THE ACCEPTABILITY AND FEASIBILITY OF HIV SELF-TESTING IN ZIMBABWE

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STUDY PURPOSE AND BACKGROUND

Access to and demand for HIV testing and counselling (HTC) in Zimbabwe, as elsewhere in Africa, remains inadequate. Over 60% of people living with HIV in resource-poor countries do not know their HIV status.[1-3] Delay in diagnosis is a major contributor to high rates of early mortality in African HIV care programs.[4-7]

Data from Demographic and Health Surveys (DHS) in the general population in Africa show marked inequity in uptake of HIV testing, with males and other key sub-groups such as young people and the poor and/or less educated being least likely to have tested.[8] Importantly, low uptake of HTC will also limit effective implementation of combination HIV prevention, including male circumcision, and treatment for prevention strategies. In Zimbabwe, provider-delivered HTC (PDHTC) is widely available, yet receiving an AIDS diagnosis within a year of first positive test ("late diagnosis")[9] remains common, and there are significant demographic disparities in late diagnoses. DHS data from 2010/11 indicate that 39% of males versus 60% of females aged 15 to 49 had ever tested.[10] In addition to males, Zimbabwe has a substantial proportion of other sub-groups (e.g., young people, less educated, those who have never tested) that remain reluctant to attend PDHTC services. Regular repeat testing, essential for those testing negative, is uncommon; 28% of adults, and only 20% of males, reported testing in the previous 12 months.[10] Barriers to testing include concerns about stigma, fear of

prognosis, lack of awareness of HIV risk, and the inconvenience, transportation and opportunity costs incurred.[11, 12]

Sex workers are a marginalized group in Zimbabwe and elsewhere, who are disproportionately affected by HIV.[13] However, the current rates of sex worker enrolment in HIV testing, treatment and retention in care do not reflect their heightened levels of risk.[13] This is not only an issue of health equity, it also of great public health importance. Sex workers with undiagnosed and untreated HIV risk onward transmission to their clients and regular partners, with whom condom use is rarely consistent. Historically data on sex worker rates of HIV testing are scant, although sub-optimal when reported, e.g. 4% of sex workers surveyed in Somalia had ever tested,[14] and 38% in the Democratic Republic of Congo.[15] In Zimbabwe, data from a nationally representative survey conducted in 2011-2012 indicated that 1.3% of sexually active women reported 2 or more transactional sex partners in the past 6 months, and these women were least likely to have had more than one HIV test in their life. Among women who reported being HIV positive, those reporting 2 or more transactional sex partners were the least likely to report accessing anti-retroviral therapy (ART) ($p<0.032$). Barriers to testing among sex workers include those faced by others in developing country settings, including lack of awareness of services, distance to facilities, transportation costs, opportunity costs, time constraints, and fear of a positive result.[16-18] Additional barriers unique to sex work include anxiety about contact with authorities and concern about confidentiality, particularly that other sex workers or potential clients may learn their status.[19] Increasing the engagement of sex workers in HIV testing as the first step towards prevention and care services will minimize health inequity, and by increasing timely initiation of ART, is likely to reduce sexual transmission of HIV to their partners and clients.

HIV self-testing, where an individual collects their own sample and conducts the HIV test privately without a provider, has the potential to substantially scale up acceptability and access to testing both in the general population as well as in hard-to-reach populations such as sex workers, in a manner that is low-cost, confidential, and empowering for users. Rapid testing technologies include simple-to-use oral HV tests that offer high sensitivity and specificity, ideal for self-testing strategies.[20, 21] Early research suggests that self-testing is acceptable, with high uptake and accuracy of results. For example, in a community-based study in Malawi, 92% of participants opted for supervised self-testing over standard PDHTC, including a high proportion of men and first time testers, key groups that are historically reluctant to test. Accuracy was >99% as compared to confirmatory testing by a trained health worker.[22] Empirical research on self-testing is limited, and research has not yet been conducted on HIV self-testing in Zimbabwe. Self-testing in the general population in Zimbabwe may be a useful strategy for addressing many of the identified barriers to testing among those who remain reluctant to test using current provider-delivered strategies. To date, there has been no research on HIV self-testing among sex workers, a population for which self-testing may be particularly appropriate due to their heightened risk, need for regular repeat HIV testing, and typically a familiarity with HIV testing and modes of transmission.

SELF-TESTING IN THE GENERAL POPULATION

THE PARENT PROGRAMME

Population Services International, Zimbabwe (PSI/Z), our implementing partner, has 18 static HTC clinics nationwide and utilizes outreach teams to conduct mobile testing. They also conduct point-of-care CD4 testing, medical male circumcision, TB diagnosis, and have a network of New Life centres providing post-test counselling and support. They utilize barcoded client ID numbers that are used on participant documents and referral forms for HIV services. PSI collaborates with the Ministry of Health and Child Welfare (MOHCW - also partnering with us on this research), to refer PSI/Z clients identified as HIV-infected to government ART clinics nationally.

We will adapt a culturally appropriate set of materials to support safe and accurate self-testing, and evaluate the acceptability and uptake of HIV self-testing among the general population HTC clients in Zimbabwe, as a

means to increase regular repeat testing and early access to HIV treatment and care. We will conduct formative work to maximize and measure linkage to onward HIV care services. We will then evaluate the offer of self-testing versus PDHTC in communities to compare preference for testing methods and to assess key characteristics and linkage to HIV services by testing method. We will collect qualitative data in order to explore important contextual aspects of self-testing. Among HIV positive clients who were referred for HIV care (both self-testers and those who opted for PDHTC), we will conduct pilot discrete choice experiments (DCE) in order to get an insight into the relative importance of factors that are considered barriers and facilitators to linkage to care after HIV testing. In addition, in preparation for a large trial of methods for community-based distribution of self-test kits and promoting linkage to care, we will pilot a home distribution model where community based distribution agents (CBDAs) will distribute self-test kits in their communities.

SELF-TESTING AMONG SEX WORKERS

THE PARENT PROGRAMME

Zimbabwe's National Sex Worker Program, which began in 2009, works with sex workers in cities and along highways to improve their engagement with HIV prevention and care services. The program operates out of clinics that are tailored to accommodate sex workers, located in convenient and discreet locations, with staff trained to work with the unique needs of sex workers in a friendly and non-judgmental environment. Specifically the project combines community mobilization with risk reduction counselling and efforts to increase rates of HIV testing. For those testing positive for HIV the program assists with referral and engagement in government HIV care services including CD4 count testing, access to ART, and providing support for adherence to treatment. For those testing negative, women are encouraged to engage in regular repeat HIV testing. The program currently operates out of 16 sites nationally, including 3 fixed sites in urban areas and 13 mobile sites on major highways across the country. Based on the success of the program thus far, funding has been increased to expand to 36 sites by December 2013.

We will utilize the adapted self-testing materials for the general population, first ensuring that the materials are appropriate and comprehensive for the population of sex workers, making any modifications as necessary. We will then conduct a pilot observational study where self-testing is offered alongside PDHTC to evaluate uptake and acceptability of self-testing, and conduct a qualitative analysis to explore various important aspects of self-testing among this population. Using findings from the qualitative study, we will finalise a model for distributing HIVST kits at all the static sites offering services to female sex workers in Zimbabwe (Mbare, Bulawayo, Mutare, Gweru, Masvingo and Karoi).

AIMS

The specific aims of this research are as follows:

1. Develop a culturally relevant set of materials for the promotion and support of HIV self-testing and linkage to care in Zimbabwe (i.e. a "product") that utilizes written and pictorial instructions.
    1.1 Conduct cognitive interviewing to ensure understanding of written materials
    1.2 Determine acceptability and accuracy of self-testing through supervised self-testing among PSI HTC clients
2. Conduct an observational study comparing the offer of self-testing versus PDHTC in six to twelve peri-urban communities in Zimbabwe to examine (a) preferred testing method, (b) key characteristics of testers by testing method, including gender, age, education, socioeconomic status, couples testing, and testing history; and (c) the proportion of testers that link to prevention/care services appropriate to their HIV status, by testing method; (d) relative importance of factors that influence linkage to care, using a discrete choice experiment.

3. Explore qualitatively, among participants and health care workers why people chose to self-test, how and where people self-test (in the presence of partner/friend, at home, etc), why people did or did not link to care, strategies to promote and support self-testing and linkage to care, potential safety or other concerns around self-testing, and the expressed demand for self-testing.
4. Conduct pilot research among sex workers, to determine accuracy, uptake and acceptability of self-testing as compared to standard HTC among sex workers.
    4.1 Determine acceptability and accuracy of self-testing among sex workers through supervised self-testing
    4.2 Offer self-testing alongside PDHTC at Mbare SW clinic and determine uptake and acceptability in this group. Explore qualitatively various aspects of self-testing among sex workers including demand for self-testing, how women self-test (in the presence of a partner/friend, at home, etc); alternative strategies to promote and support self-testing and linkage to care; and safety or other concerns around self-testing.
    4.3 Offer self-testing alongside PDHTC at five other static SW clinics in Zimbabwe
5 Pilot community based distribution of HIV self-test kits in one community in Mashonaland Central.

STUDY DESIGN

STUDY DESIGN OVERVIEW

Materials to support safe, accurate self-testing and linkage to care will be adapted from other African contexts for use in Zimbabwe (Aim 1). Among a general population of HTC clients, cognitive interviewing will be employed to ensure understanding of these materials (Aim 1.1). We will then conduct supervised self-testing among HTC clinic attendees to evaluate accuracy and acceptability of self-testing using the adapted materials (Aim 1.2). Materials will be iteratively refined to ensure a high level of accuracy (>95% sensitivity and specificity). When the materials have been finalized, we will conduct an observational study among the general population in six to twelve peri-urban communities around Harare, comparing the offer of self-testing versus PDHTC in terms of uptake as well as linkage to onward services (Aim 2). Qualitative data will be collected from a sub-set of aim 2 participants and from PSI and MOHCC health care workers, to evaluate key factors such as views on self-testing, why, where and how people self-test, and barriers and facilitators to linkage to onward HIV services, and any safety concerns We will also interview relevant individuals to identify enablers and barriers in the regulatory environment for HIV self-testing (Aim 3).

Using the materials developed in Aim 1, we will conduct pilot research to evaluate acceptability, uptake and accuracy of self-testing among a sex worker population (Aim 4). We will conduct supervised self-testing among sex workers attending a dedicated sex worker clinic in Harare, and will adapt the self-testing materials to ensure a high level of accuracy in this population (Aim 4.1). We will then offer self-testing alongside PDHTC at the dedicated sex worker clinic to evaluate uptake and acceptability of self-testing as compared to PDHTC (Aim 4.2). Qualitative data will be collected from sex workers opting to self-test in order to evaluate key factors such as demand for self-testing, how to promote linkage to onward HIV services, and any safety concerns.

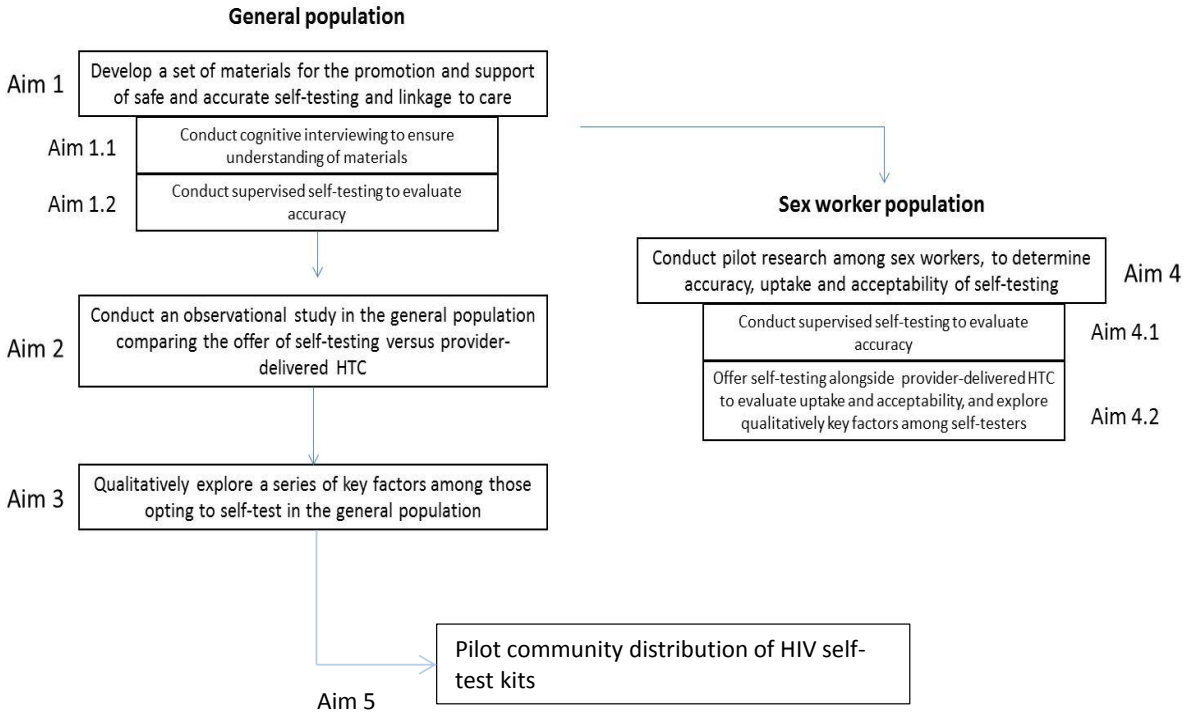
Finally, we will pilot the distribution of self-test kits in the community using community based distribution agents, CBDAs. During this phase, we will observe and assess completeness and quality of CBDA training, individuals from randomly selected households will be asked to participate in a survey about receipt and use self-test kits. Also, 300 individuals from randomly selected households will be asked to participate in discrete choice experiments which are aimed at exploring the relative preference of various components of a self-test kit distribution model.

STUDY LOCATION

The proposed study will take place in partnership with colleagues at the MOHCW, PSI/Z, and the Centre for Sexual Health and HIV AIDS Research (CESHHAR), Zimbabwe. Aims 1-3 and 5 of this study will be carried out in close collaboration with our implementing partner, PSI/Z, utilizing their network of static and mobile testing facilities. PSI/Z has 18 static HTC clinics nationwide and conducts mobile testing with four daily outreach teams testing 160–240 people per day, 5 days a week. Teams visit 90 outreach points per month around Zimbabwe, with each community visited once every 3 months. Data for Aim 1 will be collected at PSI/Z's largest static HTC clinic in Harare, which sees about 5000 clients per month. Aims 2 and 3 will be implemented in peri-urban communities around Harare, which are part of PSIZ's HTC mobile outreach effort. Aim 5 will be implemented in rural Mazowe, in Mashonaland Central Province.

Aim 4 will be implemented at the MOHCW National Sex Worker Program's (NSWP) static clinic in Mbare. This clinic is the NSWP's largest static clinic, and roughly 50% of women seen at the clinic are HIV-negative or of unknown HIV status.

FIGURE 1. OVERVIEW OF STUDY DESIGN



ELIGIBILITY CRITERIA

AIM 1

Data for Aim 1 will be collected among a general population of static HTC clinic attendees who meet the eligibility criteria described below.

Eligibility criteria will be as follows:

- Age 18 or older (legal age of consent)
- Willing to provide written informed consent for participation (including consent for possible future contact).

AIMS 2-3

Eligibility criteria for Aims 2 and 3 are as follows:

- Age 18 or older (legal age of consent)
- Using a personal mobile phone
- Willing to provide a personal mobile phone number
- Willing to provide written informed consent for participation (including consent for possible future contact).

AIM 4

Data for Aim 4 will be collected among a sex worker population attending the Mbare sex worker clinic who meet the eligibility criteria described below.

Eligibility criteria will be as follows:

- Age 18 or older (legal age of consent)
- Currently working as a sex worker (has exchanged sex for money in the past 90 days)
- Living or working in the area served by the National Sex Worker Program (for at least 1 month)
- HIV-negative or of unknown HIV status, defined as never having received a positive HIV test result (not required for Aim 4.1)
- Using a personal mobile phone and willing to provide a personal mobile phone number
- Willing and able to provide informed consent

AIM 5

In aim 5, community-based distribution of HIV self-test kits will be piloted. CBDAs will distribute self-test kits to each household, according to number of household members who are at least 16 years old (based Ministry of Health policy that the age of consent for HIV testing is 16 years) and who would like to self test for HIV.

Following test distribution, individuals from randomly selected households will be asked to participate in a household survey about receipt and use self-test kits and/or discrete choice experiments which are aimed at exploring the relative preference of various components of a self-test kit distribution model.

Eligibility criteria for both the survey and discrete choice experiments:

- At least 16 years of age
- Willing and able to provide written informed consent (assent and parent/guardian consent if less than 18)
- Having resided in the community for the last two months

STUDY DESIGN, METHODS, AND PROCEDURES

HIV SELF-TEST KITS

We will use the Oraquick Advance oral fluid-based rapid test for this research. Oraquick Advance is not currently approved for self-testing in Zimbabwe, therefore participants will be notified in the informed consent process that self-test kits are for research only, and results are preliminary and should be confirmed by a health care professional. There are a host of free public testing sites around Harare and a list of these sites will also be included with the test kit. Free testing is also available at the Mbare sex worker clinic, or any other sex worker clinic in the NSWP, and this information will be provided with test kits distributed to sex workers.

AIM 1

Materials developed in Malawi, South Africa and Kenya to promote and support safe and accurate HIV self-testing and encourage linkage to care will be adapted for use in Zimbabwe. This will consist of modifying written instructions and enhancing pictorial instructions for clarity. Locally relevant information will be added, such as where to go for confirmatory testing and onward HIV prevention and care services. A local 'helpline' number will also be added to the set of supporting materials, which participants may call for further information, counselling and support. Materials will be translated into local languages.

AIM 1.1

We will conduct cognitive interviewing among HIV-negative clients of the New Africa House static HTC clinic in Harare and PSI mobile testing in Shamva to ensure comprehension of the adapted materials and their translation into local languages.

RECRUITMENT FOR AIM 1.1

Recruitment will be conducted through convenience sampling of HTC clients who attend the New Africa House HTC clinic and PSI mobile testing in Shamva. Participants will be asked to participate in cognitive interviewing related to the adapted self-testing materials. Approximately 5-15 participants who meet the eligibility criteria for Aim 1 (described above) will be enrolled.

DATA COLLECTION FOR AIM 1.1

Written and pictorial materials to support self-testing that have been adapted and translated into local languages, will be evaluated and refined through cognitive interviewing. This will consist of discussing with participants their understanding of the adapted self-testing materials as they go step by step through the process of testing themselves, and discussing their understanding of the materials to assist with linkage to post-test services, including counselling, repeat testing, and treatment and care services.

AIM 1.1 ANALYSIS

Modifications to the materials will be made based on feedback from participants participating in cognitive interviewing, in order to improve understanding of these supporting materials. Self-testing materials adapted and modified in Aim 1.1 will be utilized in Aim 1.2.

AIM 1.2

Supervised self-testing will be conducted among HTC clinic attendees in order to evaluate and improve the accuracy of self-testing using supporting materials.

RECRUITMENT FOR AIM 1.2

To carry out supervised self-testing, we will again use convenience sampling of New Africa House HTC clients. We will also sample a small population in the district of Shamva, to ensure the supporting material we develop are also appropriate and understandable among a rural population. The study population will consist of those who have presented for HTC services at the clinic, and thus may not be representative of the general population. However, our aim is to work out the modalities of offering self-testing, which is better done in a controlled setting such as the HTC clinic.

DATA COLLECTION FOR AIM 1.2

Clients participating in supervised self-testing will be issued a study identification number. Following written informed consent they will complete a brief interviewer-administered questionnaire using a personal digital assistant (PDA) to collect socio-demographic data, reasons for HIV testing, testing history, and interest in self-testing. After pre-test counselling, participants will be given the self-testing materials in the language of their choice, and a results card on which to indicate their test result. For participants who provide explicit consent for

this, a video camera will be set up in the self-testing room and will record the participant as they perform the self-test procedures. This video documentation of the self-testing process will help us to determine which self-testing steps participants find more or less difficult, and to identify where any errors have occurred. Participants will provide a fingerprick blood sample for confirmatory rapid HIV testing using the standard MOHCC HIV testing algorithm used at the clinic, which will be conducted while the participant is carrying out self-testing. The participant will be left alone to conduct the self-test for around 30 minutes.

When self-testing is complete, a nurse counsellor will review the results card and evaluate the test kit to determine if the self-test was performed correctly, and results read accurately. Participants will be given results of the confirmatory test and post-test counselling will be provided. An interviewer-administered semi-structured post-test questionnaire will be administered to collect information on self-testing materials, the self-testing experience, potential strategies to promote and support self-testing and to facilitate linkage to care, and potential safety or other concerns. Participants may be distressed after receiving their test result and will not be coerced in any way to take the post-test questionnaire. However, those unwilling to complete the questionnaire at this time will be asked for permission to contact them at a later date to complete the questionnaire by phone. Participants will receive $5 for their participation in the study in line with recommendations by MRCZ.

Once we have finalized our self-test instructions, we will also develop a video which will provide a visual demonstration of each of the self-testing steps, as outlined in the instructions. This will form a component of our self-test supplementary materials. To ensure good understanding of the video, and to evaluate if this facilitates the self-testing process, a small proportion of participants who participate in supervised self-testing in Shamva will be shown this video prior to testing themselves.

AIM 1.2 ANALYSIS

At New Africa House in Harare, accuracy of testing, participant feedback on self-testing materials, and where available, video recording of the self-testing process, will be evaluated after every 20 participants, and materials will be revised as needed to improve comprehension and test accuracy. Instructions will be considered final when participants express a clear understanding of self-testing materials and a sensitivity and specificity of >95% (the FDA Blood Products Advisory Committee recommended acceptable minimal performance for sensitivity)[23] are attained as compared with confirmatory testing among at least 50 participants. We will then use these self-testing materials to conduct supervised self-testing in Shamva in the context of routine PSI mobile outreach for HTC. Materials will be evaluated for accuracy among an initial 20 participants. Materials will be revised as needed to improve comprehension and test accuracy. We will then continue to evaluate these materials among an additional 10 participants in an iterative manner until participants express a clear understanding of the materials and we achieve a sensitivity and specificity of >95% as compared with confirmatory testing among at least 20 participants (i.e. 19/20 participants achieve accurate test results). We will also use post-test questionnaire data to finalize our strategy for the promotion of community-based self-testing and engagement in post-test HIV services. We will introduce the video to participants in Shamva after we have finalized our instructions, and we will evaluate if this facilitates the self-testing process based on test results and post-test questionnaire data. The final strategy and materials (informed by Aim 1.2) will be implemented in Aim 2 and 4.

SAMPLE SIZE CONSIDERATIONS

We estimate 90–220 people will participate in supervised self-testing in Aim 1.2 at New Africa House, and approximately 20-90 participants in Shamva, depending on comprehension of self-testing materials. Approximately 5-40 participants in Shamva will view the self-testing video. With the large volume of clients/month seen at the New Africa House clinic (about 5000), as well as the extensive mobile outreach conducted by PSI in Shamva, we do not anticipate any difficulty in recruiting the required number of participants within 1-3 months.

AIM 2

In peri-urban communities, PSI/Z mobile outreach teams accompanied by study staff will promote the option to test using either provider-delivered HTC or self-test. Those opting to self-test will be given a self-test kit supported by the materials refined in Aim 1. All participants will register their mobile phone number with the study in order to track engagement with post-test services.

RECRUITMENT FOR AIM 2

Participants will be recruited from the general population in four to eight peri-urban communities targeted for PSI/Z mobile testing. Adapting a model already in use by PSI/Z, we will enhance PSI/Z's community outreach demand creation for HIV testing by including the option of HIV self-testing. We will go to communities in advance to promote the option of HIV self-testing or PDHTC and inform them of when we will be in their community. Temporary testing sites will be set up on the designated date. All adults presenting for testing who meet the eligibility criteria and are willing to provide informed consent will be enrolled.

Participants who were referred for HIV care, regardless of choice of testing method, will be invited to participate in a pilot discrete choice experiment (DCE) which is aimed at giving insight into the relative importance of factors that facilitate or hinder linkage to post-test services. The factors to be tested will be determined using findings from the qualitative research that is detailed in this protocol and those from prior research that was conducted by CeSHHAR Zimbabwe.

DATA COLLECTION FOR AIM 2

Participants will be provided with a PSI ID and asked to register their mobile phone number with study staff. To maintain confidentiality, phone numbers will be linked via a separate database to the client-level data in the routine PSI/Z database. Pre-test questionnaires will be administered by a trained interviewer onto a PDA to capture key sociodemographic data (age, gender, marital status, economic status, HIV testing history). Participants will have the option to self-test, which may be conducted in a private location at the testing site, at home or elsewhere, or undergo standard provider-delivered HTC. Those opting to self-test will be given the test kit and supplementary materials, and will have the opportunity to ask questions and to receive pre-test counselling. They will be given a study 'helpline' number which they can call for further information, counselling or support. Participants will be asked to use the test kit within 2 weeks. After 2 weeks they will be contacted by phone to complete a brief questionnaire. They will also be asked to return their used test kit, along with a brief self-administered questionnaire on which they will be asked to indicate their test result, to a designated place in the community. We will provide an envelope in which to place their test kit and results card which, for confidentiality, will only be labelled with their PSI ID. Participants will receive a small incentive of $2 of airtime by SMS for doing so. Participants will receive $5 for their participation regardless of whether or not they return their test kit.

All participants, regardless of testing method, will be encouraged to attend post-test HIV services according to their test result. Participants will be asked to text a free 'call me back' SMS to the study number once they have used the self-test. A nurse counsellor will then call the participant to i) ascertain their HIV result ii) ensure appropriate referral to prevention / care services. An SMS referral slip will then be sent to the participant to show to the service provider upon linking to prevention/care services. [All referral services in that geographic location will have been told about SMS referral slips and health care workers will be asked to send SMS confirmation that the participant has attended their service and will receive an airtime incentive for doing so]. Note that all participants who self-tested will be retested at the point of service as a matter of course. At 3 months post enrolment, if we have not been able to track a participant's link to services, we will attempt to contact the participant up to three times by SMS and/or live call to collect data on if/when they attended HIV services and to assist with linkage to HIV services, as necessary.

The DCE will investigate a small number of attributes that are related to linkage to post-test services. Hypothetical alternatives for each attribute will be developed and these will be combined into choice sets, on which the questionnaire will be based. An example of a choice set that might be given is shown in Fig 2 below. Participants will be presented with a number of choice pairs (between 8 and 12) and will be asked to make a choice on which set of conditions might best motivate uptake of post-test prevention and care services. An opt-out choice will allow for respondents to state if neither of the alternatives would induce them to seek follow-up care. In addition, for respondents who do not choose either option, there will be a second question where participants will be asked to take account of their own circumstances and indicate whether they would choose the first or second option. The questionnaire will be self-completed on tablets using the audio computer-assisted self-interview (ACASI) software.

Fig 2: An example of a choice set that might be developed for linkage to HIV care

Attribute	Attribute level		
	Programme 1	Programme 2	Not seek care (Opt-Out)
Type of referral given	SMS referral	Paper-based referral	
Location of clinic	Very close to home (less than 30 minutes' walk)	Far from home (more than two hours walk)	
Volume of people at clinic	Very quiet clinic, few people at a time	Busy facility with lots of patients or attendees	
Maintenance of confidentiality by clinic staff	Some clinic staff are feared not to uphold confidentiality	All staff uphold confidentiality	
User fees	Fees levied	No fees levied	No Fees
CHOICE			

SAMPLE SIZE AND ANALYSIS FOR AIM 2

Working with one PSI/Z mobile outreach team, we anticipate enrolling approximately 1000 participants from six to twelve communities over 3 months. A list of key outcomes, analytic plan, and statistical power for each outcome are presented in Table 1. We will be unable to directly measure whether the option of self-testing increases overall uptake of HIV testing; however, we will compare uptake of testing in communities at visits prior to and after the offer of self-testing to assess whether an impact on overall testing was detected. Returned test kits will be read and recorded, and compared to self-reported test results on their results card. It is common practice to use "late read" for quality assurance purposes,[23] though some inaccuracy is inevitable, primarily in the form of "faint positive bands." A clear positive is typically a true positive, and movement from positive to negative (i.e., fading) is uncommon. This will provide us a minimum estimate of accuracy that is nonetheless very informative. We will also evaluate general process data for the study, including evaluation of ability to track participants, participant use of the helpline, content of participant contacts made to this system, and response to participant contact.

Table 1. Measurement of Key Outcomes

Outcome Measure(s)	Analysis	Assumptions	Statistical Power
Testing method preference: PDHTC versus self-testing	Compare preference using chi-square analysis.	We estimate that 60% of participants will prefer one testing method over the other.	100% power, 95% confidence, to detect a preference.
Key characteristic of testers: gender, age, education, socioeconomic status, couple testing, and testing history	By testing method, compare gender, age, education, socioeconomic status, couples testing and testing history using chi-square and t-test (for continuous variables) analysis.	For gender: We estimate that 40% of participants will opt for PDHTC and 60% will opt for self-testing. We assume 55% of those opting for self-testing and 40% of those opting for PDHTC will be male.	For gender: 99% power, 95% confidence, to detect a difference in proportion of males opting to self-test versus PDHTC
Linkage to care: (a) prevention services, including confirmatory testing and male circumcision; and (b) treatment services, including CD4 count testing and treatment	Due to low power, this analysis will be largely descriptive, comparing the proportion of uptake of (a) prevention services, and (b) treatment services by testing arm (using chi-square analysis where appropriate).	We estimate that 13% will be HIV+, and that linkage to both prevention and treatment services will be similar by testing method. The number of HIV+ in the PDHTC arm will be small (N=~52). To increase precision, we will also use PSI/Z data on rates of linkage to care for non-study PDHCT clients to supplement this.	80% power, 95% confidence, to detect a 9% difference in linkage to any post-test services (irrespective of test result) between those opting for self-testing vs. PDHTC

SAMPLE SIZES FOR THE PILOT DISCRETE CHOICE EXPERIMENT

1,000 participants will be enrolled in the observational study. Assuming an HIV prevalence of 8% (based on PSI outreach testing statistics), about 80 participants will be eligible for the pilot DCE.

Data analysis for the pilot DCE

Discrete choice models will be used to estimate changes in the odds of linkage to prevention and treatment services associated with changes in attribute levels moving from one alternative to another. We will also look at preferences by user / client characteristics and how much variation in preferences there are.

AIM 3

A subset of Aim 2 participants will be invited for focus group discussion (FGD) or in-depth interview (IDI) to collect additional information on barriers and facilitators to uptake of self-testing and the self-testing experience. In addition, focus group discussions will be held with health care workers at PSI and Ministry of Health and Child Care in Shamva to explore views/attitudes towards HIV self-testing.

RECRUITMENT FOR AIM 3

A subset of participants who participated in Aim 2 will be contacted by mobile phone and invited to participate in a FGD or IDI. They will be purposefully selected for inclusion from among those who did and did not link to HIV services, who linked to prevention (for negatives) and care (for positives) services, and ensuring that we have representation from sub-groups reluctant to test through PDHTC.

DATA COLLECTION FOR AIM 3

Eight FGD (four each among males and females), with about 10 participants in each, and 20-30 IDI (10-15 male, 10-15 female) will be conducted. During focus group discussions, participants will be asked about views on HIV self-testing, anticipated advantages and disadvantages of self-testing over provider-delivered HTC, best approaches for distribution of HIV self-test kits to households, views on linkage to prevention and care services following HIV self-testing, views on proposed ST kit distribution mechanism and procedures for ensuring linkage to post-test services, including the nature and sizes of incentives that might stimulate linkage. During in-depth interviews, data collected will include feedback on why participants opted/did not opt to self-test (including feedback on promotional strategies); self-testing materials; the self-testing experience, including where and how

people self-test (in the presence of a partner/friend, at home, etc.); what systems of support they accessed or would like to be able to access; reasons why they did or did not link to HIV services; alternative strategies to promote and support self-testing (recognizing that different approaches may be necessary based on age, gender, or socioeconomic status); safety or other concerns around self-testing; and the expressed demand for self-testing.

For health care workers, four FGDs will be held with health care workers from PSI New Start Centres, while another four will be held with those from Ministry of Health and Child Care who work in Shamva district and therefore are likely to have some limited experience of HIV self-testing. HCW will be asked about their perceptions of HIV self-testing, including views on importance and usefulness of ST, implications of widespread roll-out of ST, anticipated barriers and facilitators to uptake and what marketing strategies might be useful.

For investigating the regulation environment for HIV testing key informants will be purposively sampled and then, if they consent, be interviewed. The topic guides for the in depth interviews were developed based on the Walt and Gilson policy analysis triangle (actors, content, context, process) to determine key enablers and barriers for developing regulation in Zimbabwe. Thus context will include legal and regulatory issues content the perceptions of policy issues in place or to be developed, actors will be the key players who can influence HIVST scale up and process is to determine the potential next steps.

Analysis for Aim 3

IDIs and FGDs will be audio-recorded, transcribed, and translated into English if necessary. Data will be uploaded, coded, and summarized using a qualitative software package. We will utilize a thematic analysis. Two research staff will code a preliminary set of transcripts independently and discrepancies will be resolved through consensus, ensuring an intercoder reliability of at least 80% for the first set of transcripts. The remaining transcripts will be single-coded, with coding review of every fifth document. Qualitative data will be used in conjunction with quantitative data collected to assist in the grounding and clarification of the outcomes in Aim 2 and to provide necessary supporting data on issues related to promotion, support and safety of community-based self-testing, required for implementation on a larger scale.

Aims 4

Women attending the sex worker clinic for HIV testing, located in Mbare, will be invited to participate in pilot research to evaluate the acceptability, accuracy and uptake of HIV self-testing.

Aim 4.1

In Aim 4.1, the materials developed in Aim 1 will be adapted for a sex worker population by including appropriate contact and referral information, and verified for accuracy and understanding among sex workers through supervised self-testing.

Recruitment for Aim 4.1

Recruitment for Aim 4.1 will be conducted through convenience sampling of clients at the Mbare sex worker clinic, and who meet the eligibility criteria (described above).

Data collection for Aim 4.1

Data collection for Aim 4.1 will be similar to that employed in supervised self-testing in Aim 1.2. Clients participating in Aim 4.1 will be issued a study identification number, and following written informed consent, they will participate in supervised self-testing in the same manner as that described in Aim 1.2. After self-testing participants will indicate on a card what their results were and this will be confirmed through testing by a nurse counsellor. Questionnaires will be administered before and after supervised self-testing to gather information on understanding of the self-testing materials and acceptability of self-testing.

Analysis for Aim 4.1

Materials will be evaluated for accuracy among an initial 10 participants. Materials will be revised as needed to improve comprehension and test accuracy. We will then continue to evaluate these materials among an additional 10 participants in an iterative manner until participants express a clear understanding of the materials and we achieve a sensitivity and specificity of >95% as compared with confirmatory testing among at least 20 participants (i.e. 19/20 participants achieve accurate test results). The final materials will be implemented in Aim 4.2.

sample size considerations

We anticipate that 20-60 people will participate in supervised self-testing at the Mbare sex worker clinic in Aim 4.1, depending on comprehension of materials. This clinic, formerly based at New Africa House, opened at Mbare in October 2015 and currently sees about 15 clients per day. With this volume of clients per month, we do not anticipate any difficulty in recruiting the required number of participants within 2-6 months.

Aim 4.2

In Aim 4.2 HIV self-testing will be offered to all clients of negative or unknown HIV status presenting for HTC at the Mbare sex worker clinic, in order to evaluate acceptability and uptake of self-testing as compared to standard HTC. Participants in Aim 4.2 will be asked to participate in an in-depth interview about self-testing.

Recruitment for Aim 4.2

Recruitment of participants for Aim 4.2 will be conducted at the Mbare sex worker clinic. The sampling population will be all women of HIV-negative or unknown HIV status who attend the clinic for HIV testing. Women who visit the clinic and wish to have an HIV test will be offered the option of either standard HIV testing and counselling, or self-testing. Those who opt to self-test will be asked to consent to study participation and will be enrolled. Consent for participation will include consenting to provide a cell phone number which will be used for post-test follow up of participants. We will recruit participants for up to 6 months.

Data collection for Aim 4.2

Over a period of up to 6 months women attending the clinic will be given the option of standard provider-delivered HIV testing and counselling or HIV self-testing. In additional to standard data collected at each visit, which includes demographic and sexual behaviour data, all women who consent to participate in this study will be asked to complete a brief questionnaire to collect supplementary information on HIV testing history and perceptions about various aspects of self-testing. These data will be collected via an interviewer-administered questionnaire on a PDA. Those opting to self-test will be given brief instructions on how to use the self-test kit, as well as written and pictorial self-testing materials (developed in Aim 1 and validated among sex workers in Aim 4.1) to take with them, and will have the opportunity to ask questions and to receive pre-test counselling. Women will be able to test in a private location at the study site, home, or elsewhere, but will be asked to use the test within one week. Study staff will be available by phone or in person at the New Africa House clinic if additional support is required, either for accurately performing the test, counselling, linkage to care or other.

Women who opt to self-test will be asked to return to the clinic after taking the self-test, or within one month of enrolment if they have not taken the self-test. We will use SMS messaging to remind participants to return to the clinic, sending up to three reminder messages per participant. They will be asked to return their test kits (either used or unused) at this time and complete a brief post-test questionnaire. Those who returned to the clinic will be asked to participate in an in-depth interview (IDI) to collect data on: the self-testing materials; why they did or did not self-test; the self-testing experience including where and how they self-tested (in the presence of a partner/friend, at home, etc); what systems of support they accessed or would like to be able to access; safety or other concerns around self-testing; how self-testing might be promoted to sex workers, and the demand and willingness to pay for self-testing should it become widely available. Post-test counselling, confirmatory testing, and/or any additional referral services will also be provided at this time, as necessary.

Participants will be reimbursed $5 upon completion of the IDI. At approximately 1 month post-enrolment, all participants who have not returned to the clinic will be asked to complete a brief post-test questionnaire which will be undertaken by phone, at the phone number provided at enrolment. This questionnaire will consist of a few simple questions with yes/know or multiple choice answers, and is designed to gather basic information regarding whether the self-test was used, what the result was, and whether the participant has or plans to link to onward care services.

Analysis for Aim 4.2

We anticipate enrolling participants over 2-6 months. Pre and post-test questionnaire data will be analysed descriptively. Returned test kits will be read and recorded, and compared to self-reported test results. We will also evaluate general process data for the SMS messaging component of the study, including evaluation of its implementation, response to the SMS reminders and questionnaire, participant use of the clinic staff by phone or in person for additional support, and content of participant contacts made.

IDIs will be audio-recorded, transcribed, and translated into English if necessary. Data will be uploaded, coded, and summarized using a qualitative software package. Analysis will utilize a thematic approach. Two research staff will code a preliminary set of transcripts independently and discrepancies will be resolved through consensus, ensuring an intercoder reliability of at least 80% for the first set of transcripts. The remaining transcripts will be single-coded, with coding review of every fifth document. Qualitative data will be used to provide necessary supporting data on issues related to promotion, support and safety of self-testing among sex workers, required for implementation on a larger scale.

Aim 4.3

In Aim 4.3 we will use findings from aim 4.1 and 4.2 to refine procedures for distributing HIVST kits at all six SW program facilities in Zimbabwe (Mbare, Bulawayo, Mutare, Gweru, Masvingo and Karoi). HIV self-testing will be offered to all clients of negative or unknown HIV status presenting for HTC at these sex worker clinics in Zimbabwe.

Recruitment for Aim 4.3

Recruitment of participants for Aim 4.2 will be conducted at all six static site sex worker clinics in Zimbabwe. The sampling population will be all women of HIV-negative or unknown HIV status who attend the clinics for HIV testing. Women who visit the clinics and wish to have an HIV test will be offered the option of either standard HIV testing and counselling, or self-testing. Those who opt to self-test will be asked to consent to study participation and will be enrolled. Consent for participation will include consenting to provide a cell phone number which will be used for post-test follow up of participants. The offer for self-testing will continue until August 2017.

Data collection for Aim 4.3

Until August 2017 women attending the SW clinics will be given the option of standard provider-delivered HIV testing and counselling or HIV self-testing. Demographic data that is completed as part of the SW program will be completed as per routine. Those opting to self-test will be given brief instructions on how to use the self-test kit, as well as written, pictorial and video self-testing materials (developed in Aim 1 and validated among sex workers in Aim 4.1), and will have the opportunity to ask questions. Women will be able to test in a private location at the study site, home, or elsewhere. Study staff will be available by phone or in person at the SW clinics if additional support is required, either for accurately performing the test, counselling, linkage to care or other services.

Clients will be asked to place their used test kits, together with a results form, in a dropbox that will be at SW facilities. They will be told that they do not have to disclose their self-test results to SW staff. However it will be emphasized that should they obtain a reactive self-test result, confirmatory HIV testing is necessary and will be

available at SW clinics or any local clinics. Confirmatory testing will be offered without charge according to usual procedures for provider-delivered testing. In addition they will be advised that if they are HIV negative they may wish to consider PrEP which will be available through PSI Zimbabwe in 5 of the six sites.

At two weeks after collection of the kit, clients who took kits away will be telephoned to ask if they self-tested, and if so the result of the self-test. If the self-test was reactive, they will be asked whether, when and where they sought confirmatory testing. Those whose result was negative will be asked whether, when and where they took up PrEP. This information will be updated on the participant's electronic record.

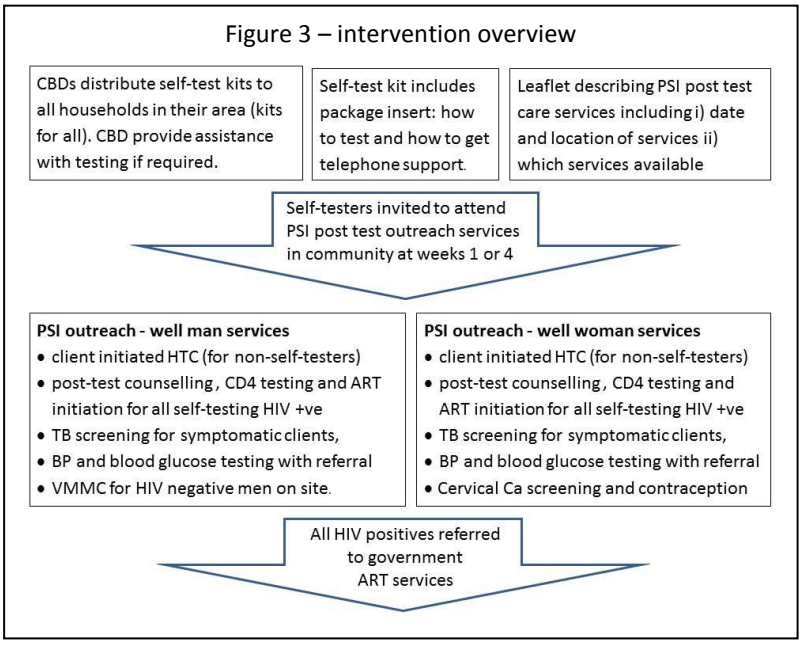
Analysis for Aim 4.3

We anticipate that 100 participants will take up HIV self-testing across sites each month. The SW program data will be analysed descriptively. Returned test kits will be read and recorded, and compared to self-reported test results.

Aim 5

In aim 5 we will pilot community distribution of HIV self-test kits in a district Mazowe rural, Mashonaland Central Province. One round of kit distribution will be done by trained community based distribution agents in four communities that are designated by local government as wards. Following kit distribution, PSI will conduct outreach visits at 1 and 4 weeks in the same communities in order to provide confirmatory testing (for those who self-test HIV positive) and other primary care services that are branded as well-woman and well-man services as depicted in figure 3 below.

Figure 3 – intervention overview



In the same communities, individuals from randomly selected households in randomly selected enumeration areas will be asked to participate in a survey about receipt and use of self-test kits and/or discrete choice experiments which are aimed at exploring the relative preference of various components of a self-test kit distribution model. In addition, due to the possibility that self-testing could increase social harms such as gender based violence (GBV), eight focus group discussions will be held with general population individuals from the same wards to explore ways in which the study team can identify incidents of GBV in their communities that might be related to self testing. An additional four FGDs will be held to explore these issues among youth in the

same communities. In addition, key informant interviews will be held with representatives from organisations involved in HIV testing and counselling, Ministry of Health and Child Care and organisations providing GBV services to explore best methods for detecting and preventing social harms as a result of HIV self-testing.

DISTRIBUTION OF SELF-TEST KITS AND PSI PROGRAMME ACTIVITIES

Processes for selecting CBDs will be developed by PSI and evaluated by CeSHHAR. A training curriculum will be developed by PSI which will cover HIV testing basics, self-testing procedures, kit distribution procedures and how to support self-testers before, during and after testing. Training will be observed by CeSHHAR, competence at distributing self-tests will be assessed at the end of training.

CBDs will visit all households in the study communities, where they will assess need/requirement for self-test kits and distribute kits accordingly. CBDs will ensure that each household receives a kit for each member of the household. At time of kit distribution, CBDs will give out appointment cards on which clients will document the intended date and time of performing the self-test. This will ensure that clients make a commitment to self-test (an intervention that previous research has proven effective in ensuring future uptake of health interventions[24, 25]). CBDs will inform clients of the date of the next PSI outreach visit, and encourage them to think about the time that they would like to attend the outreach clinic. The client will be asked to write this time on their card, which will help foster a commitment to attend post-test services. The card will have the CBD identity number, and clients will be asked to take it to the outreach clinic.

One to two weeks after self-test kits have been distributed to households within a community, a PSI outreach team will visit the community to provide a comprehensive package of services packaged as 'well woman' and 'well man' services. The exact locations that will be visited during outreach will be determined by looking at satellite maps and would aim to be sited where they would reach the greatest number of people in each community i.e. outreach sites will be set up in areas of greatest household density. Outreach services will include client initiated counselling and testing (for those who opted not to self-test), post-test counselling, CD4 testing services and clinical staging for those who self-tested HIV positive, referral to government treatment services for those confirmed HIV positive, TB screening and TB laboratory testing for symptomatic clients, STI screening, blood pressure and blood glucose testing with onward referral to government services as required. For HIV negative men voluntary medical male circumcision (VMMC) will be provided on site. Women, regardless of HIV status, will be able to access cervical cancer screening using VIAC, contraceptive advice and provision including long acting reversible contraceptive methods (LARC). All clients who are seen at PSI outreach visits will be given cards that are identified only by a PSI number (as is part of normal PSI services). Clients will be asked to keep these cards safe as they will be useful during household surveys.

This outreach team will revisit the community 3-4 weeks later to provide a second opportunity for those who did not attend at the first visit to access services.

RECRUITMENT AND DATA COLLECTION FOR AIM 5

<u>Household Survey</u>

A representative population-based survey will be conducted among a subset of individuals living in the four study communities in Mazowe. In each community, households from four enumeration areas (EAs) will be randomly selected for surveying using satellite maps. Survey questionnaires will be self-administered using Audio Computer Assisted Self Interview (ACASI) on computer tablets. Respondents will be asked whether they or other household members were offered, accepted, used self-test kits and if not why not; their experience of self-testing, whether they chose to link to services, what factors influenced their decision to attend or not attend, what their experience was, whether they would opt to self-test again, recommend to a friend etc. In addition,

information on previous testing history and ART experience of household members will be collected. Participants from one randomly selected ward will complete an extended questionnaire that has extra questions on history of HIV testing, linkage to care and HIV-related stigma. Respondents who visited PSI outreach sites will be asked to show their PSI cards so that the PSI identity numbers can be recorded. This will be required for confirming linkage to prevention and care services among those who were referred.

The survey will be conducted two weeks after the second PSI outreach visit. Two survey teams of four people will each survey one community per week. It is anticipated that 160 adults will be surveyed in each community.

Inclusion criteria for survey participants

- At least 16 years of age
- Willing and able to provide written informed consent (assent with parent/guardian consent for those less than 18 years old)
- Having resided in the community for the last three months

Discrete choice experiments

Discrete choice experiments will be conducted in the four study communities in Mazowe to determine client preferences for models of distribution of self-test kits. Because DCEs are typically used to test preferences of programme packages, the preference of specific kit distribution program attributes as revealed in Aim 3 qualitative studies will be tested.

DCEs will be kept simple by investigating a small number of attributes. Hypothetical alternatives for each attribute will be developed and these will be combined into choice sets, which the questionnaire will be based on. A D-efficient design will be used to come up with a workable combination of attribute levels using the computer software NGENE. Participants will be presented with a number of choice pairs (between 8 and 12) and will be asked to make a choice on which set of attributes are preferred for distribution of ST kits. An opt-out choice will allow for respondents to state if neither of the distribution programs is preferred. In addition, for respondents who choose neither option, there will be a second question where participants will be constrained to take account of their own circumstances and indicate whether they would choose the first or second option. The questionnaire will be completed on tablets using Audio Computer Assisted Self-Interview (ACASI) and will be piloted before use.

Focus group discussions and key informant interviews

Eight FGDs (four among men and four among women) will be conducted with members of the general population to explore people's views on whether there are anticipated social harms (e.g. forced testing and gender based violence) as a result of HIV self-testing, and how these can be prevented or minimised. CBDAs will be asked to identify households in which people were enthusiastic about ST kits and those where they were less well received. Potential FGD respondents will then be randomly selected from the list provided by CBDs. Participants will be asked to give their views on how researchers might get the most accurate information on the level of GBV in the community.

Inclusion criteria for FGD participants

- At least 18 years of age
- Willing and able to provide written informed consent
- Having resided in the study community for the last three months

An additional four (two each among males and females) FGDs will be held to explore GBV issues among youth in Mazowe community. Study staff will engage the CBDAs who will help identify youth who are potentially eligible for study participation.

Inclusion criteria for general population youths

- Resident in Mazowe district for past three months
- Aged between 18-25 years
- Willing and able to provide written informed consent

Key informant interviews will be held with representatives from organisations involved in HIV testing and counselling, Ministry of Health and Child Care and organisations providing GBV services to explore best methods for detecting and preventing social harms as a result of HIV self-testing.

Written informed consent will be obtained from all FGD and key informant participants before discussions begin. All discussions will be conducted according to a discussion guide, and will be audio-recorded.

DATA ANALYSIS FOR AIM 5

Survey

Descriptive analysis will be done to compute the following:

- Proportion of individuals who have self-tested in each community
- Proportion of people who linked to PSI outreach services
- Proportion of men taking up VMMC in each community
- Proportion of HIV positives assessed for ART
- Proportion of women accessing cervical cancer screening in each community
- Proportion of women accessing contraception consultations in each community

Logistic regression will be done to determine associations between participant characteristics with all the above factors (outcomes).

Discrete choice experiments

Discrete choice models will be used to estimate changes in the odds of preference of kit distribution models with changes in attribute levels moving from one alternative to another. We will also look at preferences by user / client characteristics and how much variation in preferences there are.

FGDS and key informant interviews

IDIs and FGDs will be audio-recorded, transcribed, and translated into English if necessary. Data will be uploaded, coded, and summarized using a qualitative software package. We will utilize a thematic analysis. Two research staff will code a preliminary set of transcripts independently and discrepancies will be resolved through consensus, ensuring an intercoder reliability of at least 80% for the first set of transcripts. The remaining transcripts will be single-coded, with coding review of every fifth document. Qualitative data will be used in conjunction with quantitative data collected to assist in the grounding and clarification of the outcomes in Aim 2 and to provide necessary supporting data on issues related to promotion, support and safety of community-based self-testing, required for implementation on a larger scale.

DATA REPORTING REQUIREMENTS

Reporting requirements to regulatory authorities will include any untoward event potentially related to procedures specific to the intervention. Examples include those:

- Related to self-testing procedures
- Related to knowledge of HIV status
- Related to issues of confidentiality, perceived or actual stigma, discrimination
- Related to coercion around testing

General signs/symptoms/diagnoses/untoward events that are definitely not related to study procedures will be recorded in source documents, but will not be reported to MRCZ and other regulatory authorities, regardless of grade.

SAE REPORTING

The Standard Level of SAE reporting (see Division of Acquired Immunodeficiency Syndrome [DAIDS] Manual for Reporting of Adverse Events to DAIDS, dated June 1, 2010) will be used, for reporting the following to the study leadership, MRCZ and other relevant authorities within two (2) working days of becoming aware of the event:

- All deaths
- All disabilities/incapacities
- All hospitalizations that are “suspected adverse drug [procedure] reactions” (cannot rule out relationship to study procedures)
- All other Grade 4 events that are “suspected adverse drug [procedure] reactions” (cannot rule out relationship to study procedures)
- All social incidents of GBV that are deemed related to self-testing

DATA MANAGEMENT

CeSHHAR Zimbabwe will be the data coordinating centre. This unit is headed by an experienced data manager. Data will be cleaned, entered, analysed and safely stored here.

Data management and security standards will be equivalent for questionnaire, in-depth interviews and focus group discussion data. Questionnaire data will be collected using computer-assisted personal interviewing (CAPI) with a trained interviewer. Data validity checks will be built into the CAPI platform. In the field, data will be backed up daily onto a memory stick and/or into “cloud storage”. Laptop computers on which any data may be stored will be kept in locked storage at all times. Field teams will download data into a password protected database accessible only to the project data manager and named study personnel, on a central computer. This

will be backed up daily. One hard-copy file linking participants' names with ID numbers, signed consent forms, and contact/locator information will be maintained by the Project Coordinator and stored in a secure locked cabinet separate from participant data. Other hard-copy data will be stored separately in participant files and locked in a file cabinet located in a secure room accessible only to key study personnel. Participants will be asked to provide written informed consent for participation.

TIMELINE

Schedule of trial	**Year 1**				**Year 2**			
	Q1	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Preparatory work								
Regulatory approvals								
Development of data collection instruments and database								
Training of staff								
Aim 1								
Adaptation of self-testing materials								
Aim 1.1								
Cognitive interviewing								
Aim 1.2								
Initiate offer of supervised self-testing in static testing clinic								
Iterative process of analysis, revision of self-testing materials, and evaluation of revisions								
Validation of self-testing materials among sex workers								
Analysis of Aim 1 data, finalize materials in preparation for Aims 2								
Aim 2								
Offer of community-based PDTC or self-testing								
Follow up of participants who did not provide data on linkage to care								
Aim 3								
Carry out focus group discussion and in-depth interviews								
Aim 4.1								
Supervised self-testing among clients at sex worker clinic								
Analysis of Aim 4.1 data, finalize materials in preparation for Aims 4.2								
Aim 4.2								
Offer of self-testing among HTC clients at sex worker clinic								
Carry out in-depth interviews among sex workers who elect to self-test								
Aim 5								
Pilot distribution of self- test kits								
Household surveys and discrete choice experiments								
Focus group discussions and key informant interviews								
Analysis and dissemination of results								

ETHICAL CONSIDERATIONS

This protocol will be subject to review and approval by institutional review boards at all participating institutions, including the Medical Research Council of Zimbabwe, University College London and RTI International. This will include, according to each IRB's requirements, approval prior to the initiation of research, on-going adverse event monitoring, periodic review, and final study reporting.

PARTICIPANT INFORMED CONSENT AND REMUNERATION

Informed consent will be required from all research participants. Participants will be provided with information about the research and study procedures by a trained interviewer, and will have the opportunity to ask questions as part of the informed consent process.

Participants will receive financial compensation of the MRCZ standard $5 for participating in Aim 2, aim 3 and aim 5 and for completing Aim 4.2. Additionally, a small compensation of $2 in airtime will be provided for completing any SMS or telephone questionnaire data.

CONFIDENTIALITY

The research team will ensure that all research data collected are numbered with a unique ID and not named. A link log which links the unique ID to name will be kept by the project coordinator in Harare in a locked and secure place, separate from the de-identified questionnaire/interview data. Names, phone numbers and other identifying information will be required at the clinic sites for follow up purposes, and will be kept separately from questionnaire and laboratory data. Only the site coordinator, data manager and principal investigator will have access to this information. Laboratory and questionnaire data will be linked using an individual's unique study ID number.

All study staff will undergo GCP and ethics training. All people working with CeSHHAR Zimbabwe sign a confidentiality agreement; they have very strict confidentiality procedures in place.

STUDY MODIFICATION AND DISCONTINUATION

The study may be modified or discontinued at any time by the IRBs as part of their duties to ensure that research participants are protected.

PROTOCOL DEVIATIONS AND EXCEPTIONS

The investigator should not implement any deviation from, or changes of, the protocol without prior review and documented approval from the Ethical Committee of an amendment, except where necessary to eliminate an immediate hazard(s) to trial subjects. The investigator should document and explain any deviation from the approved protocol and to file waivers received from the MRCZ, if applicable.

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