Estimating trends in population-level HIV viral suppression from routine laboratory data

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Background

• Global targets for antiretroviral therapy (ART) programmes call for 90% of those on ART to achieve sustained viral suppression by the year 2020.
• Few programmatic data from viral load (VL) monitoring in sub-Saharan Africa are available.
• Progress towards this goal has not been documented at a programmatic / population level.

Aims and Objectives

• Examine trends in VL monitoring and suppression (any VL test < 1000 copies/mL) using routine laboratory data from the Western Cape province of South Africa from January 2008 to September 2015.

Methods

• Available VL tests (1,105,775 tests from 514 sites), represent a catchment area of public-sector ART clinics and hospitals in the Western Cape.
• Population level data were extracted from Statistics South Africa (STATSSA) mid-year population estimates while HIV prevalence rates were extracted from the Thembisa model (Johnson, Chiu, et al. 2016)¹.
• End of year populations were obtained through interpolation of the mid-year estimates.

Results

• The background scale up in services went from an average 5,123 viral load tests per month in 2008 to 19,906 per month in 2015 (Figure 1) with 83% of the tests being for people aged between 25 and 54 years.
• Overall viral suppression rates range from 79% to 85% in the period.

• Marked heterogeneity in healthcare facility-level test results, with suppression rates ranging from 8-100% for small facilities, 54-93% for medium sized facilities and 74-90% for the large sites (Figure 3).

• Proportions of individuals living with HIV who are virally suppressed ranges generally increased from 15.3% in 2008 to 35.8% in 2015 (Table 1).

Discussions

• Evidence of an improvement in population viral suppression.
• Achieving the ‘third 90’ remains an ongoing challenge.
• Possible underestimation of viral suppression due to oversampling of the viremic population (viremic individuals tend to get retested).
• Low suppression rates for children between the ages of 0-2 years evidence of the higher risk of infection and the relatively smaller number of tests available in the dataset for those ages.
• Opportunities exist for targeted facility level interventions which may lead to better overall suppression.
• Estimates given in Table 1 do not factor in the change in policy from the bi-annual to annual tests hence estimates are possibly biased for the periods before the policy changes.
• Bias can be reduced by obtaining the exact number of people from whom tests were obtained using record linkage techniques.

Table 1: Viral suppression among individuals living with HIV in the Western Cape (%)

<table>
<thead>
<tr>
<th>Year</th>
<th>End of year HIV-populations</th>
<th>HIV-Prevalence</th>
<th>HIV-infected population</th>
<th>VL&lt;1000 copies/mL</th>
<th>% suppressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>5308512</td>
<td>5.3%</td>
<td>280398</td>
<td>43004</td>
<td>15.3%</td>
</tr>
<tr>
<td>2009</td>
<td>5288519</td>
<td>5.6%</td>
<td>294225</td>
<td>81382</td>
<td>27.7%</td>
</tr>
<tr>
<td>2010</td>
<td>5254963</td>
<td>5.8%</td>
<td>305330</td>
<td>87205</td>
<td>28.6%</td>
</tr>
<tr>
<td>2011</td>
<td>5455552</td>
<td>6.0%</td>
<td>328459</td>
<td>101172</td>
<td>30.8%</td>
</tr>
<tr>
<td>2012</td>
<td>5819473</td>
<td>6.2%</td>
<td>360767</td>
<td>127577</td>
<td>35.4%</td>
</tr>
<tr>
<td>2013</td>
<td>6063550</td>
<td>6.3%</td>
<td>384881</td>
<td>156479</td>
<td>40.7%</td>
</tr>
<tr>
<td>2014</td>
<td>6157898</td>
<td>6.5%</td>
<td>398308</td>
<td>170439</td>
<td>42.8%</td>
</tr>
<tr>
<td>2015</td>
<td>6222410</td>
<td>6.6%</td>
<td>408634</td>
<td>146487</td>
<td>35.8%</td>
</tr>
</tbody>
</table>

Figures:

- Figure 1: Number of viral load tests per month.
- Figure 2: Viral suppression by sex and age groups.
- Figure 3: Viral suppression by facility size (medium and large facilities).