

**HIV AMONG
FEMALE SEX WORKERS AND
MEN WHO HAVE SEX WITH MEN
IN SWAZILAND**

**A COMBINED REPORT OF
QUANTITATIVE AND QUALITATIVE STUDIES**



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TABLE OF CONTENTS

Acknowledgements..... 2

Table of contents 3

Executive Summary..... 7

 Introduction 7

 Methods: Quantitative study..... 8

 Methods: Qualitative study 8

 Key Findings: Quantitative study 9

 HIV and STI prevalence 9

 Biological and behavioral risk factors 9

 Structural risk factors 10

 Associations with HIV infection..... 10

 Key Findings: Qualitative study..... 11

 Social, structural, and economic context of key populations 11

 PHDP needs of key populations 11

Discussion..... 12

Recommendations from the Quantitative Study..... 13

 Programmatic..... 13

 Research..... 13

Recommendations from Qualitative Study..... 13

 Programmatic..... 13

 Research..... 14

Introduction 15

 HIV in Swaziland..... 15

 Importance of key populations..... 15

 HIV prevalence in key populations 16

 Biological and behavioral risk factors for key populations 17

 Structural and social factors 17

 Existing data on KP of Swaziland..... 18

 Objectives..... 19

 Quantitative study 19

Qualitative study	19
Methods: Quantitative study	21
Theoretical Framework	21
Study design and sampling	22
Respondent-Driven Sampling	22
Seed Selection	22
Sample Size Calculation.....	22
Inclusion criteria and ethical considerations	23
Data collection	23
Laboratory procedures.....	23
Risk Management	24
Analysis	24
Ethical review	24
Methods: Qualitative Study	25
PHDP conceptual framework.....	25
Study Design.....	26
Key informant interviews.....	26
In-depth interviews with FSW and MSM living with HIV	27
Focus groups with FSW and MSM.....	27
Qualitative data analysis	27
Ethical considerations	28
Results: Quantitative study.....	29
MSM Results	29
Sociodemographic profile	29
HIV/STI-related outcomes.....	29
Sexual behavior and drug use	29
Knowledge of HIV-risk behaviors	30
Condom negotiation	30
Social discrimination/human rights violations.....	30
Social cohesion.....	31
FSW Results.....	31
Sociodemographic profile	31

HIV/STI-related outcomes.....	32
Sexual behavior and drug use	32
Knowledge of HIV-risk behaviors	32
Condom negotiation	33
Social discrimination/human rights violations.....	33
Social cohesion.....	33
Results: Qualitative study	34
Social, structural and economic context of FSW and MSM.....	34
Social context	34
Structural and economic context.....	34
PHDP needs of FSW and MSM living with HIV	35
Care and treatment: protecting physical health	35
Psychosocial support: protecting mental well-being.....	36
Prevention: preventing ongoing HIV transmission	37
Rights/involvement: increasing agency and involvement	38
Tailoring existing PHDP interventions and services for FSW and MSM.....	38
Care and treatment interventions	38
Psychosocial support interventions	39
Prevention interventions	39
Human rights and increased involvement	39
Discussion	40
Overview	40
Interpretation of quantitative findings	40
HIV prevalence	40
Biological and behavioral risk factors	41
Structural risk factors	41
Associations with HIV infection.....	42
Interpretation of qualitative findings.....	43
Social and structural context of PHDP	43
Protecting physical health.....	44
Protecting mental well-being.....	44
Preventing on-going HIV transmission.....	44

Key Populations and HIV in Swaziland

Leadership and advocacy for KP living with HIV	45
Limitations.....	45
Conclusions	46
Recommendations	47
Recommendations from Quantitative Study	47
Programmatic.....	47
Research.....	49
Recommendations from Qualitative Study.....	49
Programmatic.....	49
Research.....	50
References	51
Appendix	57

EXECUTIVE SUMMARY

Introduction

Swaziland is burdened by one of the world's worst generalized HIV epidemics, with an estimated 26.1% of reproductive age adults currently infected (Macro International & Swaziland Central Statistics Office, 2008). Research indicates that key populations (KP) such as men who have sex with men (MSM) and female sex workers (FSW) are vital groups to target in HIV prevention efforts, even in generalized epidemics (Baral et al., 2009; Smith et al., 2009). Unique biological, behavioral, and structural risk factors put these groups at heightened risk for HIV infection and of transmission to members of their sexual networks (Baral et al., 2009; Smith et al., 2009).

To date, there remains limited data on MSM¹ and FSW² in Swaziland, making it difficult to accurately gauge the role of these populations in larger HIV transmission dynamics, as well as the biological, behavioral, and structural risk factors that contribute to their heightened vulnerability. There is also little known about the prevention and care experiences of KP living with HIV, particularly as they relate to the Positive Health, Dignity and Prevention (PHDP) framework (Kennedy et al., 2010).

In response to key knowledge gaps regarding HIV among KP in Swaziland and the Ministry of Health's recently expressed interest in addressing the needs of KP, we conducted two complementary research studies. The first, a quantitative study, was designed to evaluate HIV prevalence among KP in Swaziland and describe behavioral, social, and structural factors associated with HIV infection in KP. The specific aims of this study were

1. to calculate an unbiased estimate of HIV and Syphilis prevalence among FSW and MSM in Swaziland;
2. to describe behavioral factors associated with HIV infection, including individual sexual and drug-related practices, condom use and negotiation, and knowledge of HIV transmission risk factors; and
3. to examine the role of social and structural factors on HIV-related behaviors and risk for HIV infection among FSW and MSM, including human rights violations as a result of stigma/discrimination and degree of social cohesion.

The second study was conducted as part of a comparative study in Swaziland and the Dominican Republic (DR), countries with very different HIV epidemics. The study used qualitative methods to explore the PHDP needs of KP living with HIV. The specific aims of this study were

¹ The term sex workers can include male, female, and transgender individuals, although female sex workers (FSW) have been most extensively studied. The nature and structure of sex work varies considerably, but for the purposes of this study, we focus specifically on female commercial sex work, i.e., the explicit exchange of sex for money, not transactional sex more broadly defined (Baral et al., 2009; Smith et al., 2009).

² MSM is a term that was coined in 1994 to reduce stigma against homosexual, bisexual, gay-identified, and non-gay-identified MSM by describing the behavior rather than using potentially stigmatizing labels (Young & Meyer, 2005). As such, MSM is a broad term that encompasses a wide range of sexual identities and behaviors.

1. to describe the social and structural context of FSW and MSM in Swaziland and the DR, particularly as it relates to stigma and discrimination among individuals living with HIV;
2. to examine the specific PHDP needs of FSW and MSM who are living with HIV, including challenges to accessing ongoing prevention, treatment, care, and support services;
3. to describe existing PHDP interventions and services and how these interventions and services do and do not meet the ongoing needs of KP; and
4. to identify ways in which PHDP interventions and services can be tailored to meet the needs of FSW and MSM, including specific program models and communication messages.

Results from the quantitative (Baral, Gross, et al., 2013) and qualitative (Kennedy et al., 2013) studies have been published in report form and can be found online at www.jhsph.edu/r2p. This document is an integrated version of these reports, focusing on the Swaziland-specific activities and results across both studies.

Methods: Quantitative study

The study utilized the Modified Social Ecological Model (MSEM) as a guiding theoretical framework (Baral, Logie et al., 2013). The MSEM modifies the traditional Social Ecological Model and posits five layers of risk for HIV infection: individual, network, community, policy, and stage/level of the HIV epidemic.

MSM and FSW were recruited via respondent-driven sampling (RDS), a peer-referral sampling methodology designed for data collection among hard-to-reach populations (Heckathorn, 1997). Potential participants were required to be at least 18 years of age, able to provide informed consent in either English or siSwati, and willing to undergo HIV and syphilis testing. They also were required to present a valid recruitment coupon. Additionally, FSW participants had to report exchanging or selling sex for money, favors, or goods in the past 12 months. MSM had to report having had anal sex with another man in the past 12 months.

All participants completed face-to-face behavioral surveys and received HIV and syphilis tests on-site. Surveys were administered by trained members of the research staff and lasted approximately one hour. Questions on socio-demographics (e.g., age, marital status, education), HIV-related behavioral risk factors (e.g., HIV-related knowledge, attitudes, risk behaviors), and structural factors (e.g., stigma, discrimination, social cohesion) were included. HIV and syphilis testing were conducted by trained phlebotomists or nurses, according to official Swazi guidelines. Test results, counseling, and any necessary treatment (for syphilis) and/or referrals (for HIV) were provided on-site.

Methods: Qualitative study

The study was structured around the PHDP framework by Kennedy and colleagues (2010), which includes four main goals: (1) keeping people living with HIV (PLHIV) physically healthy; (2) keeping PLHIV mentally healthy; (3) preventing further transmission of HIV; and (4) involving PLHIV in prevention activities, leadership, and advocacy.

Data collection methods included: (a) key informant interviews (n=16) with HIV program planners, policy makers, clinicians, and community leaders from the FSW and MSM communities; (b) in-depth interviews with FSW (n=21) and MSM (n=20), all of whom were living with HIV; and (c) focus groups with FSW (3 groups, 19 total participants) and MSM (3 groups, 26 total participants), including both individuals who were living with HIV as well as those who were not. In-depth interview participants were interviewed twice to enhance rapport and to gain more depth and understanding of the study topics. Topics covered in interviews and focus groups included KP experiences, existing HIV-related services for KP, and suggestions for tailoring of services. All interviews and focus groups were conducted in siSwati or English and were audio recorded, transcribed, and translated into English if necessary.

Data were analyzed thematically using a participatory and multi-step process. An iterative process of data collection and analysis was ensured through interview debriefing notes and weekly team meetings to discuss emerging themes and follow-up questions. After all data were collected, a full-day data analysis workshop was attended by representatives from MSM and FSW groups, Ministry of Health (MOH) and National Emergency Response Council on HIV and AIDS (NERCHA) staff, interviewers and members of the research team, clinicians, and others. Following this meeting, a codebook was developed based on both *a priori* and emergent themes, and all transcripts were systematically coded using the computer software package Atlas.ti.

Both the quantitative and qualitative studies received human subjects research approval from both the National Ethics Committee of Swaziland and the Institutional Review Board of the Johns Hopkins Bloomberg School of Public Health.

Key Findings: Quantitative study

HIV and STI prevalence

HIV prevalence among FSW was estimated at 60.5%, while HIV prevalence among MSM was 12.6%. Participants who tested positive for HIV were no more likely to test positive for syphilis than those who tested negative for HIV in both populations. Of the FSW who tested positive for HIV during the study, 78.0% had been tested for HIV elsewhere within the past year. For MSM who tested positive for HIV during the study, only 47.30% reported that they had been tested for HIV elsewhere within the past year. A greater percentage of FSW living with HIV (41.5%) also reported receiving HIV treatment than did MSM living with HIV (33.3%) in our sample.

Biological and behavioral risk factors

In general, MSM and FSW reported multiple sexual partners. One-third of all FSW (33.5%) reported an average of six or more clients per week. One-quarter of all MSM reported having both male and female partners in the past year (25.5%), providing evidence that the heightened risk ascribed to MSM may have a direct link to the general population. Encouragingly, condom use with all types of partners was high; 69.5% of MSM reported condom use at last sex with main male partners and 82.9% of FSW reported condom use at last sex with a regular client. However, a large proportion of FSW (68.7%) and MSM (54.2%) also reported having sex without a condom in the past 6 months. In addition, 54.8% of

FSW reported a condom had slipped off or broken at least once in the last 30 days (data not shown); this question was not asked for MSM.

Though knowledge of condom use to prevent HIV was high, only 18.3% of MSM and 10% of FSW in our study knew of the heightened risk of contracting HIV from receptive anal sex. The majority of FSW in our study answered that you could get HIV from using a needle to inject illegal drugs (95.6%), although the question did not specify whether this was a needle that had previously been used by someone else. Approximately one-quarter of MSM reported using condom-compatible lubricants (26.8%), and 81.5% of FSW did not use lubricants at all. Importantly, questions did not define “safe” as specifically relating to the prevention of HIV, and did not specify that this meant with latex condoms. However, since a large proportion of FSW reported using condoms, it is notable that low percentages reported that condom-compatible lubricants were the safest. It is possible that HIV education campaigns for the general population may overlook the myriad behavioral risks that are more relevant for KP. For example, while 78.9% of MSM had received HIV prevention information concerning sex between men and women, only 21.4% had received information concerning sex between men.

Structural risk factors

More than half of all FSW reported that it was somewhat or very difficult to insist on condom use if a client offered more money not to use one (61.8%), and 57.8% of MSM reported the same for male sexual partners who provide regular economic support. There were also high levels of human rights violations reported among our sample, with around one-third of both MSM and FSW reporting legal discrimination. FSW reported strained interactions with law enforcement, including being refused police protection (37.1%). Over one-third (36.2%) of MSM reported having been tortured due to their sexual orientation. However, “torture” can be difficult to translate, and while the study defined torture as sustained physical or sexual violence, it is possible that participants interpreted the term differently.

Stigma and discrimination also carried over into healthcare settings. Over one-third (38.1%) of FSW and almost two-thirds (61.8%) of MSM felt afraid to seek healthcare due to their sexual orientation or practices.

In general, MSM indicated that they had strong social networks. Approximately three-quarters (73.6%) reported that they could trust the majority of MSM in their community, and the majority of participants gave positive answers to questions on trust within various situations. Social cohesion among FSW was less clear. For example, while 60.0% of FSW could count on fellow FSW to talk to about their problems, only 38.0% reported that they could trust the majority of their sex worker colleagues.

Associations with HIV infection

Student’s t-tests revealed few significant differences between participants who tested HIV-positive and those who tested HIV-negative within both populations.

Participants who tested positive for HIV were more likely to be older than participants who tested negative in both populations. This finding could be due to the fact that older persons have had more

years of potential exposure to HIV for longer than younger persons. FSW with HIV were also more likely to have one or more children than FSW who tested negative for HIV.

Key Findings: Qualitative study

Social, structural, and economic context of key populations

Participants described a social context characterized by multiple layers of stigma and discrimination related to gender, sexual orientation, professional identity, poverty, and their identities as PLHIV. Violence was a common experience as both populations are criminalized and constantly fear being caught.

Participants described living in situations of extreme social and economic deprivation. FSW experienced a cycle of economic need, hunger, sex work, and HIV that inhibited their opportunities to find other work as well as to prevent further transmission of HIV. This underscores the effect that broader economic and legal structures have on KP. FSW cited hunger and financial needs of themselves or their children as the impetus to begin sex work, and as the primary force in continuing to sell sex following their HIV diagnosis. MSM also reported struggling with poverty and lack of socio-economic opportunities, fueled by their own multi-layered experiences of stigma.

PHDP needs of key populations

Protecting physical health: Participants reported perceived and experienced stigma related to their sexual and professional identities in health care settings, contributing to low levels of care seeking. Participants also reported perceived and experienced stigma against PLHIV from families and partners, contributing to low levels of HIV serostatus disclosure. Lack of HIV serostatus disclosure translated into lack of social support, which led to challenges with HIV treatment access and ART adherence. FSW and MSM also faced considerable care-related expenses, including the high costs of transportation to get to appointments as well as prescribed medicines and treatments (beyond ART).

Protecting mental health: The primary threat to mental health among participants was living with the aforementioned multi-layered stigma related to their HIV status and their sexual or professional identity. In some cases, the high prevalence of HIV in Swaziland seemed to help mitigate this stigma. Participants reported receiving emotional support from a variety of sources such as family, friends, and pastors; yet, only one Swazi MSM mentioned going to formal counseling services. FSW more commonly discussed the emotional support they received from participating in formal support groups.

Preventing ongoing HIV transmission: Participants were very aware of the need to prevent HIV transmission to sexual partners. Many had changed their behavior after being diagnosed with HIV in order to reduce transmission risk to others by using condoms and reducing the number of partners. They did, however, continue to face barriers to prevention. Clinical providers' questions about HIV prevention often assumed heterosexuality and monogamy, limiting opportunities for safe sex conversations relating to the true risk behaviors of MSM and FSW. Some FSW also described being offered more money for sex without condoms, which some accepted due to financial need.

Comprehensive services: Participants disagreed about whether they would prefer separate services dedicated to the needs of KP or whether they favor integrated services with providers and staff who were trained to address the specific needs of KP and provide respectful care. Regardless, our findings indicate that KP require services that consider their specific needs in a holistic fashion, and PHDP program planners should consider this in comprehensive programs.

Increasing agency and involvement: The recurring theme of multiple layers of stigma among FSW and MSM living with HIV also impacted participants' involvement in HIV-related programs, advocacy, and policy making. Participants indicated that people from their communities are often unwilling to disclose their HIV status or their sexual and professional identities publically to represent these groups in HIV-related activities.

Discussion

These studies represent the first attempt to quantify the prevalence of HIV in MSM and FSW; draw associations between HIV in these KP and behavioral, structural and social factors; and describe the positive health, dignity, and prevention needs of KP living with HIV in Swaziland.

Comparisons of the quantitative data to previous literature show that FSW have a much higher prevalence of HIV as compared to the 31.2% prevalence in the general adult female population (Macro International & Swaziland Central Statistics Office, 2008). The prevalence of HIV in the MSM sample was comparable to that in the general adult male population in Swaziland.

Given the high prevalence of HIV in FSW and the encouraging proportion of participants being tested and treated for HIV, it is possible that a biologically based prophylactic approach may be beneficial for this population. The high prevalence also calls attention to the importance of meeting treatment needs for the many FSW living with HIV. Poor levels of HIV-testing among MSM have been noted in other generalized epidemics (Baral et al., 2009), and appear to be a problem in Swaziland. High levels of condom use knowledge among KP may possibly reflect the success of population-level campaigns promoting condom use. However, the low levels of knowledge about lubricants and the risk of anal sex suggest that behavior change campaigns have not effectively addressed the specific needs of KP. Economic problems need to be addressed, especially for the many FSW whose economic need puts them at risk for engaging in multiple sexual partnerships and unprotected sex. Both MSM and FSW face violence and require a means of reporting it without putting themselves at risk of being criminalized for their practices. Discrimination in health care settings must also be addressed.

The multi-level stigma reported by KP living with HIV in the qualitative study must be considered in efforts to achieve all PHDP goals. Stigma was experienced in the health care, legal, and social arenas, and thus needs to be mitigated across a variety of setting. Participants' accounts indicate they need additional support in navigating health care services. Comprehensive services should be considered, as well as how to promote agency and involvement without legal discrimination.

Findings support the need for innovative approaches to promote consistent condom use among KP living with HIV and their partners. Economic suffering of KP also needs to be addressed in this context,

as it limits the ability for KP to fully pursue the full goals of PHDP. Additionally, MSM and FSW expressed that they would also be willing to participate in HIV prevention, care and treatment decisions for their communities if they were offered legal protection.

These studies do have several limitations, including the potential for social desirability bias and the limitations of non-random sampling. Findings cannot be generalized outside of these study populations in Swaziland.

It is clear that urgent action and consistent monitoring of HIV in KP are needed to turn the tide of the epidemics facing these KP, as well as populations connected through sexual networks. The data in both the quantitative and qualitative studies highlight the need for a targeted HIV primary prevention and PHDP strategy that integrates behavioral, biomedical, and structural components.

Recommendations from the Quantitative Study

Programmatic

1. Develop and implement evidence-based, multi-level interventions for KP.
2. Tailor intervention efforts to the needs of KP in Swaziland, recognizing differences between groups in the following areas:
 - a. HIV and STI prevalence
 - b. Biological and behavioral risk factors
 - c. Structural risk factors
3. Include a focus on human rights in HIV programs for KP.
4. Include MSM and FSW in national HIV surveillance.

Research

1. Conduct population size estimations of MSM and FSW to gauge the role they may play in population-level dynamics of HIV transmission.
2. Explore the feasibility of biological interventions.
3. Examine other KP such as people who use drugs.

Recommendations from Qualitative Study

Programmatic

1. Pair KP with trusted “expert clients” to help them navigate the health care system and the processes of diagnosis, disclosure, and treatment.
2. Expand outreach services provided by and for KPs in order to accelerate their access into HIV testing and care services. Concurrently, target a small number of KP-friendly services promoted by individuals within these networks, and eventually, train clinical providers and staff in HIV clinics to address stigma and improve their ability to provide specific, sensitive, and effective care for KP.

3. Improve access to nutritional support to enhance the health of KP and to limit the necessity of FSWs engaging in high-risk sexual practices such as multiple clients or unprotected sex out of need for economic and/or food security.
4. Support mental health with formal counseling, peer educators, support groups, or working with existing HIV clinics to identify opportunities to integrate psychosocial counseling and support into the services provided.
5. Encourage condom use through programs targeting partners of KP.
6. Support KP wishing to participate in advocacy, outreach, and policy-making activities.

Research

1. Explore multi-layered stigma in greater depth.
2. Develop and evaluate tailored PHDP policies and programs for KP.

INTRODUCTION

HIV in Swaziland

Sub-Saharan Africa is home to the majority of the world's generalized HIV epidemics, with an estimated 22.9 million people currently living with HIV/AIDS (UNAIDS, 2010). In contrast to concentrated epidemics, in which the burden of HIV-infection is primarily carried by key populations (KP) such as female sex workers³ (FSW) and men who have sex with men⁴ (MSM), generalized epidemics are characterized by a population-wide HIV-prevalence of greater than 1% (UNAIDS/WHO, 2000).

Swaziland is burdened by one of the worst generalized HIV epidemics, with an estimated 26.1% of the country's reproductive age adults currently infected (Macro International & Swaziland Central Statistics Office, 2008). Heterosexual transmission currently accounts for the majority of HIV infections in the country. The 2009 Swaziland Modes of Transmission study found that important drivers of HIV incidence included multiple concurrent partnerships before and during marriage as well as low levels of male circumcision (UNAIDS, NERCHA et al., 2010). Surveillance suggests that Swaziland has an epidemic with differential risk by gender, with significantly higher risk among younger women. This is evident from a study that estimated HIV prevalence among 15- to 24-year-old women to be 22.6%, compared to 5.9% among age-matched men (UNAIDS et al., 2010).

Importance of key populations

Research and prevention efforts in countries with generalized epidemics tend to operate on the assumption that KP are less relevant in widespread epidemics, and focus instead on addressing heterosexual sexual transmission and mother-to-child transmission (Baral & Phaswana-Mafuya, 2012; Potts et al., 2008; Smith et al., 2009). However, there has been an increasing recognition of the importance of KP in not only concentrated but also generalized epidemics. As the categorization of an epidemic as "generalized" is based on surveillance methods that fail to account for variations within subpopulations, any influence KP may have on transmission dynamics in a particular country is effectively masked (Baral & Phaswana-Mafuya, 2012). There is therefore a need for countries with generalized epidemics to better examine these important groups.

KP are vital groups for HIV prevention efforts, not only because of their own heightened risk of acquisition but also because of the risks of HIV transmission to members of their sexual networks. To date, there is limited data about these populations in Swaziland, making it difficult to accurately gauge the role of these populations in larger transmission dynamics and to understand the biological,

³ The term sex workers can include male, female, and transgender individuals, although female sex workers (FSW) have been most extensively studied. The nature and structure of sex work varies considerably, but for the purposes of this study, we focus specifically on female commercial sex work, i.e., the explicit exchange of sex for money, not transactional sex more broadly defined (Baral et al., 2009; Smith et al., 2009).

⁴ MSM is a term that was coined in 1994 to reduce stigma against homosexual, bisexual, gay-identified, and non-gay-identified MSM by describing the behavior rather than using potentially stigmatizing labels (Young & Meyer, 2005). As such, MSM is a broad term that encompasses a wide range of sexual identities and behaviors.

behavioral, and structural risk factors that contribute to their heightened vulnerability of infection and transmission.

There is also little known about the prevention and care experiences of KP living with HIV. In the context of recent studies showing the importance of HIV treatment in the prevention of ongoing transmission (e.g., Cohen et al., 2011) and the dramatic expansion of HIV testing, care and treatment services globally, prevention activities are increasingly focusing on individuals who know they are HIV-infected (Janssen & Valdiserri, 2004). This strategy, originally called “positive prevention,” is now known as “Positive Health, Dignity and Prevention” (PHDP).⁵ PHDP values and recognizes the overall well-being and human rights of those living with HIV (Global Network of People Living with HIV/AIDS, 2009). PHDP interventions and programs are being rolled out globally in association with the scale-up of antiretroviral treatment and associated care services for PLHIV. However, these programs are generally targeted toward heterosexual populations. KP may have specific and unique needs that should be addressed by targeted services, including PHDP programs, yet little research has been conducted on the PHDP needs of these groups globally.

Due to the lack of reliable data on KP in Swaziland, national HIV prevention policies and strategies addressing these populations are conflicting and incomplete. Neither MSM nor FSW populations were cited as major influences on the generalized epidemic for the country’s 2009 report *Modes of Transmission* (NERCHA, 2009). Likewise, the Swaziland Partnership Framework on HIV and AIDS 2009 – 2013 does not specifically address KP in the epidemic. There is also no mention of MSM in the 2008 USG Country Operating Plan for Swaziland (amfAR & Johns Hopkins Bloomberg School of Public Health, 2011). Contrastingly, the 2006 – 2008 Swaziland National Strategic Plan describes the need to strengthen condom promotion among FSW and MSM (UNAIDS et al., 2010).

HIV prevalence in key populations

Despite the lack of data from Swaziland, results from other sub-Saharan countries support the notion that that FSW and MSM are at heightened risk for HIV infection, even within generalized epidemics (Baral, Beyrer, et al., 2012; Baral et al., 2009). For MSM, cross-sectional HIV prevalence studies among MSM have now been completed in numerous countries of Southern and Eastern Africa (Baral et al., 2009). In South Africa, for example, the HIV prevalence among MSM was estimated to be 3.6 times higher than that among men who did not report they had sex with a man (Jewkes et al., 2006). Likewise, in Malawi, HIV prevalence was 21.4% among MSM, compared to 11.5% of men in the general population (Baral et al., 2009). Among FSW in sub-Saharan Africa, HIV prevalence ranged from 24% in Rwanda (Braunstein et al., 2011), and 37% in Uganda (Vandepitte et al., 2006), to over 70% in Malawi, approximately 14 times higher than what is typically found in the general population (Baral, Beyrer, et al., 2012; National AIDS Commission of Malawi, 2007).

⁵ We use the term PHDP here as it is most accepted by PLHIV groups and has been agreed upon as the preferred terminology at the world AIDS conference in Vienna, Austria, 18-23 July, 2010. In addition to “positive prevention,” it has also previously been known as prevention by, for, or with positives (Auerbach, 2004; Centers for Disease Control and Prevention, 2003a, 2003b; Collins et al., 2000; International HIV/AIDS Alliance, 2003).

Biological and behavioral risk factors for key populations

Both FSW and MSM exhibit specific biological and behavioral characteristics that are thought to contribute to their heightened risk for HIV. The increased risk of MSM is considered biologically driven by the risk of contracting HIV through anal intercourse (Beyrer, Baral, et al., 2012). Certain sexual risk behaviors have also been shown to make MSM more vulnerable to infection. For example, a study on MSM in Kenya found that a significant portion of MSM may have also participated in transactional sex, and that men who sold sex were more likely to report unprotected sex (Sanders et al., 2007). Low levels of HIV testing and knowledge have been shown to be a problem among MSM in some countries experiencing generalized epidemics. In a study conducted in Malawi, 95.3% of MSM participants were unaware of their HIV status (Baral et al., 2009). MSM were also more likely to have received information about preventing HIV transmission in sex between men and women than in sex between men, and few were aware that HIV was more easily transmitted through anal intercourse than through vaginal intercourse. Further, sexual networks of MSM are not closed to this KP, and female partners of MSM represent pathways for the increased risk associated with MSM to affect the general population (Beyrer, Baral, et al., 2012).

The heightened risk for HIV acquisition and transmission among FSW operates through a variety of behavioral and biological (or biomedical) risks (Kilmarx, 2009; Watts et al., 2010). FSW demonstrate greater risk for HIV acquisition through high numbers of sexual partners and frequent concurrency of these partners (Baral, Beyrer, et al., 2012). Biologically, simply being female makes FSW eight times more likely to contract HIV in a single sexual act with an infected male partner than men are with an infected female partner (Quinn & Overbaugh, 2005). The high prevalence of bacterial sexually transmitted infections (STIs) among FSW (Cwikel et al., 2008) and synergistic relationship between HIV and STIs (M.S. Cohen, 1998) compound their risk of infection and raise complications around reproductive health and child-bearing (Chacham et al., 2007; Decker et al., 2011; Swain et al., 2011). HIV transmission among FSW may also be exacerbated by the intersection of injection drug use and sex work, as studies have demonstrated a high prevalence of injecting drug use among FSW in various settings (Medhi et al., 2012; Strathdee et al., 2008; Tuan et al., 2007). These women may face additional risk factors such as parenteral exposures from shared injection equipment, sex with greater numbers of partners living with HIV, lower likelihood of condom use, and increased risk of other STIs such as syphilis and hepatitis C (Strathdee et al., 2008).

Structural and social factors

A growing body of evidence highlights the importance of structural and social factors above and around the individual in relation to HIV-related vulnerability. In a seminal systematic review detailing the global context of sexual practices, Wellings and colleagues (2006) identified laws and policies that marginalize or stigmatize certain populations as key risk factors for heightened HIV epidemics in both KP and general national populations. By criminalizing targeted HIV interventions or disrupting funding mechanisms supporting HIV prevention and treatment for KP, these policies can hinder a community's ability to provide preventive or harm-reduction services to its constituents. For example, as sex work is criminalized in Swaziland, researchers and program administrators can have difficulty finding and enrolling FSW in HIV prevention studies or treatment (Mandla, 2007). These policies may therefore have negative

ramifications for HIV transmission within the general population, as KP—though marginalized—are intricately linked to the population at large.

Structural factors are thought to indirectly heighten risk for HIV infection among FSW through a complex and self-replicating relationship between social structures and power (R. Parker & Aggleton, 2003). The illegal nature of sex work can intensify inequalities and power dynamics already at play within a society, limiting a woman's ability to negotiate safer sex (Ghimire et al., 2011). Systemic violence against FSW has been documented as being inflicted by both law enforcement officials and clients (Arnott & Crago, 2009; Simic & Rhodes, 2009), and experiences with police have been linked to outcomes such as physical abuse from clients, inconsistent condom use, and unprotected sex with police officers in return for favors (Erasquin et al., 2011). Socioeconomic hierarchies can also make condom negotiation more difficult for FSW, as it has been shown to do for FSW who have a greater number of clients (Grayman et al., 2005) or who work in venues thought to serve those of lower social standing (Yang et al., 2010). Importantly, the stigma ascribed to transactional sex may keep FSW from seeking HIV/STI treatment and prevention services. In a 2009 qualitative study of FSW living with HIV in India, FSW cited perceived discriminatory practices at healthcare centers as a key reason to not seek antiretroviral treatment (Chakrapani et al., 2009).

Clients of FSW are also at increased risk of HIV, and act as a bridge for infection from the FSW to the general population. A study of five African countries that compared HIV prevalence among men who have ever paid for sex to men reporting not having paid for sex found that having had transactional sex with a woman significantly increased the odds of having a positive HIV status (Leclerc & Garenne, 2008). Additionally, a cross-sectional survey of 1,405 male workers conducted in rural Zimbabwe—in which 48% of men reported ever having had sexual contact with an FSW—concluded that contact with FSW played a significant role in the spread of HIV (Cowan et al., 2005).

Certain social factors have been shown to be beneficial to FSW in terms of HIV prevention. Studies from both Asia and Latin America have demonstrated that social cohesion and social inclusion among FSW are significantly positively associated with consistent condom use (Kerrigan et al., 2006; Lippman et al., 2010). Intervention models developed in India, the Dominican Republic, and Brazil have sought to mobilize FSW by establishing safe centers that aim to improve social cohesion, facilitate access to resources, and better ensure the protection of their human rights (Lippman et al., 2010). In all three settings, these efforts were found to decrease HIV-related risk behavior.

Though less research exists, studies suggest that MSM experience frequent human rights abuses, including data from Malawi, Botswana, Lesotho, and South Africa (Baral, Adams, et al., 2011; Baral, Burrell, et al., 2011; Baral et al., 2009). Therefore, in light of the similar social and structural risk factors confronting the FSW and MSM communities, it is conceivable that comparable social cohesion elements may also be protective for MSM.

Existing data on KP of Swaziland

Data on the biological, behavioral, and structural risks faced by KP in the HIV epidemic in Swaziland is limited, particularly among MSM, and there currently exists no population-level estimate of HIV

prevalence among these groups. One study of 1,050 women in Swaziland and Botswana found that 5% had engaged in transactional sex, a behavior that was significantly associated with food insecurity and economic hardship (Weiser et al., 2007). Two rapid assessments of sex work in Swaziland were conducted in 2002 and 2007 by FHI and UNFPA, respectively, but these utilized small convenience samples which could not provide accurate measures of HIV prevalence (Mandla, 2007). These reports suggested that 98% of FSW had used condoms with their last client in Swaziland and 94% had been tested for HIV and were aware of their status, but that knowledge related to HIV was low (Mandla, 2007). The Swaziland 2006/07 Demographic and Health Survey suggested that payment for sex is considerably less common in Swaziland compared to other countries in the sub-region. Nationally, only about 0.1% of men reported paying for sex in Swaziland compared to 10.6% in Zambia, 7.0% in Zimbabwe and 8.3% in Malawi (Macro International & Swaziland Central Statistics Office, 2008).

Objectives

The Swaziland Ministry of Health recently expressed willingness to address needs of KP, claiming that the core mandate of “equitable non-discriminatory health services” should be applicable for all (Phakathi, 2009). In response to this statement and in light of the lack of definitive research on HIV among KP in Swaziland, two complementary studies were designed to address the following specific objectives:

Quantitative study

The first, a quantitative study, was designed to evaluate probability estimates of HIV prevalence among KP in Swaziland, describe behavioral factors associated with HIV infection, and examine the influences of social and structural factors on HIV-related behaviors and risk for infection among these populations. The specific aims of this study were

1. to calculate an unbiased estimate of HIV and Syphilis prevalence among FSW and MSM in Swaziland;
2. to describe behavioral factors associated with HIV infection, including individual sexual and drug-related practices, condom use and negotiation, and knowledge of HIV transmission risk factors; and
3. to examine the role of social and structural factors on HIV-related behaviors and risk for HIV infection among FSW and MSM, including human rights violations as a result of stigma/discrimination and degree of social cohesion.

Qualitative study

The second study was conducted as part of a comparative study in Swaziland and the Dominican Republic (DR), countries with very different HIV epidemics. Researchers used qualitative methods to explore the PHDP needs of KP living with HIV, with the following specific aims:

1. to describe the social and structural context of FSW and MSM in Swaziland, particularly as it relates to stigma and discrimination among PLHIV;
2. to examine the specific PHDP needs of FSW and MSM who are living with HIV, including challenges to accessing ongoing prevention, treatment, care, and support services;

3. to describe existing PHDP interventions and services and how these interventions and services do and do not meet the ongoing needs of KP; and
4. to identify ways in which PHDP interventions and services can be tailored to meet the needs of FSW and MSM, including specific program models and communication messages.

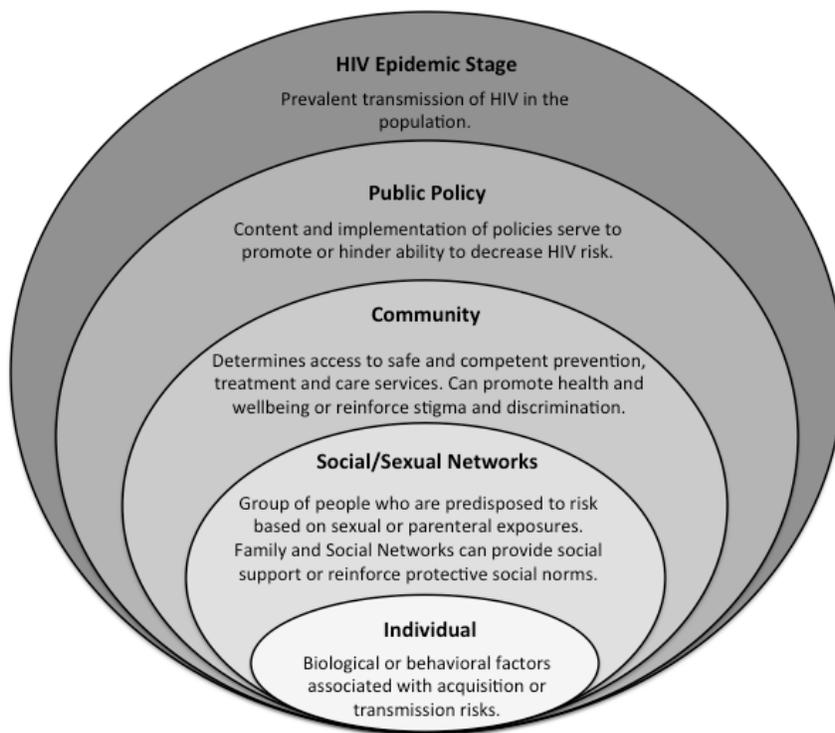
Results from the quantitative (Baral, Gross, et al., 2013) and qualitative (Kennedy et al., 2013) studies have been published in report form and can be found online at www.jhsph.edu/r2p. This document is an integrated version of these reports, focusing on the Swaziland-specific activities and results across both studies.

METHODS: QUANTITATIVE STUDY

Theoretical Framework

To explore the associations between behavioral, social and structural factors with HIV in KP, the study utilized the Modified Social Ecological Model (MSEM) as a guiding theoretical framework, presented in Figure 1 below (Baral, Logie, et al., 2013). The MSEM posits five layers of risk for HIV infection: individual, network, community, policy, and stage/level of the HIV epidemic. It modifies the traditional Social Ecological Model (Krieger, 2001) by tailoring the levels of risk to HIV-relevant domains. For example, the “interpersonal” level present in the original model has been changed to “social and sexual networks,” and an additional level specifying HIV/epidemic stage has been added. The MSEM is based on the premise that while individual-level risks are necessary for the spread of disease, they are not sufficient; higher-order social and structural levels of risk (network, community, policy, level/stage of epidemic) represent risk factors outside of the control of any individual person (Wellings et al., 2006). This model therefore recognizes the important role social and structural factors can have in HIV transmission dynamics in KP, which has been demonstrated by research in African settings (Fay et al., 2010).

Figure 1: Modified Social Ecological Model (MSEM) for HIV risk in Vulnerable Populations*



**Adapted from (Krieger, 2001)*

Study design and sampling

Respondent-Driven Sampling

Respondent-driven sampling (RDS) was used to recruit both MSM and FSW in Swaziland. RDS is a peer-referral sampling methodology specifically designed to address the challenges to collecting rigorous, representative data within hard-to-reach populations (Heckathorn, 1997). In RDS, a small convenience sample of the population is first identified and recruited. These initial participants, known as “seeds,” are then asked to recruit other individuals from the target population, beginning a series of chain-referral sampling. RDS analysis allows for estimation of unbiased prevalence estimates from a non-probability sample by limiting the number of people accrued by any one individual through the use of a coupon system—whereby a participant is given a set number of recruitment coupons to present to prospective participants in their network—and adjusting for the convenience sampling of early waves. Theoretically, with each additional wave, the recruitment becomes more diverse and representative, and thus a closer approximation of a random sample. As KP in Swaziland are considered hard-to-reach populations and present limited opportunities for venue-based time-location sampling, RDS offers an ideal means for recruiting an adequate sample.

Seed Selection

At the onset of the study, three seeds were chosen to begin the recruitment chain for each population. Seeds were chosen according to their social status and connection to the MSM and FSW communities, ability to explain the purpose of the study and requirements of participation to others, enthusiasm about the study aims, and willingness to promote the project. The research team also aimed to select seeds representing diverse demographics (age, education, socioeconomic status), risk status, sexual practices, and sub-group membership. Each seed had to meet the same study eligibility criteria required of other participants (described below). Seeds were given referral coupons with an expiration date four weeks from the date of dispersal. Each seed was allowed to recruit no more than three participants. This practice continued for all participants enrolled in the study. For FSW, six additional seeds were added to the study to sustain accrual, and for MSM eight additional seeds were added to the study when referrals began to slow.

Sample Size Calculation

The reproductive-age HIV prevalence in Swaziland was estimated to be 26% in 2007 (Macro International & Swaziland Central Statistics Office, 2008). As there are no rigorous estimates of HIV prevalence for KP in Swaziland, the national prevalence was used as the base for sample size calculations in the current study. With this base rate in mind, we estimated that we needed 324 participants in each population group (MSM and FSW) in order to detect significant differences (odds ratio [OR] of 2.0) in HIV prevalence between participants with higher HIV-related protective behaviors (such as consistent condom use) and those with lower HIV-related protective behaviors with 95% confidence, 80% power, and a design effect of 1.5. This sample size allowed us to determine whether or not there were significant differences between these two groups per level of key social factors, such as experiences with stigma and discrimination.

Inclusion criteria and ethical considerations

In order to be eligible for participation, potential participants were required to be at least 18 years of age (legally considered an adult and able to provide personal consent by Swazi law) and able to provide informed consent in either English or siSwati. They also had to present a valid recruitment coupon.

Further, FSW were considered eligible if they reported having exchanged or sold sex for money, favors, or goods in the past 12 months. MSM were considered eligible if they reported having had anal sex with another man in the past 12 months. In order to participate, potential participants also had to agree to be tested for HIV and syphilis.

Participants gave verbal informed consent at the study site. Following survey administration, each participant was reimbursed for travel, ranging from the equivalent of US \$7.00 – \$23.00. Those who recruited participants into the study also received the equivalent of US \$2.50 per participant successfully enrolled in the study. No names or identifying information were collected of any participants. HIV and syphilis tests also remained anonymous, and participants elected whether or not they wished to receive results.

Data collection

Following informed consent, FSW and MSM participants completed face-to-face behavioral surveys in a private office setting. The survey was administered verbally by a trained local member of the research staff and had a typical duration of one hour. Items included in the survey were designed to explore the multiple dimensions of the MSEM theoretical framework described above. Participants were first asked questions about their socio-demographics, followed by questions related to behavioral HIV-related risk factors, including questions on HIV-related knowledge, attitudes, and risk behaviors, as well as condom negotiation difficulty. Collateral effects of structural factors (stigma and discrimination) were ascertained by questions on human rights violations. Social cohesion for both MSM and FSW was measured according to a scale previously developed and used among sex worker populations in Brazil (Kerrigan et al., 2008; Lippman et al., 2010). Population-specific questions were included for both MSM and FSW, such as questions regarding sexual orientation for MSM and legal discrimination due to the criminalization of sex work for FSW.

Laboratory procedures

HIV and syphilis counseling and testing were then conducted according to official Swazi guidelines. Swaziland country-wide voluntary counseling and testing methodology for HIV was used, which includes screening and confirmatory tests with rapid kit tests. Serum samples were collected by a trained nurse or phlebotomist. Syphilis was tested using the Determine Syphilis Treponema Pallidum rapid kit. Participant codes were used to anonymously link results of surveys to test results as well as facilitate the provision of test results and appropriate clinical management.

Results were available on-site shortly after testing for participants who chose to receive them. If found to be positive for HIV, syphilis, or both, participants were administered optional post-test counseling and referral to appropriate healthcare services. They were also offered syphilis treatment on-site.

Risk Management

Numerous procedures were put in place to protect participants against the risk of disclosure, including the formation of two community advisory committees (CAC) that provided input into site and protocol issues. The first CAC represented the MSM community and included members from the only lesbian, gay, bisexual, and transgender (LGBT) organization in Swaziland—House of our Pride (HOOP). The second CAC included representation by FSW, though there is no dedicated organization officially registered in Swaziland to represent FSW. Both the CACs dedicated to sex work and the CAC dedicated to MSM felt there was minimal risk in presenting to a research site in terms of disclosure.

Surveys were conducted in a private setting at a dedicated site at the New Start Center, which has significant experience in providing confidential HIV testing and counseling services. The site also provided private rooms for medical treatment and counseling associated with the study. To minimize physical risks, collection of biologic samples and HIV/STI tests were performed by trained nurses who were contracted by Population Services International (PSI). All nurses had completed training with the Swaziland Ministry of Health. Psychological risks were minimized by providing sensitivity training for all staff on the specific needs of MSM and FSW.

Confidentiality was maintained by using a unique study identifier rather than real names on surveys. All electronic data was protected with passwords and hard copies of data were stored in locked cabinets. Results and data were kept off-site.

Analysis

Population weights were computed separately for each variable (Schonlau & Liebau, 2012), with each variable's proportion based on the number of participants for whom data was available. These weights were then used to calculate RDS-adjusted proportion estimates (Heckathorn, 1997). Adjusted RDS estimates attempt to account for two potential biases of the RDS methodology: The tendency for participants to recruit others like themselves (homophily), and the variation in network sizes of different individuals. A bootstrap method with 1,000 repetitions was used to estimate standard errors for these estimates.

Student's t-tests were conducted to examine the differences between proportions of participants testing positive for HIV and those testing negative for HIV within MSM and FSW populations. Those that yielded significant results are noted by asterisks (Appendix A).

Ethical review

The study received human subjects research approval from both the National Ethics Committee of Swaziland and the Institutional Review Board of the Johns Hopkins Bloomberg School of Public Health.

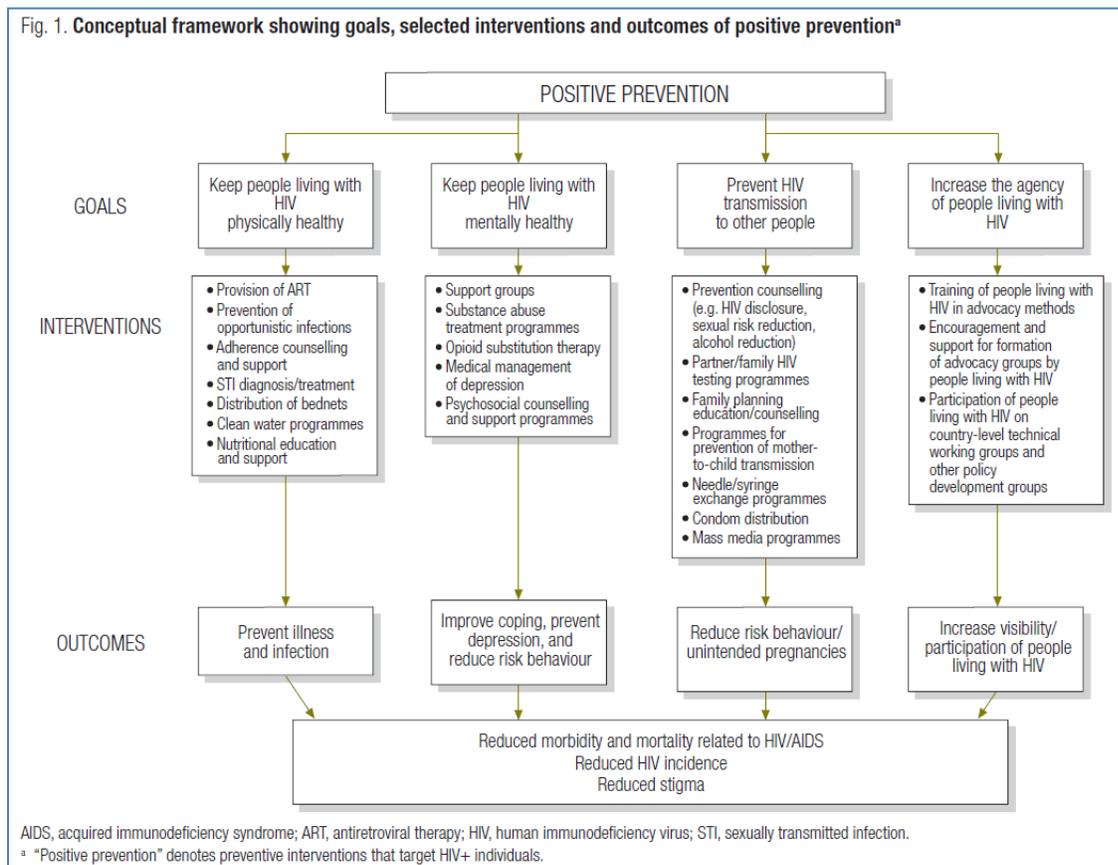
METHODS: QUALITATIVE STUDY

PHDP conceptual framework

Kennedy et al. (2010) outlined a framework for PHDP (which they refer to as positive prevention) that includes activities centered on four main goals: (1) keeping PLHIV physically healthy; (2) keeping PLHIV mentally healthy; (3) preventing further transmission of HIV; and (4) involving PLHIV in prevention activities, leadership, and advocacy. Interventions include both biomedical (e.g., antiretroviral therapy (ART), prevention of opportunistic infections, prevention of mother-to-child transmission programs, and sexually transmitted infection (STI) diagnosis and treatment) and behavioral interventions (e.g., psychosocial counseling and support programs, adherence counseling and support, prevention counseling, mass media, and training in advocacy methods). The ultimate goal of these interventions is to reduce morbidity and mortality related to HIV/AIDS, reduce HIV incidence, and reduce HIV-related stigma and discrimination.

The study methods were designed with these four goals in mind, and aimed to inform corresponding interventions to improve PHDP for KP.

Figure 2: Conceptual framework for PHDP developed by Kennedy and colleagues (2010)



Study Design

Qualitative methods included: (a) key informant interviews (n=16) with HIV program planners, policy makers, clinicians, and community leaders from the FSW and MSM communities; (b) in-depth interviews with FSW (n=21) and MSM (n=20), all of whom were PLHIV; and (c) focus groups with FSW (3 groups with 19 total participants) and MSM (3 groups with 26 total participants) including both individuals living with HIV and those who were not, to confirm preliminary findings and provide member checking (Crabtree & Miller, 1999). Study participants are summarized in the table below.

Table 1: Study participants in Qualitative Study

Key Informant Interviews	16 participants
In-depth interviews* with FSW, MSM, and TW living with HIV	41 participants (21 FSW; 20 MSM)
Focus groups** with FSW, MSM, and TW	3 groups with 19 FSW (8, 4, and 7 participants in each group)
	3 groups with 26 MSM (4, 13, and 9 participants in each group)
*All in-depth interview participants were interviewed on two occasions.	
**Focus groups included participants who were living with HIV as well as participants who were not.	

Key informant interviews

We conducted one-on-one, semi-structured interviews with a variety of key informants who had important knowledge regarding the FSW and MSM communities and PHDP services in these settings, specifically, HIV program planners, policy makers, clinicians, and community leaders. Individuals from each of these groups were identified and recruited through community partner organizations and through snowball sampling from initial participants. We interviewed a total of 16 key informants.

Eligible participants were invited to participate in an interview at a time and location of their convenience. Before the start of the interview, interviewers explained the study and obtained verbal informed consent. All interviews took place in a private setting of the participant's choice in his or her preferred language (English or siSwati). Key informant interviews lasted approximately one hour.

A field guide was developed to guide the discussion and stimulate probing on topics of interest. Participants were asked to describe the situation of FSW and MSM in their communities; their knowledge of existing PHDP services as well as services specifically targeted towards FSW and MSM; and their thoughts for how services could be improved to better meet the needs of KP. All interviews were semi-structured, whereby the interviewer used a guide to ensure that all topics were covered, but a certain amount of flexibility was allowed to permit discussion of unanticipated but interesting issues that may have arisen.

In-depth interviews with FSW and MSM living with HIV

In addition to the key informant interviews, we conducted in-depth interviews with 21 FSW and 20 MSM who were living with HIV.

Recruitment was conducted through a variety of settings and organizations to facilitate diversity of participants. These settings included HIV clinics; networks of people living with HIV; community organizations for FSW and MSM; and HIV prevention, care, and treatment activities. Individuals were identified through existing relationships, inputs from key informants, and participant referral. This purposeful sampling, also known as criterion-based selection, was deliberately intended to broaden the number of response categories to explore the experience of individuals from a variety of perspectives (Maxwell, 2005). Eligible participants were invited to participate in an interview at a time and location of their convenience. As with key informants, interviewers explained the study and obtained verbal informed consent prior to the start of each interview. All interviews took place in a private setting of the participant's choice and in his or her preferred language. Interviews lasted approximately one to two hours each.

Interviews were semi-structured and interviewers employed a field guide to direct the conversation and stimulate probing. Each participant was interviewed twice to enhance rapport and to gain more depth and understanding on the aforementioned topics. Participants were asked about the general experiences of FSW and MSM in their communities, the organization and networks of these populations, their personal and community experiences with HIV prevention, care, and treatment services, their experiences with stigma and discrimination, and their suggestions for how services, interventions, and messages could be better tailored to meet the needs of their population.

Focus groups with FSW and MSM

To gather a broader community perspective on the topics of this study, we conducted additional focus group discussions in each country. Three focus groups were conducted with 19 FSW total (8, 4, 7 participants, respectively, in each group) and 3 focus groups were conducted with 26 MSM (4, 13, and 9 participants, respectively, in each group). Focus group participants were asked to discuss similar topics as covered in in-depth interviews, including programmatic models, approaches, and messages to address PHDP that would be acceptable and appropriate for their communities.

Qualitative data analysis

All interviews and focus groups were recorded, transcribed, and translated into English. Debriefing notes were taken immediately following each interview to capture the interview context, a theoretical memo, a methodological memo, and topics for follow-up. Weekly meetings were held with all interviewers to debrief on topics covered and issues for further exploration to ensure an effective iterative process.

Analysis of qualitative data was conducted through identification of recurrent patterns and themes following Crabtree and Miller's five steps in qualitative data analysis, or what they call the "interpretive process" (Crabtree & Miller, 1999). These steps are (1) Describing, (2) Organizing, (3) Connecting, (4) Corroborating, and (5) Representing. These steps form part of an iterative process that is better seen as cyclical or spiral rather than linear. They start by re-examining the goals of the research and considering

questions of reflexivity, then move towards ways of highlighting, arranging, and reducing texts to make connections through the identification of recurrent patterns and themes.

After all data were collected, a full-day data analysis workshop was attended by representatives from MSM and FSW groups, Ministry of Health (MOH) and National Emergency Response Council on HIV and AIDS (NERCHA) staff, interviewers and members of the research team, clinicians, and others. This workshop devoted individual time to read de-identified transcripts to identify themes, and group time to categorize and discuss emerging themes and implications. Following the workshop, a codebook was developed by four members of the study team working together until agreement on a set of codes was reached. Codes were selected based on *a priori* topics of interest (i.e., research questions), themes identified during the data analysis workshop, and additional emergent themes from transcripts. Codes were then applied to all transcripts using the computer software package Atlas.ti. The coded text was read to identify further themes or patterns and memos were created for key themes, which were then further developed into the findings presented here.

Ethical considerations

All participants provided informed consent prior to participation, and referrals to clinical and counseling services were provided, as needed. Study staff members were trained on FSW- and MSM-friendly approaches to interacting with participants. Ethical review and approval for this study was received from the Institutional Review Boards of the National Research Council of Swaziland and the Johns Hopkins Bloomberg School of Public Health in the United States. A study advisory board, including representation from the community, implementing partners, and national partners in each country, reviewed the study protocol and interview guides and provided ongoing advice on the management and execution of the study.

RESULTS: QUANTITATIVE STUDY

Results from the surveys and laboratory tests are summarized below and in the corresponding tables (see Appendix). Data from the sample of MSM are reported first, followed by those from the FSW sample. Each section contains the following subheadings, consistent with the study aims: sociodemographic profile, HIV/STI-related outcomes, sexual behavior and drug use, knowledge of HIV-risk behaviors, condom negotiation, social discrimination/human rights violations, and social cohesion. All percentages reported in the text for overall populations are RDS-adjusted unless otherwise noted; only percentages for participants who tested positive for HIV are not RDS-adjusted due to smaller sample sizes.

MSM Results

Sociodemographic profile

A total of 324 men were successfully recruited and consented to participate in the study (Table 2). A majority of the participants were 21 years of age or older (64%) and unmarried (98.3%). Just over half (56.0%) had completed secondary school or more, and 69.2% were currently employed or a student. Only a small proportion (10.4%) reported having one or more children. Most participants reported their nationality at birth as Swazi (97.8%), with the remainder hailing from Mozambique (1.5%), South Africa (0.5%), or other countries (0.2%). Over half (61.2%) had grown up in an urban area.

Approximately one-third (39.9%) reported their sexual orientation as bisexual, and 57.0% reported it as gay or homosexual. While almost half (44.9%) reported having disclosed their sexual behavior to a family member, only one-third reported disclosing their sexual behavior to a healthcare worker (data not shown).

Participants who tested positive for HIV were significantly more likely to be over 21 than participants who tested negative for HIV ($p \leq .001$). No other significant differences in demographics were found between the MSM participants who tested positive for HIV and those who tested negative.

HIV/STI-related outcomes

HIV- and STI-related outcomes among MSM are summarized in Table 3. The prevalence of HIV in this sample was 12.6%, while active syphilis was present in 1.2%. The percentage of participants who reported they were diagnosed with an STI in the past 12 months was 7.2% (data not shown).

Approximately half (51.0%) of all participants reported having been tested for HIV in the last 12 months. Among participants who tested positive for HIV, 30.0% reported that they had been previously diagnosed with HIV. One-third (33.3%) of participants knowingly living with HIV were currently receiving treatment.

Sexual behavior and drug use

Table 4 summarizes responses to questions regarding sexual practices and drug use. In general, MSM participants reported some concurrent sexual partnerships in the past 12 months, including sex with

two or more male partners (23.8%), two or more female partners (1.9%), and both male and female partners (25.5%). Condom use at last sex varied by partner type, with 69.5% reporting condom use with a main male partner, 46.0% with a casual male partner, 63.7% with a main female partner, and 62.7% with a casual female partner. However, a large proportion of MSM (54.2%) also reported having sex without a condom in the past 6 months.

Lubricant use for anal sex was also prevalent, with petroleum jelly most commonly used among the entire sample (60.7%), followed by water-based lubricant (26.8%). Over half the participants reported either no access or difficulty in gaining access to water-based lubricants (data not shown).

Drug use was low among this population, with 97.7% of MSM reporting no injection drug use within the last 12 months. Almost all of those participants reporting drug use also reported that they did not share needles (95.7%; non-RDS-adjusted due to small number of MSM who have shared needles). Further, 33.7% of participants admitted to using a non-injectable drug that was not prescribed to them. There were no significant differences between proportions of participants who tested positive for HIV and those who tested negative for these sexual and drug behaviors.

Knowledge of HIV-risk behaviors

Proportions of correct responses to questions on knowledge of HIV risk behaviors appear in Table 5. Almost all participants responded that someone can get HIV from sharing needles (99.0%; data not shown), although the question did not specify whether these were needles someone else had used previously. However, only 18.3% knew that anal sex was the “most risky type of sex,” and only 31.9% responded that receptive anal sex was riskier for acquiring HIV than insertive anal sex.

Three-quarters (78.9%) of all participants reported having received HIV prevention information on sex between men and women in the last year. However, less than one-quarter (21.4%) had received prevention information relating to sex between men in the same time period.

Condom negotiation

Table 6 summarizes responses to questions about condom negotiation. In general, approximately half of all MSM reported that it was somewhat or very difficult to get their partner to agree to use condoms in most situations. This includes when the partner does not want to use a condom (46.0%), when the partner gets angry when a condom is suggested (47.7%), and when the partner has been drinking or using drugs (49.4%). It also includes situations when the participant has been drinking or using drugs (44.8%), when the participant has not always used condoms with this partner in the past (53.3%), and when the participant cares about the partner (45.4%). The item with the lowest percentage of participants reporting difficulty was when the partner may think the participant has an STI (34.9%). The items with the highest numbers reporting difficulty were when the partner provides the participant with economic support (57.8%) and during oral sex (60.9%).

Social discrimination/human rights violations

Table 7 summarizes participants' responses to questions about instances of human rights abuse as a result of their sexual orientation or practices. In regard to sexual and physical violence, 6.4% reported

having ever been raped, 8.3% reported having ever been beaten up, and 36.2% reported having ever been tortured. However, the term “torture” can be difficult to translate, and while the study defined torture as sustained physical or sexual violence, it is possible that participants interpreted the term differently.

Approximately one-third (30.2%) felt they had experienced legal discrimination, and 3.7% reported having lost employment due to their sexual orientation or practices.

More than half (61.8%) reported that they have been afraid to seek healthcare because of their sexual orientation or practices, 14.9% reported difficulty accessing healthcare (data not shown), and 1.7% reported that they had been tested for HIV without their consent. About one-fifth (19.0%) felt that they had received lower quality medical care due to their sexual orientation or practices, but only 3.0% reported having been denied healthcare.

In the entire sample, 6.8% reported ever having heard healthcare workers gossiping about the participant. This percentage was 18.5% among participants who tested positive for HIV, significantly higher than for participants who tested negative for HIV ($p < .05$).

Social cohesion

Responses to questions regarding social cohesion within the MSM community are summarized in Table 8. The MSM in this study appear to have a strong social network to confide in or go to for support, with the majority of participants (73.6%) agreeing with the statement, “You can trust the majority of MSM you know.”

Participants were asked if they could count on other MSM in their group of friends in six unique situations. Positive answers were high for all situations, which included counting on MSM colleagues to assist in violent or difficult situations (88.4%), offer a place to stay (87.2%), loan money to the participant (83.6%), accompany the participant to the hospital (77.6%), help the participant find other MSM (90.4%), and support the use of condoms (84.0%).

FSW Results

Sociodemographic profile

Table 9 summarizes selected demographic characteristics of FSW participants. A total of 327 FSW participated in the study. Of these, 67.1% of study participants were 21 years of age or older. A large majority of the participants were born in Swaziland (94.9%; non-RDS-adjusted), with the remainder from Mozambique (1.9%), South Africa (1.9%) and other African countries (1.3%). Education levels were low: only 13.9% of study participants completed secondary and/or post-secondary schooling. Participants were overwhelmingly single: 90.6% of FSW studied reported never having been married. The remaining 9.4% of FSW were married, cohabiting, or widowed. Most had one or more living children (74.1%).

Almost three-quarters of FSW (73.2%) reported sex work as their sole income. Approximately one-quarter (24.3%) had disclosed the fact that they engaged in sex work to a family member, and only 13.4% had disclosed it to a healthcare worker.

As with the MSM population, FSW participants who tested positive for HIV were significantly more likely to be over 21 than HIV-negative participants ($p \leq .001$). Participants who tested positive for HIV were also more likely to have children ($p < .05$) and to disclose their occupation to a healthcare worker ($p < .05$) as compared to the sample testing negative.

HIV/STI-related outcomes

Table 10 summarizes HIV- and STI-related outcomes among the FSW sample. Prevalence of HIV was highly elevated among this sample of FSW: 60.5%. The prevalence of active syphilis among participants was 6.6%.

Almost two-thirds (61.7%) of all participants reported having been tested for HIV in the last 12 months. Over forty percent (41.5%) of participants knowingly living with HIV were currently receiving treatment. Among participants who tested positive for HIV in our study, 73.8% had been previously diagnosed with HIV.

Sexual behavior and drug use

Responses to questions regarding sexual practices and drug use are summarized in Table 11. The majority of FSW in this sample reported having 1 to 5 clients per week (66.5%), with 18.8% reporting 6 to 10 clients and 14.7% reporting over 11 clients. Reported condom use at last sex with regular clients was 82.9% and 84.8% with new clients. Only 51.1% reported condom use with non-paying partners. However, a large proportion of FSW (68.7%) also reported having sex without a condom in the past 6 months. In addition, 54.8% of FSW reported a condom had slipped off or broken at least once in the last 30 days (data not shown). Some participants (13.0%) reported having somewhat difficult, difficult, or no access to condoms when they needed them. Most FSW (81.5%) reported going without any type of lubricant. Petroleum jelly was reported by 11.0% of participants, and only 4.0% reported using water-based lubricant.

Drug use was low, with 96.3% of all FSW reporting no injection drug use in the last 12 months. Just over one-fifth (21.5%) admitted to using a non-injectable drug that was not prescribed to them.

Knowledge of HIV-risk behaviors

Table 12 presents proportions of responses to knowledge questions of HIV-risk behaviors. As measured by this survey, HIV-related knowledge was low among this population. Only 10.0% of participants correctly identified anal sex as the most risky type of sex for HIV infection. However, when comparing groups, the proportion of participants who identified anal sex as the most risky form of sex was significantly larger for participants who tested positive for HIV than for those who tested negative ($p < .05$). The majority (95.6%) of FSW in our study correctly answered that you could get HIV from using a needle to inject illegal drugs (though the question did not specify whether this was a needle that had previously been used by someone else). Only 17.9% of FSW correctly identified water-based lubricants as the safest to use during vaginal sex, and only 1.9% responded the same for anal sex. These questions did not define “safe” specifically for the prevention of HIV, and did not specify that this meant with latex condoms. However, since a large proportion of FSW reported using condoms, it is interesting to note that low percentages reported that condom-compatible lubricants were the safest.

Just about half of all participants (49.9%) had participated in talks or meetings related to HIV in the past year, and the majority had received some HIV prevention information at that time (84.9%).

Condom negotiation

Table 13 summarizes responses to selected questions about condom negotiation. Over half of all FSW indicated that condom negotiation is somewhat or very difficult when the client provides regular economic support (56.8%), when the client offers more money not to use one (61.8%), and during oral sex (63.2%). The situation reported difficult by the most respondents was when there is a precedent of no condom use with the client (67.5%); the situations reported difficult by the least respondents were when the client is under the influence of drugs or alcohol (46.6%) and when the FSW is under the influence of drugs or alcohol (38.6%).

Social discrimination/human rights violations

Table 14 summarizes selected human rights abuses reported by FSW. Sexual and physical violence were strikingly common against FSW, with one-third of the population (33.5%) reporting that they had ever been raped since the age of 18. Over half (59.8%) had experienced verbal or physical harassment, 49.2% reported that they had even been tortured, and 32.3% reported that they had been beaten up. Almost half (49.3%) reported ever being scared to walk in public.

Legal difficulties were also frequently reported. Over one-third (34.6%) had experienced legal discrimination as a result of selling sex. This includes discrimination by law enforcement officials: 37.1% reported having ever been denied police protection and 10.1% reported that they had been arrested on false charges (data not shown). Reported experience of blackmail was common at 29.9%. Additionally, over ten percent (10.2%) felt that they had been denied educational opportunities (data no shown) and 9.5% reported that they had lost employment due to their involvement in sex work.

In regard to healthcare, 38.1% of participants felt afraid to seek services because they sell sex. Among all participants, 8.9% felt that they received lower quality healthcare as a result of selling sex; 3.9% reported being denied healthcare for this reason; and 3.1% reported being tested for HIV without their consent. There were no significant differences between the participants who tested positive for HIV and those who tested negative.

Social cohesion

As shown in Table 15, participants held conflicting opinions about other FSW in their community. When FSW were asked if they could count on other FSW in five unique situations, they tended to respond positively to items regarding client issues and material assistance. This includes counting on other FSW to assist with difficult/violent clients (82.2%), offer a place to stay (70.0%), loan money (68.0%), accompany the participant to the hospital (65%), and support the use of condoms (73.3%). However, while 60.0% of all FSW reported that they could talk to their colleagues about their problems, only 38.0% felt that they could trust the majority of other FSW.

RESULTS: QUALITATIVE STUDY

Social, structural, and economic context of FSW and MSM

Social context

Participants described a social context surrounding FSW and MSM characterized by multiple layers of stigma and discrimination due to their HIV status and their sexual or professional identity. Experiences with and fear of stigma and discrimination led to a lack of disclosure of these identities. Sometimes, participants said it was easier to disclose one identity than another to different people. For example, many explained how among family members they might disclose HIV status but not MSM/FSW status, while among sexual partners they might disclose MSM/FSW status but not HIV status.

Violence was a common experience in the social context of both FSW and MSM. FSW reported violence from clients and police. Some clients became violent when asked to use condoms. Others would refuse to pay after sex and become violent. Sex workers also described police round-ups, demand for sex, and violence. MSM reported violence from a range of individuals, including sex partners, families, the general public, and police. Both groups felt they had no recourse to bring incidents of discrimination or violence to the authorities.

Structural and economic context

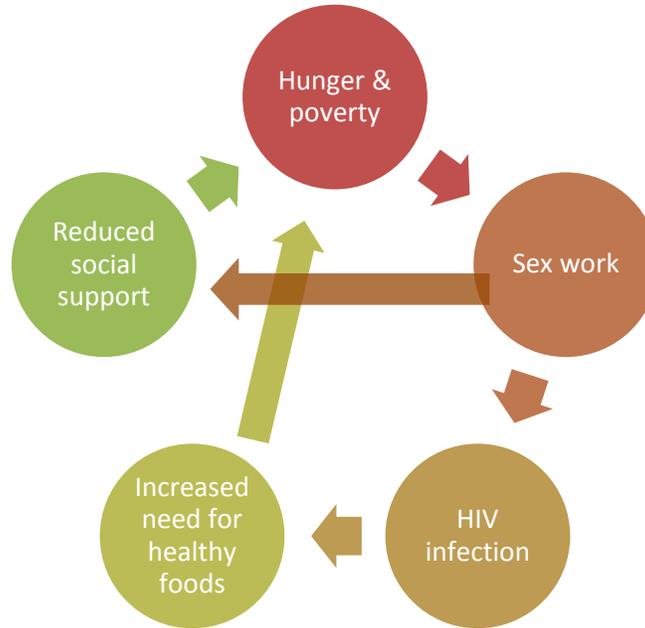
FSW and MSM in Swaziland face a challenging structural and economic context. As both sex work and same-sex practices are criminalized, both populations constantly fear being caught. One FSW described it this way:

You know that everything you do is illegal. It would be better if it was legal, then it wouldn't be a problem. Because then you could walk during the day and get called by somebody [for sex]. As it is, people are ashamed during the day. You think, eesh! I'll try and get close then be seen by people. When it's dark, I'm at ease, because even if they look at me they won't see who I am because I can just disappear. They won't even know where I went. (FSW)

Economic opportunities also significantly shaped the experiences of participants, especially for FSW. FSW described a cycle of poverty and hunger that led to sex work, and that sometimes led to HIV infection (Figure 3). HIV, in turn, drove an increased need for healthy foods, while sex work sometimes led to alienation from social networks that offer material and emotional support against hunger and poverty. FSW cited their own food insecurity or that of their children as the impetus to begin sex work, and as a primary force in continuing to sell sex. When participants were asked about what services would be helpful for people like them, a common request was food-related services (e.g., parcels, grants, education). Good nutrition and the ability to eat "healthy" or "balanced" foods were seen as important means of controlling HIV disease progression. Participants described challenges adhering to ART when faced with taking pills on an empty stomach. Finally, food security and food sharing were seen as important expressions of social networks, which many FSW felt they had trouble accessing as a result

of their profession. MSM also reported struggling with poverty and lack of economic opportunities, often related to discrimination and stigma.

Figure 3: Cycle of hunger/poverty, sex work, and HIV described by FSW participants



PHDP needs of FSW and MSM living with HIV

Care and treatment: protecting physical health

Participants reported perceived and experienced stigma against their sexual and professional identities in HIV health care settings, leading to a lack of care-seeking behavior. Participants described the following experiences in formal health services:

When they say “bring your partner,” and then you bring the same-sex partner, they are like, “yah, this is why you are having this [HIV], this is why,” and they will be throwing words at you . . . so then you get embarrassed, sometimes you’ll decide to leave without being treated, and where are you taking that sickness to? (MSM)

A health care worker comes and says, “You have an STI so bring your partner.” And if the sex worker says, “I do not have a specific partner, I have lots of partners, I sleep with different men in exchange for a living,” then the healthcare worker’s face suddenly changes and becomes unfriendly and she will say, “Ah, you are a sex worker. You are doing a dirty job.”[...] Sometimes they don’t have to say anything, it’s just the facial expression. . . . It scares them [FSW] away. They leave and they don’t come back. They are afraid to come back and decide to go ... to the pharmacy, rather than going to the hospital or clinic, where they won’t be questioned. (FSW)

Key informants did, however, emphasize that they personally treated all participants in the same way. They stated that, regardless of their personal belief, they had an ethical responsibility to provide “non-discriminatory services to all the members of the population.” One key informant explained:

Even though I don't approve of what they are doing . . . as a public health officer, I have to make sure that they have access to health services. I don't have to judge them. I don't have to give my views on what they are doing. But my duty is to make sure that they have access to services . . . whatever their sexual orientation is, they are human beings, they are Swazi. (Key Informant)

Both FSW and MSM also reported perceived and experienced stigma against PLHIV from families and partners, leading to a lack of disclosure. This lack of disclosure led to challenges with ART adherence, hiding medications, and a lack of social support for treatment access and adherence. MSM participants also described challenges adhering to ART, and challenges getting to a clinic due to poverty and hunger.

Psychosocial support: protecting mental well-being

The primary challenge for participants in staying mentally healthy was coping with the dual stigma against their HIV status and their sexual or professional identity. This stigma led to feelings of depression as well as internalized self-stigma and shame.

Participants explained that the initial receipt of an HIV-positive diagnosis was emotionally devastating. “At first I was devastated, such that I even lost weight,” said one FSW. She continued:

I was even afraid to leave the house in fear that maybe I'll be sitting with a person, and that person would just know my status. I was ashamed and at some point I told myself that the test was wrong. So I decided to go test again. I went back again and I was told the same thing. I became more ashamed and stayed in the house the whole week without coming out. (FSW)

Many participants said that, although the initial period following their diagnosis was difficult, over time, they came to accept their status. However, for some FSW especially, the risk cycle described above led them to not be particularly surprised or upset when they were diagnosed with HIV. They were aware that they had engaged in behaviors that put them at risk, as described by this woman:

I think that person [FSW] knows what they have been doing. It's something they have done to themselves. It may happen that they have the virus because you cannot sow beans and reap cabbages. (FSW)

This acceptance of their diagnosis, however, was often still intimately tied in with feelings of shame. Some MSM said feelings of self-stigma led them to drink alcohol as a coping mechanism. Participants also linked drinking to sexual risk behavior. As one MSM put it, “Most of the time we have sex without a condom it is when we are drunk.” However, in some cases, the high prevalence of HIV in Swaziland seemed to help mitigate some of the impact of diagnosis. Many participants talked about friends and

neighbors who were also living with HIV. As one FSW put it, “[I] am still free [emotionally at ease] because a lot [of people] are living with HIV”.

Participants reported receiving emotional support from a variety of sources. One MSM said he went to his pastor for support, while another derived comfort from religion but had not disclosed or discussed his lifestyle with members of his church. Only one MSM mentioned going to formal counseling services, saying he and his partner saw a private counselor who knew they were gay. FSW more commonly talked about the emotional support they received from participating in formal support groups, although they also mentioned receiving support from friends—sometimes other FSW— as well as female relatives and religion.

Prevention: preventing ongoing HIV transmission

Participants were very aware of the need to prevent HIV transmission to sexual partners. Many discussed how they had changed their behavior after being diagnosed with HIV in order to reduce transmission risk to others. These changes included condom use and reductions in their number of sexual partners. They did, however, continue to face barriers to prevention.

Some MSM felt that the clandestine nature of MSM relationships in Swaziland may lead to greater numbers and more casual types of partnerships. MSM described many of their partners as bisexual or having female partners/wives, possibly to hide MSM behavior or to fulfill cultural expectations. Further, MSM said that their relationships are often kept secret and therefore families do not play a role in relationship counseling and peacekeeping in the way that they might for heterosexual couples. An MSM participant reflected on this situation in the following way:

Usually in our community we have short-term relationships. These relationships are caused by the fact that there is nothing bonding those people. And maybe the community, the parents or relatives are not involved in our relationships. And then if I have got a problem with my boyfriend, if I say it’s over, it’s over. . . . You are not able to go tell your parents or relatives. . . . If people are informed either way about such people [MSM] in the community, if there is a relationship going on with his parent, the parent will be able to intervene either way, and those relationships will sustain. (MSM)

FSW, MSM, and key informants noted that in clinical services such as HIV testing and treatment, providers’ questions about HIV prevention often assume heterosexuality and monogamy. Due to fear of stigma, FSW/MSM often just answer the question asked rather than discuss their true risk behaviors. For example, if asked about condom use with a steady partner a FSW might just say, “I don’t have a steady partner” and not discuss her casual partners.

An additional challenge for preventing transmission was reported by some FSW who described clients who offered more money for sex without condoms. Due to the economic struggles previously described, some FSW felt compelled to accept these offers.

Rights/involvement: increasing agency and involvement

The main impediments to increasing involvement of FSW and MSM living with HIV in HIV-related programs and policy-making were dual stigma and their hidden identities. Participants indicated that people from their communities were often unwilling to disclose their status publically to represent these groups in HIV-related activities. Further, both MSM and FSW admitted difficulty trusting outsiders until they get to know particular individuals over time. If approached and engaged in sensitive and rights-affirming ways, however, these groups said they would be interested in increasing their current limited involvement in advocacy, outreach programs, and policy-making.

Tailoring existing PHDP interventions and services for FSW and MSM

Care and treatment interventions

Participants held a variety of opinions on how best to tailor existing PHDP interventions and services for FSW and MSM. Participants highlighted the need for additional training for health care workers on issues related to KP, particularly on how to work with HIV-infected patients in an appropriate and respectful manner. One participant explained:

I would train health care workers. Even their procedures manuals should have information on how to handle KP. . . . Also let's make educational materials that also speak of KP. (Key Informant)

Many participants also suggested structural and staffing changes for HIV services for KP. For example, one suggestion was to have more staff members living with HIV or “expert clients” to help individuals navigate services.

Participants did not agree as to whether there should be special clinics or services for FSW and MSM living with HIV. Some worried that targeted services would reinforce stigma because people would know that they were living with HIV and that they were FSW or MSM when seen walking into or out of the clinics. However, FSW participants emphasized the success of specific FSW-friendly services, including Family Life Association of Swaziland (FLAS) and other clinics. Several mentioned that FSW using these services have a system to avoid having to disclose that they are FSW by saying they are from the “support group,” as explained below:

For instance, Piggs Peak and Lobamba, they come and say, “I’ve come to see So-and-so” . . . and the health care worker will know it’s from the support group so it means she is a sex worker. Same with Lobamba, they meet and she can say, “I’m from the support group.” Oh, then she will know she is a sex worker without announcing. (Key Informant)

Several participants suggested that this approach of using code words for sex work could be expanded to other clinics and services.

Finally, participants described the need for nutritional and economic support in order to facilitate optimal engagement with health services. Participants faced economic insecurity and mentioned that

some patients do not have enough food to eat a few meals a day. The lack of food led people to discontinue treatment.

Psychosocial support interventions

Participants had limited suggestions related to psychosocial support. A handful of FSW and MSM said providing counselors would be helpful:

I think that the government needs to provide counselors per region [proportional to the number of PLHIV], who will counsel these people when they are faced with problems.
(MSM)

Otherwise, participants did not put forward other suggestions to improve mental health and well-being of HIV-infected FSW and MSM.

Prevention interventions

FSW appreciated the existing prevention interventions targeted to them, particularly HIV educational sessions and condom distribution programs. Participants also highlighted additional needs, including the need for specific HIV prevention services targeted to MSM. Many MSM suggested a “training of trainers” model, whereby trusted MSM community members could be trained in HIV prevention messages particularly relevant for MSM and could then share those messages with others in their community. Also, FSW and MSM suggested continued or expanded distribution of condoms and lubricant to prevent condom breakage.

Human rights and increased involvement

Both MSM and FSW said that societal acceptance and stigma reduction would be the most important mechanisms to increase their involvement in prevention activities, leadership, and advocacy. As one MSM said:

If we can be recognized and they can know that there are people who are living this kind of life and they can know how they can reach us in terms of programs and services.
(MSM)

DISCUSSION

Overview

KP are often overlooked in research and surveillance efforts in countries with generalized epidemics. To our knowledge, the quantitative study is the first of its kind to attempt to calculate an unbiased prevalence of HIV among MSM and FSW in Swaziland and to explore the behavioral and structural risk factors that may contribute to HIV infection in these populations. The qualitative study represents the region's first examination of the PHDP needs of MSM and FSW.

Our discussion section begins with interpretations of the quantitative results as follows: HIV and STI prevalence, biological and behavioral risk factors, structural risk factors, and associations with HIV infection. We then discuss the themes of the qualitative PHDP study: social and structural context, physical health, mental health, prevention of transmission, and leadership and advocacy. The section closes with a discussion of the limitations of both studies and a conclusion. Following the discussion section is a summary of key programmatic and research recommendations derived from both studies.

Interpretation of quantitative findings

HIV prevalence

Results from our study suggest that there is high HIV prevalence among KP in Swaziland. This was particularly true among FSW, with over 60% of FSW in our sample living with HIV, compared to 13.1% prevalence in the general adult female population (NERCHA, 2009). Despite literature linking STI infection and HIV risk (Cohen, 1998), participants who tested positive for HIV were no more likely to test positive for syphilis than participants who tested negative for HIV in both populations. It should be noted that because the study only tested for active syphilis infections, these results are not comparable to the demographic and health survey.

In comparing the two populations, higher percentages of FSW who tested positive for HIV in our study reported being tested for HIV within the past year than MSM living with HIV. A greater percentage of FSW living with HIV also reported receiving HIV treatment than did MSM living with HIV in our sample. Therefore, while FSW demonstrate higher levels of HIV infection than MSM, they also appear to be actively engaged in HIV testing and treatment. This may be related to the fact that these services widely coincide with prenatal visits, and around three-quarters of FSW in the sample had children. It is commonly believed that HIV-status-dependent interventions are the most effective in preventing HIV transmission, such as early antiretroviral treatment for people living with HIV/AIDS and chemoprophylaxis for people at risk for acquisition (Abdool Karim et al., 2010; Baeten et al., 2012; Cohen, 2010; Cohen & Baden, 2012; Cohen et al., 2011). Given the high prevalence of HIV in FSW and the encouraging proportion of participants being tested and treated for HIV, it is possible that an HIV-status-dependent chemoprophylactic approach to HIV may be beneficial for this population of FSW. Antiretroviral chemoprophylaxis may be a more effective means of protecting those FSW who are most at risk if they are able to adhere to such a medication regimen.

While HIV prevalence is lower in MSM than FSW, it is comparable to the high prevalence in the general population in Swaziland. Poor levels of HIV-testing among MSM have been noted in other generalized epidemics (Baral et al., 2009) and appear to be a problem in Swaziland. Programs encouraging regular testing may therefore be important components of prevention efforts targeting MSM. While health education coupled with access to condoms could provide immediate preventive impact (Beyrer, Sullivan, et al., 2012), comprehensive HIV prevention for MSM will also likely need to integrate biomedical interventions (such as early antiretroviral therapy) as they become available (Baral, Scheibe, et al., 2012; Sullivan et al., 2012).

Biological and behavioral risk factors

Our data support the existence of some biological and behavioral risk factors for KP in Swaziland, though not all. In general, MSM and FSW reported multiple sexual partners. Approximately one-quarter of our MSM sample reported having both male and female partners in the past year, providing evidence that the heightened risk ascribed to MSM may have a direct link to the general population (Beyrer, Baral, et al., 2012). Encouragingly, condom use with all types of partners is mostly comparable to the general population for MSM and FSW, suggesting perhaps that population-level condom promotion has been effective. In contrast to studies indicating a high prevalence of injection drug use among KP such as FSW (Medhi et al., 2012; Strathdee et al., 2008; Tuan et al., 2007), levels of drug use among both MSM and FSW in Swaziland were strikingly low, indicating that prevention efforts in Swaziland should focus their attention on other, more prevalent risk factors.

The lack of HIV-related knowledge appears to be a particularly salient problem among KP in Swaziland, as only 18.3% of MSM and 10.0% of FSW in our study knew of the heightened risk of contracting HIV from anal sex. Approximately one-quarter (26.8%) MSM reported using condom-compatible lubricants, and over three-quarters (81.5%) of FSW did not use lubricants at all. It is possible that HIV education campaigns for the general population may overlook the myriad behavioral risks that are more relevant for KP. For example, while 78.9% of MSM had received HIV prevention information concerning sex between men and women, only 21.4% had received information concerning sex between men. Unique campaigns tailored to these populations might highlight more specific risk factors that are shown to be problematic in KP, such as lubricant use and concurrent partnerships.

Structural risk factors

Our study provides support for the argument that behavioral and structural risk factors are intricately related for these populations. More than half of all FSW reported that it was *somewhat or very difficult* to insist on condom use if a client offered more money for unprotected sex, and a similar proportion said this of clients who provide them with regular economic support. Economic dependence has been linked to inconsistent condom use in FSW (Blankenship et al., 2008), and researchers are beginning to recognize the value of structural interventions such as economic programs in addressing these problems (Blankenship et al., 2006; Blankenship et al., 2008; Parker et al., 2000). These interventions, which include conditional cash transfers, microloans, and job or technical training, aim to promote social “bargaining power” and independence by providing an alternate means of income (Mahmud, 2003). While these interventions are not necessarily intended to prevent sex work, they may allow FSW to rely

less on monetary support from clients, giving them more power to negotiate condom use and practice safer sex. As the majority of FSW in our study reported that they could borrow money from sex worker colleagues if needed (83.6%), it is possible that this existing framework might be leveraged to create a formal, community-based savings and credit association. Interventions for sex workers should be developed within a community empowerment and rights-based approach, as these have proven successful elsewhere (Kerrigan et al., 2013) and have been recommended by the World Health Organization (WHO, 2012).

The high levels of human rights violations reported by MSM and FSW are alarming. Legal issues were prevalent, with approximately one-third of both MSM (30.2%) and FSW (34.6%) reporting legal discrimination. For FSW, the illegality of sex work in Swaziland likely complicates the interactions between FSW and law enforcement officials. Similar to results from previous studies (Arnott & Crago, 2009; Simic & Rhodes, 2009), FSW reported strained interactions with law enforcement, including being refused police protection (37.1%). Systemic legal issues must be addressed through structural interventions, such as those that provide ways for FSW to report crimes anonymously or without fear of being arrested themselves.

For MSM, anti-homophobia campaigns might help to reduce reported violations such as torture. Given the strength of social networks reported by MSM, it may be feasible to organize the MSM community to advocate for decriminalization and conduct anti-homophobia campaigns. This might also extend to the medical community, as results suggest that discrimination has a direct effect on protective healthcare-seeking behaviors. Over one-third (38.1%) of FSW and almost two-thirds (61.8%) of MSM felt afraid to seek healthcare due to their sexual orientation or practices. As discrimination within the medical community may subvert any efforts to increase HIV testing and treatment, it is essential that this barrier be addressed. Sensitization training for healthcare workers must address issues such as gossiping about clients, refusing clinical care, and providing lower quality care to MSM and FSW.

In contrast to the clear social cohesion present among MSM, responses to questions regarding social cohesion among FSW were mixed. More research is needed to better understand these social networks. It is possible that social cohesion is strong among small groups, but a central “community” of FSW could be lacking. Nevertheless, the positive responses to certain items—such as their ability to count on other FSW to accompany them to the hospital or borrow money if needed—suggest that initiatives rooted in female empowerment paradigms might be well received. Similar to the economic programs described above, these programs seek to empower women by engaging them in education and advocacy efforts. This approach has grown in popularity since its successful implementation among sex workers in India (Jana et al., 2004). Groups of FSW could be trained as peer educators and patient advocates that educate fellow FSW about HIV and promote safe sexual practices, thereby breaching the challenges in outreach when targeting this “hidden” population.

Associations with HIV infection

Student’s t-tests revealed few significant differences between participants testing positive for HIV and those testing negative within both populations. In some instances, associations between independent variables and HIV risk could be explained by the variable itself. For example, both MSM with HIV and

FSW with HIV were more likely to have been previously diagnosed with HIV than their counterparts who tested negative for HIV in our study. This is to be expected, as it is unlikely that many HIV-negative individuals would have received this diagnosis. Likewise, HIV-positive MSM were more likely to report hearing healthcare workers gossiping about them because of their sexual orientation/practices than HIV-negative MSM. A positive HIV status may lead healthcare workers to make assumptions about sexual behavior, and may also make an individual more sensitive to perceived discrimination. This behavior may therefore occur *because of* a positive HIV status, rather than serve as a predictor.

Our findings showed that HIV-positive participants were more likely to be older than HIV-negative participants in both populations. This may be reflective of the fact that older persons have been exposed to HIV for longer than younger persons.

We believe it is particularly meaningful that FSW living with HIV were more likely to have one or more children than were FSW who tested negative for HIV. As over three-quarters of our overall sample reported having children (74.1%), interventions may do well to capitalize on the existing reproductive health infrastructure in Swaziland. Medical visits associated with reproductive health services are widely regarded as an ideal means of identifying individuals living with HIV and linking them to care, as well as providing prevention services to at-risk women (Blankenship et al., 2006). The high percentage of women with one or more children in our study coupled with the associated risk of HIV infection indicate that strengthening the package of services provided by reproductive health clinics may be critical for HIV prevention among FSW.

The limited number of significant differences between groups does not necessarily indicate that the selected variables do not contribute to HIV risk in MSM and FSW. It is possible that this instead signifies that it is not individual behaviors but rather *combinations* of behaviors that characterize the heightened risk of KP in Swaziland. Future analyses should examine more complex models of combination behaviors to determine whether multiple risk factors taken together might better explain group differences.

Interpretation of qualitative findings

Social and structural context of PHDP

Participants described social and structural contexts characterized by economic deprivation. Many FSW experienced a cycle of hunger and sex work, further exacerbated by HIV, which inhibited their ability to live positively and prevent further transmission of HIV. MSM also reported struggling with poverty and lack of economic opportunities. For some FSW, this cycle also included experiences of violence. This underscores the effect that broader economic and legal structures have upon KP.

KP also experienced substantial multi-layered stigma related to their HIV status and their sexual practices or identities. Participants described experiencing stigma and discrimination in their homes, work environments and within health services. Being stigmatized or discriminated against affected participants' physical and mental health, complicated efforts to reduce the spread of HIV, and limited participation in mobilization, leadership, and advocacy activities. These experiences were described as a barrier to achieving each of the four goals of PHDP: (1) keeping PLHIV physically healthy; (2) keeping

PLHIV mentally healthy; (3) preventing further transmission of HIV; and (4) involving PLHIV in prevention activities, leadership and advocacy (Kennedy et al., 2010).

The various forms of stigma described by participants reflect Parker and Aggleton's framework for HIV-related stigma, which highlights how KP experience multiple, overlapping forms of stigma (2003). In this framework, Parker and Aggleton position stigma as a social mechanism for reinforcing differences that "feeds upon, strengthens and reproduces existing inequalities of race, gender and sexuality" (Parker & Aggleton, 2003, p. 13). Given the marginalized roles and limited power of FSW and MSM, it is unsurprising that these identities compounded the stigma that they face as PLHIV.

Protecting physical health

Participants described barriers to meeting their care and treatment needs including long lines, high costs of clinic attendance, transportation costs, drug stock-outs, and limited continuity of care. While these barriers affect all PLHIV in Swaziland, FSW and MSM are economically vulnerable and may be more affected. One approach to address some of these barriers would be to train a cadre of peer navigators or "expert clients" to accompany individuals to appointments and identify social service programs. These expert clients could also provide social support through the processes of diagnosis, acceptance and disclosure, treatment adherence, and ongoing prevention. Such models have shown promising results in other settings (Bradford et al., 2007; Van Tam et al., 2012). Participants did not all agree as to whether there should be special clinics or services for KP living with HIV. Some worried that these targeted services would reinforce stigma; therefore, careful analysis regarding the structure of the HIV care system is needed basis with active involvement of KP in the design of such services. At a policy level, there is a need for greater advocacy to address the sustainability of access to treatment for KP as well as providing nutritional and economic support to facilitate optimal engagement with health services.

Protecting mental well-being

Participants described similar psychosocial support needs, especially following diagnosis. KP may have particular counseling needs due to histories of trauma and abuse, or they may be living in unstable and highly vulnerable situations that create psychological stress above and beyond HIV (Machtinger et al., 2012). FSW and MSM reported almost no access to formal mental health services. In contrast, in a parallel study that employed the same objectives and methodology as the present study, MSM and FSW in the Dominican Republic frequently reported use of formal mental health services (Kennedy et al., 2013). Swazi participants in this study highlighted the need for more KP peer educators and support groups.

Preventing on-going HIV transmission

Participants expressed a strong desire to prevent transmission of HIV to their partners—though participants placed emphasis on an unmet need for HIV prevention services and expanded distribution of condoms and lubricants. Participants emphasized that they tried to use condoms with every partner, although economic necessity made condom use more difficult for some FSW whose clients offered more money in exchange for sex without condoms. Another reported challenge was condom use with regular partners—paying or non-paying—with whom participants may have more longstanding and intimate

relationships. Interventions with FSW in other settings have been effective in increasing condom use with casual paying clients (Kerrigan et al., 2003), but condom use with non-commercial partners remains quite low (Luchters et al., 2008; Morris et al., 2009). There are numerous barriers to condom use between FSW and regular partners, including the strong association between factors such as trust and intimacy and inconsistent condom use (Kerrigan et al., 2003; Murray et al., 2007; Ngugi et al., 2012). Findings support the need for innovative approaches to promote consistent condom use among KP living with HIV and their partners.

Leadership and advocacy for KP living with HIV

Participants reported challenges in becoming involved due to stigma and their hidden identities. Yet, if approached in the right way, MSM and FSW expressed that they would be willing to participate in HIV prevention, care, and treatment decisions for their communities.

Limitations

A number of limitations must be noted. First, both studies dealt with a number of socially stigmatized topics, such as HIV serostatus, sexual behaviors, and drug use. While we took every step to ensure confidentiality and create a safe space for the MSM and FSW who participated in our research, it is possible that some participants were not fully forthcoming during face-to-face surveys, interviews, or focus groups. This may have resulted in data that are somewhat skewed towards favorable answers (for example, an over-reporting of condom use and under-reporting of number of sexual partners). This phenomenon, referred to as “social desirability bias,” is a limitation faced by all researchers seeking to examine sensitive topics, including HIV (Maccoby & Maccoby, 1954).

Secondly, sampling in both the quantitative and qualitative studies faced limitations. RDS is built on a number of assumptions about the organization of social networks. It is possible that the relative uniformity of the sociodemographics of the sample may be due to unique social structures within these KP that violate the basic assumptions of RDS. Should this be the case, our sample may not be as representative of KP in Swaziland as we had hoped. Nevertheless, RDS is generally accepted to be the best sampling method for hard-to-reach populations. Since our qualitative data were collected largely from MSM and FSW in urban centers due to reliance on existing networks, there may be limited transferability of the findings to other groups of FSW and sexual minorities in these countries, as well as to other countries and settings.

Finally, as with any cross-sectional or qualitative study conducted at a single site, associations should not be interpreted as causal, and data are not generalizable to other populations. The study was meant to provide a snapshot of KP in Swaziland in order to inform future initiatives concerning KP within this specific country. While results provide a useful framework for countries with similar generalized epidemics, it is important that the distinctive characteristics of KP within these settings be examined independently. Qualitative findings were however thematically compared with a similarly designed study in the Dominican Republic and are documented in the full report: *Exploring the positive health, dignity and prevention needs of female sex workers, men who have sex with men and transgender women in the Dominican Republic and Swaziland* (Kennedy et al., 2013).

Conclusions

It is clear that urgent action and consistent monitoring of HIV in KP are needed to turn the tide of the epidemics facing these KP, as well as populations connected through sexual networks. The significance of KP in Swaziland's generalized epidemic should be addressed through surveillance that includes specific KP measures. Additionally, as both MSM and FSW face unique social and structural hurdles, such as high levels of stigma and discrimination, prevention programs and policies must take into account the social and political context of HIV infection in these populations. Special attention should be given to the PHDP framework as it relates to HIV-positive KP.

The results presented here reveal some barriers to HIV prevention efforts targeting MSM and FSW in Swaziland, but also potential opportunities for effective programming. The data in both the quantitative and qualitative studies highlight the need for a targeted HIV prevention strategy that integrates behavioral, biomedical, and structural components. There are additional needs for community mobilization strengthening, safe workspaces, and health sector interventions and capacity building. Future research and programming efforts must work towards developing and implementing multi-layered interventions for all KP in Swaziland that recognize the complex relationship between their HIV risk or positive status, and the need for sensitive, population-specific programming.

RECOMMENDATIONS

Results from our study represent the first data on HIV prevalence and risk factors among KP in Swaziland. As such, they not only provide useful information for HIV-prevention programming and surveillance efforts, but also raise a number of questions for future research. After examining these data, we offer the following recommendations:

Recommendations from Quantitative Study

Programmatic

1. **Develop and implement comprehensive, evidence-based, multi-level interventions for KP.** This study identified key gaps in HIV-related knowledge, behaviors, and access to services for KP. However, it also identified overarching structural constraints to accessing services and engaging in effective HIV prevention. Interventions for KP should be developed and implemented that consider how to address important factors at all levels, including structural factors such as discrimination from health care settings and law enforcement, and the availability of condoms, lubricant, and other services. Lubricant is particularly needed given the high rates of condom breakage reported by FSWs. Recently, WHO has developed guidelines for the prevention and treatment of HIV and STIs among both MSM (WHO, 2011) and FSW (WHO, 2012). These guidelines recommend a combination of evidence-based interventions for MSM and FSW at multiple levels, framed within a strong empowerment and rights-based approach. This approach has been found to be cost-effective in recent mathematical modeling exercise (Wirtz et al., 2012).
2. **Tailor intervention efforts to the needs of KP in Swaziland, recognizing differences between groups.** While both MSM and FSW demonstrated high levels of risk for HIV infection, there were differences between these populations. For example, though HIV prevalence was considerably higher among FSW than among MSM, a lower percentage of MSM reported having been tested for HIV in the past 12 months than did FSW. Social cohesion appeared to be stronger among MSM than FSW. And while a majority of the FSW in our sample had one or more children, only 10% of MSM reported having children. The differences in populations underscore the notion that no uniform intervention effectively addresses all problems facing different KP. Program administrators must consider the specific vulnerabilities of each group when designing and implementing interventions In the following areas:
 - a. **HIV and STI prevalence:** The high prevalence of HIV in KP, especially among FSW, indicates that there is a large number of KP with ongoing care and treatment needs. Multi-modal interventions focus on mitigating an individual's own physical and psychological suffering from HIV/AIDS, as well as curbing HIV transmission by protecting sexual partners and promoting greater involvement and advocacy among people living with HIV. Strengthening linkages to care within and beyond PHDP can also open possible opportunities for biologically based prophylactic interventions (see below).

- b. **Biological and behavioral risk factors.** Interventions must specifically work to address the biological and behavioral risk factors noted in this study. The high prevalence of HIV in FSW coupled with the promising proportion of FSW who had been tested and treated for HIV may signify that a biologically based prophylactic approach to HIV could be effective for FSW in Swaziland. Such interventions could include HIV pre-exposure prophylaxis (PrEP) for HIV-negative sex workers with increased availability of HIV treatment for sex workers living with HIV. Biological interventions must be coupled with behavioral approaches to address HIV-related knowledge gaps specific to individual KP (such as low lubricant use among FSW or lack of prevention information concerning anal sex among MSM). As the practice of protective sexual behaviors is shown to be influenced by the economic and social context of partners, programs should be sure to include elements that target sexual partners or clients.
 - c. **Structural risk factors.** The high numbers of KP reporting legal discrimination and fear of seeking healthcare point to a need to address stigma and discrimination in these settings. Policymakers must work with KP to establish protection for KP seeking services in HIV prevention, testing, and treatment. It is also essential to equip health and legal personnel with sensitive training on how to address the quality of care and human rights abuses that contribute to structural violence and limit access to services or protection for KP. For FSW and lower-income MSM, programs should promote economic empowerment to alleviate the cycles of poverty and risk behavior that make them particularly vulnerable to HIV infection.
3. **Include a focus on human rights.** Given the high rate of human rights abuses noted in the quantitative survey and described in the qualitative study, human rights must form a central part of any response to HIV among key populations in Swaziland. Although there will be legal, political, and funding constraints to this response, even in rights-constrained settings, comprehensive, rights-based HIV services for MSM can and should be provided (Beyrer, Sullivan, et al., 2012). Guidelines for working with MSM in rights-constrained settings have been developed for research activities (amfAR, IAVI, JHU-CPHHR, UNDP, 2012) and recent workshops have been led by UNAIDS and the International HIV/AIDS Alliance to incorporate human rights into national HIV strategic plans (UNAIDS and International HIV/AIDS Alliance, 2012). These provide best practices which could be adapted for the Swazi context.
4. **Include MSM and FSW in national HIV surveillance.** HIV surveillance in Swaziland utilizes population-based mathematical models that do not adequately capture the nuances of the country's epidemic. While this study provides the first unbiased estimate of HIV prevalence in these KP, Swaziland must develop and adopt surveillance systems that continue to collect this type of data in order to monitor the epidemic among KP and better understand the role KP play in larger transmission dynamics.

Research

- 1. Conduct Population Size Estimations of MSM and FSW.** To date, there has not been a systematic assessment of the size of MSM or FSW populations in Swaziland. A rigorous estimate of the size of these populations would allow for a better understanding of their overall contribution to the HIV epidemic in Swaziland, assist with national planning for service delivery and inform future surveillance efforts.
- 2. Explore the feasibility of biological interventions.** The results provide great support for the need for structural and behavioral programming, though biological risk factors are an important component of the HIV pandemic. Future research could determine the feasibility of biologically based prophylactic approaches, such as those mentioned in item 2b above, including assessing levels of adherence to such regimens.
- 3. Examine other KP such as people who use drugs.** A complete investigation of KP in Swaziland will also need to include an assessment of people who use drugs as another possible KP. Robust estimates of injection drug use prevalence and associations with HIV have not yet been conducted in Swaziland. Though we identified low levels of drug use among MSM and FSW, people who use drugs may be a separate KP in this setting that has yet to be explored.

Recommendations from Qualitative Study

Programmatic

- 1. Use “expert clients” to support KP living with HIV in navigating health systems.**
Pairing a KP with a trusted “expert client” could be an effective means of helping KP navigate the processes of diagnosis, disclosure, and treatment with a trusted and supportive individual. Within the clinic setting, our participants suggested that “expert clients” also be PLHIV or KP, though this model would need to be thoughtfully designed (Hallum-Montes et al., 2013; Higa et al., 2012; Kyakuwa et al., 2012).
- 2. Train health care providers.** HIV-positive KP commonly reported situations in which they were misunderstood or discriminated against in health care settings. Training clinical providers and staff in HIV clinics could improve their ability to provide specific, sensitive and effective care for HIV-positive KP. Providers should be trained how to adapt HIV counseling to KP whose sexual lifestyle may not fit the script of a typical client, and how to limit, identify, and address abuse or discrimination in clinical settings. However, such provider training will not happen overnight. We therefore recommend immediate expansion of outreach services provided by and for KPs in order to accelerate their access into HIV testing and care services. Concurrently, a smaller number of facilities could be targeted to offer KP-friendly services, which could be promoted by individuals within these networks. Eventually, sensitivity training could be expanded to the majority of health care providers.

- 3. Improve access to nutritional support.** In light of reports of poor economic and food security, nutritional support may be an appropriate mechanism to enhance the health of KP. Supporting FSW networks to implement or access safety net activities may alleviate their need to engage in high-risk sexual practices to meet their most basic needs.
- 4. Strengthen formal and informal support systems for mental health.** Mental health can be strengthened by increasing formal counseling services and the use of peer support counselors. There is also a clear need to work with existing HIV clinics to identify opportunities to integrate psychosocial counseling and support the services provided. Additionally, identifying appropriate ways to develop discreet, safe support groups for key populations could help to address the gaps in social support as well as barriers to employment and economic stability.
- 5. Target condom promotion to KP and partners.** Most HIV-positive KP emphasized the importance of preventing transmission to their partners, but some expressed resistance from partners to use condoms. Further outreach and education with the regular partners of FSW and MSM can help promote agreement to use condoms on the part of both members of the couple.
- 6. Protect the interests of KP wishing to participate in advocacy, outreach and policy-making activities.** Our findings highlight a need for nuanced approaches to addressing stigma that account for the broader history and social mechanisms that allow stigma to flourish. Efforts to reduce stigma need to be tailored to meet the unique needs of KP within Swaziland. Community mobilization, led by grassroots FSW and MSM groups, is one such approach that can empower KP to address stigma within and against their communities. However, these efforts must be sensitive to the needs of key populations and protect them from potentially dangerous legal and social consequences of participation.

Research

- 1. Explore multi-layered stigma in greater depth.** The findings from this study indicate that KP face a complicated and dense combination of social stigmas. Further research is needed to more clearly characterize these layers of stigma and determine the situations, consequences and effective coping strategies associated with each.
- 2. Develop and evaluate tailored PHDP policies and programs for KP.** Combination programs to support the four goals of PHDP need to be designed, carefully monitored, and systematically evaluated to determine how these findings translate into best practices for HIV positive KP in Swaziland.

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APPENDIX

Table 2: Sociodemographic characteristics of MSM

		Non-RDS- adjusted proportion of HIV+ participants	Non-RDS- adjusted Proportion (n)	RDS- adjusted Proportion	RDS-adjusted 95% Confidence Interval
General Demographics					
Age***	< 21 years old	1.9%	29.8% (95/319)	36.0%	[29.6%, 40.6%]
	21-25 years old	38.9%	45.5% (145/319)	45.6%	[30.7%, 41.8%]
	26-30 years old	38.9%	17.9% (57/319)	11.9%	[40.1%, 51.1%]
	> 30 years old	20.4%	6.9% (22/319)	6.5%	[4.3%, 9.7%]
Nationality at birth	Swazi	100%	95.7% (308/322)	97.8%	[96.0%, 98.7%]
	Mozambique	0%	2.5% (8/322)	1.5%	[0.7%, 3.2]
	South African	0%	1.2% (4/322)	0.5%	[0.1%, 1.4%]
	Other	0%	0.6% (2/322)	0.2%	[0.1%, 1.0%]
Highest education	Some secondary, high school or lower	30.9%	34.3% (110/321)	44.0%	[38.4%, 49.8%]
	Completed secondary or high school	45.5%	42.7% (137/321)	41.1%	[35.7%, 46.7%]
	Post HS vocational training or higher	23.7%	23.4% (75/324)	14.9%	[11.9%, 18.5%]
Employment status	Currently employed/student	75%	68.2% (212/311)	69.2%	[63.8%, 74.1%]
	Unemployed	25%	31.8% (99/311)	30.8%	[25.9%, 36.2%]
Marital status	Married, cohabitating, or widowed	7.3%	3.7% (12/322)	1.7%	[1.0%, 3.0%]
	Single/never married	92.7%	95.7% (308/322)	98.3%	[97.0, 99.0%]
Have one or more children		28.3%	12.4% (40/322)	10.4%	[7.6%, 14.1%]
Grew up in urban area		56.4%	61.6% (199/323)	61.2%	[55.7%, 66.4%]
Items specific to MSM					
Sexual orientation	Gay or homosexual	69.8%	64.2% (204/318)	57.0%	[51.3%, 62.6%]
	Bisexual	30.2%	35.8% (114/318)	39.9%	[34.4, 45.5%]
Disclosed sexual behavior to a family member		61.8%	53.1% (172/324)	44.9%	[39.5%, 50.4%]

*** = p<.001

Table 3: HIV and STI-related outcomes of MSM

	Non-RDS-adjusted proportion of HIV+ participants	Non-RDS-adjusted Proportion (n)	RDS-adjusted Proportion	RDS-adjusted 95% Confidence Interval
Laboratory tests				
HIV-positive	100%	17.1% (55/321)	12.6%	[9.7%, 16.2%]
Active syphilis	7.6%	1.9% (6/321)	1.2%	[0.5%, 2.7%]
Self report				
Tested for HIV in the last 12 months	47.3%	54.3% (176/324)	51.0%	[42.2%-60.8%]
Previously diagnosed with HIV***	30.0%	6.1% (19/311)	4.2%	[2.6%, 6.6%]
Receiving treatment for HIV	33.3%	25% (5/20)	47.1%	[22.5%-73.3%]

*** = p<.001

Table 4: Sexual behaviors and drug use among MSM in Swaziland

		Non-RDS-adjusted proportion of HIV+ participants	Non-RDS-adjusted Proportion (n)	RDS-adjusted Proportion	RDS-adjusted 95% Confidence Interval
Sexual behaviors					
Sexual partners in the past 12 months	Both male and female regular partners	21.8%	20.8% (67/322)	25.5%	[20.7%, 31.0%]
	Two or more male partners	27.3%	31.4% (101/322)	23.8%	[19.7%, 28.4%]
	Two or more female partners	1.8%	2.2% (7/322)	1.9%	[0.8%, 4.1%]
Condom use at last sex with:	Main male partner	72.2%	71.9% (218/303)	69.5%	[63.9%, 74.7%]
	Casual male partner	82.9%	74.1% (157/212)	46.0%	[40.6%, 51.6%]
	Main female partner	64.7%	67.3% (70/104)	63.7%	[53.4%, 72.8%]
	Casual female partner	69.2%	70.7% (53/75)	62.7%	[50.0%, 73.9%]
Always condom use with	Main male partner	51.9%	52.0% (156/300)	48.2%	[42.5%, 54.0%]
	Casual male partner	57.1%	56.8% (121/213)	57.1%	[50.2%, 63.8%]
	Main female partner	47.1%	51.5% (52/101)	N/A ⁶	N/A
	Casual female partner	46.2%	52.8% (38/72)	N/A	N/A
General Lubricant use	Petroleum jelly	35.8%	46.5% (144/310)	60.7%	[55.1%, 66.0%]
	Water based lubricant	45.3%	37.1% (115/310)	26.8%	[22.4%, 31.7%]
	Body creams	9.4%	6.1% (19/310)	4.0%	[2.6%, 6.3%]
	None	7.5%	9.0% (28/310)	8.6%	[5.9%, 12.2%]
Drug use					
No injection drug use in the past 12 months		96.4%	97.2% (315/324)	97.7%	[98.8%, 95.7%]
No sharing of needles		100%	95.7% (22/23)	N/A ⁷	N/A
Use of any non-injectable drug that was not prescribed		30.9%	35.6% (115/323)	33.7%	[28.7%, 39.1%]

⁶ Since these questions did not apply to many participants, it was not possible to calculate the RDS-adjusted proportions in the same way as the male partner questions.

⁷ Due to the small number of MSM who have shared needles, we could not estimate the RDS-adjusted proportion for this variable.

Table 5: Knowledge of HIV risk behaviors and exposure to prevention efforts among MSM

	Non-RDS-adjusted proportion of HIV+ participants	Non-RDS-adjusted Proportion (n)	RDS-adjusted Proportion	RDS-adjusted 95% Confidence Interval
HIV-related knowledge				
Knowledge of anal sex as the most risky type of sex	24.1%	24.3% (78/321)	18.3%	[14.8%, 22.5%]
Knowledge that receptive anal sex is riskier than insertive	30.9%	30.0% (95/317)	31.9%	[26.9%, 37.3%]
Exposure to HIV prevention efforts				
Have received HIV prevention information between man and woman in the last year	77.8%	80.9% (259/320)	78.9%	[73.9%, 83.2%]
Have received HIV prevention information between men in the last year	27.3%	26.9% (87/323)	21.4%	[17.5%, 25.8%]

Table 6: Condom negotiation among MSM

	Non-RDS-adjusted proportion of HIV+ participants	Non-RDS-adjusted Proportion reporting somewhat or very difficult (n)	RDS-adjusted Proportion	RDS-adjusted 95% Confidence Interval
Somewhat or very difficult to insist on condom use with a male sexual partner				
If he might think you have an STI	35.2%	34.9% (112/321)	34.9%	[27.5%, 43.9%]
If he does not want to use one	45.1%	42.4%(133/314)	46.0%	[37.3%, 56.1%]
If he gets angry if you suggest it	49.1%	45.4%(142/313)	47.7%	[39.1%, 57.6%]
If he has been drinking or using drugs	43.2%	44.1%(137/311)	49.4%	[40.3%, 59.9%]
If you have been drinking or using drugs	38.8%	40.2%(119/296)	44.8%	[36.1%, 55.0%]
If you haven't always used condoms with him in the past	63.0%	53.9%(171/317)	53.3%	[44.5%, 63.2%]
If he provides you with regular economic support	58.2%	55.8%(177/317)	57.8%	[49.1%, 67.5%]
If you care about him	43.6%	43.7%(141/323)	45.4%	[36.7%, 55.5%]
During oral sex	65.4%	59.2%(184/311)	60.9%	[52.5%, 70.4%]

Table 7: Prevalence of human rights abuses among MSM

	Non-RDS-adjusted proportion of HIV+ participants	Non-RDS-adjusted Proportion (n)	RDS-adjusted Proportion	RDS-adjusted 95% Confidence Interval
Sexual violence				
Ever been raped	7.4%	6.1% (19/324)	6.4%	[4.1%, 9.8%]
Occurring as a result of sexual orientation				
Lost employment	3.6%	2.8% (9/323)	3.7%	[1.9%, 6.9%]
Afraid to seek healthcare	50.9%	55.5% (178/321)	61.8%	[56.4%, 66.9%]
Denied healthcare	3.6%	3.7% (12/323)	3.0%	[1.7%, 5.3%]
Felt they received lower quality care	18.2%	16.4% (53/324)	19.0%	[14.9%, 24.0%]
Heard healthcare workers gossiping*	18.5%	10.2% (33/323)	6.8%	[4.9%, 9.5%]
Felt legal discrimination	37.7%	31.5% (101/321)	30.2%	[25.4%, 35.4%]
Beaten up	15.1%	9.0% (29/323)	8.3%	[5.8%, 11.9%]
Tortured	43.6%	39.5% (128/324)	36.2%	[31.2%, 41.5%]
Tested for HIV without consent	5.5%	2.8% (9/323)	1.7%	[0.9%, 3.3%]

* = p<.05

Table 8: Social networks and social cohesion among MSM

		Non-RDS- adjusted proportion of HIV+ participants	Non-RDS- adjusted Proportion reporting strongly agree or agree (n)	RDS- adjusted Proportion	RDS-adjusted 95% Confidence Interval
Social cohesion					
You can count on other MSM in your group of friends...	If you need to borrow money	79.6%	84.6% (264/312)	83.6%	[72.9%, 94.8%]
	To accompany you to the doctor or hospital	81.8%	80.0% (255/319)	77.6%	[67.1%, 88.7%]
	If you need somewhere to stay	87.0%	89.5% (280/313)	87.2%	[76.3%, 98.5%]
	To help deal with a violent or difficult situation	85.2%	86.7% (273/315)	88.4%	[77.3%, 99.7%]
	To help you find other MSM	92.6%	91.1% (286/314)	90.4%	[79.7%, 101.3%]
	To support the use of condoms	78.2%	85.0% (272/320)	84.0%	[73.5%, 94.9%]
You can trust the majority of MSM you know		63.6%	69.8% (225/322)	73.6%	[63.3%, 84.8%]

Table 9: Sociodemographic characteristics of FSW

Characteristic	Non-RDS-adjusted proportion of HIV+ participants	Non-RDS-adjusted Proportion (n)	RDS-adjusted Proportion	RDS-adjusted 95% Confidence Interval	
General Demographics					
Age***	< 21 years old	12.6%	19.6% (62/317)	33.0%	[27.1%, 39.4%]
	21-25 years old	31.4%	31.5% (100/317)	30.4%	[25.5%, 35.8%]
	26-30 years old	29.6%	26.5% (84/317)	22.8%	[18.6%, 27.6%]
	> 30 years old	26.5%	22.4% (71/317)	13.9%	[11.0%, 17.4%]
Nationality at birth	Swazi	93.7%	94.9% (300/316)	N/A ⁸	N/A
	Mozambique	2.2%	1.9% (6/316)	N/A	N/A
	South African	2.7%	1.9% (6/316)	N/A	N/A
	Other African	1.3%	1.3% (4/316)	N/A	N/A
Highest Education	Some secondary high school or lower	88.3%	86.8% (275/317)	86.2%	[71.5%, 103.6%]
	Completed secondary	10.3%	12.0% (38/317)	11.2%	[8.2%, 15.0%]
	Post-secondary	1.3%	1.3% (4/317)	2.7%	[1.0%, 7.0%]
Marital Status	Married, cohabiting, or widowed	13.2%	11.2% (35/313)	9.4%	[6.8%, 12.9%]
	Single/ never married	86.8%	88.8% (278/313)	90.6%	[87.1%, 93.2%]
Have one or more children	80.2%	75.6% (239/316)	74.1%	[61.4%, 88.7%]	
Items specific to FSW					
Disclosed occupation to family	31.5%	30.4% (96/316)	24.3%	[20.1%, 29.0%]	
Disclosed occupation to healthcare worker*	29.7%	25.9% (82/316)	13.4%	[10.7%, 16.6%]	
Sex work is sole income	64.6%	66.9% (212/317)	73.2%	[68.3%, 77.5%]	

* = p<.05

** = p<.001

⁸ Due to the small number of FSW born outside Swaziland, we could not estimate RDS-adjusted proportions for this variable.

Table 10: HIV and STI-related outcomes of FSW

	Non-RDS- adjusted proportion of HIV+ participants	Non-RDS- adjusted Proportion (n)	RDS- adjusted Proportion	RDS-adjusted 95% Confidence Interval
Laboratory tests				
HIV-positive	100%	69.7% (223/320)	60.5%	[52.1%, 69.0%]
Active Syphilis	8.6%	7.5% (24/319)	6.6%	[3.2%, 10.1%]
Self-report				
Tested for HIV in the last 12 months	78.0%	74.1% (234/316)	61.7%	[55.6%, 67.5%]
Previously diagnosed with HIV***	73.8%	55.3% (173/313)	45.0%	[39.5%, 50.6%]
Receiving treatment for HIV	41.5%	40.8% (71/174)	36.9%	[30.1%, 44.2%]

***= p<.001

Table 11: Sexual behaviors and drug use among FSW

		Non-RDS-adjusted proportion of HIV+ participants	Non-RDS-adjusted Proportion (n)	RDS-adjusted Proportion	RDS-adjusted 95% Confidence Interval
Sexual behaviors					
Average number of clients per week	1-5	57.6%	59.0% (183/310)	66.5%	[61.3%, 71.4%]
	6-10	25.8%	24.5% (76/310)	18.8%	[15.1%, 23.0%]
	11+	16.6%	16.5% (51/310)	14.7%	[11.3%, 19.0%]
Condom at last vaginal or anal sex with	Regular client	82.5%	82.2% (250/304)	82.9%	[78.3%, 86.7%]
	New client	86.3%	87.4% (257/294)	84.8%	[79.8%, 88.8%]
	Non-paying partner in last 30 days	50.3%	48.9% (132/270)	51.1%	[45.1%, 57.1%]
Have had sex without a condom in the past 6 months		68.2%	68.0% (215/316)	68.7%	[63.4%, 73.6%]
No, difficult, or somewhat difficult access to condoms when needed		20.5%	17.2% (54/313)	13.0%	[8.9%, 18.6%]
Lubricant use during vaginal or anal sex with men	Petroleum jelly or Vaseline	41.5%	11.3% (35/310)	11.0%	[5.7%, 16.2%]
	Body creams/fatty creams	6.2%	1.9% (6/316)	N/A ⁹	N/A
	Water-based	26.2%	6.4% (20/313)	4.0%	[1.2%, 6.9%]
	Saliva	9.2%	1.2% (4/333)	N/A	N/A
	None	16.9%	79.0% (245/310)	81.5%	[75.4%, 87.6%]
Drug use					
No injection drug use in the last 12 months		94.1%	94.3% (297/315)	96.3%	[94.2%, 97.7%]
No sharing of needles		96.2%	95.9% (71/74)	N/A	N/A
Use of any non-injectable drug that was not prescribed		33.0%	32.1% (100/312)	21.5%	[17.8%, 25.8%]

⁹ Due to the small number of participants who used particular types of lubricants, we could not estimate RDS-adjusted proportions for some of these responses.

Table 12: Knowledge of HIV risk behaviors and exposure to prevention efforts among FSW

	Non-RDS-adjusted proportion of HIV+ participants	Non-RDS-adjusted Proportion (n)	RDS-adjusted Proportion	RDS-adjusted 95% Confidence Interval
HIV-related knowledge				
Knowledge of anal sex as most risky for HIV infection*	10.0%	10.9% (34/312)	10.0%	[7.2%, 13.8%]
Identified water-based as safest lubricant type to use during vaginal sex	23.4%	21.2% (38/179)	17.9%	[13.1%, 23.9%]
Identified water-based as safest lubricant type to use during anal sex	23.9%	21.6% (21/97)	1.9%	[1.2%, 3.1%]
Knowledge of HIV risk from using a needle to inject illegal drugs	96.4%	96.2% (302/314)	95.6%	[92.4%, 97.5%]
Exposure to prevention efforts				
Have received HIV prevention information in the past year	88.2%	86.0% (271/315)	84.9%	[80.3%, 88.6%]
Have participated in talks or meetings related to HIV in the past year	61.5%	60.5% (190/314)	49.9%	[44.2%, 55.6%]

* = p<.05

Table 13: Condom negotiation among FSW

Characteristic	Non-RDS-adjusted proportion of HIV+ participants	Non-RDS-adjusted Proportion (n)	RDS-adjusted Proportion	RDS-adjusted 95% Confidence Interval
Somewhat or very difficult to insist on condom use with a client				
While under the influence of drugs or alcohol	34.1%	34.7% (96/276)	38.6%	[30.8%, 48.2%]
While client is under the influence of drugs or alcohol	42.5%	44.6% (138/309)	46.6%	[38.0%, 56.5%]
If client offers more money not to use one	58.9%	57.0% (179/314)	61.8%	[52.2%, 72.6%]
If client provides regular economic support	50.7%	49.9% (158/317)	56.8%	[47.3%, 67.5%]
If client hasn't always used condom in the past	54.7%	57.7% (176/305)	67.5%	[57.2%, 78.8%]
During oral sex	52.2%	54.2% (143/264)	63.2%	[53.9%, 73.7%]

Table 14: Prevalence of human rights abuses among FSW

	Non-RDS-adjusted proportion of HIV+ participants	Non-RDS-adjusted Proportion	RDS-adjusted Proportion	RDS-adjusted 95% Confidence Interval
Sexual violence				
Ever been raped	43.6%	40.5% (122/301)	33.5%	[28.5%, 38.8%]
Events occurring as a result of selling sex				
Felt afraid to seek healthcare	43.0%	44.8% (142/317)	38.1%	[33.0%, 43.4%]
Received lower quality healthcare	10.8%	10.7% (34/317)	8.9%	[6.4%, 12.3%]
Been denied healthcare	6.3%	5.4% (17/317)	3.9%	[2.4%, 6.2%]
Tested for HIV without consent	4.0%	3.8% (12/317)	3.1%	[1.7%, 5.3%]
Lost employment	15.7%	13.6% (43/317)	9.5%	[7.1%, 12.7%]
Experienced legal discrimination	50.0%	47.5% (150/316)	34.6%	[29.7%, 39.8%]
Been refused police protection	52.3%	49.4% (156/316)	37.1%	[32.0%, 42.4%]
Been blackmailed	36.3%	35.0% (111/317)	29.9%	[25.2%, 34.9%]
Experienced verbal or physical harassment	64.1%	61.5% (195/317)	59.0%	[53.5%, 64.4%]
Been tortured	52.5%	53.9% (171/317)	49.2%	[43.7%, 54.8%]
Been beaten up	39.5%	38.9% (122/314)	32.2%	[27.4%, 37.4%]
Heard healthcare workers gossiping about them	11.3%	11.7% (37/315)	12.3%	[9.0%, 16.5%]

Table 15: Social networks and social cohesion among FSW

	Non-RDS- adjusted proportion of HIV+ participants	Non-RDS- adjusted Proportion (n) agree or strongly agree	RDS- adjusted Proportion	RDS-adjusted 95% Confidence Interval
Social cohesion				
Can borrow money from sex worker colleagues if needed	66.1%	66.9% (210/314)	68.0%	[57.7%, 79.0%]
Can count on sex worker colleagues for accompaniment to the doctor or hospital	71.5%	68.9% (215/312)	65.0%	[55.2%, 75.7%]
Can count on sex worker colleagues for somewhere to stay	72.8%	74.9% (235/314)	70.0%	[59.6%, 81.0%]
Can count on sex worker colleagues for help dealing with violent or difficult clients	83.1%	83.0% (259/312)	82.2%	[71.7%, 93.1%]
Can count on sex worker colleagues to support the use of condoms	80.5%	81.3% (256/315)	73.0%	[72.3%, 94.1%]
Can count on sex worker colleagues if you need to talk about your problems	58.2%	59.7% (187/313)	60.0%	[50.2%, 70.7%]
Can trust the majority of sex worker colleagues	35.3%	36.9% (116/314)	38.0%	[29.9%, 47.6%]