Content

1. The South African situation
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3. Challenges
4. Conclusions
Knowledge of HIV status, antiretroviral therapy coverage and viral suppression among people living with HIV, eastern and southern Africa, 2016

Source: UNAIDS special analysis, 2017
South Africa treatment cascade

90-90-90 Cascade - Total Population
(Jun 2017 - South Africa)

Source: Dr Yogan Pillay, Jun, 2017
South African National HIV Prevalence, Incidence, Behavior and Communication Survey

Progress to UNAIDS 90-90-90 Targets
(15-64 years of age)

There has been progress toward reaching epidemic control

(15-64 years of age)


Source: COP18
Individuals currently on treatment in SA

Source: COP18
South Africa HIV Treatment Surge Proposal

- A plan has been developed to fast-track epidemic control by aiming to have a 6.1 million individuals on ART in the public health system by December 2020.

- Treatment Surge plan includes interventions aimed at:
  - improving health care service delivery in the 27 priority districts
  - These priority districts account for 82% of the HIV burden in SA
Adult & child deaths due to AIDS | 1990–2016

There has been a decline in AIDS related deaths in sub-Saharan Africa, 1990-2017

Source: UNAIDS 2018 estimates.
Causes of mortality

<table>
<thead>
<tr>
<th>Category</th>
<th>Overall (95% CI)</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIDS related</td>
<td>57% (46–68)</td>
<td></td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>27% (20–34)</td>
<td></td>
</tr>
<tr>
<td>Toxoplasmic encephalitis</td>
<td>15% (10–20)</td>
<td></td>
</tr>
<tr>
<td>Cryptococcal meningitis</td>
<td>13% (9–16)</td>
<td></td>
</tr>
<tr>
<td>Pneumocystis pneumonia</td>
<td>13% (7–19)</td>
<td></td>
</tr>
<tr>
<td>AIDS malignancies</td>
<td>6% (4–7)</td>
<td></td>
</tr>
<tr>
<td>Bacterial</td>
<td>23% (17–30)</td>
<td></td>
</tr>
<tr>
<td>Bacteraemia</td>
<td>19% (12–25)</td>
<td></td>
</tr>
<tr>
<td>Bacterial pneumonia</td>
<td>17% (8–26)</td>
<td></td>
</tr>
<tr>
<td>Neurological</td>
<td>8% (5–12)</td>
<td></td>
</tr>
<tr>
<td>Respiratory</td>
<td>9% (2–16)</td>
<td></td>
</tr>
<tr>
<td>Liver</td>
<td>6% (4–8)</td>
<td></td>
</tr>
<tr>
<td>Children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIDS related</td>
<td>56% (20–81)</td>
<td></td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>30% (11–49)</td>
<td></td>
</tr>
<tr>
<td>Pneumocystis pneumonia</td>
<td>29% (5–52)</td>
<td></td>
</tr>
<tr>
<td>Bacterial infections</td>
<td>36% (3–70)</td>
<td></td>
</tr>
<tr>
<td>Bacteraemia</td>
<td>9% (0–18)</td>
<td></td>
</tr>
<tr>
<td>Bacterial pneumonia</td>
<td>31% (6–56)</td>
<td></td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>23% (3–43)</td>
<td></td>
</tr>
<tr>
<td>Malnutrition/wasting</td>
<td>15% (7–22)</td>
<td></td>
</tr>
</tbody>
</table>

Ford et al, Lancet HIV 2016
Persistent challenge of advanced HIV disease in SA

Carmona S et al, *CID* 2018

IeDEA and COHERE, *CID* 2017
Persistent challenge of advanced HIV disease

Proportion presenting with low CD4 cell count has not changed in the last 5 years

Carmona S et al, *CID* 2018

IeDEA and COHERE, *CID* 2017
Advanced HIV disease: a renewed focus
What about Viral Load testing in SA?

Logistics? Differential care?
Viral load testing network in South Africa

Note:  Red - NHLS CD4 / VL lab ;  Blue - DoH clinic
What about Viral Load Testing in SA?
The Viral Load laboratory network

7.1 million PLWHIV
± 4500 ARV facilities
± 4.9 millions samples for VL
Viral load testing continues to scale up in LMICs, with over 50% coverage in 2017. However, a few high-volume countries such as South Africa and Kenya make up a large portion of the current global demand.

Source: CHAI projections of 19 high-burden countries (81% of people on ART in LMICs), supplemented by linear extrapolations of “Rest of World” by Avenir Health. Need is estimated using projected ART patient numbers and testing guidelines. Where national guidelines are unknown, the WHO’s recommendations of 2 tests for new patients and 1 test for existing patients is used.
Viral Load projections + Surge

Data credit to: Meyer-Rath, Katja Gesine and Naseem Cassim
High throughput technology used by the NHLS
NHLS Viral Load testing volumes from 2010 to date
NHLS -> 5,62 Million VL - Sep 17 to Sep 18

- >1000 cp/ml: 15%
- < 1000 cp/ml: 85%
Viral loads below 1000 copies/mL: Require careful consideration

Effect of HIV-1 low-level viraemia during antiretroviral therapy on treatment outcomes in WHO-guided South African treatment programmes: a multicentre cohort study

Lucas E Hermans, Michelle Moolhouse, Sergio Carmona, Diederick E Grobbee, L Marije Hofstra, Douglas D Richman, Hugo A Tempelman, Willem D F Venter, Annelmarie M J Wensing

Summary
Background Antiretroviral therapy (ART) that enables suppression of HIV replication has been successfully rolled out at large scale to HIV-positive patients in low-income and middle-income countries. WHO guidelines for these regions define failure of ART with a lenient threshold of viraemia (HIV RNA viral load ≥1000 copies per mL). We investigated the occurrence of detectable viraemia during ART below this threshold and its effect on treatment outcomes in a large South African cohort.

Methods In this observational cohort study, we included HIV-positive adults registered between Jan 1, 2007, and May 1, 2016, at 57 clinical sites in South Africa, who were receiving WHO-recommended ART regimens and viral load monitoring. Low-level viraemia was defined as the occurrence of at least one viral load measurement of 51–999 copies per mL during ART. Outcomes were WHO-defined virological failure (one or more viral load measurement of ≥1000 copies per mL) and switch to second-line ART. Risks were estimated with Cox proportional hazard models.

Lancet Infect Dis 2017
Published Online
November 17, 2017
http://dx.doi.org/10.1016/S1473-3099(17)30681-3
See Online Comment
http://dx.doi.org/10.1016/S1473-3099(17)30680-1
Translational Virology, Department of Medical Microbiology (L E Hermans MD, L M Hofstra MD, A M J Wensing MD) and Clinical
Viral load suppression (Feb 2018) by district
OPPORTUNITIES
Plasma is the predominant sample used. Specimen collection using DBS could be implemented to increase coverage.
Plasma is the predominant sample used. Specimen collection using Plasma Separation Cards could be implemented to increase coverage.
Evaluation of new technologies and support Prequalification of devices

- EDTA Whole Blood Exposed <18 months old infants
  - ± 150 # Positives
- Capillary whole blood
  - ± 150 # Positives
  - ± 150 # Positives
- Standard of Care
  - Munktell or 903 Free virus elution protocol
  - Roche
Some POCT to be considered for Viral Load testing where impact is high enough to make it worthwhile

Alere Q
HIV-1/2 VL

Cepheid Xper
HIV-1 VL
Increase utilization of data to monitor programme performance and allocation of resources accordingly
Summary indicators in SA (> = 15 yrs)

- % People on treatment (DHIS): 3,234,516
- % People with a VL test done in the last 12 months: 3,168,785

- % People in care with a VL < 1000 cp/mL (VL suppression): 83.5%
- % People in care who have a VL done in the last 12 months (VL coverage): 98.6%
- % People with CD4 tests done, with a CD4 count <= 500 cells/mm3: 88.4%
- % People with CD4 tests done, with a CD4 count <= 350 cells/mm3: 47.0%
- % People with CD4 tests done, with a CD4 count <= 200 cells/mm3: 34.6%
- % People with CD4 tests done, with a CD4 count <= 100 cells/mm3: 12.4%
- % People with CrAg tests done, with a CD4 count < 100 cells/mm3: 11.5%
- % People with positive CrAg tests result, with a CD4 count < 100 cells/mm3: 5.6%

Of those being monitored...
### Enhance utilization of Viral Load Results for Action Report (RfA)

**“VL Results for Action” worksheet:**

All VL results > 1000 are reported by the NHLS laboratories in the past 7 days are recorded.

The VL results are highlighted in red.

The last column “Total No. of Previous Consecutive VL >1000” indicates how many previous consecutive VL results were >1000 cps/ml for a particular patient.

<table>
<thead>
<tr>
<th>Province</th>
<th>District</th>
<th>Sub District</th>
<th>Facility</th>
<th>Ward</th>
<th>Folder Number</th>
<th>Patient Surname</th>
<th>Patient Name</th>
<th>Patient DOB</th>
<th>Patient Address</th>
<th>Patient Tel No</th>
<th>Patient Age</th>
<th>Take n Date</th>
<th>Review n Date</th>
<th>Episode No</th>
<th>CD4 Identification</th>
<th>Total No. of Previous Consecutive VL &gt;1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauteng</td>
<td>City of Johannesburg Metro</td>
<td>Johannesburg D</td>
<td>Chris Hani (Engcobo) Hosp</td>
<td>Van 13</td>
<td></td>
<td>Sergio Davis</td>
<td>Sergio</td>
<td>24/07/1987</td>
<td>5th Floor, 5th</td>
<td>1234567890</td>
<td>56789012345</td>
<td>20/07/2018</td>
<td>31/07/2018</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Viral Load scale up will require improving the coverage to populations left behind.

12 populations being left behind

1. I am a person living with HIV. Worldwide, 19 million of the 35 million people living with HIV today do not know that they have the virus.

2. I am a young woman. 16% of adolescent girls in sub-Saharan Africa do not have comprehensive and correct knowledge about HIV.

3. I am a prisoner. HIV prevalence among prisoners in some settings is 30 times higher than among the general population.

4. I am a migrant. Around the world, 39 countries have an HIV-related travel restriction.

5. I am an injecting drug user. Only 55 of 192 countries offer a needle-syringe programme.

6. I am a sex worker. HIV prevalence among sex workers is 12 times greater than among the general population.

7. I am a man who has sex with other men. Same-sex sexual conduct is criminalised in 78 countries.

8. I am a transgender woman. Transgender women are 41 times more likely to acquire HIV than all other women in the same age group.

9. I am a pregnant woman. Only 41% of pregnant women in low- and middle-income countries received HIV testing and counselling in 2013.

10. I am a child. Of the 3.7 million children under the age of 15 living with HIV, 2.4 million are not accessing antiretroviral therapy.

11. I am a displaced person. At the end of 2013, there were 51.2 million people forcibly displaced worldwide.

12. I am 50+. The life expectancy of people aged 50 and older living with HIV and accessing treatment is the same as the life expectancy of others of the same age.
Conclusion

- NHLS provides the largest VL service WW
- Current lab capacity sufficient to support Surge 2020
- NHLS without improvements in SCM and Pre-analytics runs the risk of not delivering
- Opportunities to implement DBS / PSC or POCT where necessary and cost effective (impactful) should be considered.
Conclusions

1. Scaling up in VL has continue to progress

2. Increasing coverage of VL to achieve the 90-90-90 will require extending lab capacity (improve utilisation of platforms) and # sites (decentralisation – mix model) and to increase service to key populations.

3. The last “90” requires a broader systems approach to ensure those on ART are accessed and result utilisation is improved
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