Cost-Effectiveness of Urine Tenofovir Point Of Care Assay for ART Adherence Feedback in Namibia

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BACKGROUND

- Virologic failure (VF) in patients on Tenofovir Lamivudine Dolutegravir (TLD) usually due to non-adherence given dolutegravir's high resistance barrier
- Real-time adherence measurement could improve counseling, aid in virological suppression (VS), and reduce viral load (VL) tests conducted, thereby promoting cost-effective (CE) adherence interventions
- In Namibia, we found that a new point-of-care (POC) urine-based tenofovir (TFV) assay-enhanced intervention raised VS to 92% at Month 6 among participants who remained unsuppressed on TLD after 3 months of WHO-recommended enhanced adherence counseling (EAC). These result contrast with an overall 71% VS rate worldwide for people living with HIV (PLWHIV) per UNAIDS.

METHODS

- We examined the cost and cost-effectiveness of POC urine testing and estimated the health and cost impacts of the intervention compared to EAC alone (Table 1)
- Under standard EAC, participants received monthly adherence counselling with a VL every 3 months. Those who achieved VS were no longer eligible for EAC and were removed. Under the intervention, patients received monthly POC urine tests with counselling, and every 3 months, patients with 3 consecutive positive urine tests received a VL. As in standard EAC care, those who achieved VK were no longer eligible for the intervention and were removed
- The hypothetical eligible population included 100 patients in care for at least 2 years failing ART (i.e., VL>1000). Model input parameters were populated with data derived from the above study, including outcomes of achieving adherence, achieving VS (VL<40), time-motion analysis, and financial documents.
- A VL test costs $50, and the urine TFV test costs $1.33, including supplies and personnel time
- Sensitivity analyses were conducted to address uncertainties in key inputs.

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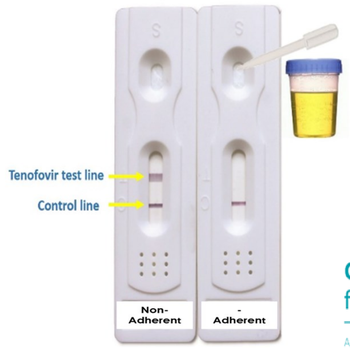
RESULTS

The urine tenofovir (TFV) assay was highly cost effective when added to enhanced adherence counseling to improve virologic suppression rates

Table 1. Comparison of costs incurred with the standard-of-care adherence counseling compared to adherence counseling informed by a point-of-care urine tenofovir assay

	Cost	Difference in cost	Patients with viral suppression	Difference in patients with viral suppression	Incremental cost-effectiveness ratio
Standard care	$8,894		92		
Intervention A (with VL re-test of suppressed)	$7,241	($1,653)	95	3	Dominant

Data in the table are for enrolment cohort of 100 patients after 12 months. Parentheses indicate net savings. The term "dominant" means the intervention leads to health benefits and dollar savings compared to the prior row



- Following the current standard EAC guidelines, the patient cohort received a total of 478 EAC sessions & 159 VL tests over 12 months
- This was associated with $8,894 in net costs and led to 92% of patients achieving VS at Month 6. With the POC urine test. patients achieved VS sooner than with standard ECA, requiring 442 urine tests and EAC sessions over 12 months
- A total of 37 VL tests were avoided as patients were removed from the intervention sooner and for patients whose urine tests showed non-adherence
- This led to savings of $1,653 compared to standard care, equal to an 18% reduction in costs. VS at the end of 12 months with the urine test was 95%

CONCLUSIONS

- The study evaluated the cost and cost-effectiveness of incorporating a POC urine TFV test into counseling for ongoing viremia on TLD
- The intervention was less expensive and improved health compared to standard-of-care
- A randomized clinical trial is planned to compare SoC EAC to urine assay counseling within a larger sample
- The TFV test could improve VS and reduce expenditure in a scalable manner

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