COST-EFFECTIVENESS OF HIV SELF-TESTING AMONG LONG-DISTANCE TRUCK DRIVERS IN KENYA

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HIV TESTING IN LONG-DISTANCE TRUCK DRIVERS

Awareness of HIV status is critical for reaching UNAIDS targets. Long-distance truck drivers (LDTDs) are a high-HIV-risk population in which more than 1 in 4 live with HIV in some sub-Saharan African settings (Delany-Moretlwe *Int J STD AIDS* 2014). LDTDs face crucial occupational barriers, such as continuous travel and irregular schedules, that hinder access to healthcare. While health clinics along major transport corridors have improved access, HIV test uptake remains suboptimal (North Star Alliance 2018). A novel approach—the **choice to HIV self-test (CHIVST**) at a roadside clinic—increased test uptake for Kenyan LDTDs (Kelvin *AIDS Care* 2018). We leveraged data from this trial to conduct a trial-based **cost-effectiveness analysis** of CHIVST versus provider-administered testing.

ESTIMATING COST-EFFECTIVENESS

Data are from a **randomized controlled trial** of clinic- or home-based self-administered oral HIV testing (n=150) vs provider-administered testing (standard of care, n=155) for LDTDs at roadside clinics in Kenya. We adopted a **societal** perspective, with economic costs from the literature and reported in 2017 international dollars (I$).

We used generalized Poisson and linear gamma regression models to estimate the relative risk of HIV test uptake and incremental cost of CHIVST. Incremental effectiveness was expressed in terms of the **number needed to treat (NNT)**, or the number offered CHIVST for an additional HIV test uptake.

We reported **incremental cost-effectiveness ratios**, with 95% CIs calculated using Fieller's theorem. Deterministic sensitivity analysis identified key costs driving variation in the cost-effectiveness ratio. Non-parametric bootstrapping estimated the probability of cost-effectiveness at a given willingness-to-pay threshold.

Table 1. Mean per patient costs for CHIVST vs standard of care (I$)

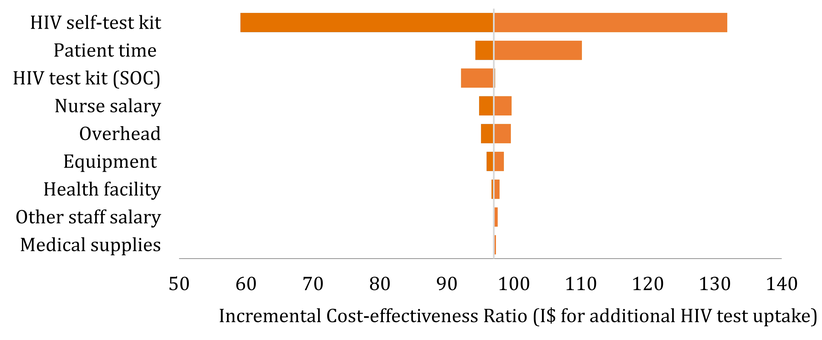
	Mean per patient costs [95% CI]		
Cost domain	**CHIVST**	**Standard of care**	**p-value**
HIV test kit	13.17 [11.52, 14.81]	0.00 [0.00, 0.00]	<0.001
Medical supplies	0.28 [0.26, 0.31]	0.25 [0.23, 0.28]	0.090
Labor			
Nurses	2.60 [2.43, 2.78]	1.87 [1.68, 2.06]	<0.001
Other	0.94 [0.87, 1.02]	0.84 [0.76, 0.93]	0.090
Health facility	1.57 [1.44, 1.71]	1.41 [1.27, 1.55]	0.090
Equipment	0.11 [0.43, 0.17]	0.00 [0.00, 0.00]	<0.001
Overhead	4.07 [3.79, 4.35]	3.47 [3.12, 3.82]	0.009
Patient time	3.79 [3.55, 4.04]	2.62 [2.35, 2.88]	<0.001
Total	26.56 [24.31, 28.80]	10.47 [9.43, 11.52]	<0.001

Offering self-administered oral HIV testing is a **cost-effective** strategy to increase HIV test uptake for long-distance truck drivers

CHOICE TO SELF-ADMINISTER ORAL HIV TEST in LDTDs: COSTS MORE, BUT COST-EFFECTIVE

LDTDs offered CHIVST were 23% (95% CI 11%, 37%) more likely to uptake any HIV test vs those offered provider-administered testing. This equated to 6 LDTDs offered CHIVST for each additional HIV test uptake. Mean per patient costs for drivers in the CHIVST arm were >2x those receiving standard of care (Tables 1, 2). **CHIVST is cost-effective at willingness-to-pay thresholds of I$97 for each additional test uptake**. This falls below 3x Kenya's 2017 GDP/capita ((I$97 < I$9,774, Table 2), a commonly used threshold for assessing cost-effectiveness. **Self-test kits** and **patient time** are key **cost drivers** of cost-effectiveness (Fig 1). The probability of cost-effectiveness approaches 1 at a willingness-to-pay threshold of I$140 (Fig 2).

Figure 1. Cost of oral HIV self-test kit is primary driver of variation in cost-effectiveness



EFFECTIVE, EFFICIENT TESTING FOR ALL POPS

Offering the choice of self-administered oral HIV testing to long-distance truck drivers at roadside clinics is a **highly efficient** use of resources. Our findings contribute to growing evidence on the cost-effectiveness of HIV self-testing among high-risk populations in resource-limited settings. Future work should consider long-term health and economic outcomes, which were not captured in the current study, as well as the application of self-testing strategies in other high-risk or hard-to-reach populations.

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Table 2. Incremental cost-effectiveness of CHIVST vs Standard of Care

Outcome	**Base case**	**95% CI**
Number offered CHIVST for additional test uptake	6.25	[5.00, 8.33]
Incremental cost (I$)	15.55	[12.72, 18.38]
Cost-effectiveness ratio (I$ for additional test uptake)	97.18	[65.74, 120.98]

Figure 2. The probability CHIVST of cost-effectiveness is high at low WTP thresholds

