

UNITAID-PSI
HIV SELF-TESTING AFRICA

Value of secondary distribution of HIV self-test kits to male partners of women attending antenatal clinics

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BACKGROUND

As the proportion of people living with HIV already diagnosed increases, the cost-effectiveness of any form of HIV testing declines and it is becoming challenging to diagnose 90% or more of the population, while using only cost-effective approaches. Countries are considering secondary distribution of HIV self-tests (HIVSTs) to partners of women attending antenatal clinics (ANCs), as it could be a sustainable approach to reach men.

METHODS

We simulated 904 setting-scenarios for adult HIV epidemics and care programmes typical of southern Africa using a dynamic-transmission model, and projected 50 years from 2018. For each setting-scenario we compared outcomes under continuation of current testing policy to those obtained by providing, in addition, an HIVST to long-term partners of women attending ANCs (not diagnosed with HIV and not tested in the last 3 months). Our aim was to assess impact and cost-effectiveness. The cost per partner of woman attending ANC tested using HIVST of US\$5.16 was based on costing from Malawi (excluding cost of male-friendly clinics, MFCs). We assumed that 80% of men tested positive with HIVST would have confirmatory testing by a health-care-worker (HCW) within 1 year, a discount rate 3%/annum and cost-effectiveness threshold of US\$500/disability-adjusted life-year (DALY) averted. Several sensitivity analyses were conducted: considering a 20 year time-frame, 0% and 10% discount rate, assuming 50% of partners of women attending ANCs testing positive with an HIVST would have confirmatory testing by a HCW within 1 year, assuming MFCs are available and 10% of men testing negative using an HIVST are linked to voluntary medical male circumcision (VMMC; average cost per partner of woman attending ANC tested using HIVST, including the cost of MFC attendance for those who do, without incentive: US\$6.50), assuming men are offered US\$10 of incentive if they attend the MFC and 35% of uncircumcised men testing negative using an HIVST are linked to VMMC (average cost per partner of woman attending ANC tested using HIVST, including the cost of MFC attendance for those who do, with incentive: US\$8.51).

Table. Baseline characteristics of setting-scenarios at baseline (in 2017, n = 904)

	Median (90% range) across setting-scenarios	Examples of observed data
Population size		
All aged 15-64 (in million)	10.0 (9.1 - 10.8)	Zambia (2018): 8.2m; Malawi (2018): 9.8m; Zimbabwe (2018): 7.8m;
Eligible men, per year (in 1000)*	301.9 (10.6 - 674.7)	
HIV prevalence		
All aged 15-49	9.5% (3.4% - 22.4%)	Zimbabwe DHS (2015): 14%; Tanzania (2011): 5%; Uganda (2011): 9%;
Eligible men*	7.8% (1.8% - 21.1%)	Lesotho (2014): 25%;
HIV incidence (per 100 person years)		
All aged 15-49	0.73 (0.12 - 2.01)	Malawi MPHIA (2015-16): 0.37%; Zambia ZAMPHIA (2016): 0.66%;
Eligible men*	3.06 (0.19 - 11.02)	Zimbabwe ZIMPHIA (2016): 0.45%; Swaziland: 2.4%; KZN Mbongolwane and Eshowe (Huerga): 1.2%;
Prevalence of undiagnosed HIV		
All aged 15-64	2.1% (0.6% - 5.1%)	Malawi: 2.9%; Zimbabwe: 3.8%; Zambia ZAMPHIA (2016): 4.0%;
Eligible men*	3.5% (0.4% - 10.2%)	Rwanda (Nsanziimana): -0.3%**
Proportion tested in past year		
Men 15-49	14% (9% - 21%)	Zimbabwe DHS (2015): 36%; Namibia DHS (2013): 38%; Nigeria DHS
Eligible men*	13% (8% - 20%)	(2013): 10%;
Percentage of tests resulting in HIV diagnosis		
All aged 15-64	3.1% (0.8 - 8.2%)	6%-55% depending on group (Sharma et al). Estimates susceptible to bias due to re-diagnosis of people who do not report previous diagnosis.
Eligible men*	3.0% (0 - 16.7%)	
Of HIV positive people, % diagnosed		
Men 15-49	66% (57% - 80%)	Malawi MPHIA (2016): 73%, 76% in women, 67% in men; Zambia ZAMPHIA (2016): 67%, 68% in women, 62% in men; Zimbabwe ZIMPHIA (2016): 74%, 77% in women, 70% in men; KZN Mbongolwane and Eshowe (Huerga): 75%; Maman: 77%; Gaolathe: 78%**
Eligible men*	58% (29% - 77%)	

*In order to be eligible they need to currently have condomless sex with the long-term partner who attended ANC, be aged 18 years old or more, not to be diagnosed HIV (i.e. being HIV negative or HIV positive but undiagnosed), not have tested for HIV in the last 3 months; **Survey estimates likely to be over-estimates due to undisclosed diagnosed HIV; Kim et al.

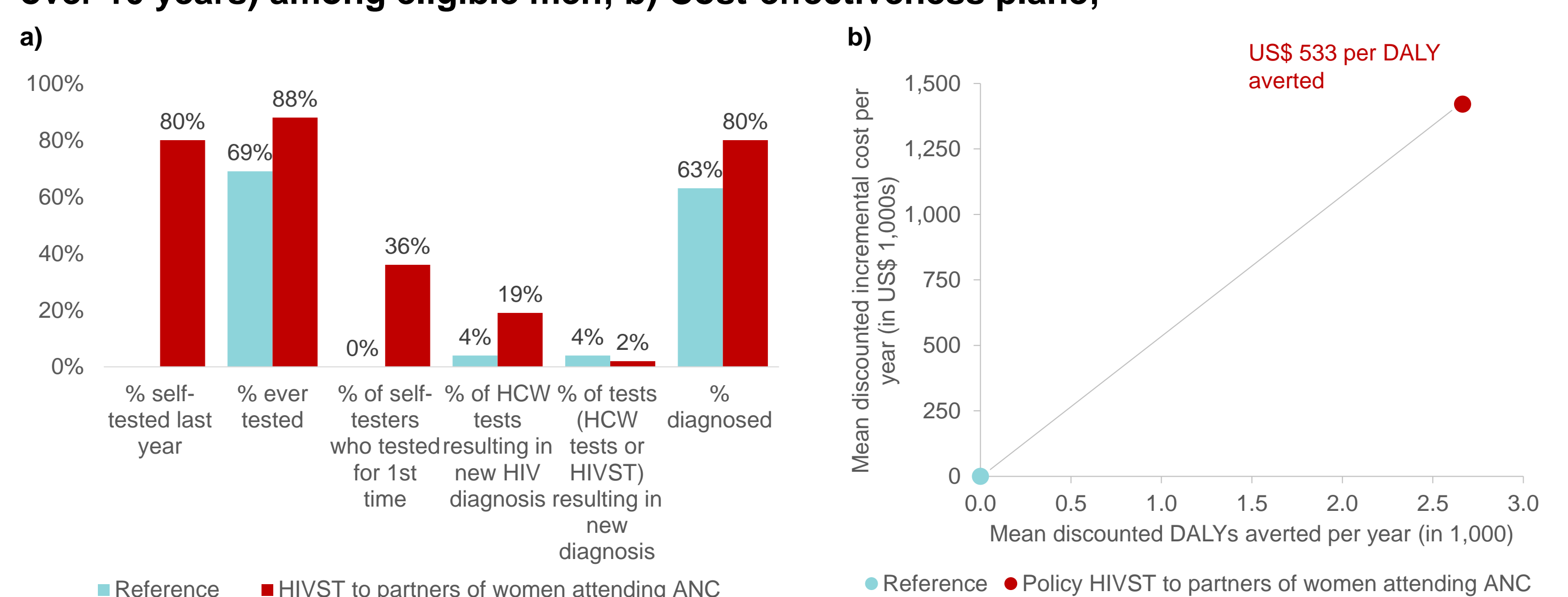
CONCLUSION

With these assumptions, HIVST distribution to partners of women attending ANCs in southern Africa (covering about 3% of the adult population/year) is predicted to avert ~500 infections/year over the next 50 years and has the potential to be cost-effective in our primary analysis, which is noteworthy given the generally high existing proportions diagnosed.

RESULTS

In an adult population of 10 million in 2017 (pregnancy incidence: median=11.8/100 person-years; 90% range: 2.8 - 21.4 per 100 person-years), our assumptions result in 302,000 (median; 90% range:11,000-675,000) men eligible per year in 2017, 3% of the adult population. The number of HIVST distributed/year would be 273,000, on average (over first 10 years; Figure a) corresponding to 80% of eligible men self-testing/year, of whom 36% would be first-time testers. The intervention would allow increasing the positivity rate of HCW-performed tests (including tests due to a recent positive HIVST) among partners of women attending ANCs from 4% to 19% and the proportion of partners of women attending ANCs diagnosed from 63% to 80% and averting ~500 infections/year, with an estimated incremental-cost-effectiveness-ratio (ICER) of US\$533/DALY averted.

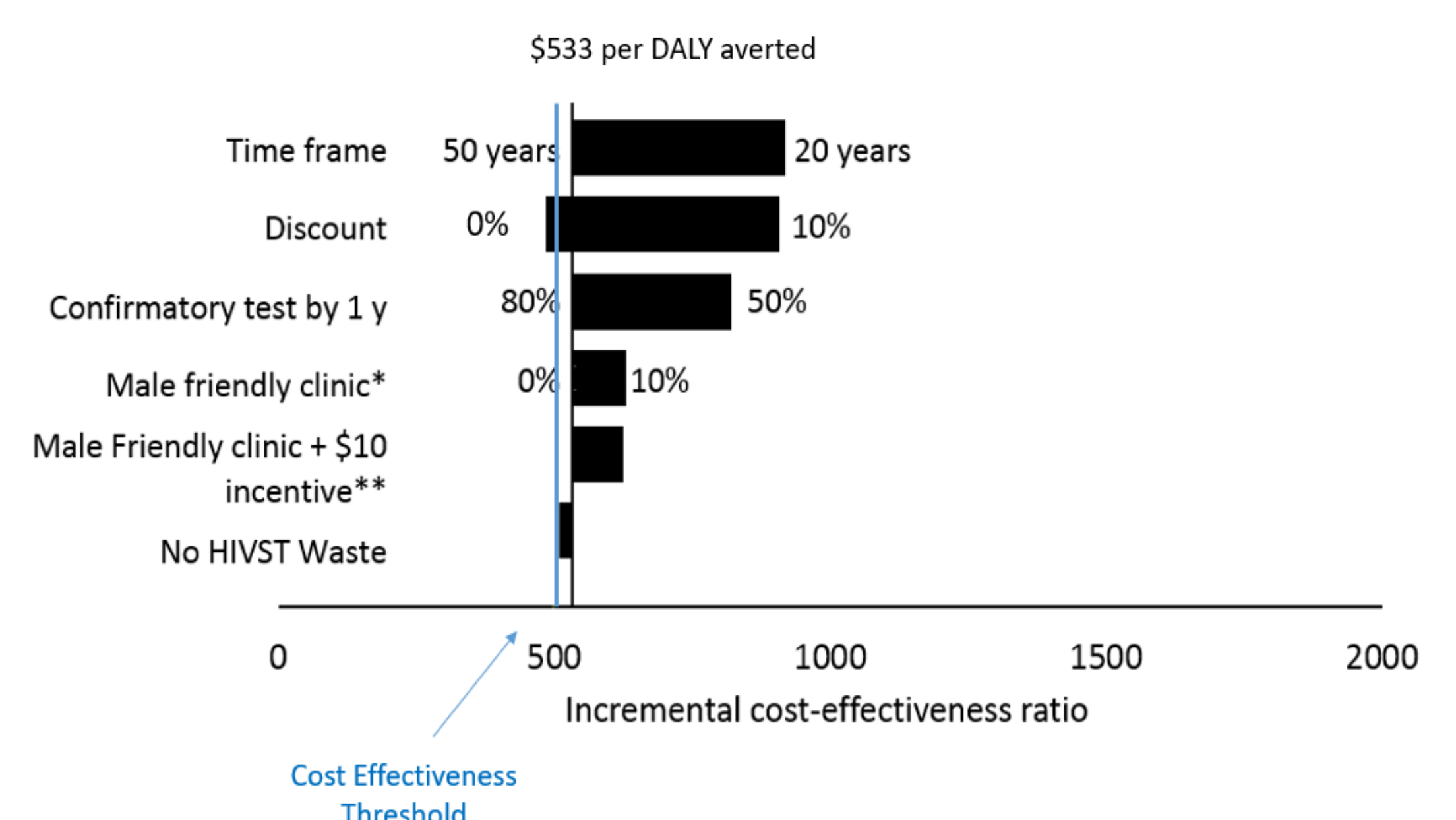
Figures. a) Effect of secondary distribution of HIVST on intermediate outcomes (mean over 10 years) among eligible men; b) Cost-effectiveness plane;



Sensitivity analyses are presented in Figure c. The sensitivity analysis produced an ICER greater than the base case when considering:

- 20-year time horizon,
- 10% discount rate,
- 50% having a confirmatory test by 1 year since a positive HIVST
- male friendly clinics being available (with or without incentive) and having an impact on the proportion of men linked to VMMC.

Figure c. Univariate sensitivity analyses



*As male friendly clinics are available it is assumed 10% of men testing negative using an HIVST are linked to VMMC and male friendly clinics are available to facilitate that. The unit cost in this case is US\$6.62. ** Men are offered US\$10 of incentive to attend the male friendly clinic and 35% of men testing negative using an HIVST are linked to VMMC.