIOUS TARGET

Beginning with the launch of the 2011 Political Declaration, national governments, international partners, civil society, the private sector and other stakeholders rallied around the "15 by 15" target. Even as major challenges have emerged or intensified in the intervening years—such as the growing threat posed by climate change, proliferation of civil unrest and humanitarian disasters, and the Ebola outbreak in West Africa—leaders have worked to ensure that the goal of achieving universal HIV treatment access remains high on the global political agenda. In 2013, African governments joined with UNAIDS, WHO, The United States President's Emergency Plan for AIDS Relief (PEFPAR) and the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) to launch the Treatment 2015 initiative, reaffirming their commitment to universal treatment access and redoubling efforts to reach the "15 by 15" target.

As global HIV treatment guidelines evolved, calling for even faster and more extensive expansion of antiretroviral therapy, countries allowed scientific evidence to guide their national responses, moving expeditiously to implement WHO treatment guidelines as they were updated. After WHO recommended raising the threshold for antiretroviral treatment initiation from 350 CD4 cells/mm^3 to 500*, countries swiftly began aligning

Fig. 7. National policies regarding initiation of antiretroviral therapy, May 2015



Source: UNAIDS, 2015.

* CD4 cells are key players in the body's immune system that are progressively depleted by HIV infection. Clinicians monitor HIV-related immune deterioration by measuring the number of CD4 cells in a cubic millilitres of plasma.

national approaches with the new international guidelines. As of May 2015, 78 countries had adopted the 500 CD4 threshold, with an additional 12 countries going even further to recommend initiation of HIV treatment for all people living with HIV, regardless of CD4 count (Fig. 7).

An important sign of leadership is accountability for results. In the final stretch to meet the "15 by 15" challenge, countries began reporting HIV treatment data every six months to UNAIDS, rather than annually as in earlier years. More frequent reporting has enabled national decision-makers and programme implementers to identify gaps and bottlenecks and move quickly to address them.

COMMUNITY ENGAGEMENT AND LEADERSHIP

Achievement of the "15 by 15" target would not have been possible without the unflagging engagement and leadership of communities. People living with HIV were the first to demand worldwide access to antiretroviral therapy, and they have remained at the vanguard of the response. Not only have communities advocated for treatment scale-up, but in addition many people living with HIV have served as peer navigators, expert patients and lay counsellors in HIV testing and treatment settings.

Communities play vital roles in building demand for testing and treatment services. And, increasingly, communities themselves are also delivering HIV testing and antiretroviral therapy (an issue addressed in greater detail on pp. 38-39).

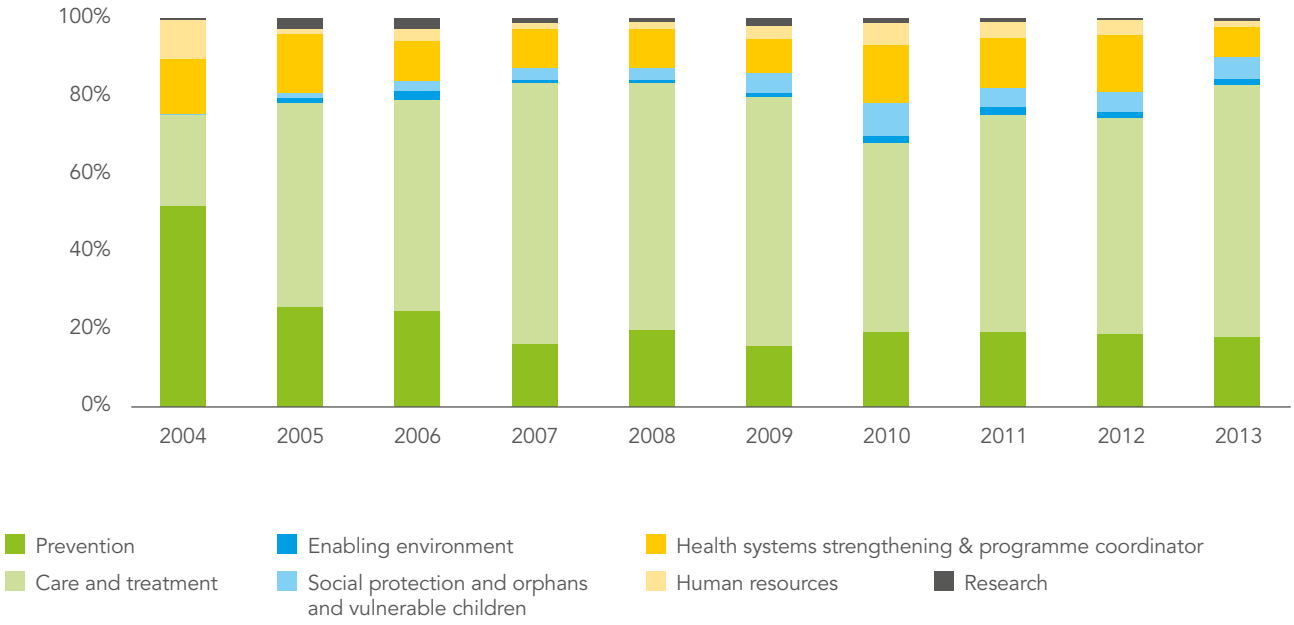
ROBUST FUNDING FOR ANTIRETROVIRAL TREATMENT

Resources available for HIV programmes have increased, rising from US$ 18.2 billion in 2011 to US$ 20.2 billion in 2014, and projected to reach US$ 21.7 billion by the end of 2015. The global movement to bring HIV treatment to those who need it has altered how HIV funds are spent (Fig. 8). In 2004 only 23% of total HIV funding supported HIV care and treatment services. From 2005-2013, it accounted for around two thirds of the total HIV resource availability. During the "15 by 15" initiative from 2011-2015, the share of HIV resources for care and treatment remained relatively constant but the total amounts increased every year.

The increases in resources mobilized, which have made achievement of the "15 by 15" target possible, vividly illustrate the power of the principles of

Fig. 8. **Financing the AIDS response, 2004–2013**

Distribution of available HIV funding among various types of activities, 2004-2013



Source: UNAIDS, 2015, unpublished.

shared responsibility and international solidarity. Low- and middle-income countries have largely driven the increase in funding for HIV treatment since 2011. In 2014, it is estimated that domestic sources (public and private) accounted for 57% of all resources available for HIV programmes.

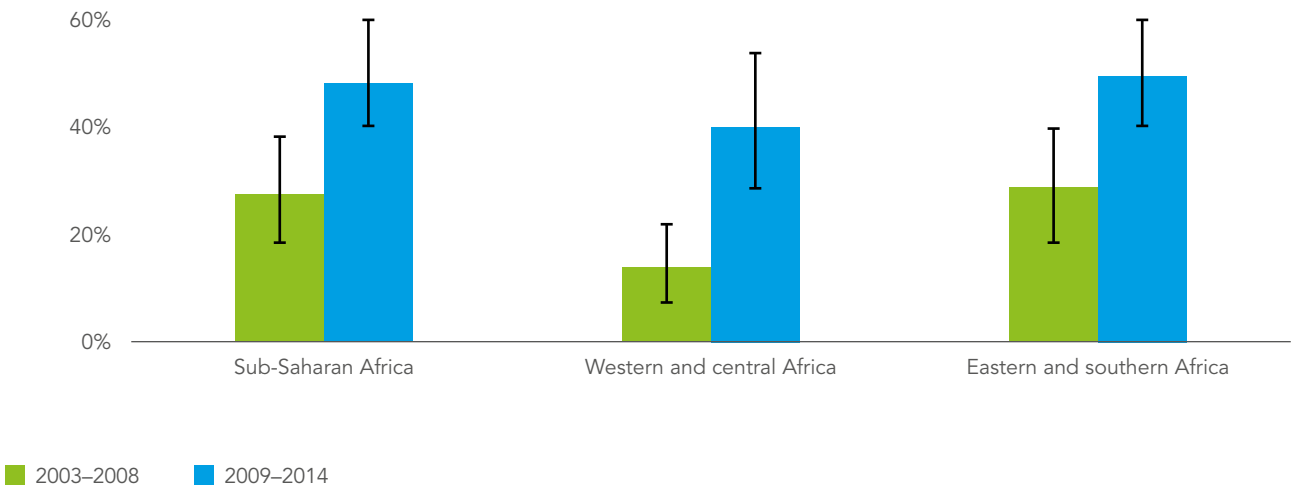
Since the ''15 by 15'' target was first launched, countries in different parts of the world took steps to increase funding for HIV care and treatment. In 2014, Myanmar upped domestic funding for the AIDS response by US$ 5 million, enabling the country to increase the number of people receiving antiretroviral therapy from 68 000 to 86 000. In South Africa, national funding for antiretroviral treatment rose by 46% from 2011-12 to 2013-14. Domestic funding for HIV care and treatment in the United States of America rose by 26% between 2010 and 2014 *(5)*.

Even with substantially greater national financing for HIV treatment scale-up, it would have been impossible to reach the "15 by 15" target without the continued solidarity of the international community. The Global Fund and PEPFAR, in particular, have played pivotal roles in the achievement of the global treatment target.

INCREASED KNOWLEDGE OF HIV STATUS

Major gains have been made in recent years in overcoming what has historically been the single greatest impediment to expedited HIV treatment scale-up—undiagnosed HIV infection. Comparing results from earlier household surveys with more recent survey results, the proportion of adults (aged 15-49 years) living with HIV in sub-Saharan Africa who know their HIV status increased by 26 percentage points from 2003-2008 to 2009-2014**. In 2014, for the first time in the AIDS response, a majority 54% [49-58%] of people living with HIV worldwide knew their HIV status.

Fig. 9. Awareness of HIV status among people aged 15-49 living with HIV in sub-Saharan Africa, 2003–2014



Source: UNAIDS, How AIDS changed everything — MDG6: 15 years, 15 lessons of hope from the AIDS response, Geneva 2015.

The push to achieve the "15 by 15" target has benefited from increased innovation in the testing field. With respect to technology, the emergence of rapid confirmatory tests have obviated the need to wait several days for confirmation, and extensive research and development efforts are focusing on further improvements in HIV diagnostic technologies.

Innovative methods of promoting and delivering HIV testing services have also contributed to increase knowledge of HIV status. Several countries have undertaken door-to-door, home-based testing campaigns, with one such campaign achieving 91% population-level knowledge of HIV status in a rural South African community *(6)*. In Kenya, a multi-disease campaign reached 86% of the population with HIV testing services, with 80% of those accessing HIV testing being tested for the first time *(7)*.

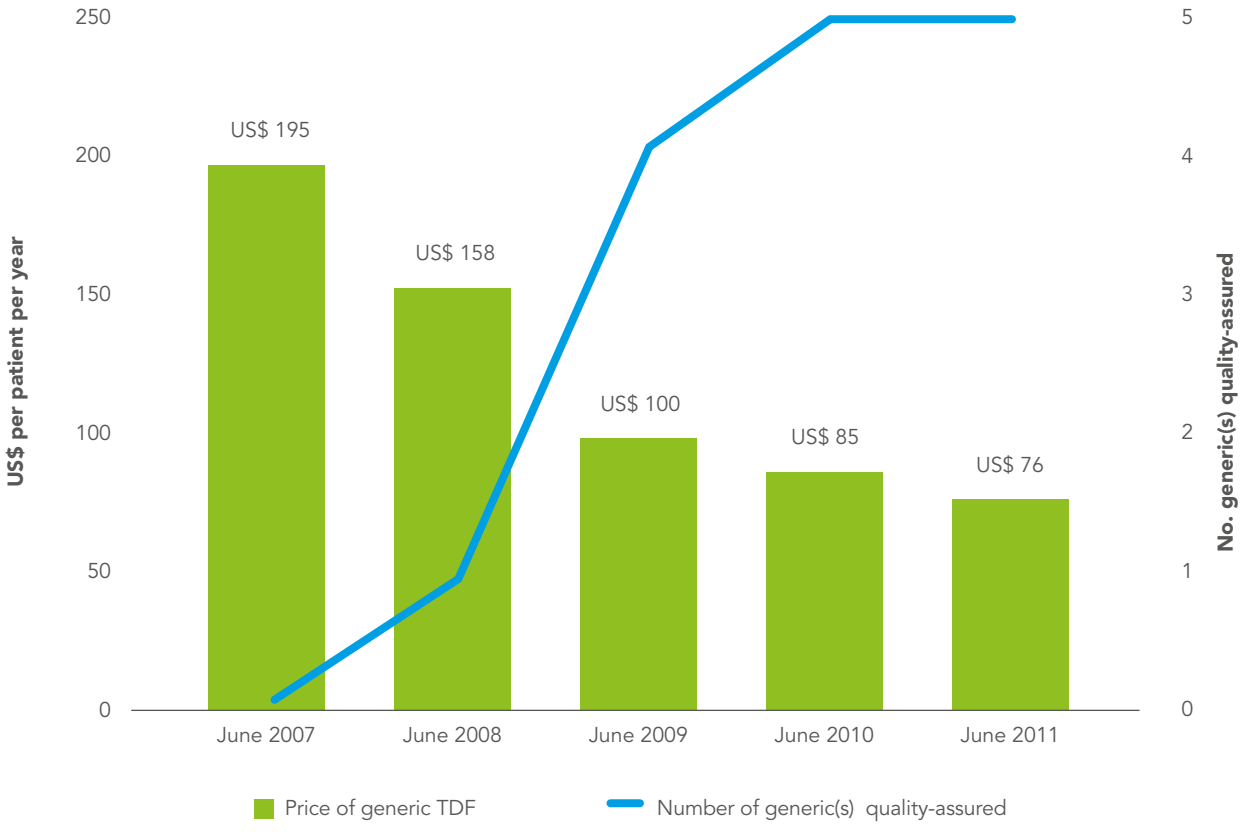
** Data derive from countries with multiple, nationally representative household studies. Results from household studies in 2003-2008 were compared with results from later household studies.

CONTINUED PROGRESS IN ENSURING AFFORDABLE AND OPTIMIZED ANTIRETROVIRAL REGIMENS

Sharp declines in the price of antiretroviral medicines in the previous decade played an important role in persuading the global community to embrace the "15 by 15" target. The drop in prices for antiretroviral medicines has persisted since endorsement of the 2011 United Nations Political Declaration on HIV and AIDS.

Competitive pressures generated by the generic pharmaceutical industry are primarily responsible for reductions in the prices of medicines for people living with HIV (Fig. 10).

Fig. 10. **Prices fall as more competitors enter the market**

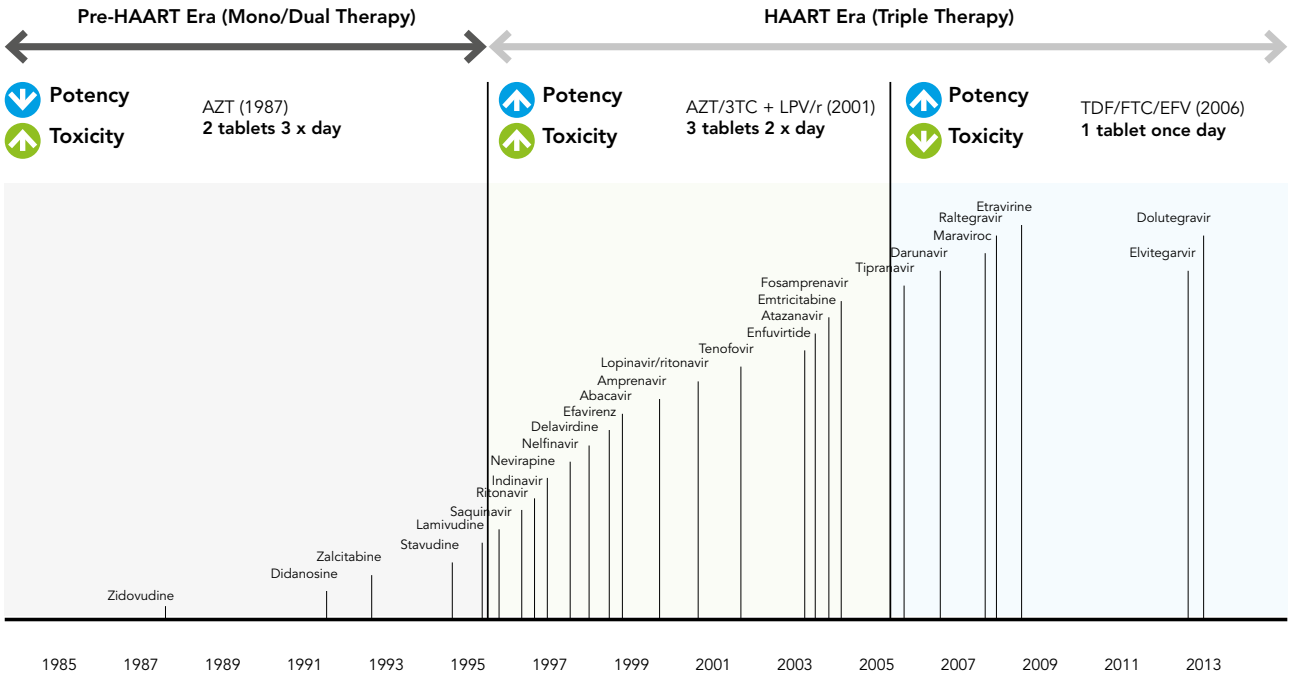


Source: Médecins Sans Frontières, 2011.

Declines in prices have also occurred for critical diagnostic technologies. In 2014, partners in the Diagnostics Access Initiative*** collaborated with the government of South Africa to forge a major new agreement to lower global prices for the leading platform for viral load testing. The agreement lowered the global price for viral load testing by at least 40% and is projected to save US$ 150 million in HIV treatment costs over the next five years.

Over time, antiretroviral regimens have been optimized and simplified. While patients earlier in the epidemic needed to take multiple medicines, often with complicated timing and dietary restrictions, the development of fixed-dose combinations has simplified antiretroviral therapy, making it easier for patients to adhere to prescribed regimens. WHO has also taken steps to standardize antiretroviral therapy for both adults and children, identifying a small number of preferred regimens to guide clinical practice.

Fig. 11. Science evolved: smarter and better HIV treatment options now available



Source: UNAIDS, 2014.

*** The Diagnostics Access Initiative aims to leverage improved, affordable, accessible and optimally used diagnostics to accelerate progress towards the 90-90-90 target. Founding partners in the initiative are UNAIDS, WHO, the Clinton Health Access Initiative (CHAI), The United States President's Emergency Plan for AIDS Relief (PEPFAR), the Global Fund to Fight AIDS,Tuberculosis and Malaria, The United States Centers for Disease Control and Prevention (CDC), the African Society for Laboratory Medicine (ASLM), UNITAID and UNICEF.

In 2015, preferred first-line antiretroviral regimens, as outlined in WHO treatment guidelines, are more tolerable and durable than earlier regimens. The superior regimens not only improve the health and quality of life of individuals taking the medicines, but they also enhance the long-term cost-effectiveness of treatment programmes by substantially delaying the need for individuals to switch to more costly second- and third-line regimens.

Steps have also been taken to simplify and optimize antiretroviral therapy for children. WHO's 2013 consolidated antiretroviral guidelines streamlined global guidance on paediatric antiretroviral therapy, and the Inter-Agency Task Team identified a limited number of optimal paediatric formulations recommended for procurement. The Global Fund assumed leadership of the Paediatric ARV Procurement Working Group, while WHO led the efforts of diverse stakeholders to prioritize research and development of optimized paediatric antiretroviral regimens.

Sharp declines in the price of antiretroviral medicines played an important role in persuading the global community to embrace the "15 by 15" target.

IMPROVED EFFICIENCY AND QUALITY OF ANTIRETROVIRAL TREATMENT PROGRAMMES

As medicines in PEPFAR-supported facilities account for less than half of total costs of antiretroviral therapy *(8)*, efforts to improve the efficiency of HIV treatment have also focused on other items, such as staff salaries, laboratory supplies, non-antiretroviral medicines for opportunistic infection, facilities and other infrastructure costs, and programme management costs. As they have expanded, programmes have achieved considerable economies of scale, permitting reductions in per-patient costs for HIV treatment. For PEPFAR-supported programmes, the annual per-patient expenditure of treatment has declined from US$ 1,100 to US$ 315 – a savings of roughly 70% *(8)*.

Improved efficiency in the delivery of antiretroviral therapy has allowed finite treatment funding to extend much further than it otherwise would, permitting a rate of scale-up that exceeds the much lower rate at which funding has increased. While total resources available for HIV rose by 11% from 2011 to 2014, the number of people accessing antiretroviral therapy increased by 60% during this period.

Careful, systematic monitoring of treatment-associated expenses has enabled programmes to identify and reap efficiency gains. PEPFAR's Impact and Efficiency Plan has used just such an approach, tracking key expenses over time and using monitoring to intervene strategically to further lower per-patient costs *(8)*.

Fig. 12. **Leveraging commodity opportunities**

-40%
DECLINE IN PRICE

PRICE REDUCTION FOR THE HIV VIRAL LOAD TEST

US$ 9.40
PER TEST

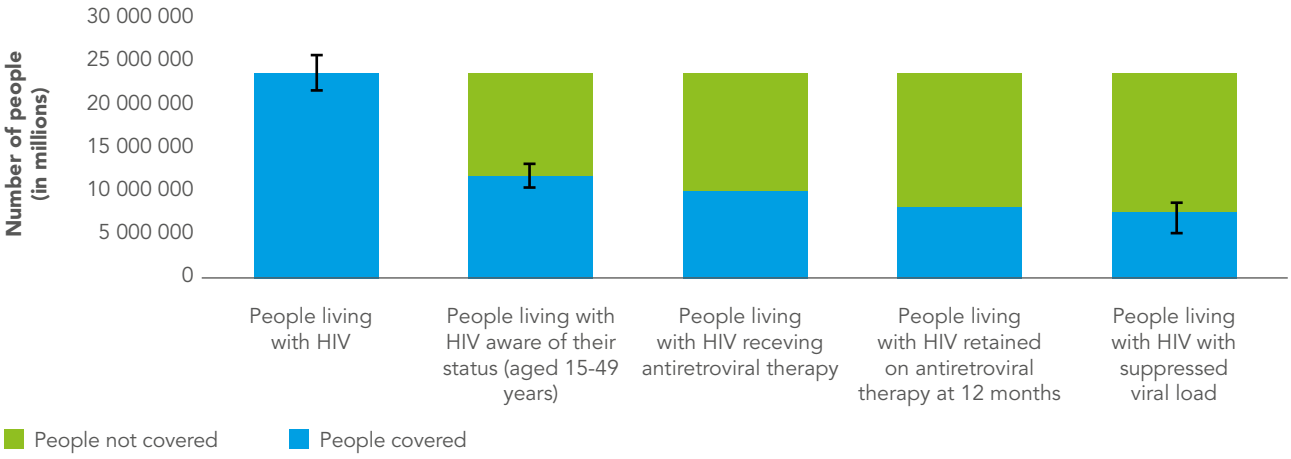
- US$ 150 million in costs savings over the next five years.
- Will change the market for viral load testing in low- and middle-income countries by improving access and competition.

Source: UNAIDS, 2014.

This is seen in sub-Saharan Africa, where the large majority of people who are diagnosed with HIV infection receive antiretroviral therapy and achieve viral suppression (Fig. 13).

Better use of diagnostic tests have improved the quality of HIV treatment services. In Mozambique, for example, introduction of point-of-care tools for monitoring CD4 counts has sharply lowered the proportion of antiretroviral therapy patients who discontinue HIV care (Fig. 14).

Fig. 13. **HIV treatment cascade for people aged 15 years and over in sub-Saharan Africa, 2014**



Sources and methods:

1. UNAIDS, How AIDS changed everything — MDG6: 15 years, 15 lessons of hope from the AIDS response, Geneva 2015.

2. Demographic and Health Surveys, 2008-2014 (www.measuredhs.com), the South African National HIV Prevalence, Incidence and Behaviour Survey 2012, the Swaziland HIV Incidence Measurement Survey (SHIMS) 2012, and the National HIV&AIDS and Reproductive Health Survey (Nigeria) 2012 (n=30 countries).
51% is the mid-point between the low and high bounds. The low bound (45%) is derived from the percentage of people living with HIV (PLHIV) receiving ART or the percentage of PLHIV who report receiving the results of an HIV test in the previous twelve months. The high bound (57%) is calculated as the percentage of PLHIV who report ever being tested for HIV. PLHIV who report never having been tested for HIV do not know their HIV status and make up the remaining 43%.

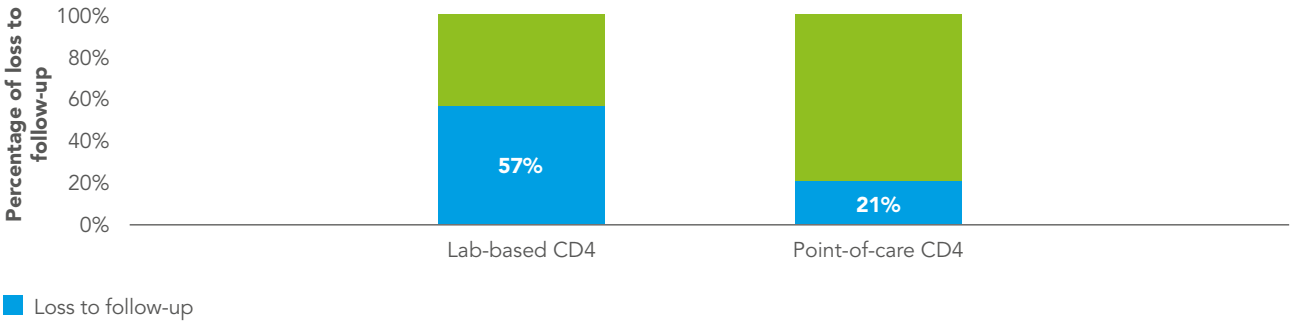
3. UNAIDS 2014 estimates.

4. GARPR 2015, representing the weighted average of 27 countries.

5. Barth RE, van der Loeff MR, er 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 the 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.

Viral load tests are a critical tool for delivering high-quality antiretroviral therapy. The proportion of people living with HIV who have access to viral load testing, while still inadequate, has increased.

Fig. 14. Loss to follow-up in Mozambique (before CD4 results) using point-of-care (POC) CD4 vs. Lab-based tests, 2010

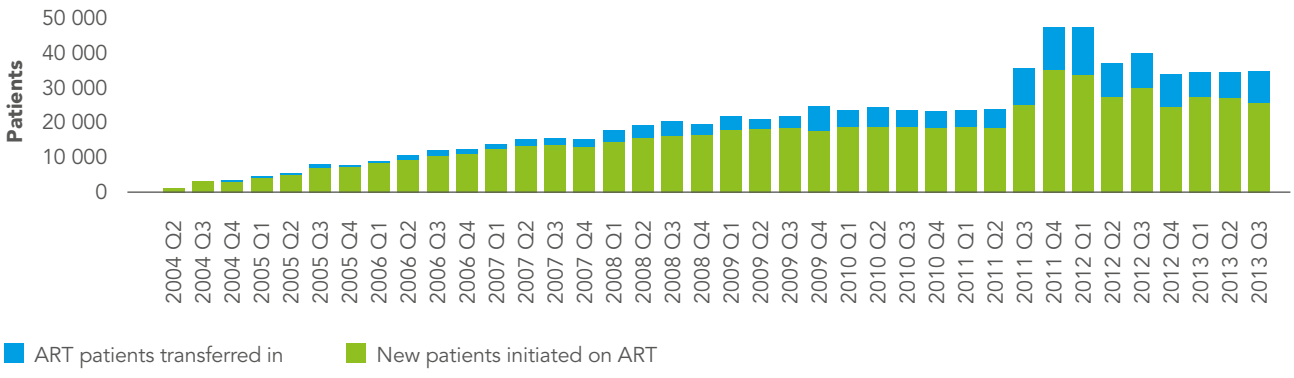


Source: Jani, Ilesh V et al., The Lancet, 2011.

INNOVATION TO IMPROVE OUTCOMES

Innovation in countries has resulted in breakthroughs in treatment delivery that have been adopted globally. For example, after Malawi began systematically initiating lifelong antiretroviral therapy for all pregnant women living with HIV in 2011, treatment uptake among pregnant women increased 7-fold (Fig. 15), in 2013, WHO recommended adoption of this approach worldwide. In Mozambique, a community support programme involving self-forming patient groups was rolled out to complement clinic-based services, leading to a sharp increase in patient retention rates (Fig. 16).

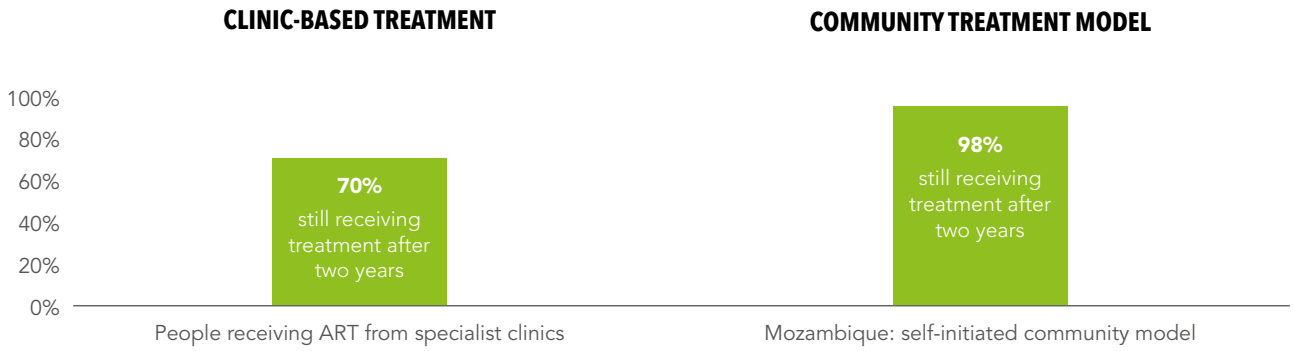
Fig. 15. Patients newly initiated on antiretroviral therapy (ART) and total ART clinic registrations per quarter, Malawi, 2004–2013



Source: Malawi Ministry of Health, 2014.

Innovation is helping improve outcomes for children living with HIV. In Kenya, health facilities are incorporating mothers living with HIV, providing a monthly stipend to support their efforts to increase retention in care and treatment adherence *(10)*. In Uganda, a family-centred model of comprehensive, multi-disciplinary care in 10 health facilities and 10 community clinics resulted in a 40-fold increase in enrolment in paediatric HIV treatment (Fig. 17) *(11)*.

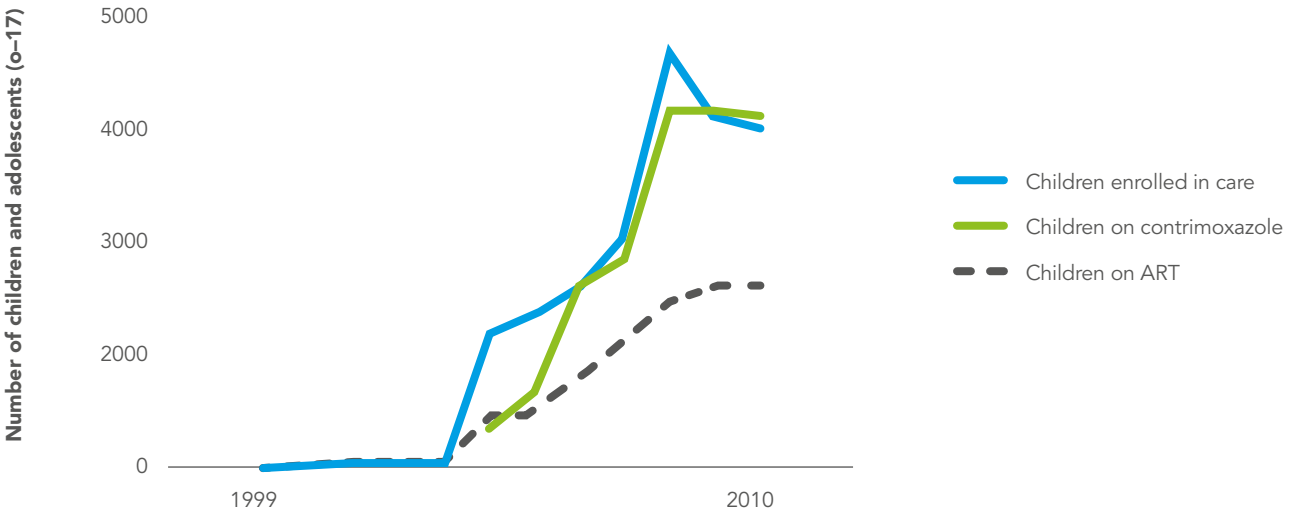
Fig. 16. **Community support keeps people on treatment: The experience in Mozambique, 2008–2010**



Source: Decroo, T. et al, JAIDS, 2011.

Across treatment programmes in eight countries in sub-Saharan Africa, Médicins Sans Frontières (MSF) has successfully applied various patient-driven approaches to improve medical outcomes for people receiving antiretroviral therapy *(12)*. These include adherence clubs that involve group distribution of antiretroviral therapy for antiretroviral therapy patients who are stable, as well as peer counselling and support to improve adherence. A 2013 study in South Africa found that MSF-supported adherence clubs reduced loss to care by 57% *(13)*. MSF programmes have also used various methods for community distribution of antiretroviral therapy for stable patients, with provisions made for regular health monitoring. Retention in care over 13 months approached 100% for one MSF programme of community distribution of antiretroviral therapy *(14)*. Facility-based innovations by MSF include implementation of patient-friendly appointment protocols as well as fast-track procedures for refilling medicines.

Fig. 17. Uptake of pediatric HIV services after introduction of family-based approach, Uganda, 1999–2010



Source: Luyirika M. et al., PLOS ONE, 2013.

Investments in HIV-related research and development have helped spur innovation in the AIDS response. The knowledge base on HIV treatment further expanded in 2011-2015, and the AIDS response moved rapidly to incorporate this new learning into treatment-related policy and practice *(15)*. As the "15 by 15" target was being launched, the first evidence from a large clinical trial confirmed that HIV treatment sharply lowers the risk of HIV transmission *(16)*, giving further urgency to global efforts to scale up HIV treatment. In 2015, another large international trial definitively demonstrated the clinical benefits to people living with HIV of early initiation of HIV treatment, providing further support for the growing number of countries that recommend the offer of HIV treatment for all people living with HIV, regardless of CD4 count. These and other studies have influenced international normative guidance, as reflected by the continuing evolution of WHO's international antiretroviral treatment guidelines.

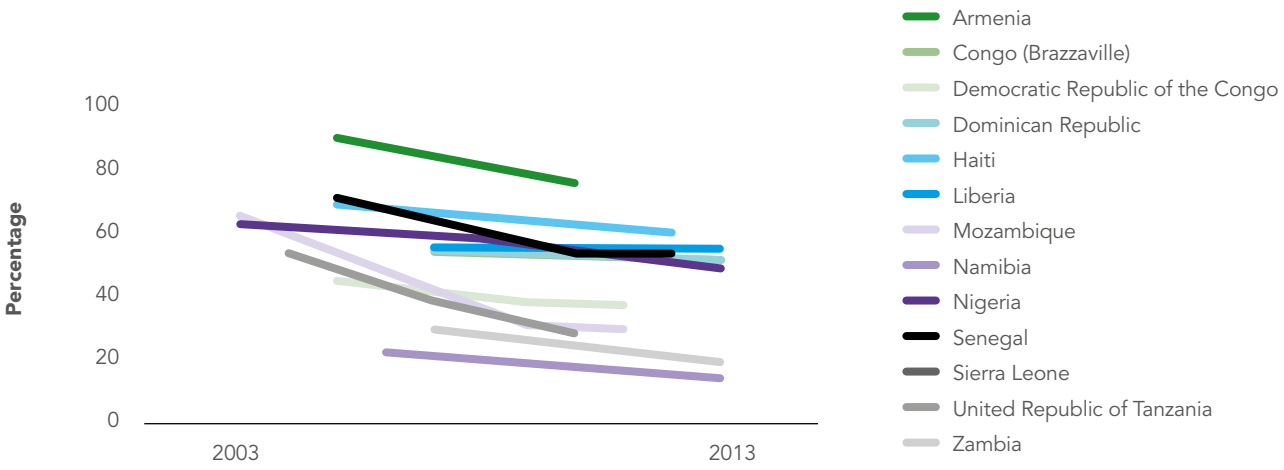
Investments in research and development are also improving treatment options. Responding to an acute shortage of treatment alternatives for very young children living with HIV, at least 10 paediatric HIV medicines from multiple antiretroviral classes are currently in development *(17)*. Research efforts in 2011-2015 yielded a new class of antiretroviral agents (integrase inhibitors), as well as new breakthrough compounds from existing classes that are likely to substantially aid global efforts to optimize antiretroviral therapy *(18)*.

DECLINES IN HIV-RELATED STIGMA

Although stigma and discrimination remain major barriers to uptake of HIV testing and treatment, the prevalence of discriminatory attitudes towards people living with HIV appears to be on the decline. In countries where multiple household surveys have been conducted, there have been notable declines in the proportion of adults who say they would avoid buying vegetables from a vendor known to be HIV-positive (Fig. 18). In these surveys, there is a strong relationship between increased HIV treatment coverage and reduced prevalence of HIV-related stigma *(19)*.

Fig. 18. **Discriminatory attitudes towards people living with HIV, 2003–2013**

Percentage of women and men 15-49 who would not buy fresh vegetables from a shopkeeper or vendor if they knew the person had HIV.
Demographic and Health Surveys, selected countries



Source: UNAIDS, How AIDS changed everything -- MDG6: 15 years, 15 lessons of hope from the AIDS response, Geneva 2015.

HIV treatment and stigma have a multi-directional relationship. Expanding access to HIV treatment reduces discriminatory attitudes towards people living with HIV, while reductions in stigma mitigate deterrents to utilization of HIV testing and treatment services.

Although these gains are encouraging, much work remains to be done in overcoming the deterrent effects of stigma and discrimination. This is especially true of many populations who are being left behind by the AIDS response *[20]*.

PREVENTING NEW HIV INFECTIONS WHILE SAVING LIVES:

ADDITIONAL BENEFITS OF HIV TREATMENT SCALE-UP

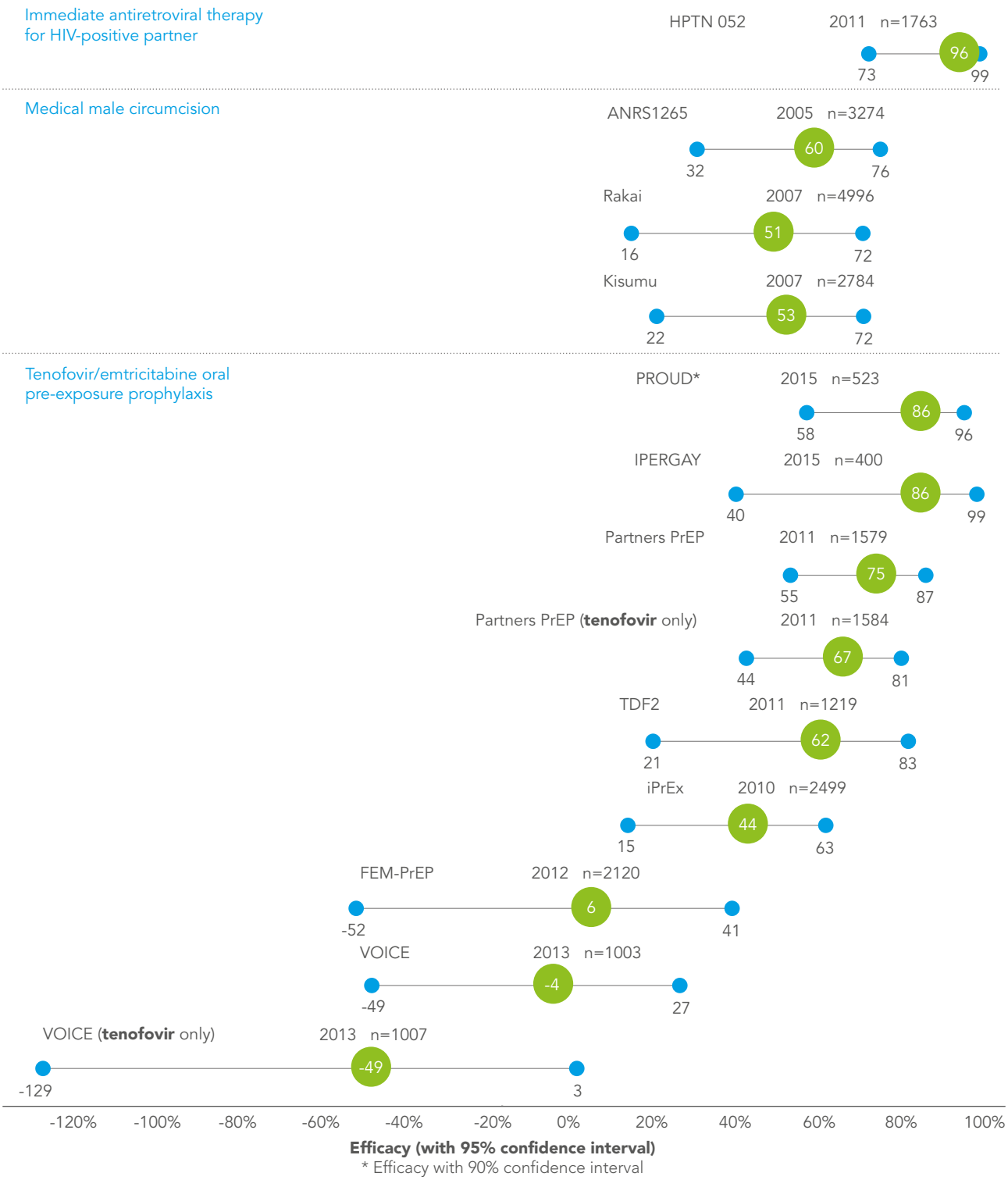
The primary purpose of the "15 by 15" target was to reduce illness and death associated with HIV. However, beginning in 2011, it became apparent that HIV treatment is a core component of combination HIV prevention.

Antiretroviral therapy reduces by 96% the risk of HIV transmission.

In 2011, a major international trial found that antiretroviral therapy reduces by 96% the risk of HIV transmission *(16)*. This finding has been confirmed by subsequent studies, which have found that HIV treatment scale-up has a powerful population-level prevention impact. Studies in KwaZulu-Natal, South Africa, found a clear correlation between increases in HIV treatment coverage and reductions in HIV incidence *(20)*. In a study of outcomes in 51 low- and middle-income countries, researchers found the same relationship between increased HIV treatment coverage and reduced HIV incidence *(22)*. Among biomedical HIV prevention interventions studied to date in randomized controlled trials, HIV treatment has by far the most powerful prevention effect (Fig. 19).

HIV treatment to support HIV prevention is one of a broad spectrum of preventive uses of antiretroviral medicines. As Fig. 19 demonstrates, validated antiretroviral-based prevention methods include pre-exposure antiretroviral prophylaxis. Administration of antiretroviral medicines is also a pillar of effective prevention of mother-to-child HIV transmission and for post-exposure prophylaxis.

Fig. 19. **Efficacy of available bio-medical prevention interventions derived from randomized clinical trials**



Modified with permission from Marrazzo et al, JAMA, in press, 2015.*

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.

LEVERAGING TREATMENT SCALE-UP TO HELP END THE EPIDEMIC:

THE CERTAINTY OF FAILURE WITH 'BUSINESS AS USUAL'

Clear evidence that HIV treatment not only saves lives but virtually stops HIV transmission prompted the world to adopt a new target for the post-2015 world: the 90-90-90 approach. Rather than focus only on saving the lives of people living with HIV, the 90-90-90 target takes account as well of the powerful prevention benefits of antiretroviral therapy. In place of a singular focus on the number of people initiating HIV treatment, the 90-90-90 target requires success across the HIV treatment continuum, with sustained viral suppression representing the realization of the maximum potential of antiretroviral therapy.

The 90-90-90 approach is essential to hopes for ending the AIDS epidemic.

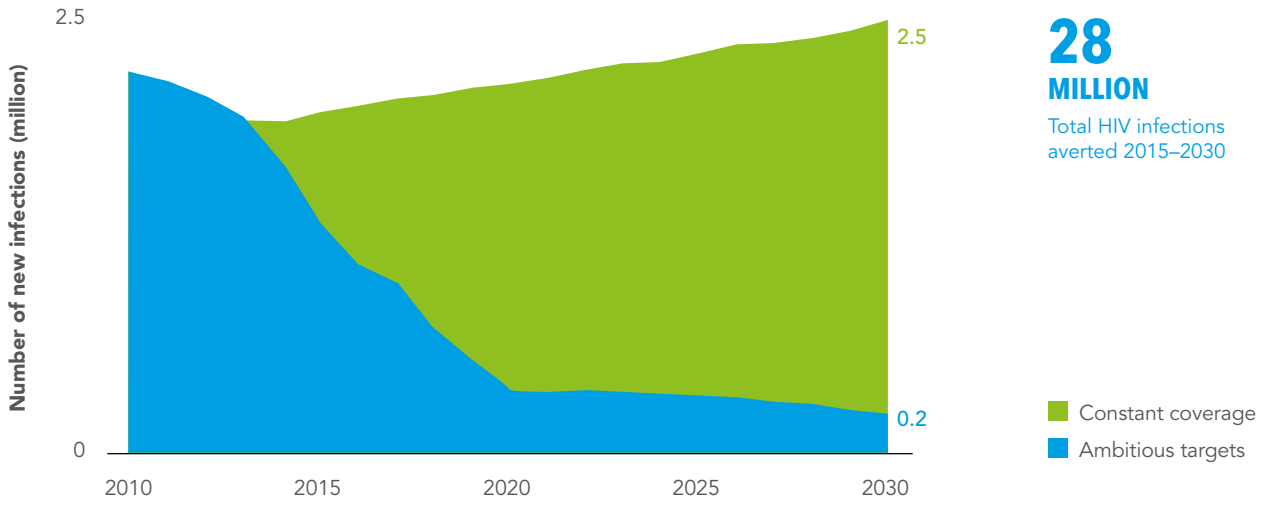
The global community has embraced the 90-90-90 approach as essential to hopes for ending the AIDS epidemic. In 2013, African countries, under the umbrella of the African Union, enthusiastically embraced the goal of ending the AIDS epidemic by 2030, re-committing themselves to this goal at an AU summit meeting in June 2015. The call to end the epidemic was forcefully taken up by global leaders at a major event during the United Nations General Assembly in September 2014, with strong international support voiced for the 90-90-90 approach. Countries across the world, as well as the leading international HIV donors, are aligning their efforts with the 90-90-90 target.

The world has a brief, five-year window of opportunity to lay the foundation to end the AIDS epidemic as a public health threat by 2030.

Modelling by UNAIDS indicates that the world has a brief, five-year window of opportunity to lay the foundation to end the AIDS epidemic as a public health threat by 2030. By achieving the 90-90-90 target, along with ambitious new targets for HIV prevention and non-discrimination, it is estimated the world could reduce progression to AIDS and AIDS-related deaths as well as new HIV infections by an order of magnitude within 15 years *(3)*. However, as Fig. 20 indicates, failing to build on coverage gains would have catastrophic consequences, resulting in an epidemic that is far more serious and rapidly rising by 2030.

To ensure that the world seizes this historic opportunity to create a healthier, more equitable world for future generations, UNAIDS has called for a Fast-Track approach to rapidly scale up strategic responses in 2015-2020 *(23)*. To assist countries in fast-tracking their response, UNAIDS is prioritizing technical support for the 28 low- and middle-income countries that together account for more than 80% of new HIV infections. To make this intensification of effort possible, UNAIDS has redeployed substantial numbers of staff from its global headquarters to priority Fast-Track countries and regions.

Fig. 20. New HIV infections in low- and middle-income countries, 2010–2030, with achievement of ambitious Fast-Track Targets, compared to maintaining 2013 coverage



Source: UNAIDS, Fast-Track - Ending the AIDS epidemic by 2030, Geneva 2014.

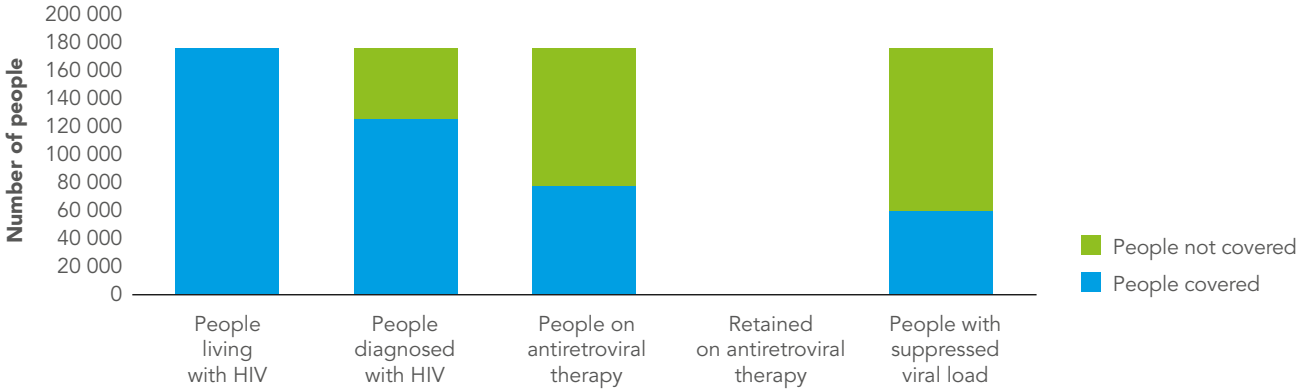
Although it will be impossible to end the epidemic without scaling up HIV treatment and improving outcomes across the treatment cascade, achievement of the 90-90-90 target will take the world only 60% of the way towards the ultimate goal of reducing new HIV infections by 90% by 2030. In addition to the push for 90-90-90, the world also needs to redouble primary HIV prevention efforts and commit to overcome once and for all the legacy of stigma, discrimination and human rights violations that have slowed progress thus far.

Nearly half of people living with HIV still do not know their HIV status.

While the 90-90-90 target is achievable, the world will reach it only if it addresses persistent gaps in the response. Although testing rates continue to rise, nearly half of people living with HIV still do not know their HIV status. Moreover, while most people who are diagnosed with HIV access HIV treatment and enjoy good medical outcomes in many regions, results along the treatment cascade must still be substantially improved. For example, in Latin America and the Caribbean, which has achieved notably greater knowledge of HIV status than the world as a whole, more than one in three people with diagnosed HIV infection were not receiving antiretroviral therapy in 2013 and slightly more than half of people with an HIV diagnosis had viral suppression (Fig. 21).

A comparable pattern prevails in Thailand (Fig. 22). Although Thailand is approaching the target for knowledge of HIV status, with 80% of all people living with HIV in the country aware of their HIV status in 2014, less than two-thirds of people living with HIV are receiving antiretroviral therapy. Only 43% of people living with HIV in Thailand had achieved viral suppression in 2014.

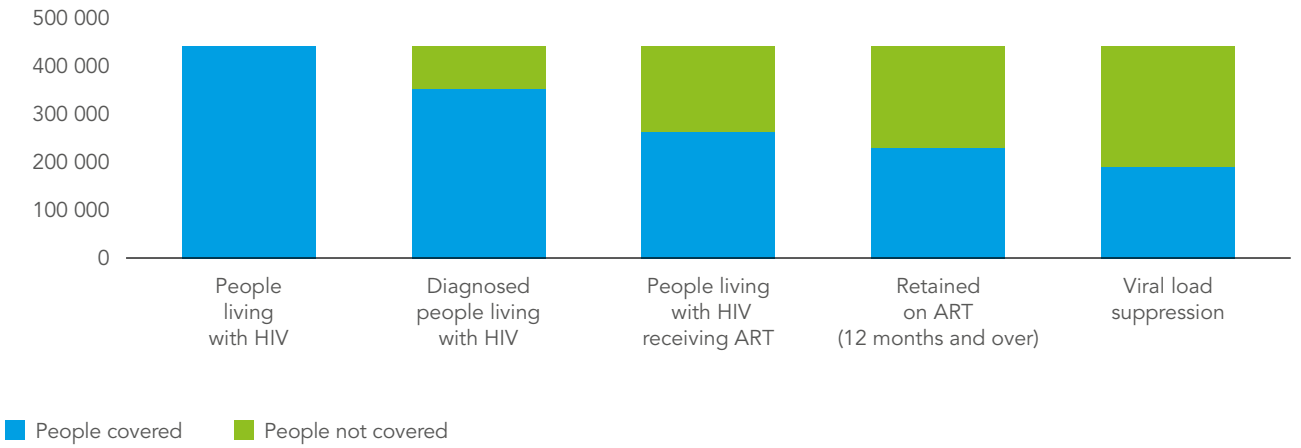
Fig. 21. **HIV continuum of care and treatment cascade for Latin America and the Caribbean, 2013**



Source: Based on Antiretroviral Treatment in the Spotlight: A Public Health Analysis in Latin America and the Caribbean. Key messages. PAHO, 2014.

While the 90-90-90 target is grounded in principles of equity, many populations face profound obstacles to treatment access, often as a result of stigma and discrimination that is frequently abetted by national legal and policy frameworks. Groups that confront key obstacles to care and treatment include adolescents (especially girls and young women), gay men and other men who have sex with men, migrants, people who inject drugs, prisoners, sex workers and transgender people *(20)*. While 41% [38-46%] of adults had access to antiretroviral therapy in 2014, only 32% [30-34%] of children living with HIV obtained HIV treatment. These and other gaps in the response must urgently be closed if the world is to achieve the 90-90-90 target.

Fig. 22. **HIV continuum of care and treatment cascade,Thailand, 2014**



Source: Based on National Health Security Office (NHSO) and National AIDS Management Center, MOPH.

THE AIDS RESPONSE AT A CROSSROADS:

IMMINENT SUCCESS, OR LOOMING CRISIS?

Although the world is within reach of what was once almost unimaginable—bringing the AIDS epidemic to an end as a public health threat—both the achievements to date, as well as hopes for ending the epidemic, are also at grave risk. Important trends in the broader financial, industrial and global health environment potentially jeopardize everything that has been achieved in the AIDS response. Only immediate action, putting in place the foundation needed to achieve the 90-90-90 target and complementary ambitious targets for HIV prevention and non-discrimination by 2020, will avert this looming crisis and help the world seize the opportunity to end the AIDS epidemic as a public health threat by 2030.

If the world pursues 'business as usual,' it will by 2030 confront a resurgent epidemic that is rapidly spiralling out of control.

HIV TREATMENT SCALE-UP REMAINS TOO SLOW

If the world pursues 'business as usual' in the AIDS response, resting on current laurels but failing to build on successes thus far, it will by 2030 confront a resurgent epidemic that is rapidly spiralling out of control. While the annual number of new HIV infections in sub-Saharan Africa was 1.4 million [1.2-1.5] in 2014 and trending downwards, failing to build on current coverage would by 2030 cause the annual number of HIV infections in the region to reach 2 million, essentially returning the region to the worst days of the epidemic. Likewise, whereas AIDS-related deaths are sharply declining in sub-Saharan Africa (with 790 000 [670 000 - 1 000 000] deaths due to HIV-related causes in 2014), failing to strengthen the response will cause annual AIDS-related mortality to increase; by 2030, in the absence of concerted action to build on successes to date, 1.7 million people in Africa will die each year of AIDS-related causes. Even more ominous is the fact that the annual number of both new HIV infections and AIDS-related deaths will by 2030 be trending clearly upwards if global leaders do not make new investments in the AIDS response.

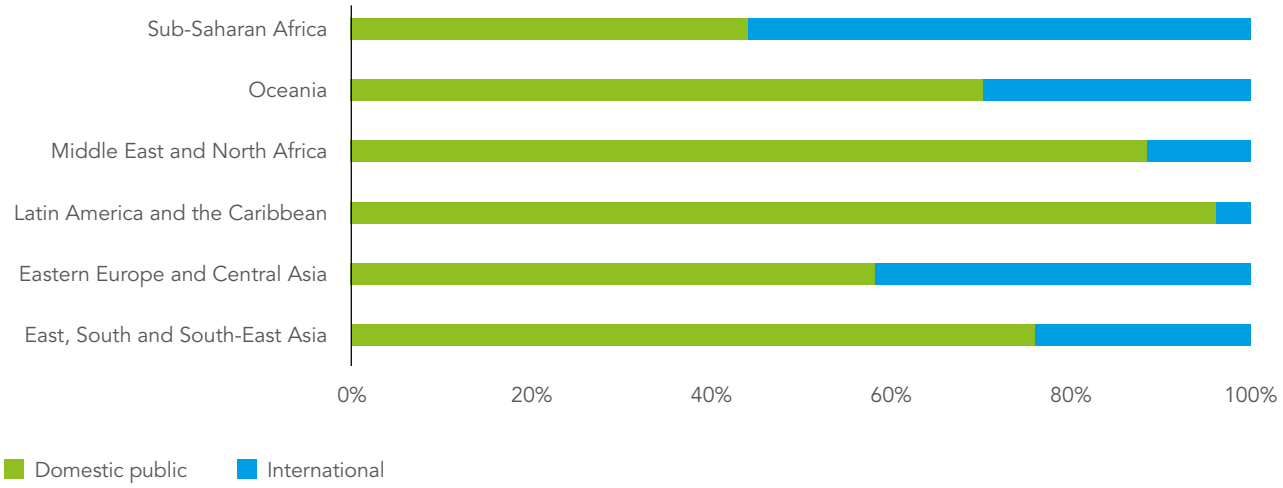
THE FINANCIAL SUSTAINABILITY OF TREATMENT SCALE-UP IS INCREASINGLY UNCERTAIN

Although rapid economic growth in many low- and middle-income countries is generating historic human benefits for millions of people, it also has important implications on future financing of the global AIDS response. In Africa, for example, numerous countries have graduated from low-income to middle-income status. Increasingly, international donors are reducing their financial assistance to middle-income countries, potentially jeopardizing future funding for essential HIV programmes in many lower-middle-income countries.

This is placing considerable strains on national AIDS responses in many countries. However, as Fig. 23 indicates, many countries remain heavily dependent on international HIV assistance; this is especially true in sub-Saharan Africa, the region most heavily affected by HIV and home to three-quarters of the world's low-income countries.

As prosperity continues to grow and spread in many low- and middle-income countries, domestic sources will inevitably need to shoulder a greater share of financing for its AIDS response. Accordingly, if the Fast-Track approach is to succeed in laying the foundation to end the AIDS epidemic within the next 15 years, low- and middle-income countries must play a pivotal role in mobilizing front-loaded financial resources. Currently, domestic public sources cover around 45% of costs associated with HIV treatment programmes in Africa.

Fig. 23. **Funding sources for antiretroviral treatment, by region**



Source: UNAIDS 2015 estimates, based on most recent (between 2010 and 2014) country reported data.

As prosperity continues to grow and spread in many low- and middle-income countries, domestic sources will inevitably need to shoulder a greater share of the national AIDS response.

These numbers reflect not only a potential humanitarian and social catastrophe, but also a looming financial calamity as well. Failing to end the epidemic and prevent a resurgence of HIV will saddle countries with rising poverty, slower economic growth and enormous future outlays for HIV treatment and services for children orphaned by the epidemic. At a historic transition when hopes for genuine, sustainable development are at their highest in decades, AIDS could yet again undercut everything the global community aims to achieve.

THE FUTURE AVAILABILITY OF AFFORDABLE ANTIRETROVIRAL MEDICINES

While price declines for first-line antiretroviral regimens over the last 15 years represent one of the greatest accomplishments in global health history, threats are emerging to the future availability of affordable antiretroviral medicines, potentially imperilling hopes for ending the epidemic.

Increasing need for second- and third-line medicines

With a small but meaningful fraction of antiretroviral treatment patients needing to move each year from first- to second-line regimens, the Global Fund estimates that 24% of African patients receiving antiretroviral therapy through its grants will be on second-line regimens in 2020. However, second-line regimens are at least twice as expensive—and often substantially more so—as first-line regimens.

Generic manufacturers account for more than 95% of antiretroviral medicines used in low- and middle-income countries *(24)*. However, while there are reasons to expect that increased demand will translate into lower prices, the same competitive dynamics within the generic pharmaceutical industry that resulted in dramatic price reductions for first-line antiretroviral regimens may not necessarily be available to make prices for second- and third-line medicines affordable.

The future of generic antiretroviral medicines

India's generic pharmaceutical industry has played a central role in facilitating treatment scale-up, with Indian generic manufacturers accounting for 70% of the global market for antiretroviral medicines in 2013 *(24)*. Although India has displayed strong, courageous commitment to its generic pharmaceutical industry, the future availability of Indian-manufactured

generic antiretroviral medicines, especially second- and third-line regimens, is uncertain. Free trade agreements increasingly aim to impose limitations on generic drug manufacturing that exceed those allowed under the Trade-Related Aspects of Intellectual Property (TRIPS) Agreement. In various global fora, the branded pharmaceutical industry and the countries in which they are based are bringing legal and diplomatic pressure to bear on India's generic industry.

The overall market for generic antiretroviral medicines is becoming increasingly concentrated and less competitive, and the generic market for second-line medicines is more concentrated than the first-line market. Emerging business opportunities for generic manufacturers in other diseases may make the industry less likely to invest in the production of low-margin antiretroviral medicines. Slow and costly drug registration processes also deter generic manufacturers from entering the HIV market.

TRIPS allows countries to issue compulsory licenses to address a pressing public health need. Indeed, compulsory licenses have played a critical role in lowering prices of antiretroviral medicines. However, reviews in recent years have found that many countries are not fully using flexibilities available under TRIPS to increase access to affordable medicines. Preserving flexibilities available under TRIPS -- and assisting countries in fully leveraging these flexibilities -- will be essential to ensuring a robust supply of affordable antiretroviral medicines in future years.

The overall market for generic antiretroviral medicines is becoming increasingly concentrated and less competitive.

Growing risks of interruptions in access to medicines

As the pharmaceutical industry for antiretroviral medicines becomes more and more concentrated, the risk increases that a disruption in plant operations (such as due to a natural disaster) or access to active pharmaceutical ingredients for any single company could cause widespread interruptions in the supply of essential medicines. Drug makers contacted in connection with a recent economic review of the generic antiretroviral pharmaceutical market reported that, in the case of a major supply disruption by a leading company, other companies would have difficulty compensating for this supply reduction and would be likely to do so only by charging substantially higher prices.

THE RISK OF HIV DRUG RESISTANCE

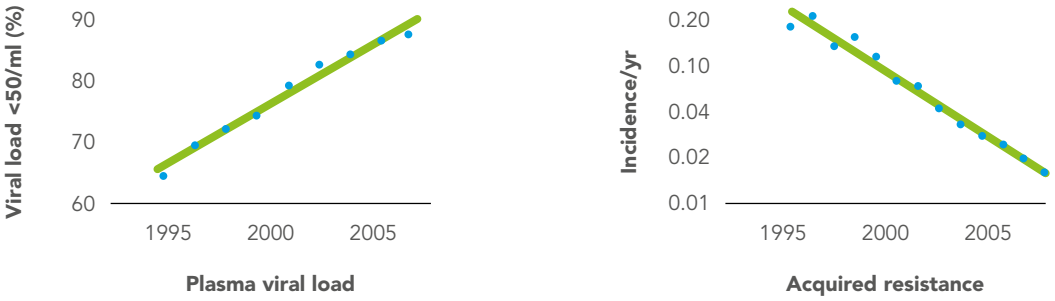
Sub-optimal adherence to prescribed regimens is the primary reason why resistance develops to antiretroviral medicines. When resistance develops, treatment begins to fail, requiring patients to switch to a new regimen. Given

the higher costs of second-line regimens, national treatment programmes have an important incentive to minimize the emergence of drug resistance. Moreover, drug-resistant strains may also be transmitted, which means that more affordable first-line regimens may be ineffective for treatment of many newly infected individuals.

WHO reports that surveys in Africa have, to date, found relatively modest rates of HIV drug resistance. However, these surveys also indicate that rates of drug resistance in the region are increasing. Indeed, WHO has found that rates of HIV drug resistance tend to increase as treatment coverage increases *(25)*. At various sites across the region (including sites in Burkina Faso, Guinea, Kenya, Morocco, Niger, United Republic Tanzania and South Africa), at least 10% of antiretroviral therapy patients have HIV drug resistance *(26)*.

While some degree of HIV drug resistance is unavoidable, it can be minimized. In the British Columbia province of Canada, for example, researchers have found low levels of HIV drug resistance following the steady scale-up of HIV treatment beginning in 1997 *(27)*.

Fig. 24. HIV drug resistance 1995–2008, British Columbia, Canada



Source: Courtesy of Julio Montagner, BC Centre for Excellence in HIV/AIDS, 2013.

Close monitoring of drug resistance is essential for national decision-makers. Understanding the rate at which drug-resistant strains are emerging helps countries forecast future demand for second- and third-line medicines. Monitoring trends in HIV drug resistance also enables countries to identify places and populations where intensified efforts are needed to support patients in taking their medicine as recommended.

However, most countries have yet to put in place the strategies and infrastructure needed to monitor HIV drug resistance. As of mid-2014, WHO reported that less than half of its 58 focus countries for HIV drug resistance surveillance had developed an HIV drug resistance prevention and assessment strategy *(25)*. In addition to immediately developing and implementing an HIV drug resistance strategy, African countries urgently need to invest to build the analytical capacity that will be needed to use drug resistance data to refine and adapt policy and programmatic approaches to preserve treatment effectiveness and slow the emergency of HIV drug resistance.

THE LOOMING HIV TREATMENT CRISIS: THE SOCIAL AND ECONOMIC STAKES

Together, the various factors that have brought the AIDS response to a crossroads have the potential to create grave social crises in many countries.

Together, the various factors that have brought the AIDS response to a crossroads have the potential to create grave social crises in many countries. Unless countries move now to anticipate and respond to these emerging threats, millions of people who depend on antiretroviral medicine for their very lives may have no meaningful treatment options when they need them. Some countries may face the prospect of discontinuing HIV treatment for patients who currently receive it. Social unrest and political instability could well result from failure to follow through on the commitment to universal treatment access.

Although these scenarios are frightening, they are wholly avoidable. Through smart and courageous action, in partnership with the international community and the private sector, it is possible to end the epidemic.

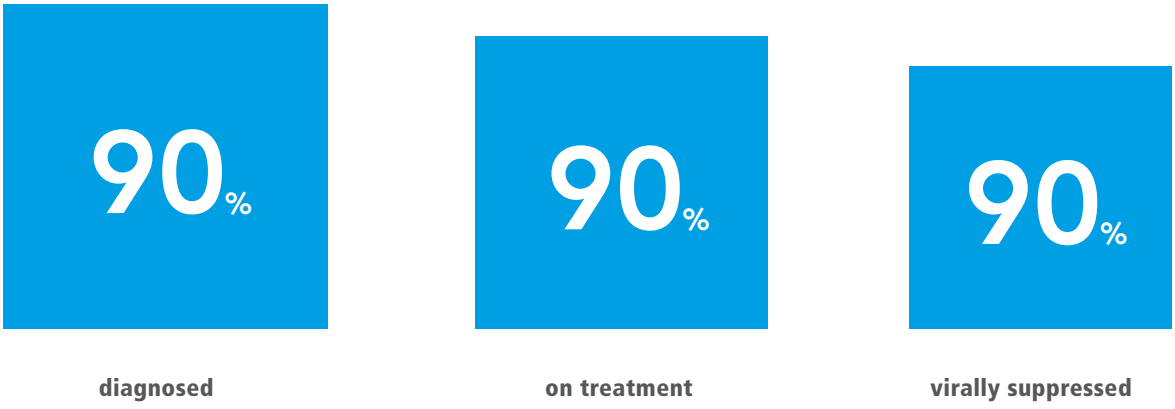
LAYING THE FOUNDATION TO END THE AIDS EPIDEMIC:

AN ACTION FRAMEWORK FOR REACHING THE 90-90-90 TARGET

The 90-90-90 target offers a roadmap to help end the AIDS epidemic, in concert with strengthened HIV prevention and non-discrimination measures.

Achievement of the "15 by 15" target has yielded critical lessons that need to be taken into account—and also highlighted persistent gaps that must be closed – if the world hopes to end the AIDS epidemic as a public health threat by 2030. Building on gains to date—and leveraging lessons learned over the last 15 years—the world should pursue a strategic, prioritized action agenda to reach the 90-90-90 target.

Fig. 25. **Ambitious, but achievable, new target**



Source: UNAIDS, 2014.

As outlined below, key actions steps needed fall into four categories: political, financial, policy and programmatic. As in all aspects of the AIDS response, efforts to achieve the 90-90-90 target must be firmly grounded in scientific evidence, equity and human rights principles.

TOWARDS THE 90-90-90 TARGET: POLITICAL ACTION STEPS

Just as strong leadership and commitment from both political leaders and affected communities have proved pivotal in the successful push to reach the "15 by 15" target, these will remain essential ingredients for achieving the 90-90-90 target.

Leadership in cities can help accelerate progress towards the 90-90-90 target.

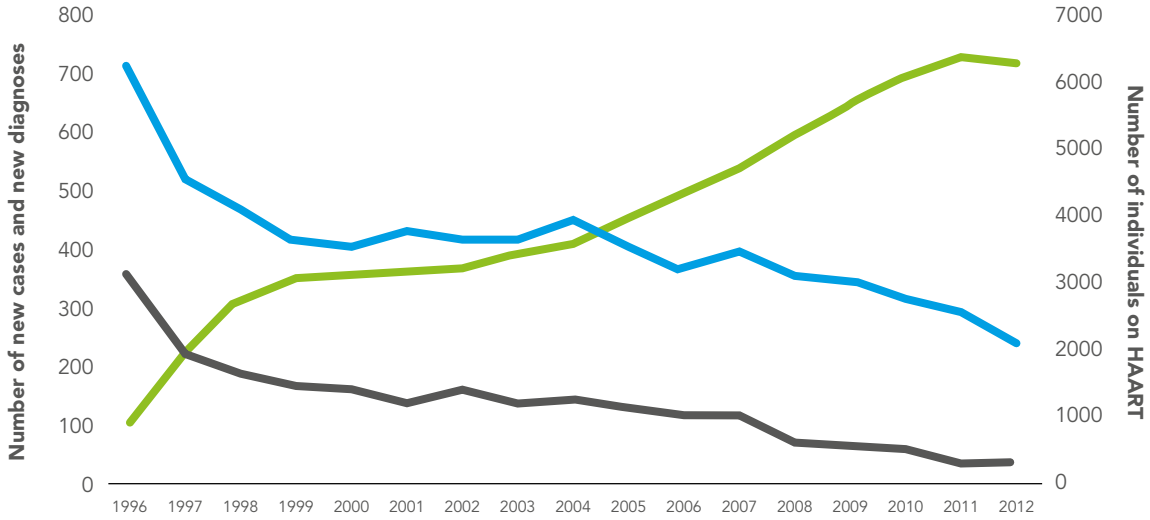
Demonstrate strong, sustained leadership to end the epidemic

Nationally, each country should set clear annual targets towards achievement of 90-90-90 and swiftly implement the policy and programmatic changes required to expedite scale-up. Strong monitoring systems need to be in place, and countries should use data from testing and treatment programmes to adapt approaches as needed to overcome bottlenecks and to speed uptake.

Reaching the 90-90-90 target will demand a special kind of political courage. Typically, political leaders focus on actions that yield results within the next 3-5 years. Yet while scaling up HIV treatment will indeed generate clear short-term benefits, the most pronounced effects of reaching the 90-90-90 target will occur in 15 years, when the AIDS epidemic will no longer be a public health threat. To achieve the 90-90-90 target, leaders will need to persuade the public and key decision-makers to avoid short-term thinking and instead lay the groundwork for a healthier, more productive, more secure society for future generations.

Already, signs of such leadership are emerging. With visible, robust support from Heads of State, countries such as Malawi and South Africa have already taken major steps to align national efforts with the 90-90-90 approach, including the establishment of clear national targets along the HIV treatment cascade. In 2013, Brazil became the first middle-income country to commit to providing antiretroviral therapy to all people living with HIV, regardless of CD4 count. The alliance of Brazil, the Russian Federation, India, China and South Africa have boldly pledged to bring their national responses into line with the 90-90-90 target.

Fig. 26. **Use of Highly Active Antiretroviral Therapy (HAART) and HIV new diagnoses British Columbia, 1996–2012**



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
New HIV Diagnoses	702	519	471	416	400	420	418	408	442	400	361	391	345	337	301	289	238
New HIV Diagnoses (People Who Inject Drugs)	352	215	177	159	152	132	156	136	137	125	115	118	65	64	52	34	29
PLHIV on HAART	837	1960	2596	2994	3079	3120	3211	3356	3585	3913	4256	4654	5123	5595	5999	6298	6260
Number of people living with HIV	7900	8228	8593	8933	9150	9408	9690	9936	10 216	10 398	10 566	10 790	11 040	11 280	11 500	11 700	11 972

Source: Courtesy of Julio Montagner, BC Centre for Excellence in HIV/AIDS, 2013.

Leadership in cities can help accelerate progress towards the 90-90-90 target. As cities such as San Francisco and Vancouver (Fig. 26) have shown, focused action at the local level helps accelerate HIV treatment, engage communities and drive innovation in HIV service delivery. Compared to national governments, cities possess unique strengths in the HIV response, as urban values of inclusiveness and tolerance offer opportunities to foster inclusive responses that reduce the likelihood that individuals or communities will be left behind in the scale-up towards 90-90-90. In such cities as Abidjan, Dakar and Mexico City, urban environments have allowed testing and treatment programmes for sex workers, men who have sex with men and other key populations to flourish.

Empower communities to help lead the way towards the 90-90-90 target

Recognizing that communities themselves are essential partners and leaders in the push to achieve 90-90-90, national responses should be fully inclusive, with robust engagement by people living with HIV, populations most at risk of

being left behind, the private sector, faith-based communities and other key stakeholders. Communities themselves are ideally positioned to understand and address the needs of their peers, especially in marginalized communities that experience challenges in accessing mainstream services.

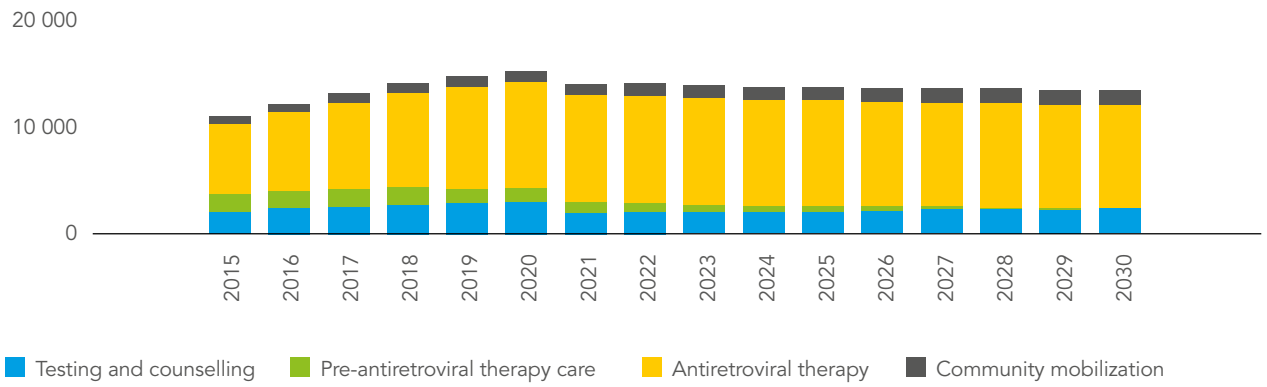
Innovative community service delivery models, such as those pioneered by MSF and described earlier (see p. 21), should be rapidly brought to scale. Enabling the needed scale-up of community service delivery demands meaningful, sustained investments in community systems.

TOWARDS THE 90-90-90 TARGET: FINANCIAL ACTION STEPS

Although saving lives is by far the most important outcome of HIV treatment, the choices that decision-makers will make in the short term will also have profound financial consequences over the long run. With HIV investments yielding a 17 to 1 economic return, spending to achieve the Fast-Track targets, including 90-90-90, represents among the most cost-effective of all potential uses of public funds.

Failing to make the needed investments will cause the epidemic to rebound, increasing the health and financial burdens associated with HIV for decades to come. When it comes to financing the push to achieve the 90-90-90 target, the world will either pay now—or pay much, much more in the future.

Fig. 27. **Resource needs for treatment, care and support, US$ Million, low- and middle-income countries, 2015–2030**



Source: UNAIDS, 2014.

Total resources for the AIDS response will need to increase at a faster pace in 2016-2020 to reach the 90-90-90 target. Spending now to achieve the fast-track target by 2020 will enable total resource needs for HIV testing and treatment to begin to decline early in the coming decade (Fig. 27). By contrast, failing to reach the fast-track targets and keeping the current coverage levels would mean that the total global bill for HIV testing and treatment by 2030 would be US$ 24 billion greater than it would be with achievement of the fast-track target.

Mobilizing the resources needed to reach the 90-90-90 target will require adherence to principles of international solidarity and shared responsibility. International donors will need to remain fully engaged in the AIDS response, as low-income and high-burden lower-middle-income countries will still need substantial external assistance to close the resource gap. At the same time, upper-middle-income countries and those transitioning to upper-middle-income status will need to assume an even larger proportion of AIDS financing, moving ultimately towards self-financing of the national response. This transition will need to be carefully planned and phased in over time, with a clear roadmap that defines respective roles, responsibilities and timelines among national and international partners that will define the post 2015 HIV agenda.

To meet the resource challenge, countries will need to effectively allocate existing resources for the response that are commensurate with national wealth and HIV burden.

To meet the resource challenge, countries will need to effectively allocate existing resources for the response that are commensurate with national wealth and HIV burden, taking into account economic growth over time. Innovative financial mechanisms may also be needed, such as national HIV and health trust funds or dedicated tax levies (e.g., airline tickets, mobile communications usage, etc.). Where appropriate, concessional, or 'soft', loans from international development lenders can help countries reduce their dependence on international assistance.

TOWARDS THE 90-90-90 TARGET: POLICY ACTION STEPS

Countries will need to ensure that an enabling environment is in place to faciliate rapid progress towards the 90-90-90 target.

Secure a sustainable, uninterrupted supply of antiretroviral medicines

One important strategy to increase the security of supplies of affordable antiretroviral medicines is to increase investments in local and regional

More effective efforts are needed to address the social, legal and economic factors that diminish uptake of HIV testing and treatment.

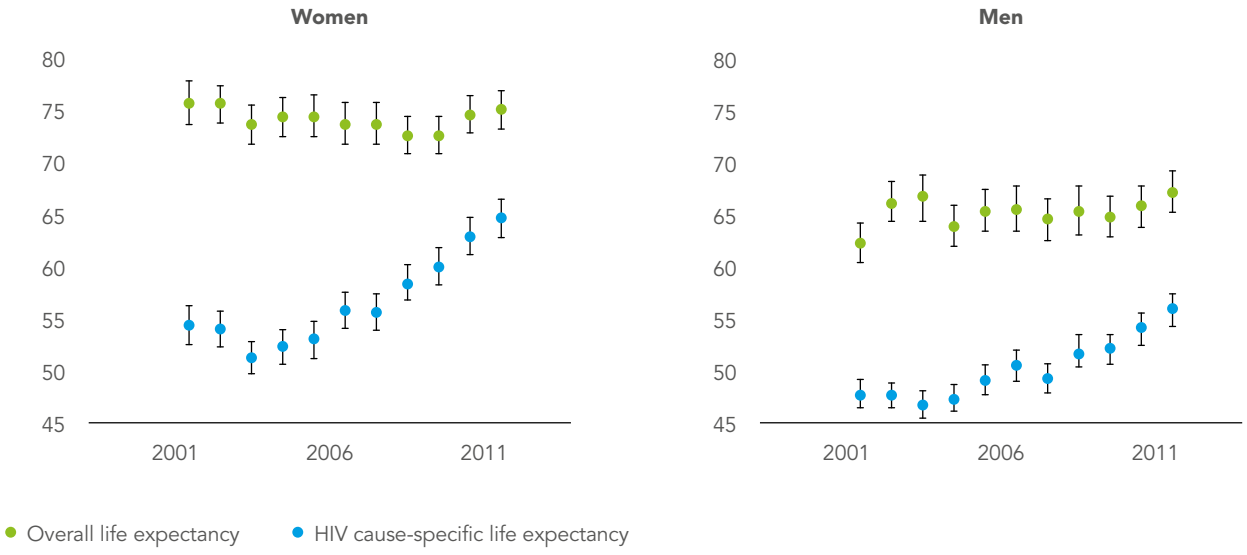
manufacturing. Of the 18 manufacturers of antiretroviral medicines that have been prequalified by WHO or approved by the U.S. Food and Drug Administration as of 2013, only four are based in Africa. African countries should urgently move forward the Pharmaceutical Manufacturing Plan for Africa.

Ultimately, a combination of strategies will be needed to ensure the ready availability and affordability of essential HIV medicines, including second- and third-line medicines. In addition to exploring the creation of new local and regional manufacturing, potential strategies include direct negotiations with manufacturers to reduce prices of their medicines, full use of TRIPS flexibilities, and advocacy in global fora to ensure the continued viability of generic manufacturing in India and other countries. Meanwhile, high-income countries that are home to major pharmaceutical companies need to ensure that their trade policies and international diplomacy take into account the critical importance of public health and the universal right to treatment.

Address structural barriers to HIV testing and treatment utilization

Building on recent declines in HIV-related stigma, more effective efforts are needed to address the social, legal and economic factors that diminish uptake of HIV testing and treatment. For marginalized populations at elevated risk of HIV infection, this involves the repeal of punitive laws that criminalize sex work, drug use and same-sex relationships. Counterproductive laws that criminalize HIV exposure, transmission or

Fig. 28. Overall and HIV cause-specific life expectancy by sex, rural South Africa, 2001–2011



Source: Barnighausen et al., CROI, 2014.

non-disclosure also need to be repealed, as they essentially provide an incentive for individuals at high risk to avoid learning their HIV status. While working to remove laws and policies that impede service access for marginalized populations, other strategies should be pursued to increase these groups' access to testing and treatment services, including the creation of dedicated service channels for key populations and training and capacity-building assistance to equip mainstream health workers to provide high-quality, non-judmental care to diverse patients. A prerequisite to more accessible services for key populations is their active engagement in the development, implementation and monitoring of strategies at the national, district and municipal levels.

In 2014, coverage of antiretroviral therapy among men is lower than women (36% [33-42%] versus 46% [43-53%]. Given such disparities, it is hardly surprising that among people living with HIV men lag far behind women in HIV-related health outcomes (Fig. 28) *(28).* Innovation and focused efforts will be needed to develop care and treatment options that reach men and encourage them to remain engaged in HIV services. Working directly with men to better understand their needs and concerns can help identify new strategies to increase their service uptake.

Focused efforts will also be needed to overcome barriers faced by other populations. Adolescents, for example, encounter considerable impediments to service access as a result of informed consent laws and the lack of adolescent-friendly service settings. The high prevalence of gender-based violence deters many women from seeking HIV services. For other people living with HIV, such as those living in informal urban settings and in rural areas, transport costs and other expenses associated with HIV treatment utilization function as overwhelming impediments to life-saving care and treatment. Each of these barriers must be tackled if the world aims to achieve the 90-90-90 target.

As the burden of HIV varies by place and population in all settings, including those with high HIV prevalence, planning for HIV services and allocation of finite HIV resources need to take account of this reality.

Use data to accelerate scale-up and improve health outcomes

As the burden of HIV varies by place and population in all settings, including those with high HIV prevalence *(29)*, planning for HIV services and allocation of finite HIV resources need to take account of this reality. Specifically, data systems should be fine-tuned to yield more granular data on treatment gaps, and programme planners should use these results to allocate resources and focus services so that they reach those who most need them.

This will require a substantial strengthening of national data systems. Data systems will need to collect relevant information for results across the HIV treatment cascade and provide a feedback loop for timely intervention to address emerging problems. A useful example is the system for data collection and analysis in Malawi, which publishes results quarterly and uses performance results to identify emerging problems that require correction. Significantly, Malawi's data system is not especially expensive, accounting for a small fraction of total HIV costs and demonstrating the feasiblility of more data-driven approaches in other resource-limited settings.

Data systems—including national and provincial systems, as well as site-specific performance monitoring mechanisms—need to be adapated to enable ongoing monitoring of outcomes across the HIV treatment cascade. Data from these systems should be used to refine policies and programmes to address sub-optimal outcomes and to identify areas where new interventions may be needed.

Continue to invest in HIV research and development

Catalytic efforts should be undertaken to incentivize research and development of even simpler and more user-friendly testing methods, such as self-testing technologies.

With recent years witnessing the emergence of breakthrough tools generated by HIV research efforts, continued investments in HIV research remain imperative. Although the fruits of some current early-stage research may emerge only after 2020, innovations will be needed to sustain HIV treatment gains over the long term. As new and potentially breakthrough technologies are likely to emerge in the coming years, steps should be taken to harmonize and simplify regulatory processes in order to avoid delays in the uptake of vital new technologies.

Catalytic efforts should be undertaken to incentivize research and development of even simpler and more user-friendly testing methods, such as self-testing technologies that provide an immediate, definitie diagnosis. Researchers should continue to prioritize the search for simple, acceptable, easy-to-take paediatric antiretroviral medicines. More durable and tolerable antiretroviral medicines for adolescents and adults are also needed, and long-acting antiretroviral compounds offer the potential to simplify treatment and increase treatment adherence. Research towards a cure and a preventive vaccine remains a key priority.

TOWARDS THE 90-90-90 TARGET: PROGRAMMATIC ACTION STEPS

HIV programmes will need to further improve if the world is to reach the 90-90-90 target.

Implement an urgent campaign to reach 90% knowledge of HIV status among people living with HIV.

Building on recent gains in promoting knowledge of HIV status, prioritized efforts are needed to ramp up HIV testing efforts even further. While undertaking policy actions to remove structural impediments to HIV testing uptake, programmatic approaches must also become more innovative, varied and community-centred to reach 'the first 90.'

Moving beyond the continued reliance on facility-based testing in many settings is essential to achieving the 90% target for knowledge of HIV status among people living with HIV. Additional resources need to be allocated to testing promotion and delivery, with particular attention to community-based approaches such as home-based testing, mobile testing and outreach, multi-disease testing campaigns and workplace- and school-based testing. A major global effort is needed to scale up early infant diagnosis and to rapidly bring to scale emerging point-of-care technologies for the diagnosis of HIV in infants. Regardless of method, HIV testing must in all cases remain voluntary, non-coercive, confidential and consistent with human rights principles.

Immediate moves are needed to permit and actively support self-testing methods, which have proven to have high specificity and sensitivity, are especially acceptable for key populations that experience stigma-related testing deterrents, and have not been found in studies to be associated with meaningful social harms. Despite clear evidence that self-testing is a cost-effective way to reach individuals who have difficulty accessing existing testing options, self-testing remains prohibited in most countries. Specific steps, such as clearer instructions for users and innovative pre-post testing counseling approaches, will be needed to reduce the incience of user error for self-testing tools.

Strengthen and improve service delivery

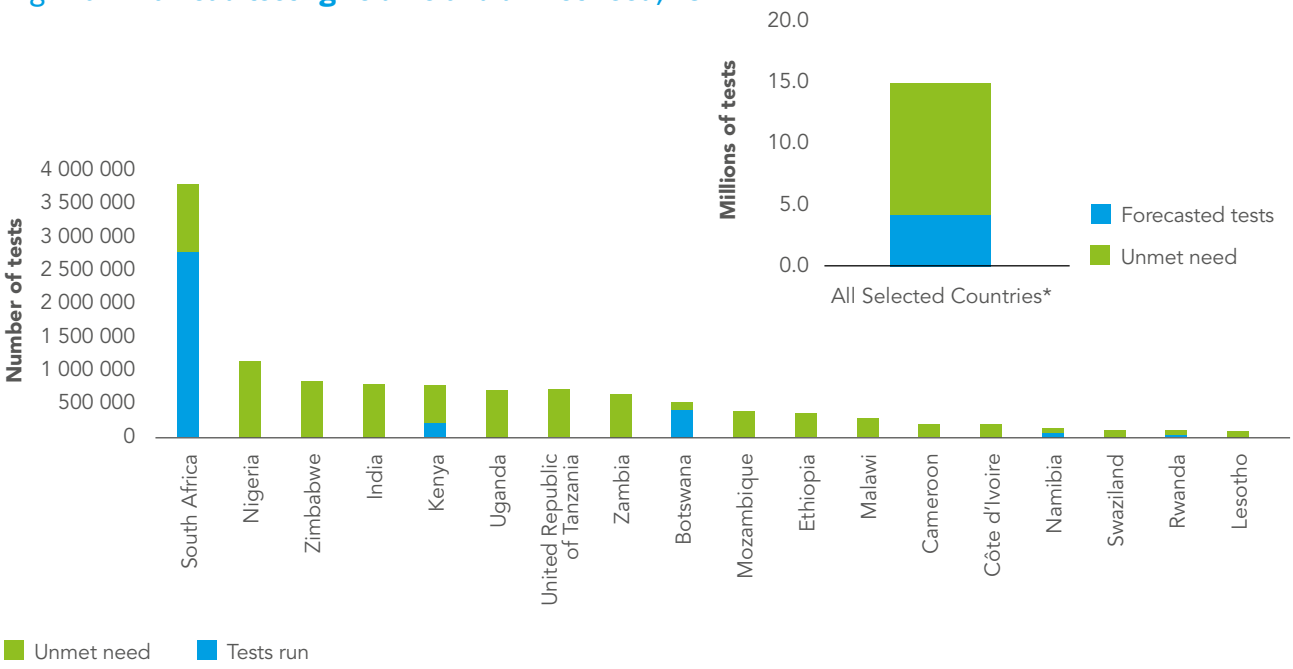
Innovation in treatment service delivery will need to remain a fundamental priority in the quest to achieve the 90-90-90 target. As studies have found a direct correlation between HIV treatment utilization and the distance to the nearest clinic *(30)*, further decentralization of HIV testing and treatment services should be considered. Geographic programme mapping may aid programme

planners in matching services with need and in ensuring that all patients are able to access essential health services. Particular efforts are needed to further implement task-shifting in clinical settings and to empower community health workers to undertake tasks currently assumed by the limited number of physicians, nurses, pharmacists and other professional medical cadres. Innovative community-centred service delivery models, such as those pioneered by MSF (see p. 22), should be emulated elsewhere and brought to scale. To reach the 90-90-90 target, UNAIDS projects that the share of HIV spending allocated to community services will need to grow from 1% in 2014 (US$ 216 million) to 3.6% in 2020 and 4.0% in 2030 *(3)*.

Countries such as Ghana, Malawi and Ethiopia have institutionalised task shifting and community service delivery by implementing a clear legal and regulatory framework for trained community workers. Key actions, including training, systems adaptation and regulatory changes, are needed to ensure that community workers are effectively integrated into HIV testing, treatment and care systems.

Ensuring ready access to viral load testing for every person receiving antiretroviral therapy is vital achieving the 90-90-90 target. In addition to the fact that measuring viral load is needed to monitor the last component of the 90-90-90 target, viral load testing also helps health care workers identify

Fig. 29. **Viral load testing volume and unmet need, 2014**



*See list of countries in X-axis of main figure.

Sub-Saharan Africa represents over 95% of the total VL volumes in low and middle-income countries today, with 75% of global volumes coming from South Africa.

Source: Clinton Health Access Initiative.

adherence challenges early, permitting timely adherence support intervention and potentially delaying the need to switch patients to more costly second- and third-line medicines. While viral load testing has increased, the Clinton Health Access Initiative reports that the pace of scale-up remains far too slow. Outside South Africa, which has prioritized scale-up of viral load testing, access to such testing remains negligible in most settings (Fig. 29). Countries should take immediate steps to avail themselves of the favourable global price to purchase, introduce and expand viral load testing capacity.

Innovate to improve linkage and retention in care

With linkage and retention representing key points along the HIV treatment continuum where many people living with HIV fall out of care, efforts need to be redoubled to ensure strong linkage and retention in care for people living with HIV. In addition to regular monitoring of linkage and retention, treatment sites should incorporate evidence-informed strategies to increase linkage and retention, including peer-based patient navigation, intensified outreach, focused counseling for patients, and adaptations to clinical practices and protocols *(31)*. For example, studies have found that community-based adherence support is associated with increased retention in care and rates of viral suppression *(32)*. Tracing patients who have fallen out of care—so-called default tracers—and use of SMS reminders also offer innovations that have proven effective in increasing treatment adherence.

Intensified investments are warranted in operations research to identify the most effective strategies to increase linkage and retention. One potential innovation that should immediately be prioritized for research involves the provision of vouchers or other incentives, conditional or non-conditional, to promote linkage and retention. In rural KwaZulu-Natal province, the provision of a household voucher increased the probability that household members would consent to be tested by 29 percentage points *(33)*.

With no time to waste, the world now needs to build on the successful campaign to reach the "15 by 15" milestone and move on the ultimate goal: ending the AIDS epidemic as a public health threat.

MOVING FORWARD TOWARDS THE ULTIMATE GOAL OF ENDING THE AIDS EPIDEMIC

We are at a remarkable moment in the response to HIV. In 2011, many questioned the feasibility of reaching 15 million people with antiretroviral therapy by 2015, but the AIDS field proved the doubters wrong.

With no time to waste, the world now needs to build on the success of reaching 15 million people with antiretroviral treatment by 2015 and move on to ending the AIDS epidemic as a public health threat by 2030. This will require not only that we fully leverage the extraordinary benefits of antiretroviral therapy, but that we also strengthen primary HIV prevention and eradicated HIV-related stigma and discrimination.

However, in moving forward, we must also recognize how much has changed since the "15 by 15" target was first embraced in 2011. Scientific learning – regarding when to start antiretroviral therapy and how HIV treatment can strengthen HIV prevention efforts—has continued to evolve in 2011-2015. The place of AIDS in the global political agenda and the AIDS funding picture have also changed since 2011. Whereas few people living with HIV had access to second- and third-line antiretroviral regimens in 2011, demand for these more expensive medicines is growing and will increase further still.

To reach the 90-90-90 target, the pace of treatment scale-up will need to increase, and programmes will need to do a better job of helping people living with HIV have increased viral suppression. New funds, often from new sources, will need to be found. Innovation, commitment and political courage will be required to ensure an affordable, reliable supply of the antiretroviral medicines that people will need in future years and to reach populations that are currently being left behind. To achieve the 90-90-90 target, we will need to strategically and effectively leverage all available financial, human and technological resources.

The world now needs to enter into a broadly inclusive global pact to see the AIDS epidemic through to its end. Countries will need to do more in financing the response, international partners at least maintain and preferably increase their commitments, communities need to be placed at the very centre of the response, and new donors must be cultivated. All partners in this final global campaign against AIDS need to hold each other accountable for results.

The world has traveled far since the early days of AIDS, when a diagnosis of HIV infection was tantamount to a death sentence. Now comes the ultimate test. Will the world rest on its laurels and watch while all the many gains we have made are lost, or will the global community do what needs to be done to make the AIDS epidemic a thing of the past?

The future of AIDS is in our hands.

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