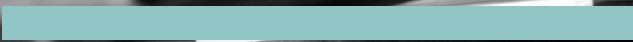
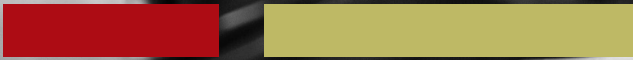
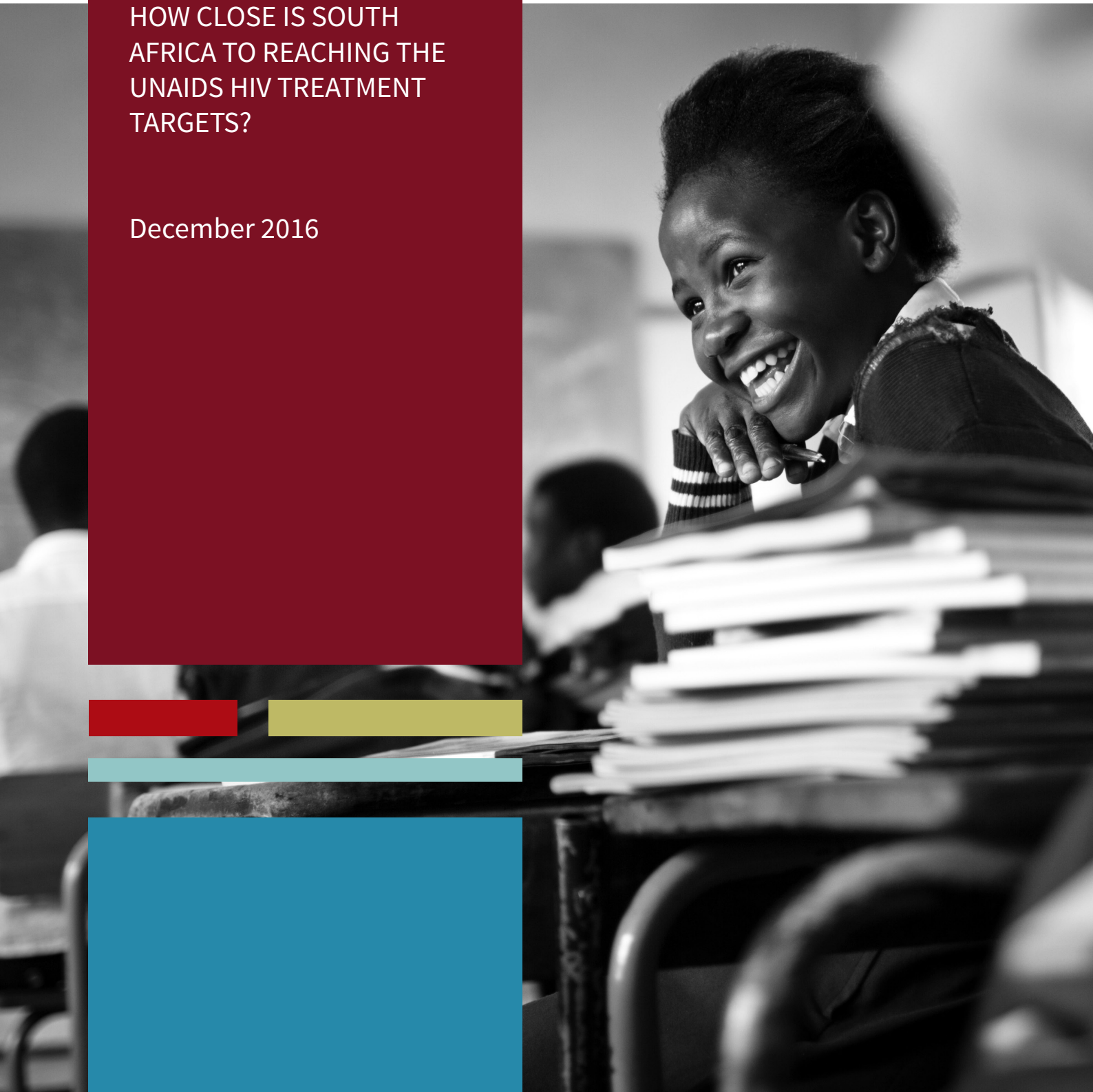


# TOWARDS 90-90-90

HOW CLOSE IS SOUTH  
AFRICA TO REACHING THE  
UNAIDS HIV TREATMENT  
TARGETS?

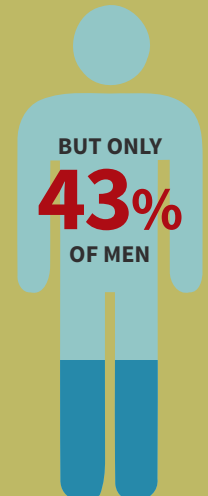
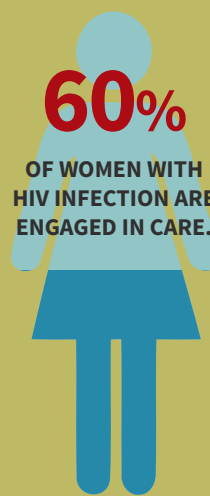
December 2016



# QUICK FACTS

50%  
**ALMOST HALF**

OF ALL PEOPLE WITH HIV IN SOUTH AFRICA ARE EITHER UNDIAGNOSED, OR DIAGNOSED BUT NOT ENGAGED IN HIV CARE PROGRAMMES



BY  
**2015** NO DISTRICT HAD YET ACHIEVED THE 90-90-90 TARGET OF VIRAL SUPPRESSION IN REPRODUCTIVE-AGED WOMEN

**SOUTH AFRICANS LIVING WITH HIV** ARE SEEKING CARE EARLIER THAN EVER BEFORE BUT MEN CONTINUE TO LAG BEHIND

PROVINCES SHOW WIDE AND PERSISTENT **DISPARITIES IN CARE-SEEKING BEHAVIOUR**

THERE IS SUBSTANTIAL **UNDERESTIMATION** OF RETENTION IN CARE

**MIGRATION**  
BETWEEN CLINICS WITHIN SOUTH AFRICA IS COMMON



**15-19 YEAR-OLD**  
AGE GROUP IS GROWING SEGMENT OF THE ART PROGRAMME AND EXPERIENCES DISPROPORTIONATELY POOR TREATMENT OUTCOMES

**!** **GIRLS AGED 15-19**  
**NEED URGENT**  
**INTERVENTION**

WITHOUT INTERVENTION, THERE'S POTENTIAL TO UNDERMINE SIGNIFICANT GAINS MADE BY THE PMTCT PROGRAMME



## KEYWORDS

**Sentinel site:** a hospital or clinic that collects data on HIV infections and treatment

**Cohort:** a group of people with a common statistical characteristic, e.g. new mothers

**ART:** Anti-Retroviral Treatment

**Viral suppression:** when ART reduces a person's viral load to an undetectable level, though HIV still remains in the body.

UNAIDS has set a worldwide goal for the year 2020: for 90% of people with HIV to know their status, 90% of those diagnosed with HIV to be on **ART**, and 90% of those on ART to have **viral suppression**. Should this three-part target be achieved, at least 73% of all people living with HIV worldwide will be virally suppressed. As countries scale up services to meet the **90-90-90 targets**, it will be critical to monitor progress on a national level.

## UNAIDS 90-90-90 targets for the year 2020



Diagnosed



On ART



Virally suppressed

This target presents significant challenges in settings where representative monitoring of national HIV care and management programmes is restricted to **sentinel sites** or **cohorts**, and where pre-ART care and transfer between sites is not well documented. Consequently, researchers at National Health Laboratory Service (NHLS), HE<sup>2</sup>RO and Boston University (BU) have been working to set up systems to monitor and evaluate the evolving HIV response in South Africa, and investigating previously unanswerable questions.

The Corporate Data Warehouse database of the NHLS contains national data from the country's public sector HIV treatment programme since the programme's inception in 2004. A team of researchers from NHLS, HE<sup>2</sup>RO and Boston University has developed and validated a matching technique that generates a unique patient identifier, allowing for patient-level analysis of key features of the national ART programme while still protecting patient anonymity.

Several preliminary results from these analyses were presented at the AIDS 2016 conference in Durban, providing input to some key questions for policymakers monitoring South Africa's progress towards 90-90-90. These results allow us to consider several important questions.

# 1 HOW CLOSE ARE WE TO THE 90-90-90 TARGETS?

## KEYWORDS

**CD4:** a type of white blood cell that plays a major part in protecting the human body from infection

**Viral load:** a measurement of the quantity of virus in a human body

**HIV care cascade:** a model that outlines the stages of HIV medical care, from initial diagnosis to viral suppression

Drawing on multiple nationally representative data sources, we constructed **HIV care cascades** for the entire South African population by sex and age group. Population and HIV prevalence data was provided by StatsSA and the Human Sciences Research Council, while engagement in care and viral load suppression was estimated using **CD4** count and **viral load** test data provided by the National Health Laboratory Service. ART coverage was assessed using District Health Information System (DHIS) data for the period April 2014 to March 2015.

There are approximately 6.8 million people currently living with HIV in South Africa, and the vast majority are aged 15 years or older. We estimate that almost half of all people with HIV in South Africa are either undiagnosed, or diagnosed but not engaged in HIV care programmes.\* There were large gender disparities in engagement in care: 60% of women with HIV infection are engaged in care, but only 43% of men.

The good news is that once men are engaged in HIV care and on ART, they are almost as likely as women to be virally suppressed. While only 26% of all people living with HIV (PLHIV) are virally suppressed, close to 80% of patients on ART who had a viral load test were found to be virally suppressed. Nevertheless, getting more PLHIV onto ART must be prioritised in order to meet the 90-90-90 goals.

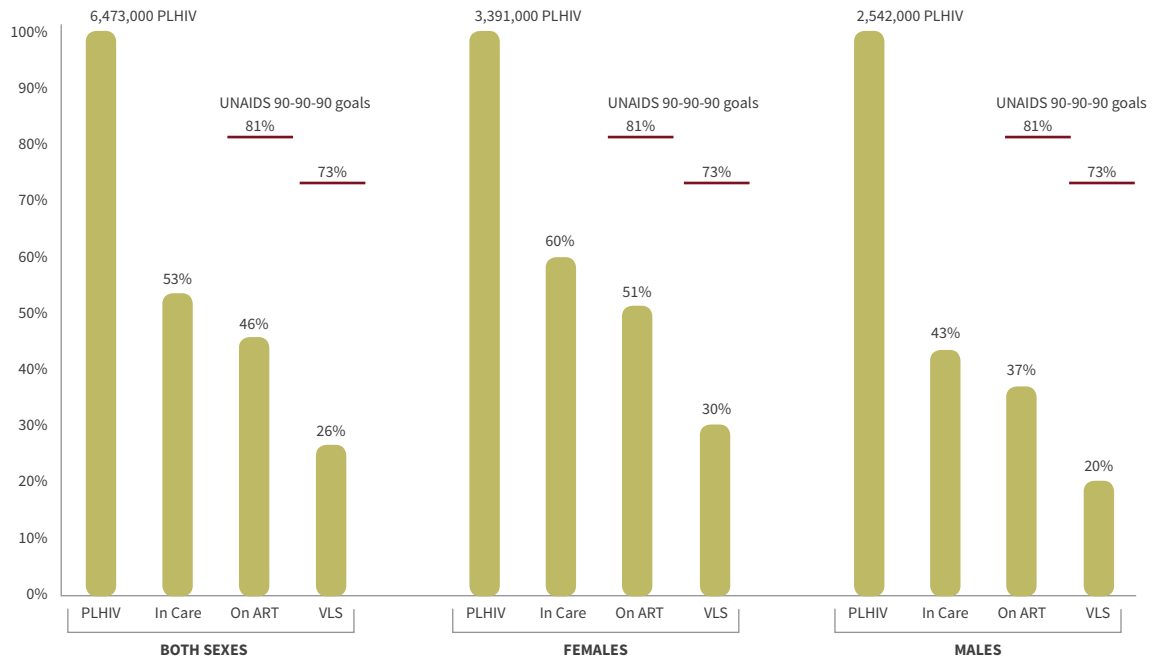
We also looked at a district level, where performance of testing and treatment may be below the national average. Combining multiple data sources, we estimated the prevalence of unsuppressed HIV among women of reproductive age – a key determinant of HIV morbidity, mortality, onward transmission, and a measure of the unmet need for treatment and prevention services. District HIV prevalence for women aged 15 - 49 was estimated using national antenatal surveillance data and was combined with data from DHIS, NHLS and the South African Census to estimate the proportion of these women considered virally suppressed.

The prevalence of unsuppressed HIV varied widely across districts from 5% to 33%. We noticed that the districts that had the highest HIV prevalence were not necessarily the districts with the highest prevalence of *unsuppressed* HIV viral load. By 2015, no district had achieved the 90-90-90 target of 73% population-level viral suppression in the study population of reproductive-aged women. However, there was large variability in the percentage of HIV-infected women who were virally suppressed (9% to 39%) and thus a clear opportunity to learn from high-performing districts.<sup>1,2</sup>



\*Care programmes of the National Department of Health (public sector).

### Unequal progress towards UNAIDS 90-90-90 targets



**KEYWORDS**

**PLHIV:** people living with HIV

**In care:** receiving medical treatment and prevention counselling from a healthcare provider

**VLS:** viral load suppression





## 2 ARE SOUTH AFRICANS STILL SEEKING HIV CARE LATE?

Treatment as prevention requires earlier HIV-testing and linkage to care. However, prior research suggests that many patients only seek care at low CD4 counts, once they are very sick. To better guide resource allocation as the test-and-treat approach is scaled up, it's critical to monitor the entry of South Africans into clinical HIV care.

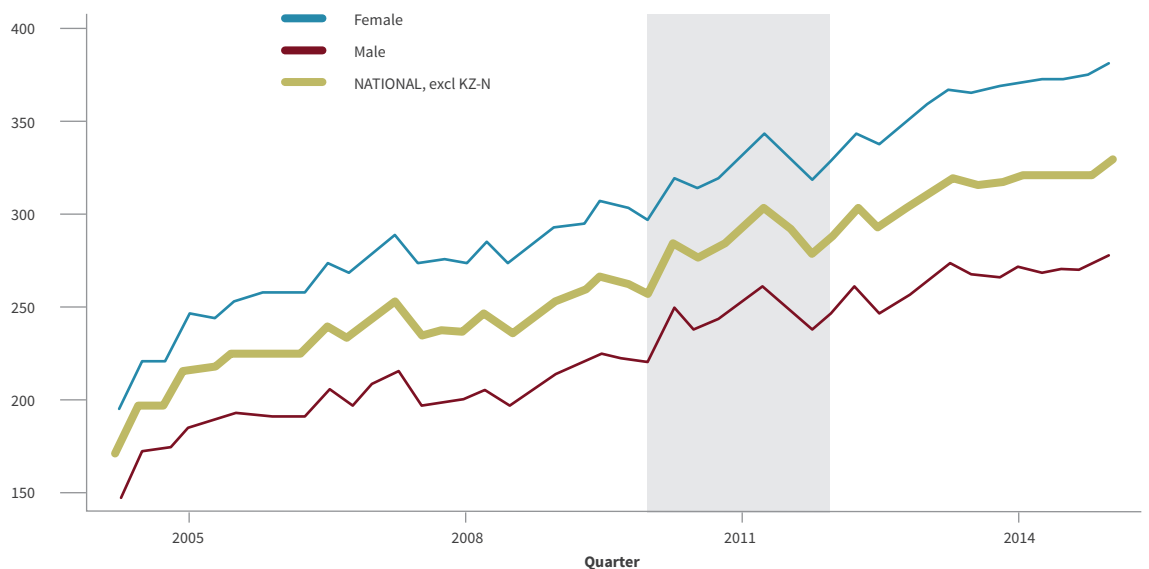
We estimated the number of patients identified in the NHLS database with a first CD4 specimen – a proxy for entry into care – and the median value of these CD4 counts on a quarterly basis from 2004 to 2015, stratifying by gender and province. Numbers entering HIV care each quarter increased from 2004 through 2010, reaching over 350,000 per quarter during the 2010/2011 national testing campaign, and have since plateaued at 210,000 per quarter. The median first CD4 count increased from 178 cells/mm<sup>3</sup> in the second quarter of 2004 to 348 cells/mm<sup>3</sup> in the first quarter of 2015, with rapid increases occurring during the national testing campaign.

South Africans living with HIV are seeking care earlier than ever before. However, there are large and persistent disparities in care-seeking by gender – in 2004 the median first CD4 count among men was 147 cells/mm<sup>3</sup> compared to 194 cells/mm<sup>3</sup> for women; in 2015 these figures were 280 and 386 cells/mm<sup>3</sup> for men and women respectively.

We also observed wide provincial disparities in CD4 count at entry into care – gaps that have persisted over time.

Opportunities to learn from higher-performing regions should be considered and targeted interventions may be required for specific areas, and among men in general, to increase early engagement with HIV care.<sup>3</sup>

**Median CD4**



# 3 IS RETENTION ON ART UNDERESTIMATED DUE TO PATIENT TRANSFERS?

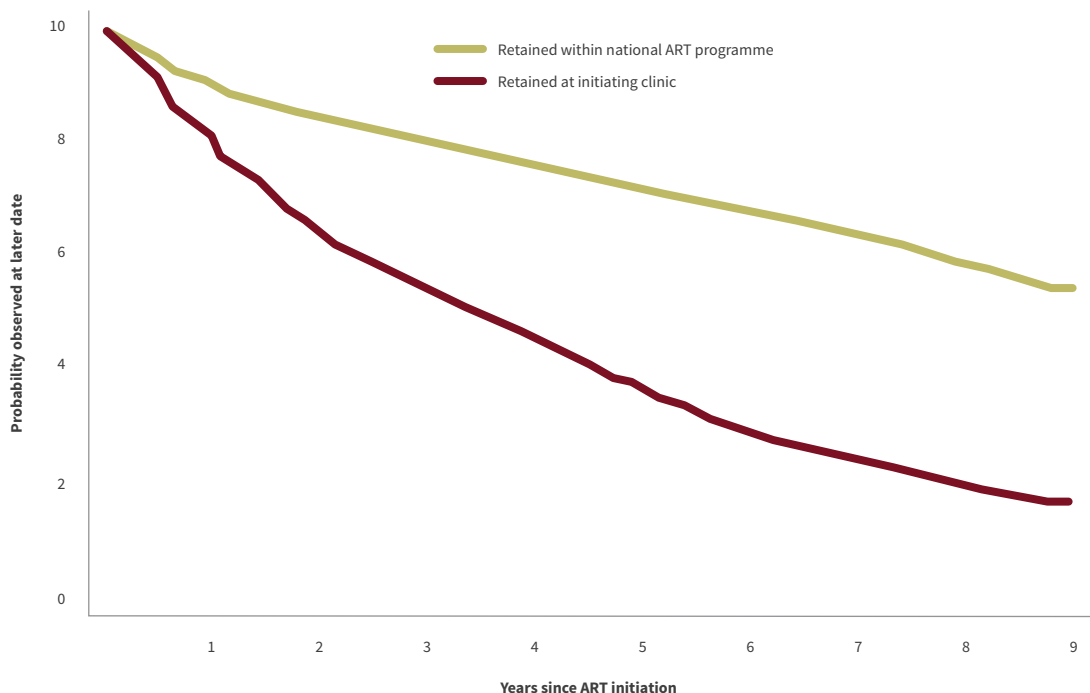
Systematic reviews of retention in HIV care have shown high rates of attrition in patients receiving ART. However, these results come mainly from clinical cohorts that cannot account for 'silent transfers' – patients who reengage in care at a site other than the initial site without informing the treatment centre. The consequence of this is that retention-in-care data is underestimated.

Using data from the NHLS database, we compared system-wide retention (retention at any site within South Africa) to clinic retention (looking only at data from the initiating clinic, as most clinical cohorts would observe).

We analysed the cohort of 66,865 patients who initiated ART during 2004/2005 and followed them through March 2015. For *system-wide retention* we defined a patient as still in care if a laboratory test was requested at any clinic between April 2013 and March 2015, while for *clinic retention* we defined a patient as still in care if their last laboratory test occurred within that period at the same clinic at which they initiated treatment. Using the *clinic* perspective, retention at 9 years appeared to be 16.7% (95% CI: 15.8 - 17.7) while the *system-wide* perspective revealed retention to be 54.5% (95%CI: 53.5 - 55.4).

Our results show there is substantial underestimation of retention in care using a clinic perspective and that migration between clinics within South Africa is a common practice.<sup>4</sup>

## The effect of patient transfer on retention estimates



# 4 WHICH KEY POPULATIONS SHOULD WE BE WATCHING AND INVESTING IN?

## KEYWORDS

**Vertical infection:** an infection transmitted directly from the mother to an embryo, foetus, or baby during pregnancy or childbirth

**PMTCT:** Prevention of mother-to-child transmission

Accurately monitoring adolescents in the absence of a nationally representative cohort is challenging. We analysed data from the NHLS database from 2004 to 2014 for those aged 20 years or younger at the date of testing and found a demographic bulge of HIV-infected adolescents on ART occurring over time. This bulge represents a shift in the relative age distribution of those on ART away from those under 5 years of age and towards those older than 10.

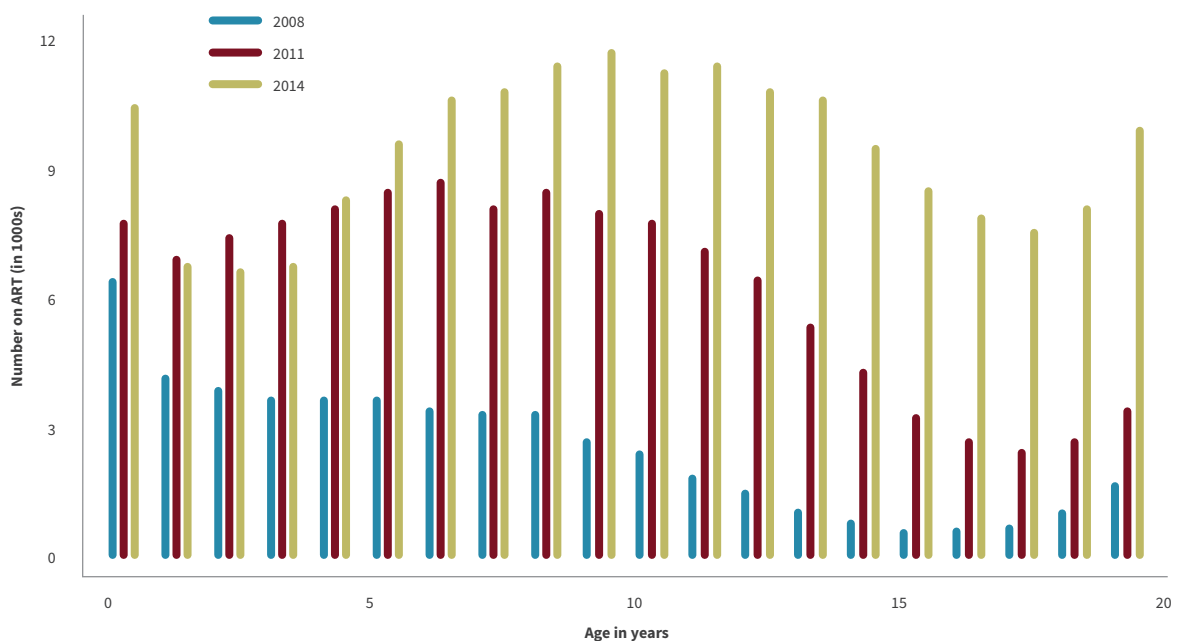
This is the result of a combination of an increase in absolute numbers on ART, of perinatally infected children surviving into adolescence, and of new **vertical infections** occurring in the older adolescent groups.

Of further concern is that not only are the numbers in the group on ART aged 15-19 increasing the most rapidly of all groups, but that this group experiences disproportionately poor treatment outcomes.

Only 62% of those aged 15-19 years currently in care were virally suppressed compared to 69% in the group aged 10-14 years and 74% in the 5-9 group.

The gender distribution of those currently entering into care is roughly equal in the younger age groups, as would be expected from perinatal transmission, but above 15 years of age, we see the distribution shift to predominately females (>80% of those aged 15-19 entering care in 2014 were female). This highlights the urgent need to intervene in reducing their risk of acquiring HIV during this adolescent period. If girls in the 15-19 group remain poorly suppressed on treatment during pregnancy, it is also possible that we will see an increase in rates of mother-to-child transmission among this group, which, in theory, has the potential to undermine the significant gains made by the **PMTCT** programme.<sup>5</sup>

## Distribution of age among those on ART by calendar year





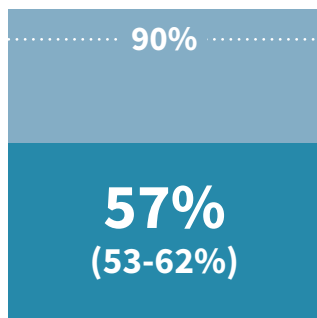
# CONCLUSIONS

South Africa is moving closer the UNAIDS 90-90-90 targets, and keeping pace with the rest of the world. Nevertheless, a significant amount of effort is still required to reach the goals.

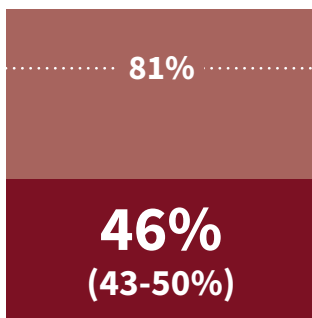
Improvements in HIV diagnosis, treatment initiation and engagement in care are all urgently needed if South Africa aims to ensure that 73% of people living with HIV are virally suppressed by 2020. Identifying and intervening in key and vulnerable populations as well as in under-performing geographic regions will be necessary to meet the UNAIDS 90-90-90 goals. The prospect of utilizing routine laboratory testing in HIV care programmes provides a unique and potentially powerful resource for national-level monitoring and evaluation as South Africa takes strides towards the 2020 milestone, and sets its sights on an end to the HIV epidemic.

1. Current estimates suggest that just over half of people who know their HIV status are accessing ART in South Africa, but that too few men access ART.
2. Despite this, South Africans are seeking care earlier than ever before.
3. To accurately estimate figures for retention in care, South Africa needs a system-wide approach that accounts for transfers between sites. This approach is now possible through routine laboratory monitoring.
4. Of special concern are adolescents, and in particular girls aged 15-19, who remain at highest risk of poor treatment outcomes.

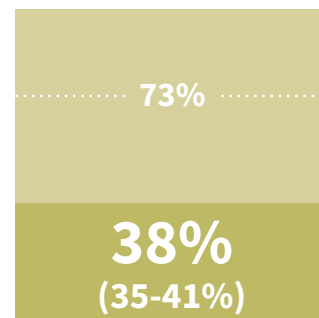
## Global results: HIV treatment cascade, 2015



Percentage of people living with HIV who know their HIV status

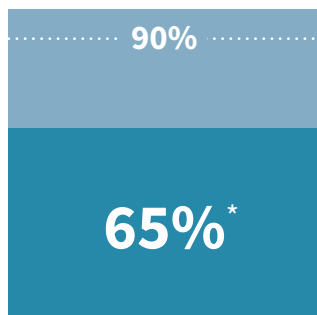


Percentage of people living with HIV who are on antiretroviral treatment

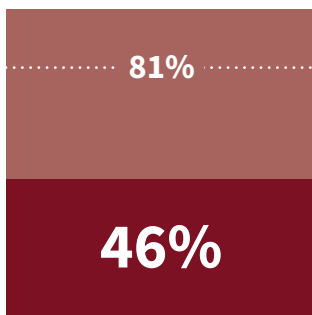


Percentage of people living with HIV who are virally suppressed

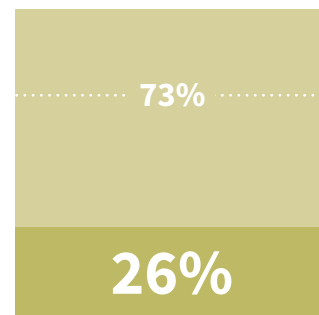
## South Africa: HIV treatment cascade



Percentage of people living with HIV who know their HIV status



Percentage of people living with HIV who are on antiretroviral treatment



Percentage of people living with HIV who are virally suppressed

\*Source: Dr. Yogan Pillay, NDoH, Nov 2016



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