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Acceptability of HIV Self-testing in sub-Saharan Africa: Scoping study

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Abstract

Several HIV testing models have been implemented in sub-Saharan Africa (SSA) to improve access to HIV testing, but uptake remains poor. HIV Self-Testing (HIVST) is now available, and may serve to overcome barriers of current testing models which include stigma, discrimination and non-confidential testing environments. A scoping study was conducted to provide an overview of the current literature in SSA, as well as identify future research needs to scale-up HIVST and increase HIV testing uptake. The outcome of the review indicated only 11 reported studies to date, showing variable acceptability (22.3% – 94%) of HIVST, with acceptability of HIVST higher among men than women in SSA. We conclude that research around HIVST in SSA is still in its infancy, and further implementation research and interventions are required to improve acceptability of HIVST among diverse study populations, failing which policy adoption and scale-up may be hindered.

Keywords

HIV; Self-testing; Access; Acceptability; sub-Saharan Africa

INTRODUCTION

Despite concerted efforts in engaging community members to get tested and know their HIV status, uptake of HIV testing has not been optimal globally (1). Lack of HIV awareness is a rate limiting step for anti-retroviral therapy (ART) initiation, and will naturally hinder success of global initiatives intended to eliminate HIV by 2030 (1, 2). The United Nations Programme on HIV/AIDS (UNAIDS) has set an ambitious 90-90-90 goal to help end the

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Compliance with Ethical Standards

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Research involving human participants and/or animals

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AIDS epidemic, through which 90% of people living with HIV should know their HIV status in order to allow for successful subsequent treatment initiation and viral suppression (2). As a result, researchers are investigating new approaches to HIV testing that would increase the uptake, and in return, lead to early HIV diagnosis and treatment initiation, as well as prevention options for people who test HIV negative (3–5). A newer approach to HIV testing, HIV Self-Testing (HIVST), has received global recognition as an alternate method to HIV testing. Growing evidence suggests that HIVST will likely serve to overcome several persisting barriers associated with current HIV testing models (3, 6). Barriers such as HIV-related stigma and discrimination, poor HIV testing facilities, excessive travel costs, inaccessible testing for hard-to-reach populations and lack of privacy and confidentiality seem to explain poor uptake of HIV testing associated with current HIV testing models, and have therefore created a niche for the adoption of HIVST. (3, 6–8).

Globally, there is strong evidence to support the potential of HIVST to access hard-to-reach study populations, but the acceptability levels of HIVST among these key populations has been found to vary widely in both developed and developing countries (6, 9–12). Studies have reported acceptability of HIVST ranging between 20.3% and 95% collectively among men-who-have-sex-with-men (MSM) (10, 13–19), female sex workers (16), and transgender women (19), but also among men and women targeted by gender (11, 20, 21). Globally, research evidence around differences in acceptability of HIVST between men and women is limited. Much of the HIVST research foci among these target groups have been directed toward issues inclusive of regulatory, policy and ethics, (9, 10, 22, 23), cost and distribution of HIVST kits (9), linkage to care (24, 25), and feasibility of implementation (18, 26). Whilst global HIVST research efforts are directing innovative research towards key populations that are hard-to-reach, such breakthroughs are also much needed in sub-Saharan Africa (SSA), where targeted populations should include the general population in addition to key populations. However, very little evidence for the use of HIVST exists in SSA, and adoption of this innovation is lagging behind many developed and developing countries. According to the UNAIDS technical report, evidence around acceptability and factors affecting policy development is limited in SSA, thus preventing scale-up of HIVST (27).

In SSA, voluntary counselling and testing (VCT), and its variations in design, is the most widely recommended model of HIV testing, where testing may be initiated by the patient or health worker. However, reported disadvantages of the VCT model include stigma and discrimination when presenting at HIV testing facilities to test (28), staff burnout at healthcare centres (28), inability to reach target populations for HIV testing (29, 30), high costs associated with implementing testing method (30), involuntary HIV status disclosure and possible adverse social impacts (28, 31). In light of the imperative to expand HIV testing uptake, frequency and awareness, new testing strategies such as HIVST will become important to consider for the general and key populations in SSA, where the burden of HIV remains the highest in the world (4). However, the current body of evidence on HIVST appear to be disproportionately lower in SSA given the burden, and the adoption of HIVST is only a recent development. We therefore sought to synthesize the evidence base on the growing adoption of HIVST in SSA using a scoping study methodology, so as to profile the target populations and their acceptability rates of HIVST. We further aimed to map and locate the current literature on HIVST within SSA in the broader context of the global

evidence base, so as to identify gaps to be potentially addressed in future research, as well as related policy implications.

METHODS

The Arksey and O'Malley scoping study methodology (32) was used for this review. Due to the exploratory nature of our review, and the intent to “map” the existing research and look for recurring themes within the literature, a scoping review methodology was the most appropriate methodological approach (33–35). Five main phases are followed in scoping reviews: 1) identifying the research question, 2) identifying relevant studies, 3) study selection, 4) charting the data, and 5) collating, summarizing and reporting the results. Scoping review methodology is similar to systematic reviews on the basis of rigorous literature techniques, but differ in that the criteria for inclusion are not based on quality of the study designs, but on relevance of the study to the question. As a result, studies with mixed designs can be reviewed, including both qualitative and quantitative studies. All data from the included studies are charted, emerging themes are identified and gaps are highlighted. Due to the broad inclusion criteria in scoping reviews when compared to systematic reviews, scoping studies tend to include a large body of published research, and identified gaps can help researchers guide future research.

Identifying the research question

Arksey and O'Malley (32) recommended a wide and inclusive approach to setting research questions in order to generate breath of coverage in the literature search process. Therefore, the research question for this scoping study was: what is known from existing literature about acceptability of HIV self-testing in SSA? The following questions were included to guide the main research question: 1) what is known in the literature? 2) what are the research gaps? and 3) what are the future needs?

Identifying relevant studies

According to Arksey and O'Malley, several literature sources should be reviewed to provide a wide breadth of coverage of the available literature (32). For this scoping review, English electronic academic databases were reviewed, which included: PubMed, Science Direct, Web of Science, African Journals Online and African Medicus Index. In addition, local and international policies on HIV self-testing were reviewed. Key words used in the search were “HIV”; “Self-testing”; “Testing methods” and “Acceptability”. Two full searches were conducted in all electronic academic databases from August 2015 to January 2017. Four stages of exclusion or inclusion were applied following outcome of search results: 1) Year (articles were excluded if pre year 1990), 2) Title (if title was irrelevant then article was excluded), 3) Abstract (if abstract was irrelevant, article was excluded), and 4) Article (if irrelevant, article was excluded).

Study selection

To ensure standardized study selection that was relevant to the research question, the process was guided by the following inclusion criteria: 1) Articles published from the year 1990 onwards, 2) Only articles published in English language, 3) Qualitative and Quantitative

research methods and 4) Studies from SSA. Qualitative and quantitative research methods were included to allow for a broader range of studies on the basis of their relevance, and in keeping with scoping review methodology. Since scoping reviews are exploratory by design, results from all studies in SSA on the topic were included. Articles related to home-based self-testing were included, but other home-based testing were excluded from study selection process when implemented by a healthcare worker or lay counsellor. HIVST was specifically defined, “as a process by which an individual performs a rapid diagnostic HIV test and interprets the results themselves”.

Charting the data

Data extraction from articles that met the inclusion criteria was conducted in accordance with recommendations by Arksey and O’Malley (32). Charting involved synthesising and interpreting data according to key issues and themes. A data extraction tool was developed, using the program Excel, to ensure relevant and efficient data extraction of information related to HIVST in SSA. Charting of data involved having to enter data into the Excel spreadsheets for each selected article, and ensuring data captured is comparable between included articles.

Collating, summarizing and reporting the results

Levac *et al.*, (2010) (36) recommended an approach to stage five of the scoping review that includes three steps (analysing the data, reporting results and applying meaning to the results) to increase consistency in reporting of results. After collation of data, summaries were generated and combined for reporting purposes. Research gaps were identified based on recommendations from authors, key findings, gaps in charts and lack of evident research from the chart.

RESULTS

A total of 551 relevant study titles, as shown in Figure 1, met the eligibility criteria for the scoping review. Further screening of the titles, resulted in exclusion of 350 studies which were duplicates retrieved between databases. A further 121 studies were excluded after abstract review found content to be irrelevant to this scoping review. Review of full articles resulted in exclusion of 69 studies conducted outside of SSA. Ultimately, a total of 11 articles on HIVST in SSA were included for analysis in this review, presented in Table I. However, only 9 of 11 studies reported specifically on acceptability in general of HIVST. Quantitative assessment was method of choice for most studies, used in eight of the studies. However, as HIVST is a relatively novel area of research, the three qualitative studies included in this review were also found to be useful in understanding perceived concerns around adoption and scale-up of HIVST. Nine of eleven studies reported on acceptability of HIVST (Table I), with acceptability rates ranging from 22.3% (37) to 94% (12) across studies conducted in SSA. The majority of studies around HIVST within SSA were conducted in South Africa (45%), Kenya (36%) and Malawi (36%). Further emerging themes from the current scoping review included target populations, benefits of HIVST, need for counselling, linkage to care, usability of HIVST kits, costs of test kits for HIVST, in terms of affordability and informing the scale-up of HIVST.

Acceptability across different target populations

The majority of studies conducted in SSA included study populations of healthcare workers, policy makers, men only and general population. HIVST acceptability was higher among health professionals than community health workers, the latter having levels similar to the one study on policy makers and members of the civil society. Reviewed literature also highlighted the use of HIVST to access hard-to-reach populations to test for HIV, but men were the only sub-population identified in two studies (6, 38–41). Four studies evaluated acceptability of HIVST on target populations inclusive of both men and women in SSA, with acceptability ranging from 22.3% to 94% (Table I). In each of the four studies, men indicated higher acceptability for HIVST due to lower direct non-medical costs and not being absent from work (12, 37, 42, 43). Also, acceptability rates in studies with men only (12, 39) were higher (70% – 94%) when compared to studies combining both men and women (22.3% – 64%) (12, 37, 39, 43). Uptake of HIV testing is lower among men using current HIV testing models, although there were no studies targeting women only (44). Therefore, higher acceptability rates among men suggests HIVST may be best suited to increase their uptake of HIV testing. However, further research is required to understand reasons for these gender-disparate lower acceptability rates of HIVST among women. Furthermore, future research should include explicit descriptions of targeted general populations, as well as sub-groups of key populations, and assess consistency of acceptability levels.

Benefits of HIVST

Evidence related to advantages and benefits of HIVST in SSA were reported in five studies (37, 38, 40, 41, 45). Several authors reported increased confidentiality and privacy, decreased burden on healthcare system, decreased coercive testing by healthcare workers, and decreased stigma and discrimination associated with HIV testing as advantages of HIVST (37, 40, 41, 45). Autonomy to make one's own choice of HIV testing method was also cited as advantageous by van Dyk *et al.* (41). Makusha *et al.* (38) reported that HIVST has the potential to address gender disparate barriers to testing, often encountered by males at HIV testing centres, such as non-male friendly testing spaces, inconvenient operating hours and healthcare provider attitudes that may not be sensitive to men's needs. Also, study outcomes from current literature on the advantages of HIVST reiterate the argument that HIVST should be offered as a complementary HIV testing method to overcome current barriers associated with conventional HIV testing approaches (voluntary counselling and testing, provider-initiated counselling and testing, etc).

Drawbacks of HIVST

Despite compelling evidence around advantages of HIVST, policy makers, key stakeholders and community members have reported several concerns associated with HIVST, which warrant further research to ensure that HIVST scale-up is not compromised (6, 38, 40, 46–48). Formative research is required to address concerns identified during the scoping review, including lack of face-to-face counselling, poor linkage to care and potential for social harm.

Face-to-face counselling—Mixed reactions toward the need for face-to-face HIV counselling during HIVST were noted (37, 38, 40, 41, 45). Counselling is considered an essential component of all current testing models (38). In keeping with this perspective, studies conducted with academics, key stakeholders and community leaders perceived absence of face-to-face HIV counselling as a disadvantage in two studies (38, 40). Key stakeholders believed that complete lack of face-to-face HIV counselling could lead to increased risk of distress and suicide (38). However, outcomes from the remaining two studies, involving both men and women from community, indicated the need to consider face-to-face HIV counselling on the basis of user preference (41). Van Dyk *et al.* (41) reported 22.2% of participants who felt that face-to-face HIV counselling was not necessary. Participants from another paper published by van Dyk *et al.* (37) indicated that they were comfortable to test for HIV, but did not want to be counselled by someone they did not know as they would likely be negatively judged. Participants who were willing to test for HIV through HIVST suggested telephone counselling as a more suitable counselling method when compared to face-to-face HIV counselling (37). Given varied preference to counselling in current studies in SSA, alternate methods to face-to-face counselling should be investigated.

Linkage to care—Linkage to care following a positive HIV result was highlighted as a major concern throughout literature from SSA which was identified during the scoping review (6, 38, 40, 41, 45, 48, 49). Researchers have found that adequate linkage to care, whereby participants access treatment or care facilities after testing for HIV, is an important component of the HIVST model and requires more formative research (6, 38, 39, 47–49). Choko *et al.* (49) reported 41.7% of participants linked to care following a positive HIV result in a study population of men and women. Lack of counselling may be linked to inadequate linkage to care as patients who test positive for HIV would not have adequate information to access care and treatment (38). Limited research has been conducted on linkage to care following HIVST. Algorithms and methods that ensure adequate linkage to care need to be evaluated through future research.

Social Harm—Incidents of harm such as suicide was not reported in the literature. However, Makusha *et al.* (38) reported that several stakeholders feared that people who test through HIVST may not be able to handle their results and actions taken by such people could be harmful to them. Choko *et al.* (49) reported 3% of coercive testing by partners in their study (38). Coercive testing may lead to gender-based violence between partners, but may also be experienced between family members. Potential for social harm through HIVST in SSA has mainly been reported through perceptions of community health care workers and key stakeholders (38, 49). Therefore, research gaps exist for evidence of social harm from general community members and key populations using HIVST, and methods to prevent occurrence of social harm should be designed and evaluated.

Usability of Test Kits for HIVST

Rapid oral fluid HIV tests and rapid finger prick test kits were used in studies reviewed as part of scoping review (12, 47, 49). The overall concern raised across studies reporting on usability of HIVST kits was suitability of instructions for diverse target populations (6, 12,

50). Researchers reported that the language of instructions, and the information relevant to linkage to care should be adequately recorded in user instructions (12, 50). However, limited research around usability of HIVST kits has been conducted in SSA, and therefore factors that can contribute to an “ideal HIV self-testing kit” need to be evaluated. Educational campaigns focused on usage of HIVST kits may be required for target populations not exposed to testing through HIVST (12). As literacy and education levels may vary greatly for individuals in resource limited settings, delivery method of educational campaigns promoting use of HIVST as well as innovative approaches to the packaging of HIVST kits will be required.

Costs of test kits for HIVST

Varied responses relating to cost of HIVST kits were noted in literature within SSA (39, 40, 48). Some participants felt that the government should provide HIVST kits free of charge, whilst others were willing to pay for HIVST kits if made available at distribution points that would ensure privacy and confidentiality such as pharmacies (38, 48). According to Brown *et al.* (40), accessibility of HIVST kits through pharmacies may increase access to HIVST kits, however affordability may be a concern for those individuals who are geographically and socioeconomically disadvantaged. Kurth *et al.* (12) reported that affordability of HIVST was a main theme in their behavioural survey data collected. A consensus on cost and distribution point of HIVST kit could not be determined as researchers across studies reviewed during the scoping review indicated that the cost and distribution point would be determined by the target population (38–40, 45, 48). Whilst limited research evidence around appropriate cost and distribution points of HIVST kits is available, future research should be directed toward identification of the most cost effective HIVST kit and suitable distribution points for HIVST kits stratified by target populations.

Informing the scale-up of HIVST

Four of the eleven studies reported on policy and regulations related to HIVST (6, 40, 48, 49). Some countries within SSA have reportedly integrated HIVST into their existing HIV testing policies, but do not have adequate policy and regulatory infrastructure to support scale-up of HIVST (6, 48). Qualitative evidence from key stakeholder’s, policy makers and healthcare professionals within communities in South Africa, Kenya and Malawi agreed that a policy and regulatory framework was essential for HIVST scale-up (38, 48). Van Rooyen *et al.* (48), Choko *et al.* (49) and Maheswaran *et al.* (42) reported that mechanisms to regulate cost, quality and reliability of HIV ST kits is required for scale-up of HIVST in line with WHO guidelines. Limited evidence around implementation of HIVST for scale-up exists in SSA. Therefore, policy makers are unable to make informed decisions around scale-up of HIVST. Thus, future research that provides evidence around mechanisms to regulate cost, quality, reliability, distribution of HIVST kits and linkage to care is required to aid policy makers in developing a regulatory framework in line with WHO, UNAIDS and local country guidelines for scale-up of HIVST (39, 48, 49).

DISCUSSION

The results of this scoping review revealed wide-ranging HIVST acceptability levels between 22% and 95% in SSA, consistent with findings from other regions of the world. However, a more unique pattern of gender disparities in HIVST acceptability rates was observed in studies within SSA, with acceptability rates of HIVST being much higher for men compared to women. Given men's natural aversion of healthcare facilities in SSA, the review suggest that men may prefer HIVST as it does not require for them to present at medical facilities for testing, often associated with loss of income due to absence from work (41). Higher acceptability rates amongst men are consistent with studies conducted in developed countries among MSM populations (10, 11, 13–15, 17–19). On the contrary, routine HIV testing through VCT is presumably higher with women compared to men, as women access healthcare facilities through family planning, management of sexually transmitted infections and antenatal care during pregnancy (38). Women's inclination towards VCT may render HIVST generally less acceptable to them compared to men, although certain sub-groups of women may actually benefit from HIVST. Therefore, further understanding of these gender disparities in preferential models for HIV testing is needed to inform policy and interventions to optimise HIV testing, including research on the potential role and impact of using HIVST to increase uptake of HIV testing and status knowledge among male populations, often considered hard-to-reach in SSA. Research is lacking in SSA on the use of HIVST among MSM, FSWs and transgender key populations. On the contrary, the bulk of the research on HIVST come from regions of the world outside of SSA, predominantly developed countries, where the majority of studies were conducted among key populations such as MSM and FSWs (27).

Ultimately, adoption and scale-up of HIVST in SSA will depend on the balance between potential benefits and related risks. On the one hand, potential benefits of HIVST include testing of self in a confidential setting of personal choice (48), testing opportunities for hard-to-reach populations (38, 51), autonomy in HIV testing (45) and reduction of stigma and discrimination impacts associated with testing at HIV testing facilities (52). However, more robust studies are needed to demonstrate these benefits, and their impact on HIV testing uptake or knowledge of HIV status in clearly-defined target populations. Whilst the potential benefit of home-based self-testing on the individuals and their households necessitate further research, the presumed reduction of burden on human resources within the health system also calls for relevant research. Since most countries in SSA are resource-poor, cost-effectiveness studies and other resource-related benefits of HIVST will be paramount. On the other hand, risks associated with HIVST include potential for coercive testing already identified at a small scale in this review, as well as concerns regarding potential self and social harms related to lack of counselling, and possible poor linkage to care following a positive test result. Careful monitoring and measurement of coercive testing, partner violence and suicide will be necessary in suitably-designed studies, as well as the best approaches likely to mitigate these potential risks. Such data is needed to inform country-specific regulatory and policy frameworks for HIVST, as well as responsible scale-up, which remain as important gaps globally (3, 13). In SSA, formative research studies around costing, access points, user-friendly test kits packaging, monitoring and evaluation systems,

quality assurance measures and appropriate HIV counselling approaches are still required for the development of regulatory support systems and policy guidelines for implementation of HIVST (3, 23, 41).

Policy guidance will also need to inform adoption of suitable HIVST test kits, taking into account diversity in target populations, options and reliability of testing methods, components of test kits adopted, clarity of user instructions appropriate to varying literacy levels, disposal of the test kit, counselling approaches and linkage to care options. Several studies have reported that evidence on the usability of HIVST kits remains limited globally, including major gaps in SSA (14, 23, 24, 50). Global evidence on counselling approaches for HIVST is mixed, also observed in this review. According to a study in Hong Kong, 16% of MSM preferred HIVST due to absence of face-to-face counselling (53). However, a study in Peru reported 87% of participants required face-to-face counselling by trained counsellors (26). International policy no longer advocates for face-to-face HIV counselling, and suggests use of toll-free numbers for counselling (48), which highlights the need for further research to explore suitable counselling and training approaches for users of HIVST, with clear linkages to care (54). Whilst linkage to care may be hindered by travel costs to health facilities, a known barrier to access, the cost and accessibility of HIVST test kits may constitute the first barrier likely to prevent awareness of HIV status. Participants in middle to high-income countries are more willing to pay for test kits, when compared to participants from low-income countries (53). In SSA, cost to purchase HIVST kits will likely compete with daily necessities such as food and housing due to high levels of poverty to the exclusion of relatively wealthier individuals. Also, the cost of the test kit will likely influence location of distribution points (13). These may include, but are not limited to local clinics, supermarkets, bars or restaurants and condom distribution points (19). Therefore, an affordable or a government-subsidised HIVST kit may be required for successful scale-up of HIVST to accommodate geographically hard-to-reach and poverty-stricken populations. Cost of HIVST kits has not been extensively evaluated globally, thus requiring additional research to reduce the economic burden on an individual as well as limit cost implications for governments and other health providers.

CONCLUSIONS

Overall, this scoping review highlighted a broad range of acceptability rates for HIVST in SSA, very similar global rates, although men seem to benefit more from HIVST than women. However, the body of research on HIVST is still in its infancy stage relative to the global literature, except for research on policy guidance and frameworks on HIVST, which seems to lag behind across many countries of the world. Additional priorities for research on HIVST in SSA should be targeted at the information needed to inform scale-up and wider adoptions in the context of very diverse populations in education, wealth, geographical access and most likely socio-cultural values. These research priorities should include types of target populations, location of HIVST, packaging of test kits, appropriate counselling services, social protection from harm, conducive policy frameworks, and demonstrable impact on the uptake of HIV testing and levels of HIV status awareness. Whilst HIVST has the potential to complement current HIV testing models which could lead to increased uptake of HIV testing, HIV status awareness and earlier initiation of ART, much

implementation research work is still needed in SSA to contribute towards evidence base for the responsible scale-up of HIVST.

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References

1. Asante AD. Scaling up HIV prevention: why routine or mandatory testing is not feasible for sub-Saharan Africa. *Bulletin of the World Health Organization*. 2007; 85(8):644–6. [PubMed: 17768526]
2. UNAIDS. 90-90-90 An ambitious treatment target to help end the AIDS epidemic. Geneva: 2014.
3. Johnson C, Baggaley R, Forsythe S, van Rooyen H, Ford N, Napierala Mavedzenge S, et al. Realizing the potential for HIV self-testing. *AIDS and behavior*. 2014; 18(Suppl 4):S391–5. [PubMed: 24986599]
4. Cambiano V, Mavedzenge SN, Phillips A. Modelling the potential population impact and cost-effectiveness of self-testing for HIV: evaluation of data requirements. *AIDS and behavior*. 2014; 18(Suppl 4):S450–8. [PubMed: 24957978]
5. Daniel OE. Acceptability and barriers to uptake of HIV testing and counselling among students of tertiary institutions in Owo Ondo state Nigeria. *South American Journal of Public Health*. 2014; 2(1)
6. Kalibala S, Tun W, Cherutich P, Nganga A, Oweya E, Oluoch P. Factors associated with acceptability of HIV self-testing among health care workers in Kenya. *AIDS and behavior*. 2014; 18(Suppl 4):S405–14. [PubMed: 24974123]
7. Musheke M, Ntalasha H, Gari S, Mckenzie O, Bond V, Martin-Hilber A, et al. A systematic review of qualitative findings on factors enabling and deterring uptake of HIV testing in Sub-Saharan Africa. *BioMed Central Public Health*. 2013; 13(220):1–16. [PubMed: 23280303]
8. Nyblade L, Stangl A, Weiss E, Ashburn K. Combating HIV stigma in health care settings: what works. *Journal of the International AIDS Society*. 2009; 12(15)
9. Krause J, Subklew-Sehume F, Kenyon C, Colebunders R. Acceptability of HIV self-testing: a systematic literature review. *BMC public health*. 2013; 13(735):735. [PubMed: 23924387]
10. Volk JE, Lippman SA, Grinsztejn B, Lama JR, Fernandes NM, Gonzales P, et al. Acceptability and feasibility of HIV self-testing among men who have sex with men in Peru and Brazil. *Int J STD AIDS*. 2015
11. Ng OT, Chow AL, Lee VJ, Chen MI, Win MK, Tan HH, et al. Accuracy and user-acceptability of HIV self-testing using an oral fluid-based HIV rapid test. *PLoS One*. 2012; 7(9):e45168. [PubMed: 23028822]
12. Kurth AE, Cleland CM, Chhun N, Sidle JE, Were E, Naanyu V, et al. Accuracy and Acceptability of Oral Fluid HIV Self-Testing in a General Adult Population in Kenya. *AIDS and behavior*. 2015
13. Wong HT, Tam HY, Chan DP, Lee SS. Usage and acceptability of HIV self-testing in men who have sex with men in Hong Kong. *AIDS and behavior*. 2015; 19(3):505–15. [PubMed: 25145608]
14. Yan H, Yang H, Raymond HF, Li J, Shi LE, Huan X, et al. Experiences and correlates of HIV self-testing among men who have sex with men in Jiangsu province, China. *AIDS and behavior*. 2015; 19(3):485–91. [PubMed: 25480598]
15. Lippman SA, Perisse ARS, Veloso VG, Sullivan PS, Buchbinder S, Sineath RC, et al. Acceptability of self-conducted home-based HIV testing among men who have sex with men in Brazil: data from an on-line survey. *Cad Saude Publica*. 2014; 30(4):724–34. [PubMed: 24896048]
16. Marley G, Kang D, Wilson EC, Huang T, Qian Y, Li X, et al. Introducing rapid oral-fluid HIV testing among high risk populations in Shandong, China: feasibility and challenges. *BMC public health*. 2014; 14:422. [PubMed: 24884431]
17. Chiu CJ, Young SD. Correlates of requesting home HIV self-testing kits on online social networks among African-American and Latino men who have sex with men. *AIDS Care*. 2016; 28(3):289–93. [PubMed: 26444956]

18. Woods WJ, Lippman SA, Agnew E, Carroll S, Binson D. Bathhouse distribution of HIV self-testing kits reaches diverse, high-risk population. *AIDS Care*. 2016;1–3.
19. Bustamante MJ, Konda KA, Joseph Davey D, Leon SR, Calvo GM, Salvatierra J, et al. HIV self-testing in Peru: questionable availability, high acceptability but potential low linkage to care among men who have sex with men and transgender women. *Int J STD AIDS*. 2016
20. Gaydos CA, Hsieh YH, Harvey L, Burah A, Won H, Jett-Goheen M, et al. Will patients “opt in” to perform their own rapid HIV test in the emergency department? *Annals of emergency medicine*. 2011; 58(1 Suppl 1):S74–8. [PubMed: 21684413]
21. Gaydos CA, Solis M, Hsieh YH, Jett-Goheen M, Nour S, Rothman RE. Use of tablet-based kiosks in the emergency department to guide patient HIV self-testing with a point-of-care oral fluid test. *Int J STD AIDS*. 2013; 24(9):716–21. [PubMed: 23970610]
22. Ibitoye M, Frasca T, Giguere R, Carballo-Dieiguez A. Home testing past, present and future: lessons learned and implications for HIV home tests. *AIDS and behavior*. 2014; 18(5):933–49. [PubMed: 24281697]
23. Wong V, Johnson C, Cowan E, Rosenthal M, Peeling R, Miralles M, et al. HIV self-testing in resource-limited settings: regulatory and policy considerations. *AIDS and behavior*. 2014; 18(Suppl 4):S415–21. [PubMed: 24957979]
24. Wood BR, Ballenger C, Stekler JD. Arguments for and against HIV self-testing. *HIV/AIDS - Research and Palliative Care*. 2014; 6:117–26.
25. Pant Pai N, Klein MB. Are we ready for home-based, self-testing for HIV? *Future HIV Therapy*. 2008; 2(6):515–20.
26. Lee VJ, Tan SC, Earnest A, Seong PS, Tan HH, Leo YS. User acceptability and feasibility of self-testing with HIV rapid tests. *Journal of acquired immune deficiency syndromes*. 2007; 45(4):449–53. [PubMed: 17554213]
27. UNAIDS. A short technical update on self- testing for HIV. 2014
28. Bateganya M, Abdulwadud OA, Kiene SM. Home-Based HIV voluntary counselling and testing (VCT) for improving uptake of HIV testing (Review). *Cochrane Database of Systemic Review*. 2010; 7
29. Ramfolo M, Chidarikire T, Farirai T, Matji R. Provider-Initiated Counselling and Testing (PICT): An overview. *South African Journal of HIV Medicine*. 2011; 12(2)
30. Mabuto T, Latka MH, Kuwane B, Churchyard GJ, Charalambous S, Hoffmann CJ. Four models of HIV counseling and testing: utilization and test results in South Africa. *PLoS One*. 2014; 9(7):e102267. [PubMed: 25013938]
31. Kalichman SC. HIV testing attitudes, AIDS stigma, and voluntary HIV counselling and testing in a black township in Cape Town, South Africa. *Sexually Transmitted Infections*. 2003; 79(6):442–7. [PubMed: 14663117]
32. Arksey H, O’Malley L. Scoping studies:towards a methodological framework. *International Journal of Social Research Methodology*. 2005:19–32.
33. Webster F, Krueger P, Macdonald H, Archibald D, Telner D, Bytautas J, et al. A scoping review of medical education research in family medicine. *BioMed Central Medical Education*. 2015; 15(79)
34. Weeks LC, Strudsholm T. A scoping review of research on complimentary and alternative medicine (CAM) and the mass media: Looking back, moving forward. *BioMed Central Complementary and Alternative Medicine*. 2008; 8(43)
35. Brien SE, Lorenzetti DL, Lewis S, Kennedy J, Ghali WA. Overview of a formal scoping review on health system report cards. *Implementation Science*. 2010; 5(2)
36. Levac D, Colquhoun H, O’Brien KK. Scoping studies: advancing the methodology. *Implementation Science*. 2010; 5(69)
37. van Dyk AC. Client-initiated, provider-initiated, or self-testing for HIV: what do South Africans prefer? *The Journal of the Association of Nurses in AIDS Care : JANAC*. 2013; 24(6):e45–56. [PubMed: 23582579]
38. Makusha T, Knight L, Taegtmeier M, Tulloch O, Davids A, Lim J, et al. HIV self-testing could “revolutionize testing in South Africa, but it has got to be done properly”: perceptions of key stakeholders. *PLoS One*. 2015; 10(3):e0122783. [PubMed: 25826655]

39. Maheswaran H, Petrou S, MacPherson P, Choko AT, Kumwenda F, Lalloo DG, et al. Cost and quality of life analysis of HIV self-testing and facility-based HIV testing and counselling in Blantyre, Malawi. *BMC Med.* 2016; 14(1):34. [PubMed: 26891969]
40. Brown B, Folyan MO, Imosili A, Durueke F, Amuamuziam A. HIV self-testing in Nigeria: public opinions and perspectives. *Global public health.* 2015; 10(3):354–65. [PubMed: 25186234]
41. van Dyk AC. Self-testing as strategy to increase the uptake of HIV testing in South Africa. *African journal of AIDS research : AJAR.* 2013; 12(1):41–8. [PubMed: 25871310]
42. Maheswaran H, Petrou S, MacPherson P, Choko AT, Kumwenda F, Lalloo DG, et al. Cost and quality of life analysis of HIV self-testing and facility-based HIV testing and counselling in Blantyre, Malawi. *BMC Med.* 2016; 14:34. [PubMed: 26891969]
43. Zerbe AV, DiCarlo AL, Mantell JE, Remien RH, Morris DD, Frederix K, et al. Acceptability and Uptake of Home-Based HIV Self-Testing in Lesotho. *CROI Conference.* 2016
44. Bwambale FM, Ssali SN, Byaruhanga S, Kalyango JN, Karamagi CA. Voluntary HIV counselling and testing among men in rural western Uganda: implications for HIV prevention. *BMC public health.* 2008; 8:263. [PubMed: 18664301]
45. Kebede B, Abate T, Mekonnen D. HIV self-testing practices among Health Care Workers: feasibility and options for accelerating HIV testing services in Ethiopia. *The Pan African medical journal.* 2013; 15:50. [PubMed: 24106578]
46. MacPherson P, Lalloo DG, Webb EL, Maheswaran H, Choko AT, Makombe SD, et al. Effect of optional home initiation of HIV care following HIV self-testing on antiretroviral therapy initiation among adults in Malawi: a randomized clinical trial. *Jama.* 2014; 312(4):372–9. [PubMed: 25038356]
47. Choko AT, Desmond N, Webb EL, Chavula K, Napierala-Mavedzenge S, Gaydos CA, et al. The uptake and accuracy of oral kits for HIV self-testing in high HIV prevalence setting: a cross-sectional feasibility study in Blantyre, Malawi. *PLoS Med.* 2011; 8(10):e1001102. [PubMed: 21990966]
48. van Rooyen H, Tulloch O, Mukoma W, Makusha T, Chepuka L, Knight LC, et al. What are the constraints and opportunities for HIVST scale-up in Africa? Evidence from Kenya, Malawi and South Africa. *J Int AIDS Soc.* 2015; 18(1):19445. [PubMed: 25797344]
49. Choko AT, MacPherson P, Webb EL, Willey BA, Feasy H, Sambakunsi R, et al. Uptake, Accuracy, Safety, and Linkage into Care over Two Years of Promoting Annual Self-Testing for HIV in Blantyre, Malawi: A Community-Based Prospective Study. *PLoS Med.* 2015; 12(9):e1001873. [PubMed: 26348035]
50. Peck RB, Lim JM, van Rooyen H, Mukoma W, Chepuka L, Bansil P, et al. What should the ideal HIV self-test look like? A usability study of test prototypes in unsupervised HIV self-testing in Kenya, Malawi, and South Africa. *AIDS and behavior.* 2014; 18(Suppl 4):S422–32. [PubMed: 24947852]
51. Brown AN, Djimeu EW, Cameron DB. A review of the evidence of harm from self-tests. *AIDS and behavior.* 2014; 18(Suppl 4):S445–9. [PubMed: 24989129]
52. Martinez O, Carballo-Diequez A, Ibitoye M, Frasca T, Brown W, Balan I. Anticipated and actual reactions to receiving HIV positive results through self-testing among gay and bisexual men. *AIDS and behavior.* 2014; 18(12):2485–95. [PubMed: 24858480]
53. Figueroa C, Johnson C, Verster A, Baggaley R. Attitudes and Acceptability on HIV Self-testing Among Key Populations: A Literature Review. *AIDS and behavior.* 2015; 19(11):1949–65. [PubMed: 26054390]
54. Estem KS, Catania J, Klausner JD. HIV Self-Testing: a Review of Current Implementation and Fidelity. *Current HIV/AIDS reports.* 2016

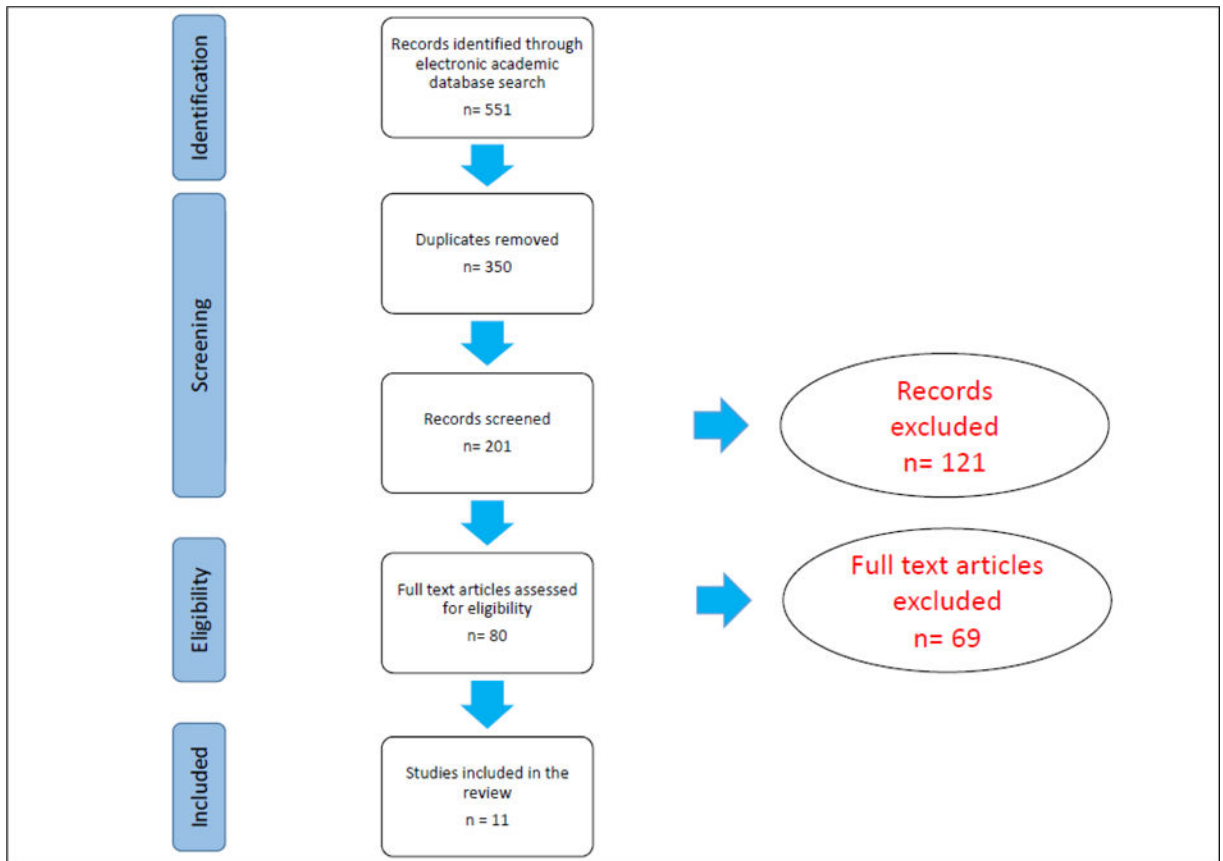


Figure 1. Flow chart depicting process of article selection for scoping study

Table 1

Studies on acceptability of HIV Self-Testing in Sub-Saharan Africa

Authors and Year	Country	Study Aim	Population	Sample Size (n)	Research Method	Acceptability Rate (%)
Kalibala <i>et al.</i> , 2014 (7)	Kenya	To examine the acceptability of an unsupervised facility based HIVST intervention among healthcare workers and their partners and factors associated with uptake of HIVST among healthcare Workers.	Healthcare workers	842	Quantitative (Cross sectional survey)	85.3%
Kurth <i>et al.</i> , 2015 (13)	Kenya	To evaluate the performance and accuracy parameters of unsupervised oral fluid HIVST among adult lay users in the general population of Kenya.	Men	240	Quantitative (Prospective validation)	94%
Macpherson <i>et al.</i> , 2014 (38)	Malawi	To test the hypothesis that offering optional home initiation of HIV care after HIV self-testing might increase population level uptake of ART and increase willingness to test and to report positive results compared with HIV self-testing accompanied by facility based services only.	Community Healthcare Workers	1200	Quantitative (Cluster randomized trial)	58.3%
Choko <i>et al.</i> , 2011 (39)	Malawi	To test whether supervised oral self-testing could yield accurate results. Also explored reasons for accepting self-testing and respondent's preferences for HIV testing.	Community Healthcare Workers	283	Quantitative (Mixed method)	56.4%
Choko <i>et al.</i> , 2015 (40)	Malawi	To evaluate uptake, accuracy, linkage into care, and health outcomes when highly convenient and flexible but supported access to HIVST kits was provided to a well-defined and closely monitored population.	Adults (16 years and older)	16660	Quantitative (Prospective study)	84.1%
Maheswaran <i>et al.</i> , 2016 (41)	Malawi	To investigate the costs of both healthcare providers and users accessing HIVST or facility-based HTC.	Men	1241	Quantitative (Cluster randomized trial)	>70%
Brown <i>et al.</i> , 2015 (42)	Nigeria	A report on the perspectives of informed members of the Nigerian public on the use of	Ethicists, researchers, those in academia, journalists, community advocates, activists and policy makers.	5324	Qualitative (Key informant)	54.8%

Authors and Year	Country	Study Aim	Population	Sample Size (n)	Research Method	Acceptability Rate (%)
Van Dyk <i>et al.</i> , 2013 (37)	South Africa	To explore how a sample of South African citizens felt about the various HIV testing models and to find out which testing model they preferred if given a choice between client initiated, provider-initiated and self-testing for HIV. Participant's feelings about mandatory HIV counselling was also explored.	Men and Women	466	Quantitative (Survey)	22.3%
Zerbe <i>et al.</i> , 2016 (43)	Lesotho	This feasibility study explored the acceptability and uptake of home based self-testing in a sample of Basotho women and men.	Men and Women	88	Quantitative (Survey)	67%