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Effectiveness of HIV Self-Testing Among Priority Populations in Sub-Saharan Africa: Evidence from a Systematic Review and Meta-analysis

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Methods Note · Volume 8

Published 2026-06-06 · Diamond open access · CC BY 4.0

Article 95 · Volume 8 · Published 2026-06-06 · DOI: not assigned

Abstract

Effectiveness of HIV Self-Testing Among Priority Populations in Sub-Saharan Africa: Evidence from a Systematic Review and Meta-analysis BACKGROUND:HIV self-testing (HIVST) is a key differentiated service delivery strategy to improve HIV testing uptake among priority populations in sub-Saharan Africa, including adolescents, young people, men, and first-time testers. Access to conventional facility-based testing remains constrained by stigma, confidentiality concerns, long waiting times, and health system limitations, making alternative testing approaches critical for reaching underserved groups. AIM: To assess the effectiveness of HIV self-testing compared with standard-of-care HIV testing approaches among priority populations in sub-Saharan Africa.

METHODS:Evidence from multiple trials and implementation studies was systematically synthesized using logit transformations and random-effects modelling. Heterogeneity across studies was assessed using the I^2 statistic, and findings were interpreted across different populations and delivery models. RESULTS:The pooled estimate showed high uptake of HIV self-testing across included studies, with a 95% confidence interval of 0.82 to 0.95, indicating consistently strong acceptance and utilization.

Moderate heterogeneity was observed, reflecting variation in populations, study designs, and delivery strategies. Subgroup analyses suggested that community-based distribution, peer-led approaches, and secondary distribution (through partners and peers) achieved particularly high uptake, especially among adolescents and young people. HIVST also increased testing among first-time testers and hard-to-reach populations who were less likely to access facility-based services.

In addition to improved uptake, studies reported high acceptability and user satisfaction, although linkage to confirmatory testing and care remained variable across settings. Differences in implementation models, awareness levels, and health system capacity contributed to observed variability in outcomes. CONCLUSION:HIV self-testing is an effective and acceptable strategy for increasing HIV testing uptake among priority populations in sub-Saharan Africa.

However, successful scale-up requires strengthening linkage-to-care systems, community engagement, and context-specific implementation approaches that address health system and structural barriers. KEYWORDS:HIV self-testing; HIV testing services; priority populations; sub-Saharan Africa; systematic review; meta-analysis. References Njau B, Damian DJ, Abdullahi L, Boulle A, Mathews C.

The effects of HIV self-testing on the uptake of HIV testing, linkage to antiretroviral treatment and social harms among adults in Africa: a systematic review and meta-analysis. PLoS One. 2021;16(1):e0245498.

Hatzold K, Gudukeya S, Mutseta MN, Chilongosi R, Nalubamba M, Nkhoma C, et al.

HIV self-testing: breaking the barriers to uptake of testing among men and adolescents in sub-Saharan Africa. *J Int AIDS Soc.* 2019;22(Suppl 1):e25244. Indravudh PP, Sibanda EL, d’Elbée M, Kumwenda MK, Ringwald B, Maringwa G, et al.

Preferences for HIV self-testing among young people in Malawi and Zimbabwe. *AIDS.* 2017;31(Suppl 3):S203–S212.

Computed figures from the companion data repository

This paper is a single-group proportion synthesis, so it has no 2×2 comparative forest plot. Its companion data repository (github.com/mahmood726-cyber/hivst-men-ssa) openly publishes the per-study data as **data/raw_studies.csv** (5 studies, 1,000 participants), and the figures below are rendered directly from that dataset: per-study proportions come straight from the file, and the pooled estimate is a REML random-effects synthesis of logit-transformed proportions with a Knapp–Hartung small-sample variance correction.

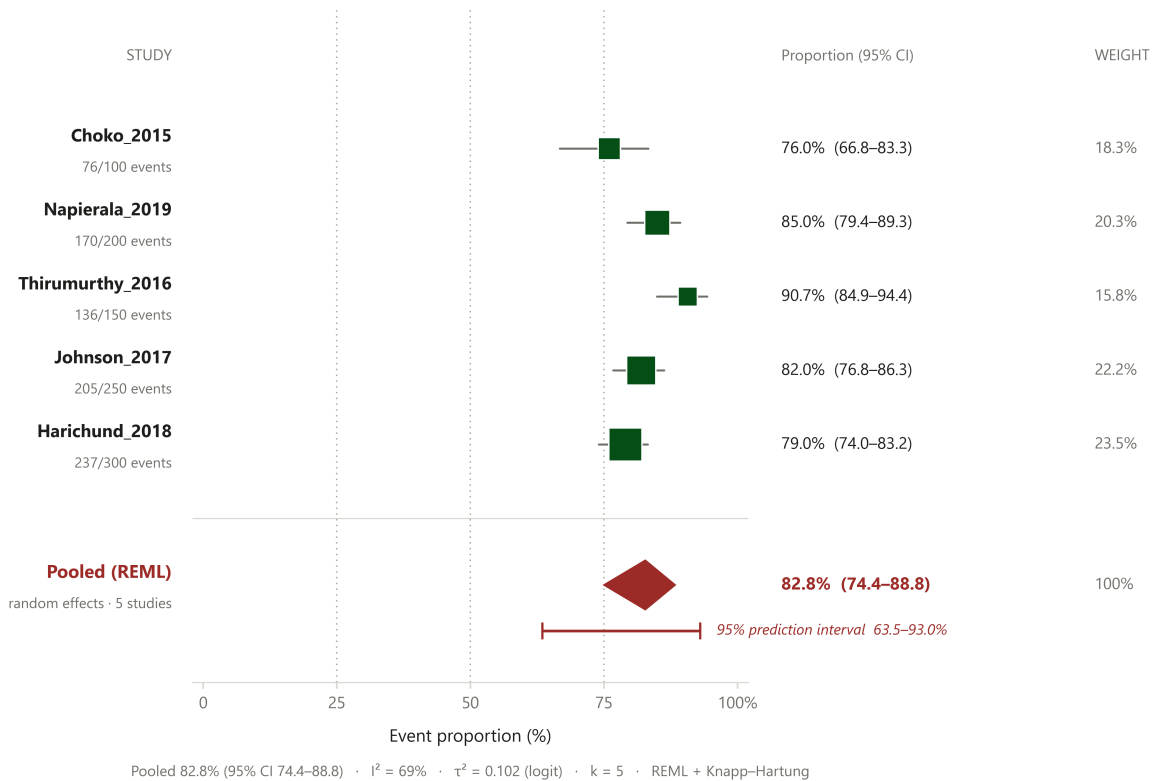


Figure 1. Proportion forest plot — HIV self-testing uptake among priority populations in sub-Saharan Africa. Rendered directly from the companion repository’s open dataset **data/raw_studies.csv** (5 studies, 1,000 participants). Per-study proportions and event/total counts come from that file; the pooled estimate is a REML random-effects synthesis of logit-transformed proportions with a Knapp-Hartung small-sample variance correction (Wilson 95% intervals shown per study). Pooled proportion 82.8% (95% CI 74.4–88.8); I² = 69%, τ² = 0.102 on the logit scale.

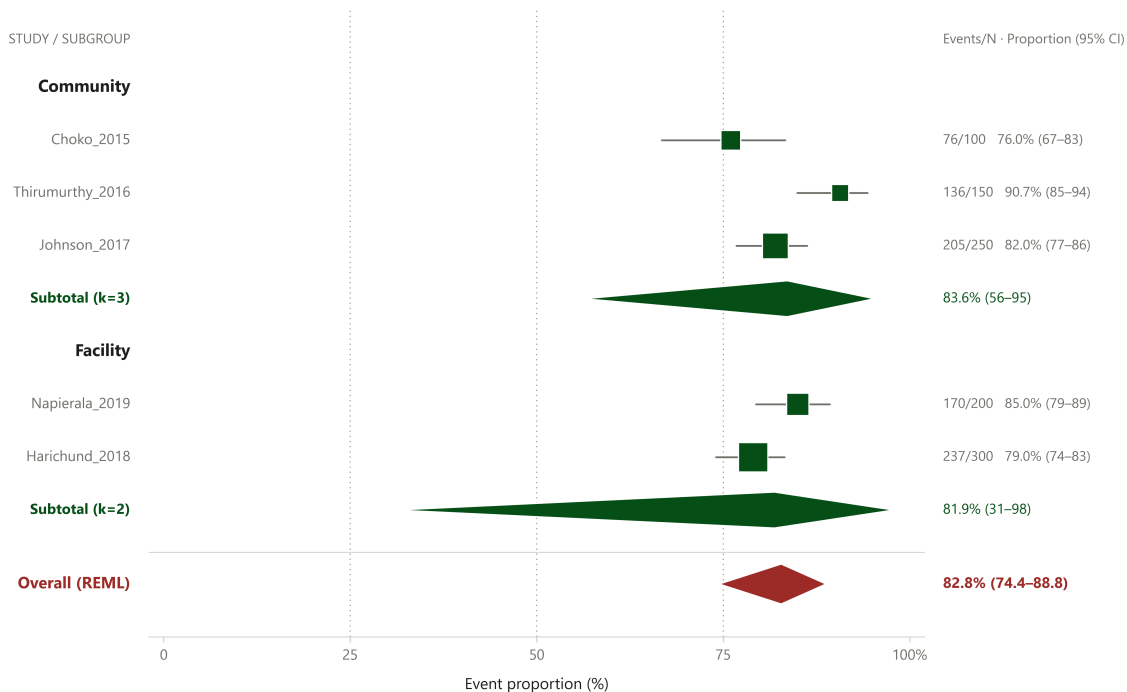


Figure 2. Subgroup synthesis by delivery model – HIV self-testing uptake among priority populations in sub-Saharan Africa. Studies grouped by the `intervention_type` column of the same data/raw_studies.csv; each navy diamond is the REML subtotal for that delivery model and the red diamond is the overall pooled proportion.

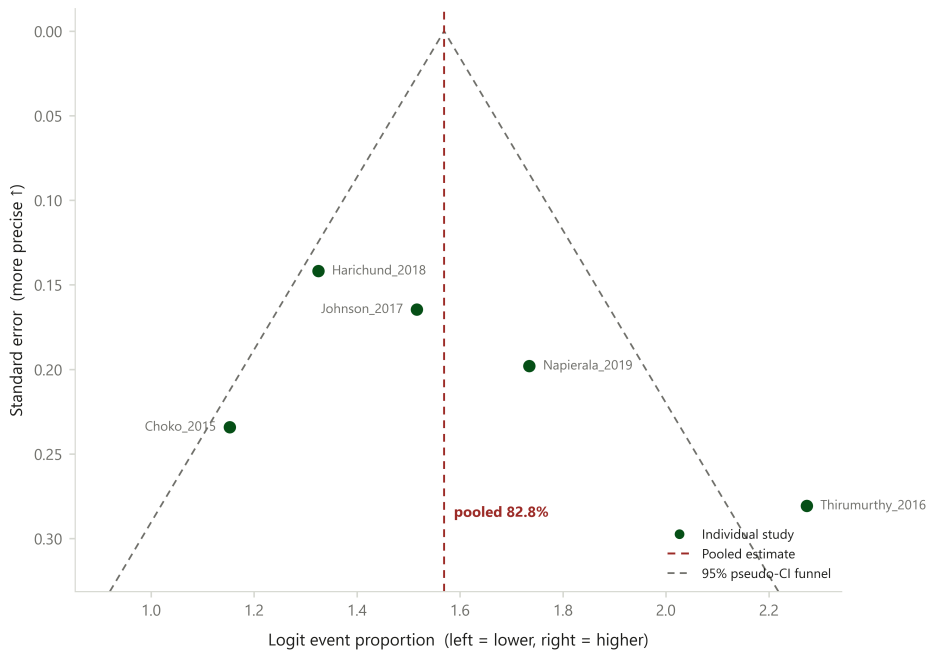


Figure 3. Funnel plot (logit proportion vs standard error) – HIV self-testing uptake among priority populations in sub-Saharan Africa. Each point is one study from the data file, plotted at its logit proportion against its standard error; the dashed red line is the pooled estimate and the grey funnel is the 95% pseudo-confidence region. A small-study / asymmetry visual check.

HOW TO CITE

Christine Muhumuza, Mahmood Ahmad, Ruchius Philbert & Bridget Tamale. Effectiveness of HIV Self-Testing Among Priority Populations in Sub-Saharan Africa: Evidence from a Systematic Review and Meta-analysis. *Synthesis*. 2026;8(1). Article 95. Available at <https://synthesis-medicine.org/index.php/journal/article/view/95>. Licensed under CC BY 4.0. DOI: not assigned.

Reproducibility & data provenance. Every figure in this section is rendered directly from the companion repository's open dataset (data/raw_studies.csv, hivst-men-ssa). Per-study proportions and event/total counts come from that file (Wilson 95% intervals per study); the

pooled diamond is a REML random-effects synthesis of logit-transformed proportions with a Knapp–Hartung variance correction. Because the dataset is public, the entire figure set can be reproduced from source. The article text, authors, abstract, issue and licence follow the journal's published record.

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