



---

*REDUCING COMMUNITY LEVEL STIGMA AND IMPROVING  
HIV TESTING SERVICE UPTAKE AMONG MEN IN SOFALA  
PROVINCE, MOZAMBIQUE*

Report to USAID

October 19, 2018





## TABLE OF CONTENTS

<b>Executive summary:</b> .....	3
<b>Background:</b> .....	7
<b>Objective:</b> .....	8
<b>Methods:</b> .....	8
Site descriptions: .....	8
The <i>Sawa Sawa</i> Intervention: .....	8
Evaluation overview: .....	11
Longitudinal community-based survey: baseline & endline surveys: .....	11
Intervention Process Data: .....	13
Qualitative research: .....	13
Statistical analysis: .....	14
CHASS Clinic Data: .....	14
<b>Results</b> .....	15
Longitudinal survey: Baseline results .....	15
<i>Sawa Sawa</i> Intervention process data: Community Dialogues, Positive Prevention, SMYes, and HIV Testing Campaign .....	18
Qualitative findings of men participating in Positive Prevention groups: .....	19
Past experiences of HIV stigma in the community: .....	19
Engagement in <i>Sawa Sawa</i> and impact of <i>Sawa Sawa</i> : .....	20
Longitudinal survey: Endline results and intervention impact estimates: .....	21
Primary outcomes: changes in community-level stigma and HIV testing among men .....	24
Other outcomes of interest: .....	24
Clinic data: ART initiation among men .....	25
<b>Discussion and Recommendations:</b> .....	26
<b>Acknowledgments:</b> .....	29
<b>References:</b> .....	30



## EXECUTIVE SUMMARY:

**Background:** Ending stigma and discrimination is essential to halting the spread of HIV. Stigma at both the individual and community level has consistently been a barrier to engagement in HIV services, particularly among men. In communities where isolation and mistreatment is evident, many people living with HIV (PLHIV) are forced to live, seek services, and utilize ARV medications in the context of fear and shame.

The current evidence base highlights critical gaps and challenges with HIV testing, treatment and care, which are associated with HIV stigma in its many forms. While individual-level characteristics, such as knowledge and attitudes, are important in engagement in the HIV care continuum, expressions of stigma, including the perception that community stigma towards PLHIV is high, are equally critical to address.

In Mozambique, the 2013 People Living with HIV Stigma Index revealed relatively high levels of stigma experienced by PLHIV. Further, prior research from Maputo, Mozambique have found that the fear of discrimination plays an important role in low uptake of HIV testing. Here, as well, the fear of stigma as well as partner/family abandonment often discourages those who are living with HIV from disclosing their HIV status and gaining the needed social support for ART initiation and adherence.

In 2017 the Health Communication Capacity Collaborative (HC3), led by Johns Hopkins Center for Communication Programs (CCP), implemented a comprehensive community-based intervention called *Sawa Sawa*, in the Sofala Province of Mozambique – one of the provinces most affected by HIV - to reduce HIV stigma within the community, leading to improved HIV testing among men. This report details the results of an evaluation that was conducted to estimate the impact of this intervention on community-level stigma and HIV testing outcomes among men.

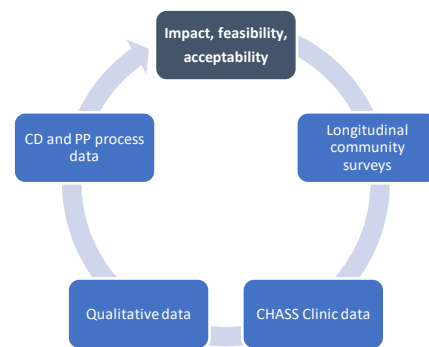
**The *Sawa Sawa* Intervention:** The *Sawa Sawa* (which means equality in the local Sena language) intervention was comprised of four main components, Community Dialogues, Positive Prevention sessions, radio spots and call-in programs, and an SMS-based linkage to care system, *SMYes*, that was coupled with health facility focal points. The Community Dialogues consisted of six sessions, held once a week for six weeks, and targeted all community members, both men and women including those living with HIV and those with unknown or negative status. Positive Prevention dialogues consisted of seven sessions, held twice a week for 3.5 weeks, and targeted those living with HIV. Five radio shows and two spots were aired on the local Dondo district community radio station to broaden the reach of the community level intervention, reinforcing the same messages given during the Community Dialogue and Positive Prevention sessions. The Community Dialogues, Positive Prevention, *SMYes*, and radio programs were implemented continuously between March and December 2017. The *SMYes* application, was a referral system which sent a notification from a *Sawa Sawa* facilitator to a *Sawa Sawa* focal person at the health center informing them the referral had been made. Once the person came to the health facility, they were encouraged to locate the *Sawa Sawa* focal point, who was clearly identifiable in a bright yellow shirt and an integral part of the facility, to check in and receive guidance and assistance on next steps. Individuals identified with referral needs through *Sawa Sawa* activities were linked into the *SMYes* system and made aware of the facility-based *Sawa Sawa* focal point.

An HIV testing campaign also took place in the intervention communities in October 2017. Seven providers from local health facilities provided HIV testing services (HTS) directly in the community throughout the month. *Sawa Sawa* mobilizers supported these activities by recruiting community members and informing participants that testing was available outside of the health facilities in certain locations. Participants who tested positive or otherwise required a related referral to health services were linked into *SMYes* and informed of the availability of the *Sawa*

*Sawa* focal point located within the health facility. All intervention activities were implemented in Dondo district, whereas Nhamatanda district served as the control district.

**Evaluation:** This study was a quasi-experimental design, centered on the objective of estimating the effect of a pilot community-level stigma reduction intervention, *Sawa Sawa*, on 1) community-level stigma and 2) changes in HTS among adult men. The evaluation also assessed for evidence of improvements in ART initiation among adult men that were associated with the *Sawa Sawa* intervention, though it was not powered nor designed to identify significant change in initiation. The design utilized multiple methodologies and data sources, including: 1) a longitudinal survey among more than 3,000 community members in intervention and control districts to measure community-level stigma, changes in HIV testing and engagement in the overall HIV care continuum among adult men, 2) qualitative research among 40 men living with HIV in intervention sites and who participated in Positive Prevention groups to understand how and the mechanisms by which *Sawa Sawa* changed stigma and engagement in the HIV care continuum among men living with HIV, 3) analysis of intervention process data related to Community Dialogues, Positive Prevention Groups, and *SMYes* referrals, and 4) analysis of Clinical and Community HIV/AIDS Services Strengthening (CHASS) clinic-level data to compare trends in facility-based ART initiation among men across intervention and control districts. This mixed approach was both in response to the multifaceted design of the proposed intervention and, in addition to measuring the impact of the intervention, also aimed to measure acceptability, feasibility and safety of the intervention.

Evaluation inputs for comprehensive analysis of the *Sawa Sawa* intervention



**Findings:** The community-based baseline survey was conducted from November - December 2016. A total of 3,017 participants were enrolled and surveyed, including 1,510 in Dondo and 1,507 in Nhamatanda. By design, two-thirds of participants were men (N=2,005). The baseline survey demonstrated notable gaps in HIV testing, highlighting that women were more likely than men to have a recent HIV test (47.6% vs. 38.3%,  $p < 0.001$ ). The most common reasons among men for failure to undergo HTS within the last 12 months included: feeling healthy/having no symptoms of HIV (59.5%), no time for testing (27.9%), and not perceiving themselves to be at risk for HIV (19.7%). However, in multivariable logistic regression analysis, men who reported any individual stigma toward PLHIV had 36% lower odds of recent HIV testing (aOR: 0.64, 95%CI: 0.44-0.92,  $p = 0.015$ ). Multivariable analysis also highlighted the importance of exposure to informational materials, radio programs, and community discussions in HIV testing among men, as men who had received fliers or had participated in past community discussions had increased odds of recent HIV testing.

A total of 9,175 participants engaged in *Sawa Sawa* Community Dialogues and Positive Prevention in the four Dondo communities. In addition to participating in the Community Dialogue and Positive Prevention sessions, participants were often provided with appropriate health care referrals and were most commonly provided referrals for HTS, general consults, ART initiation or re-initiation. Process data from the HIV testing campaign revealed that a total of 3,107 people were tested, of which 78% were men. Among the participating men, 4.5% were newly diagnosed and referred for ART.

A total of 40 men living with HIV and who had participated in Positive Prevention groups completed qualitative in-depth interviews in November 2017. These interviews highlighted past experiences of stigma, observed changes in stigma associated with the intervention, and the mechanisms by which *Sawa Sawa* supported HIV care. Participants acknowledged that HIV stigma was prevalent at the community level prior to the implementation of the intervention regardless of the extent to which they personally experienced stigma. Stigma in community was largely associated with a notion that men were promiscuous and disloyal within their relationships. Decreases in community stigma

and self-stigma, however, were greatly attributed to *Sawa Sawa*. The participants noticed that people in their community were more willing to help them, now thinking that they were equal.

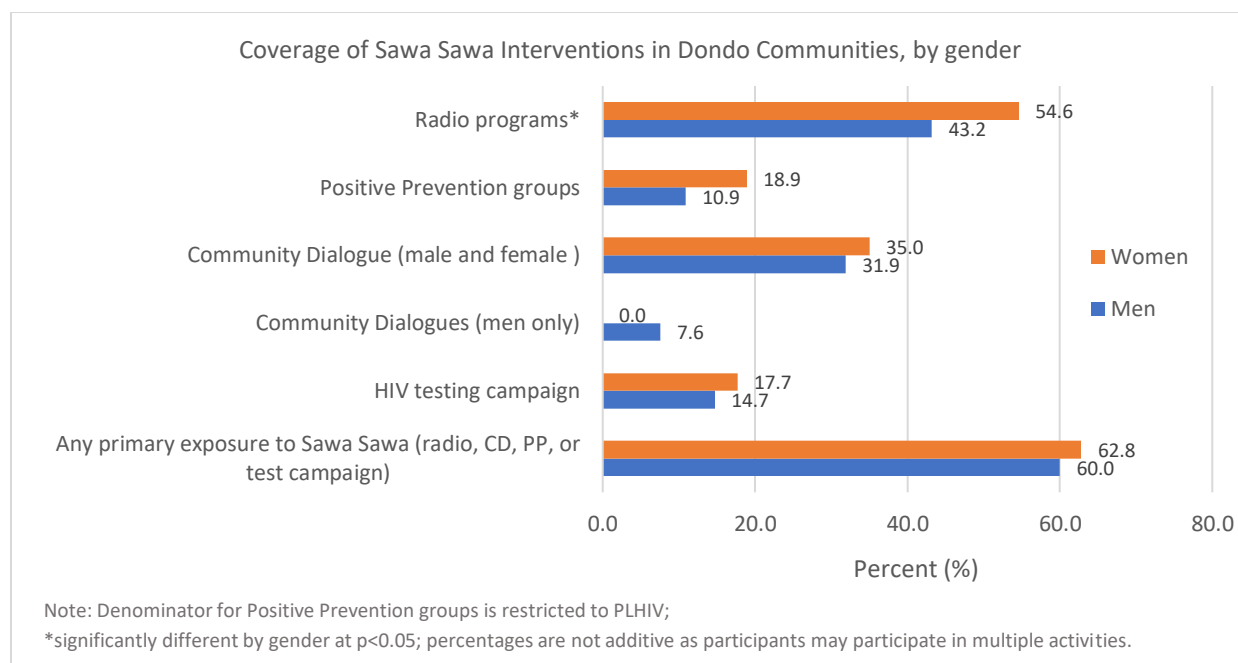
*I think that the behavior in the community changed a lot, because the community knows ways that people with AIDS and people without AIDS are the same.* – IDI 20, aged 57 years

Many of the participants maintained a positive outlook on their own health status and a high confidence in their ability to manage HIV after attending Positive Prevention sessions. In addition to stigma, people were more likely to adopt behaviors to take care of themselves after the intervention.

*There is something that changed a lot, I used to drink but since I joined Sawa Sawa when they explained to me what happens when you drink and you have HIV/AIDS, I haven't drunk anymore till now... I don't stay out late anymore and I take my medication at the same time every day.*

– IDI 20, aged 57 years

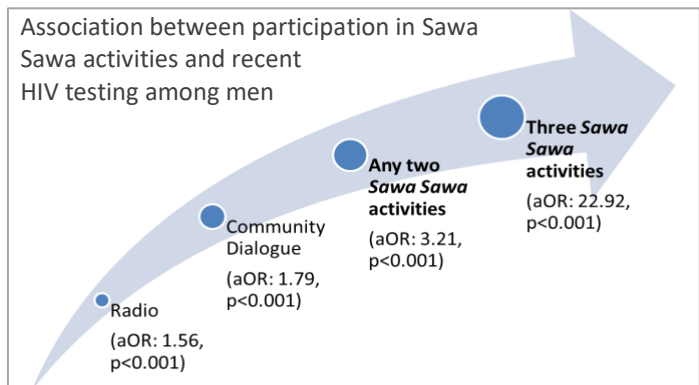
The community-based endline survey was conducted from February to March 2018. A total of 2,447 people who participated in the baseline were retained and participated in the endline survey, resulting in 81% retention. As the community-based survey is a random sample of the population, the survey gives a sense of the coverage of the various *Sawa Sawa* activities across the intervention communities. Radio programs had the greatest coverage, as over 47% of the sample reported hearing the *Sawa Sawa* radio programs and spots. A total of 16% of the population were tested via the *Sawa Sawa* HIV testing campaign; of these, 40% of men reported that they were tested for the first time. In total, 60% of the population was exposed to at least one *Sawa Sawa* activity, with no difference by gender. Individuals who may not have directly participated in *Sawa Sawa* activities were often exposed secondarily to *Sawa Sawa* messages through conversations with other people who had participated.



Men who participated in at least one *Sawa Sawa* activity tended to report more frequent sexual behaviors, including recent sexual intercourse (90% vs. 84% among those who had not participated) and greater numbers of lifetime sexual partners (mean: 7 partners, range: 1-400 compared to a mean of 6 partners, range: 1-50 among those who did not participate in *Sawa Sawa*).

The primary objectives were to assess changes in community stigma over time and changes in recent HIV testing among men that were associated with the intervention. Using the total stigma scale score (composite of shame, discrimination and inequity subscales), a significant reduction in stigma was observed that was associated with the *Sawa Sawa* intervention (Beta: -2.38; 95%CI: -3.07, -1.69;  $p < 0.001$ ). The odds of HIV testing among men, a primary outcome of interest, significantly increased with the intervention (OR: 1.32; 95%CI: 1.01-1.74;  $p = 0.049$ ).

While several components of the intervention were independently associated with improvements in HIV testing, the combined approach seemed to provide the greatest benefit in which the odds of testing for HIV increase for men who were exposed to two (aOR: 3.21; 95%CI: 1.99-5.20;  $p < 0.001$ ) or three activities (aOR: 22.92; 95%CI: 7.70-68.25;  $p < 0.001$ ), compared to none.



Finally, among the 217 men living with HIV who participated in baseline and endline surveys, non-significant improvements in ART uptake among men were observed in the intervention communities (aOR: 1.23; 95%CI: 0.36, 4.14  $p > 0.10$ ). This was supported by an analysis of CHASS clinic data that also demonstrated increased trends in ART initiation among adult men in the intervention sites, compared to the control sites.

**Conclusions:** Stigma plays an important role in engagement across the HIV care continuum; however, the implementation of *Sawa Sawa*, a community-based stigma reduction and HIV care continuum intervention, demonstrated significant impacts that may be translatable to other settings. *Sawa Sawa* was both effective at reducing community-level stigma and improving HIV testing among men. The combined use of radio programs, an HIV testing campaign, and community discussions through Community Dialogues and Positive Prevention directly reached over 60% of the population in the intervention communities. The combination approach to *Sawa Sawa* was critical to the success of the intervention, not only increasing coverage within the community, but also exponentially increasing the effect of the intervention on HIV testing among men with increased engagement in *Sawa Sawa* activities. *Sawa Sawa* also appeared to reach appropriate candidates for HIV testing, tending to engage men who reported great sexual risk behaviors and activity.

While this study was not designed or powered to assess ART initiation among men as a primary outcome, there is evidence to suggest that this intervention does improve treatment outcomes for men. A magnitude and direction of effect on ART initiation among men associated with the intervention was observed in both the longitudinal survey data and CHASS clinical data. While these findings are not statistically significant, they suggest a relationship and were further supported by qualitative findings. This warrants future implementation research to understand the full impact of the intervention on ART initiation and re-initiation in light of efforts to maximize test-and-start approaches.

*Sawa Sawa* is a simple low-cost intervention that provides comprehensive results. Evidence suggests that interventions to improve engagement in HTS - or the broader HIV care continuum - will not reach their maximum effectiveness without efforts to both reduce stigma and to increase access to HIV prevention and care information and educational opportunities. Findings from the evaluation of *Sawa Sawa* suggest that this intervention is feasible, acceptable and effective for both reducing community-based HIV stigma and for improving HIV testing and care among men in Mozambique.



## **BACKGROUND:**

Ending stigma and discrimination is essential to halting the spread of HIV. Stigma at both the individual and community level has consistently been a barrier to engagement in HIV services, particularly among men. In communities where isolation and mistreatment is evident, many people living with HIV (PLHIV) are forced to live, seek services, and utilize medications in the context of fear and shame.<sup>1</sup>

A recent systematic review identified critical gaps and challenges with HIV testing, treatment and care are associated with stigma.<sup>2</sup> While individual-level characteristics, such as knowledge and attitudes, were important in engagement in the HIV care continuum, expressions of stigma, including the perception that community stigma towards PLHIV is high, are equally critical to address. Across the treatment continuum, stigma is an important factor that affects HIV continuum outcomes.

Specifically in Mozambique, the 2013 People Living with HIV Stigma Index revealed relatively high prevalence of stigma towards PLHIV.<sup>3</sup> More than half of all respondents had experienced some form of stigma and discrimination due to their HIV status in the 12 months preceding the survey, 36% were victims of psychological pressure or manipulation by their spouse, 24% were verbally threatened or insulted, and some were excluded from family activities (12.8%) and social activities (7.2%). Around 60% expressed negative feelings about themselves for being HIV-positive: 35.5% had low self-esteem, 34.8% felt ashamed, 32.8% felt guilty, and 10% felt desire to commit suicide.<sup>3</sup>

**HIV Testing:** A recent review of community-level factors across the treatment continuum outlined evidence pertaining to stigma as it interferes with positive engagement and outcomes across the continuum.<sup>4</sup> Perceived and experienced stigma in communities leads to lower levels of HIV testing, affecting the critical first step in the continuum.<sup>5-27</sup> In Maputo, Mozambique, it was found that the fear of discrimination plays a part in low uptake of HIV testing.<sup>28, 29</sup>

**Linkage to Care:** The period between HIV testing and treatment initiation often sees a substantial loss of clients.<sup>30</sup> Fear of the stigma attached to being seen at an ART facility is prominent in several countries including Uganda, South Africa, Ghana, and Swaziland.<sup>31-34</sup> In Mozambique the fear of stigma as well as partner/family abandonment often discourages those who are living with HIV from disclosing their status. Nondisclosure can make it more difficult to receive the support needed to begin treatment.<sup>35</sup> In Ethiopia, people living with HIV (PLHIV) who reported fear of stigma had 4.4 greater odds of presenting late for HIV care.<sup>36</sup> While delays in linkage to care may change as same day treatment initiation increases,<sup>36</sup> stigma still remains a challenge.

Among men in particular, a recent study in South Africa revealed that fear of stigmatization among men was a major reason for non-disclosure that has implications for men living with HIV to remain healthy and cope with their illness.<sup>37</sup> Likewise in Uganda, social constructs of masculinity including respectability, independence, and emotional control, intersected with stigma to further disadvantage men's utilization of HIV services.<sup>38</sup> Without addressing the harmful effects of adhering to common masculine ideas related to risk taking and independence, it will be difficult to fully engage men in care and treatment.

**Adherence:** While some have argued that the increasing availability of ART may reduce HIV-related stigma, this is not always the case. One study in Uganda found that internalized stigma increased among PLHIV despite an increase

in accepting attitudes towards PLHIV in general.<sup>29</sup> Additional studies have found that participants' fear of stigma and discrimination constituted a common barrier to adherence.<sup>5, 6, 31, 39-45</sup> In Mozambique, stigma has been shown to hinder adherence due to fear among PLHIV that being observed taking medication will unintentionally disclose their HIV status to others, resulting in isolation and loss of social support due to stigma.<sup>31</sup> Stigma from health care staff has also been found to be a problem in Mozambique leading to low adherence. Patients who miss a refill or appointment may be chastised in front of other patients by doctors or pharmacists, leading others to learn of their status and discouraging the patient from returning to the facility again.<sup>29</sup>

In 2017 the Health Communication Capacity Collaborative (HC3), led by Johns Hopkins Center for Communication Programs (CCP), implemented a comprehensive community-based intervention called *Sawa Sawa*, in the Sofala Province of Mozambique which aimed to reduce HIV stigma within the community, leading to improved HIV testing among men. This report details the results of an evaluation that was conducted to estimate the impact of this intervention on community-level stigma and HIV testing outcomes among men.

## OBJECTIVE:

The overall **objective** of the intervention was to reduce community-level stigma, including both PLHIV perceptions and attitudes among the community, and in doing so improve uptake of HIV testing among men. The overall objective of the evaluation was to estimate the effect of the intervention on the intervention's outcomes of interest.

## METHODS:

The intervention was evaluated using a quasi-experimental design. The design utilized multiple methodologies and data sources in response to the multifaceted design of the proposed intervention and, in addition to measuring the impact of the intervention, also aimed to measure acceptability, feasibility and safety of the intervention.

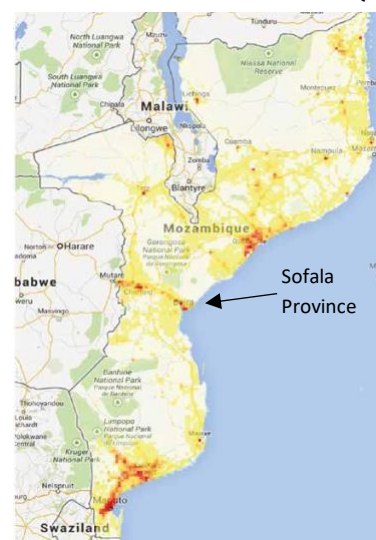
## SITE DESCRIPTIONS:

All study participants were enrolled from eight select intervention and control sites in Dondo and Nhamatanda districts of Sofala Province, respectively. Sofala is located in Central Mozambique, has one of the highest HIV prevalence in the country, is a PEPFAR priority site, and is an area in which CCP has successfully implemented communication interventions in the past (Map 1). Within Dondo district, the following sites were included: Canhandula, Dondo Sede, Mafambisse, and Macharote. Nhamatanda Sede, Nharuchonga, Tica, and Lamego were participating sites in Nhamatanda district. Sites were selected based on reported accessibility and security (local conflict was ongoing in the province at the time of the launch of the evaluation and intervention) and matched by population size across intervention and control districts.

## THE SAWA SAWA INTERVENTION:

The *Sawa Sawa* (which means equality in the local Sena language) intervention was comprised of four main components, Community Dialogues, Positive Prevention sessions, radio spots and programs, and an SMS-based linkage to care system, *SMYes*, that was coupled with health facility focal points. *Sawa Sawa* was implemented following six underpinning principles of community engagement for stigma reduction (Panel 1). All intervention activities took place in the four intervention communities in Dondo district.

MAP 1 HIV PREVALENCE IN MOZAMBIQUE





The Community Dialogues consisted of six sessions, held once a week for six weeks, and targeted all community members, both men and women including those living with HIV and those with unknown or negative status. Groups were formed with 15-25 people and were either mixed gender, or male only.

### Community Dialogue Session Topics

- Session 1: Introduction to *Sawa Sawa*
- Session 2: Stigma in Communities
- Session 3: Testing for HIV and Living with Your Status
- Session 4: Disclosure and Discordance
- Session 5: Importance of Treatment and Living Healthy with HIV
- Session 6: Continuing the work of *Sawa Sawa* In Your Community

Positive Prevention dialogues consisted of seven sessions, held twice a week for 3.5 weeks, and targeted those living with HIV. Groups were around 5-12 people and were either mixed gender or male only. In order to help with recruitment of community members to the groups, 16 community leaders were enlisted to assist with mobilization, specifically mobilization of men. They held at least two meetings per month with their community to introduce the program and encourage participation, recording the names of those who were interested and providing them to *Sawa Sawa* facilitators who were recruited from local community-based organizations.

### Positive Prevention Session Topics

- Session 1: Health and STI's
- Session 2: Disclosure and Discordant Partners
- Session 3: Antiretroviral Treatment
- Session 4: Living Positively
- Session 5: Feeling Good
- Session 6: Dealing with Stigma
- Session 7: Strengths-based Counselling

At the conclusion of each Community Dialogue session participants were encouraged to get tested for HIV and provided referrals to the local health center for HIV testing and other health issues. The referral was entered through the *SMYes* application, a Commcare system created under the PACTO project, which then sent a notification to a *Sawa Sawa* focal person at the health center informing them the referral had been made. Once the person came to the health facility, they were encouraged to locate the *Sawa Sawa* focal point, who was clearly identified and an integral part of the facility, to check in and receive guidance and assistance on next steps. If the person did not show up at the health facility within two days, the system sent the group facilitator a message to check in on them, and ask why they may not have

### PANEL 1 CORE PRINCIPLES UNDERPINNING SAWA SAWA

- Using community mobilizers from the community to ensure direct interaction and knowledge of the community
- Implementing the intervention over a long period of time (> 6 months) to support changes in social norms
- Quality control through training and ongoing mentoring of community facilitators
- Focus on everyone: community mobilization teams included PLHIV and those not infected with HIV to provide mutual support and to role model meaningful relationships between PLHIV and those not infected
- Recognizing that increasing knowledge is easier to accomplish than is obtaining skills for coping with stigma
- Involving the entire community in the stigma reduction intervention to reduce stigma.

followed through on their referral, if another two days passed, the focal point called the facilitator to follow up and ascertain why the person had not come to the facility and what assistance may be needed to complete the referral. Individuals identified with referral needs through the HIV testing campaign or via other *Sawa Sawa* activities were linked into the *SMYes* system and made aware of the facility-based *Sawa Sawa* focal point.

Five radio shows, a monthly debate and two spots were aired on the local Dondo district community radio to broaden the reach of the community level intervention, reinforcing the same messages given during the Community Dialogue and Positive Prevention sessions. The spots were aired by the local community radio and focused on promotion of the *Sawa Sawa* program, encouraging people to learn their HIV status, to adhere to treatment and to disclose to partners. The programs included testimonials from PLHIV where they discussed the difference ART made in their life and how important the support of their family and friends was. In addition, two songs were created by local artists promoting the messages of *Sawa Sawa* and played on the local radio.

Radio Show Topics	Radio Spot Topics
Stigma: What it is and how does it affect us	Promotion of Intervention: What is Stigma
How Stigma affects Men - Testing	
Importance of Disclosure	
Importance of Treatment	Importance of Testing
Communities putting Sawa Sawa into Practice	

The following grid displays the weekly schedule of radio programs and spots, as well as the monthly debate.

**Programs and Spots display grid**

Dondo Community Radio							
Time	Mo	Tu	We	Th	Fr	Sa	Su
6:05	Spots	Spots	Spots	Spots	Spots	Spots	Spots
7:05	Spots	Spots	Spots	Spots	Spots	Spots	Spots
8:20	Programs	Programs	Programs	Programs	Programs	Programs	Programs
16:05	Spots	Spots	Spots	Spots	Spots	Spots	Spots
17:05	Programs	Programs	Programs	Programs	Programs	Programs	Programs
23:25	Spots	Spots	Spots	Spots	Spots	Spots	Spots
17:05					<b>Monthly debate</b>		

The HIV testing campaign took place over the course of four weeks in October 2017. Seven providers from local health facilities conducted HIV testing directly in the community. *Sawa Sawa* mobilizers supported these activities by recruiting community members and informing participants that testing was available outside of the health facilities in certain locations. Participants who tested positive or otherwise required a related referral to health services were linked into *SMYes* and informed of the availability of the *Sawa Sawa* focal point located within the health facility.

## EVALUATION OVERVIEW:

This study was a quasi-experimental design, centered on the objective of estimating the effect of a pilot community-level stigma reduction intervention on 1) community-level stigma, including attitudes among the community as well as perceptions among men living with HIV, and 2) changes in HIV testing services (HTS; primary outcome) and treatment initiation (secondary outcome) among adult men. The design utilized multiple methodologies and data sources, including: 1) a longitudinal survey among community members in intervention and control districts, 2) qualitative research among men living with HIV in intervention sites, 3) analysis of intervention process data related to Community Dialogues, Positive Prevention Groups, and *SMY* referrals, and 4) analysis of CHASS clinic-level data in intervention and control sites.

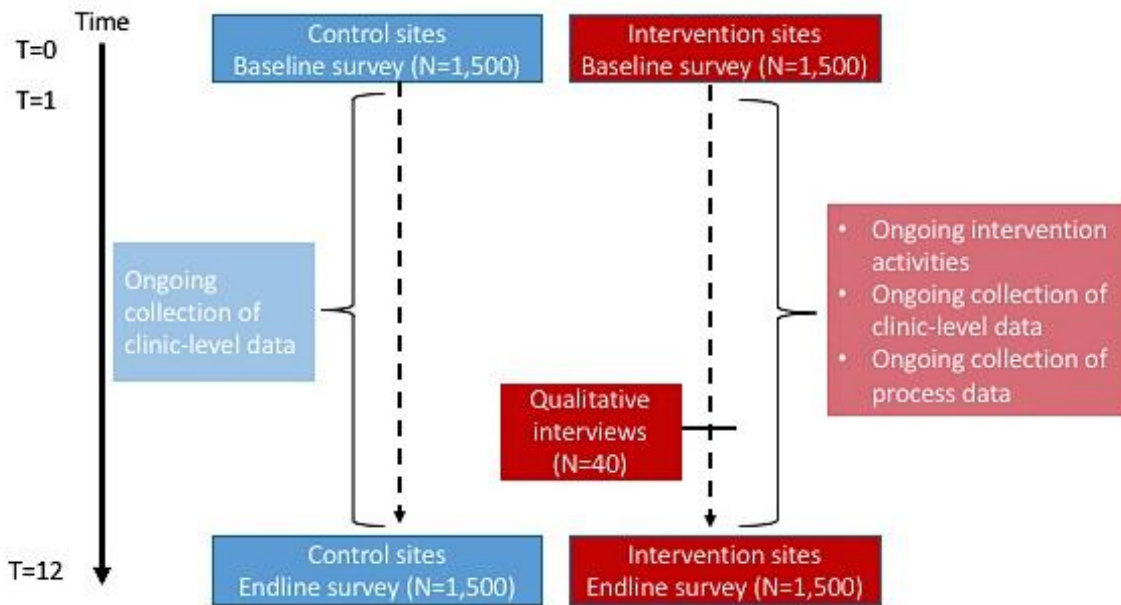
### LONGITUDINAL COMMUNITY-BASED SURVEY: BASELINE & ENDLINE SURVEYS:

Two districts in Sofala Province, Nhamatanda and Dondo, each comprised of four facility sites and their surrounding catchment areas per district, were assigned to either intervention or control. Dondo was selected as the intervention site. Assignment at the district-level to intervention or control was based on the use of the radio in the intervention, which would have contributed to contamination across sites had assignment occurred at the site-level.

Male and female community participants were randomly selected via household probability sampling in both settings and were surveyed at baseline (prior to the intervention) and at endline (after at least 9 months of intervention; Figure 1). Following participants longitudinally allows for adjustment of site-level and individual confounders, which would not otherwise be possible with only two areas assigned to intervention or control. Intervention activities took place for a total of 9 months spanning March through December 2017 between the baseline and endline surveys.

Prior to initiation of survey implementation, local research team members briefed community leaders to make them aware of the process and to obtain approval for the implementation of the survey within their communities. To minimize potential risk of stigma associated with being seen participating in the survey, the local research team members also informed the leaders and community members that houses/participants were randomly selected (e.g. that selection is not based on any individual characteristics). This process served to make the wider community both aware of the study and increase willingness to participate in research. The number of participants sampled per site was based on probability proportional to population size and stratified by gender. Local interviewers were trained to recruit participants and administer the baseline and endline surveys. Each interviewer was given a quota of the number of participants to recruit within each gender strata. Male interviewers only recruited and interviewed male participants and female interviewers only recruited and interviewed female participants. Since men of working age are often more challenging to find at home during the day, the interviewers also conducted surveys during early evening and weekends and were allowed to go to the man's work place to invite participation in the survey if the work place was in the targeted area and private space could be identified. In some cases, this required employer authorization.

FIGURE 1 FLOW DIAGRAM OF INTERVENTION EVALUATION



Consent was conducted in private within the participant’s home or other private space. Participants were asked to take part in both baseline and endline surveys that were planned for approximately 12 months later (i.e. no additional recruitment was conducted for endline). Eligible and consenting participants then completed a structured tablet-based, interviewer-administered questionnaire, which serves as the baseline assessment. The survey lasted approximately 30-45 minutes, depending on individual characteristics and skip patterns.

The evaluation aimed to enroll 3,000 participants across the two sites. The target sample size was based on 80% power to detect a conservative 5% difference in the change in stigma at alpha < 0.05 between intervention and control and an assumption of 20% loss to follow-up. This produced a target sample of 1,500 per intervention or control group (N=3,000 total). Given the other primary outcome of interest related to changes in HTS among men, men were oversampled, such that the longitudinal survey participants would be comprised of 2/3 men and 1/3 women. Considering the estimated sample size of 1,500 per group, 66% of whom would be men, and 20% loss to follow-up, it was estimated that there would be greater than 80% power to detect at least 10% difference in self-reported HTS among surveyed men.

Participants were considered eligible for the community survey if they were residents of the select sites, resided in household selected during probability sampling; aged 18 years or above; intended to live in the same community for the next 12 months; and consented to both baseline and endline surveys. Participants who planned to move within the next 12 months or who consented to only one or neither (baseline or endline) survey were excluded.

**Survey measures:** The questionnaire was developed to allow for baseline comparison of participants in intervention and control sites and to assess differences in changes in community-level stigma and HIV testing among men across the two sites. Measures included demographic characteristics; basic HIV risk behaviors; exposure to and participation in interventions addressing HIV stigma, HIV prevention, or HIV care; and HIV testing history and self-reported HIV status. For participants who self-reported living with HIV, additional questions addressed the HIV care continuum, including: self-reported measures of initial engagement in HIV care (or CD4 measure, as a proxy), treatment initiation, retention in care, viral load testing, and treatment adherence,<sup>46</sup> as well as perceived or experienced stigma within these components of HIV care using the PLHIV stigma index.<sup>47</sup>

Three stigma constructs were measured. Community level stigma and enacted stigma, was measured using an international stigma scale that includes stigma subscales measuring shame/blame/isolation, inequity, and discrimination (alpha=0.79).<sup>48</sup> Typical items within the scale included the following and were followed with Likert scale response options to indicate the extent to which the participant agreed/disagreed with the statement: shame/blame/isolation: *"People living with HIV should be ashamed"*, discrimination: *"People living with HIV face neglect from their family"*, inequity: *"People living with HIV do not deserve any support"*. Items were summed and could fall within a range of 23-92, with higher scores representing greater stigma. A new 7-item measure of perceived stigma and discrimination of PLHIV in the wider community was created (alpha=0.77). These Likert scale items were summed to create a score on the range of 7-28, with higher scores representing increased perception of community stigma of PLHIV. A typical item included: *"In this community, men who are known to be living with HIV have the same level of importance in society as men who are not living with HIV"*. A new 5-item measure of anticipated individual stigma was created based on prior DHS AIDS Indicators surveys. A composite binary score of 'any individual stigma' was created based on any 'Yes' response to at least one of these items. A typical item in this measure included: *If you found out that one of your friends was living with HIV, would you still be friends with him/her?"*

Between baseline and endline surveys, interviewers and other research team members conducted retention activities to mitigate loss to follow-up by the endline survey. Retention activities included calling participants on private telephones to inform them of the upcoming endline survey or informing community leaders that activities would resume and requesting that they inform participants who had not been reached by telephone.

#### INTERVENTION PROCESS DATA:

Process data documenting *Sawa Sawa* Community Dialogues, Positive Prevention, the HIV testing campaign and *SMYes* activities were collected throughout the intervention period. Data pertaining to the implementation of Community Dialogues and Positive Prevention activities included the numbers and genders of group participants, dates of group initiation, number of participants attending each group session, and numbers and types of HIV-related referrals made for group participants. All Community Dialogue and Positive Prevention process data were recorded by group facilitators and entered by a data entry staff member in the Maputo CCP office.

*SMYes* was housed within the secure CommCare platform. All referral data that were sent via text, including participant ID, origin of referral (e.g. Community Dialogue group or Positive Prevention group), date of referral, type of referral, as well as whether and when (date) the participant appeared for the referral were recorded. Referral information was entered either by the *Sawa Sawa* facilitator or the focal point serving in the local health facility.

#### QUALITATIVE RESEARCH:

Qualitative research was included to obtain contextual understanding of the intervention's impact on stigma and men's decision making related to HIV care. Qualitative research took place during the intervention implementation at approximately eight to nine months into implementation of *Sawa Sawa*. Qualitative participants were a subsample of men living with HIV, who participated in Positive Prevention or Community Dialogues and resided in the intervention sites.

The target sample size for the qualitative research was 40 men living with HIV. This sample size was based on experience in similar qualitative research studies that are related to stigma<sup>49, 50</sup> and ensured data saturation to satisfactorily answer the research questions.

Candidate participants were recruited by *Sawa Sawa* facilitators to participate in in-depth interviews (IDI) and were provided with information on how to contact study interviewers to set up an interview. Facilitators had no other role in the IDIs beyond inviting participants. Maximum variation sampling was used with a goal of enrolling men

living with HIV with a variety of characteristics across, age, site, employment status, and intervention exposure. Trained qualitative interviewers, who were independent of *Sawa Sawa* activities, conducted the IDIs.

IDIs were guided by semi-structured interview guides and utilized open-ended questions to explore experiences and perceptions of the intervention and its components; opinions on how the intervention may/may not have changed stigma within the community and access to key components of the HIV care continuum, and recommendations for future scale-up of the intervention.

All interviews were recorded, transcribed, then translated for subsequent coding and qualitative analysis. Qualitative data analysis software, Atlas.ti was used to facilitate thematic analysis. A priori codes were created based on the field guides, and codebooks were modified based on emergent themes as coding progresses. Codes were applied using Atlas.ti, which were then reviewed and summarized by the research team.

#### STATISTICAL ANALYSIS:

Analysis of survey and intervention process data was descriptive in nature to describe population characteristics and use of *Sawa Sawa* activities. Further analysis focused on two major outcomes of interest: 1) reduction in community-level HIV stigma and 2) improvements in HIV testing among men. ART initiation was a secondary outcome of interest that was assessed for qualitative differences (i.e. differences in magnitude, even if not statistically significant). A residualized change regression model was used to estimate the effect of the intervention on the total stigma scale score in intervention sites (Dondo), compared to control (Nhamatanda) sites. This model allows for assessing changes in stigma among community members, taking into consideration their baseline levels of stigma and recognizes that each individual may have a difference baseline starting point on the stigma scales.<sup>51</sup> The results of this analysis were tested by also running a difference-in-difference model, which controls for unobservable, time variant characteristics across sites.<sup>52</sup> Additional residualized change models were run to assess changes in perceived stigma within the community and experiences of stigma among PLHIV. Separate models were run to also produce gender-stratified estimates of the impact of the intervention on each form of stigma.

To test the effect of the intervention on HIV testing among men, a multi-level random effects model of survey data from male participants was implemented. This model accounts for site-level clustering and allows for the comparison of self-reported uptake of HIV testing among men over time. This was followed by logistic regression modeling among men in Dondo to test how HIV testing varies by exposure to *Sawa Sawa* activities, after controlling for other confounding variables. The random effects model was also used to assess changes in the binary outcome of anticipated individual stigma.

#### CHASS CLINIC DATA:

Data standardly collected by the FHI360 CHASS program were received from USAID. Collected data provide monthly totals of the numbers of individuals newly diagnosed with HIV infection, initiating ART, and continuously receiving ART. These data are also stratified by gender and age and were used to assess qualitative changes in ART initiation over time from the quarter prior to the *Sawa Sawa* intervention, throughout the implementation of the intervention, and the quarter after the intervention ended, comparing intervention (Dondo) to control (Nhamtanda) sites. Linear regression models and visualization methods were used to compare differences in ART initiation trends among adult men across the select sites.

## RESULTS

### LONGITUDINAL SURVEY: BASELINE RESULTS

The community-based baseline survey was conducted from November - December 2016. There was a total of 3,017 participants, including 1,510 in Dondo and 1,507 in Nhamatanda. By design, two-thirds of participants were men (N=2,005). Table 1 describes participant demographics across districts.

	District where survey was conducted						p-value
	Nhamatanda (N=1507)		Dondo (N=1510)		Total (N=3,017)		
	n	Col %	n	Col %	n	Col %	
<b>Median age (IQR)</b>	32	(24-45)	31	(24-45)	31	(24-45)	
<b>Male gender</b>	1001	66.4	1004	66.5	2005	66.5	0.969
<b>Born in Mozambique (n=3,016)</b>	1496	99.3	1505	99.7	3001	99.5	0.070
<b>Ethnicity (among those born in Mozambique)...*</b>							
...Sena	1081	72.3	1057	70.2	2138	71.2	0.220
...Ndao	488	32.6	391	26.0	879	29.3	<0.01
<b>Religion (n=3,009)*</b>							<0.01
Evangelical/Pentecostal	546	36.4	642	42.5	1188	39.5	
No religion	247	16.5	225	14.9	472	15.7	
<b>Ever attended school (n=3,015)</b>	1331	88.4	1380	91.4	2711	89.9	0.007
<b>What is your current employment status? (n=3,016)</b>							<0.01
Unemployed	609	40.4	448	29.7	1057	35.0	
Self-employed (informal)	412	27.3	272	18.0	684	22.7	
Employed full-time	236	15.7	282	18.7	518	17.2	
Employed part-time	97	6.4	282	18.7	379	12.6	
Student	71	4.7	128	8.5	199	6.6	
Retired or disabled	24	1.6	85	5.6	109	3.6	
<b>Current marital status</b>							0.441
Live together as married	995	66.0	961	63.6	1956	64.8	
Single/never married	279	18.5	309	20.5	588	19.5	
Widow	86	5.7	94	6.2	180	6.0	
Married	78	5.2	87	5.8	165	5.5	
Divorced/separated	69	4.6	59	3.9	128	4.2	
<b>Median number of children in residence (IQR)</b>	4	(2-6)	3	(2-5)	3	(2-5)	

\* Other categories comprising less than 10% of sample excluded from table

The baseline survey demonstrated notable gaps in HIV testing, as well as experiences and perceptions of stigma, both of which differed by gender. Over one-quarter of participants had never been tested for HIV infection in their lifetime. Of those who had been tested, 13% self-reported a positive result on their last HIV test, which was more common among women than men (19.3% vs 9.0%,  $p<0.01$ ). Among those who were not living with HIV, 41% reported

an HIV test within the last 12 months. Women were more likely than men to have a recent HIV test (47.6% vs. 38.3%,  $p < 0.001$ ). The most common reasons among men for failure to undergo HTS within the last 12 months included: feeling healthy/having no symptoms of HIV (59.5%), no time for testing (27.9%), and not perceiving themselves to be at risk for HIV (19.7%). Generally, higher levels of stigma towards PLHIV were present among women than men. Table 2 describes experiences with HIV prevention and testing, awareness of PLHIV, and levels of stigma within the community.

	Gender						p-value
	Man (N=2,005)		Woman (N=1,012)		Total (N=3,017)		
	n	Col %	n	Col %	n	Col %	
<b>Exposure to HIV prevention and testing</b>							
Seen/read informational fliers about HIV prevention, last 12 mo. (n=3012)	1435	71.7	492	48.7	1927	64	<0.01
Ever tested for HIV (n=3012)	1332	66.5	871	86.2	2203	73.1	<0.01
Tested in home district at last test (n=1,277)	699	88.5	444	91.2	1143	89.5	0.128
Positive HIV test result (n=2142)	116	9.0	165	19.3	281	13.1	<0.01
Tested for HIV in the last 12 mo (n=2,723)	721	38.3	400	47.6	1121	41.2	<0.01
<b>Reasons for not testing within the last 12 months (n=1614)*</b>							
Feel healthy/have not had symptoms of HIV infection	695	59.5	195	43.7	890	55.1	<0.01
No time to get tested	326	27.9	95	21.3	421	26.1	<0.01
Not at Risk for HIV	230	19.7	110	24.7	340	21.1	0.028
Worried about a positive result	30	2.6	10	2.2	40	2.5	0.706
Husband/wife/partner tested for HIV and the result was negative (no HIV)	7	0.6	32	7.2	39	2.4	<0.01
Heard any discussion about HIV on the radio, last 12 mo. (n=3012)	1605	80.2	625	61.9	2230	74	<0.01
In the last 12 months, have you participated in any community group discussions (n=3013)	638	31.9	141	13.9	779	25.9	<0.01
<b>Awareness of PLHIV</b>							
Median no. of people participant knows living with HIV (IQR; n=2,607)	1	(0-5)	2	(0-5)	2	(0-5)	
<b>Relationship of PLHIV to participant (n=1571)*</b>							
Neighbor	386	38.7	317	55.3	703	44.7	<0.01
Friends	466	46.7	202	35.3	668	42.5	<0.01
Family member	354	35.5	260	45.4	614	39.1	<0.01
Acquaintance	318	31.9	187	32.6	505	32.1	0.753
Co-worker	203	20.3	37	6.5	240	15.3	<0.01
Spouse	20	2	39	6.8	59	3.8	<0.01
<b>Ways in which participants offer support to PLHIV* (n=1139)</b>							
Take him/her to the health center/hospital	147	19.4	105	27.4	252	22.1	<0.01
Provide monetary support	168	22.2	41	10.7	209	18.3	<0.01
Help him/her with chores around the house	56	7.4	109	28.5	165	14.5	<0.01
Give him/her medicine	73	9.7	59	15.4	132	11.6	<0.01



	Gender						p-value
	Man (N=2,005)		Woman (N=1,012)		Total (N=3,017)		
	n	Col %	n	Col %	n	Col %	
<b>Stigma</b>							
<b>Individual stigma towards PLHIV (ref: no)</b>	243	12.2	141	14.1	384	12.8	0.145
Shame subscale: average (95%CI)	16.7	(16.5-16.8)	17	(16.6-17.2)	16.7	(16.6-16.9)	0.099
Discrimination subscale: average (95%CI)	16.0	(15.9-16.2)	16.3	(16.1-16.5)	16.1	(16.0-16.2)	0.046
Inequity subscale: average (95%CI)	8.3	(8.2-8.4)	9.2	(9.0-9.3)	8.5	(8.5-8.7)	<0.01
Total stigma score: average (95%CI)	40.9	(40.6-41.2)	42.4	(41.9-42.8)	41.4	(41.1-41.6)	<0.01
Perceived community stigma: average (95%CI)	19.6	(19.4-19.7)	20.2	(19.9-20.5)	19.8	(19.7-19.9)	<0.01
Experiences of stigma among PLHIV: average (95%CI)	15.5	(15.1-15.9)	16	(15.5-16.5)	15.8	(15.4-16.1)	0.229

Note: \* Other categories <10% among sample excluded from table;

Although stigma was not listed as one of the most common reasons for failing to test for HIV within the last 12 months, multivariable regression analysis stratified by gender highlighted the role of stigma in HIV testing. Men who reported any individual stigma toward PLHIV had 36% lower odds of recent HIV testing (aOR: 0.64, 95%CI: 0.44-0.92, p=0.015). Multivariable analysis also highlighted the importance of exposure to informational materials, radio programs, and community discussions in HIV testing among men, as men who had received fliers or had participated in past community discussions had increased odds of recent HIV testing.

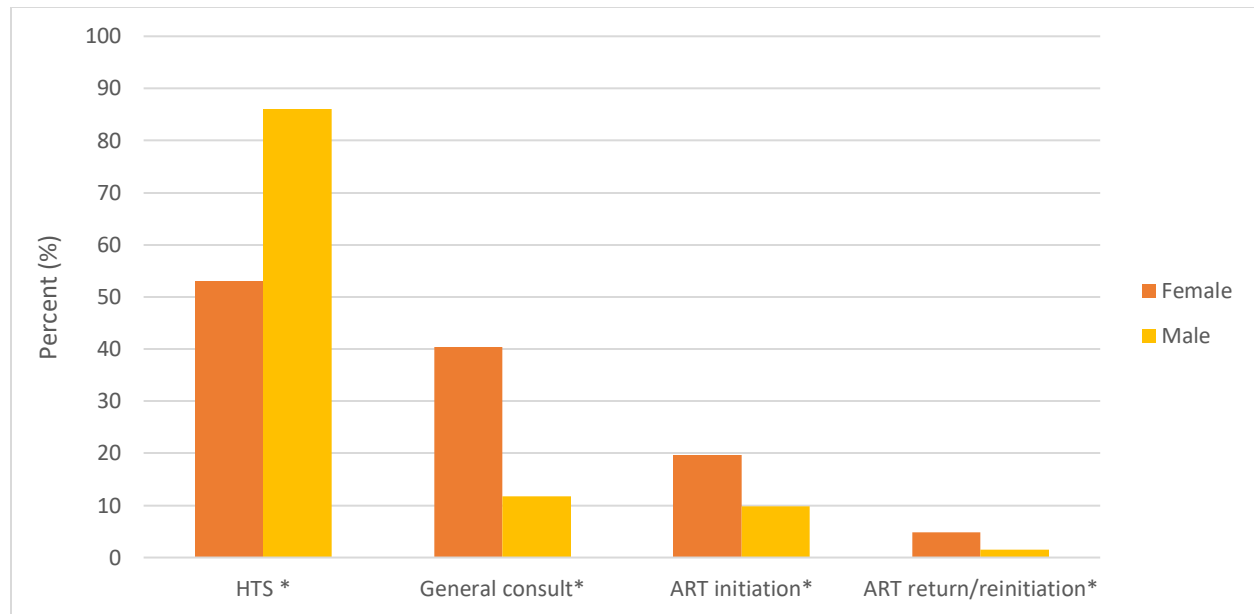
Variable	Men		Women	
	Adj. OR (95% CI)	p-Value	Adj. OR (95% CI)	p-Value
Age	0.99 (0.98, 1.00)	0.003	0.98 (0.96, 1.00)	0.027
Highest level of education completed				
Secondary	1.37 (1.08, 1.73)	0.010	1.62 (1.12, 2.36)	0.011
Technical school or university	4.01 (2.16, 7.42)	<0.001	2.73 (0.68, 10.96)	0.156
Employed	1.01 (0.79, 1.30)	0.907	1.06 (0.75, 1.49)	0.760
Marital status				
Married	1.39 (1.05, 1.85)	0.022	1.89 (1.14, 3.15)	0.014
Separated	1.33 (0.74, 2.38)	0.339	1.44 (0.70, 2.94)	0.324
Seen or read HIV informational fliers	1.67 (1.29, 2.18)	<0.001	1.81 (1.26, 2.60)	0.001
Heard any HIV discussion on the radio	1.10 (0.84, 1.46)	0.485	0.84 (0.58, 1.22)	0.359
Participated in HIV community discussion groups	1.82 (1.45, 2.27)	<0.001	1.22 (0.75, 1.98)	0.425
Perceived shame of PLHIV	0.99 (0.96, 1.03)	0.688	0.94 (0.89, 1.00)	0.038
Perceived discrimination of PLHIV	0.98 (0.94, 1.01)	0.203	1.02 (0.96, 1.09)	0.469
Feelings of inequity for PLHIV	1.06 (1.01, 1.12)	0.031	1.05 (0.96, 1.14)	0.304
Perceptions of community treatment towards PLHIV	1.01 (0.98, 1.05)	0.440	1.03 (0.98, 1.07)	0.216
Any anticipated individual stigma towards PLHIV	0.64 (0.44, 0.92)	0.015	0.88 (0.52, 1.49)	0.631

## SAWA SAWA INTERVENTION PROCESS DATA: COMMUNITY DIALOGUES, POSITIVE PREVENTION, SMYEs, AND HIV TESTING CAMPAIGN

A total of 9,175 participants engaged in *Sawa Sawa* Community Dialogues and Positive Prevention between March and December 2017. Participants had a median age of 30 years (IQR: 23-42) among men and 32 years among women (24-44).

A total of 8,133 individuals participated in Community Dialogues, which was relatively distributed across gender (n=3,845 or 47.3% men and n=4,288 or 52.7% women). Positive Prevention enrolled a total of 1,042 PLHIV, which was predominantly comprised of men (n=843, 80.9%), as designed. *SMYEs* collected data on clinical referrals provided to participants of the Community Dialogue and Positive Prevention groups. Participants were most commonly provided referrals for HTS, general consults, ART initiation or re-initiation, and to a lesser degree malaria prevention, family planning, STI testing and treatment, and community adherence groups and were often referred for multiple services. A total of 573 of 3,526 (16.3%) participants who were referred via Community Dialogues and were recorded as having attended their referral. Over 80% (86.1%) of referrals attended by men and 53.1% of referrals attended by women were for HTS (Figure 2).

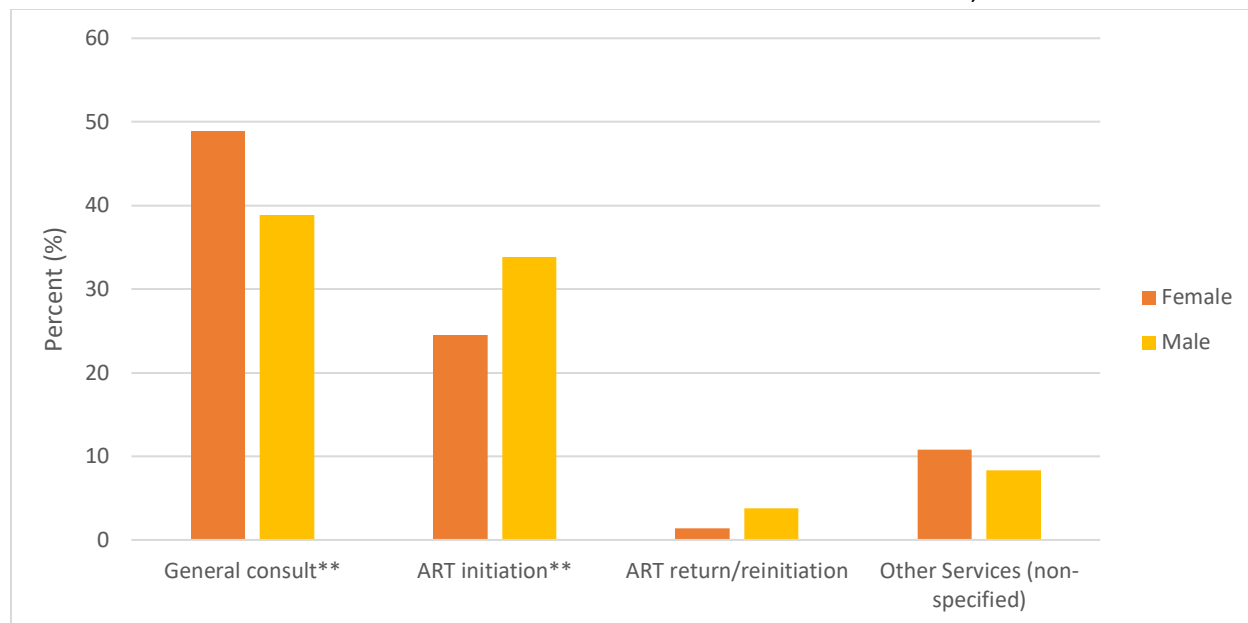
**FIGURE 2 SMYEs: CLINICAL VISITS ATTENDED FOLLOWING REFERRALS FROM COMMUNITY DIALOGUE GROUPS: BY GENDER**



\* Significantly different by gender

Of 1,816 participants referred from Positive Prevention groups, 302 (16.6%) were recorded as having attended their visit. One-third (33.8%) of men who were referred and attended their visit, completed ART initiation services (Figure 3). Women were more likely to be referred for and attend general consult services.

**FIGURE 3 SMYES: CLINICAL VISITS ATTENDED FOLLOWING REFERRALS FROM POSITIVE PREVENTION GROUPS, BY GENDER**



\*\*Marginal difference by gender at p<0.10

The HIV testing campaign was implemented in October 2017 and engaged 3,107 people, of which 78% were men. Among the participating men, 4.5% were newly diagnosed and referred for ART during the HIV testing campaign.

### QUALITATIVE FINDINGS OF MEN PARTICIPATING IN POSITIVE PREVENTION GROUPS:

A total of 40 men living with HIV and who had participated in Positive Prevention groups completed in-depth interviews in November 2017. All participants had been diagnosed with HIV prior to participation in the Positive Prevention groups (a condition of participation in Positive Prevention instead of Community Dialogue groups). Participants reported seeking HIV testing because they had either experienced symptoms that prompted them to seek testing or because their partner had been diagnosed during antenatal care.

### PAST EXPERIENCES OF HIV STIGMA IN THE COMMUNITY:

Many participants reported past disclosure of their status to their partner and some immediate family members, though disclosure to other family, friends, or community members were much more limited. Participants acknowledged that HIV stigma was prevalent at the community level regardless of the extent to which they personally experienced stigma. Stigma in community was largely associated with a notion that the men were promiscuous and disloyal within their relationships. Participants perceived that people in their communities feel those who are living with HIV have a high risk of death, and thus there is no hope for recovery.

*They can even come to a stage of despising him by saying that we cannot eat together with him in the same plate, because otherwise we will be contaminated, while it is not true.*  
 – IDI 8, aged 70 years

Stigma was also present in HIV care settings, often when patients were in a queue to receive medications. As participants were afraid of being observed filling prescriptions, adherence to ART was reportedly more challenging despite social support that the participants had received from their family members and other peer patients who had helped pick up the medications on behalf of the patients.

*There are others who are afraid/ ashamed of collecting ARVs at the pharmacy, when they arrive they just leave their card and go sit far away waiting for their turn to be called. These same people when their turn comes to collect the medication even if they are called first, they check if there is someone they know close by or not so they can go to the counter and collect their ARVs. Sometimes they give money to someone to go collect the medication, I say this type of behavior is not good, the health is yours and you must know how to take care of it personally*  
– IDI 27, aged 60 years

*When my wife went to receive medications, when she arrived, she took out her bag and the pills fell. My neighbors asked whose pills were those. My wife responded that they were mine. And my neighbor started to say that my life was over. When I heard it, I was a little disappointed, a little mad, thinking badly, and I even thought that my life was over.* – IDI 11, aged 46 years

Stigma was also reported among healthcare providers, which remained a major barrier to improving care seeking among HIV patients. Lack of support from healthcare providers could have further decreased care seeking practices of the patients.

*I never want to discriminate myself for being affected, I feel that I am a human being who is born to die. One day I went to the hospital and there was a nurse. I was about to explain it how it was she offended me, saying I would die. I told her that she will also die.*  
– IDI 34, aged 42 years

#### ENGAGEMENT IN SAWA SAWA AND IMPACT OF SAWA SAWA:

Participants reported managing their fear of stigma with knowledge that they obtained from *Sawa Sawa* program. Knowing that HIV could be transmitted in various ways allowed them to internally cope with stigma within community. Many of the participants held positive perception on their own health status and maintained high confidence to manage HIV after attending Positive Prevention sessions.

Most of the participants engaged in all seven Positive Prevention sessions and some were also exposed to the radio campaign, depending on the availability of radio in their households. All of the participants positively evaluated the competence and support of *Sawa Sawa* facilitators. They stated that the facilitators were knowledgeable in the issues that they needed to care for their health. *Sawa Sawa* staff members directly helped participants receive healthcare services as they escorted participants to hospital, when needed, and facilitated medication pick-up process at the hospital.

*Sawa Sawa helped me because sometimes even if they get you in a situation where you are sick Sawa Sawa takes you to the hospital, to get urgent treatment, even in my neighborhood if you get tested for AIDS they take you to the hospital to get treated* – IDI 20, aged 57 years

*They helped me with antiretroviral medicines. If they were not helping, I would have been in trouble. They helped me to recover my process in the hospital when the hospital had lost it but with Sawa Sawa, I managed to get it in less than an hour. They helped me so much.*  
– IDI 33, aged 34 years

The interaction with other PLHIV during the program further promoted care seeking through social support. Some of the participants continued to meet their group members after the program ended to discuss HIV care related topics and help each other in getting medications.

*Only when it comes to the day it's just going to take medicine, if I can't get it delivered here at home, but now we go to the hospital in a group or we pick up for each other in the group, so when it's my turn I also do it. – IDI 16, aged 60 years*

Participants mentioned that *Sawa Sawa* increasingly helped them adhere to ART and adopt behaviors to manage the disease. The majority of the participants reported that their behaviors substantially changed after the program; they began using condoms during sex, limited smoking and alcohol consumption. Participants demonstrated confidence and were motivated to maintain their healthcare after attending the Positive Prevention groups.

*Well, people look at you the way they do and speak about you, but since you know your status, you should ignore what they say, for it is normal for them to speak... Now if someone speaks about you without knowing his status it does not help him, for he is speaking ill of himself while he is dying and I am saving my life. – IDI 13, aged 57 years*

Decreases in community stigma and self-stigma were greatly attributed to *Sawa Sawa*. The participants noticed that people in their community were more willing to help them, now thinking that they were equal.

*It helped because before when people discovered that you have this disease, everyone would stay away from you, but now they approach you, talk to you and treat you well. – IDI 4, aged 36 years*

*I think that the behavior in the community changed a lot, because the community knows ways that people with AIDS and people without AIDS are the same. – IDI 20, aged 57 years*

In addition to stigma, people were more likely to adopt behaviors to take care of themselves after the intervention.

*There is something that changed a lot, I used to drink but since I joined Sawa Sawa when they explained to me what happens when you drink and you have HIV/AIDS, I haven't drunk anymore till now... I don't stay out late anymore and I take my medication at the same time every day. – IDI 20, aged 57 years*

Recommendations by participants for future implementation were logistical in nature, requesting improvements such as expanding the length and time of the sessions and using different tents for group discussions. Generally, the participants asked for an expansion of the program to other communities, regions, and to youth. Participants reported wanting to spread what they learned to other people who suffered from HIV and stigma around the disease.

*In my opinion, Sawa Sawa could go into institutions, into schools, because the most affected people are the youth... so instead of just going into the community, they could also go into public institutions, because Sawa Sawa is not just for poor people it is for everyone. Sawa Sawa has no borders. – IDI 19, aged 69 years*

## LONGITUDINAL SURVEY: ENDLINE RESULTS AND INTERVENTION IMPACT ESTIMATES:

The community-based endline survey was conducted from February to March 2018. A total of 2,447 people who participated in the baseline were retained and participated in the endline survey, resulting in 81% retention. Demographics of endline participants were similar to those at baseline (Table 4).

**Table 4.** Demographic characteristics of baseline and endline community survey participants

	Baseline (N=3,017)		Endline (N=2,447)	
	n	Col %	n	Col %
<b>District where survey is conducted</b>				
Nhamatanda	1506	50.0	1209	49.4
Dondo	1506	50.0	1238	50.6
<b>Male gender</b>	2003	66.5	1635	66.8
<b>Born in Mozambique</b>	2996	99.5	2996	99.5
<b>Ethnicity*</b>				
Sena	2136	71.3	1872	77.7
Ndao	877	29.3	883	36.7
<b>Religion*</b>				
Evangelical/Pentecostal	1186	39.5	1186	39.5
No religion	472	15.7	472	15.7
<b>Ever attended school</b>	2708	90.0	2708	90.0
<b>Current employment status</b>				
Unemployed	1054	35.0	752	31.2
Self-employed (informal)	684	22.7	564	23.4
Employed full-time	517	17.2	461	19.2
Employed part-time	379	12.6	330	13.7
Student	198	6.6	180	7.5
Retired or disabled	109	3.6	102	4.2
Self-employed (formal)	70	2.3	18	0.7
<b>Current marital status</b>				
Single/never married	586	19.5	393	16.3
Live together as married	1955	64.9	1670	69.4
Married	164	5.4	87	3.6
Divorced/separated	127	4.2	101	4.2
Widowed	180	6.0	157	6.5

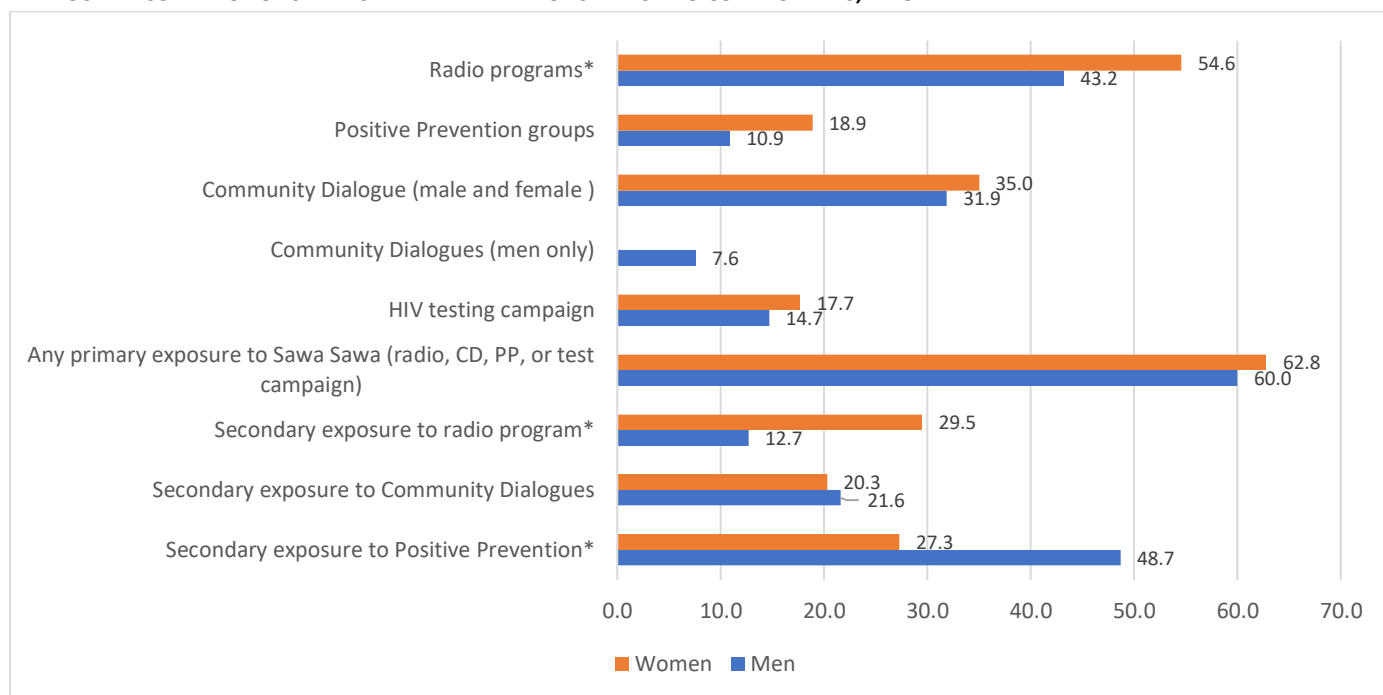
Note: \* Other categories representing <10% of the sample excluded from table

As the community-based survey is a random sample of the population, the survey gives a sense of the coverage of the various *Sawa Sawa* activities across the intervention communities (Figure 4). Radio programs had the greatest coverage, as over 47% of the sample reported hearing the *Sawa Sawa* radio programs and spots. Community Dialogue groups reached over one-third of the population while Positive Prevention groups reached almost 30% of PLHIV in the community. A total of 16% of the population were tested via the *Sawa Sawa* HIV testing campaign; of these, 40% of men reported that they were tested for the first time. In total, 60% of the population was exposed to at least one *Sawa Sawa* activity, with no difference by gender. Men who participated in at least one *Sawa Sawa* activity tended to report more frequent sexual behaviors, including recent sexual intercourse (90% vs. 84% among those who had not participated) and greater numbers of lifetime sexual partners (mean: 7 partners, range: 1-400 compared to a mean of 6 partners, range: 1-50 among those who did not participate in *Sawa Sawa*).

Individuals who may not have directly participated in *Sawa Sawa* activities were often exposed secondarily to *Sawa Sawa* messages through conversations with other people who had participated. For example, 21% of people who had not participated in Community Dialogues had discussed the *Sawa Sawa* Community Dialogue messages with others who had participated. Almost 50% of men who were living with HIV and who had not participated in Positive

Prevention groups had discussed the *Sawa Sawa* Positive Prevention messages with others who had participated, which was significantly higher than women (27%) who had not participated.

**FIGURE 4 COVERAGE OF SAWA SAWA INTERVENTIONS IN DONDO COMMUNITIES, BY GENDER**



Note: Denominator for Positive Prevention groups is restricted to PLHIV; denominator for secondary exposures is restricted to those who had not directly participated in those activities; significantly different by gender at \* p<0.05; percentages are not additive as participants may have participated in multiple activities or had both primary and secondary exposures.

*Sawa Sawa* activities covered many topics, but *Stigmatization of HIV* and *Stigma in the Community* were the most favored topics across radio and Community Dialogues activities. How participants internalized *Sawa Sawa* messages, however, often varied greatly by gender. Radio listeners reported feeling that PLHIV have the same rights as others (“everyone is equal”; 68% men vs 54% women), feeling compassion for PLHIV (26% men, 8% women), and that they better understood PLHIV (4% men vs 36% women). Community Dialogue participants reported being motivated to have discussions with other community members to try to reduce stigma of HIV (49% men vs 30% women) and engage in activities to help care for PLHIV (13% men vs 45% women).

For Positive Prevention participants, *Living Positively* was the most favored Positive Prevention topic. Positive Prevention participants most commonly reported that they had learned how to prevent HIV transmission, how to disclose HIV status, and how ART works in the body, with no difference by gender. Participants most commonly reported being motivated to have discussions with other community members (80% men vs 40% women).

**PRIMARY OUTCOMES: CHANGES IN COMMUNITY-LEVEL STIGMA AND HIV TESTING AMONG MEN**

The primary objectives were to assess changes in community stigma over time and changes in recent HIV testing among men that were associated with the intervention. Table 5 describes the impact of the intervention among the total sample. Using the total stigma scale score (composite of shame, discrimination and inequity subscales), a

**Table 5.** Impact of the *Sawa Sawa* intervention on various forms of HIV stigma among the total population and stratified by gender

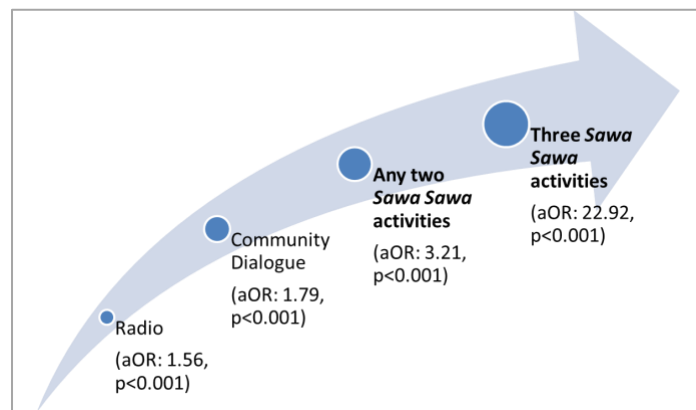
Stigma measure	Beta	Total 95%CI:	p-value
Shame subscale	-1.13	(-1.49, -0.76)	<0.001
Discrimination subscale	-1.23	(-1.53, -0.92)	<0.001
Inequity subscale	-0.02	(-0.23, 0.19)	0.862
<b>Total stigma score</b>	<b>-2.38</b>	<b>(-3.07, -1.69)</b>	<b>&lt;0.001</b>
<b>Perceived community stigma</b>	<b>1.86</b>	<b>(1.52, 2.20)</b>	<b>&lt;0.00</b>

\*Models were run separately for each stigma outcome and control for age, education, and community

significant reduction in stigma was observed that was associated with the *Sawa Sawa* intervention (Beta: -2.38; 95%CI: -3.07, -1.69; p <0.001). These findings were supported by a test using a difference-in-difference analysis, which produced a similar result (Beta: -2.15; 95%CI: -2.9, -1.32; p<0.001; not displayed). The scores measuring perceived community stigma appeared to increase with the intervention; however, this is likely a secondary effect of widespread discussion of HIV stigma within the *Sawa Sawa* activities.

Twenty percent of men who were tested in Dondo during the course of *Sawa Sawa* intervention reported completing HTS for their first time. The odds of HIV testing among men, a primary outcome of interest, significantly increased with the intervention (OR: 1.32; 95%CI: 1.01-1.74; p=0.049). Among men in Dondo, participating in any Community Dialogue was independently associated with 1.79-fold increased odds of testing for HIV over the course of the intervention (aOR: 1.79; 95%CI: 1.28-2.50; p=0.001), after controlling for other factors. Listening to a *Sawa Sawa* radio program was also associated with a 1.56 increased odds in HIV testing among men (aOR: 1.56; 95%CI: 1.09-2.23; p=0.013). Focusing on the combined approach of *Sawa Sawa*, we see that there was no difference in testing for male participants with primary exposure to only one activity, compared to none. However, the odds increase in testing for men who were exposed to two (aOR: 3.21; 95%CI: 1.99-5.20; p<0.001) or three activities (aOR: 22.92; 95%CI: 7.70-68.25; p<0.001) were significant, compared to none (Figure 5).

**FIGURE 5 ASSOCIATION BETWEEN PARTICIPATION IN SAWA SAWA ACTIVITIES AND RECENT HIV TESTING AMONG MEN**



**OTHER OUTCOMES OF INTEREST:**

Stratifying the models to assess changes in stigma by gender, reductions in stigma were significantly pronounced among men (Beta: -3.56; 95%CI: -4.39, -2.73; p <0.001), though no significant reductions were observed among women (Table 6). Shame and discrimination subscales appeared to be most impacted by the intervention, while only a significant reduction was observed on the inequity subscale among men and inequity scores among women appears to have a minor, but significant increase.



**Table 6.** Impact of the *Sawa Sawa* intervention on various forms of HIV stigma, stratified by gender

Stigma measure	Men			Women		
	Beta	95%CI:	p-value	Beta	95%CI:	p-value
Shame subscale	-1.60	(-2.04, -1.16)	<0.001	-0.17	(-0.79, 0.45)	0.589
Discrimination subscale	-1.47	(-1.85, -1.09)	<0.001	-0.76	(-1.25, -0.26)	0.003
Inequity subscale	-0.49	(-0.75, -0.24)	<0.001	0.92	(0.57, 1.28)	<0.001
<b>Total stigma score</b>	<b>-3.56</b>	<b>(-4.39, -2.73)</b>	<b>&lt;0.001</b>	<b>-0.005</b>	<b>(-1.18, 1.17)</b>	<b>0.994</b>
<b>Perceived community stigma</b>	<b>1.55</b>	<b>(1.15, 1.95)</b>	<b>&lt;0.001</b>	<b>2.41</b>	<b>(1.80, 3.03)</b>	<b>&lt;0.001</b>

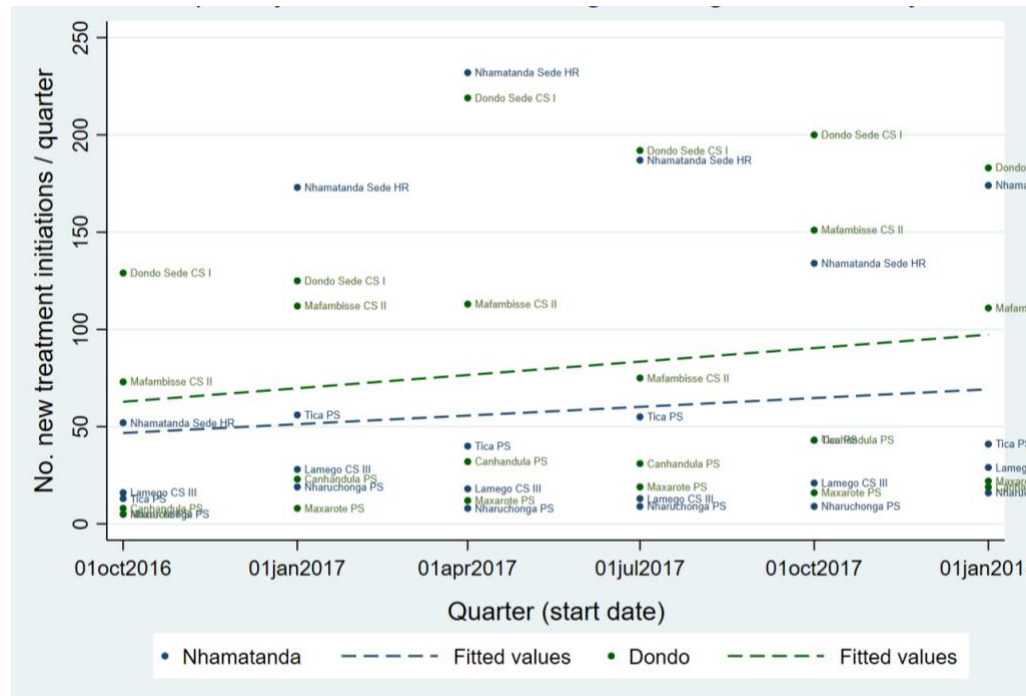
Assessing the broader impact of *Sawa Sawa* on HIV testing beyond men, among men and women combined, the odds of HIV testing within the last 12 months increased by 1.23 (aOR: 1.23; 95%CI: 0.98, 1.53,  $p=0.073$ ) with the intervention, though was marginally significant ( $p<0.10$ ).

Among the 217 men living with HIV who participated in baseline and endline surveys, non-significant improvements in ART uptake among men were observed in the intervention communities (aOR: 1.23; 95%CI: 0.36, 4.14  $p>0.10$ ).

### CLINIC DATA: ART INITIATION AMONG MEN

Figure 6 displays the visualized trends in ART initiation among men in Nhamatanda compared to Dondo.

**FIGURE 6 NEW QUARTERLY ART INITIATIONS AMONG MEN LIVING WITH HIV IN STUDY SITES**



This figure shows an increase in new ART initiations in both sites, with an increasing rate of change in the Dondo intervention sites (represented by the green fitted trend line) compared to the Nhamatanda control sites. If there

was no difference, we would otherwise expect parallel trend between the two districts. While there is a magnitude of effect, the findings are not statistically significant at  $p < 0.05$ . Overall, while the study was not designed to assess ART initiation as a primary outcome, there is evidence in the CHASS data to suggest there may have been an effect on ART initiation, which is consistent with qualitative data and survey findings of non-significant improvement in ART among men.

## **DISCUSSION AND RECOMMENDATIONS:**

Stigma plays an important role in engagement across the HIV care continuum. Data from the baseline survey demonstrated that increased anticipated individual stigma scores are negatively associated with recent (last 12 months) HIV testing among men, counteracting the positive effects of past exposures to HIV prevention messaging. This baseline finding of the association between stigma and reduced HIV testing was particularly interesting, as barriers to testing among men often included feeling healthy, not perceiving that one was at risk for HIV infection, and not having enough time to participate in facility-based HTS, whereas concerns about stigma were rarely mentioned as a barrier. This suggests that underlying stigma that percolates within a community may obstruct individual efforts to overcoming more immediate barriers (time and low perceived risk) to HIV testing. Future HIV care continuum interventions that incorporate stigma reduction efforts should also continue to address these immediate barriers and perceptions.

The implementation of *Sawa Sawa* demonstrated significant impacts that may be translatable to other settings. The combined use of radio programs, an HIV testing campaign, and community discussions through Community Dialogues and Positive Prevention directly reached over 60% of the population in the intervention district. For those who had not participated directly in *Sawa Sawa* activities, discussing the topics with others who had participated added an additional 12-49% coverage, depending on the component of the intervention. This form of secondary exposure introduced *Sawa Sawa* topics to a substantial proportion of men living with HIV who had not participated in Positive Prevention programs. While other HIV prevention and care interventions often predominantly reach women but have limited access to men, *Sawa Sawa* was able to reach equal proportions of men and women across the intervention communities.

Endline surveys highlighted the heterogeneity in which men and women interpreted and incorporated *Sawa Sawa* messages into their lives. While men and women had relatively equal participation in *Sawa Sawa* and heard the same messages, men tended to report learning more about stigma and being motivated to engage in discussions around stigma in the community. Comparatively, women were more likely to report understanding more about PLHIV and wanting to engage in activities to help care for PLHIV. Gender-based differences are often viewed negatively in intervention research; however, it could be beneficial to future interventions to understand more about these positive differences in interpretation of *Sawa Sawa* messaging and how these could be built upon to enhance gender-specific impacts of HIV care continuum interventions that include stigma reduction.

*Sawa Sawa* was found to be both effective at reducing community-level stigma and improving HIV testing among men. The combination approach to *Sawa Sawa* was critical to the success of the intervention, increasing coverage within the community, but also exponentially increasing the effect of the intervention on HIV testing among men with increased engagement in *Sawa Sawa* activities. Each individual *Sawa Sawa* activity (e.g. radio programs, Community Dialogues, etc.) was independently associated with recent HIV testing among men; however, increasing the number of activities in which men participated to two or three activities provided a 3- or 22-fold increased odds, respectively, of HIV testing among men, compared to men who did not participate in any activity. *Sawa Sawa* appeared to reach appropriate candidates for HIV testing, tending to engage men who reported great sexual risk

behaviors and activity. Moreover, 20% of the men tested in the interventions sites overall had no prior history of HIV testing and, among the men receiving HTS through the HIV testing campaign, 40% were tested for the first time.

Qualitative research demonstrated that *Sawa Sawa* also appeared to provide additional benefits to men living with HIV by supporting engagement in the HIV care continuum, in addition to reducing community stigma of HIV. Men who participated in Positive Prevention programs described learning more about how ART works in their bodies and, as a result, understanding and being motivated to make healthy changes in their life and adhere to ART. Participants also noted increases in self-esteem and self-efficacy, which suggests that the participants developed resilience to stigma in community and maintained strong intention to adhere to care. The practice of embedding *Sawa Sawa* focal points within the health facilities supported ART uptake and adherence by reducing the expense of time and the potential risk of stigma while waiting to receive medications within health facilities. The ability to immediately identify trusted *Sawa Sawa* focal points within the health facility was a welcome sight to men who were attending clinical services or picking up ARV medications.

There is evidence to suggest that this intervention does improve treatment outcomes for men. A magnitude and direction of effect on ART initiation among men associated with the intervention was observed in both the longitudinal survey data and CHASS clinical data. While these findings are not statistically significant, they suggest a relationship and were further supported by qualitative findings. This warrants future implementation research to understand the full impact of the intervention on ART initiation and re-initiation in light of efforts to maximize test-and-start approaches.

*Sawa Sawa* is a simple intervention that provides comprehensive results. Baseline findings suggest that interventions to improve engagement in HTS - or the broader HIV care continuum - will not reach their maximum effectiveness without efforts to both reduce stigma and to increase access to HIV prevention and care information and educational opportunities. Findings from the evaluation of *Sawa Sawa* suggest that this intervention is feasible, acceptable and effective for both reducing community-based HIV stigma and for improving HIV testing and care among men in Mozambique. In settings where resources may be limited and *Sawa Sawa* may not be implemented by one agency as a standalone intervention, *Sawa Sawa* could be implemented in a cross-sectoral approach. In this model, stigma can become a cross-cutting issue that is recognized with the potential to affect and be addressed by all sectors that are involved in the HIV response. In this approach, each low-cost *Sawa Sawa* activity can be incorporated into existing activities that are implemented by the sector for which it is most relevant.

Regardless of whether *Sawa Sawa* is implemented as a standalone intervention or via a cross-sectoral approach, several recommendations should be considered for future implementation now that test and start has rolled out.

1. **Utilize meaningful branding and messaging with positive focus.** The term, *sawa*, is a simple but powerful reference to equality. The messaging of *Sawa Sawa* - that everyone is equal - became ubiquitous across the intervention communities, from the bright *Sawa Sawa* shirts that staff wore in the community and health facilities, to the messages of the radio programs and group discussions, and to the songs that were developed for the program. This message strongly reinforced the intervention activities. Further, the widespread brand recognition of *Sawa Sawa* also increased the ease at which this evaluation could tease apart the effects of the intervention compared to the effects of other local prevention and care efforts.
2. **Maintain the combination approach.** The benefits of *Sawa Sawa* are maximized by the combination and diversity of activities that are included in this intervention. Future efforts should continue to utilize a combination approach, rather than focusing efforts on implementation of one potentially effective activity.

3. **Duration of stigma interventions.** Stigma is deeply rooted within communities and requires time and effort to see positive impacts of intervention efforts. Future stigma reduction interventions should aim to implement activities for at least 10-12 months to begin to see changes. Sustained interventions are ideal.
4. **Build community cohesion:** Engagement of community members, and especially community leaders, in Community Dialogues and Positive Prevention builds and empowers support networks in communities to take steps to address stigma. Groups may benefit from and may be more sustainable if they have more time to discuss content and to build relationships.
5. **Engage men in their workplace and other common meeting areas.** Time is an important commodity to men and, related, is a critical barrier to HTS, engagement in HIV care, and engagement in HIV interventions. Future interventions that specifically focus on engaging men across the HIV care continuum will benefit from actively engaging with employers and implementing workplace-based interventions.
6. **Support intervention effort with real-time monitoring.** Interventions that run for long durations of time and incorporate multiple activities are subject to drift and to heterogeneous implementation of activities. Maintaining real-time monitoring and adapting address areas for improvement is critical to maintaining high quality of the intervention.
7. **Offer HIV self-testing (HIVST) at Community Dialogue sessions.** HIVST has been widely found to be effective at improving community-level HIV testing and awareness of HIV infection in African settings, is acceptable, relatively low-cost and is a standard of HIV testing programs in many settings. Where time is a barrier to visiting healthcare facilities for HIV testing, this method can bring rapid testing approaches to populations who may otherwise go untested and undiagnosed.
8. **Collaborate with local community-based organizations to provide more frequent community-based testing.** As with HIVST, bringing HIV testing to the community can help address structural barriers related to time and transportation required to access testing at health facilities. Community-based HIV testing, including HIVST, can be coupled with *SMYes* and facility-based focal points. This can help to ensure that all newly diagnosed individuals and those requiring related referrals can be referred as necessary and efficiently access and navigate facility-based services with minimal concerns of stigma.
9. **Risk assessment can be used in sessions to screen for testing to increase yield.** Through the application of a targeted risk assessment, any individual can be assessed for their relative risk of having HIV which can further help target those at highest risk and ensure HIV testing is done efficiently.
10. **Increase emphasis on test and start.** Test-and-start is now a standard practice in Mozambique and many settings though was not at the start of the *Sawa Sawa* intervention. Future *Sawa Sawa* interventions can provide more focus on immediate linkage to care for those who are newly diagnosed through *SMYes* and by devoting greater efforts to following-up with people who do not appear for their recommended services. As 10-15% of participants in our survey report accessing services in another site outside of their catchment area, it is important to ensure that linkages across communities is supported and that those participants who may not appear for their referred services in their home community but visit facilities in other communities are not presumed simply to have dropped out of care.
11. **Build the role of the facility-based focal point for more assisted ART initiation.**

## **ACKNOWLEDGMENTS:**

This intervention and evaluation would not be possible without the diligent efforts of an enormous team of people. We thank USAID for their support of the intervention, without which *Sawa Sawa* would not have been implemented. We acknowledge the participation and lived experiences of the community members and leaders in the Dondo and Nhamatanda communities. The following people are acknowledged for their contribution to the implementation of *Sawa Sawa* and the evaluation:

**USAID:** Kim Ahanda

**USAID Maputo:** Lopa Basu, Shadit Murargy, Julio Machava, and Ferreira Ferreira

**Center for Communications Programs HC3 project, headquarters:** Lynn Van Lith and Beth Mallalieu

**Center for Communications Programs HC3 project, Maputo:** Patrick Devos, Dida Pinho, Jose “Braz” Chidassicua, and Matilde Cunhaque

**Johns Hopkins University School of Public Health:** Andrea Wirtz with research assistants Jackie Tran, Shirley Yan, and Bee-Ah Kang

**Survey data collectors in Nhamatanda:** Armando Bandazi Castigo, Burcela Domingos Cofereme, Creva Bernardo Nharuchonga, Joao Francisco Jo, Fabio Muchanga, France Licete Agostinho Tete, Jose Fernando Jose, Daniel Moiane Jossias, Rui Vasco Araujo, Salmo Joao Jaquecene, Manuel Francisco Comissal, Domingos Lubico Marrove, Nelson Nunes Nicoadala, Carlota Elisa Massora, Celeste Massasse Ferrao Vilanculo, Claudia Luisa Manuel Macamo, Helena Elias Mastala, Claudina Lourenco dos Santos Chival

**Survey data collectors in Dondo:** António Adelino Tembo, Daniel Arone, Fernando Chafinhe, Joaquim Joao Jone, Nelson Araujo de Jesus, Pedro Joao Jemuce, Pedro Maria Alves, Simoes Antonio Mussa, Domingos Joao Muanda, Noe Joao Guiane, Rita Zacaria Vicentes, Casimira Cossa Domingos Manuel, Lurdes Guente Licova, Muaziza Abudo, Olga Miquelina Francisco, Loyd Mimi Nsona, Carolina Rui Vasco Araujo Dembuenda, and Maria do Ceu Baute Cunhaque.

**Qualitative data collectors:** Hélder Joaquim Martinho, Joaquim Domingos Lequechane, and Fabio Antonio Muchanga.

**Field supervisors:** Etelvino Ernesto Sande, Aleixo Francisco Dembuenda, Brigida Nhantumbo, and Natercia Carolina Sousa Manuel.

**Community Leaders:** Manuel Zeca Miquitaio, João Caetano, Afonso Lampião. Alberto Bento Bamboa. Domingos António Arota, Saraiva Tauzene Cadete, Joaquim Paulo Nequeute, Luis Chicaua, Antonio Fernando Mwandamwa, Mussa Francisco Jamal, José João Constanja, João Chironda, Francisco Samuel Agostinho, Lucas Cobirizamala, and Carlos José Afonso.

**Community Dialogues Facilitators:** Marejane Pereira Meque, Aissa Perreira Meque, Samuel, Jusstino Dino, Inês Manuel, Aly Amisse Francisco, Rita Marizana Gambulene, Daniel Jossias Moyane, Maria do Céu Baute, Orleto Francisco Tembe, Rita Zacarias Vicente, Raimundo Pascoal, Berta José, Manuel Alfinete, Lázaro Júlio, Elina Xavier Jorge, Joaquim João Jone, Laura Nota Sandramo, Mário Zeca Mário, Otília Zacarias, Francisco Inácio Araújo, Isaura Joaquim, Lúcia Oficio Tivane, Fátima Mauzinho, Arminda João

**Positive Prevention Facilitators:** Ramadane Armando, Lázaro Feleciano, Fernando Chico samuel, Izaque Domingos, José Veve, Claussidia Augusto Veríssimo, Luis Hussene José, Paulo Arnaldo Micaajo, Hortência Domingos Francisco, Daniel Feniassa Macahala, Gonçalves Luis Rui José, Almeida Chico Sitole, Juiana Rabeca Jorge, Helena Elia Massitala  
Focal Points: Betinho Domingos de Arimateia, Leopoldino Amisse, Nelson Nunes, and Rosa Joalita Oliveira Zimba.

**Sawa Sawa Supervisors:** Etelvino Ernesto Sande, Bachir Aly Mamad

**Driver:** Sergio João Maondera

## REFERENCES:

1. Mbonu NC, van den Borne B, De Vries NK. Stigma of People with HIV/AIDS in Sub-Saharan Africa: A Literature Review. *J Trop Med* 2009; **2009**: 145891.
2. Stangl AL, Lloyd JK, Brady LM, Holland CE, Baral S. A systematic review of interventions to reduce HIV-related stigma and discrimination from 2002 to 2013: how far have we come? *J Int AIDS Soc* 2013; **16**(3 Suppl 2): 18734.
3. Rede Nacional de Associações de Pessoas que Vivem com HIV/SIDA (RENSIDA). Índice de Estigma de Pessoas Vivendo com HIV/SIDA MOÇAMBIQUE: Relatório Final - Metodologia e Resultados (The People Living with HIV Stigma Index Mozambique: Final Report- Methods and Results). Maputo; 2013.
4. Underwood C, Hendrickson Z, Van Lith LM, Lengwe Kunda JE, Mallalieu EC. Role of community-level factors across the treatment cascade: a critical review. *J Acquir Immune Defic Syndr* 2014; **66 Suppl 3**: S311-8.
5. Musheke M, Bond V, Merten S. Individual and contextual factors influencing patient attrition from antiretroviral therapy care in an urban community of Lusaka, Zambia. *J Int AIDS Soc* 2012; **15 Suppl 1**: 1-9.
6. Kranzer K, Govindasamy D, Ford N, Johnston V, Lawn SD. Quantifying and addressing losses along the continuum of care for people living with HIV infection in sub-Saharan Africa: a systematic review. *J Int AIDS Soc* 2012; **15**(2): 17383.
7. Admassu M, Yohannis F. Factors affecting acceptance of VCT among different professional and community groups in north and south Gondar administrative zones, north west Ethiopia. . *Ethiop J Health Dev* 2006; **20**(1): 24–31.
8. MacPhail CL, Pettifor A, Coates T, Rees H. "You must do the test to know your status": attitudes to HIV voluntary counseling and testing for adolescents among South African youth and parents. *Health Educ Behav* 2008; **35**(1): 87-104.
9. Babalola S. Readiness for HIV testing among young people in northern Nigeria: the roles of social norm and perceived stigma. *AIDS Behav* 2007; **11**(5): 759-69.
10. Karim QA, Meyer-Weitz A, Mboyi L, et al. The influence of AIDS stigma and discrimination and social cohesion on HIV testing and willingness to disclose HIV in rural KwaZulu-Natal, South Africa. *Global Public Health* 2008; **3**(4): 351-65.
11. Smolak A, El-Bassel N. Multilevel stigma as a barrier to HIV testing in Central Asia: a context quantified. *AIDS Behav* 2013; **17**(8): 2742-55.
12. Koku EF. Desire for, and uptake of HIV tests by Ghanaian women: the relevance of community level stigma. *J Community Health* 2011; **36**(2): 289-99.

13. Tenkorang EY, Maticka-Tyndale E. Individual- and school-level correlates of HIV testing among secondary school students in Kenya. *Stud Fam Plann* 2013; **44**(2): 169-87.
14. Berendes S, Rimal RN. Addressing the slow uptake of HIV testing in Malawi: the role of stigma, self-efficacy, and knowledge in the Malawi BRIDGE Project. *J Assoc Nurses AIDS Care* 2011; **22**(3): 215-28.
15. Bwambale FM, Ssali SN, Byaruhanga S, Kalyango JN, Karamagi CA. Voluntary HIV counselling and testing among men in rural western Uganda: implications for HIV prevention. *BMC Public Health* 2008; **8**: 263.
16. Day JH, Miyamura K, Grant AD, et al. Attitudes to HIV voluntary counselling and testing among mineworkers in South Africa: will availability of antiretroviral therapy encourage testing? *AIDS Care* 2003; **15**(5): 665-72.
17. Epule ET, Mirielle MW, Peng C, et al. Utilization rates and perceptions of (VCT) services in Kisii Central District, Kenya. *Glob J Health Sci* 2012; **5**(1): 35-43.
18. Ford K, Wirawan DN, Sumantera GM, Sawitri AA, Stahre M. Voluntary HIV testing, disclosure, and stigma among injection drug users in Bali, Indonesia. *AIDS Educ Prev* 2004; **16**(6): 487-98.
19. Haraka F, Mohamed A, Kilonzo G, Shao H. Factors affecting HIV counselling and testing among adults in Muheza District, Tanzania. *Tanzan J Health Res* 2012; **14**(1): 84-7.
20. Kalichman SC, Simbayi LC. HIV testing attitudes, AIDS stigma, and voluntary HIV counselling and testing in a black township in Cape Town, South Africa. *Sex Transm Infect* 2003; **79**(6): 442-7.
21. Kitara DL, Aloyo J. HIV/AIDS Stigmatization, the Reason for Poor Access to HIV Counseling and Testing (HCT) Among the Youths in Gulu (Uganda). *Afr J Infect Dis* 2012; **6**(1): 12-20.
22. Koku EF. Stigma, sexual risk and desire for HIV tests in Ghana. *Sex Health* 2011; **8**(1): 110-9.
23. Leta TH, Sandøy IF, Fylkesnes K. Factors affecting voluntary HIV counselling and testing among men in Ethiopia: a cross-sectional survey. *BMC Public Health* 2012; **12**: 438.
24. Ma W, Detels R, Feng Y, et al. Acceptance of and barriers to voluntary HIV counselling and testing among adults in Guizhou province, China. *AIDS* 2007; **21 Suppl 8**: S129-35.
25. Meiberg AE, Bos AE, Onya HE, Schaalma HP. Fear of stigmatization as barrier to voluntary HIV counselling and testing in South Africa. *East Afr J Public Health* 2008; **5**(2): 49-54.
26. Mugo M, Kibachio C, Njuguna J. Utilization of voluntary counselling and testing services by women in a Kenyan village. *Journal of Rural and Tropical Health* 2010; **9**: 36-9.
27. Wolfe WR, Weiser SD, Bangsberg DR, et al. Effects of HIV-related stigma among an early sample of patients receiving antiretroviral therapy in Botswana. *AIDS Care* 2006; **18**(8): 931-3.
28. Programs. JHCfC. Positive Prevention in the Community for Community Health Agents. 2012.

29. Chan BT, Weiser SD, Boum Y, et al. Persistent HIV-related stigma in rural Uganda during a period of increasing HIV incidence despite treatment expansion. *AIDS* 2015; **29**(1): 83-90.
30. Rosen S, Fox MP. Retention in HIV care between testing and treatment in sub-Saharan Africa: a systematic review. *PLoS Med* 2011; **8**(7): e1001056.
31. Kunihiro NR, Nuwaha F, Mayanja R, Peterson S. Barriers to use of antiretroviral drugs in Rakai district of Uganda. *Afr Health Sci* 2010; **10**(2): 120-9.
32. Mitchell SK, Kelly KJ, Potgieter FE, Moon MW. Assessing social preparedness for antiretroviral therapy in a generalized AIDS epidemic: a diffusion of innovations approach. *AIDS Behav* 2009; **13**(1): 76-84.
33. Zamberia AM. HIV-related stigma and access to health care among people living with HIV in Swaziland. *Development Southern Africa* 2011; **28**(5): 669-80.
34. Mill JE. Shrouded in secrecy: breaking the news of HIV infection to Ghanaian women. *J Transcult Nurs* 2003; **14**(1): 6-16.
35. Rapid Situational Analysis of PLWHA and the supporting services in the communities. Inputs for the development of the Positive Prevention Strategy at community level in the provinces of Maputo, Gaza and Maputo City. . 2010.
36. Gelaw YA, Senbete GH, Adane AA, Alene KA. Determinants of late presentation to HIV/AIDS care in Southern Tigray Zone, Northern Ethiopia: an institution based case-control study. *AIDS Res Ther* 2015; **12**: 40.
37. Klopper C, Stellenberg E, van der Merwe A. Stigma and HIV disclosure in the Cape Metropolitan area, South Africa. *Afr J AIDS Res* 2014; **13**(1): 37-43.
38. Mburu G, Ram M, Siu G, Bitira D, Skovdal M, Holland P. Intersectionality of HIV stigma and masculinity in eastern Uganda: implications for involving men in HIV programmes. *BMC Public Health* 2014; **14**: 1061.
39. Underwood C, Skinner J, Osman N, Schwandt H. Structural determinants of adolescent girls' vulnerability to HIV: views from community members in Botswana, Malawi, and Mozambique. *Social science & medicine (1982)* 2011; **73**(2): 343-50.
40. Coates TJ. An expanded behavioral paradigm for prevention and treatment of HIV-1 infection. *J Acquir Immune Defic Syndr* 2013; **63 Suppl 2**: S179-82.
41. Kagee A, Remien RH, Berkman A, Hoffman S, Campos L, Swartz L. Structural barriers to ART adherence in Southern Africa: Challenges and potential ways forward. *Glob Public Health* 2011; **6**(1): 83-97.
42. Van Dyk AC. Treatment adherence following national antiretroviral rollout in South Africa. *Afr J AIDS Res* 2010; **9**(3): 235-47.



43. Mutwa PR, Van Nuil JI, Asiimwe-Kateera B, et al. Living situation affects adherence to combination antiretroviral therapy in HIV-infected adolescents in Rwanda: a qualitative study. *PLoS One* 2013; **8**(4): e60073.
44. Lyimo RA, Stutterheim SE, Hospers HJ, de Glee T, van der Ven A, de Bruin M. Stigma, disclosure, coping, and medication adherence among people living with HIV/AIDS in Northern Tanzania. *AIDS Patient Care STDS* 2014; **28**(2): 98-105.
45. Jones J, Zulu I, Mumbi M, et al. Strategies for living with the challenges of HIV and antiretroviral use in Zambia. . *International Electronic Journal of Health Education* 2009; **12**: 253-70.
46. Chesney MA, Ickovics JR, Chambers DB, et al. Self-reported adherence to antiretroviral medications among participants in HIV clinical trials: the AACTG adherence instruments. Patient Care Committee & Adherence Working Group of the Outcomes Committee of the Adult AIDS Clinical Trials Group (AACTG). *AIDS Care* 2000; **12**(3): 255-66.
47. Global Network of People Living with HIV, International Planned Parenthood Federation, International Community of Women Living with HIV/AIDS, UNAIDS. The People Living with HIV Stigma Index. Geneva, 2008.
48. Genberg BL, Kawichai S, Chingono A, et al. Assessing HIV/AIDS stigma and discrimination in developing countries. *AIDS Behav* 2008; **12**(5): 772-80.
49. Wirtz AL, Kamba D, Jumbe V, et al. A qualitative assessment of health seeking practices among and provision practices for men who have sex with men in Malawi. *BMC Int Health Hum Rights* 2014; **14**: 20.
50. Wirtz AL, Zelaya CE, Peryshkina A, et al. Social and structural risks for HIV among migrant and immigrant men who have sex with men in Moscow, Russia: implications for prevention. *AIDS Care* 2014; **26**(3): 387-95.
51. Dalecki M, Willits FK. Examining change using regression analysis: Three approaches compared. *Sociological Spectrum* 1991; **11**(2): 127-45.
52. Dimick JB, Ryan AM. Methods for evaluating changes in health care policy: The difference-in-differences approach. *JAMA* 2014; **312**(22): 2401-2.