Population-level viral load monitoring to measure progress towards the 'third 90'

P989

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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.
- SA national guidelines call for routine VL monitoring at 6m and 12m after ART initiation and annually thereafter. Repeat VL testing done for individuals with suspected virological failure.
- We examined trends in VL monitoring over time using routine laboratory data from the Western Cape province of South Africa.

Methods

- Routine VL monitoring data from the Western Cape province in South Africa from 2009-2015
- All available VL tests (n=964,184) in adults $\geq$ 16 years included in this analysis
- Viral suppression defined as any VL test $<$ 1000 copies/mL.
- Facility-level and individual-level proportion suppressed tests calculated on annual or monthly basis.

Results

- Average number of VL tests/month increased from 7,291 in 2009 to 17,841 in 2015.
- Overall, the annual pooled proportion of suppressed test results remained between 80-86%.
- Increasing trend in site-level proportion of suppressed test results by year ($p < 0.001$).
- Marked heterogeneity in site-level test results (Figure 1).
- Only 12% of facilities had suppression proportion >90%, but these contributed 23% of all VL tests.

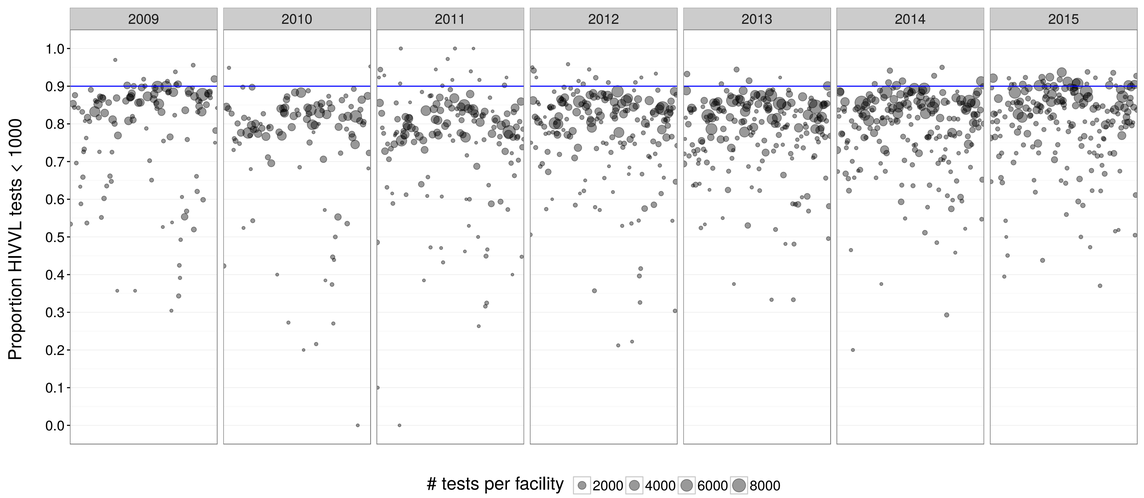


Figure 1: Facility-level viral suppression by year. Each circle is a facility; larger circles indicate more VL tests conducted per year.

- Younger patients were less likely to be suppressed (Figure 2) but were a minority of the patient population: individuals aged 16-24 years were significantly less likely to have VL $<$ 1000 copies/mL compared to older age groups, but comprised 11% of patients in the cohort.

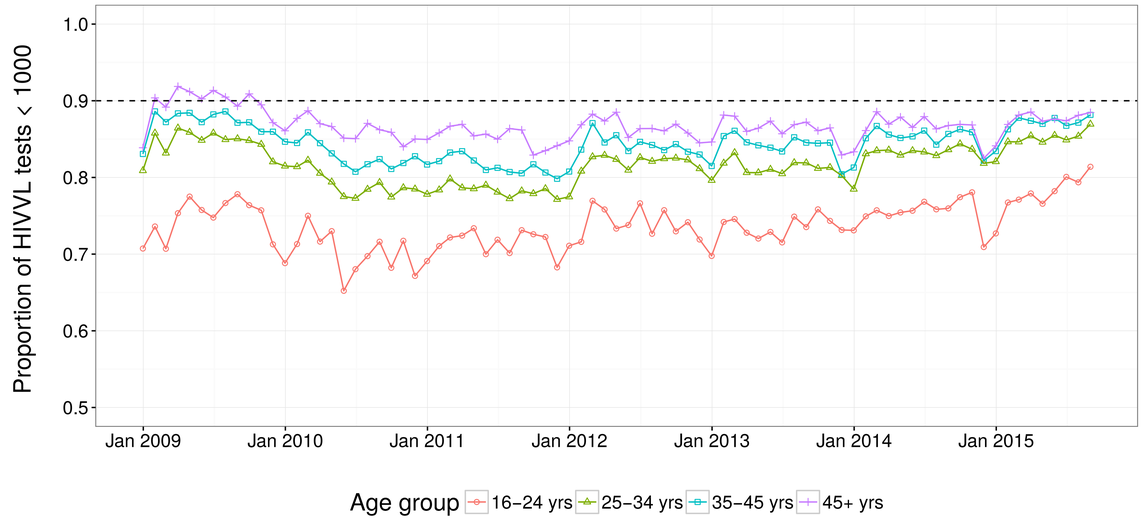


Figure 2: Individual-level viral suppression by age group over time.

Discussion

- Population viral suppression has been improving even with a major scale-up in provision of services.
- However, achieving the 'third 90' remains an ongoing challenge.
- Heterogeneity in facility suppression rates suggests the need for targeted approaches to strengthen ART delivery and patient adherence, with poorly-performing facilities requiring special consideration.
- Larger facilities tend to have better suppression rates, but the reasons for this remain unclear and require further investigation.
- Meanwhile, young people remain a key population for adherence support, with levels of viral suppression substantially below those observed in older groups.
- These are test level results and may underestimate of true individual level rates of viral suppression due to increased likelihood of re-testing when viremic.
- Routine laboratory data systems can play an important role in monitoring progress towards programmatic targets for ART programmes in sub-Saharan Africa.

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