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Applying a social-ecological lens to opinions about HIV self-testing among Kenyan truckers who declined to test: a qualitative study

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HIV prevalence among truckers in Africa is high and testing rates suboptimal. With numerous African countries having approved HIV self-testing kits, more information on how to design acceptable and accessible self-testing programs for high-risk populations is necessary. We explored views about self-testing via in-depth interviews with 24 truckers participating in a randomised controlled trial who refused HIV testing. A social-ecological lens was used to guide data analysis and frame study findings. While most participants said that they would use an HIV self-test, perceived barriers and facilitators were identified at multiple levels. Many participants noted lack of time to test or obtain a self-test kit as a major barrier (intrapersonal) and varied in their views about self-testing with a partner (interpersonal). Participants offered programmatic/policy recommendations, suggesting that they preferred accessing self-test kits in settings where training could be provided. Participants believed they should be able to pick up multiple test kits at the same time and that the test kits should be free or low cost. These study findings will help guide the design of self-testing programs for truckers and other mobile populations.

Keywords: Kenya, self-administered HIV testing, social-ecological model, truck drivers

Introduction

HIV prevalence among truckers in sub-Saharan Africa is higher than in the general population (Botão et al., 2016; Bwayo et al., 1991; Delany-Moretlwe et al., 2014; Regondi et al., 2013), and in Kenya, where this study was conducted, previous research has found that HIV prevalence among truckers was over twice that of the general population (Kissling et al., 2005). Truckers in this region participate in high levels of risky sexual behaviour. In a survey among 381 truck drivers and their assistants at four truck stops in Kenya (Morris & Ferguson, 2007), only 47.5% of the married drivers reported being monogamous, over half reported sexual encounters with female sex workers, and 71% reported using condoms during their last sexual encounter with a non-spouse partner. In the trial in Kenya from which the data for this paper are derived, 55.9% of truckers had used commercial sex services in the past six months, 46.6% had regular partners along their trucking route in addition to a girlfriend or wife at home, and only 14.1% had always used condoms during sex in the past six months (Kelvin,

George, et al., 2018). Truckers can potentially contribute to transmitting HIV to partners, including sex workers, spouses, and girlfriends at home, as well as across geographic regions due to the mobile nature of their work (Ramjee et al., 1998).

Regular HIV testing and applicable follow-up procedures are important for those at high HIV risk for both the health of the individual and the prevention of HIV transmission to others. However, HIV testing rates remain suboptimal among truckers. One 2012 study found that only 65.8% of truckers in Mozambique had ever tested (Botão et al., 2016). A 2010 study of truck drivers in Togo found that 47.4% had tested for HIV (Yaya et al., 2016). By the end of 2016, the North Star Alliance, a non-governmental organisation in sub-Saharan Africa that provides services to truckers, sex workers, and community residents at 38 roadside clinics on major transit routes in 10 eastern and southern African countries, reported that only 36% of client visits included HIV testing, even though testing is offered at visits. (North Star Alliance, 2016).

Numerous barriers prevent people from testing for HIV,

including concerns about confidentiality (Fylkesnes & Siziya, 2004), inconvenient location of testing centres (Negin et al., 2009), and fear of being stigmatized (Krause et al., 2013). For truckers, regulations, including inability to deviate from their routes, the need to stay on schedule during the hours when traditional facilities are open, as well as lack of parking spaces for the trucks near clinics, are barriers to facility-based testing (Núñez Ares et al., 2016). Making HIV self-testing kits available to this population could address some of the barriers that prevent truckers from testing. In May 2017, the Kenyan Ministry of Health approved HIV self-testing kits for distribution and introduced the *Be Self-Sure* HIV self-testing campaign (Pharmaceutical Society of Kenya, 2017). About a year and a half before HIV self-testing was approved in Kenya, we conducted a randomised controlled trial (RCT) evaluating whether offering oral HIV self-testing as a choice would increase HIV test uptake among truckers recruited from two North Star Alliance roadside clinics in Nakuru County, Kenya. We found that, while in the clinic, those in the "Choice group" (that is, those who were offered self-test kits in addition to the standard HIV test) were more likely to accept HIV testing compared to those in the "Standard of Care group" (SOC) (that is, those who were only offered the standard HIV test). However, a fair number of clients in each group refused HIV testing while still in the clinic (27.1% in the SOC group and 12.7% in the Choice group) (Kelvin, George, et al., 2018) and there was no difference in HIV testing over a six-month follow-up period when clients in the intervention group would have had to return to the clinic for a self-test kit (Kelvin, Mwai, et al., 2017).

To better understand how HIV self-testing may or may not address the barriers facing truckers and what characteristics of an HIV self-testing program might most appeal to truckers, we conducted an exploratory qualitative study.

Methods

Theoretical framework

We used the social-ecological model (SEM) to frame the analysis and findings of the qualitative data regarding barriers and facilitators to HIV self-testing. McLeroy and colleagues (McLeroy et al., 1988) expanded Bronfenbrenner's SEM (Bronfenbrenner, 1977, 1979) to explore how individual, social and environmental factors potentially impact the uptake of health promotion interventions, more specifically intrapersonal factors, interpersonal processes, institutional factors, community factors, as well as public policies. The theory posits that health-seeking behaviour often stems from a combination of both internal and external environmental factors. This model has been applied to qualitative research identifying ecological factors impacting young people's sexual risk-taking, resilience, and ideas for HIV preventative interventions in Kenya (Njoroge et al., 2010), as well as analysing interviews regarding HIV-related sexual resilience and risk behaviours among young people in Kenya (Harper et al., 2014). An abbreviated SEM has also been used to explore the acceptability of self-administered oral HIV testing in a clinic-based sample in South Africa (Kelvin et al., 2016).

Study setting

This study was conducted in two clinics in Nakuru County, Kenya, run by the North Star Alliance, an international

non-governmental organisation that provides a range of health services, including primary healthcare, sexually transmitted infection screening and treatment, tuberculosis screening and treatment, treatment of mobility-related illnesses, behaviour change communication, laboratory services, HIV counselling and testing, and in some clinics, antiretroviral therapy and pre-exposure prophylaxis (North Star Alliance, 2017). As of January 2019, North Star Alliance had established a network of 33 clinics in sub-Saharan Africa, eight of which are in Kenya, at 'hotspots' such as border posts, transit towns or ports where large numbers of truck drivers relax, and sex work and informal trading are ubiquitous. The two study clinics together serve about 400 clients weekly, about 30% of whom are truck drivers.

Clients are offered HIV testing at every clinic visit and about 60% of truck driver clients accept testing, of whom about 1.5% test HIV-positive (pers. comm. Eva Mwai, East Africa Director, North Star Alliance).

Participant eligibility criteria, sampling, recruitment and study procedures

Eligibility criteria for inclusion in the trial were (1) at least 18 years old, (2) male, (3) employed as a truck driver, (4) primary residence in Kenya, (5) able to speak English or Kiswahili, (6) self-reported HIV-negative or unknown HIV status, (7) able to sign the consent form, and (8) willing to receive payment for participation via MPesa (a cell phone-based money transfer system widely used in Kenya).

We used purposive sampling to recruit and interview truck drivers from both the Choice and the SOC groups who refused HIV testing when offered in the clinic following recruitment at baseline. In addition, we interviewed eight participants in the Choice group, who were eligible to pick-up a self-test kit for home use at any of the eight North Star Alliance clinics in Kenya during follow-up, but who did not test over the six-month follow-up period between October-December 2015 in an effort to understand why some people refuse to test and if these reasons vary when offered testing choices. Those who refused to be tested were approached by a Research Assistant and asked to participate in an in-depth interview. We conducted in-depth interviews with 16 men who refused HIV testing at baseline (11 in the SOC group and 5 in the Choice group) and 8 men in the Choice group who did not pick-up a test kit during follow-up. All of the 8 Choice group participants interviewed at follow-up had tested at baseline. Four had self-tested in the clinic with provider supervision and 4 had selected the provider-administered blood test.

Although we planned for the baseline in-depth interviews to be conducted in-person at the clinic directly following the second quantitative interview, we allowed participants the option to schedule their interview for another time in-person or over the phone. Scheduling challenges resulted in all baseline in-depth interviews being conducted between 3 and 6 months later. The in-depth interviews with men who did not pick-up a self-administered HIV test kit for use outside of the clinic during follow-up were conducted between one to three months following their quantitative follow-up interview, again due to scheduling difficulties.

We used a semi-structured guide that was developed based on Prospect Theory to elicit opinions about barriers

and benefits to HIV testing in general, HIV self-testing, oral versus blood-based HIV testing, HIV risk perception, and health beliefs (Tversky & Kahneman, 1981). Interviews were conducted in-person at the clinic (16 interviews) or by phone (8 interviews), and in English, Kiswahili or both, depending on the participant's preference. Interviews were audio-recorded, transcribed, and translated into English. A bilingual Kiswahili and English member of the research team reviewed all in-depth interviews before they were submitted for coding and analysis. The truck drivers who participated in the in-depth interviews received 450 Kenyan shillings (~USD 1.00 at the time of interview).

Research Assistants were trained in qualitative interviewing by the study investigators. Study procedures were approved by the City University of New York Institutional Review Board, the Kenya Medical Research Institute Ethics Committee, and the University of KwaZulu-Natal Biomedical Research Ethics Committee.

Data analysis

Coding schemes were developed guided by the SEM framework to guide organization of the narrative data by level of organization. The codes were compared, combined and edited in an iterative process until coding consensus was reached. Three researchers then independently coded four transcripts manually and compared their coding to ensure that each team member was applying the codes consistently. The codes and operational definitions were revised as needed after this process to ensure coding consistency. The consensus code book was then uploaded into Dedoose (version 6.2.21, SocioCultural Research Consultants, Los Angeles, CA) and the transcripts were

coded by organizing the text within the codes. Texts in codes relevant to each of the levels of the SEM were identified and responses analysed. The data from the three groups (SOC and Choice groups at baseline and Choice group at follow-up) were combined, as we did not discern any differences by group. Two coders coded interview excerpts to estimate inter-rater reliability, which was found to be good (Cohen's kappa = 0.70).

Description of the sample

The mean age of participants was 37.3 years (range of 25–62), and all reported that they had tested for HIV prior to the study. The mean time since last testing for those interviewed following baseline was 1.6 years, with a range of less than one month to over seven years since last HIV test. All eight participants interviewed at follow-up had tested at baseline, four participants opting to self-test in the clinic under supervision and four participants opting for the provider-administered blood test.

Results

Key barriers and facilitators perceived by study participants that emerged in the interviews are grouped by four categories of the SEM: (1) intrapersonal, how the participant reported that he and others would feel about using a self-test, (2) interpersonal, if the self-test would be good to use together with partners, (3) institutional and community, what and how organisations might make oral HIV self-testing available, and (4) policy, what policies and programs would facilitate HIV self-testing (Figure 1).

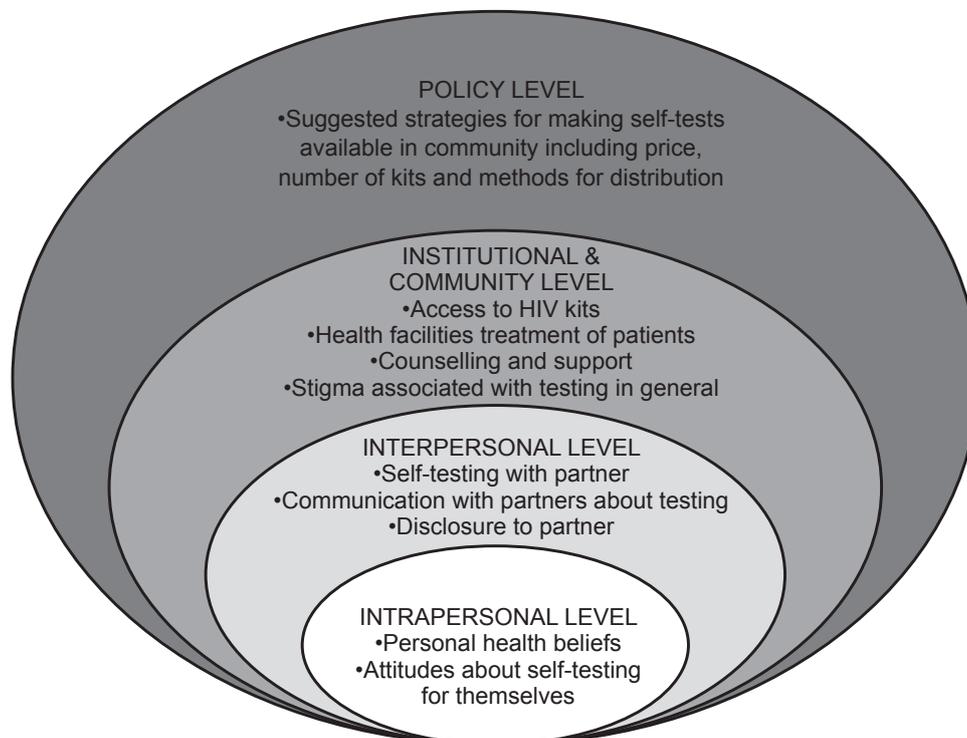


Figure 1: Social-ecological factors impacting choice in self-administered HIV testing

Intrapersonal factors

Truck drivers had varied opinions about whether HIV self-testing would be a good option for them to use personally. Specifically, sixteen participants said that it was a good option, but only if they had some training. Six participants said they did not feel comfortable with HIV self-testing, indicating that it was not a good option for them, and one participant reported he might consider self-testing. Reasons for not wanting to test on their own included lack of confidence in their ability to test or interpret the results and preference for the presence of a counsellor. Additionally, the potential for someone to perform the test incorrectly, potentially leading to false results, was a source of apprehension.

I think it is better to be tested by a healthcare provider because you can make mistakes and will end up having lied to yourself...No, I don't see any benefit. (Participant 4154, 56 years, baseline, Choice)

Additional reasons included a lack of confidence about the accuracy of the test to detect HIV antibodies in the oral fluid.

You mean the one to use in the gum? That one might not give results...Because many people say that saliva does not transfer any disease. (Participant 5029, 28 years, baseline, SOC)

One participant noted he would not attempt to try the kit because he believed that oral self-testing was only for White people.

I cannot do that one. You know I was told the method that is known is the blood test. This oral one you know, these are for White people. I cannot trust them [oral tests]. (Participant 9067, 38 years, follow-up, Choice)

However, participants who did trust it believed the oral self-test to be efficacious because it was endorsed by trained healthcare providers.

But you get confident because you know it must be working correct [sic] because the healthcare workers already approved [it]... (Participant 5145, 43 years, baseline, Choice)

Additionally, some noted that personal experience with HIV testing in general enhanced their perceived ability to use the test kit alone and made them feel more confident that they could administer it independently.

Yes, I can test myself alone because it might not be the first time I am testing myself. I have been counselled the other times I have tested and there is nothing to fear. (Participant 5011, 28 years, baseline, SOC)

Benefits of self-testing noted by participants included being able to find out their results privately, circumventing stigma that might occur during a clinic visit and saving time.

If one...can self-test, then I think it's okay because he won't waste time going to look for people to administer the HIV test. (Participant 5044, 53 years, baseline, SOC)

Privacy at home was mentioned as a key advantage to preclude being stigmatized while testing in a clinic and participants also expressed their willingness to follow-up with a healthcare provider if they were to take the test. Sixteen participants optimistically reported that if they tested

positive for HIV while using the HIV self-test kit, they would seek treatment, even if they delayed taking this step.

It takes time and soul searching. Maybe it will take me a day or a week or a month, then I will accept that am infected with HIV. Then I will go to a well-equipped hospital and get some help. (Participant 5021, 32 years, baseline, SOC)

Yes, I would seek care and treatment. There are government clinics that have the drugs and also clinics like North Star Alliance that educate people on HIV. It will be easy for them to get drugs faster because one will realize that since he is already infected with HIV, he has no other option than to take the drugs. (Participant 5011, 28 years, baseline, SOC)

Another perceived benefit to using the oral self-testing kit was avoiding pain associated with a blood test and becoming infected with another disease due to the finger prick.

It [oral HIV self-test] is not painful (Participant 4153, 46 years, baseline, SOC)

[A] negative is that sometimes I feel that the lancet used to prick [my finger for HIV testing] may infect me of other diseases. (Participant 5021, 32 years, SOC)

Interpersonal factors

In terms of communication about testing, participants reported that they often talked about HIV testing with partners, including their wives, girlfriends, and other regular partners on the road, but not with casual partners. Two participants stated that they discussed testing with their wives when they were pregnant, likely due to routine HIV testing of pregnant women in antenatal care services.

The majority of participants believed that HIV self-testing with a partner was a good idea because partners can simultaneously learn each other's status.

I think that's the best so that you get to know each other. We would do the test together so that we see each other's results. (Participant 5145, 43 years, baseline, Choice)

It is good because each will know about the other one and there will be no hiding. (Participant 5024, 48 years, baseline, SOC)

However, one participant felt that using a self-test with a partner could give a false sense of security if a partner tested negative, leading to unprotected sex and increased vulnerability to HIV.

To me I don't see any [advantages] because self-testing won't be beneficial, especially that again there will be misuse of the kit. ... I was told these viruses are not detected within a short period. If you will test her, you will think she is negative and not use protection. To me, I don't think there is any benefit. (Participant 9067, 38 years, follow-up, Choice)

Trust and suspicion between partners arose as a theme while discussing testing together. Distrust of their partner's fidelity, or their partner's distrust of a participant's fidelity while travelling, were given as reasons to initiate a conversation about testing for HIV.

Participant: We mostly talk about getting tested because my wife knows I always travel away from home only that she cannot tell me directly.

Interviewer: *So, you mean she is normally suspicious and that's why she wants you to get tested?*

Participant: *Yes, mostly.* (Participant 5135, 26 years, baseline, SOC)

Some participants expressed concern about how their partner would react to being asked to self-test together or their partner seeing them with a test kit.

I think it is not very good [to self-test together] because she will not accept. She will ask the meaning of the kit and what kind of worry I have as we had tested, and we were both fine. I think it will be hard. (Participant 8091, 41 years, follow-up, Choice)

Why carry an HIV test kit and walk around with it? If it was just medicine you had given me to prevent infection, it's okay,...you know now when I go home, maybe I haven't used it and my wife sees it, won't she wonder why I was testing these things. (Participant 9067, 38 years, follow-up, Choice)

When asked how they would react if their partner's result was positive, but their result was negative when self-testing together, participants differed in their reactions. Eleven suggested they would remain in the relationship, provide support, encourage their partner to seek care, and be more vigilant about practicing safer sex.

Participant: *I would advise her to start on medication and I will test again to make sure that I am ok. ... [I would separate] for a while so that she can start on her medication.*

Interviewer: *How would you help her access health care?*

Participant: *I would advise her to go get medicine and be told on how to use them.*

Interviewer: *would you be angry with her?*

Participant: *No... [I would] just advise her because I don't know where it came from and when she got it. If she was on her own engagements, that's when it can be a problem.* (Participant 4106, 27 years, baseline, Choice)

[I would stay in the relationship] because when she was negative, I was with her so I should not discriminate [against] her when she is positive...We would use condoms. (Participant 5063, 28 years, baseline, SOC)

Six other participants said that they or men in general, might break-off the relationship. Four participants stated that either they or others could become angry and/or violent with their partners.

I will have to beat her up first. (Participant 5135, 26 years, baseline, SOC)

Yes, it is possible [that some men would become angry], especially if you had not prepared your partner to test and maybe forced her then she tests positive. One may get very angry and chase her away from the home. You find most of the men tend to be violent and blaming their partner who may have to bear the consequences of everything. There are other women who also do that. (Participant 5021, 32 years, baseline, SOC)

When asked about safer sex practices in the relationship if they decided to stay together even in the event of discordant

test results, participants stated that they would use condoms. However, if they discovered that they were both positive while testing, seven participants stated they would no longer use condoms.

If both are positive, there would be no need for condoms and you'll use ARVs. (Participant 5029, 28 years, baseline, SOC)

Institutional and community factors

The vast majority of participants reported positive experiences with provider-administered HIV testing in the past and believed that men were treated fairly and given the services that they needed.

I liked the services a lot because they even give me advice. They explain and allow me to ask questions which they respond to very well without disrespecting me. It makes [me] become very informed and want to encourage others to also go for the services. (Participant 4154, 56 years, baseline, Choice)

These positive previous experiences may affect participants' confidence in the HIV self-test because the providers who they trust endorsed it. One participant was confident that he could self-test either within or outside of the clinic.

Now [with the self-test] I can test from the house or anywhere else, in the car, in the house, at the clinic, here at your centre. (Participant 4153, 46 years, baseline, SOC)

However, a few participants complained about lack of privacy when testing in the clinic, which could be alleviated with self-testing outside of the clinic.

Many clinics that I know, you find maybe the place where the health provider is and where the patients are seated are so close to each other that when you speak, people can hear you out there. That also contributes to worrying. (Participant 4071, 28 years, baseline, SOC)

Because this is going to be very private when you self-test at your private convenient time, convenient place. (Participant 9043, 62 years, follow-up, Choice)

The most frequently mentioned barrier to HIV testing, whether in-clinic testing or picking-up a self-test kit from the clinic for home use, was lack of time to come to the clinic. However, many participants who reported that work schedule constraints hindered their picking up the HIV self-test kits in the RCT indicated that if they had the kits at home, they would test themselves when they had time.

Because you may find like for truckers, you lack time and yet you want to test so if you have been provided with that self-test kit, you cannot keep saying you have no time. So when you are alone relaxing you can test yourself, especially when you are with your partner. (Participant 5024, 48 years, baseline, SOC)

Stigma associated with being seen in a clinic picking up a self-test kit was a concern, suggesting that HIV self-test kits should be available in "neutral" venues that would not be stigmatizing.

I was afraid to come and take it [the self-test kit] ...Because some may think that you are coming to take medicine for curing HIV/AIDS. (Participant 5011, 28 years, baseline, SOC)

Counselling and support were viewed as essential following HIV self-testing. With respect to unsupervised self-testing, the absence of in-person counselling was a concern, regardless of whether participants agreed that self-testing would be beneficial.

It has challenges, especially for men, because you know once you have gone to test yourself and do a slight mistake and get wrong results, it can make one to lose hope and even commit suicide.

(Participant 5024, 48 years, baseline, SOC)

When different forms of counselling were mentioned, such as via phone, text messages, or videos, most participants expressed strong preferences for in-person counselling.

It depends because maybe where I will be when you are calling could be somewhere public and the people around may start saying this person is being counselled because I will also have to give my views, opinions and we will discuss. So...phone is not good. I would prefer going to the facility and meeting the counsellor one-on-one. (Participant 5021, 32 years, baseline, SOC)

The phone counselling, I don't think it will be reachable to many since some of them will go after discovering they are infected, they will go break up their phones or switch off their phones. (Participant 9084, 31 years, follow-up, Choice)

Others viewed phone counselling as acceptable in situations when individuals are not near a testing facility.

The counselling can be sent through the phone if the person is far away, but if he is near, he may be called to come to the centre and offered the counselling. Because sometimes it may be that I am in Uganda and you are here in Kenya which may be difficult to communicate. (Participant 5145, 43 years, baseline, Choice).

Policy and programmatic factors

Although the interviews did not address current HIV self-testing policies being implemented in Kenya, participants made a few suggestions regarding cost, venues for distribution, number of kits that people should receive, and the frequency with which they should use the HIV self-test kits when self-testing becomes widely available to the public.

There was consensus that the test kits should be free of charge, but if there were a fee, the acceptable range suggested was 100 to 200 Kenyan shillings (~USD 1.00 to 2.00), in contrast to it being sold for 800 shillings (~USD 8.00; UNAIDS, 2017). When asked about incentivizing HIV testing by paying people to self-test, some participants were concerned that people would pretend to self-test for the money.

Someone may be in need of money, but if he came wanting to test, there are some questions that will be asked then and after testing, then one can be given the cash. But if you advertise there is money, now there you will see many people saying they will go to test at home, but when you call them you will find out that they haven't used it. He will keep it and then you'll call again and he will lie that he tested yet; he hasn't yet known his status. (Participant 4153, 46 years, baseline, SOC)

Suggestions regarding venues for self-test kit distribution were diverse and included public-sector clinics, NGO-run roadside clinics like those operated by North Star Alliance, the workplace, supermarkets, pharmacies, through the mail, and at public gatherings such as chief's meetings and school events. However, many participants emphasized the need to make the test kits available only to those who had received training which may be more easily done in a clinic setting.

I think from a clinic is better because there you will get some guidance. From a shop it is hard because in a shop you buy items...and don't get any guidance on how to use; you just buy and go to use them. So I think where there is a clinical officer or health officer like in a clinic or pharmacy is ok, especially when someone is testing for the first time. But after one has used it successfully, then they can just walk in a shop or supermarket and buy. (Participant 5021, 32 years, baseline, SOC)

When asked about the number of self-test kits that people should receive at a time, answers varied between one and four kits. Among those who recommended receiving more than one kit at a time, their reasons included having multiple kits on hand to use throughout the year when needed, test kits to use with partners, and having extra kits in case the first one malfunctioned.

Let's say two, two test kits...Yes, someone can test the first time and doubt the results and decide to repeat the test. (Participant 4071, 28 years, baseline, SOC)

More than two because when you are with your partner, you test yourself and test her as well. (Participant 8018, 50 years, follow-up, Choice)

The frequency of self-testing ranged from using the tests every month to only once a year, but many mentioned every three months, which the North Star Alliance recommends to their trucker clients.

After three months because if you are infected, it will be detected after three months. (Participant 8018, 50 years, follow-up, Choice)

The potential for improper disposal of finger prick blood self-tests was described by one participant.

...he throws [the used test kit] and then a child plays with the test kit and pricks him. You see it will hurt the child there. That's why I refuse this thing of people being given the test kit to go test themselves. (Participant 8037, 38 years, follow-up, Choice)

Discussion

Kenyan truck drivers in this study felt that Kenyans in general would use a self-administered HIV test if it were available. Most said that they would use it themselves and thought it was a good idea to self-test with partners. Despite these generally positive views on HIV self-testing, only four of the truck drivers in the Choice group in this sample used the HIV self-test when it was offered at baseline, and none came to the clinic to pick-up a self-test kit during the six month follow-up. Reasons for not returning to the clinic to pick up a self-test kit was primarily due to lack of time, but concern about the stigma of being seen in the clinic was also reported.

With regard to intrapersonal factors, the apprehension regarding self-testing related to lack of confidence that they could administer the test and interpret the results correctly. In this context, participants stressed the importance of training on the use of the test kit as well as the availability of post-test counselling. Many felt that counselling should be conducted in-person rather than over the phone, which might be another reason why some did not pick-up a self-test kit during follow-up since we offered phone-based post-test counselling. Importantly, Kenya's *Be Self-Sure* HIV self-testing campaign not only includes a website with written and video instructions and a phone hotline, but also provides information about health care centres where people can go for confirmation of test results and counselling (Pharmaceutical Society of Kenya, 2017). This may address some concerns about accessing in-person counselling.

Interestingly, the four participants who self-tested at baseline did so in the clinic with provider supervision, taking advantage of this guidance when self-testing for the first time, even though testing privately at home was cited as a benefit. One participant stated they would have difficulty finding privacy at home. In these instances, providing space to conduct the tests themselves where they purchase the kits may be an alternative. Additionally, lack of confidence regarding the efficacy of the oral test to detect HIV was discussed as a barrier both in this sample and other studies as well (Kelvin et al., 2016). The HIV self-test kits recently approved for distribution in Kenya include two blood-based tests (WHO, 2017), in addition to an oral test which may address this concern. One participant mentioned 'race' in regard to his own personal choice in not wanting to use the kit, stating that this particular form of testing was for White people. Further, promotion of self-testing kits should aim to emphasize that they can be used by anyone.

In this study, only a few participants expressed concerns about suicide when testing HIV-positive in the absence of a counsellor, which was expressed as a concern by half of participants in a qualitative study of primary care clinic clients in South Africa (Kelvin et al., 2016). Regarding interpersonal factors, in both this study and the South African study, few participants anticipated partner violence due to discordant test results when testing with a partner (four in this study and one in the South Africa study). Partner violence is a valid concern as both Kenya and South Africa have high rates of intimate partner violence (Jewkes et al., 2009; Kenya National Bureau of Statistics, 2015). However, it is important to note that there is little evidence that such violence will be higher when people self-test for HIV (Agot et al., 2018). There was variation in participants' potential reactions if they received discordant results. Uncertainty regarding further actions to take if results are discordant was also found in a 2016 study in Malawi examining factors discouraging 33 individuals living with their partners from self-testing together (Kumwenda et al., 2018). Similar to our findings, participants expressed concern about potential physical and psychological harm and potentially divorce or separation if the results were discordant.

Two participants mentioned they discussed testing when their wives were pregnant, which most is likely due to routine testing in antenatal care. In a recent study analysing HIV self-testing preferences among pregnant women and male

partners in Uganda, all participants preferred to have a nurse administer the test rather than to self-test (Korte et al., 2019). However, they both preferred the oral over finger prick test and to test with their partners. Male participants even preferred testing at home rather than in a clinic. The introduction of self-testing kits to the general population would mean that this population of truckers would have the option of testing with their partners in a private setting. Providing counselling options for both the individual and their partners may help to allay concerns about repercussions of experiencing their results together.

Institutional and community factors related to self-testing at home centred on factors associated with treatment within facilities and stigmatization in communities. While participants generally preferred getting HIV self-test kits from healthcare facilities where they could also receive training on their use, the potential stigma they described with collecting kits at a clinic suggests that alternative distribution sites should be explored. Some participants in our follow-up sample reported that if they had a test kit at home, they would have used it. Allowing or even encouraging people to pick-up multiple test kits at one time might be another partial solution as it would reduce the number of trips to the clinic or pharmacy and would address some of the other preferences described by participants, such as having multiple test kits for use with partners or to retest if the first test malfunctioned.

Finally, in terms of policies, study participants believed that the kits should be available in public institutions such as pharmacies and clinics, but that training for the use of kits should be mandatory; people should be able to pick up multiple kits at a time; people should be able to test periodically with the most common time frame being every three months; and that the test kits should be available for free. HIV testing has historically been a free service in many Kenyan healthcare facilities, and this has created an expectation that this service will remain free of charge. Participants suggested that they might be willing to pay a small fee for the test kits (USD 1.00–2.00), which is much less than the current USD 8.00 price. Participants in our study were employed as truckers, thus working in the formal sector with a regular salary. If this population is unable or unwilling to pay USD 8.00 for an HIV test kit, the price will likely make these test kits completely inaccessible for the majority of Kenyans working in the informal sector. Thus, some thought about ways to make self-test kits available at a lower cost or free for lower-income individuals is needed.

This study had some limitations, including a small number of participants, which means we may not have gotten a complete picture of the diversity of views. In addition, social desirability bias may have affected how some participants answered our questions, especially around sensitive issues such as intimate partner violence. Since our study was conducted with a sample of Kenyan truckers recruited from the waiting rooms at two North Star Alliance clinics and who had tested for HIV at least once, the views of our participants may not reflect those of Kenyan truckers in general, let alone truckers from other countries or those who do not access healthcare.

Despite these limitations, the views expressed by our study participants have some important implications

for the roll-out of HIV self-testing in Kenya. While the current plan seems to address some of the concerns of our participants, including those regarding oral versus blood-based tests and in-person counselling, other issues raised by our participants, including pricing, distribution venues and number of test kits provided, might be useful for policymakers to consider as they continue to design HIV self-testing programs to increase demand for self-testing among key and at-risk populations in Kenya.

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