SELF-TEST STRATEGIES AND LINKAGE INCENTIVES TO IMPROVE ART AND PREP UPTAKE IN MEN

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CONFIDENTIALITY STATEMENT

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STATEMENT OF COMPLIANCE

The study will be carried out in accordance with International Council on Harmonization Good Clinical Practice (ICH GCP) and the following:

- United States (US) Code of Federal Regulations (CFR) applicable to clinical studies (45 CFR Part 46, 21 CFR Part 50, 21 CFR Part 56, 21 CFR Part 312, and/or 21 CFR Part 812).

National Institutes of Health (NIH)-funded investigators and clinical trial site staff who are responsible for the conduct, management, or oversight of NIH-funded clinical trials have completed Human Subjects Protection and ICH GCP Training.

The protocol, informed consent form(s), recruitment materials, and all participant materials will be submitted to the IRB for review and approval. Approval of both the protocol and the consent form(s) must be obtained before any participant is consented. Any amendment to the protocol will require review and approval by the IRB before the changes are implemented to the study. All changes to the consent form(s) will be IRB approved; a determination will be made regarding whether a new consent needs to be obtained from participants who provided consent, using a previously approved consent form.

1 INVESTIGATOR'S SIGNATURE

The signature below constitutes the approval of this protocol and provides the necessary assurances that this study will be conducted according to all stipulations of the protocol, including all statements regarding confidentiality, and according to local legal and regulatory requirements and applicable US federal regulations and ICH guidelines.

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2 ABSTRACT

This is a randomized controlled trial to test a combination behavioral and biomedical interventions to improve the HIV prevention and care cascades in a population of mobile men in a high priority setting (fishermen in Kenya). The intervention strategy is to recruit and train highly socially-connected men to distribute HIV self-tests and provide linkage support to men in their close social networks. The study will determine whether this social network-based approach along with small financial incentives in the form of transport vouchers can increase men's self-testing, linkage to and uptake of ART and PrEP after self-testing, virologic suppression at 6 months (for those initiating ART) and PrEP adherence (for those initiating PrEP) at 6 months. The study includes a longitudinal qualitative and mixed methods (quantitative and qualitative assessments) to identify the pathways of intervention action, and understand how the social network-based approach with support for linkage affects testing and ART and PrEP uptake and retention in men.

3 PROTOCOL SUMMARY

3.1 SYNOPSIS

Title:	Self-Test Strategies and Linkage Incentives to Improve ART and PrEP Uptake in Men
Grant Number:	1R01 MH120176
Brief Summary:	This is a randomized controlled trial to test a combination behavioral and biomedical intervention to improve the HIV prevention and care cascades in a population of mobile men in a high priority setting (fishermen in Kenya). The intervention strategy is to recruit and train highly socially-connected men to distribute HIV self-tests and provide linkage support to men in their close social networks. The study will determine whether this social network-based approach along with small financial incentives in the form of transport vouchers and biomedical technologies can increase men's HIV testing (within3 months linkage to and uptake of ART and PrEP after testing (within 3 months, and virologic suppression (HIV RNA < 400 c/mL) at 6 months and PrEP adherence (tenofovir levels of >=1500 ng/mL in urine) at 6 months. The study includes a longitudinal qualitative and mixed methods quantitative and qualitative assessments to identify the pathways of intervention action, and understand how the social network-based approach with support for linkage affects testing and ART and PrEP uptake and retention in men.
Study Design:	Cluster randomized controlled trial of a combination intervention to increase men's HIV testing uptake, increase their linkage to and uptake of ART and PrEP, and improve their outcomes (virologic suppression for HIV-infected men and adherence to PrEP in uninfected men)
Study Population:	At least 650 and up to 1,800 men aged ≥18 years who are primarily working in the fishing industry or related activities, who reside in beach communities in Siaya. Study population will consist of up to 140 clusters of men with close social network ties with a variable number of men in each cluster.
Description of Sites/Facilities Enrolling Participants:	**Clinic sites**: up to 10 beach landing sites and associated clinics, within one or more sub-counties, Rarieda, Bondo and Alego Usonga, in Siaya County in western Kenya **Community sites**: up to 10 Lake Victoria beach communities (with Beach Management Unit -governed landing sites) within sublocations in Rarieda, Bondo and/or Alego Usonga
Objectives:	1. Determine whether providing training and HIVST to select fishermen to distribute to other men in their close social networks increases men's HIV testing uptake; 2. Determine whether network-central promoters and small incentives can improve ART and PrEP uptake among men in their close social networks; and 3. Test the impact of interventions on ART or PrEP retention and adherence.
Approach:	In Aim 1, following the study pilot, community selection, and preparation (see 'recruitment and retention plan') the study team will conduct a census/BMU registry verification in study communities to identify the population of men eligible for the study. We will screen, recruit and enroll eligible men who give their informed consent to participate, then measure their close social networks identify network-central, highly-connected men ("promoters") and randomize their close social network (a cluster) to 1:1 intervention and control groups. We will then

	conduct a baseline survey to collect sociodemographic and baseline sexual behavior data among men in the close social networks. Following this baseline data collection, all promoters will be provided a training. Promoters in the intervention group will receive HIVST training, multiple HIVST for distribution to other men, and a small amount of remuneration. Promoters in the control group will receive basic HIV education and training about the study, and will be given vouchers that can be exchanged for HIV tests (standard or free HIVST kits) at nearby health facilities. Using follow-up survey data, we will test the hypothesis that a higher rate of HIV testing will be observed after 3 months among men in networks that receive the intervention compared to control. In Aim 2, we will test whether network-central promoters can enhance linkage to ART and PrEP after HIV testing among men in their close social networks. Promoters in the Aim 1 intervention group will be asked to distribute information and transport vouchers for ART or PrEP when distributing HIV self-tests to men in their close social networks. We will use clinic data (managed by study staff) to test the primary hypothesis that the intervention will result in higher rates of linkage to ART or PrEP (confirmatory testing and ART referral for positives, and PrEP screening for negatives). We also will test the hypothesis that higher ART and PrEP uptake will be observed within 3 months (+ about one month) in the intervention group. In Aim 3, we will measure 6 month (+ about 1 month) VL and 6 month (+ about 1 month) tenofovir levels using viral load testing and a novel point of care PrEP adherence assay (an antibody-based assay permitting measurement of tenofovir levels in urine) in study sites, and test the hypothesis that higher rates of virologic suppression will be observed in HIV-infected men, and PrEP adherence in un-infected men, in the intervention group. Viral load measurements will be conducted by drawing venous blood at a study visit scheduled at 6 months and through adherence assessment during a study visits scheduled at 3 and 6 months. Similarly, we will measure PrEP adherence utilizing the study urine assay at a study visit scheduled at 6 months and through adherence assessment at 3 and 6 months. Across all aims, we will assess the pathways of intervention action using qualitative and mixed methods. We will identify the mechanisms of action, and barriers and facilitators of the social network and incentives intervention implementation, using qualitative and mixed methods quantitative and qualitative assessments embedded in Aims 1, 2 and 3. The data collection approach will include in-depth interviews with participants in both groups, key informant interviews with network-central promoters, and focus group discussions with study participants stratified by HIV status and study group. Data will be collected at baseline and three follow-up periods corresponding to the timing of quantitative outcome measurements in Aims 1 through 3.
Description of Study Intervention:	**Intervention type: Behavioral intervention trial** The intervention strategy is to recruit and train highly socially-connected men to distribute HIVST and provide linkage support (encouragement, along with small

	financial incentives to offset transport costs) to other men in their close social network.
Outcome Measures:	**Primary outcomes** 1. Self-reported HIV testing within 3 months of intervention start 2. Linkage to care or prevention within 3 months of intervention start 3. Viral suppression (HIV RNA <400 c/mL) at 6 and 12 months among HIV-positive participants 4. PrEP adherence at 6 months **Secondary outcomes** 1. Initiation of ART or PrEP within 3 months confirmatory test or PrEP eligibility screening 2. Confirmatory HIV testing uptake 3 to 6 months after intervention start
Study Duration	5 Years
Participant Duration:	Approximately 30 months
Phase or Stage:	Phase III

3.2 SCHEDULE OF ACTIVITIES

Below is a table detailing the key activities in intervention and control communities, from baseline through the end of the study.

Table 1. Detailed Overview of Activities by Control and Intervention Sites

	Planning	Baseline	3-month	6-month	9-month	12-month	15-month	
INTERVENTION AND CONTROL								
Pilot survey (phone or in-person) and qualitative interviews	X							
Baseline BMU Census/ Registry verification & updating	X	X						
Eligibility screening and informed consent		X						
Baseline survey		X						
Social network mapping and randomization		X						
Follow up survey – (includes HIVST self-report)			X					
Qualitative in-depth interviews and focus group discussions (HIVST and network support)			X	X				
Linkage to ART or PrEP				X				
VL measurement and adherence for those initiating ART				X				
Urine tenofovir levels measurement and adherence for those initiating PrEP				X				
Qualitative in-depth interviews (Linkage and retention)				X				
INTERVENTION								
Enhanced training (HIV basics, HIVST, PrEP, and ART)		X	X	X				
HIVST for distribution via network-central promoters		X	X					
Voucher for cash redemption 500 KSH (at clinic linkage)		X	X					
Enhanced promoter support/training		X	X	X				
Retention support via SMS/phone			X	X				
CONTROL								
Basic training (HIV basics and facility access/info)		X						
Voucher for HIV test or HIVST redemption at facility		X	X					
Standard of care for ART or PrEP		X	X	X				

4 INTRODUCTION

4.1 STUDY RATIONALE

Ending the AIDS epidemic in sub-Saharan Africa (SSA) will require further engagement of men in HIV testing, prevention, and treatment, a challenging task given that nearly 50% of HIV-positive men in many countries are unaware of their HIV status and men have lower uptake of HIV treatment and pre-exposure prophylaxis (PrEP).[1,2] In SSA, highly mobile men such as those working in fishing communities alongside Lake Victoria have low uptake of HIV testing and low rates of linkage to HIV treatment and PrEP, despite increasing availability of these services. As a result, HIV transmission risks remain high in these communities. Two recent innovations – HIV self-testing (HIVST) and social network-based interventions – hold promise for overcoming barriers to HIV testing and linkage to services for HIV-positive and HIV-negative men. This study seeks to determine if an HIV status-neutral, social network-based approach can promote HIV testing, linkage to care and prevention, and better health outcomes in men.

We focus on a highly mobile population of men: fishermen in communities on Kenya's Lake Victoria shoreline, where HIV incidence (2.4-9.3 per 100 PY)[3,4] and prevalence (24-26%)[5-7] remain high despite progress elsewhere, [3,5,8-10] and where treatment uptake is only 53-61%.[5,6] Our prior work showed that mobility of fisher folk and a transactional sex economy contribute to their exceptionally high HIV risks.[11-15] Low rates of testing and care engagement among fishermen are influenced by the mobility inherent to their livelihoods, stigma in beach communities, and gender norms.[16-18] new strategies specifically targeted to reach highly mobile men are urgently needed to increase men's testing uptake and linkage to ART and PrEP

This study will leverage new technologies and insights from behavioral economics and social network research to test low-cost, scalable interventions to close gaps in the prevention and care cascade. To increase uptake of HIV testing and existing prevention and treatment services, we will test a strategy that recruits and trains highly-connected, network-central men to distribute HIV self-tests and provide linkage support to men in their close social networks. Men due to its convenience and privacy prefer HIVST.[19,20] Policies are evolving rapidly, with WHO recommending HIVST scale-up and the Gates Foundation subsidizing self-test prices. Building on our studies of secondary distribution of self-tests by women,[21,22] financial incentives,[23-25] and adherence metrics[26-29] to objectively assess outcomes, as well as other research demonstrating the importance of social networks for influencing norms and behaviors,[30-38] we will evaluate an innovative social-network based approach to promoting HIV prevention and treatment behaviors among men. Network-central promoters – who are well positioned to disseminate information and influence behaviors – will distribute HIV self-tests, transport vouchers for referral services, and information on ART and PrEP, to men in their networks. Specifically, we will conduct a cluster-randomized trial of social network-based self-test distribution and linkage intervention among 80 close social networks of men in Kenya.

4.2 BACKGROUND

Men's engagement in HIV prevention and care remains suboptimal, especially in high priority settings in sub-Saharan Africa (SSA). Ending the AIDS epidemic requires interventions that can achieve higher uptake of HIV testing, particularly among the ~50% of HIV-positive men in many countries who are unaware of their HIV status.[1,2] It also requires interventions to successfully link HIV-positive individuals to existing services for antiretroviral therapy (ART) and high-risk HIV-negative individuals to prevention including HIV pre-exposure prophylaxis (PrEP). A focus on men is warranted because, relative to women, men test for HIV at lower rates, [39] are less likely to engage in HIV treatment and PrEP programs,[1,2] have higher attrition from treatment programs,[40-45] and have higher rates of viral failure on ART.[5,46-49] This results in men's lower life expectancy on ART[50,51] as well as their continued onward transmission of HIV to women.[52] This proposed study addresses the high priority research needs identified in PA-19-042, Engaging Men in HIV Testing, Prevention, and Care.

We know that men's barriers to HIV prevention and care engagement are both structural (e.g. labor-related mobility) and cultural (e.g. gender norms). We and others have identified structural and cultural barriers, including men's labor-related mobility, and gender norms that valorize risk-taking and discourage health-seeking behavior, that have contributed to men's lower participation in HIV testing relative to women.[16,53] While men's enactment of masculinity (i.e. behavior that fulfills male gender role expectations) often results in personal advantage, these same constructs and associated behaviors also serve to configure vulnerabilities for men in terms of HIV acquisition, HIV care engagement, and HIV-related mortality.[41,43,53-61]

This study focuses on a particularly high-priority population of men residing in communities along Lake Victoria. HIV incidence remains high among fisher folk despite progress against the spread of HIV elsewhere in the region.[3,5,8-10] Recent studies estimate HIV prevalence is 24-26%[5-7] and incidence is 2.4-9.3 per 100 PY,[3,4] yet treatment coverage is only 53-61%.[5,6] Dr. Camlin's research has revealed that the mobility of fisher folk coupled with a "sex-for-fish" economy (locally called "jaboya", in which fishermen give female traders access to fish in exchange for sex), contributes to their exceptionally high risks.[11-15] Our team and others have found low rates of HIV testing and care engagement among fishermen are influenced by structural factors – fishermen find it difficult to access services at fixed-location clinics and typical clinic hours because of their mobility – and cultural factors such as HIV-related stigma and gender norms counter to men's health-seeking behaviors, e.g. HIV testing "by proxy" (i.e. inferring their HIV status from their female partners' test results).[16-18,62] In this setting of high risks,[6,63] where 10% of adults have undiagnosed HIV and 60% of HIV-positive people need ART,[5] strategies are urgently needed to increase men's testing uptake and linkage to ART and PrEP Moreover, HIV status-neutral approaches are needed to counter HIV-related stigma among fishermen.

The research to date reveals several scientific and implementation knowledge gaps: What are the best approaches to engaging highly mobile, high-risk men to increase their uptake of HIV testing and linkage to ART and PrEP? Given that conventional testing and care delivery approaches have not been successful to date, what new strategies are needed to address men's well-known barriers, including work-related mobility?

HIV self-testing (HIVST) presents an excellent opportunity to bridge these gaps. A growing literature shows that HIVST is safe and can overcome barriers to clinic-based, counselor-administered testing. With HIVST, individuals collect their own oral fluid sample and perform a simple, rapid antibody test in the absence of a provider. Studies show high acceptability and demand for HIVST across many populations and settings, as it offers convenience, privacy, and accuracy among lay users.[19,64-73] Interest is typically highest among high-risk groups and those who have never tested.[70]

Providing multiple self-tests to men and encouraging them to distribute tests to men in their social networks (i.e. 'secondary distribution') is a promising but untested strategy to increase men's testing. Secondary distribution of self-tests within social networks may be a low-cost, efficient way to increase testing coverage. We and others have shown that secondary distribution of self-tests by women to their male partners is an effective way to promote partner and couples testing; [21,22] such approaches are now being implemented in many countries.[74] However, this approach may not be feasible for all women and it does not sufficiently leverage the fact that men are highly influenced by their peers. To date no studies have assessed the impact of secondary distribution of self-tests in men's social networks – an important evidence gap regarding HIVST.

Countries in SSA are scaling-up HIVST to close the testing gap in priority populations – evidence is needed on delivery approaches that maximize testing coverage. A growing number of countries, including Kenya, are scaling-up HIVST after the WHO's December 2016 guidelines called for large-scale implementation of HIVST.[75-77] The feasibility of HIVST interventions was further enhanced by the Gates Foundation's 2017 decision to subsidize oral fluid-based HIV tests, bringing their price down to $2/test. What countries are actively seeking are optimal distribution strategies for self-tests, to ensure that testing is increased among high-risk individuals not reached by other HIV testing modalities.

Social network-based approaches show promise for generating positive social influence and accelerating health behavior change in men. The influence of social networks on health behaviors and outcomes is well established[78-84] and it is known that social network characteristics can influence behavior through the circulation of ideas and social influence.[85] Network interventions are purposeful efforts to use networks to generate social influence, accelerate behavior change, and achieve positive health outcomes.[86-91] In SSA, prior research has shown the influence of social networks on HIV testing, [92-94] partner concurrency, [95] and condom use.[96] Such an approach is further supported by research showing that behavioral and organizational change programs are most effective when implemented by members of the group undergoing the change, i.e., peers.[97,98] We also now know that selecting influential nodes in a network (i.e. individuals who are highly connected) results in superior intervention effectiveness: selecting well-connected nodes, from a network perspective, are better than nodes chosen randomly, a finding demonstrated with simulations [99,100] and empirical examples.[101,102] Thus, selecting highly socially connected men within social networks to act as 'promoters' may overcome long-standing barriers to HIV testing and uptake of additional health services.

To maximize the HIV prevention potential of HIVST, interventions are needed to promote linkage to care and prevention. As with strategies including home-based and community-based HIV testing, linkage rates following HIVST are often suboptimal without other interventions to motivate confirmatory testing and

linkage to care and prevention. Given the absence of a counsellor during HIVST, it is arguably even more important to promote linkage interventions with HIVST. A recent WHO summary of the few HIVST studies conducted (usually without linkage interventions) reported that linkage after HIVST was 50-56% in general populations in SSA.[75] In its 2016 HIVST guidelines, WHO emphasized a need for evaluation of interventions to facilitate linkage to care and prevention. We will directly address this "Achilles heel" of HIVST with social network approaches and low-cost financial incentives, both intended to promote linkage to care.

PrEP has the potential to reduce HIV incidence in SSA, but there are many knowledge gaps concerning PrEP implementation, especially in men. Trials have proven the efficacy of PrEP,[103-108] but varied protection levels have been attributed to low adherence: in trials in young women, adherence was too low to demonstrate effectiveness.[104,106] PrEP non-use was influenced by partners and peers,[109,110] and many women perceived themselves to be at low HIV risk. In a trial in discordant couples in which adherence was higher,[103] only 20% of those at high risk reported they were at risk.[111] while much has been learned about PrEP adherence among couples and young women, and current interventions (e.g. DREAMS) focus on these populations, much less is known about men's demand for PrEP Our team has implemented PrEP in high-risk populations in the SEARCH trial,[112,113] and low enrollment (~18%[114]) supports a need for strategies to stimulate uptake and adherence in this group. Moreover, self-reported adherence has proven limited in PrEP and objective adherence metrics using drug levels measure adherence more accurately.[115] This study will fill key knowledge gaps by testing novel strategies to promote PrEP uptake, as well as to measure PrEP adherence among men.

Behavioral economics theories provide a strong rationale for using small financial incentives to promote healthy behaviors such as linkage to care and prevention. Insights from psychology and economics point to various factors and decision-making biases, such as limited attention and present bias,[116-120] that make financial incentives valuable strategies for promoting healthy behaviors. Studies in low-income countries show that providing small financial incentives results in significant behavior change.[121] Trials conducted by our team in eastern Africa and others have shown that providing small incentives can promote uptake of services such as vaccinations, HIV testing and male circumcision, [23,121,122] warranting testing whether incentives promote linkage to appropriate available health services (ART or PrEP) after HIVST. The cost-effectiveness of incentives as a demand creation intervention for HIV prevention has led several programs and countries to adopt them on a larger scale, demonstrating the potential for sustainability. For example, revised WHO Guidelines of VMMC include recommendations for providing small amounts of compensation to clients in order to offset time cost and lost wages. This study will use a rigorous design to assess whether incentives, embedded within a social network approach, can promote ART/PrEP linkage, uptake and adherence.

5 OBJECTIVES AND ENDPOINTS

Table 2. Overview of Study Aims, Design, and Outcomes

	Study design and interventions	Outcomes

Aim 1	Self-reported HIV testing within 3 months of intervention start BMU census / registry verification & updating 1. Baseline social network data collection 2. Identification of close social networks and network-central 'promoters' 3. Baseline survey among those randomized to control and intervention 4. RCT: **Intervention**: Promoters given training & multiple STs, & asked to offer STs to men in their social networks. **Control**: Promoters given basic training & vouchers for HIV testing (including HIVST) at clinics to offer to men in their networks 5. 3-month follow-up survey	● Self-reported HIV testing uptake within 3 months ● Confirmatory HIV testing uptake 3 – 6 months after intervention start
Aim 2	Measure impact of intervention on linkage to & uptake of ART & PrEP 1. Intervention: Promoters are given incentives (clinic transport reimbursement vouchers valued at ~$5) & encouraged to give to men in their networks to promote linkage to ART or PrEP after HIV testing 2. Control: Promoters given same training & info, but no linkage incentives	● Linkage to ART or to PrEP within 3 months after self-reported HIV testing ● Initiation of ART or PrEP (among those eligible), within 3 months of confirmatory testing (linkage)
Aim 3	Measure impact of intervention on ART & PrEP retention & adherence 1. Men who test HIV-positive undertake VL testing and counseling at scheduled intervals to ascertain adherence to ART 2. Men who test HIV-negative undertake rapid HIV & TFV testing with counseling at scheduled intervals and urine testing to ascertain PrEP adherence	● Viral suppression (HIV RNA <400 c/mL) and adherence at 6 & 12 months ● Adherence to PrEP (TFV levels of >=1500 ng/mL in urine = adequate adherence[28]) at 6 months
Qualitative	Across all aims, we will assess the pathways of intervention action using qualitative and mixed methods quantitative and qualitative assessment. We will identify the	

Studies	mechanisms of action, and barriers and facilitators of the social network and incentives intervention implementation, using qualitative and mixed methods quantitative and qualitative assessments embedded in Aims 1, 2 and 3. The data collection approach will include in-depth interviews with participants in both groups, key informant interviews with network-central promoters, and focus group discussions with study participants stratified by HIV status and study group. Data will be collected at baseline and at follow-up periods corresponding to the timing of quantitative outcome measurements in Aims 1 through 3.

6 STUDY DESIGN

6.1 OVERALL DESIGN

This study among fishermen at beach landing sites in Siaya County, Kenya, is a 5-year combination prevention study using both novel biomedical tools and low-cost behavioral interventions to pursue three outcomes corresponding to the study's aims: 1) to increase men's HIV testing with self-tests; 2) to improve care linkage to prevention or treatment among men who HIV test; and 3) to assess the long-term impacts of the intervention on men's engagement in HIV care and prevention, including adherence. The study includes qualitative and mixed methods- quantitative and qualitative assessments in all aims, designed to ascertain the pathways of intervention action and to identify key implementation factors that affect outcomes. The study design is a cluster randomized controlled trial where the unit of randomization will be a clusters of men's close social network in study communities. Prior to the study launch, we will conduct a pilot for the study which will test survey instruments and refine our approach for the main RCT.

PILOT SURVEY AND QUALITATIVE INTERVIEWS

We will conduct a small pilot in a beach-landing site in order to refine and improve our study approach and data collection tools. The data collected from this pilot social network mapping will not be included in the main study. In order to conduct this pilot, we will, utilizing locally available data and information, select a beach community to conduct the activity. The consent forms, enrollment, and eligibility screening procedures, including incentives for participation, will outlined in the sections to follow.

NB: COVID amendment:

Implementing phone-based data collection. In response to COVID-19 related disruptions, and in an effort to avoid further delays, we may utilize phone-based data collection to collect key demographic and social network data during the pilot phase. In the event of COVID-19 related restrictions being lifted in June or July of 2020, we will resume our modified in-person data collection, adhering to local, IRB and country-level mandated guidelines for social distancing and human subjects' protections.

Should it become necessary to implement phone-based data collection during the pilot phase, we will screen and determine eligibility using the larger study criteria detailed in section 7.1, verbal recruitment script and versions of the screening form- one for phone and one for in-person. We will provide incentives of 500 KSH via *Mpesa*, for all those who participate in any potential phone survey for this pilot. If pilot data is collected in person, the incentive will be provided in-person. We will conduct the pilot survey (attached to the protocol) with eligible (18 and older, men who are involved in fishing or related

occupations), after screening (using the pilot phone-based *or* in-person screening form) and consenting them using (the pilot phone-based consent form-verbal *or* the written pilot consent form) - attached to this protocol. Once we have conducted these surveys, we will take the information obtained to map social networks. Based on the data obtained from the pilot survey, we will also purposively select up to n=20 men who will be invited for additional in-depth interviews. This rapid interview will utilize the instruments attached to this protocol (see qualitative pilot interview). Information obtained during this pilot phase, from both the surveys and subsequent qualitative interviews, will be utilized to modify, improve, and adjust the survey and study approach. Subsequent modifications will be submitted to IRB.

6.2 Beach Census/Registry Verification & Abstraction

Tool for the baseline BMU Census/Registry data verification, updating and abstraction is included as appendix to this protocol.

6.3 Social Network Survey

We will contact fishermen identified during the BMU census/registry data abstraction to screen for eligibility in the study. Fishermen who provide informed consent will be administered a baseline survey that elicits information on the close social networks of fishermen. This module will ask participants to name the men in their community to whom they are most closely connected to for domains such as health (whom they would seek health information from or share information with), finances (to whom they would turn to borrow money), and spending time (on work and social activities). The social network data obtained in this way will enable us to determine the ties and close social networks that exist in the community, particularly among fishermen. The procedures for the baseline survey are described in detail in the study procedures section.

The social network survey instrument is included as an attachment to this protocol.

6.4 Identification of Close Social Networks and Network-Central Promoters

Using the social network data obtained from the baseline survey and BMU census/ registry data along with a name-matching algorithm, we will identify male close social networks that exist in study communities. Their defining characteristic will be that individual members of any given network will be connected to each other on multiple domains that indicate strong ties between them. Following the identification of distinct close social networks in communities, we will analyze the network data to determine a network-central individual having a high degree of connectedness across domains within each network. The network-central individual will be considered as the network-central 'promoter' of HIV testing and will be the main individual study staff will contact to implement intervention and control group activities and approached for consent. If a central individual is not interested in participation, we will approach the next most central individual. Local close networks with consenting promoters will be eligible for randomization.

6.5 Randomization of Close Social Networks

Close social networks will be randomized 1:1 to intervention and control arms using a computer algorithm

that performs randomization stratified by beach and network size in blocks of two networks. All network members will receive the study arm condition to which their network is assigned. Participation of all network members is not a requirement for network randomization.

6.6 Baseline Survey With Mapped Social Networks and Promoters Social Networks

Based on men who have agreed to be in the study and were mapped to social networks and randomized , we will conduct a baseline survey with all network members and their central promoters. This baseline survey will include socio-demographic, health and sexual behaviors, including HIV testing history and will serve as the baseline for a number of measures prior to the study implementation.

The baseline survey is included as an attachment to this protocol.

6.7 Follow Up Survey

Following randomization, study enrollment and participation in the baseline survey, at about 3 months we will conduct a follow-up survey to assess the primary outcome of HIV testing. Following this window, we will conduct follow up interviews with the baseline survey cohort (those who were randomized to a network and participated in the baseline survey) as well as additional new participants who received a self-test from central network promoters.

Three versions of the 3-month follow up survey is included as an attachment to this protocol.

6.8 Qualitative Studies

6.8.1.1 OVERVIEW

Across all aims, assess pathways of intervention action using qualitative and mixed methods. Identify mechanisms of action, and barriers and facilitators of the social network and incentives intervention implementation, using qualitative and mixed methods (quantitative and qualitative) assessments embedded in Aims 1, 2 and 3 (at baseline, and at follow-up time points corresponding to quantitative measurements in all aims).

Analytic Approach: Mixed-methods approach of qualitative analysis of key informant interviews and focus groups combined with quantitative process and fidelity measures and trial outcome data.

We will use a rigorous two-phased analysis approach, beginning with: 1) qualitative analysis of in-depth and key informant interview and FGD data, using a grounded theoretical approach that involves iterative inductive coding of empirical data (transcripts); followed by a 2) mixed-methods analysis of qualitative data grouped by categories defined using social network survey data, process and fidelity measures, and trial outcome data. This will involve analyzing qualitative data collected within categorized groups of participants including (but not limited to) testers vs. non-testers, linkers vs. non-linkers to ART and PrEP, virally suppressed vs. detectable VL, and PrEP adherent vs. non-adherent. This approach will allow us to identify emergent themes within groupings and to rigorously assess conceptual alignment or differences across groupings, with attention to evidence of contradictory findings and deviant cases in the data.

Primary Research Questions: Investigations will be focused on three domains (Table 2): 1) mechanisms of action of the intervention that result in success or failure in Aim 1 (HIVST usage), Aim 2 (linkage to ART or PrEP), and Aim 3 (suppressed or unsuppressed or detectable TFV levels in urine), 2) key issues impacting the effectiveness of individual components of the intervention, and 3) barriers and facilitators of implementation of the intervention.

Table 3. Qualitative and Mixed Methods (quantitative and qualitative) Research Domains and Topics by Research Aim

Domain	Aim 1 Topics	Aim 2 Topics	Aim 3 Topics
Mechanisms of intervention action	●Attributions for decision to test ○ Role of promoter: perceived influence ○ Other barriers & facilitators to testing ●Attitudes & expectancies re: use of HIVST ●Perceived norms re: testing within close social network ●Vicarious efficacy re: HIV self-testing *(seeing peers successfully use HIVST*)	●Attributions for decision to link ○ Role of promoter: perceived influence ○ Role of incentives ●Attitudes & expectancies re: ART & PrEP ●Perceived norms re: linkage to ART & PrEP within close social network ●Vicarious efficacy re: linkage *(seeing peers successfully link to ART or PrEP*)	●Attributions for ongoing engagement in HIV care (ART) & prevention (PrEP) ○ Role of promoter: perceived influence ○ Role of incentives ●Perceived norms re: engagement in ART & PrEP within close social network ●Vicarious efficacy *(seeing peers successfully engaged in ART or PrEP*)
Factors impacting effectiveness of intervention components	●Knowledge of how to use self-tests (*effectiveness of promoter training*) ●Relationship factors (e.g. HIV status disclosure, HIV seroconcordant/ discordant status) ●Psychological factors (e.g. perceived risk, fear, fatalism, self-efficacy to test for HIV)	●Knowledge of benefits of ART and PrEP (*effectiveness of promoter training*) ●Relationship factors (e.g. HIV status disclosure, partner support) ●Psychological factors (e.g. expectancies, fear, fatalism, self-efficacy to link)	●Experiences with ART / PrEP (*perceived emotional, physical benefits/costs*) ●Effective management of side effects ●Relationship factors (e.g. relationship change, disclosure, partner support) ●Psychological factors (e.g. ART/PrEP fatigue, changes in risk, self-efficacy)
Barriers and facilitators of implementation	●Role of promoter: salience, trust towards promoter within network ●Promoters' self-perceptions & motivation	●Individual mobility and distance to clinic ●Past and current experiences with providers / perceived quality of care	●Individual mobility and distance to clinic ●Past and current experiences with providers / perceived quality of care

6.8.1.2 SAMPLING AND RECRUITMENT

Qualitative Study Populations: 1) In-depth interviews (IDIs). Sample up to 40 participants, selected to be equally balanced across study arms (i.e. 20 men per arm); 2) Key informant interviews (KIIs). Sample up to 15 promoters from the intervention, and 15 in the control arm. 3) Focus group discussion (FGD) groups.

1-2 focus groups per study arm, with 8-12 participants in each group. FGDs will include participants from all study sites, stratified by HIV status.

Sampling approach. We will use a qualitative sampling strategy drawing from grounded theory, in which sampling, data collection and analysis processes are iterative: we will use baseline data to define initial sampling categories (balance across study arms by age, fishing status (occupation) for selection of the first several participants in each category, and thereafter select additional participants according to new categories based upon emergent findings: sampling is completed when data are 'saturated', i.e. no emergent findings elicit a need for additional participants. Thresholds are defined for practical reasons of study schedule and budget. Recruitment will be iterative, using sample lists generated using data collected from the baseline BMU register review and baseline/follow up surveys, among participants who indicate during the informed consent process that they are willing to participate in qualitative research.

6.8.1.3 ANALYTIC APPROACH

Analytic Approach: We will use a rigorous two-phased analysis approach, beginning with: 1) qualitative analysis of in-depth interview and focus group discussion data, using a grounded theoretical approach that involves iterative inductive coding of empirical data (transcripts); followed by a 2) mixed-methods analysis of qualitative data grouped by categories defined using social network survey data, process and fidelity measures, and trial outcome data. This will involve analyzing qualitative data collected within categorized groups of participants including (but not limited to) testers vs. non-testers, linkers vs. non-linkers to ART and PrEP, virally suppressed vs. detectable VL, and PrEP adherent vs. non-adherent. This approach will allow us to identify emergent themes within groupings and to rigorously assess conceptual alignment or differences across groupings, with attention to evidence of contradictory findings and deviant cases in the data. The qualitative instruments for the IDIs, KIIs and FGDs described are included as attachments to this protocol. Future follow up qualitative tools may be submitted as amendments to the protocol.

6.9 JUSTIFICATION FOR INTERVENTION

Social network-based approaches show promise for generating positive social influence and accelerating health behavior change in men. The influence of social networks on health behaviors and outcomes is well established[78-84] and it is known that social network characteristics can influence behavior through the circulation of ideas and social influence.[85] Network interventions are purposeful efforts to use networks to generate social influence, accelerate behavior change, and achieve positive health outcomes.[86-91] In SSA, prior research has shown the influence of social networks on HIV testing,[92-94] partner concurrency,[95] and condom use.[96] Such an approach is further supported by research showing that behavioral and organizational change programs are most effective when implemented by members of the group undergoing the change, i.e., peers.[97,98] We also now know that selecting influential nodes in a network (i.e. individuals who are highly connected) results in superior intervention effectiveness: selecting well-connected nodes, from a network perspective, are better than nodes chosen randomly, a finding demonstrated with simulations [99,100] and empirical examples.[101,102] *Thus, selecting highly socially connected men within social networks to act as 'promoters' may be overcome long-standing barriers to HIV testing and uptake of additional health services* including HIVST.

Countries in SSA are scaling-up HIVST to close the testing gap in priority populations – evidence is needed on delivery approaches that maximize testing coverage. A growing number of countries, including Kenya, are scaling-up HIVST after the WHO's December 2016 guidelines called for large-scale implementation of HIVST.[75-77] The feasibility of HIVST interventions was further enhanced by the Gates Foundation's 2017 decision to subsidize oral fluid-based HIV tests, bringing their price down to $2/test. *What countries are actively seeking are optimal distribution strategies for self-tests, to ensure that testing is increased among high-risk individuals not. S*tudies on secondary distribution of self-tests. Our pilot study on secondary distribution of self-tests enrolled HIV-negative pregnant women and FSW in Kisumu. Participants were shown how to use oral fluid-based self-tests and given 3-5 tests with easy-to-use instruction sheets. Overall, 90% of women reported their primary sexual partner used a self-test. Women reported high acceptability of HIVST among men and over 85% of men found self-tests easy to use. *The proposed study builds on this work and targets men who are not partners of pregnant women and who may be reached more effectively through their peers.* We followed the pilot study with an RCT that randomized pregnant & postpartum women to receive two self-tests or invitation cards for partners to seek clinic-based testing. Partner testing occurred for 91% of women in the intervention group and 52% of women in the control group (P<0.001). This finding was confirmed in another study in Uganda[123] and several programs in SSA are now this approach in antenatal clinics. This work underscores a high interest in HIVST among men and suggests feasibility of an intervention in which men offer self-tests to their peers. While distribution of self-tests by pregnant women has much promise, the approach may not reach all high-risk men, which motivates a study on men's social networks.

6.10 End-of-Study Definition

A participant in the RCT is considered to have completed the study if he has completed at least the 6 month (-/+ 1 month) follow-up VL assessments if HIV-positive, and the 6 month (-/+ month) PrEP adherence assessment (if HIV- negative and eligible for and on PrEP).

7 STUDY POPULATION

The study population will include:

- Men >=18 yrs who are primarily working in the fishing industry or fishing-related occupations, who reside in beach communities in Siaya County, Kenya who consent to participate in the study.

7.1 Inclusion Criteria

In order to participate in the study individuals must meet all of the following criteria:

1. Adult (18 years or older)
2. Male
3. Working as a fisherman or fishing-related occupation
4. Willing and able to provide informed consent for participation
5. Not participating in another research study related to HIV testing, treatment and/or prevention

7.2 Exclusion Criteria

1. Younger than 18 years of age
2. Female
3. Included in another intervention study on HIV/AIDS
4. Inadequate cognitive and/or hearing capacity to complete planned study procedures, at the discretion of the study team

The study is male only and the primary intervention is designed for men and their social networks (other men).

7.3 Strategies for Recruitment and Retention

Up to 10 beach landing sites in Siaya County will be selected as study sites. Community preparation and entry will be needed to ascertain the final number of sites, as sites vary in population size. In preparation for the study we will confer with partners in the Siaya County Ministry of Health and implementing partners to select clinics sites for implementation of clinical data extraction for the study's clinical end points. Clinics in Siaya County are operated by the Kenya Ministry of Health and typically staffed by a medical doctor, a clinical officer, and a nurse. The Siaya sub-counties bordering Lake Victoria have 70 health facilities offering ART with 40,258 patients currently in care. The study will be conducted in partnership with clinics, two of which offer 24 hour and weekend services including HIV care and prevention.[124] Study clinics will be selected with consultation with local partners, the study team, and based on the baseline social network mapping exercise, to be convenient for study participants. Strategies for recruitment will draw on previous work in the area, as well as community mobilizers, including members of the fishing economy. Since sustained retention and adherence is necessary to reduce transmission risk, in Aim 3 we will use novel measurement strategies and longer-term follow-up to assess impacts of the social network interventions on retention and adherence. The intervention itself is designed to increase retention through peer and social network based healthy behavior promoting strategies.

8 STUDY PROCEDURES

8.1 Pilot

Visit 1 for up to n=200 men

Prior to the study start, we will conduct a small pilot among up to n=200 men in a selected beach. The study team will conduct a Beach Management Unit (BMU) census/registry verification in the pilot community to identify the population of men eligible for the pilot. Tool for the baseline BMU Census/Registry data verification, updating and abstraction is included as appendix to this amendment and is the same as the one that will be used for the main study. Conduct either in person or phone-based screening, recruitment and survey data collection in up to n=200 eligible men who give their informed consent to participate in the pilot (see consent forms for the pilot study- written and verbal versions).Men who provide informed consent will be administered the pilot, that elicits information on socio-

demographic and work/livelihoods. In addition, the baseline survey will include a module that obtains information on the close social networks of fishermen. This module will ask participants to name the men in their community to whom they are most closely connected to for domains such as health (whom they would seek health information from or share information with), finances (to whom they would turn to borrow money), and spending time (on work and social activities). The social network data obtained in this way will enable us to determine the ties and close social networks that exist in the community, particularly among fishermen. Based on the data obtained during the pilot, we will purposively select up to n=20 men who will be invited for an additional qualitative interview. These interviews will utilize the instruments attached to this protocol. Information obtained during this pilot phase, from both the surveys and subsequent qualitative interviews, will be utilized to modify, improve, and adjust the study approach. Subsequent modifications will be submitted to IRB.

8.2 Social Network Survey

Visit 1 (recruitment/screening) for up to n=1800 men

Following community selection and preparation, the study team will conduct a Beach Management Unit (BMU) census/registry verification in study communities to identify the population of men eligible for the study. Tool for the baseline BMU Census/Registry data verification, updating and abstraction is included as appendix to this protocol. The study team will then screen, recruit and enroll up to n=1800 eligible men who give their informed consent to participate in the social network survey. Men who provide informed consent will be administered a social network survey that obtains information on the close social networks of fishermen. This module will ask participants to name the men in their community to whom they are most closely connected to for domains such as health (whom they would seek health information from or share information with), finances (to whom they would turn to borrow money), and spending time (on work and social activities). The social network data obtained in this way will enable us to determine the ties and close social networks that exist in the community, particularly among fishermen.

The social network survey is included as an attachment to this protocol.

8.3 Social Network Mapping

After the social network survey data collection is completed, data will be analyzed and the close social networks of participants will be identified. These close social networks, clusters, will then be randomized 1:1 to intervention and control groups. Network-central, highly socially-connected men (“promoters”) will be identified in each network group (one per group, with additional ‘adjacent’ alternates identified if primary potential promoters do not consent to participate as promoters). The study team will contact the potential promoters to administer informed consent to participate in the study as promoters; recruitment will proceed until at least n=45 and up to n=70 men in intervention, and at least n=45 and up to n=70 in control groups have been enrolled as promoters.

8.4 BASELINE SURVEY

Visit 2 for up to n=1000 individuals mapped in the social networks

Based on men who have agreed to be in the study and were mapped to social networks, and the close social network cluster randomized, we will conduct a baseline survey with all network members and their central promoters. This baseline survey will include socio-demographic, health and sexual behaviors, including HIV testing history and will serve as the baseline for a number of measures prior to the study implementation.

The baseline survey is included as an attachment to this protocol.

8.5 PROMOTER TRAININGS

Visit 3 for up to n=140 promoters from the study population of up to n=1000 men

All men who are enrolled/consent as promoters (i.e. in both study groups) will participate in mandatory core training sessions. For the intervention group, an enhanced training of up to two days will be facilitated by study personnel and trainers, and will orient them to the study, their role, as well as equip them with enhanced knowledge about HIVST, information about HIV, PrEP, and treatment, including learning about the benefits of HIV testing (materials are included as attachments to this protocol). Promoters will be trained in the usage of oral fluid-based HIV tests (Oraquick Advance, approved for use in Kenya and other countries), and in how to interpret the results of self-tests. Building on prior work of the investigative team, the study team will utilize instruction sheets (with pictures and local language text) that have been developed in the setting (Kenya) to explain self-test usage. The team will also train promoters on how to use motivational interviewing techniques to motivate others to use self-tests, and the importance of confidentiality as a part of the study. For the control group, a basic training will be provided to present the study, importance and benefit of HIV testing, care, and prevention. The training will also cover issues related to confidentiality.

After the training, the intervention promoters will receive multiple HIV self-test kits for distribution to other men in their close social networks. The HIVST distribution will be as follows: each network-central promoter will receive a test kit for himself, and an addition number of kits (up to 8), for as many of his close network members as identified during the mapping exercise. They also will be given, and asked to distribute to men in their close social networks, transport vouchers for ART or PrEP after HIV self-testing. The voucher worth Ksh 500 (~$5) will be used for reimbursement when seeking confirmatory testing for HIV and screening for ART or PrEP within 3 months of self-testing at home. The amount reflects prevailing transport and opportunity costs of time. In the session for promoters in the control group, the promoters will be given vouchers with information on facilities with free HIV testing and free self-tests at nearby health facilities, to distribute to men in their close social networks. The control promoters will receive a voucher with information about where to get an HIVST or standard HIV testing within the facilities in the community. The voucher will not have any monetary value. All promoters, in both groups, will be given up to Ksh 1000 (~$10) for their participation in a full day of training.

Training curriculum is attached to this protocol.

8.6 3-Month Follow Up Surveys/baseline for new participants

Up to n=1500 participants

Visit 1 for new participants (those not mapped in the baseline but received self-tests with incentive vouchers (intervention) or referral vouchers (control) from promoters

Visit 3 for baseline mapped and surveyed participants who received self-tests with incentive vouchers (intervention) or referral vouchers (control) from promoters

Visit 4 for promoters who will have participated in the social network survey, baseline survey, and promoter trainings (visits 1 2 and 3, respectively)

Follow up surveys will be conducted with study participants at 3 months. Please note that at this stage of the data collection, there will be three possible study participants groups for which we will provide individualized surveys, (1) those who were mapped during the social network mapping exercise and identified as a part of the network where the central promoter was randomized to control or intervention, (2) those who were not mapped or named during the baseline social network mapping exercise but received an HIVST with an incentive voucher (intervention) or referral voucher (control) from a central promoter, and (3) central promoters themselves. These surveys will assess self-reported HIV testing among study participants, whether they sought confirmatory testing, whether they linked to ART or PrEP, interactions they had with study promoters, as well as assess health behaviors. We will have three versions of the follow up survey which are attached to this protocol.

8.7 Biospecimen collection and Clinical Data to Assess Confirmatory Testing, Linkage to ART and PrEP, and Long Term Outcomes

Up to n=1500 participants*

**** We do not know aprior the rate of care or prevention uptake so the total numbers are tentative.***

Visit 2 (for 6 months) for new participants (those not mapped in the baseline but received self-tests with incentive vouchers (intervention) or referral vouchers (control) from promoters and then linked to care or prevention

Visit 4 (for 6 months) for baseline mapped and surveyed participants who received self-tests with incentive vouchers (intervention) or referral vouchers (control) from promoters and then linked to care or prevention

Visit 5 (for 6 months) for promoters who will have participated in the social network survey, baseline survey, and promoter trainings (visits 1 2 and 3, respectively) and then linked to care or prevention

We will obtain informed consent in clinics, from all of the study participants who opt to visit a study clinic for confirmatory testing, for the release of medical record data. The clinical data abstraction and follow

up bio-specimen collection will take place for two cohorts (1) those who HIV test, link to care and are enrolled in care and taking ARVs, and (2) those who HIV test, are HIV-negative, screened and eligible for and start PrEP. The chart abstraction data focused on 6-month outcomes will be collected retrospectively through the end of year 4, June 2023.

HIV-positive study participants

For those who are identified as HIV-positive through abstraction of medical records from the MOH data where the study is being implemented, the study will also conduct viral load measurements utilizing venous blood draw a during study visit at 6 months following intervention start. Participants will also participate in a brief survey to assess adherence to ART at the 3 and 6 month timepoints. Participants will be consented and asked to have their blood drawn by a trained phlebotomist/lab technician for measurement of viral load. Collection of blood for testing of HIV viral load at 6 months since the start of the intervention (note that the MOH program includes annual VL testing, which the study will supplement with additional testing to ensure study measurements). Phlebotomy will be performed using universal precautions, and specimens will be aliquoted, assigned a unique number, and stored at -70 C until shipment to laboratory for processing. Viral load testing will be performed on venous blood on Abbott realTime HIV-1 platform and assay, with a detectable threshold of 40 cells per microlitre. The venous sample and results of the viral load test will only be released to the study and not the MOH facility or those providing the patient's care. As a result, the measurements will majorly be for outcome measurements related to the trial. If requested by providers to make care decisions, and with the verbal consent of the study participant, we may share the results of the viral load in an effort to improve the care of patients and to fulfill our ethical obligations. Further, results or information will be shared with the participants if requested. Participants, through the consent forms, will be advised of the study purposes for the venous blood draw and that the results may be shared with them, if they request, or with their healthcare providers if requested and provided we have the patient's verbal consent.

HIV-negative study participants

HIV-negative participants who screen as eligible and enroll in PrEP, and who give their informed consent will provide, in clinic, the urine specimen for measurement of PrEP adherence. The device used for testing is the PUMA Point of Care urine monitoring assay for TFV- Alere. It is not invasive and is merely a testing tool to determine if the patient is taking tenofovir or not at time of a clinic or study visit. Tenofovir is a mainstay of both HIV treatment and prevention and adherence to tenofovir-containing regimens is paramount for efficacy. Given that the effectiveness of PrEP is tightly linked to adherence, a real-time method of measuring tenofovir adherence is desirable. This immunoassay will test for tenofovir detection at a study visit using urine samples. This test is exempt because it is non -invasive (tests tenofovir detection in urine, which is collected noninvasively) and is diagnostic. The study will be working with facilities implementing PrEP (per MOH guidelines) and will work with providers to integrate real-time PrEP adherence monitoring for study participants only. Study participants will be provided PrEP per the MOH guidelines and will come in for their routine visits. At the 6-month -month visit, we will train MOH providers to include the PUMA assay for monitoring adherence. The providers will also administer a brief survey to assess participant adherence to PrEP at the 3-month **and** 6-month visits. As part of boosting

PrEP knowledge, we will use an informational sheet on PrEP available in the local languages, to provide standardized information to participants on PrEP's purpose to prevent HIV acquisition.

Performing and Interpreting Urine Tenofovir Adherence Assay

1. Present patient with a cup and ask them to please provide a urine sample. Of note, there is no need to clean the urethra prior to urine collection. The patient can just urinate into the cup (about 5-10mL). Please ask them to urinate into the pit latrine if they have excess urine after filling the cup to the line.

2. Please ask the patient to screw the lid on to the urine cup after collection and bring it back out to the provider.

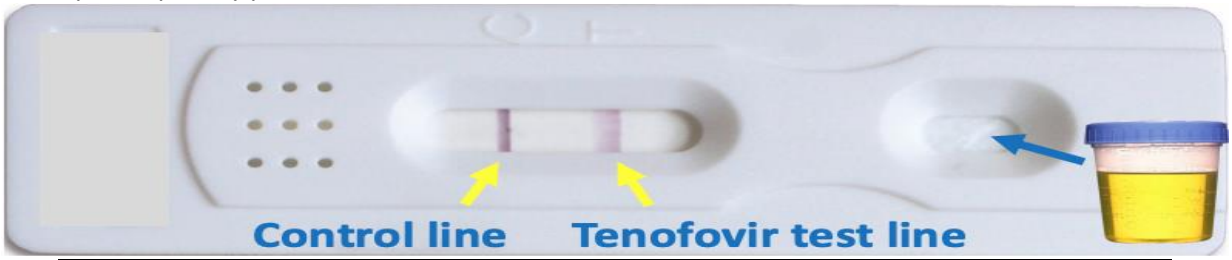
3. The provider (using gloves) should use the dropper provided with the urine test to drip 3-4 drops of urine from the urine cup into the divet of the urine test strip (indicated by blue arrow on below picture).

4. After putting the urine drops on the the urine strip test, please lay it on a paper towel and let it develop for 2-3 minutes

5. Please take the sheet provided (table shown below) and write in the study ID in the first column.

6. The control line should turn positive no matter what the adherence line shows. Please mark the sheet provided in the second column with a "Y" for yes if the control line turns positive. If the control line does not turn positive, please mark "N" for no.

Urine rapid strip assay picture



Participant ID number	Dark control line present (Y/N)	Test line present (Y/N)

7. The test line will appear if the client is NOT taking his/her PrEP and be absent (not appear) if the patient is taking his/her PrEP. Please mark the sheet provided in the third column with a "Y" for yes if the test line turns positive. If the control line does not turn positive, please mark "N" for no.

8. Please take a picture of the rapid strip test with the participant ID label next to record the results for the future.

9. Please discard the urine test strip and remaining urine sample after marking the sheet and taking the picture

8.8 Qualitative Studies

Up to n=76 participants (for IDIs &FGDS) and n=30 promoters (KIIs)

Visit 4 for new participants (those not mapped in the baseline but received self-tests)

Visit 6 for baseline mapped and surveyed participants who received self-tests

Visit 7 for promoters

The qualitative data collection approach will include in-depth interviews with participants in intervention and control, key informant interviews with network-central promoters, and focus group discussions with study participants stratified by HIV status and study group. Within the sample of up to n=1000 men, a subsample of men will be sampled and recruited for participation in:

1. **In-depth interviews**. A sample of up to 40 participants, selected to be equally balanced across study arms (i.e. 20 men per arm);
2. **Key informant interviews**. A sample up to 15 promoters from the intervention, and 15 in the control arm.
3. **FGD groups**. 1-2 focus groups per study arm, with 8-12 participants in each group. FGDs will include participants from all study sites, stratified by HIV status.

Data will be collected at baseline and up to three follow-up periods corresponding to the timing of quantitative outcome measurements in Aims 1 through 3. The team will use a qualitative sampling strategy drawing from grounded theory (ref. K. Charmaz), in which sampling, data collection and analysis processes are iterative: baseline data will be used to define initial sampling categories (balance across study arms, sites and HIV status) for selection of the first several participants in each category. Thereafter the team will select additional participants according to new categories based upon emergent findings: sampling is completed when data are 'saturated', i.e. no emergent findings elicit a need for additional participants. Thresholds are defined for practical reasons of study schedule and budget. Recruitment will be iterative, using sample lists generated using data collected from the baseline BMU census and survey, among participants who indicate during the baseline informed consent process that they are will to be contacted for potential participation in qualitative research.

8.9 Ongoing Promoter Support and Training

Up to visits 8-11 for up to n=70 promoters in the intervention arm only

Promoters in the intervention group will be invited for up to four additional training sessions in which they will be encouraged to motivate men in their network who initiated PrEP or ART to come to clinics for periodic medication refills and consultations. Promoters will be given up to KSH 1000 (~$10) for their participation in each additional full day of follow up training.

8.10 Text Message Reminders

To the extent that men on PrEP and ART are willing, optional cell phone appointment reminders and text messages motivating adherence will be sent to them (including promoters). These messages will be motivational, will not include any identifying information and will include generic texts such as "maintain your good health", to cater for status-neutral language that can work for both HIV positive individuals taking ARVs, as well as HIV-negative individuals on PrEP who may need adherence support.

Sample language for these text messages are included in the table below. These sample texts will be further refined with the input of the community and our peer leaders to ensure that they are locally and culturally salient and relevant. We will ensure these messages are status-neutral and non-stigmatizing to ensure they are relevant and do not compromise patient confidentiality.

Table 4. Sample Text Messages to Facilitate Adherence

It is important to maintain your health.
Please prioritize your health and well-being to stay strong.
Please remember your appointment.
If you need support to make your appointments, please reach out to your provider.
Your provider can help keep you healthy, please reach out if you need help.
Be healthy, have a healthy happy family!
Be healthy, be productive!

8.11 Incentives and Study Payments

Table 5 Details of Incentive Types, Amounts, Populations, and Purpose

Incentive Type	Amount	Recipient	Purpose
Cash (in-person) or Mpesa (for phone surveys)	500ksh (~$5)	All participants who take part in the pilot survey – either in person or phone	To offset time/wages lost due to participation in survey data collection
Cash (in-person) or Mpesa (for phone surveys)	500ksh (~$5)	All participants who take part in the pilot survey and are then randomly selected for interviews – either in person or phone	To offset time/wages lost due to participation in survey data collection
Cash	500ksh (~$5)	All participants who take part the social network survey to be mapped	To offset time/wages lost due to participation in social network survey
Cash	500ksh (~$5)	All control and intervention participants who are mapped and randomized in the study and who participate in the baseline survey	To offset time/wages lost due to participation in survey data collection
Cash	500ksh (~$5)	All control and intervention participants who take part in the 3 month follow up survey	To offset time/wages lost due to participation in 3 month survey data collection
Cash	500ksh (~$5)	All control and intervention participants who take part in either the in-depth interviews or focus group discussions- incentivized per data collection method	To offset time/wages lost due to participation in data collection

Voucher	500ksh (~$5)	Only intervention participants who have used a HIVST and bring in their voucher to the health facility for cash redemption	To encourage confirmatory HIV test and off set travel to facility
Cash	1000ksh (~$10) 500ksh (~$5) 200ksh (~$2)	Only intervention and control participants selected to be promoters and those who participate in the promoter training	1000 Ksh to offset time/wages lost due to participation in trainings. 1000Ksh per day of training. 500ksh to buy airtime in order to contact men in their social networks for promotion activities Up to 200ksh to offset transport costs related to promotion activities.
Cash	500ksh	Intervention and control participants who link to care (ART) or PrEP who come in for 6 month study visit for blood and urine samples (for adherence)	500 ksh to offset transport

9 FIDELITY

9.1 PROMOTER TRAINING AND TRACKING

There may be heterogeneity in fidelity to intervention procedures by promoters (some may offer self-tests to non-network members); we will assess fidelity using follow-up survey data from promoters and network members. We will also try to achieve high fidelity by asking research team members to periodically contact promoters to check in on their activities. Adjustments, clarification, and re-training will be conducted as needed. We will collect quantitative process and fidelity measures corresponding to each of the components of the intervention through review of administrative records, and other study data. Further, we will use various tools attached to the protocol to assess the outcome of the promotor training and the extent to which the training was delivered and received as intended. Please see the appendix for the tools we will use to evaluate the training effectiveness.

Following the promoter training, the cadre of promoters will receive individual support from the study regional manager/nurse, who will conduct study check-ins at the beaches and be available by cell phone to answer questions and problem solve if issues arise. Additionally, we will use a rigorous two-phased

approach, beginning with: 1) qualitative of in-depth and key informant interview and FGD data, and 2) mixed-methods data grouped by categories defined using social network survey data, process and fidelity measures, and trial outcome data. This will involve analyzing qualitative data collected within categorized groups of participants including (but not limited to) testers vs. non-testers, linkers vs. non-linkers to ART and PrEP, virally suppressed vs. detectable VL, and PrEP adherent vs. non-adherent. This approach will allow us to identify emergent themes within groupings and to rigorously assess conceptual alignment or differences across groupings, with attention to evidence of contradictory findings and deviant cases in the data. Feedback on key recruitment, data collection and other metrics will be provided via regular data reports to study sites.

9.2 Measures to Minimize Bias

The study is subject to limitations that we will take steps to address. First, it may be difficult to objectively ascertain self-test results, as we will not directly observe self-testing. However, we expect measurement error to be distributed randomly across study arms, and we will use pre-printed cluster IDs on clinic vouchers and on self-tests to validate our measurements of this outcome. Second, it may be difficult to contact mobile men for follow-up, but we will benefit from tracking procedures we are successfully using in ongoing studies and will strengthen them further by collecting contact details of trusted friends of participants. This information (names and phone numbers) will be collected using secure study forms and will be protected similar to other study data and discarded following the procedures outline in sections 12.3 and 12.4. Since these trusted friends of participants are not taking part in study activities, they will not be consented. Third, there may be heterogeneity in fidelity to intervention procedures by promoters (some may offer self-tests to non-network members); we will assess fidelity using follow-up survey data from promoters and network members. We will also try to achieve high fidelity by asking RAs to periodically contact promoters to check in on their activities. Adjustments, clarification, and re-training will be conducted as needed. Fourth, as in most community-based interventions, there is potential for cross-contamination between control and intervention social networks. Our approach to this risk is to both minimize cross-contamination and also measure the extent to which cross-contamination occurs in the trial, which in turn will allow us to model how this influences effect sizes. In our training we will emphasize that promoter efforts should be limited to members of their own close social network and not to those outside or adjacent to their network. To measure cross-contamination we will include in our surveys questions to elicit the frequency and intensity of exposure to the intervention and control condition elements. We will also assess whether men who have spatial proximity to intervention clusters are more likely to have been tested for HIV – a proven empirical approach to testing for spillover effects.

9.3 Study Intervention/Experimental Manipulation Adherence

Because promoters (study participants and members of social networks) are primarily implementing the intervention, adherence will be encouraged by training at the outset, and periodic monitoring to ensure that the correct messages on HIVST, ARV and PrEP are being disseminated as needed.

1 STATISTICAL CONSIDERATIONS

1.1 STATISTICAL HYPOTHESES

Primary Endpoint(s): self-reported HIV testing in the past 3 months by participants, as measured in the 3-month follow-up surveys.

> We hypothesize that the intervention group will be more likely to test for HIV than the control group.

Primary Endpoint (s): Linkage to ART or to PrEP within about 3 months and Initiation of ART or PrEP (among those eligible), within 3 months of linkage

> We hypothesize higher a proportion of participants linking to ART or PrEP (confirmatory testing and ART referral for positives, and PrEP screening for negatives among those receiving the intervention. We also hypothesize higher ART and PrEP uptake within 3 months among men in social networks assigned to the intervention group.

Primary Endpoint (s): Viral suppression (HIV RNA <400 c/mL) at 6 months and adherence to PrEP (TFV levels of >= 1500 ng/mL in urine = adequate adherence [28]) at 6 months.

> We hypothesize a higher proportion of individuals both retained in care and adherent to treatment in the intervention group compared to the control group.

1.2 SAMPLE SIZE DETERMINATION AND POWER CALCULATIONS

Aim 1

We calculate that the study will have an 80% or greater power to detect a significant difference in the proportion of HIV testing associated with the intervention arm, assuming a proportion self-testing in the control arm of 38% (observed data from SEARCH in fishermen) if the proportion testing in the intervention arm is 52% or greater (odds ratio of 1.8), calculated using an Intraclass Correlation Coefficient (ICC) of 0.15 (conservative based on SEARCH data), 70 clusters each in the intervention and control arms, average cluster size of 7 in both arms, and a type-1 error rate of 5%.[125,126] Figure 2 shows statistical power and the range of detectable odds ratios over extremes of clustering effects.

Aim 2

For the Aim 2 combined primary outcome of successful linkage to ART or PrEP within 3 months of intervention start (+about 1 month), this study will have a 80% or greater power to detect a significant increase in successful linkage, assuming a proportion successfully linked at 3 months in the control arm of 24% (*based on observed SEARCH trial linkage rates weighted for the number of eligible PrEP HIV-negative men and HIV-positive men not currently in HIV care*) if the observed proportion in the intervention arm is 39% or greater (odds ratio of 2.0), using an ICC of 0.15, 70 clusters each in intervention and control arms, a cluster size of 7 in both arms, and a type-1 error rate of 5%. Statistical power for combined ART or PrEP

start is similar, with a reduction in anticipated eligible numbers per cluster reduced to 6 resulting in a small increase in the detectable odds ratio to 2.2 or greater. Power for a separate analysis of ART initiation alone is likely to be low given the small numbers of new HIV infections in the study sample with odds ratios in excess of three or four required.

Aim 3

For the primary outcome, we will have ≥80% power to detect a significant increase in viral suppression and adherence in those on ART and PrEP, respectively, assuming a proportion of successes in the control arm of 70% or greater power (*based on SEARCH trial data on viral suppression rates among fishermen and projected urine TFV detection rates of 70%, weighted for the likely number of men on PrEP (n=168) and men on ART (n=72)*). We assume the observed proportion of successes in the intervention arm will be 89% or greater using an ICC of 0.10, a design effect from clustering of 1.7, and a type-1 error rate of 5%. For the combined primary outcome of retention on ART or PrEP at 6 months (+ about 1 month), this study will have 81% or greater power to detect a significant increase in linkage assuming a proportion retained in care in control arm of 81% (*based on SEARCH data on retention rates weighted for the likely number of men on PrEP (n=168) and ART (n=72)*) if the observed proportion in intervention arm is 96% or greater using the above assumptions.

1.3 STATISTICAL ANALYSES

1.3.1 GENERAL APPROACH

As a general approach, we will use methods designed for the analysis of clustered data, given the inherent clustered nature of the intervention design. For the primary outcome we will utilize cluster adjusted Pearson's Chi-square tests comparing the proportion of study participants' HIV testing in the intervention versus the control arm and apply the analysis method in the same way for secondary analyses of linkage to HIV care and PrEP. In additional secondary analyses, we will use multilevel mixed-effects logistic regression with cluster-adjusted standard errors using cluster levels at the close social network and beach levels and allowing for random effects at the cluster and beach levels.

1.3.2 ANALYSIS OF THE PRIMARY ENDPOINT(S)

Primary Outcome: The primary outcome will be self-reported HIV testing in the past 3 months by participants, as measured in the 3-month follow-up surveys.

Primary Predictor: Cluster (social network) Randomized Arm (intent-to-treat), Intervention or Control.

Analytic Plan: For the test of the intervention effect on the primary outcome of self-reported HIV testing in past 3 months, we will utilize a cluster adjusted Pearson's Chi-square test comparing the proportion of subjects' HIV testing in the intervention versus the control arm. In secondary analysis, we will utilize multilevel mixed-effects logistic regression with cluster-adjusted standard errors and a binary outcome of reported HIV testing or not (including cluster as one of the levels with random effects allowed). We will

investigate factors that influence the probability of success of HIV testing, including characteristics of clusters (the close social networks' size and composition, metrics of connectedness, mean cluster self-testing rate), characteristics of the cluster's promoter (age, marital, HIV, ART, PrEP status, measures of the promoter's ties to close-social-network cluster members), and individual level characteristics (demographics, SES, prior HIV testing, duration in boat crew, self-reported HIV risk).

1.3.3 ANALYSIS OF ADDITIONAL ENDPOINT(S)

Primary Outcome: the primary outcome measure will be linkage to care or prevention within 3 months of the Aim 1 intervention start. Linkage will be defined for HIV-positive participants as a documented confirmatory HIV test result, and a documented HIV clinic visit following referral. Linkage will be defined for HIV-negative participants as documented evidence of evaluation for PrEP (following standard of care procedures) extracted from medical records.

Secondary outcome: The secondary outcomes will be confirmatory HIV testing uptake 3 – 6 months after intervention start and the initiation of ART, or PrEP (among those screened as eligible), within 3 months of the confirmatory test or eligibility screening. HIV testing uptake will be measured via documented testing records in clinic records and ART start will be measured via documented prescription for ARV medications, and for PrEP start, via oral PrEP prescription.

Third outcome: The third primary outcome is a composite measure meant to capture "success" in HIV prevention and/or treatment behaviors. The measure will be defined as either adequate levels of tenofovir, indicating PrEP adherence (defined as TFV levels of >= 1500 ng/mL in urine indicating adequate adherence vs. < 1500 ng/ml) among HIV seronegative individuals who screened eligible for PrEP or the proportion of HIV-positive participants with viral suppression (defined as HIV RNA <400 c/mL using the Abbott realTime HIV-1 platform and assay, with a detectable threshold of 40 cells per microliter at 6 months. PrEP adherence will be measured at 6 months after initiation using our novel technology of point-of-care rapid testing to assess TFV adherence in urine (developed by Co-I Gandhi in collaboration with Alere Rapid Diagnostics™). For both components of the measure, we will define missing values as failure (i.e. inadequate adherence or unsuppressed).

Analytic Plan: For the test of the *social network-central promoters and small incentive* intervention effect on the primary outcome of linkage to care or prevention within 3 months of intervention start we will utilize a cluster adjusted Pearson's Chi-square test comparing the proportion of subjects with documented linkage to care or prevention in the intervention versus the control arm. In secondary analysis, we will utilize multilevel mixed-effects logistic regression as described in Aim 1 to investigate factors that influence the probability of success of linkage to care and prevention. We will also evaluate the secondary outcomes of ART initiation among HIV-positive persons not currently on treatment, and initiation of PrEP among HIV-negative persons who screen as eligible. We will compare the initiation proportions between study arms using cluster adjusted Chi-square tests and additional multilevel mixed-effects logistic regression to identify influencing factors.

We will measure the combined outcome of 1) Proportion of HIV-positive participants with viral suppression (HIV RNA <400 c/mL) at 6 months missing=failure (unsuppressed) and 2) Proportion of participants adherent to PrEP (TFV levels of >=1500 ng/mL in urine indicating adequate adherence) at 6

months missing=failure (nonadherent). PrEP adherence will be measured at 6 and 12 months after initiation using our novel technology of *point-of-care rapid testing to assess TFV adherence in urine*). (+ about 1 month for all measures)

Secondary Outcomes: HIV testing uptake 3 to 6 months after intervention start and retention on ART at 6 months or PrEP at 6 months. Using clinic records, we will assess whether men had confirmatory HIV testing and those who initiated PrEP and ART attended scheduled appointments and record VL results. (+ about 1 month for all measures)

Analytic approach: We will utilize a cluster adjusted Pearson's Chi-square test comparing the proportion of successes (HIV viral suppression and adequate TFV levels) among men (on ART and PrEP, respectively) in the intervention and control networks. For the outcome of retention on ART or PrEP at 6 months. We will utilize a cluster adjusted Pearson's Chi-square test comparing the proportion of subjects on ART or PrEP at 3 months post trial start who are retained in care at 6 months in intervention versus control group. In secondary analysis, we will utilize Cox proportional hazards regression to investigate factors that influence time to discontinuation of ART or PrEP We will also use multilevel mixed-effects logistic regression to investigate factors that influence the probability of viral suppression and TFV detection in urine. (+ about 1 month for all measures)

1.3.4 ANALYSIS OF QUALITATIVE DATA

For the qualitative study aims throughout aims 1-3, we will conduct semi-structured in-depth interviews and FGDs in the local languages spoken in the region, by gender and language-matched trained qualitative researchers. Interviews will be conducted at a venues agreed upon by the participant while maintaining privacy and confidentiality. FGDs and Interviews will be audio recorded; recordings marked with study IDs will be transferred to secure servers and encrypted laptops for transcription, translation, and analysis. After FGDs and IDIs are conducted, the interviewers will transcribe and translate the audio recorded interviews into English and import into a qualitative software for analysis by the full team. The team will collaboratively develop an inductive coding framework on the basis of the interview/FGD guides and previous research. The inductive code list will be applied to the first set of transcripts; the team will meet periodically to review the coding framework and iteratively refine the coding framework, adding new codes through a deductive approach. Overlapping (blind coding) to achieve inter-rater reliability. All the qualitative interpretation activities will be guided by constructivist grounded theoretical approaches. Coding and analysis will take team-based approach to ensure rigor. We will use a two-phased analysis approach, beginning with: 1) qualitative analysis of in-depth and key informant interview and FGD data, using a grounded theoretical approach that involves iterative inductive coding of empirical data (transcripts); followed by a 2) mixed-methods analysis of qualitative data grouped by categories defined using social network survey data, process and fidelity measures, and trial outcome data. This will involve analyzing qualitative data collected within categorized groups of participants including (but not limited to) testers vs. non-testers, linkers vs. non-linkers to ART and PrEP, virally suppressed vs. detectable VL, and PrEP adherent vs. non-adherent. This approach will allow us to identify emergent themes within groupings and to rigorously assess conceptual alignment or differences across groupings, with attention to evidence of contradictory findings and deviant cases in the data.

2 STUDY INTERVENTION/EXPERIMENTAL MANIPULATION DISCONTINUATION AND PARTICIPANT DISCONTINUATION/WITHDRAWAL

2.1 Discontinuation of Study Intervention/Experimental Manipulation

Participants who discontinue from the intervention will also be discontinued from the overall study; however they may continue to receive care at clinics according to country standard of care guidelines.

2.2 Participant Discontinuation/Withdrawal from the Study

Participants are free to withdraw from participation in the study at any time upon request. An investigator may discontinue a participant from the study for the following reasons:

- The participant meets a previously unrecognized exclusion criterion
- Significant non-compliance with the study
- Any event or situation that occurs such that continued participation would not be in the best interest of the participant

The reason for discontinuation and date of discontinuation will be documented in the study participant withdrawal/move case report forms (CRFs).

3 ETHICAL CONSIDERTATIONS

3.1 Known Potential Risks

HIV self-testing. Based on our own studies conducted in the past two years and several other studies, we believe there are relatively few risks to study participants. We have conducted research in the Nyanza region among female sex workers (FSW) as well as pregnant and postpartum women. Women in these studies were given multiple self-tests and encouraged to offer them to their male partners at their own discretion. One of our key objectives was to assess intimate partner violence (IPV) and other adverse events experienced by women. Our findings indicate that IPV and other adverse events were extremely rare – both for the women themselves and for their male partners who accepted and used the self-tests. These findings are consistent with other studies highlighted in WHO guidelines showing that self-tests are easy to use safely. The proposed study includes men only, who are rarely victims of IPV in this setting. The primary risk involved in study participation include emotional discomfort related to decision-making surrounding the decision to test for HIV and the receipt of test results in the absence of a counselor. HIV self-testing is designed reduce anxiety about testing for HIV because it enables self-test users to conduct the tests privately at a time and location of their choosing, and it does not require observation or help from others. However, as with any HIV testing research, if a study participant uses an HIV self-test or seeks clinic-based testing and obtains an HIV-positive test result, there is a risk of adverse reactions including psychological distress due to testing. There is also a risk that study participants may feel pressured by their peers to test and if they test, may be distressed by the results, especially if they obtain an HIV-positive result.

Our pilot study data indicate that women and their male partners reacted well to receiving their test results, even when a reactive result was obtained. These data are consistent with studies from sub-Saharan Africa showing that risks of adverse reactions following HIVST are very low. Proper information and subsequent counseling is nonetheless necessary to minimize the possibility of distress. We will put in place study procedures (described below) that are intended to minimize risks and address any adverse events that do occur. In our pilot study that implemented the intervention, we developed and used these procedures, and we also obtaining IRB approval for the procedures. Below we outline potential risks to study participants and the steps we are taking to minimize these risks.

In the close social network clusters assigned to the intervention, men will likely receive oral fluid-based HIV tests from the network central promoters who will receive multiple tests and be encouraged to offer them to other men in their networks. Each test will include instructions on how to use the oral fluid-based tests. Promoters will also be trained on test use so they can offer guidance to their male peers. We will provide detailed, easy-to-use instruction sheets on how to use self-tests as well as a demonstration to men at the time of enrollment on how to use self-tests, and a 'train the trainer' component to help them learn to instruct other men in the self-test usage.

Men in comparison networks will be asked to distribute (or attempt to distribute) referral vouchers that can be used to exchange for a free HIV self-test kit at the local study clinic, to the men in their close social networks. We will also provide detailed information to men in both groups on the need to seek clinic-based confirmatory testing after receiving an HIV-positive self-test result, as well as information on where individuals can receive care and treatment. Moreover, the study includes additional information about the benefits of screening for enrollment in HIV pre-exposure prophylaxis, for those who receiving an HIV-negative self-test result.

For the Aim 2 study, linkage to a local health facility for HIV care and treatment following confirmatory testing, and to PrEP eligibility screening, as well as uptake of either ART or PrEP, is measured for individuals in the Aim 1 study who report having used a self-test. In the intervention group only, incentives (vouchers to be exchanged for a small remuneration of the cost of transport to the local health facility), will be offered by network-central promoters to the men in their close social networks.

Network-central promoters in intervention clusters may be asked for HIV self-tests by individuals who are not part of their defined cluster (i.e. close social network) but are members of their community. Promoters may feel stress arising from not being able to comply with these requests. In our training of promoters and community sensitization and preparation, we will explain the purpose of the study carefully to ensure that promoters and members of communities understand that not all people in the community will receive HIV self-tests through the promoters. We will instruct the promoters to refer anyone interested in HIV testing to the nearest testing venue (the standard of care), and will ensure they have lists of appropriate nearby venues, including those where HIV self-tests are freely available. We will coach promoters in how to explain that they were given a limited number of self-tests for specific BMU members in their close social networks. In our experience with secondary distribution of HIV self-tests, we have found that the distribution of self-tests does not tend to be a public activity. We do not anticipate,

based on other studies that it will be common for men to approach with numerous requests for self-tests, but will have contingencies and messaging in place to handle these situations should they occur.

Incentives. A risk stems from the use of incentives to promote confirmatory testing and linkage to care. However, the value of the incentives will be relatively low – on par with certain costs of confirmatory testing such as transportation and opportunity costs. This means that most participants are unlikely to experience a significant economic gain because of coming for confirmatory testing, thereby minimizing the risk of coercion. A recent publication by the Ethics Working Group of HPTN has also made the case that the use of incentives for health promotion does not necessarily undermine individual autonomy. Instead, the incentives can help overcome economic obstacles or motivational deficiencies; they can promote engagement in health-related behaviors that participants regard as beneficial or worthwhile, but do not undertake due to behavioral biases such as present-biased preferences. Our experience implementing small economic incentive interventions in Kenya and Uganda has also demonstrated that such interventions are acceptable to both communities and ethical review boards.

In addition, we will ensure that our training session for network-central promoters, including messaging to participants promoting confirmatory testing or linkage to care or to prevention, includes a component on the importance of maintaining privacy and confidentiality and the rights of all individuals to choose whether, when, how, and to whom to disclose their HIV status. Our prior experience in Kenya implementing interventions among HIV-infected adults who are receiving ART, and on the nature and pathways of stigma and stigma reduction, shows that the risk of stigma and inadvertent disclosure can be minimized. As a result, we expect the risk of inadvertent disclosure of HIV status because of study participant to be very rare.

Behavioral and social network research. In this study, we will be conducting survey questionnaires and in-depth semi-structured interviews among adult men only (ages 18 and older) working in fishing or fishing-related occupations. Aim 1 begins with a BMU census/registry verification and updating at participating beach landing sites to identify and enumerate the population of men registered as working in the fishing industry currently registered as working at the beach-landing site. This will involve collection of non-sensitive data including residency, confirmed occupation in fishing, and age. The baseline survey for Aim 1 will include questions about participants' perceived personal risk and perceived severity of HIV infection; self-reported sexual behavior, as well as marital and partnership status, sero-concordant or discordant couple status; prior HIV testing history; knowledge, attitudes, beliefs, and self-efficacy related to HIV care and prevention behaviors (specifically, usage of PrEP or ART); socio-demographic characteristics; and members of close social networks.

Under Aim 1, the 3-month follow up surveys will be used to assess HIVST experiences and to verify self-test usage, and to measure the sexual and health behaviors of men who do and do not accept self-tests or vouchers. Qualitative key informant interviews with a small sample of network promoters will include questions about men's experiences offering self-tests to the men in their close social networks (intervention group) or offering vouchers to exchange for self-tests at local clinics (comparison group).

Under Aim 2, A small sample of respondents will be selected for recruitment for in depth interviews that explore in greater depth, the dimensions of ART and PrEP decision-making including perceptions of risk and severity of HIV disease, beliefs about efficacy of ART and PrEP, and other factors in the individuals' lives (occupational mobility, relationship context and dynamics, community norms and dynamics, and perceptions of local health care services) that influence the decision whether or not to self-refer for confirmatory testing and enrollment in ART, or PrEP eligibility screening and uptake.

Under Aim 3, qualitative in-depth interviews will explore factors that affect participants' motivations and ability to stay engaged in HIV care and prevention programs.

As with all collection of data on sensitive topics, there is a risk of emotional discomfort that may accompany disclosure of potentially stigmatized behaviors. To minimize this risk, we will use the procedures we have previously used in several studies in the setting that we have conducted that involved collection of sensitive information; these are described in the sections that follow.

3.2 Known Potential Benefits

The proposed benefits to the participants are two-fold. First, we will provide free HIV self-testing kits to fishermen, allowing them to test themselves regularly and offer tests to their friends. This will help them make informed sexual decisions, thereby protecting them from HIV acquisition or helping them to avoid transmitting HIV to their sexual partners. The study may give rise to increased identification of HIV-infected men in fishing communities in Siaya, Kenya, and their increased engagement in HIV care and treatment, thereby reducing the overall number of HIV transmissions to women. The linkage of HIV-negative men to PrEP will also have individual and community-level benefits to both men and women.

Importance of the knowledge to be gained. The risks faced by men and their sexual partners in this study are far outweighed by the benefits to participants and the community, as well as the importance of the knowledge to be gained. Given the public health importance of achieving higher uptake of HIV testing among high-risk populations – particularly Lake Victoria fishermen, who generally have lower uptake of HIV care and prevention services, and poorer health outcomes – it is vital to find effective new strategies that can be used to promote testing and identify HIV-infected men who are unaware of their HIV infection. The knowledge gained from this study is particularly relevant at a time when countries in Africa are actively developing HIV self-testing policies and seeking optimal ways to scale-up HIV self-tests. Our study will also provide information on the effectiveness of secondary distribution of HIV self-tests by men to other men in their close social networks as a strategy to improve men's testing uptake. And, it will examine whether a social network based approach, when combined with low-cost incentives, can be useful for improving linkage to care and prevention among men. Finally, this study will determine whether these novel interventions, combined, can be useful for reaching populations of men who are especially hard to engage in fixed-location, fixed calendar-based programs and interventions.

3.3 Assessment of Potential Risks and Benefits

Trained study team members will obtain written informed consent from all participants. The study team members will find a private place; carefully explain the nature and purpose of the study to each potential

participant, potential risks and benefits, compensation for participation, and will describe the two study groups to which participants will be randomized. The consent process will be offered in English, Kiswahili, Dholuo or Luyha (as per the participant's preferences). Our study team has prior experience in obtaining informed consent for research and clinical trials within the cultural context of in Kenya. The informed consent procedure has been designed to maximize understanding of potential risks. Participants will be told that they may decline to participate at any point.

Maintaining privacy and avoiding stigmatization: Study visits with participants to recruit, screen, consent, enroll and follow-up participants will occur at the drop-in centers or participant homes in order to reduce the unlikely possibility of stigmatizing study participants. Every effort will be made to ensure privacy is maintained during survey administration. Participants will be given a unique study identification number (their study ID number). Participants' names and study number, and thus their HIV status and name, will never appear in a dataset together.

Training and referral process for requests for HIV self-tests by non-eligible persons: community members with requests may approach Network-central promoters for HIV self-tests. In our training of network of network-central promoters and community sensitization and preparation, we will explain the purpose of the study carefully to ensure that promoters and members of communities understand that not all people in the community will receive HIV self-tests through the promoters. We will instruct the promoters to refer anyone interested in HIV testing to the nearest venue (the standard of care), and will distribute multiple copies of a list of the nearby testing venues to each promoter, including sites distributing free HIV self-tests. Promoters will receive coaching on how to explain that they were given a limited number of self-tests that were pre-assigned to specific individuals. In our experience with secondary distribution of HIV self-tests, we have found that the distribution of kits does not tend to be a public activity. We do not anticipate, based on other studies, that it will be common for men to approach with numerous requests for tests, but will have contingencies and messaging in place to handle these situations should they occur.

Minimizing probability of adverse reactions to test results and ensuring receipt of appropriate services: To ensure correct usage of self-tests and to minimize the probability of psychological distress due to HIV testing, we will include simple instruction materials with each self-test on how to use the tests, in English and local languages (see Appendix 1 for materials we have prepared). These instruction materials have been developed by us and used in several HIVST studies (including studies that other teams are conducting in eastern and southern Africa). They were well received by women and their sexual partners. In addition, the network-central promoter training will include messaging and informational materials including clear information on the importance of seeking confirmatory HIV testing for those who obtain an HIV-positive test result (which is recommended by the WHO and the Kenyan Ministry of Health) – and a list VCT clinics in the area where free confirmatory is available. In addition, training and informational materials will emphasize the importance of screening for PrEP, in the case of an HIV-negative test result, and information will be provided on clinics in the area where free HIV care, treatment, and PrEP are available. We will also establish a support telephone line (hotline) that study participants can call at any time that will put them in touch with the study coordinator, who will be ready to provide additional information on where to seek further testing, care or treatment, or prevention services.

Minimizing discomfort during blood draws or urine collection: to ensure that the participants are comfortable and do not experience discomfort or pain related to blood draws or urine collection, only trained staff and phlebotomists will conduct blood draws- these will be the same trained staff who usually draw blood for routine care. The same will be done for urine collection in a private and protected space.

Minimizing potential emotional discomfort related to collection of sensitive data in survey and qualitative research. Study surveys will be administered in a private area so that participants can answer questions freely. For survey questionnaires, interviewers will record responses into a pre-programmed data collection software "interface" using portable tablets. In-depth interviews will be conducted by trained qualitative interviewers and recorded using a digital recording device. For both types of data collection, interviewers who are native speakers of languages of the research participants (in most instances, Dholuo, or Luyha), and will receive in-depth training on research ethics and methods for collection of sensitive information. We will use the same approach to training and oversight that we have successfully used for the collection of data on sexual behavior in the same setting, which is designed to create rapport and emotional comfort, and involves assurances of human subjects protections for participants, which include emphasizing the right to skip over questions that the participant does not want to answer, and the right to end an interview at any time, and use of the 'relationship history calendar' method with enables the collection of data on sexual behavior in a manner that contextualizes collection of sensitive sexual behavior data and minimizes a need to ask direct questions that are potentially stigmatizing (e.g. numbers of sexual partners within given time periods.) These assurances are discussed by interviewers not only during the process of obtaining informed consent; they are also repeated again, as needed, during the data collection process. No individually identifiable private information will be collected or recorded by interviewers, in either qualitative or quantitative data collection.

Maintaining confidentiality, confirming identity and obtained informed consent over phone-based data collection. In response to COVID-19, UCSF CHR, the regulatory body for research at UCSF, has indicated that all research studies that were previously approved and endeavoring to "change visits that are not essential to the health and/or well-being of participants from in-person visits to remote/virtual visits", are in fact making changes that do not increase risks to subjects, and therefore do not require prior IRB approval. Instead, UCSF asks studies to submit these changes at the time of the next scheduled modification or continuing review, and to note-to-file in the interim (*https://irb.ucsf.edu/irb-covid-19-faqs-resources*). KEMRI, the regulatory body for research in Kenya and our study sites, has encouraged research studies to utilize phone-based methods where possible, and is requesting that all studies submit modifications detailing the changes in the data collection format. This amendment to adjust to a potential need to conduct phone-based rather than in person data collection to respond to the COVID-19 epidemic, is being included as a modification to both UCSF and KEMRI IRBs, in order to ensure that study progress is not delayed. To ensure confidentiality we will draft and institute SOPs to confirm key information in beach management registers (BMU) - official data sources at the beach sites. We will ask potential participants key questions to confirm/verify identity. To ensure privacy, we will only conduct interviews when convenient for participants. We have also drafted a detailed verbal consent form, which includes additional sections to confirm and document participant's comprehension of the activities. These

measures will allow us to ensure that only intended participants take part in the survey, and are informed and have provided consent.

Data Security: Precautions will be taken to avoid any risks of data being inadvertently shared. We will make strong efforts to ensure the maintenance of privacy, confidentiality, and security of all study data that are obtained. We will develop standard operating procedures for data security and confidentiality procedures at collection, transfer, entry and storage levels, and make these readily accessible to all staff members who have access to confidential study data.

All study tablets used for data collection will be encrypted and password protected. They will be autonomously monitored so that the tablet can be wiped clean in the case of a tablet going missing. All electronic study data will be stored on a secure server with access limited only to authorized staff. All computers and servers will be encrypted and password-protected with limited access. Daily backup of the data will be done by a designated study staff onto a secure server at UCSF. All electronic information will be recorded using study identification numbers, rather than participant names.

Physical data collection forms will be stored at IRDO headquarters in Kisumu, which will be the operating headquarters of the study. No participants will have any identifier on the data forms; names and signatures will only be on the consent forms, which will be kept under lock and key by the Study Coordinator and after signing, will be accessible only to the MPIs, Coordinator and IRDO Regulatory Research Officer. At the end of the study, data will be kept for up to 5 years for electronic version and up to 2 years for paper forms, including consent forms.

Institutional Review Board approval: Approval from the University of California San Francisco institutional review board, and the Kenya Medical Research Institute institutional review boards will be obtained prior to initiation of any study activities. All study staff are required to undergo training in human subjects research, and good clinical practice. Having received approval for the intervention in our pilot study, we are confident that the risks to participants and our strategies to minimize these risks will be acceptable to the IRBs.

3.4 Data Safety and Monitoring Plan

This research presents minimal risk to participants- the duration of study follow-up is relatively short, interventions have previously been deployed (incentives) and testing technology (HIVST) is now WHO pre-qualified and in Kenya's HIV testing guidelines. Given the level of risk posed in this study, we have proposed in the sections to follow, a close monitoring and evaluation plan to assess the nature and frequency of adverse events. These steps will ensure that the study is being implemented as designed, following the strictest guidelines to protect participants' confidentiality and minimize physical, psychological, and social risks due to study participation. We believe these rigorous procedures will ensure the protection of the research participants.

Data and Safety Monitoring Plan

This study will employ three levels of data and participant safety monitoring including:

1. Event reporting
2. US and host country Institutional Review Board (IRB) review,
3. Data Safety Monitoring Board (DSMB) Review.

1. **Event reporting**: Participants will be encouraged to report serious adverse events to study team members through a hotline, and the study will also routinely inquire about the occurrence of such events. Events will be reported immediately to the UCSF and KEMRI IRBs. Study team members will be trained to complete descriptions of adverse events that will then be sent electronically to both the US and Kenyan site PIs. Thus, adverse events will be monitored at three levels; by the Principal Investigators, by the UCSF IRB, and by the KEMRI IRB. Of course, efforts will be taken to minimize the potential for adverse events. Research staff training will stress ensuring confidentiality and the study team will perform avoidance of negative events, and quality assurance/quality control (QA/QC) regularly to ensure adherence to proper enrollment procedures. Two types of reports will be made involving the conduct of the study. (1) Adverse Events Reports will be made using standard forms available from the relevant IRBs for adverse events associated with the study procedures or subject participation. We expect the risk of such events to be very low. (2) Incident Reports will also be made of any incidents involving the conduct of the study (e.g., enrolling a participant who did not meet eligibility). These reports will be made in the form of a letter or memo to the Chairs of the relevant IRBs signed by the Principal Investigators and shared with the DSMB as detailed in the sections below.

   We will provide participants with cards containing information on how to contact the local study team to report such events as breach of confidentiality, disruption of families, acts of discrimination, and physical harm. We will ask participants to return to the research site or otherwise contact research team members in order to make such reports as well as receive referrals to mitigate potential harm. Cards will not include identifying information about the study or references to IPV or HIV, so that the cards will not have the potential to jeopardize the confidentiality of participants. We will also establish links to social service organizations or provide referral information to participants who are in need of appropriate IPV services

2. **Institutional Review Boards**: Institutional Review Boards (IRB) in both the United States and in the host country Kenya will be responsible for the review of the study protocol, relevant background information, the informed consent documents, proposed plans for informing participants about the trial, and any other procedures associated with the trial. The IRBs will be responsible for evaluating the trial to determine, among other things, whether "[r]isks to subjects are minimized" and "[r]isks to subjects are reasonable in relation to anticipated benefits" (21 CFR 56.111(a)) and to determine whether risks to subjects are minimized by "using procedures which are consistent with sound research design" (21 CFR 56.111(a)(1)(i)). The IRBs will also be responsible for considering information arising from the trial that may bear on the continued acceptability of the trial at the study site(s) it oversees (see 21 CFR 56.103). The IRBs will be reported to annually by the study and PIs and will include communications from the DSMB as they occur. In addition, occurrences of Severe Adverse Events will be reported to all IRBs within their required reporting timeframes.

3. **Data Safety Monitoring Board (DSMB):** Overall, the level of risk to study subjects participating in the study is low and no investigational or study drugs are being provided or evaluated. The primary criteria supporting the use of a Data Safety Monitoring Board (DSMB) for this study is its classification as a Phase-III clinical trial per the US DHHS Guidance for Clinical Trial Sponsors on the Establishment of Clinical Trial Data Monitoring Committees (March 2006, OMB Control No. 0910-0581 Expiration Date: 10/31/2021).

   A Data Safety and Monitoring Board (DSMB) will be convened to provide oversight of the trial. The role of the DSMB will be to review a) study enrollment, b) fidelity to the intervention, and c) unexpected problems that might arise during the study. The study team will convene the DSMB consisting of 3-4 members whose expertise cover the following areas: 1) the specific disease(s) under study, 2) biostatistics, 3) ethics/patient advocacy, and 4) clinical trials. Membership will consist of persons completely independent of the investigators who have no financial, scientific, or other conflict of interest with the trial. A written DSMB Charter containing these responsibilities will be drafted and signed by all DSMB members and the trial leadership (including the PIs).

   Timing of DSMB Meetings: The DSMB will meet prior to commencement of study implementation, as needed during the implementation period (with a meeting taking place at least once every 12 months), and at end of the study for review of data and findings. At the annual meeting, the study Statistician and Principal Investigator will present summaries of the trial progress: enrollment, intervention fidelity and any unexpected problems. Following its meetings, the DSMB will present its recommendations in writing to continue or modify the trial to the NIH and the study Principal Investigator.

   Responsibilities of DSMB:

   These may include:

   - Review the research protocol, informed consent documents and plans for data safety and monitoring;
   - Evaluate the progress of the project, including periodic assessments of data quality and timeliness, recruitment, accrual and retention, participant risk versus benefit, and other factors that can affect study outcome;
   - Review study performance, make recommendations and assist in the resolution of problems reported by the PI;
   - Make recommendations to protect the safety of the study participants;
   - Make recommendations concerning continuation, termination or other modifications of the trial based on the observed beneficial or adverse effects of the treatment under study;
   - Ensure the confidentiality of the study data and the results of monitoring; and,
   - Review any problems with study conduct, enrollment, sample size, and/or data collection.

   Monitoring for Unanticipated Problems: In the unlikely event that a serious adverse event (SAE) is considered possibly, probably or definitely related to the study, or in the event of unexpected

incidents or protocol violations, reporting to University of California-San Francisco CHR and Kenya Medical Research Institute SERU IRBs will be reported as outlined in the protocol. Suspected events will be reviewed by study investigators prior to submission to the IRB.

Data Safety Monitoring Reports: A report to the DSMB will be prepared annually. Interim reports will describe enrollment, intervention fidelity and unanticipated problems.

DSMB Membership and Affiliation: We will constitute a DSMB for the study that includes specialists from Kenya and the US – including clinicians, scientists, and other relevant specialists who have HIV prevention research expertise in sub-Saharan Africa. The DSMB membership will be reviewed and approved by NIMH. Invitations to be part of the study DSMB will be issued when the study implementation is in progress and confirmed DSMB members and their CVs will then be sent to NIMH. DSMB members will have no direct involvement with the study investigators or intervention. Each DSMB member will sign a Conflict of Interest Statement which includes current affiliations, if any, with pharmaceutical and biotechnology companies (e.g., stockholder, consultant), and any other relationship that could be perceived as a conflict of interest related to the study and / or associated with commercial interests pertinent to study objectives

Confidentiality and Conflicts of Interest: All materials, discussions and proceedings of the DSMB are completely confidential. Members and other participants in DSMB meetings are expected to maintain confidentiality. The DSMB will routinely assess potential conflicts of interest of DMC members and provide disclosure to all DMC members of any potential conflicts that are not thought to impede objectivity and thus would not preclude service on the DMC.

3.5 Adverse Events and Serious Adverse Events

Minimizing probability of adverse reactions to test results and ensuring receipt of appropriate services: To ensure correct usage of self-tests and to minimize the probability of psychological distress due to HIV testing, we will include simple instruction materials with each self-test on how to use the tests, in English and local languages (see Appendix 1 for materials we have prepared). These instruction materials have been developed by us and used in several HIVST studies (including studies that other teams are conducting in eastern and southern Africa). They were well received by women and their sexual partners. In addition, the network-central promoter training will include messaging and informational materials including clear information on the importance of seeking confirmatory HIV testing for those who obtain an HIV-positive test result (which is recommended by the WHO and the Kenyan Ministry of Health) – and a list VCT clinics in the area where free confirmatory is available. In addition, training and informational materials will emphasize the importance of screening for PrEP, in the case of an HIV-negative test result, and information will be provided on clinics in the area where free HIV care and treatment and PrEP are available. We will also establish a support telephone line (hotline) that study participants can call at any time that will put them in touch with the study coordinator, who will be ready to provide additional information on where to seek further testing, care or treatment, or prevention services.

3.6 Definition of Unanticipated Problems

This protocol uses the definition of Unanticipated Problems (UPs) as defined by the Office for Human Research Protections (OHRP). OHRP considers unanticipated problems involving risks to participants or others to include, in general, any incident, experience, or outcome that meets all of the following criteria:

- Unexpected in terms of nature, severity, or frequency given (a) the research procedures that are described in the protocol-related documents, such as the Institutional Review Board (IRB)-approved research protocol and informed consent document; and (b) the characteristics of the participant population being studied;
- Related or possibly related to participation in the research ("possibly related" means there is a reasonable possibility that the incident, experience, or outcome may have been caused by the procedures involved in the research); and
- Suggests that the research places participants or others at a greater risk of harm (including physical, psychological, economic, or social harm) than was previously known or recognized

3.7 Unanticipated Problems Reporting

The investigator will report unanticipated problems to the reviewing Institutional Review Board (IRB) and study sponsor. The UP report will include the following information:

- Protocol identifying information: protocol title and number, PI's name, and the IRB project number
- A detailed description of the event, incident, experience, or outcome
- An explanation of the basis for determining that the event, incident, experience, or outcome represents an UP
- A description of any changes to the protocol or other corrective actions that have been taken or are proposed in response to the UP

UPs that are serious adverse events (SAEs) or protocol violations will be reported to the IRBs within 7-10 working days of the investigator becoming aware of the event (see section 10.1.10 for individual IRB reporting timelines).

3.8 Reporting Unanticipated Problems to Participants

Participants will be informed of any UP that changes the study's risk/benefit ratio and/or requires modification to the informed consent. The nature of the UP will determine how and when participants will be notified.

4 REGULATORY, ETHICAL, AND STUDY OVERSIGHT CONSIDERATIONS

4.1 Informed Consent Process

Informed consent will be obtained for the Owete RCT participants and for participants of the qualitative focus groups and in-depth interviews to better understand mechanisms of the intervention action. Verbal

as well written consent forms will be utilized. Study team members will find a private place; carefully explain the nature and purpose of the study to each potential participant, potential risks and benefits, compensation for participation, and will describe the two study groups to which participants will be randomized. The consent process will be offered in English, Kiswahili, or Dholuo (as per the participant's preferences). Our study team has prior experience in obtaining informed consent for research and clinical trials within the cultural context of in Kenya. The informed consent procedure has been designed to maximize understanding of potential risks. Participants will be told that they may decline to participate at any point.

4.1.1 CONSENT/ASSENT

The following informed consent form (ICF) materials will be used in the main study:

- Phone study contact script (verbal)
- Eligibility screening consent (verbal)
- Census and screening form (written)
- Social network survey consent (written)
- Survey, HIVST, qualitative, medical record release, viral load, urine assay, and future contact consent form (written)
- Follow up survey, qualitative, medical record release, viral load, urine assay and future contact consent form (written)
- Promoter consent form (2 versions- control and intervention) (written)
- Photo consent forms

These consents are included as attachments to the protocol.

4.1.2 CONSENT PROCEDURES AND DOCUMENTATION

All consent forms will be translated into the local language and back translated into English to ensure correct use of language. Consent forms will be read aloud to participants by trained staff. The informed consent will describe the purpose of the study, all the procedures involved, and the risks and benefits of participation. Interviewers will ask participants to summarize the study and explain the reasons why they want to participate. Either a signature or a thumbprint (for those who cannot read) will be acceptable to confirm informed consent for participation in the study, in the case of written consent forms.

The process and timing of obtaining informed consent for study participation is detailed below:

1. Prior to the study start, we will conduct a pilot survey and qualitative interviews with potentially eligible men listed in the BMU census registry in the pilot site. If interested, study staff will administer a verbal script for informed consent, to screen men's potential eligibility to be in the pilot (the same screener used for the main study). Both the phone introduction and eligibility forms are verbal and included as attachments. The screening will be documented using a census and screening form, also attached. Following eligibility screening, written informed consent will be

obtained to enroll up to n=200 eligible men to participate in the pilot survey, using the pilot informed consent form. Some or all of these interviews may also be conducted over the phone, in response to the restrictions placed by the COVID-19 response efforts. For phone based data collection, we will include the phone data collection screening verbal script, a verbal consent for screening, and a verbal consent to participate-all of which are included as amendments to this protocol.

The in-person pilot activities will use the following forms (and their local-language versions):

a. *English phone screening script*
b. *English census and screening form*
c. *English verbal script for informed consent for study screening*
d. *English written consent for pilot*

The phone pilot activities will use the following forms (and their local-language versions):

a. *English pilot phone screening script*
b. *English pilot screening form*
c. *English verbal script for informed consent for study screening*
d. *English verbal phone consent for study pilot*

2. At study start, study team members will use a screening script, to introduce the study for potentially eligible men listed in the BMU census registry in the study sites. If interested, study staff will administer a verbal script for informed consent, to screen men's potential eligibility to be in the study. Both the phone introduction script and consent are verbal and included as attachments. The screening will be documented using a census and screening form, also attached. This will allow us to conduct these activities remotely, allowing for COVID-19 precautions.
3. After eligibility screening, written informed consent for the social network survey will be administered to up to n=1000 men to participate in the social network mapping process.
4. Within the first quarter of the study start, the network data will be analyzed and the sub-group of up to n=90 men who are socially connected, network central men will be selected for recruitment as promoters. Study staff will then obtain written informed consent from up to n=45 men in the intervention arm using the Informed Consent for Intervention Promoters and from up to n=45 men in the control arm using the Informed Consent for Control Promoters. This procedure will include consent to participate in trainings, to distribute information, HIVSTs (for intervention) and vouchers to peers in their networks, and to be contacted by study team members for follow up activities during the study period.
5. After the social networks are mapped, and clusters randomized to control or intervention, and promoters consented, written informed consent will be obtained to enroll up to n=>=1000 eligible men to participate in the study, using the *survey, HIVST, qualitative, medical record release, viral load, urine assay, and future contact consent* form. Potential participants will be presented and explained a consent form to participate in the baseline survey, 3 month follow up survey, qualitative interviews or focus group discussions if selected, contact for future research, as well as consent to use an HIVST. Further, this consent will ask for release of test dates, appointment dates, and medication information as well as other medical records. It will include permission for the use of the urine assay to test for PrEP adherence, if applicable and for those who are

subsequently identified as HIV-positive and enrolled in care, venous blood draws for viral load measurements during study scheduled visits. If verbally authorized, the viral load results may also be released to their provider to guide their care.

6. For men who receive a self-test and incentive voucher from a promoter (intervention) or a voucher for referral to the facility (control) but who were not part of the social network survey or the baseline survey consent procedures, we will consent them anew, following screening procedures similar to the baseline survey and study enrollment (men, >=18 yrs., working in fishing related industries), and consent for the 3 month follow up survey, qualitative interviews or focus group discussions if selected, contact for future research. Further, this consent will ask for release of test dates, appointment dates, and medication information as well as other medical records. It will include permission for the use of the urine assay to test for PrEP adherence, if applicable, and for those who are subsequently identified as HIV-positive and enrolled in care, venous blood draws for viral load measurements.

4.2 Study Discontinuation and Closure

This study may be temporarily suspended or prematurely terminated if there is sufficient reasonable cause. Notification documenting the reason for study suspension or termination will be provided to study participants, the funding agency, and regulatory authorities.

4.3 Confidentiality and Privacy

Participant confidentiality and privacy is strictly held in trust by the participating investigators, their staff, and the sponsor. This confidentiality is extended to the data being collected as part of this study. Data that could be used to identify a specific study participant will be held in strict confidence within the research team. No personally-identifiable information from the study will be released to any unauthorized third party without prior written approval of the sponsor/funding agency. All research activities will be conducted in as private a setting as possible. However, elements such as the baseline survey, may be conducted in areas where other individuals are present. Our study will do everything possible to ensure privacy in this case. The study participant's contact information will be securely stored at each clinical site for internal use during the study. At the end of the study, all records will continue to be kept in a secure location for as long a period as dictated by the reviewing IRB, institutional policies, or sponsor/funding agency requirements.

Data Security

All information will be recorded using study identification numbers, rather than participant names, and stored securely in locked offices at a study data center. All study computers will be password encrypted and kept in locked offices.

Risk of HIV Status Disclosure

Given the sensitive and private nature of the HIV-status of participants of the RCT, extra measures will be put in place to ensure maintenance of privacy, confidentiality and security of the data obtained.

Measures Taken to Ensure Confidentiality of Data Shared per the NIH Data Sharing Policies

It is NIH policy that the results and accomplishments of the activities that it funds should be made available to the public (see *https://grants.nih.gov/policy/sharing.htm*). The PI will ensure all mechanisms used to share data will include proper plans and safeguards for the protection of privacy, confidentiality, and security for data dissemination and reuse (e.g., all data will be thoroughly de-identified and will not be traceable to a specific study participant). Plans for archiving and long-term preservation of the data will be implemented, as appropriate.

4.4 Future Use of Stored Specimens and Data

There is no planned use of specimens. Plans for data use are described in detail under section 13.8.

4.5 Key Roles and Study Governance

Protocol Co-Chair	Protocol Co-Chair	Protocol Co-Chair
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4.6 Safety Oversight

Safety oversight in this minimal risk study will be led by the study investigators and by adherence to the quality management plan (QMP) described in section 12.1.9

4.7 Quality Assurance and Quality Control

Each clinical site will perform internal quality management of study conduct, data collection, documentation and completion. All sites will follow a common quality management plan.

Quality control (QC) procedures will be implemented as follows:

a. Informed Consent Review

Study staff will review both the documentation of the consenting process as well as all the completed consent documents. This review will evaluate compliance with GCP, accuracy, and completeness. Feedback will be provided to the study team to ensure proper consenting procedures are followed and retraining done as appropriate.

b. Data

Data will be captured on source documents or entered directly onto electronic CRFs. To ensure accuracy study staff will compare a representative sample of source data against the database, targeting key data points in that review. Reports based on recent data will be made available to study staff and investigators.

c. Intervention Fidelity

Consistent delivery of the study interventions will be monitored throughout the study. Procedures for ensuring fidelity of intervention delivery will be detailed in subsequent protocol amendments.

d. Protocol Deviations

The study team will review protocol deviations on an ongoing basis and will implement corrective actions when the quantity or nature of deviations are deemed to be at a level of concern. As required, the investigators will provide direct access to all trial related sites, documents, and regulatory records for the purpose of monitoring and auditing by local regulatory authorities.

4.8 Data Collection and Management

The UCSF-based study director will oversee quantitative and qualitative activities for this study while data acquisition in Kenya will be managed in collaboration with Impact Research and Development Organization (IRDO) and the in-country study data manager. A UCSF-based data manager will oversee the work of the Kenya-based data manager and provide support.

Data Storage

i. Provision for database management: Data from the tablets will be uploaded weekly to a UCSF-based server. All records will be kept on password protected tablet computers at KEMRI and UCSF. All participant record forms will be kept in individual files in a secured filing cabinet in an access-limited room at the health facility. Participant names and addresses will be stripped from the database prior to analysis.
ii. Description of devices to be used for storage: Data collected for this study will be entered into handheld computer tablets operating RedCap system. The database will be protected by a separate password on password-protected tablets.

In order to ensure data security and integrity, the following measures will be implemented:

- All members of the study team will be educated in the study protocol prior to the onset of the study.

- Detailed Standard Operating Procedures (SOPs) will be written for all project activities and be provided to relevant team members.
- Team members will be thoroughly trained on the SOPs.
- Where applicable, team members will receive additional training on the use of tablet computers.
- All data transcribed from paper will be double data entered or verified.
- All electronic data will be backed up regularly.
- All data will be transferred to the main secure server. This sever is backed up on a daily basis and a monthly backup is stored off-site and on the cloud.
- All computers, including the tablets, will be password protected.
- All computers, including tablets, will be locked in a secure room each night.
- Any Log Books and CRF's will be locked in a secure room each night.

4.9 Study Records Retention

Data archives will be kept for periods based upon the terms of the agreement between the funding organization UCSF and IRDO. Datasets that are required to be retained for periods as prescribed by law will also be kept following the respective durations as set in the enacted laws of Kenya. In general, study data will be kept electronically for a period of at least 5 years post completing of the study. Data will remain on the password secured study servers. After 5 years from the close of the study, all paper records will be destroyed and the electronic records will be removed from the server, but retained on Archival, password-protected cloud servers.

4.10 Protocol Deviations

It will be the responsibility of the site investigators and staff to use continuous vigilance to identify deviations or violations and report violations that meet the IRB definition of reportable events. Protocol violations that occur at UCSF will be reported to the UCSF CHR IRB within 10 working days of the PI's awareness. Protocol violations that occur on-site will be reported to the KEMRI IRB within 7 working days. SOPs will describe the process for communicating with study coordinators and investigators and the event reporting procedures.

4.11 Publication and Data Sharing Policy

The results will be shared with the study site staff; NASCOP and other stakeholders in relevant forums. The results will also be presented at local and international meetings and conferences where other researchers and policymakers are present, particularly those working on HIV prevention and treatment. Our conclusions regarding the implications for health services planning, and our policy recommendations based on the findings, will be shared with representatives of the Government of Kenya including Ministry of Health officials at the national and Siaya County level, as well as the National AIDS Control Program of the Government of Kenya (NASCOP). We will prepare manuscripts containing our quantitative and qualitative results and submit them to peer-reviewed journals for publication and wider dissemination. In

addition, findings will be shared with study participants in year 5, through communications in local community dissemination meetings in the study sites, as well as via circulation of press releases to local media. Local community dissemination meetings will be advertised through local leadership structures (including Beach Management Units) and printed notices at the study sites.

No individual identities will be used in any reports or publications resulting from the study. The researchers will publish results of the study in accordance with NIMH, UCSF, IRDO, and KEMRI policies and procedures.

4.12 Conflict of Interest

Any actual conflict of interest of persons who have a role in the design, conduct, analysis, publication, or any aspect of this trial will be disclosed and managed. Furthermore, persons who have a perceived conflict of interest will be required to have such conflicts managed in a way that is appropriate to their participation in the design and conduct of this trial. The study leadership in conjunction with the NICHD has established policies and procedures for all study group members to disclose all conflicts of interest and will establish a mechanism for the management of all reported dualities of interest.

4.13 Abbreviations and Special Terms

ART	Antiretroviral Treatment
BMU	Beach Management Unit
CHR	Committee on Human Research (UCSF)
CMP	Clinical Monitoring Plan
CRF	Case Report Form
eCRF	Electronic Case Report Forms
FGD	Focus Group Discussion
GCP	Good Clinical Practice
HIV	Human Immunodeficiency Virus
HTS	HIV Testing Services
ICF	Informed Consent Form
ICH	International Council on Harmonization
IDI	In-depth interviews
IRDO	Impact Research and Development Organization
IRB	Institutional Review Board
KEMRI	Kenya Medical Research Institute
LTFU	Lost to Follow-Up
NASCOP	National AIDS and STI Control Programme
NCT	National Clinical Trial
NIMH	National Institute of Mental Health (NIH)
NIH	National Institutes of Health
OHRP	Office for Human Research Protections

PI	Principal Investigator
PrEP	Pre-Exposure Prophylaxis
QA	Quality Assurance
QC	Quality Control
QMP	Quality Management Plan
RCT	Randomized Controlled Trial
SAE	Serious Adverse Event
SOA	Schedule of Activities
SOP	Standard Operating Procedure
SSA	Sub-Saharan Africa
UCSF	University of California, San Francisco
UPenn	University of Pennsylvania
UP	Unanticipated Problem
US	United States
VL	HIV Viral Load

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6 APPENDICES

6.1 DATA COLLECTION INSTRUMENTS AND TOOLS

These attachments are included as a part of the protocol submission.

6.1.1 BMU DATA ABSTRACTION FORM

6.1.2 PILOT SURVEY

6.1.3 PILOT QUALITATIVE INTERVIEW GUIDE

6.1.4 BASELINE SOCIAL NETWORK SURVEY

6.1.5 BASELINE SURVEY

6.1.6 3-MONTH FOLLOW UP SURVEY (THREE VERSIONS)

6.1.7 PROMOTER TRAINING CURRICULUM AND ASSESSMENT TOOLS

6.1.8 BASELINE QUALITATIVE IN-DEPTH TOOLS (COMBINED IDI, KII, FGD GUIDES)

6.1.9 3 MONTH FOLLOW UP QUALITATIVE IN-DEPTH TOOLS (COMBINED IDI, KII, AND FGD GUIDES)

6.1.10 6 MONTH FOLLOW UP QUALITATIVE IN-DEPTH TOOLS (COMBINED IDI, KII, AND FGD GUIDES)

6.1.11 6 and 12 MONTH ADHERENCE ASSESSMENT

6.2 Informed Consent Forms and Screening Forms

These consent and screening form attachments are included as a part of the protocol submission.

6.2.1 PHONE ELIGIBILITY SCREENING SCRIPT (VERBAL)

6.2.2 ELIGIBILITY SCREENING CONSENT FORM (VERBAL)

6.2.3 CENSUS AND SCREENING FORM (WRITTEN)

6.2.4 SOCIAL NETOWRK CONSENT (WRITTEN)

6.2.5 SURVEY, HIVST, QUALITATIVE, MEDICAL RECORD RELEASE, VIRAL LOAD, URINE ASSAY, AND FUTURE CONTACT CONSENT (WRITTEN)

6.2.6 FOLLOW UP SURVEY, HIVST, QUALITATIVE, MEDICAL RECORD RELEASE, VIRAL LOAD, URINE ASSAY, AND FUTURE CONTACT CONSENT (WRITTEN)

6.2.7 PHOTO/MEDIA CONSENT (WRITTEN)

6.2.8 PROMOTER CONSENT (WRITTEN)-2 VERSIONS (INTERVENTION AND CONTROL)

6.3 Other study tools

These attachments are also included as additional study tools/resources.

STUDY CONTACT CARD