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# Implementation of a Comprehensive HIV Prevention Intervention for Men Who Have Sex with Men in Malawi: Assessment of Feasibility and Impact

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**Authors:** Andrea L. Wirtz, Gift Trapence, Vincent Jumbe, Dunker Kamba, Eric Umar, Sosthenes Ketende, Mark Berry, Susanne Stromdahl, Chris Beyrer, Stefan Baral

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From the collaborative team, Stefan Baral (JHU), Gift Trapence (CEDEP), Andrea Wirtz (JHU) and Chris Beyrer (JHU) designed the study. The JHU team was also comprised of Mark Berry, Susanne Stromdahl, and Sosthenes Ketende. JHU provided scientific technical support during its implementation and analysis of baseline and intervention results.

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## PARTNER ORGANIZATIONS

Department of Community Health
University of Malawi, College of Medicine
Private Bag 360, Chichiri, Blantyre 3

Department of Community Health
University of Malawi, College of Medicine
Private Bag 360, Chichiri, Blantyre 3

Center for Public Health and Human Rights
Johns Hopkins Bloomberg School of Public Health
615 Wolfe St, Baltimore, MD 21205

# ACRONYMS

| | |
|---|---|
| AIDS | Acquired Immunodeficiency Syndrome |
| ART | Antiretroviral Therapy |
| CBO | Community-based Organization |
| CCL | Condom Compatible Lubricants |
| CCP | Center for Communication Programs |
| CDC | Centers for Disease Control and Prevention |
| CEDEP | Center for the Development of People |
| CHPI | Combination HIV Prevention Intervention |
| CoM | College of Medicine |
| CoMREC | College of Medicine Research and Ethics Committee |
| CPHHR | Johns Hopkins School of Public Health Center for Public Health and Human Rights |
| FPAM | Family Planning Association of Malawi |
| FSW | Female Sex Worker |
| HIV | Human Immunodeficiency Virus |
| HTC | HIV Testing and Counseling |
| JHU | Johns Hopkins University |
| LGBT | Lesbian, Gay, Bisexual, and Transgender |
| MNG | Malawi National Government |
| MSM | Men Who Have Sex with Men |
| NAC | National AIDS Commission |
| RCT | Randomized Control Trial |
| STI | Sexually Transmitted Infection |
| UAI | Unprotected Anal Intercourse |
| TPHA | Treponema Pallidum Haemaglutination Assay |
| USAID | United States Agency for International Development |
| WHO | World Health Organization |
| 95% CI | 95% Confidence Interval |

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# EXECUTIVE SUMMARY

## Background and aims

Recent years have witnessed an increased awareness of the high burden of HIV among men who have sex with men (MSM) across the globe and the increased transmission efficiency of HIV through receptive anal intercourse (18 times higher than that of vaginal sex). Malawi has a generalized HIV epidemic with approximately 8% of adult men living with HIV, yet a pioneering study of HIV risks among MSM documented HIV prevalence as high as 21%. Malawi is one of several countries in which homosexuality is criminalized and highly stigmatized, creating a situation in which MSM do not have equal access to HIV prevention programs.

In collaboration with The Center for Development of People (CEDEP), a community-based organization (CBO) that provides HIV prevention services to MSM, and the Malawi College of Medicine (CoM), we designed a mixed methods research study consisting of a formative, qualitative phase and a quantitative baseline study to understand the HIV prevalence and risk behaviors among MSM. This was followed by the feasibility testing of a combination HIV prevention intervention (CHPI) tested among a new cohort of MSM over a one-year follow-up period.

## Methods

### *Phase 1: Formative research*

From May to July 2011, we conducted qualitative research that included in-depth interviews among purposely sampled MSM and health service providers working in Blantyre, Malawi. Using peer and key informant referrals for recruitment, a total of eight in-depth interviews were conducted with MSM participants representing a range of ages, social and behavioral characteristics, sexual orientations, and marital patterns (with women). A further five key informants were recruited from the district hospital, local public health clinics, STI research clinics, as well as from an HIV prevention service organization.

### *Phase 2: Baseline research*

The quantitative portion of the study included enrollment of a total of 338 MSM recruited via respondent-driven sampling (RDS) from August 2011 through March 2012 in Blantyre, Malawi. Study activities included a structured survey instrument and biological assessment of HIV and syphilis. Those testing preliminarily positive were referred for confirmatory testing and treatment as indicated. During this period, the CHPI was developed to provide comprehensive services and address barriers to health and HIV prevention service use that had been previously identified. Qualitative and baseline research was used to inform the development of the CHPI to maximize acceptability to participants.

### *Phase 3: Longitudinal research*

From this baseline population, 103 HIV-uninfected MSM were recruited and ultimately enrolled in the CHPI study cohort from January 2012 through May 2013. Participants of the CHPI were followed prospectively, with three quantitative and qualitative follow-up assessments.

## Key Findings

***Quantitative baseline data***

Preliminary analysis of the baseline data showed that the mean age of participants was 25.1 years (range: 18-49) and 46.6% reported being unemployed. Only slightly more than half identified as gay (61.9%). A significant proportion reported varying different forms of relationships with women: 10.3% were currently married to a woman; 17% were divorced/separated; 3% were cohabitating; and 32% reported having a female sexual partner in the last year. Sexual behaviors related to HIV acquisition and transmission were prevalent: participants reported a mean of three male sex partners in the last 12 months; 49–54% reported consistent condom use with regular or casual male partners, respectively, and fewer (33%) with female partners. HIV prevalence was high at 15.8% (unadjusted). Among those with HIV infection, 91% reported being unaware of their HIV status and 39.9% reported never having been tested for HIV. Nearly 60% reported that vaginal sex was the highest risk form of sex, suggesting limited knowledge of transmission risks related to anal intercourse.

***Qualitative research (formative and follow-up)***

Results from qualitative research may help to explain the low awareness of transmission risks among MSM. Respondents indicated that HIV prevention information is targeted to heterosexual married couples and MSM are not informed or knowledgeable of risk of transmission and acquisition related to anal intercourse. Consequently, some participants believed that transmission happens only between wife and husband. Participants also described fears related to disclosure of same-sex practices or orientation during health visits, including concerns about unintentional disclosure to others by health professionals and fear that homosexual behavior would be reported to authorities. Many avoided HIV prevention and treatment for sexually transmitted infections (STIs) as a result of these fears. Providers likewise voiced concern that they would be seen condoning illegal behavior.

With these findings and review of literature on HIV prevention interventions for MSM, we developed a multi-level intervention (CHPI) for use among this population, which included several components.

1) At the individual level, CHPI included the following:
    a. Outreach and education using a peer-based approach;
    b. HIV testing and counseling (HTC) with individualized risk reduction counseling during follow-up assessments, which is targeted to identifying unknown infections for treatment referrals as well as for reducing sexual risks with both male and female partners;
    c. STI screening during follow-up assessments;
    d. A behavioral change intervention aimed at increasing use of condoms and condom compatible lubricants (CCLs), reducing risks in bisexual concurrency, and negotiating condom use with male partners; and
    e. Referral to care for HIV-positive MSM.

2) Service-level components focused on improvements in knowledge of MSM health and access to and uptake of HTC and STI programs. Clinical training and sensitization was offered to health

care providers and testing counselors to reduce barriers to appropriate HTC and STD services for MSM.

3) To address greater-level barriers to HIV prevention, community capacity building for CBOs aimed to increase community penetrance of HIV prevention packages, provide epidemiologic evidence to support decriminalization of homosexuality as a public health imperative, and build community social capital and improve advocacy for MSM inclusion in National HIV strategies.

Moderate improvements in behavior and use of HIV prevention options were observed during follow-up with regard to history of receiving information about HIV prevention for sex with men; condom use with causal and main male partners and main female partners; consistency of always using condoms with main and casual male partners; knowledge of risk related to sexual positioning; knowledge of safe lubricants; and use of water-based lubricants. Improvements were also evident in uptake of condoms and lubricants provided by peer educators; discussing mental health, sexual behavior, and HIV testing with peer educators; self-confidence with sexual orientation when among MSM; and perceived access to condoms and lubricants. A total of seven HIV seroconversions were reported during the course of follow-up. Greater length of follow-up will be necessary to understand further behavioral changes or any decay in behavior changes that were observed.

The study answered several questions about the feasibility of providing CHPI to MSM in Malawi. Qualitative and quantitative assessment of the CHPI cohort indicated that MSM were able to safely and confidentially access HIV prevention materials and receive information about mental health and other health issues. The cohort maintained 99% retention, demonstrating the importance of CBOs and peer-based approaches to maintaining contact with those at risk for acquiring or transmitting HIV. Qualitative findings suggest that peer support and regular communication between peers and participants appear to be important factors for retention in CHPI.

## Conclusions

This study reinforces that MSM are a relevant population in Malawi's HIV epidemic and are in high need of targeted HIV prevention services. As of May 2012, the government of Malawi publicly announced intention to decriminalize homosexuality and Parliament has requested report briefs from this study to consider decriminalization of homosexuality as a public health priority. The data here highlight the need to take advantage of this opportunity to provide important services to MSM given the limited HIV-related knowledge and high-risk practices among this population coupled with the potential for epidemiologic data to influence national advocacy. Preliminary results were presented to UNAIDS, USAID, and CDC in January 2013. They have agreed to support expansion of the baseline study to six other sites in Malawi. This will include the results and recommendations during the redrafting of the National HIV Strategy (February 2013). Importantly, this intervention may be generalizable to other settings where homosexuality is criminalized or stigmatized.

# INTRODUCTION

## Overview of the HIV epidemic in Malawi

Malawi has a generalized HIV epidemic with an estimated prevalence of 8.1% in 2011 among reproductive-aged men, 12.9% among reproductive-aged women, and an estimated total of 13,588 adults living with HIV. The HIV prevalence among adult men has substantially declined since 2004 when HIV among men was estimated at 20.4% (Malawi National Government [MNG], 2012). The dominant risk factors for HIV in Malawi have been heterosexual and vertical transmission, with HIV more prevalent among urban and older age groups (aged 35-44) (MNG, 2012). A recent study of adults in rural regions similarly found higher HIV prevalence among older populations, aged 50-64 (prevalence: 8.1%), compared to those of lower ages (prevalence 4.1%) (Freeman & Anglewicz, 2012). AIDS-related mortality was estimated at 22,000 deaths at the beginning of the epidemic in 1985, and reached its peak at 76,000 deaths by 2005 (MNG, 2012). Substantial mortality has resulted in an estimated 600,000 orphans over the course of the epidemic (MNG, 2012). In 2004, with Global Fund support, a national antiretroviral therapy (ART) program was initiated and was last estimated to cover 67% of the population in 2011. At that time and during this intervention, ART guidelines recommended initiation at a CD4 count of 350 cells/mm (World Health Organization [WHO], 2010), though recent updates now recommend initiation at 500 cells/mm (WHO, 2010; WHO HIV/AIDS Program, 2013).

## Key Populations and MSM in Malawi

The few behavioral studies that have been conducted in Malawi among key populations such as female sex workers (FSW) and men who have sex with men (MSM) indicate higher prevalence compared to general populations. A Behavioral Surveillance Survey conducted in 2006 estimated HIV prevalence to be 70.7% among FSW (MNG, 2012). The most recent behavioral survey conducted in 2011 among FSW found that only 29.5% had accessed HIV testing and counseling (HTC) within the last 12 months (Family Planning Association of Malawi [FPAM], 2011). In this context, barriers to services, social and physical violence, and HIV vulnerability of FSW are attributed to penal codes that criminalize earnings from prostitution and brothel keeping (FPAM, 2011). No biologic assessment was conducted with this study, thus no recent HIV prevalence updates have been provided for FSW since 2006 and no study has been completed among male sex workers. A study of 10 prisons in three regions was also conducted in 2011, providing updated information of HIV prevalence estimates from a total of 551 participants (Mwapasa et al., 2011). This study found HIV prevalence among male prisoners to range from as low as 19% among small prisons to as high as 41% among central prisons, and syphilis prevalence ranging from 7-10%. HIV prevalence appeared to be higher among male prisoners who reported same-sex practices, compared to those who did not (Mwapasa et al., 2011).

Amongst the key populations, recent studies from Africa have suggested that gay men and other MSM are also at risk for HIV infection, and that these men may be vulnerable due to the lack of targeted prevention programs, stigma, and human rights violations (Beyrer et al., 2012; Sabin et al., 2012; Smith et al., 2009). In 2008, our collaborative group completed the first study to evaluate HIV risk status of MSM in Malawi, enrolling 201 MSM in total from Blantyre and Lilongwe through snowball sampling methods. Findings demonstrated that MSM are a high-risk group for HIV infection and human rights

abuses (Baral et al., 2009; Beyrer et al., 2010; Fay et al., 2010). HIV prevalence was 21.4%, with 95.3% unaware of their HIV status. MSM were more likely to have received information about preventing HIV transmission with women than with men ($p<0.05$), and were less likely to know that HIV was transmitted through anal intercourse than through vaginal intercourse ($p<0.05$). In a multivariate model controlling for education, having had a female partner in the last six months, number of male partners, being older than 25 ($p=0.06$), having used the internet to find a partner ($p=0.07$), and not always wearing condoms with men ($p=0.01$) were predictive for being infected with HIV (Baral et al., 2009). Bisexual concurrency (i.e., sexual partnerships with both genders) was common among Malawian and other African MSM and may play important roles in HIV transmission in the general population (Beyrer et al., 2012). Another exploratory study conducted around the same time in central and southern Malawi examined socio-demographic and sexual behavior characteristics among 97 MSM (no biologic assessments were conducted). The study found evidence of high-risk behaviors among MSM, including inconsistent condom use (32.5%), transactional sex (23.7%), low exposure to HIV messaging (17.5%), and low history of HIV testing (58.8% had ever tested) (Ntata et al., 2008).

Similar to sex work, homosexuality is criminalized in Malawi (MNG, no date), limiting provision of and access to HIV prevention and sufficient health services for MSM. Until this year, the National HIV Prevention Strategy and the National AIDS Framework included MSM as a key population for HIV prevention, but provided only vague recommendations to "improve services" and "engage media" (National AIDS Commission, 2009a, 2009b). In Malawi and globally, contradictory guidance by government laws and public health policies contributes to an environment in which service providers are uncertain of their legal capacity to provide HIV prevention and clinical services and where the provision of these services may be considered as evidence of criminal activities (Gruskin & Ferguson, 2009). This was the case in 2009 when outreach workers, including CEDEP staff members, were arrested for carrying HIV prevention materials for MSM, citing the materials as pornography.

## HIV prevention interventions for MSM

Globally, only 5–10% of MSM have access to any HIV prevention programming, with the majority of programming for MSM taking place in high-income countries (amfAR, 2008). However, studies of interventions targeting MSM in low- and middle-income settings have consistently demonstrated both the need for and effectiveness of these programs in reducing risk for HIV among MSM. Although prevention strategies targeting MSM have been shown to be effective across country income levels, the benefit of these interventions, particularly those focused on condom uptake, has been subject to decay over time, indicating that programs should be ongoing to preserve increased condom usage.

Throughout the last two decades, there have been a number of randomized controlled trials evaluating both individual- and community-level interventions for MSM. One of the most recent randomized controlled trials (RCTs) to investigate individual-level interventions for MSM was Project Explore (Koblin, 2004). This study randomized 4,295 MSM participants in six US-based sites to a control or experimental group. The experimental group participated in activities that included 10 core counseling modules, which were delivered one-on-one, and then supplemented with maintenance counseling every 3 months until the end of the study. The control group received standard risk-reduction counseling based

on the Center for Disease Control and Prevention (CDC) Respect Model (CDC, 1993). Retention in this study was excellent with rates of above 83% in the experimental group and above 87% in the control group after 4 years of follow-up. In multivariate analysis, the ratio for HIV infection in the group receiving the intervention was 0.84 (95% CI 0.66-1.08), which equates to a trend towards a 16% decrease in HIV incidence (95% CI -8%-34%), though this did not reach statistical significance. In this study, there was no trend of a decreasing HIV incidence throughout the follow-up period (Koblin, 2004). Project Explore did demonstrate that intense behavioral interventions could improve self-reported sexual risk practices, but not significantly decrease HIV incidence. Other research, predominantly conducted in high-income countries, has demonstrated impacts on sexual risk behaviors from interventions targeted to MSM. A systematic review of interventions to reduce sexual risk behavior among MSM, which included 16,224 men in 38 experimental and observational studies, demonstrated that compared to controls with no interventions, study groups demonstrated reduced self-reported unprotected anal intercourse (UAI) by 27% (95% CI 15-37%) (Herbst et al., 2005; Johnson et al., 2005. Similarly, a review of 16 studies in which MSM were given targeted prevention strategies MSM in study groups decreased UAI by 17% (95% CI 5-27%) more than MSM who received standard HIV prevention measures. Findings from these reviews have been validated by more recent studies such as Mpowerment (Kahn et al., 2001, Kegeles et al., 1996), which focuses on young MSM, and the Bruthas Study (Operario et al., 2010), which targets communities of Black MSM in the US.

The manner and duration in which interventions are delivered are also important factors in long-term impact; yet, the benefit of episodic or one-time interventions has been shown to be subject to decay over time. At approximately 12 months, the beneficial results of cross-sectional or one-time behavioral interventions tend to be significantly attenuated. Due in part to funding limitations, few studies have evaluated the efficacy of these interventions past 12 months of follow-up. However, the short-term attenuation of efficacy highlights the need for ongoing or episodic boosters of community-level behavioral interventions if these are to contribute to curbing HIV epidemics (Herbst et al., 2010). Collectively, these research findings demonstrate that interventions can effectively target networks or communities rather than individuals to potentiate increased condom usage.

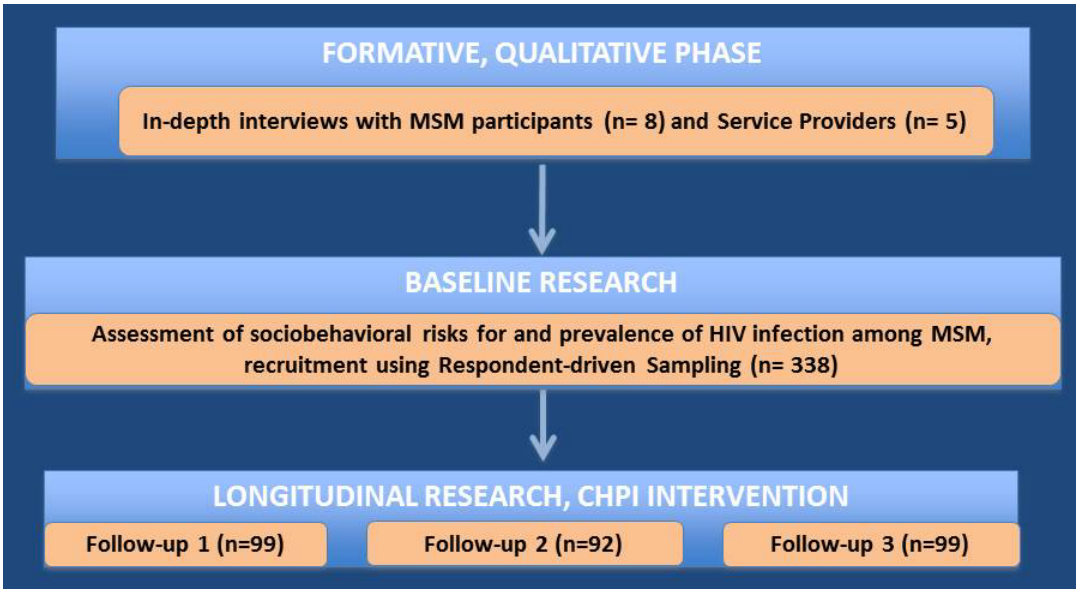
## Study objectives

In the past, the lack of information about the MSM population has left an impression that MSM are non-existent in Malawi or that they are irrelevant in the epidemic. In order to provide guidance for National Strategies that recognize this population, stakeholders must understand the size of the MSM population as well as specific HIV prevention, treatment, and care needs of this group. At the same time, there is a clear need for interventions that address more than individual-level factors in HIV risk among MSM. In collaboration with The Center for Development of People (CEDEP), a community-based organization (CBO) that provides HIV prevention services to MSM, and the Malawi College of Medicine, we designed a mixed methods research study to understand the HIV prevalence and risk behaviors among MSM. The full study was implemented from May 2011 through May 2013. This consisted of a formative, qualitative research phase and a quantitative baseline study. Following these efforts, we designed and tested a combination HIV prevention intervention (CHPI) among a cohort of MSM for one year.

# METHODS

The CHPI feasibility study was conducted from May 2011 to May 2013 in three phases: (1) a formative, qualitative research phase with MSM participants (n=8) and service providers (n= 5) to understand socio-behavioral risks for HIV infection, identify barriers and facilitators to HIV prevention and healthcare, and inform the development of the intervention and research surveys; (2) baseline, quantitative research among MSM recruited by respondent driven sampling (n=338) to assess socio-behavioral risks for HIV infection, stigma, and access to HIV prevention; and (3) a longitudinal study of the intervention feasibility among HIV-negative MSM (n=100) with three follow-up assessments. **Figure 1** presents the overall process of formative development and feasibility research conducted in Blantyre, Malawi.

**Figure 1** CHPI Study Flow Diagram




## Phase 1: Formative research

From May to July 2011, we conducted in-depth interviews among purposively sampled MSM and health service providers working in Blantyre, Malawi.

### *Participants and setting*

Participants were recruited via peer-referral recruitment methods, which allowed for an initial enrollment of eight MSM for in-depth interviews. MSM participants were selected to represent a range of socio-demographic characteristics including age, social and behavioral characteristics, sexual orientation (gay, bisexual, heterosexual), and marital history and status (i.e., marriage with a woman). Eligibility criteria for enrollment of MSM in the in-depth interviews included being male, being aged 18

years or older, living in Blantyre for at least one year, reporting sex with another man in the previous 12 months, and providing informed consent to participate.

Likewise, health service providers were purposively sampled from local hospital, health clinics, and HIV prevention organizations. Eligibility criteria for these interviews included being aged 18 years or older, having worked in the specific health setting for one year or more, and providing informed consent to participate. A total of five participants were recruited from the district hospital, local public health clinics, STI research clinics, and an HIV prevention service organization.

Interviews among MSM and health professionals were conducted in a private room at the study office in Blantyre, Malawi. Health professionals were given the option to be interviewed in their office or other preferred, private location. MSM participants were only interviewed in the office to ensure privacy and confidentiality when discussing sensitive topics.

#### *Qualitative topics and conduct of interviews*

Trained interviewers with past experience in qualitative research conducted in-depth interviews using semi-structured interview guides. Questions and probes for the interviews with MSM were developed to assess perspectives on socio-behavioral and structural risks for HIV infection; experiences of stigma and discrimination related to same-sex practices or HIV status; health service and HIV prevention utilization; and specific barriers or facilitators to accessing or providing care. Interview questions and probes for health professionals were developed to assess services provided to the general public and those provided (or not) to MSM; opinions of services and prevention programs that should be provided to MSM; knowledge and perspectives on health and HIV risks among MSM; perceptions of stigma and discrimination towards MSM that may exist in the health sector; and barriers or facilitators related to providing care to MSM.

#### *Qualitative data analysis*

Interviews were conducted in the local language, Chichewa, and lasted 30 - 60 minutes. The interviews were recorded with the participants' permission and subsequently transcribed and translated for analysis. Transcripts were independently coded and analyzed by two investigators using Atlas.ti (Cincom Systems, Berlin) who coded based on pre-identified codes from a qualitative guide and using grounded theory to identify emerging themes. Coded transcripts were then compared to resolve discrepancies between the two analysts. An overview of the findings from these two study populations are summarized in the Results section with select quotations included to support the findings.

### Phases 2: Baseline research

The baseline, cross-sectional assessment was conducted from August 2011 to March 2012 in Blantyre, Malawi, among a total of 338 MSM to assess the overall HIV prevalence among the MSM population as well as socio-behavioral exposures, experiences of stigma, and access to HIV prevention and healthcare among the MSM population. The study consisted of a structured survey instrument and biological assessment of HIV and syphilis infection.

#### *Study population and setting*

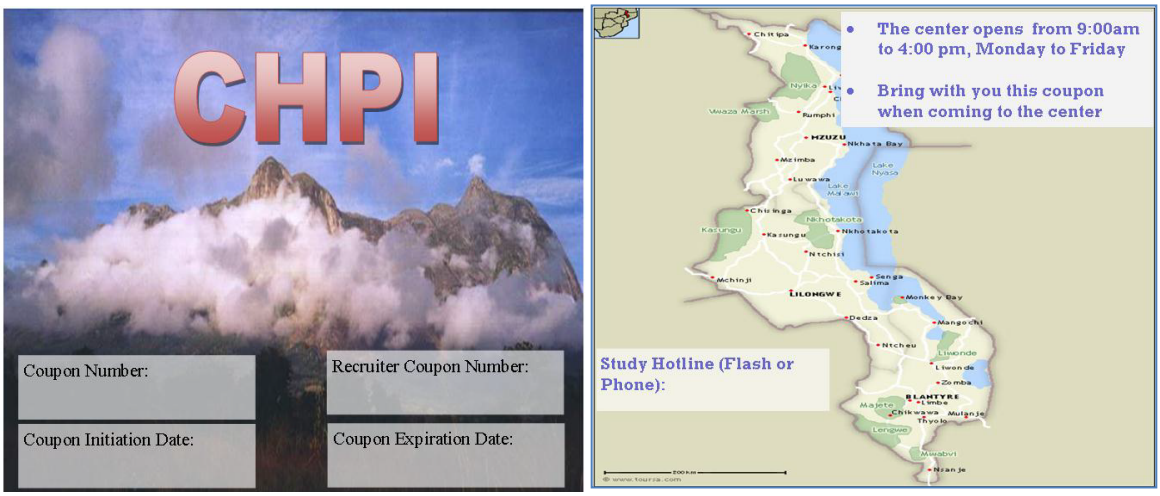
Eligibility requirements for participation in the baseline study were similar to the qualitative MSM

criteria: for eligibility, participants must have been born male, aged 18 years or older, fluent in Chichewa or English, reported anal sex with another man in the last 12 months, reported no prior participation in this study, and provided informed verbal consent to participate. Study activities were conducted in private rooms of CEDEP's study office.

***Recruitment method***

Participants were recruited via respondent-driven sampling methodology (RDS), a process that is widely used to reach hidden and stigmatized populations and is considered a more acceptable approach for recruiting stigmatized or criminalized population than traditional venue-based or snowball sampling approaches. Recruitment began with 10 purposively selected seeds—participants who were known to be well networked within the MSM population—that represented a range of characteristics (age, sexual identity, professions) and were willing to recruit other MSM into the study. These seeds, who were identified during the formative research phase, were each provided with three study-specific coupons with which to recruit peer MSM from their social networks into the study. **Figure 2** displays the RDS coupon (front and back) used for study recruitment. Seeds and subsequent recruiters were trained to inform interested peers that the study aimed to assess HIV infection and risks among MSM; however, the coupon was designed to be non-specific to MSM or HIV, so as not to identify participants as MSM or participants in an HIV research study and avoid stigmatization.

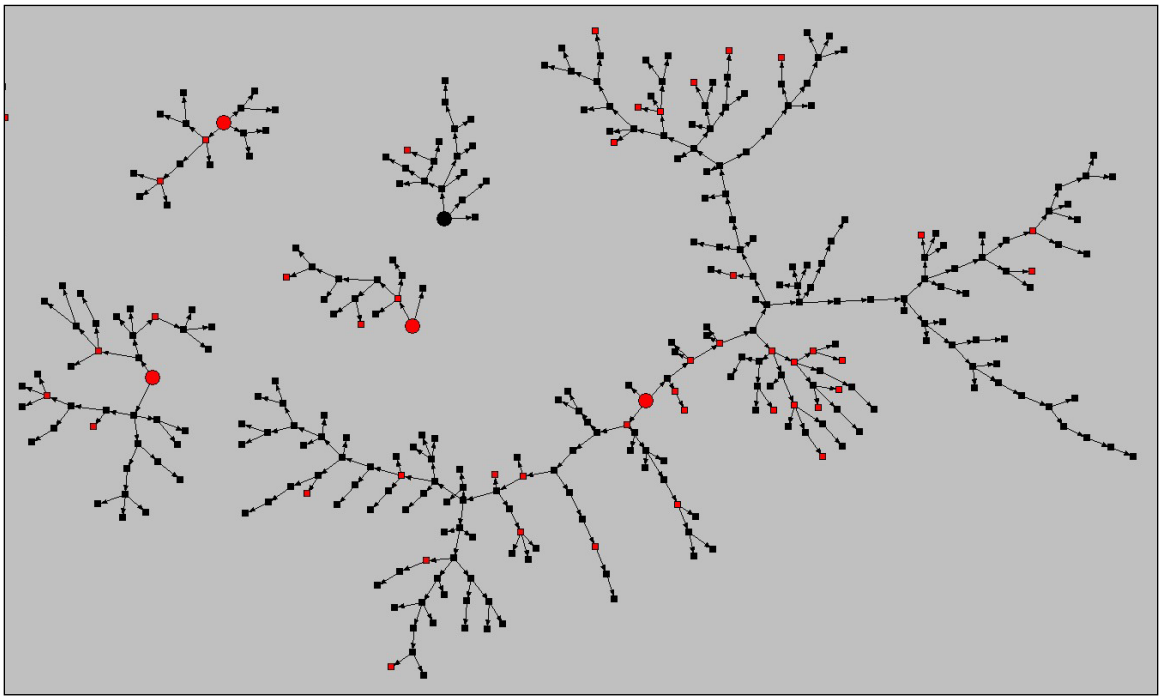
**Figure 2 CHPI RDS Recruitment Coupon (panel 1: front; panel 2: back)**




Initiation of seeds was staggered over the duration of the study, taking into consideration potential recruitment failure by some seeds and eventual die-out of certain recruitment chains. Eligible participants who were recruited by seeds, had a valid coupon for participation (i.e., the coupon was not expired and the coupon identification number had not been previously used), provided informed consent for participation, and were enrolled into the study were subsequently provided with three study coupons for further recruitment of peers. **Figure 3** displays the RDS network recruitment. Large nodes represent seeds while smaller nodes represent recruits. Black nodes represent participants who screened negative for HIV infection during baseline analysis, while red nodes represent those who screened positive for HIV infection. We used this method to monitor recruitment and to assess whether

HIV diagnosis inhibited recruitment, which did not appear to be the case. Three seeds with smaller recruitment networks were enrolled at the end of the baseline recruitment to resume final recruitment following a holiday break. This process continued until the target sample size was reached. Participants were reimbursed K1500.00 (USD $5) for transportation costs for participation in the study and K500.00 (USD $1.50) for recruitment of each peer into the study. Full description of RDS methods is available elsewhere (Johnston et al., 2008; Magnani et al., 2005; Malekinejad et al., 2008; Montealegre et al., 2013)

**Figure 3 RDS Recruitment Network**



***Legend:*** Large nodes= Seeds; Small nodes= recruits; Red= HIV+ on HIV Determine rapid test; Black=HIV- on HIV Determine rapid test or Blue=unreported on Determine test

### *Quantitative Survey Measures*

Development of survey questions, recruitment methods, coupons, and baseline study procedures were informed by results from the formative research phase, described above. Survey measures included socio-demographic characteristics; substance use; mental health and depression symptoms; sexual relationships; and disclosure of orientation or sexual practices to family and peers. Quantitative measures of sexual practices included number(s) of sexual partners; partner characteristics; concurrent relationships; sexual practices with men and women between different partner types (casual, committed, etc.) including anal/oral/vaginal sex; and history of transactional sex (purchased or sold). HIV knowledge and prevention exposures were measured, including aspects of condom and condom compatible lubricant (CCL) use; HIV testing and counseling (HTC) exposures; and access to and uptake of health services. Human rights exposures, including experiences of physical and sexual violence;

experienced and perceived stigma; and history of imprisonment were measured. Recall periods were lifetime, last 12 months, or both, and are specified in the tables of the Results section.

The developed survey was pilot tested prior to use. Trained interviewers administered surveys in Chichewa language to all participants (an English version was available but not requested).

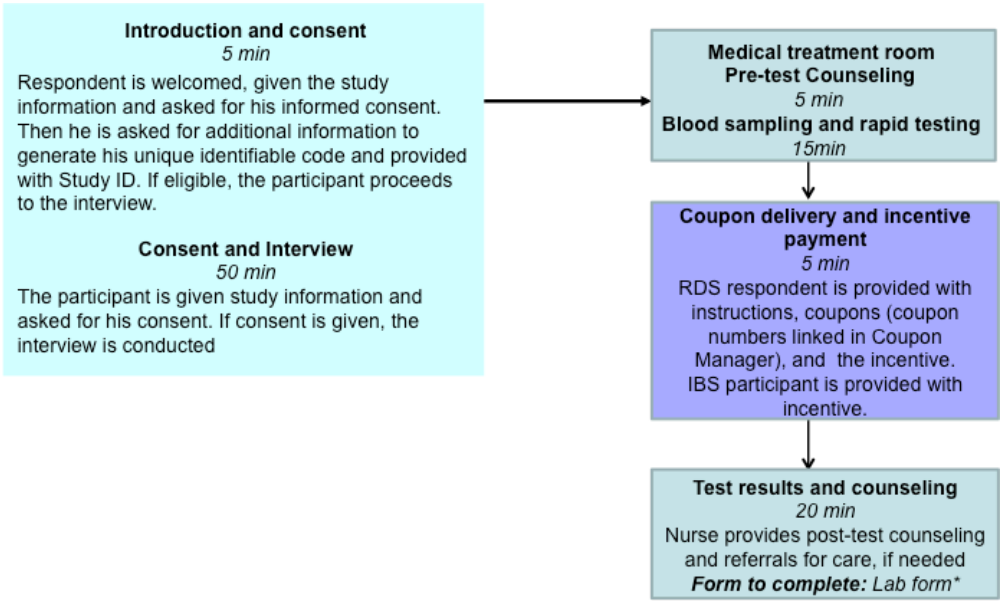
***Biologic specimens***

Consenting participants underwent HIV and syphilis testing following completion of the survey interview. **Figure 4** displays the participant study flow. Blood-based rapid HIV tests were conducted simultaneously using Determine and Unigold rapid HIV tests and followed Malawi national guidelines for HIV testing. Participants received their HIV test results and post-test counseling within 15 minutes of collection. Separate specimens were collected for confirmatory testing of discrepant or indeterminate HIV rapid tests using Western Blot, in accordance with Malawian National Guidelines, and sent to the laboratory at the Malawi College of Medicine for processing.

Approximately 5 ml of whole blood was collected for treponema pallidum haemaglutination assay (TPHA) syphilis testing (Biorad). Syphilis tests were analyzed at the Malawi College of Medicine laboratory, Blantyre. Participants returned to the office within 1 to 2 weeks to receive their syphilis test results, which coincided with the time they returned to receive recruitment reimbursements. Participants testing positive for HIV and/or syphilis were referred to the local hospital or to the Johns Hopkins ART/STI clinic located at Queens Hospital.

A trained nurse from the College of Medicine conducted all HIV testing, blood specimen collection, and pre- and post-test counseling procedures. Participants were provided with information about local health centers that had, as part of the study, received training for the provision of services to MSM. All study activities were implemented by staff from CEDEP, a nongovernmental organization that provides HIV prevention activities for MSM in Malawi, and the University of Malawi, Malawi College of Medicine. One trained research team member (EU) provided counseling services to MSM participants, as needed.

**Figure 4** Baseline Participant Study Flow



### *Quantitative data analysis*

Monitoring of RDS recruitment was conducted through analysis of RDS network data using Netdraw software (Analytic Technologies) (Borgatti, 2002). Quantitative analysis of behavioral and sociodemographic factors were conducted using Stata Statistical software (StataCorp, 2011). The analysis of data from an RDS survey requires weighting to account for the varying probabilities of recruitment that are associated with this sampling methodology (Salganik, 2006). Variable-specific individualized weights, which take into account estimates for individual degree, were computed by data-smoothing algorithm using RDS for Stata (Schonlau & Liebau, 2007). The weights were used in the estimation of univariate descriptive statistics.

RDS-adjusted results are presented in the text of the Results section; tables appear at the end of the document and present the RDS-adjusted estimates as well as crude estimates. Descriptive analysis includes univariate description of the study population.

## Phase 3: Longitudinal research

The longitudinal phase of the study aimed to develop and evaluate a comprehensive HIV prevention intervention (CHPI). From the baseline assessment group, a total of 103 HIV negative MSM were enrolled in the CHPI cohort and participated in at least one follow-up assessment from January 2012 through May 2013. Intervention and study activities were suspended at the end of May 2012 and resumed in mid-October 2012 (between baseline and the first follow-up visit), due to security threats affecting gay men and other MSM as well as general political instability in the area. Of the 103 who were enrolled in the CHPI intervention, 83 participants attended all baseline and three follow-up assessments.

### *The CHPI intervention*

The CHPI was developed by the Center for Public Health and Human Rights (CPHHR) to address the multiple levels of possible HIV transmission and acquisition risks among MSM, including individual-level risks, biomedical and health sector level factors, and environmental or structural risks. The intervention was informed by previous research conducted in Malawi (Baral et al., 2009; Beyrer et al., 2010; Fay et al., 2010), formative research conducted for this research (described in the following Methods section of this report), and global research of effectiveness of interventions for MSM. For example, previous research by the study team had brought to light challenges to reaching the MSM population due to the social stigmatization of MSM (Baral et al., 2009; Beyrer et al., 2010; Fay et al., 2010). This indicated that a method to reach MSM in a confidential and safe manner was needed. Thus, the intervention utilized peer educators, who understand the issues that MSM face, and which has also demonstrated benefit in improving uptake of HIV testing in other settings (Safren et al., 2011). The study described here is the first attempt to implement CHPI to MSM in Malawi, and it evaluated the feasibility of conducting this intervention to provide HIV prevention to MSM in a setting where MSM are particularly stigmatized and hidden.

### *Objectives of the CHPI*

The CHPI program targeted three levels of influence—individual, healthcare, and community levels—to meet the needs of MSM. **Figure 5** displays the CHPI intervention approach and targeted levels for HIV

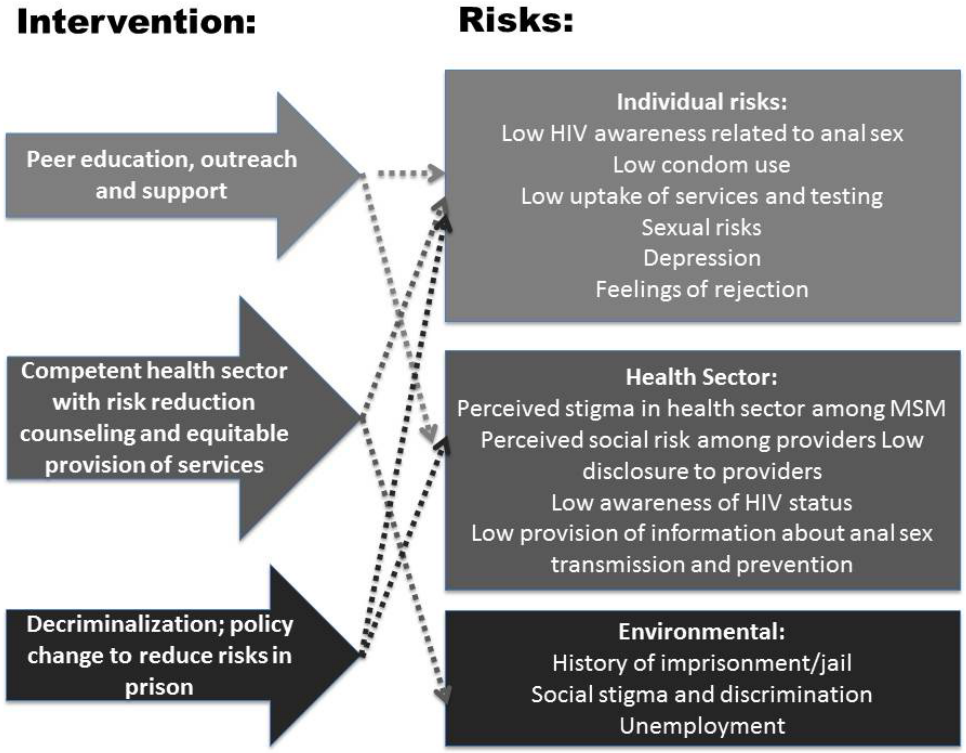
prevention. Intervention components to address these three levels of risks include the following components.

1. The individual-level component of the CHPI includes the following interventions:
    a. Outreach and education using a peer-based approach;
    b. HIV testing and counseling (HTC) with individualized risk-reduction counseling during follow-up assessments, which is targeted to identifying unknown infections for treatment referrals as well as for reducing sexual risks with both male and female partners;
    c. Sexually transmitted infections (STI) screening during follow-up assessments;
    d. A behavior change intervention aimed at increasing use of condoms and CCLs, reducing risks in bisexual concurrency, and negotiating condom use with male partners;
    e. Referral to care for HIV-positive MSM.

2. Health sector-level interventions focused on improvements in knowledge of MSM health and access to and uptake of HTC and STI programs. Clinical training and sensitization was offered to health care providers and testing counselors to reduce barriers to appropriate HTC and STI services for MSM.

3. To address greater-level barriers to HIV prevention, community capacity-building for CBOs that aimed to increase community penetrance of HIV prevention packages, provide epidemiologic evidence to support decriminalization of homosexuality as a public health imperative, and build community social capital and improve advocacy for MSM inclusion in the Malawian National HIV strategies.

**Figure 5** Approach and targets of the Comprehensive HIV Prevention Intervention for MSM in Malawi




### *Study population and setting*

Participants of the CHPI intervention were recruited from those participating in the baseline study population. Eligibility was determined on the basis of meeting eligibility requirements for the Baseline assessment, as well as screening HIV-negative during baseline assessment, and consenting to participate in a 12-month intervention and return for follow-up assessments.

### *Intervention implementation*

Each CHPI participant was assigned to a peer educator (10 peer educators were assigned to approximately 10 participants each) whom the participant could contact by cell phone and meet with in person as often as preferred. Peer educators served as the main connection between the study team and study participants, though participants were invited to contact the study office directly if they preferred. Peer educators received in-depth training and refresher trainings on HIV risks and prevalence among MSM; HIV and STI prevention; mental health issues experienced by MSM; and peer-counseling techniques. Peer educators were provided with condoms and CCLs to distribute to CHPI participants as often as requested. They also informed MSM participants of hospital and clinics where staff had been trained on MSM health and non-stigmatizing care for MSM (further description in following paragraph) where MSM could access HTC and STI testing and other health services.

Health sector trainings were conducted over a period of 2 days in December 2011. A total of 25 health professionals from five health facilities were provided with comprehensive training on MSM health,

including physical, sexual and mental health, as well as HIV prevention, following the Fenway Guide (Makadon et al., 2008).

To assess improvements in knowledge associated with training, pre- and post-training surveys were completed by 20 and 25 health professionals, respectively. Survey measures included experiences counseling MSM and perceptions of social stigma, as well as knowledge questions on mental health, HIV/STIs among MSM, and HIV prevention and condom use for MSM. Descriptive data analysis was conducted using STATA v11.

#### *Follow-up assessments and in-depth interviews*

Evaluation of the CHPI feasibility consisted of a mixed-methods approach which included (1) longitudinal, quantitative evaluation of the CHPI participants (three follow-up assessments; n=100); (2) in-depth interviews with purposively selected CHPI participants (n=10) to assess acceptability of the intervention, challenges, and recommendations; and (3) in-depth interviews with peer educators to explore experiences, challenges and recommendations for future peer-education programs.

#### *Quantitative follow-up*

MSM enrolled in the CHPI study were initially asked to return to the CEDEP office for four follow-up sessions which would include completion of socio-behavioral surveys and biologic sampling at 3, 6, 9, and 12 months. However, security breaches closed the study site for several months (from the end of May 2012 to October 2012). Thus, participants were asked to return only for three follow-up evaluations. All study activities (surveys and biologic sampling) followed the same processes as the baseline assessment (see subsection Baseline Research Methods). Follow-up surveys were identical to baseline surveys, with the exception of the inclusion of an additional module to assess acceptability and use of CHPI interventions and peer educators.

Quantitative analyses of follow-up assessment data were similar to those conducted for baseline, excluding weighting for RDS. Weighting was not conducted given that longitudinal participants were a selection of those participants from the baseline survey who tested negative for HIV infection. Analysis of behavioral and socio-demographic factors was conducted using Stata Statistical software (StataCorp, 2011). Descriptive analysis for univariate description of the study population was conducted for each follow-up phase to assess changes in the study population.

#### *Qualitative follow-up*

In-depth interviews were also conducted with 10 CHPI participants and 10 peer educators. Participants followed the same in-depth interview process as those in the formative research phase, described above. In-depth interviews with peer educators were conducted in December 2011 and followed the same qualitative process and measures to ensure confidentiality. Interviews with peer educators explored motivation to being a peer educator, experiences, and resources associated with peer-educator responsibilities. The purpose of these interviews was to understand any issues faced by peer educators during the intervention so as to improve these services during the intervention, as well as to inform future peer-based interventions.

In-depth interviews with CHPI participants were conducted between March and April 2013. Interviews were administered by CEDEP staff who were not peer educators, and participants were informed that their responses would remain confidential (i.e., peer educators would not learn of their participation in in-depth interviews nor their responses to interview questions). CHPI participants were asked about their experiences in the intervention, interactions with peer educators and local health facilities, and recommendations for future interventions and research. Interviews with peer educators and CHPI participants were conducted in the local language, Chichewa, and lasted 30 - 60 minutes. The interviews were recorded with the participants' permission, and were subsequently transcribed and translated for analysis.

Analysis of follow-up qualitative interviews followed the same process as the formative research described above. Transcripts were independently coded and analyzed by two investigators using Atlas.ti (Cincom Systems, Berlin) who coded based on pre-identified codes from the qualitative guide and using grounded theory method to identify emerging themes. Coded transcripts were then compared to resolve discrepancies between the two analysts. An overview of qualitative findings from CHPI participants and peer educators is summarized in the Results section with select quotations included to support the findings.

## Human subjects research and protections

All research activities associated with this study were reviewed and approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board and the College of Medicine Review and Ethics Committee (CoMREC) at the Malawi College of Medicine. In concordance with recommendations from the ethics committee to protect the privacy of participants, focus group discussions were not conducted. During all research activities, no personal identifiers were collected on audio recordings or paper study forms. All completed study forms were locked in study filing cabinets. The consent process for all research activities used verbal consent scripts to ensure that no participant names were collected on study forms. Participants were informed that consent forms with study information were available to take home upon request. Staff members received in-depth and frequent refresher training on security measures, participant privacy and confidentiality, and discussion of sensitive topics. Qualitative results are presented as experiences and opinions of health professionals and MSM; we do not disclose the health or service organization that employed the health providers to further protect their anonymity. During the security breach and temporary office closure, JHU, CEDEP and CoM staff immediately informed their respective IRB or ethics committee, held frequent communications related to the ongoing situation, and resumed activities only with the approval of both review bodies.

# RESULTS

## Formative research results

Qualitative research revealed gaps in HIV knowledge and barriers to accessing and using HIV prevention among MSM. The narrative below provides an overview of results from interviews with MSM and service providers. Select quotes are highlighted in **Boxes 1 and 2** to provide context to the findings.

In qualitative discussions, access to and use of basic HIV prevention options (condoms and lubricants, HTC, and STI testing and treatment) appeared lower than necessary for a population at heightened risk of HIV infection. Among MSM, awareness of risk for HIV infection was variable; some participants reported that they were not aware of the risk for HIV acquisition, while others were aware of the risk but indicated that the majority of their peers were not well informed of risks for HIV infection during sex with men. Some believed that their risk for HIV infection was only possible or elevated during sexual intercourse with a woman. Among health providers, while some participants acknowledged the risk for HIV and STI among MSM, they suggested improving risk awareness as a critical first step to HIV prevention among MSM.

In general, participants attributed lack of awareness of HIV risk among MSM and limited knowledge among service providers to existing public health policies and lack of messaging about risk for HIV among MSM. Service providers indicated that little was known about MSM in Malawi, resulting in inadequate support for risk-reduction counseling that includes same-sex practices or prioritizing interventions for MSM. Without this information and without political support for providers to serve MSM, the perceived threat of HIV among MSM by the public and providers is diminished, which gives way to poor health seeking practices. Some MSM agreed, indicating that the decriminalization of homosexuality could allow interventions for MSM to expand.

**Box 1** Select quotations from formative qualitative research with MSM

***Awareness of risk for HIV infection:*** *"…a lot of people do not believe that when you have sex with your fellow man you can contract infections. They think that amongst men you cannot infect one another. They think that you can get infection only if you have sex with a woman- that is when you can contract infections. It's just a few people who are in the know that if you have sex with your fellow man you can infect one another." MSM ID07*

***Barriers to health service utilization:*** *"I have [known] individuals who have had sexual transmitted infections. For some time they may have it. They don't seek treatment and they just walk around with it. Because they are afraid they don't know how they are going to be treated when they go to a STI clinic…They think maybe they are going to inform the police, they are going to call the police, there may be stigma, and the health workers may be calling each other [to tell them there is a MSM in the clinic]." MSM ID05*

***Dual stigmatization of MSM living with HIV*** *"Most of the times they [MSM living with HIV] are taken as people, because of their behaviors, who acquired it voluntarily. They regard them as those that are reaping from what they sowed. Their bad behaviors [have] led them to have the effects of the disease. It's like blaming them, judging them to say that's what they wanted." MSM ID04*

***Creating an enabling environment:*** *"…if [same sex practices] can be legalized in such a way, that means also the interventions that might be cropping up, they will be reaching the people engaging in same sex acts…The [current] messages that talk about with HIV AIDS are mainly targeting men/women relationships."*

Social stigma and the criminalization of homosexuality led to increased fear of unintentional disclosure to others and/or potential arrest among MSM. Participants reported several concerns regarding how they would potentially be treated in a health facility, and that

staff would inform others of their sexual behaviors or STI (particularly for anorectal STIs) if this was discussed during consultation. For men who were married or had female partners, there was concern that buying or obtaining condoms would raise suspicion about their behaviors, as they would not be expected to buy condoms for sex with wives. MSM also feared breaches of confidentiality in which family members or neighbors would learn of same-sex practices through the health providers. Health service providers reiterated concerns about lack of confidentiality among some clinical staff, having witnessed instances when an MSM was treated as a spectacle when seeking treatment for rectal STIs. Additional barriers to HIV testing that emerged in interviews was the fear of a positive HIV diagnosis or the fear unintentional disclosure of HIV status to others, given dual stigmatization of being both MSM and living with HIV infection.

There was evidence that the structural issues of criminalization and stigmatization of homosexuality led to reduced uptake of health programs, particularly those for sexual health, as there was little incentive for MSM to take on the social and legal risks associated with seeking health services. These barriers not only affected MSM but affected providers as well. Health providers who were aware of HIV risks among MSM expressed concern that there could be political or legal consequences to providing care to MSM. Much like MSM, providers felt that they could provide targeted services for MSM if the political and social environment changed to allow for acknowledgment of and care for MSM.

**Box 2** Select quotations from formative research with health service providers

***Awareness of risk for HIV infection:*** *"I would say the first, the major issue for the MSM is awareness in terms of how dangerous it is, how they are more at risk when they practice anal sex, as opposed to other people. How important it is to protect themselves using condoms and using lubricants." HP ID04*

***Barriers to health service provision:*** *"They [health providers] have their own fears… Knowing that MSM in Malawi is kind of criminalized and they said that if people know that we are treating them maybe we will be in trouble." HP ID05*

*"I personally I think … we are still moving under an umbrella of … not wanting to accept that these people are there. Because of lack of proper legislations to protect these people [MSM], then those are some of the major challenges that are hindering us to be providing the care to those that are providing you know, homosexuality sort of aspects of intercourse." HP ID02*

***Concerns about lack of confidentiality in the health sector:*** *"I think this can affect healthcare provision because when the more you talk [gossip] much about your patients it's the more you lose patients. The more you will make the infections spread. So that's bad because our aim is to make that circle break. But if you start having that attitude bad attitude discriminating them [MSM], that means they will not come for treatment and they will remain there and spread that infection and the circle will not end." HP ID03*

## Baseline survey results

RDS recruitment methods led to recruitment and subsequent enrollment of 338 adult MSM. A total of 19 waves were reached following recruitment of participants by five of ten enrolled seeds. One recruitment chain was responsible for 70% of the study population. The majority of participants reported recruitment by a friend (60.5%) or sex partner (32.3%).

**Table 1** presents the baseline population demographics, using crude and RDS-adjusted population estimates. Briefly, participants had a median age of 25.1 years (range: 18-49). Fifty-one percent were unemployed and 21.6% had ever been in jail/prison. Eighty percent identified as male gender and 60.8% identified as gay/homosexual, while more than one-third reported bisexual identity. Approximately 16.2% were married/cohabitating with a woman. The crude prevalence of HIV infection in this population was 15.4%, with an RDS-adjusted estimate of 12.5% HIV prevalence.

**Table 2** presents the crude and RDS-adjusted sexual health, behavior, and social exposure characteristics of baseline participants. Only 18.1% had ever disclosed sexual practices or orientation to their family and equally few (18.9%) had ever disclosed to a health provider. Participants reported a mean of four male partners (range: 1-50). Thirty-one percent reported having a female sexual partners in the last 12 months; these participants reported a mean of three female partners (range: 1-20) in that time. Half of the population reported concurrent sexual relationships with either gender in the last 12 months. Prevalence of perceived and experienced stigma and discrimination exceeded 20% of the population for almost all variables. Additionally, 7% had ever been raped, some more than once, and 11.4% had ever experienced physical violence.

**Table 3** presents crude and RDS-adjusted participant characteristics on knowledge of HIV risk and access to and use of HIV prevention interventions. Over 66% of the participants reported using condoms with casual male sexual partners at last sex. Likewise, almost 65% of those with casual female partners used condoms at last sex, though among MSM with main female partners, condom use at last sex was much lower (44.5%). One-fourth (25.2%) reported use of water-based lubricants. Few participants (15.4%) considered anal sex to have the greatest risk for HIV transmission/acquisition and only 18.8% had ever received information about HIV prevention during sex with men. Close to half (44.3%) had never been tested for HIV.

## Follow-up results: Peer educator interviews

Qualitative interviews conducted with peer educators during the intervention follow-up explored motivations behind being a peer educator, experiences of peer educators, and resources associated with their responsibilities. The objective of these interviews was to understand any issues faced by peer educators during the intervention so as to improve these services during the intervention period and to inform future peer-based interventions. **Box 3** displays select quotations from peer interviews.

Themes that emerged included strong motivation and feelings of empowerment associated with being a peer educator. Peer educators described high levels of HIV risk behavior among MSM participants and low awareness of risk regarding STIs/HIV and protection. Peer educators felt it was important to help other MSM be informed of their risks and help them access HIV prevention options; however, they

simultaneously reported experiencing anxiety about unintentional disclosure of themselves or their participants as MSM. Several reported that using their own strategies to avoiding disclosure of their own and others' same-sex practices and ensuring the privacy and confidentiality of their participants was paramount in their work. Peer educators reported some barriers to reaching MSM participants, most often related to disclosure and fears of arrest.

In spite of these barriers, peer educators reported feeling knowledgeable and empowered to provide services to clients in a safe, confidential manner. Many felt that trainings were not only helpful in improving their ability to serve their MSM peers, but also informative and supportive for themselves, as they dealt with similar social challenges. Overall, peer educators demonstrated immense community resilience and faith in their work.

**Box 3** Select quotes from qualitative interviews with peer educators

***Motivation:*** *"…I think I will change to the better because as a peer educator I think am standing as a role model to other guys around our community… it will help me to be a better person to behave in my ways and, aah, I think the whole gay community is going to benefit a lot." PE ID12*

***Challenges to initially reaching MSM:*** *"Yeah it has been very difficult because of the issue that most of the MSM fear being arrested when it comes out that they are MSM, so reaching out to MSM has been very difficult. Many of them were not forthcoming, you know to come out and reveal their sexuality and most of them could not trust me because it was alleged sometimes that the government has put in place some agents to try to smoke out those that are MSM. So there hasn`t been much trust, and there`s been much fear from MSMs." PE ID11*

***Barriers faced by MSM when accessing HIV prevention methods "****But to access the water-based lubricants and the like it's very hard and it's a very dangerous thing in Malawi. Just purchasing the water-based lubricants people would [realize] this person is MSM, gay or the like." PE ID14*

***Ensuring confidentiality: "****You know we are living in a country where it's illegal to be gay, I will make sure that confidentiality between me and my clients is maintained. So which means we will make sure that we will be at a very confidential place, that's between me and my clients of which sometimes might be difficult so I will look at it as being a negative effect whilst taking my duties as a peer educator." PE IDI11*

***Benefits of training and being a peer educator:*** *"But to me I can see that it is something that has benefitted me like some of my friends of course I did not explain everything to them, but my friends, other MSM from the area I come from, I am able to sit down with them and tell them guys things are supposed to be like this. So I can see that the project is helping me." PE ID18*

## Follow-up results: Health sector training survey

The baseline assessment of Health Sector trainees revealed substantial knowledge of general sexual health, but indicated gaps related to knowledge and training on sexual health specific to MSM. Prior to CHPI training, half (10/20) of the training participants reported never asking a client about same-sex behavior in the past 3 months. Only one participant had ever received any training on how to counsel patients regarding anal sex and 15% (3/20) had received any training on how to counsel MSM patients. Over 40% (7/17) of pre-test participants incorrectly reported that HIV acquisition risks were the same for unprotected receptive anal intercourse as unprotected insertive anal intercourse.

Post-training evaluation demonstrated increased knowledge regarding HIV/STI risks, condom use, and counseling for MSM. However, feelings of self-efficacy remained fairly static from pre- to post-assessment. The majority (88%, 22/25) correctly reported that anal sex is the most effective transmission method for sexual transmission of HIV. All stated that risk-reduction counseling for men should include inquiring about sexual practices with both male and female genders. Non-discrimination was high during pre- and post-testing: 75% (15/20) pre-training and 72% (18/25) post-training stated that health personnel do not have to approve of or support patients' sexual identity

in order to provide care and treatment. Despite improved knowledge, social barriers for providers were consistent: Approximately 40% (8/20) of participants pre-training compared to 36% (9/25) post-training stated that health personnel can be stigmatized for counseling and treating MSM. **Table 4** displays the pre- and post-training evaluation results.

### Follow-up results: CHPI participant survey

Of the total of 103 MSM who were enrolled in the CHPI cohort and participated in at least one follow-up assessment, 83 participants attended baseline and all three follow-up assessments between January 2012 and May 2013.

**Table 5** displays the baseline characteristics of those who were enrolled into the CHPI intervention. Briefly, slightly more than half were between the ages of 18 to 25 years. Almost 45% were unemployed. Slightly less than 80% identified as male gender, 68.9% identified as gay/homosexual, one-third reported bisexual identity. Approximately 6.8% were married/cohabitating with a woman and 8.8% had one or more children.

**Table 6** presents the sexual health, behavior, and social exposure characteristics of CHPI participants across assessments. These data highlight limited change in sexual practices in terms of numbers of sexual partners during the follow-up period. In addition, there was a consistent trend in structural risk for HIV (such as experiences of discrimination or violence) throughout the follow-up period.

**Table 7** presents the CHPI participant characteristics on knowledge of HIV risk, access to and use of HIV prevention interventions across assessments. Improvements from baseline to the last follow-up were observed in the following variables: history of receiving information about HIV prevention for sex with men; condom use with causal and main male partners and main female partners; consistency of always using condoms with main and casual male partners; knowledge of risk related to sexual positioning; knowledge of safe lubricants to use; and use of water-based lubricants.

**Table 8** displays use of the CHPI intervention and its components by participants as well as perceptions as to how the intervention impacted self-confidence and ability to use HIV prevention options. Improvements were evident in uptake of condoms and lubricants provided by peer educators; discussing mental health, sexual behavior, and HIV testing with peer educators; self-confidence with sexual orientation when among MSM; and perceived access to condoms and lubricants.

### Follow-up results: CHPI participant qualitative interviews

Qualitative research with CHPI participants who had received peer-education services and services from the CEDEP office via enrollment in the study provide context to the above survey results. The narrative below provides an overview of results from interviews with MSM and service providers. Select quotes are highlighted in **Box 4** to provide context to the findings.

In qualitative discussions, participants reported using peer-educator services to varying levels. Frequencies of contacting peer educators ranged from “almost never” to 10 or more times per month. Those who used peer-educator services suggested that benefits included receiving condoms and CCLs

and receiving information about HIV prevention, how to use condoms, and what to do in situations when condoms break. Some MSM reported that the opportunity to have a peer who provides general support and with whom to discuss general social and rights issues was most beneficial. Some MSM who did not use peer-educators services or used them less frequently reported obtaining HIV prevention materials, particularly condoms and CCL, from CEDEP offices. The CEDEP office was appreciated for its safe location, security, and non-stigmatizing atmosphere. MSM reported that they knew they could receive HIV prevention materials and testing through CEDEP or peer educators when no other institutions or organizations offered options for MSM.

In general, participants noted improvements in their awareness of appropriate condom use, the importance of using condoms with all partners, and the importance of knowing one's HIV status and discussing this with partners. Much like health providers, MSM felt that though violence towards sexual minorities had declined, there was still much stigma and discrimination to overcome to ensure that MSM could comfortably and equally access general HIV prevention services outside of CEDEP.

**Box 4** Select quotations from follow-up CHPI participants

***Awareness of status:*** *"…After the project I have been able to know my status and be able to protect myself from diseases." - MSM ID01*

***Benefits of CHPI:*** *"[The peer educator] has been very helpful as part of my life is concerned. We were free with each other when discussing issues about health, and of course how our country is going at present…He is such a person conversant with issues about the gay rights…He has taught me so many things such as how to use the condom, what to do when the condom is broken in process of having sex and so on…" –MSM ID02.*

*"[CHPI] has been quite good especially to my health and all MSM family. It gave us time to interact with each other and we had a good experience sharing our lives and other issues." MSMID03*

*"I had the chance to go for the VCT, attaining new ideas from friends, accessing condoms and lubricants to use the when having sex." MSMID04*

***Safe space:*** *"We are free and secured when we come to the office… Since the beginning of the project, I have noted that we are now almost free to do our activities without any fear. We are being treated fairly in some societies." MSM ID01*

***Opportunity where no other options exist:*** *"Right now it is very difficult just because people are not ready to accept what gays are. We can only get the services at your office only." MSM ID01*

***Recommendations if CHPI is implemented elsewhere:*** *"The youth in the village should be targeted most." MSM ID02*

*"The distribution of condoms should be a priority." MSMID02*

*"It would be good to train more people for example from each and every health facility where MSM access health information and services." MSMID03*

***Parting thoughts:*** *"Violence has changed but discrimination has not yet improved for the better. It will take some time to happen because people's minds are not yet changed to accept us gays." MSMID05*

# DISCUSSION

## Interpretation of findings

The use of community-based and mixed methods research allowed for the evidence-based development and feasibility assessment of a comprehensive HIV prevention intervention for MSM in Malawi. In a context of criminalization and stigmatization of same-sex practices, several findings have emerged from this project. First, while HIV has stabilized to 8% among adult males in Malawi, HIV remains prevalent among MSM at approximately 15% in Blantyre. Quantitative and qualitative data suggest that social factors have played a significant role in limiting the access of MSM to HIV prevention options, either through overt stigma and discrimination, lack of available information about risk and how to prevent HIV transmission during anal sex, or individual perceptions of stigma and discrimination that may exist socially and within the health sector. MSM report high levels of perceived and experienced stigma related to sexual practice and risk for HIV and also experience physical and sexual violence— all of which may also increase risk for HIV acquisition. Overall, the findings of individual, social, and structural risk behaviors and experiences are consistent with those of other countries where MSM are criminalized or highly stigmatized (Hladik et al., 2012; Larmarange et al., 2010; Muraguri et al., 2012; Wade et al., 2005) and demonstrate that MSM in Malawi are an important population for targeted, non-stigmatizing HIV prevention programs.

This project provided evidence that a comprehensive program for HIV may address multiple points of vulnerability in the HIV transmission pathway of MSM. A majority of the observed improvements were related to access to HIV prevention information, knowledge and awareness of HIV risks related to sexual positioning, and knowledge of appropriate lubricant use. Improvements were also observed among several condom use variables, including use of condoms with partners of both gender and with different partner types (e.g., casual or main). This is consistent with qualitative findings that MSM reported improved access to information, condoms, and lubricant through peer educators.

The use of peer educators, who themselves had faced similar social and structural challenges to HIV prevention, represents a feasible and effective way to reach hidden MSM. Peer educators played supportive roles for MSM participants and served as sources for HIV prevention materials (e.g., condoms and CCLs), HIV prevention information, and general information on multiple physical and mental health issues for MSM. Other trials of peer-based interventions for MSM have demonstrated high retention in longitudinal activities and reductions in transmission risk behavior among MSM reporting high-risk behaviors at baseline (Safren et al., 2011). Most effect data on peer-based interventions, however, have come from the US or European setting and have demonstrated limited impact. In a highly criminalized and stigmatized setting such as Malawi, however, peer-based interventions may be the most optimal method to both reach and protect MSM participants, as peers understand the social sensitivities and risks that may exist in the environment.

Results from the health sector training follow-up demonstrated that health service providers in Malawi are generally willing to be trained to be attentive to same sex practices and risks for HIV among MSM. Moreover, intensive training for health professionals on comprehensive care for MSM in Malawi

demonstrated that a short, didactic training can provide health professionals with comprehensive knowledge of MSM health. A two-day program that involves the Fenway (Makadon et al., 2008) or other evidence- and rights-based guide may be sufficient for an effective training. Emphasis during such trainings should focus on the HIV acquisition associated with unprotected anal intercourse and the importance of posing questions to all male patients to determine if they have male and/or female sexual partners. Moreover, the training must emphasize the need for services to be conducted in a non-stigmatizing setting. Qualitative interviews suggested that despite increased awareness and knowledge of MSM needs among participating health professionals, concerns about stigmatization of those providing care to MSM remained high after the training. This indicates the need for social- and policy-level interventions. Without political support and an enabling social environment, health service providers may continue to feel limited in their capacity to fully provide comprehensive HIV and STI services to MSM in Malawi. Provision of services may therefore remain limited until laws and policies are changed to create an enabling environment.

The temporary closure and relocation of the study office is an example of the direct impact of criminalization and stigmatization of homosexuality on provision of and access to HIV prevention. Similar incidents have been observed in other countries where homosexuality is criminalized (Poteat et al., 2011) or stigmatized (Rada, 2012). CBOs are often the only organizations providing services to stigmatized or criminalized populations and do so at great personal risk. In settings such as this, the safety of staff and participants is paramount. Staff members of the organizations participating in this study, CEDEP and CoM, were well trained on safety procedures and were able to quickly respond to perceived risks by closing the offices and notifying participants (through peer educators) that activities were suspended. That these organizations reached participants so swiftly and effectively highlights the importance of engaging CBOs with strong connections to the community. Organizations that have the community's trust will be able to swiftly notify participants during times of emergency and when services resume once stability has been reached. The challenges faced by our organizations and the lessons learned should therefore be carefully considered prior to conducting similar interventions.

The study answered several questions about the feasibility of providing CHPI to MSM in Malawi. Qualitative and quantitative assessment of the CHPI cohort indicated that MSM were able to safely and confidentially access HIV prevention materials and receive information about mental health and other health issues. The cohort maintained 99% retention, demonstrating the importance of CBOs and peer-based approaches to maintaining contact with those at risk for acquiring or transmitting HIV. Qualitative findings suggest that peer support and regular communication between peers and participants appear to be important factors for retention in CHPI.

A key objective of the CHPI was to provide support to increase the capacity of local CBOs to provide HIV prevention and advocate for changes in oppressive laws. Beyond HIV prevention for MSM in Blantyre, this work has served to inform national level data and strategies. Based on this project, CEDEP, CoM, and JHU have provided the recent (and only) HIV prevalence estimates for the national report to UNAIDS and have provided input into the recent revision of the National AIDS Strategy, which will provide guidance for HIV prevention for MSM and other key populations. Over the course of this project, CEDEP has continued training media staff across Malawi on LGBT rights and how to present

unbiased, non-stigmatizing information about issues related to HIV and the LGBT population. The impact of this work is evident in the news stories that are now published which present the facts of LGBT issues and no longer appear to carry the same level of stigma as they had in previous years. Taken together, this project can provide a model for other researchers and programmers working to improve access to HIV prevention and care for MSM in stigmatized or criminalized populations.

As of May 2012, the government of Malawi publicly announced intention to decriminalize homosexuality and Parliament has requested report briefs from this study to consider decriminalization of homosexuality as a public health priority. The data here highlight the need to take advantage of this opportunity to provide important services to MSM given the limited HIV-related knowledge and high-risk practices among this population coupled with the potential for epidemiologic data to influence national advocacy. Preliminary results were presented to UNAIDS, USAID, and CDC in January 2013. They have agreed to support expansion of the baseline study to six other sites in Malawi. This will include the results and recommendations during the redrafting of the National HIV Strategy (February 2013). Importantly, this intervention may be generalizable to other settings where homosexuality is criminalized or stigmatized.

## Limitations

Findings should be viewed in light of several limitations. We did not observe substantial changes in reported sexual risk practices. This may be a limitation related to sample size, the interruption of the study when the clinic was threatened, or the one-year duration of follow-up. Longer follow-up periods are needed for assessments of efficacy of the intervention on changing behaviors, impacting HIV transmission/acquisition, and evaluating potential decay in behavior change. This may also suggest that more intensive efforts are needed, but that these should be implemented in combination with biomedical and structural approaches. Structural approaches are crucial given the history and depth of stigma and discrimination of MSM. Consequently, programs for MSM, particularly peer-based and those working with the health sector, may need more time and resources from the community and health professionals so that MSM will feel comfortable accessing services.

The research study did not formally track participant use of referral services, which would provide additional information and support study findings of changes in service use. Participants were referred to several health providers; the study did not have agreements/resources to enable such tracking of health service utilization. Second, for security purposes and to protect confidentiality, we did not collect personal identifiers—only identification numbers—and only peer educators had participants' first names and cellular phone numbers. While these security measures were critical to protecting participant safety, they limited any potential tracking of participant health service utilization. Should the security improve in this setting, it is recommendable that future research of comprehensive interventions use safe measure to track changes in health service utilization.

This study included a small sample of transgender women participants (10 in baseline and 5 in follow-up). Given the objectives of the study, the research team did not seek to enroll a larger sample of participants; thus there is insufficient statistical power to make additional inferences on correlates of HIV infection or behavioral changes for these participants. Transgender women, however, are at

increased risk of HIV infection, and while they share similar biologic risks for HIV transmission and acquisition through anal sex as MSM, they do not typically identify as men. This group deserves a separate study that specifically focuses on transgender women and men.

## Recommendations

It is a public health imperative to provide targeted and rights-based HIV interventions to MSM in Malawi. Behavioral change interventions alone are not sufficient to curb the epidemic of HIV among MSM. Recommendations for National HIV guidelines are therefore comprehensive, aiming to address aspects related to behavioral interventions, clinical services, and surveillance. The following sets out key recommendations for HIV prevention for MSM in Malawi.

### *Recommendations at the behavioral level*

- HIV prevention messaging on topics such as risk awareness, partner reduction, and condom promotion should include messages for both male-female and male-male sexual relationships.
- MSM should be aware of locations where HIV prevention materials and confidential, stigma-free health services are available.
- Behavioral interventions should *not* attempt to encourage MSM towards only heterosexual relationships.
- Behavioral interventions may be provided by CBOs and peer educators, as well as by health-care providers. Utilizing an array of organizational support may allow interventions to reach diverse and hidden men.

### *Recommendations at the health sector level*

- Programs must promote engagement with knowledgeable and supportive health-care providers to provide routine periodic screening for HIV/STIs and education about methods to avoid HIV transmission/acquisition.
- Providers must practice sensitive HTC that provides support for HIV status disclosure and promotes partner referrals.
- In order to facilitate access and foster uptake of services, health care facilities must train staff in MSM health, health disparities, and optimum ways to provide culturally competent care.

### *Recommendations at the community and national level*

- Routine, confidential, national-level monitoring of the HIV prevalence and coverage of HIV prevention interventions must be undertaken to better understand epidemic trends and gaps in prevention for MSM.
- Simple, community-based provision of HIV prevention services can provide an alternative method of service delivery for MSM. HTC may be implemented by community health workers in a safe space, with referrals to trusted and trained health service providers for confirmatory testing and care.
- Institutions, organizations, and agencies conducting research or providing services to MSM should maintain ongoing dialogue with the Malawian government and those involved in the writing and implementation of the National HIV Strategy. Provision of information on health and

HIV risks among MSM and key populations is needed to ensure inclusion in the strategy and ensure that services are implemented for these populations. Those organizations which provide services, particularly community-based services, are well positioned to inform national strategies and programs as to what are the most acceptable methods to provide services to MSM and other key populations at risk for HIV infection.

- Governmental and public support is necessary to ensure coverage of health and HIV prevention services. Decriminalization of homosexuality is recommended as a public health priority to ensure safe access to services and it is consistent with international guidelines by the WHO for prevention of HIV among MSM and transgender populations (WHO, 2011).

***Recommendations for research***

- Future research conducted among MSM and other key populations at risk for HIV, such as sex workers and transgender women and men, must make participant safety and confidentiality a priority. Even well intentioned research risks compromising the security of participants if safety and confidentiality measures are not well designed and inherent in all research activities. Research teams must receive in-depth training and regular refresher training. Key populations are most knowledgeable of their own risks, and input from participants and CBOs within these populations can maximize security procedures and provide information on environmental and social changes that may arise during study implementation.
- A number of biologic interventions, such as PrEP, have recently demonstrated effectiveness to reduce transmission of HIV infection. In the context of high HIV prevalence and transmission, testing of the efficacy of such biologic interventions, or future promising interventions, is merited among MSM in Malawi.
- The study sought to inform national policies and provide sensitization training to health services provider but was limited in capacity to evaluate the full context of political or social changes, changes to health service provision for MSM, and uptake of health services by MSM. Future research with greater research should evaluate beyond the individual participant to assess broader, structural impacts of research.

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# TABLES

**Table 1. Demographics, identity and health indicators of baseline participants (n=338)**

| Variable: | Categories: | Crude | | RDS –adjusted | |
|---|---|---|---|---|---|
| ***Demographics*** | | **n** | **(%)** | **(%)** | **(95% CI)** |
| Age | 18-25 | 192 | 56.8 | 58.5 | [50.2-66.8] |
| | 26+ | 146 | 43.2 | 41.5 | [33.2-49.8] |
| Highest Level of Education (completed) | Less than Secondary | 146 | 43.2 | 46.3 | [38.9-53.8] |
| | Secondary or higher | 192 | 56.8 | 53.7 | [46.2-61.1] |
| Employment status | Unemployed | 158 | 46.8 | 51.7 | [44.2-59.3] |
| | Employed | 136 | 40.2 | 36.8 | [29.6-44.1] |
| | Student | 44 | 13.0 | 11.5 | [0.74-15.5] |
| Gender Identity | Male | 263 | 77.8 | 80.2 | [74.8-85.6] |
| | Female | 65 | 19.2 | 17.0 | [11.8-22.1] |
| | Transgender | 10 | 2.9 | 02.8 | [0.8-4.9] |
| Sexual Orientation | Gay or homosexual | 210 | 62.3 | 60.8 | [53.6-68.1] |
| | Bisexual | 125 | 37.1 | 36.3 | [29.1-43.4] |
| | Heterosexual or straight | 2 | 0.6 | 02.9 | [0.0-6.7] |
| Marital Status (with a woman) | Married, Cohabiting | 54 | 16.0 | 16.2 | [9.7-22.7 |
| | Single /Divorced/ Separated | 284 | 84.0 | 83.7 | [77.4-90.1] |
| No. of children | None | 285 | 84.6 | 84.9 | [78.2-91.6] |
| | One or more | 52 | 15.4 | 15.1 | [0.84-21.8] |
| ***Health Indicators*** | | | | | |
| HIV Diagnosis | Negative | 286 | 84.6 | 87.5 | [82.2-92.8] |
| | Positive | 52 | 15.4 | 12.5 | [7.2-17.8] |
| Syphilis Diagnosis | Negative | 319 | 94.7 | 95.6 | [92.9-98.3] |
| | Positive | 18 | 5.3 | 4.4 | [1.7-7.1] |

**Table 2. Sexuality, partnerships, and risk exposures of baseline participants (n=338)**

| Variable | Categories | Crude | | RDS –adjusted | |
|---|---|---|---|---|---|
| | | n | (%) | (%) | (95% CI) |
| Ever disclosed sexual practice to family | Yes | 69 | 20.4 | 18.1 | [12.9-23.2] |
| Ever disclosed sexual practice to health provider | Yes | 70 | 20.8 | 18.9 | [13.3-24.5] |
| Age at first sex with another man | <16 Years old | 55 | 16.3 | 14.9 | [08.9-21.0] |
| | 16-20 Years old | 174 | 51.6 | 53.1 | [45.5-60.8] |
| | 21-25 Years old | 74 | 22.0 | 22.4 | [16.1-28.8] |
| | >25 | 34 | 10.1 | 09.6 | [05.3-13.9] |
| Sexual partners in last 12 mos.: Mean (range) | Male partners [n=334] | 3.8 | (1-50) | N/A | N/A |
| | Female partners[n=107] | 2.9 | (1-20) | N/A | N/A |
| Concurrent relationships, last 12 mo. | None | 160 | 47.3 | 49.5 | [42.3-56.8] |
| | Yes | 178 | 52.7 | 50.7 | [43.3-57.9] |
| Normally has sex with men in a private home | Yes | 224 | 66.3 | 67.6 | [60.5-74.8] |
| … in bars/clubs | Yes | 98 | 29.0 | 26.1 | [20.2-32.1] |
| … in a hotel | Yes | 78 | 23.1 | 20.1 | [14.2-26.0] |
| ***Social Exposures*** | | | | | |
| Ever felt excluded from family gatherings | Yes | 87 | 25.7 | 26.1 | [20.0-32.2] |
| Ever felt rejected by friends | Yes | 118 | 35.0 | 27.2 | [20.7-34.] |
| Feels there are safe places to go to socialize with other MSM | Yes | 223 | 66.8 | 66.0 | [59.1-72.9] |
| Ever felt afraid to seek health services | Yes | 68 | 20.1 | 21.5 | [15.1-27.9] |
| Ever in jail/prison | Yes | 74 | 22.1 | 21.6 | [14.1-29.1] |
| Ever experienced physical violence | Yes | 40 | 11.8 | 11.4 | [6.1-16.8] |
| Ever raped (N=337) | Yes | 26 | 7.7 | 7.0 | [3.5-10.5] |

**Table 3. Knowledge of HIV risk, prevention methods, and practices of baseline participants (n=338)**

| Variable | Categories | Crude | | RDS –adjusted | |
|---|---|---|---|---|---|
| | | n | (%) | (%) | (95% CI) |
| Condom use in last sex with *main* male partner: (n=316) | Yes | 119 | 63.0 | 59.6 | [51.7-67.4] |
| Condom use in last sex with *casual* male partner: (n=256) | Yes | 174 | 68.0 | 66.3 | [57.4-75.2] |
| Condom use at last sex with *main* female partner: (n=101) | Yes | 45 | 44.5 | 50.3 | [23.9-76.6] |
| Condom use at last sex with *casual* female partner: (n=71) | Yes | 46 | 64.8 | 58.2 | [27.5-88.8] |
| HIV Testing (Ever, n=336) | Never | 134 | 39.9 | 44.3 | [37.0-51.6] |
| | Once | 123 | 36.6 | 32.8 | [26.4-39.2] |
| | More than once | 79 | 23.5 | 22.9 | [17.3-28.6] |
| Considered vaginal sex most 'risky' type of sex | Yes | 180 | 53.4 | 52.8 | [45.7-59.9] |
| Considered anal sex most 'risky' type of sex | Yes | 59 | 17.5 | 15.4 | [10.0-20.8] |
| Considered both equally 'risky' type of sex | Yes | 119 | 35.2 | 35.6 | [28.6-42.6] |
| Ever received information about HIV prevention for sex with men | Yes | 75 | 22.5 | 18.8 | [12.9-24.7] |
| Ever received information about HIV prevention for sex with women | Yes | 183 | 54.3 | 53.7 | [46.3-61.0] |
| Considers safest lubricants to use during anal sex (4.02) | Petroleum Jelly/Vaseline | 133 | 43.6 | 49.7 | [41.2-58.5] |
| | Water-based lubricant | 43 | 14.1 | 14.5 | [08.0-21.1] |
| | Others or none | 130 | 42.5 | 35.6 | [27.2-43.9] |
| Lubricant use (4.14) | Petroleum Jelly/Vaseline | 149 | 45.3 | 48.3 | [40.1-56.0] |
| | Water-based lubricant | 74 | 22.5 | 25.2 | [18.1-32.3] |
| | Others or none | 106 | 32.2 | 26.5 | [19.8-33.2] |

**Table 4. Healthcare worker training: Pre- and Post-training evaluation results**

| Variable | Pre-training (N=20) | | Post-training (N= 25) | |
|---|---|---|---|---|
| | n | *(%)* | n | *(%)* |
| **Counseling Behaviors prior to Training** | | | | |
| Asked a client about MSM behavior (prior 3mo) | | | | |
| Never | 10 | *50* | -- | -- |
| Sometimes | 8 | *40* | -- | -- |
| often | 2 | *10* | -- | -- |
| No. of MSM counseled by HCW participant (prior 3 mo.) | | | -- | -- |
| None | 13 | 65 | -- | -- |
| 1-5 | 6 | *30* | -- | -- |
| 5-10 | 1 | *5* | -- | -- |
| Ever discussed anal sex with male or female client | 11 | *55* | -- | -- |
| Ever received training on how to council on anal sex | 5 | *25* | -- | -- |
| Ever received training on how to council MSM | 2 | *10* | -- | -- |
| Feel that most risk reduction sessions assume sex is penile-vaginal | 11 | *55* | -- | -- |
| Healthcare worker can be stigmatized for serving MSM (n=13) | 8 | *40* | 9 | *36* |
| **Understanding / beliefs about MSM population** | | | | |
| Perception of population size of MSM (n=15) | | | | |
| < 2% of population | 10 | *67* | 1 | *5* |
| 5% of population | 1 | *20* | 7 | *33* |
| 10-15% of population | 2 | *13* | 1 | *5* |
| 20-30% of the population | 2 | *13* | 12 | *57* |
| **Knowledge of Mental and Sexual Health for MSM** | | | | |

| | | | | |
|---|---|---|---|---|
| Correctly recognize symptoms of panic attack (n=17) | 4 | *23* | 3 | *13* |
| Believe excessive anxiety can affect daily functioning (n=19) | 7 | *37* | 13 | *54* |
| HPV can cause anal warts (n=20) | 12 | *60* | 18 | *75* |
| Anal warts can cause cancer | 17 | *85* | 20 | *80* |
| Must have air in tip of condom to prevent breakage | 17 | *85* | 7 | *28* |
| Would provide condom demonstration to MSM | 15 | *75* | 20 | *83* |
| Believe risk of risk of HIV acquisition is same for receptive and insertive anal sex | 7 | *41* | 11 | *44* |
| Believe risk of risk of HIV acquisition is 5 times higher for receptive | 14 | *70* | 8 | *32* |
| Believe risk of risk of HIV acquisition is 10 times higher for receptive | 5 | *29* | 6 | *24* |
| Believe that when a man reports anal sex, the physician should ask if it is insertive or receptive | 14 | *70* | 21 | *84* |

**Table 5. Demographics, identity and health indicators of CHPI participants of participants enrolled into the CHPI cohort**

| Variable: | Categories: | Baseline (n=103) |
|---|---|---|
| ***Demographics*** | | **n (%)** |
| Age | 18-25 | 59 (57.3) |
| | 26+ | 44 (42.7) |
| Highest Level of Education (completed) | Less than Secondary | 36 (34.9) |
| | Secondary or higher | 67 (65.1) |
| Employment status | Unemployed | 46 (44.6) |
| | Employed | 35 (34.0) |
| | Student | 22 (21.4) |
| Gender Identity | Male | 79 (76.7) |
| | Female | 19 (18.4) |
| | Transgender | 5 (4.9) |
| Sexual Orientation | Gay or homosexual | 71 (68.9) |
| | Bisexual | 31 (30.1) |
| | Heterosexual or straight | 1 (1.0) |
| Marital Status (with a woman) | Married, Cohabiting | 7 (6.8) |
| | Single /Divorced/ Separated | 96 (93.3) |
| No. of children | None | 93 (91.2) |
| | One or more | 9 (8.8) |

**Table 6. Sexual health, behavior, and risk exposure characteristics of CHPI participants**

| Variable* | Categories | Baseline (n=100) | Follow-up 1 (n=98) | Follow-up 2 (n=92) | Follow-up 3 (n=99) |
|---|---|---|---|---|---|
| | | n (%) | n (%) | n (%) | n (%) |
| Disclosed sexual practice to family | Yes | 57 (57.00) | 15(15.6) | 12(13.8) | 31 (32.0) |
| Sexual partners in last 12 mos. Mean (range) | Male partners | 3.6 (1-16) | 3.6 (0-30) | 3.6 (1-10) | 5.4(1-74) |
| | Female partners | | 0.7(0-7) | 0.1 (0-1) | 0.4(0-4) |
| Concurrent relationships, last 12 mos. Mean (range) | None | 49 (47.6) | 42 (43.3) | 45 (48.9) | 38 (38.4) |
| | Yes, two or more male and/or female partners | 54 (52.4) | 55(56.7) | 47 (51.1) | 61 (61.6) |
| Normally has sex with men in a private home | Yes | 72 (69.9) | 82 (83.7) | 44 (47.8) | 68 (68.7) |
| … in bars/clubs | Yes | 28 (27.2) | 21 (21.4) | 36(39.1) | 28(28.3) |
| … in a hotel | Yes | 26 (25.2) | 16 (16.3) | 19 (20.7) | 29 (29.3) |
| ***Social Exposures*** | | | | | |
| Felt excluded from family gatherings | Yes | 31 (30.1) | 37 (38.5) | 33 (36.3) | 35 (35.4) |
| Felt rejected by friends | Yes | 34 (33.1) | 39 (40.6) | 35(38.7) | 52(52.5) |
| Feels there are safe places to go to socialize with other MSM | Yes | 74 (72.6) | 68 (70.8) | 70 (76.1) | 68 (68.7) |
| Felt afraid to seek health services * | Yes | 21 (20.4) | 16 (23.2) | 6 (60.0) | 3 (25.0) |
| In Jail/prison | Yes | 20 (19.6) | 6 (7.2) | 0(0.0) | 9 (10.6) |
| Experienced physical violence | Yes | 15 (15.6) | 12 (12.4) | 18 (19.6) | 16 (16.3) |
| Ever raped | Yes | 4 (3.9) | 2 (2.1) | 2 (2.2) | 4 (4.1) |

* Among MSM who sought healthcare within last 12 mo. of follow-up visit

**Table 7: Knowledge of HIV risk, prevention methods, and practices for CHPI participants**

| Variable* | Categories | Baseline (n=100) | Follow-up 1 (n= 98) | Follow-up 2 (n= 92) | Follow-up 3 (n= 99) |
|---|---|---|---|---|---|
| | | n (%) | n (%) | n (%) | n (%) |
| *New* HIV Diagnoses | Positive | 0 (0.0) | 7 (7.4) | 0 (0) | 0 (0) |
| Syphilis Diagnosis | Positive | 3(2.9) | 1 (1.1) | 3 (3.3) | 4 (4.1) |
| HIV Testing (since last assessment) | Never | 43 (41.8) | 57 (58.2) | 73 (82.0) | 77 (78.6) |
| | Once | 36 (35.0) | 29 (29.6) | 14 (15.7) | 19 (19.4) |
| | More than once | 24 (23.3) | 12(12.2) | 2 (2.2) | 2 (2.0) |
| Received information about HIV prevention for sex with men | Yes | 22 (21.8) | 45(46.4) | 35 (38.9) | 43 (44.3) |
| Received information about HIV prevention for sex with women | Yes | 68 (66.0) | 52 (53.6) | 42 (48.3) | 41 (43.6) |
| Condom use in last sex with *main* male partner | Yes | 63 (63.6) | 72 (80.0) | 66 (79.5) | 66 (77.3) |
| Condom use in last sex with *casual* male partner | Yes | 55 (70.5) | 66 (84.6) | 67 (91.8) | 66 (86.8) |
| Condom frequency with *main* male partners | Never | 14 (14.3) | 5(5.7) | 4 (4.8) | 6 (8.3) |
| | Almost never | 16 (16.3) | 4(4.6) | 3 (3.6) | 6 (8.3) |
| | Sometimes | 23 (23.5) | 16(18.4) | 22 (26.5) | 19 (26.4) |
| | Almost always | 11 (11.2) | 8(9.2) | 5 (6.0) | 2 (2.8) |
| | Always | 34 (34.7) | 54(62.1) | 49 (59.0) | 39 (54.2) |
| Condom frequency with *casual* male partners | Never | 9 (11.7) | 3 (3.7) | 1(1.4) | 5 (6.0) |
| | Almost never | 5 (6.5) | 6 (7.4) | 1 (1.4) | 0 (0.0) |
| | Sometimes | 20 (26.0) | 9(11.1) | 13(18.3) | 20 (24.1) |
| | Almost always | 9 (11.7) | 5 (6.2) | 7 (9.9) | 8 (9.6) |
| | Always | 34 (44.2) | 58 (71.6) | 49 (69.0) | 50 (60.2) |
| Condom use at last sex with *main* female partner | Yes | 10/21 (47.6) | 7 /19(36.8) | 3/7(42.9) | 5/9(55.6) |
| Condom use at last sex with *casual* female partner | Yes | 13/15 (86.7) | 8/11 (72.7) | 1/1(100.0) | 5/7 (71.4) |
| Condom frequency with *main* female partners | Never | 5 (23.8) | 3 (15.8) | 1 (14.3) | 1 (10.0) |
| | Almost never | 5 (23.8) | 1 (5.3) | 0(0.0) | 0(0.0) |
| | Sometimes | 5 (23.8) | 7 (36.8) | 4 (57.1) | 6 (60.0) |
| | Almost always | 2 (9.5) | 0 (0.0) | 1 (14.3) | 1 (10.0) |
| | Always | 4 (19.1) | 8 (42.1) | 1 (14.3) | 2 (20.0) |

| Variable* | Categories | Baseline (n=100) | Follow-up 1 (n= 98) | Follow-up 2 (n= 92) | Follow-up 3 (n= 99) |
|---|---|---|---|---|---|
| | | n (%) | n (%) | n (%) | n (%) |
| Considered vaginal sex most 'risky' type of sex | Vaginal | 43 (50.6) | 24 (24.5) | 23 (25.3) | 13 (13.3) |
| | Anal | 12 (14.1) | 29 (29.6) | 32 (35.2) | 36 (36.7) |
| | Oral | 0 (0) | 5 (5.1) | 0 (0.0) | 8 (8.2) |
| | All equal | 30 (35.3) | 40 (40.8) | 36 (39.6) | 41 (41.8) |
| Knowledge of risk related to positioning | Insertive (top) | 18 (17.8) | 5 (5.2) | 2 (2.2) | 1 (1.0) |
| | Receptive (bottom) | 33 (32.7) | 54 (55.7) | 39 (43.3) | 42 (42.9) |
| | Both carry equal risk | 50 (49.5) | 38 (39.2) | 49 (54.4) | 55 (56.1) |
| Considers safest lubricants to use during anal sex | Petroleum Jelly/Vaseline | 42 (45.7) | 36 (38.3) | 25 (28.4) | 23 (23.2) |
| | Water-based lubricant | 35 (38.0) | 53 (56.4) | 59 (67.1) | 73 (73.7) |
| | Others or none | 15 (16.3) | 5 (5.3) | 4 (4.6) | 3 (3.0) |
| Lubricant use | Petroleum Jelly/Vaseline | 45 (45.0) | 37 (38.5) | 25 (27.5) | 24 (24.2) |
| | Water-based lubricant | 31 (31.0) | 47 (49.0) | 59 (64.8) | 74 (74.8) |
| | Others or none | 24 (24.0) | 12 (12.5) | 7 (7.7) | 1 (1.0) |

**Table 8. Perceptions and use of CHPI intervention by participants**

| Variable* | Categories | Follow-up 1 (n= 98) | Follow-up 2 (n= 92) | Follow-up 3 (n= 99) |
|---|---|---|---|---|
| | | n (%) | n (%) | n (%) |
| Median time (months) since last study visit | | 10 [t] | 3 | 3 |
| Have you been to a (non-research related) health care provider like a nurse or doctor? | Yes | 23 (23.5) | 13 (14.1) | 8 (8.1) |
| Did your health care provider discuss how to have safe sex with male partners? | Yes | 6 /29(20.7) | 1/17 (5.9) | 3/10(30.0) |
| Did your health care provider discuss mental health issues relating to being MSM? | Yes | 1/27(3.7) | 0/15 (0.0) | 1/10(10.0) |
| Did your health care provider discuss or test for anal STIs or oropharyngeal STIs (STIs in the throat)? | Yes | 7/27 (25.9) | 2/14(14.3) | 2/10 (10.0) |
| Did your health care provider give you condoms and/or lubricants? | No | 15 (55.6) | 8 (57.1) | 5 (50.0) |
| | Yes, condoms only | 10 (37.0) | 6 (42.9) | 4 (40.0) |
| | Yes, lubricants only | 0 (0) | 0 (0) | 0 (0) |
| | Yes, condoms and lube | 2 (7.4) | 0 (0.0) | 1(10.0) |
| Median number of contacts/meetings with peer educator (range) | | 1 (0-10) | 3 (0-10) | 3 (0-15) |
| Did your peer educator give you condoms, lubricants? | No | 26 (30.9) | 11 (12.1) | 5 (5.5) |
| | Yes, condoms only | 16(19.1) | 22 (24.2) | 14 (15.4) |
| | Yes, lubricants only | 14 (16.7) | 10 (11.0) | 7 (7.7) |
| | Yes, condoms and lube | 28 (33.3) | 48 (52.7) | 65 (71.4) |
| Did your peer educator talk to you about your mental health, emotions, or depression? | Yes | 35 (42.7) | 66 (74.2) | 62 (69.7) |
| Did your peer educator talk to you about your sexual behavior? | Yes | 51 (63.0) | 80 (89.9) | 73 (80.2) |
| Did your peer educator talk to you about HIV testing? | Yes | 57 (70.4) | 79 (88.76) | 82.0 |

| Variable* | Categories | Follow-up 1 (n= 98) | Follow-up 2 (n= 92) | Follow-up 3 (n= 99) |
|---|---|---|---|---|
| | | n (%) | n (%) | n (%) |
| Have you felt more or less confident with your sexual orientation when you are among other MSM? | More confident than before | 46 (47.0) | 28 (30.4) | 12 (12.2) |
| | Equally confident | 52 (53.1) | 57 (62.0) | 79 (80.6) |
| | Less confident than before | 0 (0.0) | 7 (7.6) | 7 (7.1) |
| Have you felt more or less confident with your sexual orientation when you are among others who are not MSM and who are not close family or friends? | More confident than before | 45 (45.9) | 29 (31.5) | 15 (15.3) |
| | Equally confident | 38 (38.9) | 41 (44.6) | 37 (37.8) |
| | Less confident than before | 15 (15.3) | 22 (23.9) | 46 (46.9) |
| Do you think that your access to condoms and lubricants has changed as a result of participating in the CHPI study? | Yes | 2 (3.4) | 1 (6.7) | 2 (15.4) |

t The study was interrupted between baseline and follow-up visit 1, accounting for the longer median time since last study visit; * All question time periods are “since we last interviewed you.”