Validation of the National HIV Testing Eligibility Screening Tool in Tanzania

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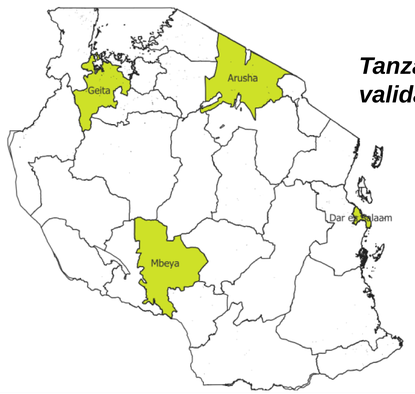
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BACKGROUND

- In 2020, Tanzania introduced a 16-question screening tool to determine adult eligibility for HIV testing services (HTS).
- This validation study compares the characteristics of the national tool to a) an optimized tool developed based on questions with significant associations and b) HIV self-testing (HIVST) modeled as a screening tool.

METHODS

- From March to June 2024, adolescents and adults aged ≥15 years with unknown HIV status seeking care were enrolled at 32 health facilities across four regions in Tanzania
- The current national screening tool was administered, and all participants were tested for HIV regardless of their eligibility screening outcome.
- Demographic information, screening responses, and HIV test results were collected
- Eligibility for HTS with the national screening tool was defined as ≥1 positive response among 16 screening questions.
- An optimized screening tool was developed using regularized logistic regression to identify the most predictive of the 16 screening questions and optimal weighting (1 to 3 points), with a total score ≥2 as the threshold for HTS eligibility.
- Sensitivity, specificity, positive and negative predictive values (PPV, NPV), and 95% confidence intervals were generated for both screening tools.
- As a point of comparison, values for these measures were also calculated for the use of HIVST as a screening tool based on manufacturer's reported sensitivity and specificity for HIVST



Tanzania map showing validation study regions

HIV self-testing performed better as a risk screening tool for identifying undiagnosed people living with HIV compared to the national and optimized tools.

Key characteristics of the Tanzanian National Adolescent and Adult HIV Risk Screening Tool, Optimized Screening Tool, and HIV Self-testing

	Sensitivity	Specificity	PPV	NPV	Persons Screened Eligible for Testing	HIV Diagnoses	Missed HIV Diagnoses
National Screening Tool † Score Threshold ≥ 1	97.8% (95.6%-99.0%)	5.2% (4.9%-5.5%)	1.6% (1.4%-1.7%)	99.3% (98.7%-99.7%)	22,228	348	8
Optimized Screening Tool‡ Score Threshold ≥ 2	97.8% (96.1%-99.2%)	5.9% (5.6%-6.2%)	1.6% (1.4%-1.7%)	99.4% (98.8%-99.7%)	22,097	348	8
HIVST using fingerstick whole blood sample with OraQuick*	100%	99.8%	88.5%	100%	402	356	0

†QUESTIONS *HIV Tested ≤12 mos*; Last HIV result unk., indeter.; Swollen glands, lymph nodes; Mouth ulcers, sores, thrush; *Recurrent skin diseases; Cough >2 weeks; Fever >2 weeks; Night sweats ever; Recent noticeable weight loss*; Blood-stained sputum; Abnormal vaginal, penile discharge; Burning, itching, painful urination; Genital ulcers, sores, warts; *Unprotected sex w/PLHIV or person w/unknown HIV status; Sex under influence of alcohol/drugs*; Multiple sexual partners last 12 months

‡Model question weights 1-3 and score threshold 2; QUESTIONS italicized above plus female sex.

*HIVST PPV and NPV calculated using enrollees HIV test results with sens, and spec from package insert. https://uk.oraquick.com/media/wysiwyg/OQHIVST_CE_IFU_-_English.pdf

RESULTS

- **Participants:** 23,444 (58.5% women); median age: 32 years (24-43 years IQR).
- **HIV diagnosis:** 356 participants (1.5%); higher in women (1.7%) and those aged ≥35 years (2.0%).
- **HTS eligibility (national tool):** 22,228 (94.8%); sensitivity: 97.8%, specificity: 5.2%.
- **HTS eligibility (optimized tool):** 22,097 (94.3%); similar sensitivity (97.8%) and specificity (5.9%).
- **Modelled HIVST screening results:** 402 participants (1.7%) eligible for HTS; included all HIV-diagnosed individuals.

CONCLUSIONS

- The national and optimized tools had high sensitivity but low specificity resulting in almost all participants screening eligible for HTS.
- Both risk screening tools misclassified some persons as ineligible for HTS who were later diagnosed with HIV.
- Screening with HIVST may be more efficient than the two screening tools, resulting in fewer individuals screening eligible for HTS but identifying all persons in whom HIV was diagnosed.
- Further econometric and qualitative analyses are needed to determine the implications of these results on HTS eligibility screening guidelines.

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DISCLAIMER: *The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the U.S. Centers for Disease Control and Prevention.*

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