

**Title:** Improving viral load test sample quality, coverage and suppression on antiretroviral therapy patients through quality improvement: A before-after study from south-western Uganda

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**Background:** To reach the 'third 90' of viral suppression (VS), it will be essential to scale-up access to routine, quality viral load (VL) tests. One strategy anticipated to increase coverage of VL is with dried blood spot (DBS) testing and the quality of VL sample is essential for accurate results. To assess the impact of a comprehensive quality improvement (QI) intervention, we analyzed secondary routine program data before and after the intervention. Trends assessed were VL sample rejection rates, VL coverage, and VS.

**Methods:** National VL database was reviewed for our 264 supported sites in Southwest (SW) Uganda on key VL testing outcomes, before (January-September 2016) and after (January-September 2017) implementation of QI activities to improve VL testing. Activities included: 5-day training Healthcare workers (HCWs) using National harmonized VL training module between October-December 2017; targeted VL mentorships; availing VL kits; continuous QI projects on identified VL cascade gaps. Aggregated data on samples rejected (rejection reasons), tests completed, and results extracted from VL dashboard, entered into Microsoft Excel for data analysis using descriptive statistics and assessed by gender and age. VL coverage defined as proportion of active ART clients eligible for VL with a VL test and VS as number of clients with a VL test result  $\leq 1,000$  copies/ml, as per national VL algorithm.

**Results:** Before intervention, 8.0% (n=2,786) of total samples were rejected commonly due to incomplete forms 59.3%, (n=1,652); poor sample quality 27.3%, (n=761); and non-eligibility (13.4%, n=373). VL coverage was 69% (n=34,825), 92.5% VS (94% women, 91% men). VS in adults (age  $\geq 19$  years) was 95%, children and adolescents (5-10 years 75%, 10-15 years 80%, 15-19 years 75%). After implementation, samples rejected decreased to 2.4% (n=2,669), VL coverage increased to 85.0% (n=111,224), 93.8% VS (95.1% women, 92.5% men). VS in adults ( $\geq 19$  years) was 95.0%, children and adolescents (5-10 years 78.0%, 10-15 years 81.0%, 15-19 years 82.0%).

**Conclusions:** In SW Uganda, following a multi-pronged QI intervention, we observed a decrease in proportion of rejected samples and increased VL coverage and VS. Investing in continuous QI and HCWs training may be important to maximize the impact of existing technologies to support VS.