Should HIV self-testing be offered as an additional testing option in health facilities?: A systematic review and meta-analysis

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BACKGROUND

- HIV self-testing (HIVST) is a process in which a person collects their own specimen (oral fluid or blood) using a rapid HIV test, performs the test, and interprets their result, when and where they want.

- World Health Organization (WHO) has recommended HIV self-testing (HIVST) since 2016. HIVST is now routinely implemented globally across different service delivery models, supporting both HIV case-finding and prevention.

- To optimise limited resources, some programmes have used risk-screening tools to limit HIV testing services to at-risk populations. However, evidence suggests that risk-screening tools may have contributed to declining HIV diagnosis and ART initiations. To date, WHO does not recommend the use of "screen-out" risk-screening tools.

- Facility-based HIVST (FB-HIVST) has been used in high HIV burden settings or sites with limited staff to increase testing coverage.

- This review aimed to evaluate the risks and benefits of FB-HIVST and explore whether FB-HIVST may be an effective method to increase diagnosis in high-burden settings.

METHODS

- Searched 9 electronic databases using key terms: "HIV" AND "self-test"

- To be included, studies needed to directly compare people receiving FB-HIVST to people receiving standard HIV testing services or no intervention.

- Risk of Bias was assessed according to guidance by Cochrane Handbook.

- Meta-analyses of studies reporting on comparable outcomes was conducted on REVMAN 5.4.1 using random-effects model for relative risk (RR), with 95% confidence intervals

- Certainty of evidence was rated using GRADEPro

RESULTS

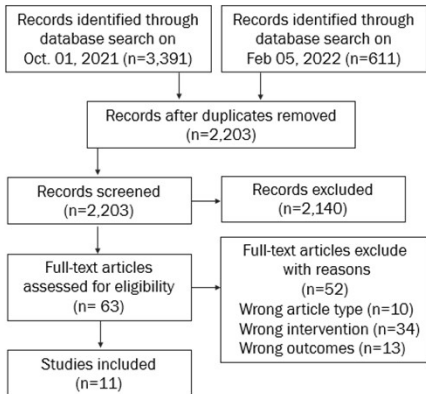Figure 1. Prisma flow chart of study selection

Table 1. Study Characteristics

Study ID	Study Type	Characteristics
Dovel et al, 2020	RCT, cluster	Malawi; OPD Adolescent & adult outpatients
Nichols et al, 2020	Cost	
Nichols et al, 2021	CEA	
Mphande et al, 2018	Qual	
Kelvin et al, 2018	RCT, indiv.	Kenya; Clinics Truck drivers
Kelvin et al, 2019 (a)	RCT, indiv.	Kenya; Clinics Truck drivers
Kelvin et al, 2019 (b)	RCT, indiv.	Kenya; Clinics Female sex workers
Gaydos et al, 2013	Cohort	USA; ED Adult outpatients
Hector et al, 2018	Cohort	Mozambique; YF Hospital Adolescents
Sande et al, 2021	Cost	Zambia, Zimbabwe Clients ANC and OPD
Hubbard et al, 2022	Qual	Malawi, Adolescent & adult positive testers

RCT: Randomized controlled trial. Indiv.: Individual. OPD: Out-patient department. ED: Emergency department. YF: Youth Friendly. ANC: Ante-natal clinic. NS: Not specified. FSW: Female sex workers

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SUMMARY OF EVIDENCE

HIV Testing Uptake

Footnotes
(1) Adjusted for cluster effect using reported ICC. Dovel, 2020 additionally reports an Adjusted OR(95% CI) for site: 8.89(4.17-18.94);...

FB-HIVST may improve HIV testing uptake.

Heterogeneity driven by Kelvin 2018, where population not sensitized to importance of HIV testing prior to intervention.

HIV Positivity

Footnotes
(1) Adjusted for cluster effect using reported ICC. Dovel, 2020 additionally reports an Adjusted OR(95% CI) for site: 1.10(0.45-2.69);...

FB-HIVST may lead to greater likelihood of HIV diagnosis compared to standard of care.

Difference in positivity likely driven by greater testing uptake among FB-HIVST participants.

Outcome	# Studies & Type	Result	Interpretation	Certainty of Evidence
HIV Testing Uptake	4 RCTs	RR= 2.47; 95% CI: 0.96, 6.33; Chi² = 187.21; df = 3; p<0.00001; I² = 98%)	FB-HIVST **may improve HIV testing uptake.**	Low
HIV Positivity	4 RCTs	RR= 3.77; 95% CI: 0.81,17.44; Chi² = 4.67; df =3 ; p<0.20; I² = 36%	FB-HIVST **may lead to greater likelihood of HIV diagnosis** compared to standard of care.	Low
Acceptability (would test again)	1 RCT	RR= 1.21; 95% CI: 1.10, 1.33		Low
Acceptability (would recommend)	1 RCT	RR=1.12; 95% CI: 1.04, 1.21	FB-HIVST is **likely acceptable** to populations	Low
Acceptability (choice of HIV test)	3 RCTs	Among participants offered a choice between 3 testing options, 16.78% (n=151/900) chose FB-HIVST vs. 10.33% (n=93/900) chose SOC		Moderate
Diagnostic Accuracy	1 Cohort	Out of 299 tests, and excluding invalid results, specificity was measured at 1.00 [95% CI: 0.48, 1.00] and specificity at 1.00 [95% CI: 0.99, 1.00].	High specificity and sensitivity, but there **may be cases of diagnostic discrepancies related to inconclusive results.**	Very Low
Usability	2 Cohorts	75.33% (n=577/766) reported HIVST was easy to use vs. 2.87% (n=22/766) reported HIVST was not easy to use.	Majority of populations may find FB-HIVST easy to use, but certain populations, such as **adolescents, may require additional support.**	Very Low
Linkage to HIV Care	1 RCT	RR= 3.77; 95% CI: 0.68, 15.62	**Linkage to care may be comparable** between FB-HIVST and SOC.	Low
Social Harm	1 RCT	No participants in FB-HIVST reported coercion to test or disclose test results compared to 10 participants in SOC reporting coercion to test, 1n 1 to disclose test results.	FB-HIVST may engender **minimal risk of social harm**	Low

VALUES & PREFERENCES

- 5 studies reported on values & preferences

- Values & Preferences for FB-HIVST were generally positive.

- FB-HIVST was commonly associated to **ease of use, immediate access to counseling and support, greater autonomy, and improved privacy** – particularly for adolescents.

- Some participants reported **lack of confidence** in correctly self-administering the test, **lack of trust in oral fluid HIV tests** compared to blood-based tests and **concerns with linkage to care.** Not everyone preferred HIVST when offered as an option.

RESOURCE USE

- Sande 2021, found the **average incremental cost** per FB-HIVST kit distributed **comparable** to home-based HIVST

- Assuming threshold analysis of $200 USD per new diagnosis, Nichols 2020 found **FB-HIVST may be cost-effective**

- In Nichols 2021 CEA, FB-HIVST **remained cost-effective** across scenarios, and even became cost-saving when kit price was reduced to $1.00

- Time and Motion Studies found that FB-HIVST has a **potential of reducing staff time** in HIV testing services.

CONCLUSIONS

- FB-HIVST may encourage higher HIV testing uptake and contribute to finding more HIV positive diagnoses. Linkage may be comparable between FB-HIVST and SOC, but further operational research to improve rapid linkage to prevention and care are still desirable.

- FB-HIVST may be an efficient method to increase testing coverage, particularly in high-burden settings, sites with limited staff and reach people in need of HIV prevention and care. Based on the findings of this review, and additional evidence, WHO now recommends FB-HIVST.

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