BROS KHMER 2010

Behavioral Risks On-Site Serosurvey among At-Risk Urban Men in Cambodia

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The BROS KHMER: Behavioral Risks On-site Serosurvey among At-risk Urban Men in Cambodia is made possible by the support of American people through the United States Agency for International Development (USAID). UNAIDS also provided additional partial funding. The contents of this report are the sole responsibility of the FHI 360 and do not necessary reflect the views of USAID or the United States Government. This report has been prepared with collaboration with National Center for HIV/AIDS, Dermatology and STDs (NCHADS), Ministry of Health in Cambodia.

This report has been printed with financial support provided by USAID through the PRASIT program.

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ABBREVIATIONS

ACASI	Audio Computer-Assisted Survey Instrument
AIDS	Acquired Immune Deficiency Syndrome
ART	Antiretroviral Therapy
BSS	Behavioral Sentinel Surveillance
CUP	100% Condom Use Program
DBS	Dried Blood Sample
EIA	Enzymeimmunoassay
EW	Entertainment Worker
FSW	Female Sex Worker
GIS	Geographic Information System
GPS	Global Positioning System
HIV	Human Immunodeficiency Virus
HSS	HIV Sentinel Surveillance
IA	Implementing Agency
IDU	Injection Drug User
IEC	Information Education Communication
IRB	Institutional Review Board
MARP	Most at Risk Population
MSM	Men Who Have Sex with Men
MSMO	Men Who Have Sex with Men Only
MSMW	Men Who Have Sex with Men and Women
MSW	Men Who Have Sex with Women
NCHADS	National Center for HIV/AIDS, Dermatology and STDs
NGO	Non-Governmental Organization
NIPH	National Institute of Public Health
NLPH	National Laboratory of Public Health
OHRP	U.S. Office for Human Research Protection
PHSC	Protection of Human Subjects Committee
PIN	Personal Identification Number
PSI	Population Services International
QC	Quality Control
STI	Sexually Transmitted Infection
UNAIDS	Joint United Nations Programme on HIV/AIDS
USAID	US Agency for International Development
VCCT	HIV voluntary counseling and testing
WHO	World Health Organization

EXECUTIVE SUMMARY

The BROS Khmer (Behavioral Risks On-Site Serosurvey of At-Risk Urban Khmer Men) study was designed to collect integrated HIV serostatus and behavioral risk information among Cambodian men frequenting 'hot spots' (i.e., entertainment venues or MSM (Men who have Sex with Men) venues) with a mobile bus.

The behavioral data of 3,007 men (1,026 of which reported having had sex with a man) have showed that not only do differences exist between MSM and MSW (Men who have Sex with Women), but there are also significant differences in HIV-risky activities between MSMW (Men who have Sex with Men and Women) and MSMO (Men who have Sex with Men Only). The mobile bus has proved an extremely popular tool to effectively recruit urban, at-risk males. Men found the novel ACASI (Audio Computer-Assisted Survey Instrument) tool interesting, easy to use and recognized the added anonymity it afforded them, enabling many men to report clandestine activities with more confidence.

Biological data showed that the proportions of men of each group who screened positive for HIV varied considerably by province but all groups had proportions that were higher than that of the general population, supporting the argument that male clients of sex workers should be considered an at-risk population. Overall, HIV positive proportions were 2.2% in MSMW, 2.1% in MSMO and 1.6% in MSW

The MSMW group was the youngest (mean age was 23.9 years) closely followed by the MSMO (mean age 24.3 years, the median for both was 22 years). The MSW group was significantly older with a mean age of 26.8 years. Approximately 10% of the participants had recently migrated to the area and half of these had no cohabiting partner. The differences in migration between groups were statistically significant with MSW reporting the most migration and MSMW, 7.9%, reporting more migration than MSMO, 4.6%. The reported monthly income was similar for MSMW and MSMO but MSMW received significantly more (median $75 compared to median of $60 for MSM). Just over half of men in all groups said that their income did not meet their expenditure.

Statistically more MSMW than MSW or MSMO reported having had a STI symptom in the past year (51.5% compared to 41.8% and 36.6%, $p<0.001$). MSW were least likely to get STI testing and treatment (14.2% for MSW, 10.3% for MSMW, and MSMO was 7.0%, $p<0.001$).

The MSW were the least likely of the groups to have received IEC (Information Education and Communication) relating to HIV/AIDS (59.5% compared to 71.3% MSMW and 72.6% MSMO) and this was reflected in their knowledge of HIV services which might be associated with use of these services. Only 55.1% of MSW had had an HIV test in the previous 12 months compared to 73.9% of MSMW and 76.8% MSMO.

Interestingly, although MSMW had better knowledge of HIV services then MSW, their knowledge of HIV transmission was poorer in some respects highlighting that there might be a gap or weakness in programs targeting knowledge among MSM.

Median age of sexual debut was almost the same for each group, but more MSMO had first sex prior to 15 years old than MSMW and MSW (7.9% vs. 4.2% in MSMW vs. 2.7% in MSW).

Within MSM, more men reported having non-transactional sex than transactional sex. Slightly more MSMW reported having non-transactional partners than MSMO (47.0% compared to 46.1%) but MSMO reported far more partners (median of 5) than MSMW (median of 2) in the last 6 months. More MSM reported selling sex than buying sex (40.6% sold sex while 26.7% bought sex). MSMW reporting more of both selling and buying sex than MSMO (43.8% MSMW sold sex while 29.3% MSMW bought sex, 36.4% MSMO sold sex while 22.6% MSMO bought sex).

More MSW than MSMW reported having both non-transactional partners and transactional partners: 62.8% MSW had non-paid partners and 50.0% had paid partners while 59.0% MSMW had non-paid partners and 42.1% had paid partners.

Consistent condom use with female paid partner at last sex in the last 3 months among MSW was higher than that among MSMW (61.2% vs. 50.8%). In contrast, condom use with female non-paid partner at last sex in the last 3 months among MSW was relatively lower than that among MSMW (51.2% vs. 54.1%).

HIV positive proportion was higher in the older age groups, particular in MSMW (14.3% of 25-44 year olds and 14.3% of over 44 year olds). It was also higher in participants who had spent less time in education (4.0% compared to 1.3% in MSMO).

The mobile model was popular because it allowed men to access HIV testing at their convenience. Men who might not have otherwise been for HIV testing were able to come and were prepared to wait to have access to a free, rapid HIV test. This created a platform for the team to screen men for eligibility, rather than interrupt them during their leisure time, resulting in participants who were more willing to spend time answering personal questions. The anonymous nature of the ACASI allows participants to disclose behaviors fully and the automated nature increases the reliability of results through standardizing interview procedures.

The results demonstrate that MSM targeted programs and policies must be developed that are flexible enough for the needs of both MSMW and MSMO. MSW, as a population, are not receiving enough information and support as they need as a group at elevated risk of HIV. The study team has also proven the effectiveness of the novel ACASI tool and identified several ways it can be improved for future, exciting studies.

BACKGROUND

While Cambodia has made significant improvements in its HIV epidemic, lowering the HIV HIV positive proportions from 3% in 1997 to 0.8% in 2010 [1], it still represents a significant problem for this resource-limited country. The epidemic is predominantly and traditionally driven by the popularity of the sex industry, and so government and NGO intervention efforts have targeted female sex workers with the most notable intervention being the 100% condom use program (CUP) launched in 2000.

In Cambodia, 100% CUP was initially piloted in Sihanoukville in 1998 and then rolled out across the country over the next two years [2]. The program did not legalize the sex industry within Cambodia, but police, government bodies and owners of sex establishments worked together to ensure that 100% of sex workers within an area used condoms for 100% of paid sex acts. Although there are some human rights concerns about the implementation of the 100% CUP, it is believed that much of the decrease in Cambodia's HIV prevalence is attributable to it (21.4% in FSWs in 2003 to 14% in FSW in 2006 according to HSS data [3]).

The closure of brothels as part of the anti-human trafficking laws in 2008, has also led to a significant shift in Cambodia's sex industry. Direct sex workers can still be found at illegal brothels or are street-based, but many have moved into the entertainment sector as either karaoke girls, beer promoters or beer garden workers. While not direct sex workers, many girls and women in these entertainment worker (EW) roles will offer sex in exchange for money or goods. Therefore sex is still available for purchase but it is now from a variety of entertainment venues and the government and NGOs must work hard to reach to all sex workers, direct and indirect.

While there have been many efforts to reduce the availability of commercial sex, little has been done in Cambodia to curb the demand for it. Studies have repeatedly shown that it is normal and acceptable (and even expected) for groups of men to purchase sex at the end of an evening of socializing as a group [4]. These clients of sex workers represent a bridging population to the general population via their wives or long term partners particularly as rates of consistent condom use are known to be lower after drinking alcohol. They are therefore very important in the effort to successfully control HIV epidemics. Even more so because.

Male client relationships with EWs can be purely transactional, but often they drift into a 'sweetheart' relationship where money is not always given and there is an emotional or 'love' attachment. With this extra emotional bond, consistent condom use decreases significantly, despite the client or EW having other sexual partners. These other partners are now put at greater risk of HIV infection often without knowing.

Studies have looked at the behavior patterns of these clients of sex workers, but it is not known what type of association between these behaviors and HIV infection exists [5,6]. Social marketing of condoms and some interventions aim to normalize condom use within client and Sex Worker (SW) / Entertainment Worker (EW) relationships and PSI's TRaC study reported factors affecting condom use. However, this study population is not representative of Cambodia as interviews were conducted with clients of entertainment workers while they were drinking or socializing in entertainment venues. This resulted in a limited male client population at selected venues and subsequent results.

While HIV prevalence in sex workers are decreasing [3] despite the complexities of sweetheart and EW relationships, certain behaviors within men who have sex with men (MSM) are another driving force of the epidemic in Cambodia. With increasing globalization, men all over South East Asia are becoming more sexually liberated [7]. Globally, MSM are disproportionally affected by HIV: A study in Thailand showed that HIV prevalence was 4.5 times higher among MSM than heterosexuals [8]. Without more targeted interventions, the risk behaviors among this 'at risk' population could initiate in a new wave of the HIV epidemic [9]. Research is needed to determine the association between risk behaviors and HIV serostatus among MSM in Cambodia. Although it is becoming more acceptable in the cities for men to be open about their sexuality, many men still hide their sexuality and often marry. Many others, whether open about their sexuality or not, engage in sex with both men and women. These men who have sex with men and women (MSMW) represent an important "bridging population" from male sexual partners to female sexual partners or vice versa.

NCHADS conducts routine BSS and HSS which provide good behavioral and prevalence data respectively, but these are not integrated behavioral and biological data. There is also no category 'male clients' but moto-dop and taxi drivers (in 2007 and 2010) and military personnel (before 2007) who are used as a proxy. The present study offers an opportunity to gather large scale, integrated data on behavioral risk and HIV serostatus among Cambodian 'at risk' men by using mobile HIV testing and computerized survey.

Mobile HIV testing has been used in many countries and groups have documented positive experiences [10, 11]. They tend to attract more men than women so it is an ideal method for the study population [10]. Studies have been done comparing HIV status and CD4 counts of groups testing at stationary and mobile clinics, but to our knowledge, mobile HIV rapid testing has not been utilized for study and screening purposes for most-at-risk populations (MARPs) in Cambodia.

In Cambodia, if popular, a mobile HIV testing unit parked near entertainment establishments could offer at-risk men an opportunity to be tested for HIV and also take part in behavioral research via interviews at their discretion. This non-invasive recruitment method could yield much lower refusal rates than approaching men whilst they are socializing with their peers and the results would be less biased. A free, rapid HIV test also represents a significant incentive for participation for many of the men.

The BROS Khmer (Behavioral Risks On-Site Serosurvey of At-Risk Urban Khmer Men) study was designed to collect integrated HIV serostatus and behavioral risk information among Cambodian men frequenting 'hot spots' (i.e., entertainment venues or MSM venues) with a mobile bus. Interviewing men on their HIV-risk related behavior, as well as knowledge and understanding of HIV transmission and available treatment can allow gaps in prevention programming to be seen and then activities designed to target these.

STUDY OBJECTIVES

The objectives of this study are as follows:

1. To determine the current HIV status and HIV testing histories in a sample of urban men who have attended targeted venues in the past 6 months.
2. To examine the range of sexual risk behaviors in a sample of urban men who have attended targeted venues in the past 6 months.
3. To collect additional HIV prevalence data of MSM samples for the HSS 2010 in Cambodia.

METHODOLOGY

1. Overview

From March through October 2010, a bus that had been converted into a mobile testing center was parked near 'hot spots' at selected times. In this bus, HIV counseling and testing was carried out and the participants completed a self-administered interview using ACASI (audio-computer assisted survey instrument) on a laptop. When the interview was completed, the participants received their HIV test results and further counseling. Men were either recruited by staff from local implementing agencies or 'self-referred' after seeing the bus and approaching the study team directly or it was recommended to them by friends.

2. Eligibility and Sample Size

Men were screened and had to fulfill the following criteria to be enrolled onto the study.

1. Biological male
2. Khmer speaking
3. Age 18-49 years at time of screening
4. Able and willing to provide oral informed consent
5. Have attended any of the targeted entertainment venues at least once in the last six months
6. **For men with a spouse or a main partner/sweetheart**: Have had sex with at least one male or female partner, other than his spouse or main partner, in the past six months.

OR

For men without a spouse or main partner/sweetheart: Have had sex with at least one male or female partner in the last s ix months

OR

For MSM: Have had sex with at least one male partner in the past 12 months

Because of the exploratory nature of this study, budgetary and logistical constraints were taken into account when deciding on a sample size. It was proposed that 2,000 'at-risk' men be sampled from eight cities in Cambodia.

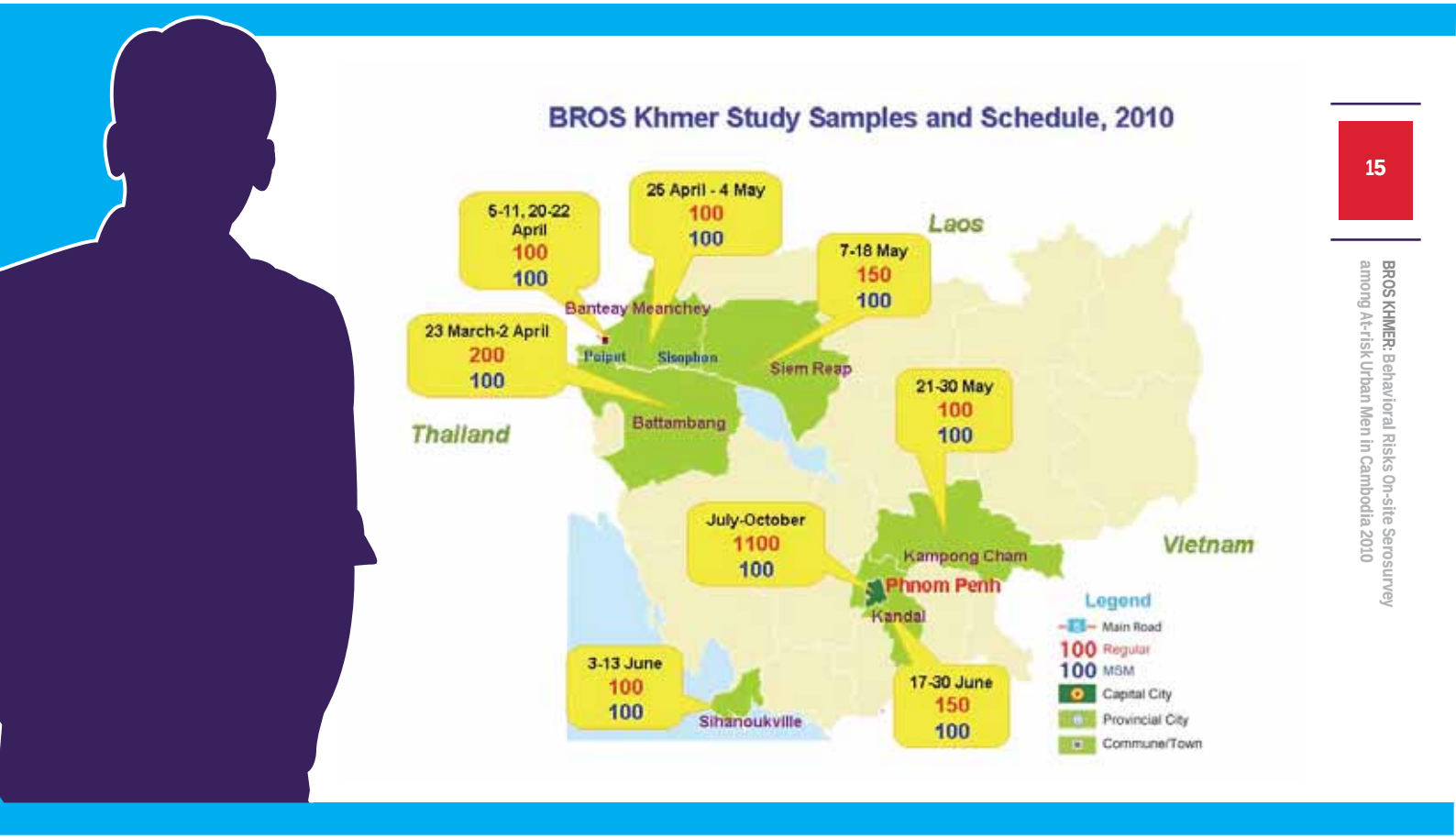
Based on the size of the urban male population from Cambodian Census data [12], and selecting the largest city or cities within each of the seven high-ranked

provinces, eight cities were selected. The targeted sample size for each city was proportional to the urban male population in each city. The cities selected and the targeted sample sizes are shown in Figure 1: 1,100 in Phnom Penh; 200 in Banteay Meanchey (i.e., 100 in Sisophon & 100 in Poipet) and 200 in Battambang; 150 each in Kandal and Siem Reap; and 100 each in Kampong Cham and Sihanoukville.

The second part of this study looked at an MSM sample in more detail, so an additional sample of 1,000 MSM were be recruited from the same cities. The sample sizes were be 300 in Phnom Penh, 100 each in Sisophon, Poipet, Battambang, Siem Reap, Kampong Cham, Kandal, and Sihanoukville (also shown in Figure 1). The HIV prevalence data of MSM samples and selected behavioral data were incorporated into HSS 2010 by the NCHADS Surveillance Unit.

Without knowing the acceptability of this study within the target population, these sizes were provisional but it was hoped that they would be sufficient to develop recommendations for targeted interventions for urban, Cambodian men most at risk of HIV acquisition and transmission (that is, MSM and clients of EW). It was also expected that the data would support development of HIV testing recruitment strategies for male clients of EWs.

Figure 1. BROS Khmer Study planned sample size by city, 2010



3. Selection of 'Hot Spots'

To reach both populations of at-risk men (male clients of sex workers and MSM), two distinct types of 'hot spots' were targeted.

(1) **Entertainment venues:** restaurants, bars, beer gardens, massage parlors, karaoke bars, and suspected (underground) brothels.

(2) **MSM gathering points:** cafes, bars, dancing clubs, saunas, parks, riverside, sports facilities (including snooker parlors), temples, and school compounds.

Lists of 'hotspots' in the eight selected cities were supplied by IA's and prevention program staff and these were then mapped using GPS/GIS to produce geographic distribution maps of 'hotspots' by two distinct types in each city. The study team used this information to select the optimum location and time to park the bus. It could not be directly in front of any one entertainment venue, but should be close to many. Several spots were selected in each city to allow broader exposures of BROS Khmer bus to targeted at-risk men for the study.

4. Measurement Instruments

The questionnaire included questions pertaining to demographics, attendance at entertainment venues, sexual history, sexual behavior with different partners, drinking and drug-using behaviors, STI symptoms, self-reported HIV status, HIV testing experiences, and experiences with HIV prevention services. The interview was expected to take approximately 20 minutes to complete.

The questionnaire was programmed into ACASI, a computer interface with an optional audio recording of all questions and possible answers. Trained interviewers were present to explain the process, help if participants had problems or even do a face to face interview if the participant preferred this. It was hoped that the ACASI would allow greater sense of privacy and anonymity for participants so they feel more at ease and therefore answer the questions more truthfully than they would do if another person was asking them.

Any 'positive' answers to questions involving risks (e.g., drug using, STI symptom without treatment, sex after drinking) were flagged at the end of ACASI to let the interviewer know whether or not a referral was needed for the participant.

5. Study Procedures

The mobile van team included one field supervisor, three interviewers, one lab technician, one testing counselor from the Provincial AIDS Offices, and one driver. The field supervisor and one interviewer helped to recruit and screen participants. Two interviewers always remained in the van to conduct informed consent as well as monitor and assist participants with the ACASI process.

5.1. Screening

Screening was the first step during data collection in the field. It ensured only eligible men were recruited. The participants must be men and meet the eligible criteria previously described.

These criteria were used to design a short questionnaire which was put onto an iPod Touch device. This was then used by the screener to interview the people who wanted to take part in the study. The iPod Touch device recorded the reasons for not participating in the study. After asking the questions from the iPod Touch, the device automatically showed whether or not the participant passed or failed in the eligibility criteria at the bottom of iPod Touch screen. For men who passed, they were asked again if they wanted to participate in the study. If they agreed, they would go to the next steps described in the following section.

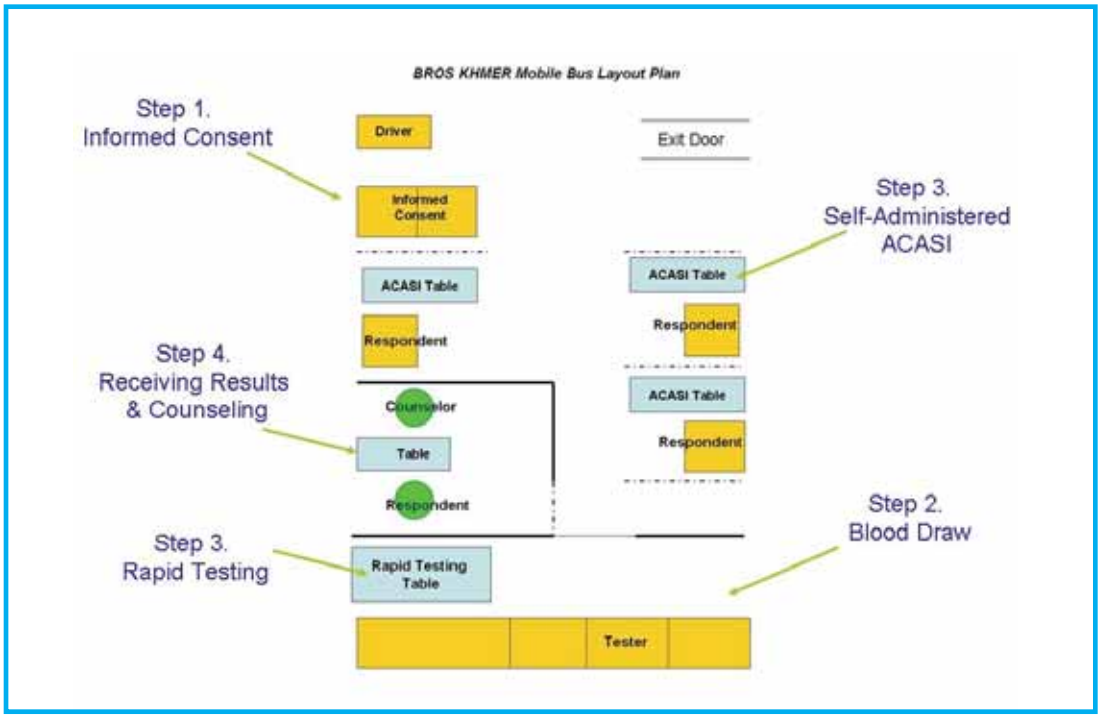
To screen effectively, the screener was required to ask open-ended questions to make sure participants understood the questions clearly, rather than asking leading questions and the participants only answer "yes" or "no". The screener had to be careful to keep screening procedures consistent.

5.2. Study Steps

When eligible men had been successfully recruited they underwent the following activities inside the BROS Khmer bus (Figure 2).

1. **Personal identification number (PIN):** Participants were assigned a PIN that had no identifying information at all. It was just to be used to link the HIV test to the interview data and to allow the HIV result to be given to the correct participant.
2. **Oral informed consent:** A trained interviewer explained the study in detail, including potential risks and benefits of participation, and obtained oral informed consent from the participants before any study procedures were performed. A witness from our field team signed to acknowledge their consent.
3. **HIV rapid test:** A blood sample by finger-prick or venipuncture methods was obtained. Veinupuncture is more usual in Cambodia, but it was agreed that finger prick methods should be trialed. The techniques to be used for obtaining blood and conducting the rapid HIV tests are described in next section.
4. **ACASI:** A trained interviewer explained to the respondent how to use ACASI and the number pad to enter answers. If participants preferred to have a face-to-face interview, they were given this option.
5. **Possible referrals:** Any 'positive' answers to questions involving risks (e.g., drug using, STI symptom without treatment, sex after drinking) were flagged at the end of ACASI. The participants could choose to discuss these risks with the counselor for any referrals to appropriate services.
6. **HIV test results and post-test counseling:** Participants were given an option to receive their results after the interview. Post-test counseling was provided to every respondent with the results by the counselor inside a private cubicle.
7. **Incentive:** After the survey and the HIV test have been completed, each respondent was given a pack with a $2 mobile phone refill card, condoms and lubricant and a BROS Khmer T shirt as a token of appreciation and to reimburse him for the time in the study.

Figure 2. Study procedures on BROS Khmer mobile bus



6. Laboratory Procedures

6.1. Blood Draw Methods

Blood was drawn by finger prick (with an automatic lancet) whenever possible. When the participant objected to this method, blood was drawn by veinupuncture. Five drops were needed for a dry blood sample card (DBS) that would be used for quality control and two drops were needed for the HIV test (one in Stat-pak and one in Determine).

A total of 2,226 (74.0%) participants had blood drawn by finger prick and 781 (26.0%) by venipuncture (Table1). The proportion of finger prick method has been increasing from 10.6% in Battambang to 92.2% in Phnom Penh over the study period. The reasons for not using finger prick among 781 participants who used venipuncture were; unable to draw blood (42.1%), too painful (39.8%), scared of lancet (8.8%), personal health condition (1.7%) and other reasons (7.6%).

Table1: Percentage of participants by finger prick method

Indicator	Percentage
Drawn blood by using finger prick	74.0 (n=3007)
Drawn blood by using finger prick by province	
Battambang (n=301)	10.6
Paoy Paet (n=204)	29.4
Serei Saophoan (n=202)	50.0
Siem Reap (n=249)	70.7
Kampong Cham (n=200)	82.0
Preah Sihanouk (n=199)	86.9
Kandal (n=251)	90.8
Phnom Penh (n=1401)	92.2
Reason for not using finger prick method	n=781
Cannot get blood by fingure prick	42.1
Too painful	39.8
Scary stick	8.8
Personal health condition	1.7
Other reasons	7.6

6.2. HIV Rapid Testing

The HIV rapid test algorithm used was based on WHO and UNAIDS recommendations for surveillance purposes. From the past NCHADS surveillance activities in Cambodia, Determine™ has been shown to be highly sensitive (100%) but slightly less specific (99.5%) and should be followed up with Stat-Pak™ which is less sensitive (99.5%) but more specific (100%) so could rule out any false positive results from the Determine™ tests.

The results for specimens reactive by Determine™ and non-reactive by Stat-Pak™ were considered HIV negative. If non-reactive by Determine™ and reactive by Stat-Pak™, both tests were repeated. Only if two or more results were reactive, were the results considered positive. Because the HIV testing was only being conducted for surveillance purposes, not diagnosis, a third, tie-breaker test was not used. The testing algorithm and the interpretation of results are shown in Table 2.

Table 2. HIV testing algorithm and interpretation of results.

Specimens that are:			
Determine™	Stat-Pak™		
Nonreactive	Nonreactive	→	Negative
Nonreactive	Reactive	→	Repeat both assays*
Reactive	Nonreactive	→	Negative
Reactive	Reactive	→	Positive

** If the same result is obtained on repeat testing, interpret the result as HIV positive.*

6.3. Quality Control

The DBS cards were given time to dry and were then stored with a desiccant and humidity monitoring cards in a refrigerator. They were then taken to NIPH for quality control testing at the end of field data collection. All samples from participants that tested positive according to our algorithm and 10% of those that tested negative were tested using an enzymeimmunoassay (EIA). If they tested positive with this, they were re-tested with Murex HIV-1.2.O EIA.

6.4. Details of Assays

The details of the testing kits are shown below.

Simple rapid assays for HSS testing:

Determine™ HIV-1/HIV-2 Assay (Abbott Diagnostics)
HIV 1/2 STAT-PAK™ (Chembio Diagnostics, Inc.)

EIA for DBS Quality Control Testing:

Vironostika™ HIV Uni-Form II Plus O® (Organon Teknika)
Murex™ HIV-1.2.O EIA (Abbott Diagnostics)

The quality control testing at NIPH verified all positive and 10% negative DBS, except one questionable sample to be confirmed as positive in confirmatory test. That questionable sample came from a participant who indicated that he was on antiretroviral therapy, but our rapid testing at site showed that reactive with Determine™ and nonreactive with Stat-Pak™ after two parallel tests. The HIV rapid testing at BROS Khmer bus has been proved accurate after quality control testing.

7. Data Analysis

All descriptive analysis was conducted on data from all participating urban men in summarizing age, marital status, residency, HIV testing history, consistent condom uses, and sex with a man. The statistical methods included t- test and ANOVA for testing mean and media for continuous variables, and chi-square for testing differences in categorical variables. Data analysis was performed without weighting by using STATA 11.0.

RESULTS

Based on their sexual behaviors, the study participants have been classified into the following groups throughout our analysis:

MSW: Men who have sex with women only (n=1,981)
MSM: Men who have sex with men, including:
MSMO – Men who have sex with men only (n=434)
MSMW – Men who have sex with men and women (n=592)
OR
Long-hair MSM (n=379)
Short-hair MSM (n=314)

Long-hair and short-hair MSM were categorized based on a question "Do you perceive yourself as being a long-hair MSM?" Any MSM who reported "No, I am not long-hair MSM" was considered as short-hair MSM and others were considered as long-hair MSM. This classification of long-hair and short-hair MSM was only available in 4 provinces: Kandal, Kampong Cham, Phnom Penh, and Sihanoukville.

1. Screening

A total of 3,863 people were screened across eight cities and capital in Cambodia (seen in Table 3). Among them, 3,175 people received "Pass" while 688 received "Fail".

Table 3: Screening result

		Approached participants	
Screening result		**n**	**%**
	Fail	688	17.8
	Pass	3175	82.2
Total		**3863**	**100**

There were 23 people who said that they did not want to participate (shown in Table 4). They suggested several reasons such as: They were busy, frightened of medical facilities, frightened of the result, do not want to be seen, or that they were not at risk. Many of the people that passed screening left before taking part because they had to wait a long time.

Table 4: Reason for not participating

Reason for not participanting	n	%
Busy	3	13.0
Frightended of medical facilities	3	13.0
Frightended of result	6	26.1
Do not want to be seen	4	17.4
Not at risk	7	30.4
Total	**23**	**100.0**

Among the people screened, there were 1,168 people who reported that they had had sex with at least one man or transgender in the past 12 month (shown in Table 5).

Table 5: Percentage of men who had had sex with a man in the last 12 months (for screening purposes)

Have you ever had sex with any MSM in the past 12 months?	n	%
No	2695	69.8
Yes	1168	30.2
Total	**3863**	**100**

A total of 3,007 urban men were recruited into this study. Approximately 43.3% of participants walked-in by themselves (21.5%) or were referred by friends (21.8%). The rest of participants were referred by IA outreach workers (24.1%), by BROS Khmer team members (16.6%), and by MSM outreach workers (15.9%).

The field notes, Appendix 1, give a breakdown of the number of people recruited in each province in prose as well as key experiences during data collection.

2. Sociodemographic Factor

2.1 Demographic Characteristics

2.1.1 Age

The mean age was 26.8 years for MSW, 23.9 years for MSMW and 24.3 years for MSMO (Table 6). For all groups, the most common age range was 20-24 years (36.9% of MSW, 47.5% of MSMW and 41.9% of MSMO). The MSW had a slightly older age distribution with 13.1% being over 35 years compared to 4.7% of MSMW and 7.8% of MSMO.

Table 6: Distribution of age and marital status by MSW, MSMW, and MSMO

Indicators	MSW	MSMW	MSMO	Overall
	%	%	%	%
Current age*	**n=1981**	**n=592**	**n=434**	**n=3007**
Less than 20	8.3	18.1	19.8	11.9
20-24	36.9	47.5	41.9	39.7
25-29	26.2	19.9	21.7	24.3
30-34	14.2	9.1	7.6	12.2
35-39	6.3	2.7	4.6	5.3
40-44	3.6	0.8	1.4	2.8
45 and over	3.2	1.2	1.8	2.6
Don't know	1.3	0.7	1.2	1.2
Mean (median) age	26.8 (25)	23.9 (22)	24.3 (22)	25.8 (24)
Marital status				
Married	33.9	18.8	8.5	27.3
Not married but living together	26.6	34.6	43.1	30.6
Single	29.8	35.1	41.7	32.6
Divorced or widowers or maried but not living together	9.6	11.5	6.7	9.6

** Statistically significant with p<0.001*

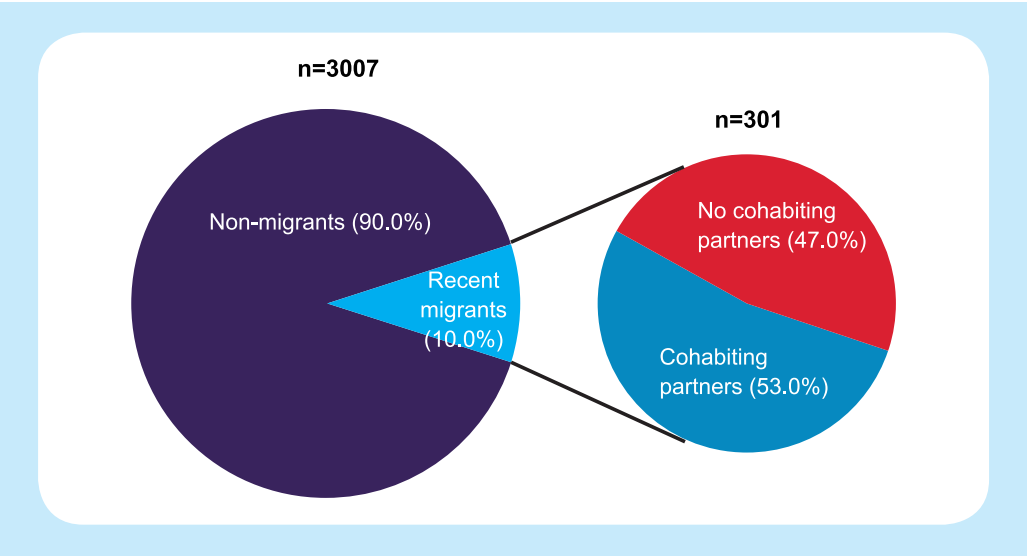
2.1.2 Marital Status

Three-fifths of MSW reported cohabiting with a sexual partner (being 'married' or 'living with a partner') compared to 53.4% of MSMW (18.8% MSMW reported being married) and 51.6% MSMO (8.5% MSMO reported being married). The most likely to report being 'single' or 'divorced or married but not living with a partner' were MSMO (see Table 6).

2.1.3 Recent Migrants

Approximately 10% of the men interviewed were 'recent migrants', defined as (1) being interviewed in a province that was different to the one they born in, and (2) that they had lived there for less than two years. Approximately 47% of these men had no cohabiting partner (shown in Figure 3).

Figure 3: Percentage of recent migrants and if they have a cohabiting partner



It can be seen in Table 7 that among study provinces, Phnom Penh had largest population of recent migrants (52.5%) followed by Siem Reap (12.0%). Significantly more MSW than MSM reported being a recent migrant (11.8% vs. 7.9% MSMW and 4.6% MSMO, p<0.001).

Table 7: Percentage of each group who were recent migrants

Indicators	MSW	MSMW	MSMO	Overall
	%	%	%	%
	n= 1981	n=592	n=434	n=3007
Recent migrants*	11.8	7.9	4.6	10.0
Mobility rate by province	n= 234	n=47	n=20	n=301
Phnom Penh	53.9	48.9	45.0	52.5
Serei Saophoan	3.4	4.3	5.0	3.7
Paoy Paet	6.4	10.6	25.0	8.3
Battambang	8.1	8.5	0.0	7.6
Kampong Cham	4.3	6.4	5.0	4.7
Kandal	3.9	0.0	0.0	3.0
Siem Reap	12.4	8.5	15.0	12.0
Preah Sihanouk	7.7	12.8	5.0	8.3

** Statistical Significant with p<0.001*

2.2 Socioeconomic Characteristics

2.2.1 Education

The average number of years spent in education of all participants was 7.5 years. There was no statistical difference in this time among the three groups. There was also no statistical difference in level of education attained by each group. MSMO were slightly more likely to reach lower secondary or secondary level education than MSW or MSMW (53.0% compared to 46.4% and 44.4%). The group with the most reported university or higher education was MSMW (20.1% compared to 18.7% in MSW and 18.0% in MSMO seen in Table 8).

Table 8: Percentage of MSW, MSMW, and MSMO by level of education

Indicators	MSW	MSMW	MSMO	Overall
	%	%	%	%
Level of education	n=1981	n=592	n=434	n=3007
Never attending school	12.8	13.5	12.2	12.9
Primary school	22.1	22.0	16.8	21.3
Lower secondary school	23.7	19.9	24.7	23
Secondary school	22.7	24.5	28.3	23.9
University and higher education	18.7	20.1	18.0	18.9
Mean (median) of years of study	7.5 (8)	7.4(8)	7.8(9)	7.5 (8)

2.2.2 Employment Status

It can be seen in Table 9, that 85.8% of the men interviewed reported being employed. When broken down into groups, MSW had the highest reported proportion of employment (88.7% compared to 83.1% MSMO and 77.9% MSMW, p<0.001). Overall, about 46% of men reported working in the private sector and 27% reported working in the transportation sector, including moto-dop and tuk-tuk drivers. The most common sectors of employment were private (44.3%) and transportation (32.8%) for MSW; private (52.9%) for MSMW and private (44.3%) and commercial (25.2%) for MSMO.

Table 9: Employment status and main occupations of each group

Indicators	MSW	MSMW	MSMO	Overall
	%	%	%	%
Employment status*	n=1981	n=592	n=434	n=3007
Employed	88.7	77.9	83.1	85.8
Type of main occupation*	n=1757	n=461	n=361	n=2579
Transportation sector	32.8	19.5	10.0	27.2
Private sector	44.3	52.9	44.3	45.9
Commercial sector	9.5	12.8	25.2	12.3
Public or NGO sector	9.1	7.2	8.6	8.6
Other sectors	4.3	7.6	11.9	6

** Statistically Significant with p<0.001*

2.2.3 Standard of Living

Only 80% participants (88.7% MSW, 77.9% MSMW and 83.2% MSMO) answered the question "How much money do you make every month?". The monthly income ranged from approximately $0.25-250 and the mean income for MSW was significantly higher than the mean incomes for MSMW or MSMO ($75.6 compared to $67.8 and $65.4, Table 10). Approximately 18% of participants received a monthly income of less than $40 (20.2% and 21.5% of MSMO and MSMW compared to 16.9% MSW) and only 3% received income more than $160 per month (1.7% MSMO compared to 3.5% MSMW and 3.2% MSW).

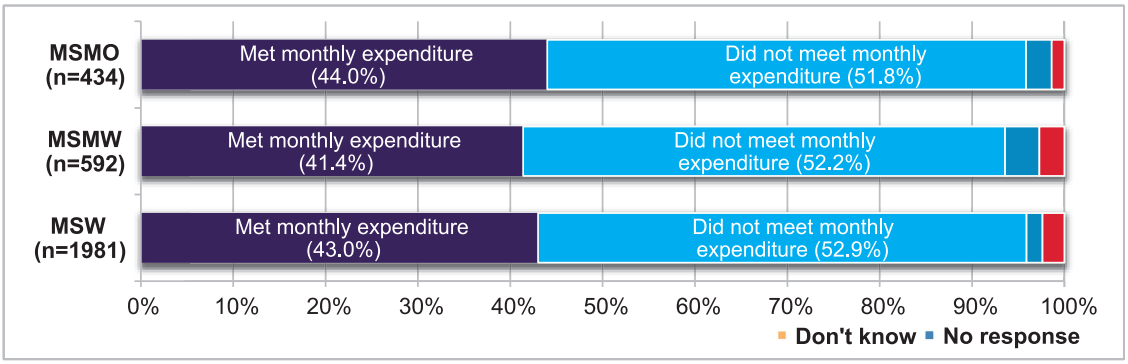
Table 10: Proportions of MSW, MSMW, and MSMO by monthly income

Indicators	MSW	MSMW	MSMO	Overall
	%	%	%	%
Categories of Monthly income	n=1757	n=461	n=361	n=2579
<40$	16.9	21.5	20.2	18.2
40-99	38.7	36.2	31.9	37.3
100-159	26.0	19.5	20.2	24.0
160-229	3.1	3.3	1.7	2.9
>229$	0.1	0.2	0.0	0.1
Missing	15.3	19.3	26.0	17.5
Mean (median) of monthly*	75.6 (75)	67.8 (60)	65.4 (60)	72.8 (72.5)

** Statistically Significant with p<0.001* *1$ = 4000 Riels*

To evaluate participants' living standards the question "Does the income meet with your expenditure?" was used. In all groups, just over 50% of participants did not meet their monthly expenditure (see Figure 4).

Figure 4 Monthly income and expenditure of MSMO, MSMW and MSW



3. Sexual Health Services Knowledge and Uptake

3.1 STI History and Treatment Seeking Behaviors

Just over half of the MSMW interviewed (51.5%) reported having experienced a sexually transmitted infection (STI) symptom in the last 12 months compared to 41.8% of MSW and 36.6% of MSMO. This was significantly significant with p<0.001 (shown in Table 11).

Table 11: Reported STI symptoms of MSW, MSMW and MSMO

Indicators	MSW	MSMW	MSMO	Overall
	%	%	%	%
	n=1981	n=592	n=434	n=3007
STI symptom experience in the 12 months*	41.8	51.5	36.6	42.9
STI symptoms**	n=720	n=263	n=141	n=1124
Only Cut and Sore	44.2	33.1	50.4	42.3
Only Swelling	8.2	8.0	6.4	7.9
Only Urethral dicharge	5.1	4.6	3.5	4.8
Cut or sore and swelling	21.1	21.7	18.4	20.9
Cut or sore and urethral discharge	4.0	3.8	3.5	3.9
Swelling and urethal discharge	2.9	1.9	2.1	2.6
All types of STI symptoms	14.4	27.0	15.6	17.5
First place visited for treatment of last STI symptom in the last 12 months*	n=1076	n=368	n=243	n=1687
Pharmacy	17.6	13.9	9.1	15.5
Private clinic	16.7	17.4	11.1	16.1
Public hospital or STI clinics	37.4	35.1	53.1	39.1
NGO clinic	11.1	17.9	18.1	13.6
Traditional doctor	2.3	3.0	0.4	2.2
Did not get care	14.2	10.3	7.0	12.3
Do not know	0.7	2.5	1.2	1.2

** Statistically significant with p<0.001* *** Statistically significant with p<0.05*

The most commonly reported symptom was 'cut or sore' (42.3% all participants, shown in Table 11) followed by 'cut or sore and swelling' (20.9%). Although MSMW were less likely than the other groups to report getting only cuts or sores (33.1% compared to 44.2% MSW and 50.4% MSMO) they were more likely to report getting all three symptoms (27.0% compared to 14.4% MSW and 15.6% MSMO).

The most popular place for their 'last STI treatment' was public hospital/STI clinic (39.1%) followed by private clinic (16.1%). If comparing among groups, MSMO were more likely first to go to public hospital/STI clinic and NGO clinics for treatment, while MSMW were more likely to go to private clinics and MSW were more likely to go to the pharmacy. Approximately 12% of all participants reported that they did not get any care for their last STI symptom (14.2% MSW compared to 7.0% MSMO).

3.2 Source of HIV Information

When discussing sources of HIV information, i.e., information, education and communication (IEC), MSM were far more likely to have received IEC than MSW (72.6% MSMO and 71.3% MSMW compared to 59.5%, p<0.001, shown in Table 12). The main source of IEC for all groups was mass media, including television and radio. Outreach workers and activities were reported as an IEC sources by more MSM than MSW (33.0% MSMO, 20.1% MSMW and 18.5% MSW, p<0.001).

Table 12: Sources of information about HIV received by MSW, MSMW and MSMO

Indicators	MSW	MSMW	MSMO	Overall
	%	%	%	%
Received any education and/or information which related to HIV/AIDS In the past 3 months*.	n=1981 59.5	n=592 71.3	n=434 72.6	n=3007 63.7
Source of HIV information	n=1178	n=422	n=315	n=1915
Television	43.7	41.9	36.5	42.1
Radio	27.7	23.9	26.0	26.6
*Outreach workers**	18.9	20.1	33.0	21.5
Booklet	18.5	20.4	20.6	19.3
Newspaper	11.4	10.2	11.4	11.1
Training/Lecture	11.2	10.7	14.3	11.6
Poster	8.4	10.7	10.5	9.2
Billboad	8.2	5.7	7.3	7.5
*FGD***	6.6	7.8	12.7	7.9
Number of sources of HIV informaton				
1 source	75.5	78.0	69.2	75.0
2-4 sources	17.1	14.9	21.9	17.4
More then 4 sources	7.4	7.1	8.9	7.6

** Statistically significant with p<0.001* *** Statistically significant with p<0.05*

3.3 Knowledge of HIV/AIDS

Questions to assess knowledge of HIV transmission were used in five of the seven provinces (Siem Reap, Kampong Cham, Sihanoukville, Kandal, Phnom Penh) with a total sample size of 2,301 men including 455 MSMW, 319 MSMO and 1,527 MSW.

Knowledge of HIV prevention among the men recruited was relatively low. It can be seen in Table 13 that only 53.7% of the men reported that “a person can avoid HIV/AIDS infection by only having sex with one faithful and uninfected partner” and 74.7% reported “using condoms can reduce the risk of HIV infection”. Only 74.9% participants believed that a healthy-looking person could have HIV and 18.3% believed a person could get HIV from a mosquito bite. Overall, 7.6% men thought you could get HIV by sharing a meal, but this differed significantly by group (12.1% MSMW compared to 8.2% MSMO and 6.1% MSW). In regards to knowing where to obtain an HIV test, 75% of participants said that they knew where they could go with MSMO having a higher level knowledge (84.0% compared to 76.9% for MSMW and 72.4% for MSW, p<0.001). More MSMO than MSMW and MSW reported having been given condoms in past 12 months (87.2% vs. 77.4% vs. 62.9%, p<0.001).

Among each group, 17.6% of MSW, 12.6% of MSMW, and 15.4% of MSMO had right answers for all five questions of HIV transmission. Among MSM, 14.4% of long-hair MSM and 12.2% of short-hair MSM had right answer for all five questions of HIV transmission.

Table 13: Knowledge of HIV/AIDS among MSW, MSMW and MSMO

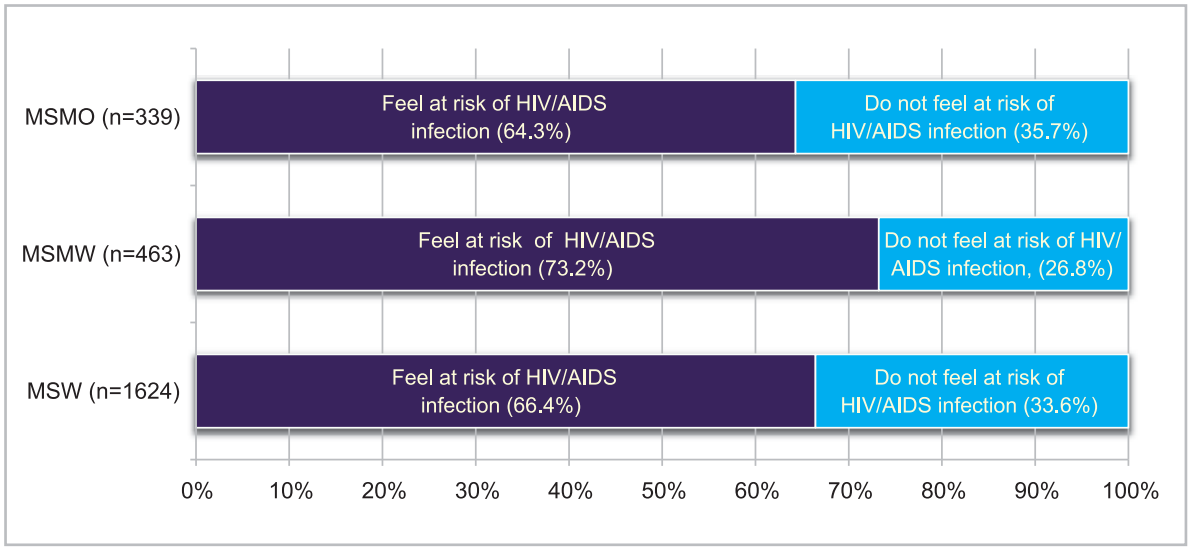
Indicators	MSW	MSMW	MSMO	Overall
	%	%	%	%
	n=1527	n=455	n=319	n=2301
Having sex with only one faithful, uninfected partner reduce the risk of HIV transmission	52.0	57.8	55.8	53.7
Using condoms reduces the risk of HIV transmission	73.5	75.8	78.7	74.7
Healthy-looking people can have HIV	75.3	73.6	75.2	74.9
A person can get HIV from mosquito bites	17.2	22.2	17.9	18.3
A person can get HIV by sharing a meal with someone who is infected**	6.1	12.1	8.2	7.6
Knows where to go for HIV test if they want*	72.4	76.9	84.0	74.9
Had been given condom in the last 12 months*	62.9	77.4	87.2	69.1

** Statistically significant with p<0.001* *** Statistically significant with p<0.05*

3.4 Self-Perceived Risk

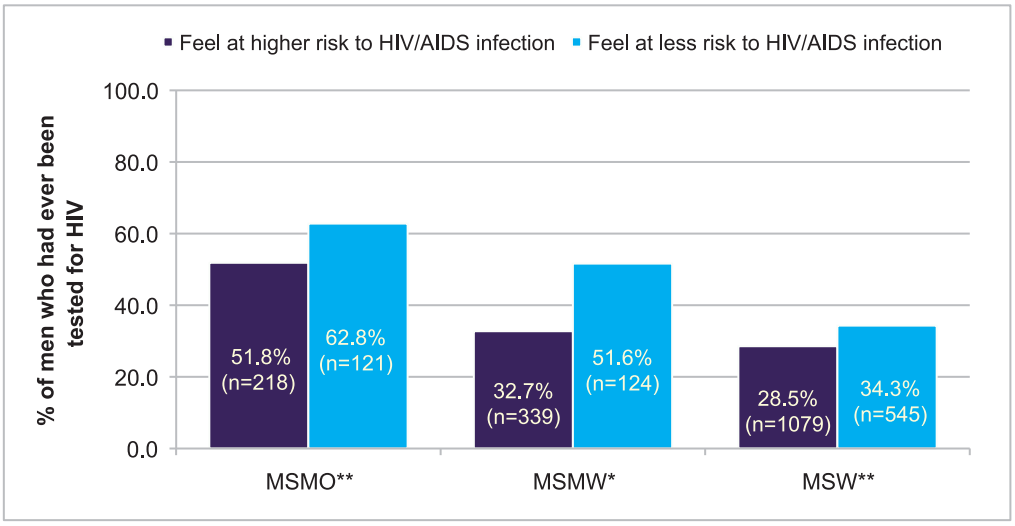
Overall, about two thirds of the men interviewed felt themselves to be at risk of HIV infection. The group that most commonly reported self-perceived risk was MSMW (73.2%) with MSW as the least likely to report feeling at risk (66.4% shown in Figure 5). The difference in self-perceived risk among groups was statistically significant (p<0.05).

Figure 5. Self-perceived risk among MSMO, MSMW and MSW



It can be seen from Figure 6, that self-perceived risk was inversely associated with HIV testing. Men who perceived themselves to be at less risk of HIV were more likely to report that they had had an HIV test in the past. Men who perceived themselves to be at higher risk of HIV reported lower rates of having ever tested for HIV: 51.8% for MSMO, 32.7% for MSMW, and 28.5% for MSW.

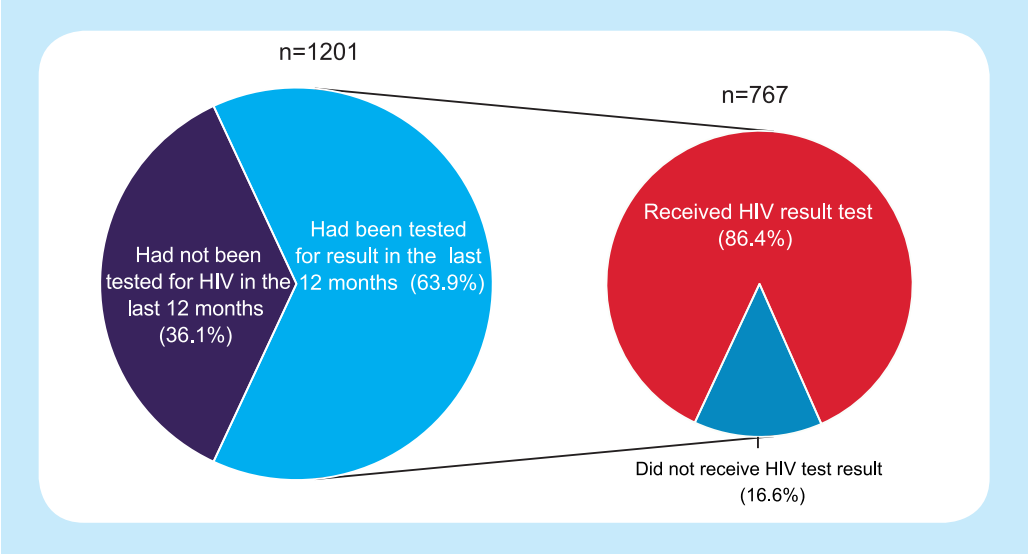
Figure 6: Percentage of being ever tested for HIV by self-perceived risk within each group



3.5 VCCT Service Uptake

Sixty percent of participants reported that they had been tested for HIV before and among these men, 63.9% reported having had an HIV test in the previous 12 months. Over four-fifths of the men that had had an HIV test in the previous 12 months received their test result (shown in Figure 7).

Figure 7: Proportion of men who had been tested and received HIV result.



Over two-thirds of the men (68.4%) who had been tested in the previous 12 months reported using services at public hospitals or VCCT sites. The group that reported ever having used government VCCT sites most were MSMO (69.5% vs. 63.3% for MSW and 60.4% for MSMW). Satisfaction with these government VCCT services was high at approximately 95% in all groups (see Table 14).

Table 14: HIV testing history and details among MSW, MSMW, and MSMO

Indicators	MSW	MSMW	MSMO	Overall
	%	%	%	%
	n=682	n=260	n=259	n=1201
Ever been tested for HIV in the last 12 months*	55.1	73.9	76.8	63.9
Site of last HIV test in the past 12 months**	n=376	n=192	n=199	n=767
Private lab or clinic	23.1	22.4	13.6	20.5
Public hospital	31.7	20.8	31.7	28.9
VCCT	32.7	45.8	46.2	39.5
HIV sentinel surveillance or other studies	10.6	8.9	7.0	9.3
Other	1.9	2.1	1.5	1.8
Overall	100	100	100	100
Had ever been to any government VCCT site for HIV testing	n=682	n=260	n=259	n=1201
	63.3	60.4	69.5	64.0
Satisfaction of HIV testing service at government VCCT site	n=432	n=157	n=180	n=769
Very satisfied	70.4	74.5	67.8	70.6
Somewhat satisfied	25.2	21.0	26.7	24.7
Somewhat unsatisfied	2.3	3.2	2.8	2.6
Very unsatisfied	0.7	0.0	1.7	0.8
Don't know	1.2	0.0	0.6	0.8
No response	0.2	1.3	0.6	0.5

Statistically significant with p<0.001* * Statistically significant with p<0.05*

4. HIV Risk-Related Behaviors

4.1 First Sexual Partner

MSMO were more likely to report that their first sexual partner was a man than MSMW (66.1% vs. 20.3%, p<0.001, shown in Table 15). The first sexual partner for MSMW was more likely to be a female (68.2% MSMW vs. 24.7% MSMO). The likelihood of the first sexual partner being transgender did not differ much between MSMW and MSMO.

Approximately, 92% of MSW stated that their first sexual partner was a female compared to 68% MSMW (p<0.001, shown in Table 15).

Table 15: Gender of first sexual partner by groups

Indicators	MSW	MSMW	MSMO	Overall
	%	%	%	%
First sexual partner*	n=1981	n=592	n=434	n=3007
Man	4.9	20.3	66.1	16.7
Woman	92.1	68.2	24.7	77.8
Transgender	2.0	9.1	8.3	4.3
No response	0.5	0.5	0.2	0.4
Not remember	0.5	1.9	0.7	0.8

** Statistically significant with p<0.001*

4.2 Age at First Sex

The mean age of sexual debut was 18.4 years for MSMW and 17.9 years for MSMO (Table 16). More MSMO than MSMW had first sex under 15 years old (7.9% vs. 4.2%).

The mean age of sexual debut was slightly higher for MSW at 19.8 years, than it was for MSMW (18.4 years, shown in Table 16). The MSW tended to be a little older than MSMW in general as only 57.6% had their first sexual encounter aged 19 years or under (2.7% under 15 years) compared to 72.7% under 19 years (4.2% under 15 years old).

Table 16: Age at first sex with a male partner

Indicators	MSW	MSMW	MSMO	Overall
	%	%	%	%
Age at having sexual intercourse for the first time*	n=1633	n=473	n=366	n=2472
Less than 15 years	2.7	4.2	7.9	3.8
15-19 years	54.9	68.5	68.3	59.5
20-24 years	32.0	23.1	18.3	28.3
25-29 years	7.7	3.6	4.4	6.4
Greater than 29 year	2.7	0.6	1.1	2.0
Mean (median) age at first sexual intercourse*	19.8 (19)	18.4 (18)	17.9 (18)	19.3 (19)

** Statistically Significant with p<0.001*

4.3 Sex with Non-Paid Partners

4.3.1 Sex with Non-Paid Male Partners

Table 17 shows that more MSMW reported having sex with a male non-paid partner in the last 6 months than MSMO (47% vs. 46.1%, p<0.05). The mean numbers of male non-paid partners was significantly less for MSMW than MSMO (mean 4.8 vs. 6.2, p<0.001).

Table 17: Occurrence of sex with a non-paid male partner in the last 6 months

Indicators	MSMW	MSMO	Overall
	%	%	%
	n=592	n=434	n=1026
Had sex with a male non-paid partner in the last 6 months**	47.0	46.1	46.6
Number of male non-paid partner in the past 6 months*			
Mean (95%CI)	4.8 (4.4, 5.1)	6.2 (5.8, 6.6)	5.4 (5.1, 5.7)
Median	4.0	6.0	5.0

** Statistically significant with p<0.001* *** Statistically significant with p<0.05*

Again, proportion of long-hair MSM reported having sex with non-paid partner in the last 6 months was lower for long-hair MSM than short-hair one (38.3% vs. 50.3%, p<0.05). Mean number of male non-paid partners was significantly higher for long-hair MSM than short-hair MSM (6.3 vs. 5.0, p<0.001).

Table 18: Occurrence of sex with a non-paid male partner in the last 6 months between long-hair and short-hair MSM

Indicators	Long hair MSM	Short hair MSM	Overall
	%	%	%
	n=379	n=314	n=693
Had sex with a male non-paid partner in the last 6 months**	38.3	50.3	46.6
Number of male non-paid partner in the past 6 months*			
Mean (95%CI)	6.3 (5.8, 6.8)	5.0 (4.6, 5.5)	5.4 (5.4, 6.0)
Median	6.0	4.5	5.0

** Statistically significant with p<0.001* *** Statistically significant with p<0.05*

4.3.2 Sex with Non-Paid Female Partners

It can be seen in Table 19 that approximately 63% of the MSW and 59% of MSMW interviewed in the study had had sex with a non-paid female partner in the last three months. The mean number of non-paid partners in the last three months was significantly higher for MSMW than for MSW (5.6 vs. 3.8, p<0.001).

Table 19: Occurrence of sex with a non-paid female partner in the last 3 months

Indicators	MSW	MSMW	Overall
	%	%	%
	n=1267	n=592	n=1859
Had sex with a female non-paid sexual partner in the last 3 months	62.8	59.0	61.5
Number of non-paid sexual partners in the last 3 months*			
Mean (95%CI)	3.8 (3.4, 4.3)	5.6 (4.5, 6.7)	4.4 (3.9, 4.8)
Median	2.0	3.0	2.0

** statistically significant with p<0.001*

4.4 Transactional Sex

This section shows all the transactional sex with different partners, including paying for sex (i.e., sex with a male paid partner or a female paid partner) and getting paid for sex (i.e., sex with a male client).

4.4.1 Sex with Male Partners

Significantly more MSMW than MSMO reported having paid a male for sex in the last six months (29% MSMW and 23% MSMO, p<0.001). The median number of male paid partners was relatively higher for MSMO than for MSMW (9 vs. 5).

Table 20: Paying for sex with a male partner among MSMW and MSMO in the last 6 months

Indicators	MSMW	MSMO	Overall
	%	%	%
	n=592	n=434	n=1026
Had sex with a male paid partner in the last 6 months**	29.3	22.6	26.7
Number of male paid partners in the last 6 months**			
Mean (95%CI)	5.1 (3.8, 6.5)	7.4 (5.1, 9.6)	5.6 (4.8, 7.1)
Median	3.0	3.0	3.0

*** Statistically significant with p<0.05*

It can be seen from Table 21 that 43.8% of MSMW and 36.4% MSMO reported having sold sex to a male client in the last six months. The mean number of reported clients was significantly higher for MSMO than MSMW (8.5 vs. 6.1, p<0.05).

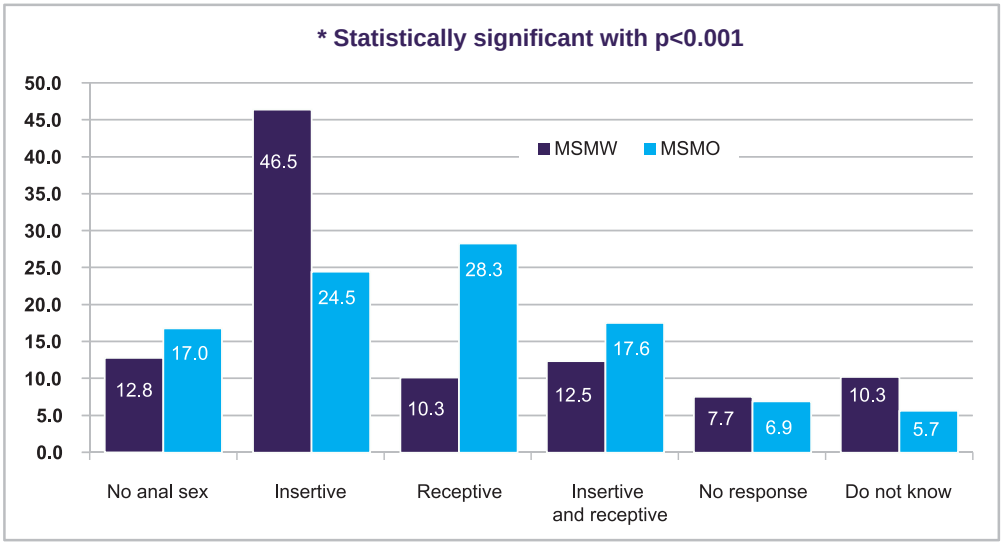
Table 21: Getting paid for sex with a male client among MSMW and MSMO in the last 6 months

	MSMW	MSMO	Overall
	%	%	%
	n=592	n=434	n=1026
Had sex with a male client in the last 6 months	43.8	36.4	40.6
Number of a male clients in the last 6 months**			
Mean (95%CI)	6.1 (4.7, 7.4)	8.5 (6.6, 10.5)	7.0 (5.9, 8.1)
Median	3.0	4.0	3.0

*** Statistically significant with p<0.05*

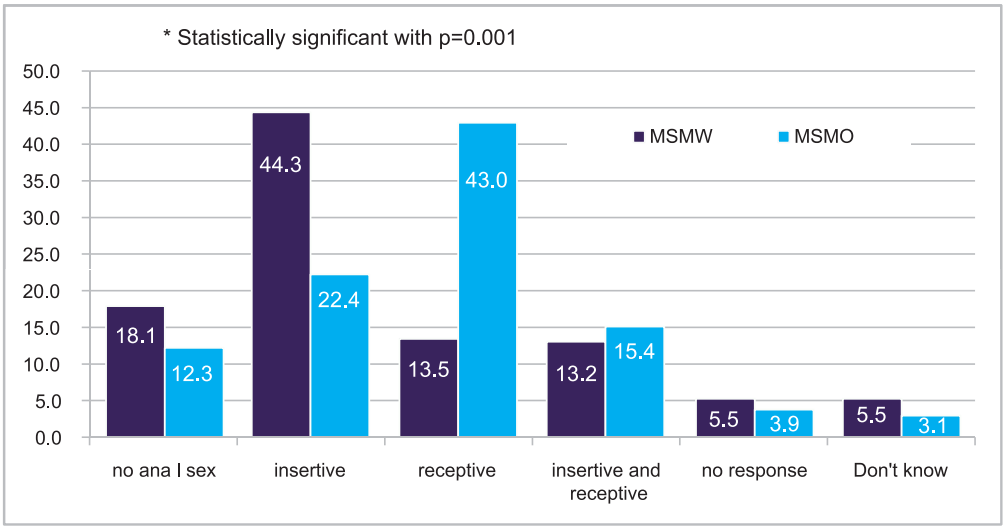
Figure 8 shows the sexual roles in the last anal sex while MWMW and MSMO paid for sex with a male partner in the last 6 months. The proportion of MSMW reported playing an insertive role was relatively higher (46.5% vs. 24.5%), but lower for a receptive (10.3% vs. 28.3%) in anal sex than MSMO. At least about 12.5% for MSMW and 17.6% for MSMO reported playing both insertive and receptive roles while having anal sex with such male partner.

Figure 8: Proportion of sexual role in last anal sex among MSMW and MSMO who have paid for sex with male partner in the last 6 months



The proportion of MSMW reported playing an insertive was statistically higher (44.3% vs. 22.4%) but much lower for a receptive (13.5% vs. 43.0%) in anal sex with a male client at last sex in the last 6 months than MSMO. At least 13.2% for MSMW and 15.4% for MSMO reported playing both insertive and receptive roles while having anal sex with such male partner (see Figure 9).

Figure 9: Proportion of sexual role in last anal sex with a male client in the last 6 months among MSMW and MSMO



Short-hair MSM had significantly higher proportion of paying a male for sex in the last 6 months than long-hair MSMS (27.4% vs. 25.6%, p<0.05) Wan number of male paid partner of both groups were the same (See Table 22).

Table 22: Paying for sex among long-hair and short-hair MSM with a male paid partner in the last 6 months

Indicators	Long hair MSM	Short hair MSM	Overall
	%	%	%
	n=379	n=314	n=693
Had sex with male paid partner in the last 6 months**	25.6	27.4	26.4
Number of male paid partners in the past 6 months			
Mean (95%CI)	6.8 (4.4, 9.2)	6.1 (4.1, 8.0)	6.5 (4.9, 8.0)
Median	3.0	3.0	3.0

*** Statistically significant with p<0.05*

The proportion of having sex with a male client in the last 6 months for long-hair MSM was relatively lower than the short-hair MSM (36.1% vs. 42.4%). Mean number of male clients of long-hair MSM was significantly less than short-hair MSMS (6.9 vs. 8.7, p<0.05) (See Table 23).

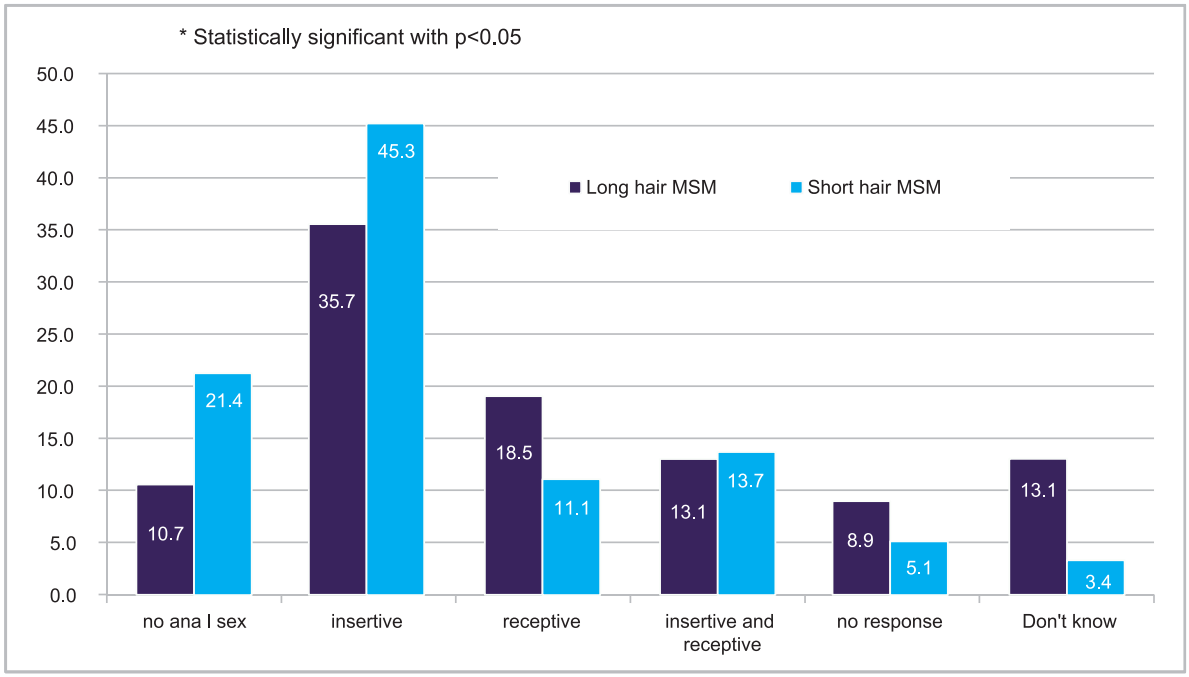
Table 23: Getting paid for sex with a male client among long and short-hair MSM in the last 6 months

Indicators	Long hair MSM	Short hair MSM	Overall
	%	%	%
	n=379	n=314	n=693
Had sex with male client in the last 6 months	36.1	42.4	39
Number of male client partner in the past 6 months**	6.9(3)	8.7 (3)	7.0 (3)
Mean (95%CI)	6.9 (5.3, 8.5)	8.7 (6.3, 11.1)	7.0 (6.3, 9.2)
Median	3.0	3.0	3.0

*** Statistically significant with p<0.05*

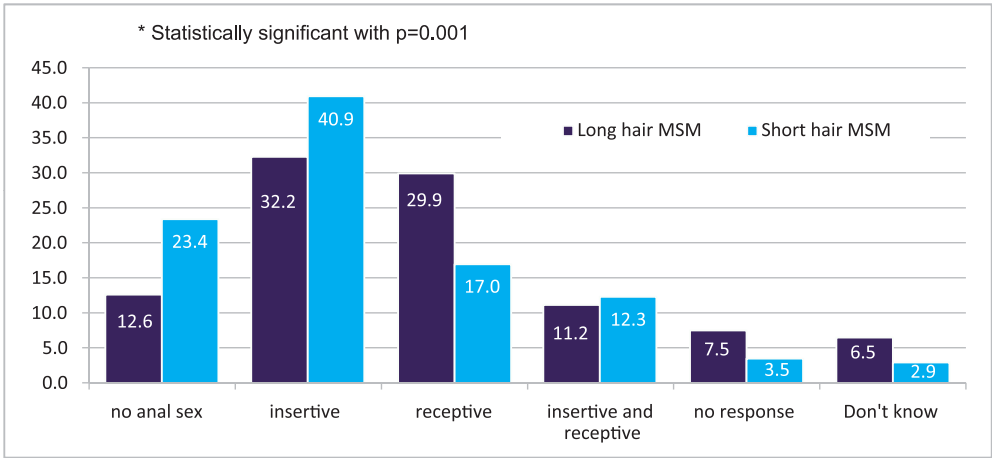
Proportion of long-hair MSM reported an insertive role was relatively lower (35.7% vs. 45.3%) but relatively higher for receptive (18.5% vs. 11.1%) in anal sex with a male paid partner at last sex in the last 6 months than short-hair MSM. At least about 13% of each group reported playing both insertive and receptive roles while having anal sex with such male partner (see Figure 10).

Figure 10: Proportion of sexual role in last anal sex among long-hair and short-hair MSM who have paid for sex with male partner in the last 6 months



The proportion of long-hair MSM reported playing an insertive was also lower than short-hair MSM while having with male clients (32.2% vs. 40.9%, p=0.001). At least about 11.2% of long-hair MSM and 12.3% of short-hair MSM reported playing both roles, insertive and receptive, while having sex with male paid partners (see Figure 11).

Figure 11: Proportion of sexual role in last anal sex with a male client in the last 6 months among long-hair and short-hair MSM



4.4.2 Sex with Female Partners

Half of the MSW interviewed reported paying women for sex in the last three months and the average number of sex workers visited was 4.4. Compared to MSW, MSMW reported a statistically lower proportion of paying a female for sex in the last three months (42.1% vs. 50.0%, p<0.05), but MSMW reported higher mean number of paying sex workers (5.6 vs. 4.4, p<0.05) (see Table 24).

Table 24: Occurrence of sex with a female paid partner in the last 3 months

Indicators	MSW	MSMW	Overall
	%	%	%
	n=1267	n=592	n=1859
Had sex with a female paid sexual partner in the last 3 months**	50.0	42.1	47.5
Mean (median) number of female paid sexual partners in the last 3 months**			
Mean (95%CI)	4.4 (3.8, 4.9)	5.6 (4.6, 6.5)	4.7 (4.2, 5.2)
Median	2.0	3.0	3.0

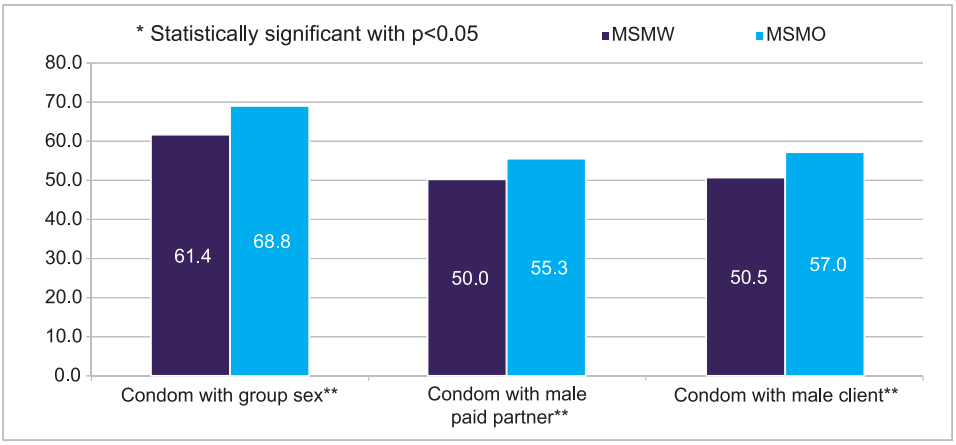
*** Statistically significant with p<0.05*

4.5 Condom Use

4.5.1 Sex with Male Partners

Correct condom use (i.e., one condom for the full duration of intercourse) among all MSM with various partners in the past 6 months was relatively low, ranging from 50.0% to 62.0% in MSMW and 55.3% to 68.8% in MSMO. Condom use was higher in MSMO than MSMW for all types of sex and this was significant in group sex (68.8% vs. 61.4%), with a paid partner (53.3% vs. 50.0%) and with a male client (57.0% vs. 50.5%) Condom use in both groups was higher in non-paid sex than paid sex (see Figure 12).

Figure 12: Condom use with male sexual partners in the past 6 months



The proportion of double condom use (using more than one condom) among MSMW was significant lower than MSMO (10.1% vs. 16.7%, p<0.05), but MSMW reported a significantly higher proportion of no condom use at last sex with male paid partner in the past 6 months than MSMO (39.9% vs. 28.0%, p<0.05). The most common reason given by MSMW and MSMO for not using a condom with a paid partner was that they were in a relationship (32.7% and 35.1%). The next most significant reason for MSMW not to use a condom was 'too high to use a condom' (18.0% vs. 5.4%) but for MSMO it was 'Trust each other' (13.6% vs. 12.6%) (see Table 25).

Table 25: Condom use and reasons for not using condom with male paid sexual partners at last sex in the last 6 months

Indicators	MSMW	MSMO	Overall
	%	%	%
Condom use with a male paid partner at last sex during the last 6 months**	n=238	n=132	n=370
Not using condom	39.9	28.0	35.7
Yes, one condom	50.0	55.3	51.9
Yes, more than one condom	10.1	16.7	12.4
Reasons for not using a condom at last sex with a male paid partner during the past 6 months	n=95	n=35	n=132
In relationship	32.7	35.1	33.3
Too high to use a condom	18	5.4	12.9
Trust each others	12.6	13.6	14.4
Dislike condoms	6.3	2.7	6.1
Condom not available	6.3	5.4	5.3
Other reasons	2.1	8.1	3.8
Do not know	22.1	29.7	24.2

*** Statistically significant with p<0.05*

MSMW also reported a significantly higher proportion of no condom use at last sex with male clients in the past 6 months than MSMO (39.9% vs. 28.0%, p<0.05). The most common reason given was also that they were in a relationship (27.0% MSMW vs. 37.0% MSMO). There were differences among the groups for the second most reason for not using condom: 'too high' for MSMO (15.2% vs. 15.0%), but for MSMW, it was 'trust each other' (21.0% vs. 10.9%) (see Table 26).

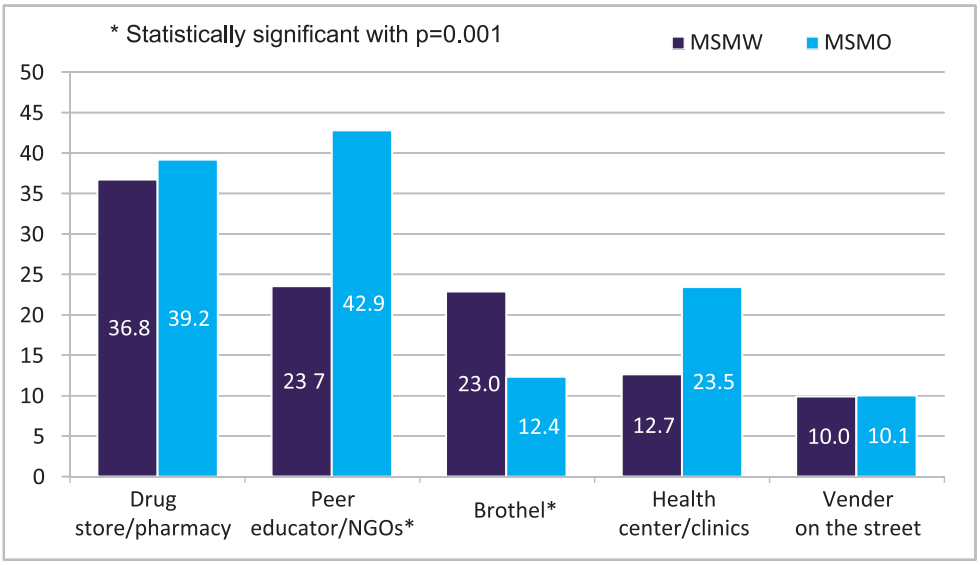
Table 26: Condom and reasons for not using condom with male client the last 6 months

Indicators	MSMW	MSMO	Overall
	%	%	%
Condom use with a male client last sex during the last 6 months**	n=285	n=200	n=485
Not using condom	35.1	23.0	30.1
Yes, one condom	50.5	57.0	53.2
Yes, more than one condom	11.9	18.0	14.4
Never had anal sex with male client	2.5	2.0	2.3
Reasons for not using a condom at last sex with a male client during the past 6 months	n=100	n=46	n=146
In relationship	27.0	37.0	30.1
Too high to use a condom	15.0	15.2	19.2
Trust each others	21.0	10.9	13.7
Dislike condoms	12.0	10.9	6.9
Condom not available	5.0	8.7	11.0
Other reasons	1.0	0.0	0.7
Do not know	19.0	17.3	18.4

*** Statistically significant with p<0.05*

There were some differences relating to where they purchased or obtained condoms between MSMW and MSMO. The significant differences in condom sources were found at brothels (23.0% of MSMW obtained condoms here compared to 12.4% MSMO, p<0.001) and from peer educators or NGOs (42.9% MSMO compared to 23.7% MSMW, p<0.001). The most common place for MSMW to obtain condoms was the pharmacy (39.2%) and for MSMO it was the peer educator or NGO (42.9%) (see Figure 13).

Figure 13: Sources of condoms among MSM



Condom use in last anal sex in last 6 months with various partners was relatively low among long-hair and short-hair MSM: 63.3% vs. 63.7% with group sex, 51.3% vs. 56.5% with male paid partners, and 50.5% vs. 57.0% with male clients (see Figure14).

Figure14: Condom use rates among long and short-hair MSM by types of male sexual partners

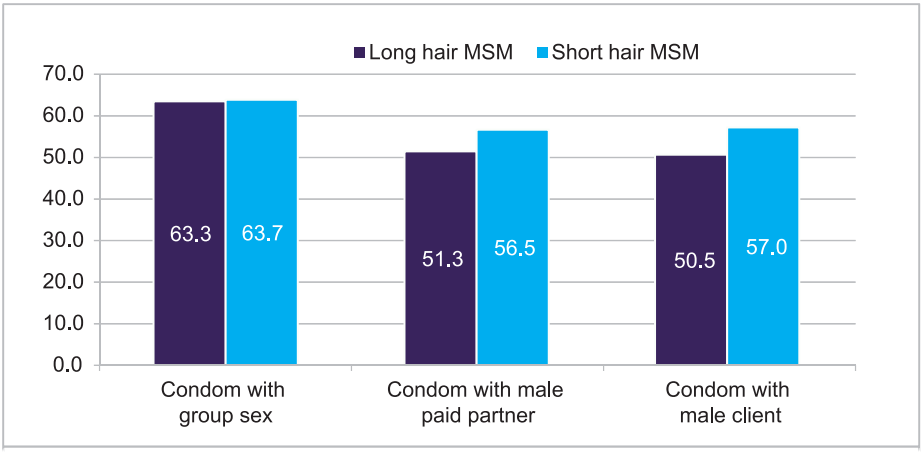


Table 27 shows that proportion of no condom use with male paid partner in the last 6 months among long-hair MSM was relatively higher than short-hair MSM (40.7% vs. 32.6%). The most common reason for not using a condom with a paid partner was in a relationship (27.9% long-hair vs. 43.3% short-hair). The second most common reason for no condom use among long-hair MSM was 'trust to each other' (21.3%), but it was 'too high to use condom' (20.0%) for short-hair MSM (see Table26).

Table27: Condom use and reasons for not using condom with male paid sexual partners in the last 6 months

Indicators	Long hair MSM	Short hair MSM	Overall
	%	%	%
Condom use with a male paid partner at last sex during the last 6 months	n=150	n=92	n=242
Not using condom	40.7	32.6	37.6
Yes, one condom	51.3	56.5	53.3
Yes, more than one condom	8.0	10.9	9.1
Reasons for not using a condom at last sex with a male paid partner during the past 6 months	n=61	n=30	n=91
In relationship	27.9	43.3	33.0
Too high to use a condom	14.5	20.0	16.5
Trust each others	21.3	3.3	15.4
Dislike condoms	6.7	6.7	6.6
Condom not available	3.3	6.7	4.4
Other reasons	3.3	0.0	2.2
Do not know	23.0	20.0	22.0

From Table 28, proportion of long-hair MSM reported not using condom with male client in the last 6 months was relatively higher than short-hair MSM (30.5% vs. 27.5%). The most common reason for not using a condom with a male client for both groups was in a relationship (26.3% vs. 27.8%). The second most common reason of no condom use was 'too high to use a condom' for long-hair MSM (17.5%) and for short-hair MSM (22.2%).

Table28: Condom use and reasons for not using condom with male clients in the last 6 months

Indicators	Long hair MSM	Short hair MSM	Overall
	%	%	%
Condom use with a male client last sex during the last 6 months	n=187	n=131	n=318
Not using condom	30.5	27.5	29.3
Yes, one condom	52.9	58.0	55.0
Yes, more than one condom	12.8	12.2	12.6
Never had anal sex with male client	3.7	2.3	3.1
Reasons for not using a condom at last sex with a male client during the past 6 months	n=57	n=36	n=93
In relationship	26.3	27.8	26.9
He has not HIV/STI	7.0	11.1	8.6
Too high to use a condom	17.5	22.2	19.4
Trust each others	5.3	8.3	6.5
Dislike condoms	8.8	5.6	7.5
Condom not available	10.5	11.1	10.7
Do not know	24.6	13.9	20.4

4.5.2 Sex with Female Partners

Condom use among MSW with a female paid partner in the past 3 months was higher than MSMW (72.3% vs. 63.0%, p<0.05). The most common reason was that they were in a relationship (38.7% MSW vs. 39.5% MSMW), followed by 'too high to use a condom' (32.0% MSW vs. 19.4% MSMW) (see Table 29).

Table 29: Condom use and reasons for not using condoms with paid partner

Indicators	MSW	MSMW	Overall
	%	%	%
Condom use with a female paid partner at last sex during the last 3 months**	n=812	n=335	n=1147
Not using condom	27.7	37.0	30.4
Yes, one condom	61.2	50.8	58.1
Yes, more than one condom	11.1	12.2	11.5
Reasons for not using a condom at last sex witha female paid partner during the past 3 months	n=225	n=124	n=349
In relationship	38.7	39.5	39.0
Too high to use a condom	32.0	19.4	27.5
Trust each others	9.3	10.5	9.7
Dislike condoms	8.9	8.9	8.9
Condom not available	6.7	5.6	6.3
Other reasons	0.9	3.2	1.7
Do not know	3.6	12.9	6.9

***statistically significant with p<0.05*

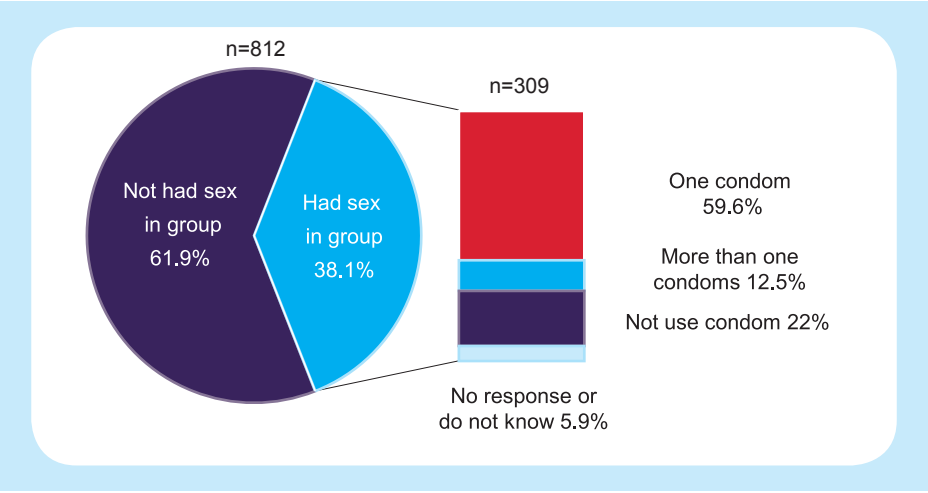
From Table 30 condom use among MSW with a female non-paid partner in the last 3 months was relatively lower than MSMW (51.2% vs. 54.1%)(Table 30). The most common reason given was also that they were in a relationship (43.0% MSW vs. 35.9% MSMW), followed by 'too high to use a condom' (24.9% MSW vs. 22.8% MSMW). Trust was a more important reason for not using a condom with a non-paid partner than with a paid partner: 15.0% vs. 9.3% for MSW; 16% vs. 10.5% for MSMW.

Table 30: Condom use and reasons for not using condoms with non-paid partner in the last 3 months

Indicators	MSW	MSMW	Overall
	%	%	%
	n=971	n=449	n=1420
Condom use with a female non-paid partner at last sex during the last 3 months	51.2	54.1	52.1
Reasons for not using a condom at last sex with a female non-paid partner during the past 3 months	n=474	n=206	n=680
In relationship	43.0	35.9	40.9
Too high to use a condom	24.9	22.8	24.3
Trust each others	15.0	16.0	15.3
Dislike condoms	7.4	8.3	7.6
Condom not available	7.2	9.2	7.8
Other reasons	0.4	1.0	0.6
Do not know	2.1	6.8	3.5

About 38% of MSW reported having had sex in a group (with a paid sex worker) in the last three months. About 72.1% of these men reported using one or more condoms in group sex (see Figure 15).

Figure 15: Condom use among MSW who participated in group sex in the last three months

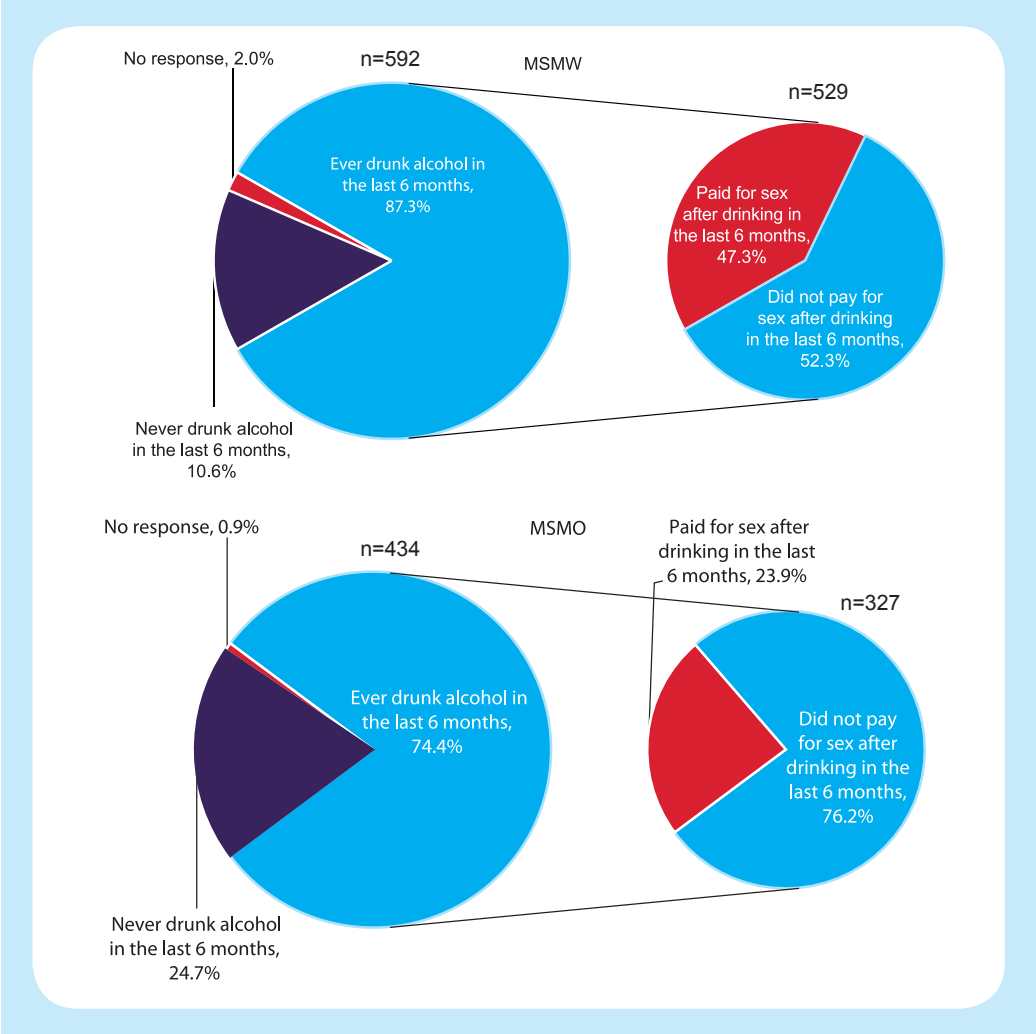


4.6 Alcohol and Drug Uses

4.6.1 MSM (MSMO and MSMW)

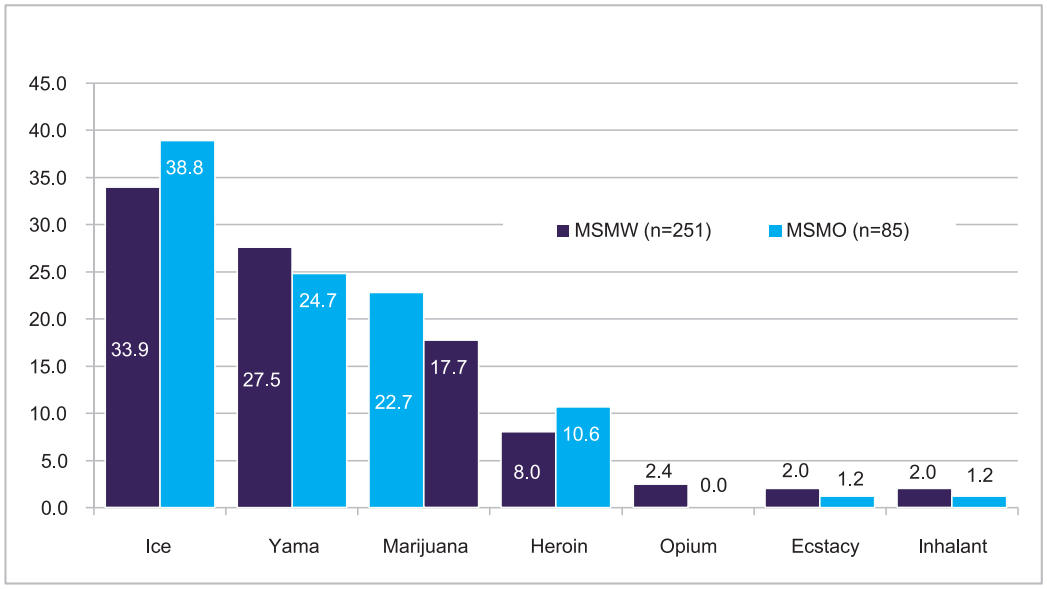
Figure 16 shows that approximately 82% of all MSM reported that they had drunk alcohol in the last six months. Drinking alcohol was more commonly reported by MSMW than MSMO (87.3% vs. 74.4%, p<0.001). MSMW were more likely than MSMO to report paying for sex after drinking alcohol (47.3% vs. 23.9%, p<0.001).

Figure 16: Sex after drinking among MSMW and MSMO



About 32.8% among MSM reported ever used drug before. Proportion of MSMW reported ever used drug was more than two times higher than MSMO (42.4% vs. 19.6%, p<0.001). The most popular drug types for both groups included ice (amphetamine), yama, marijuana, (see Figure17).

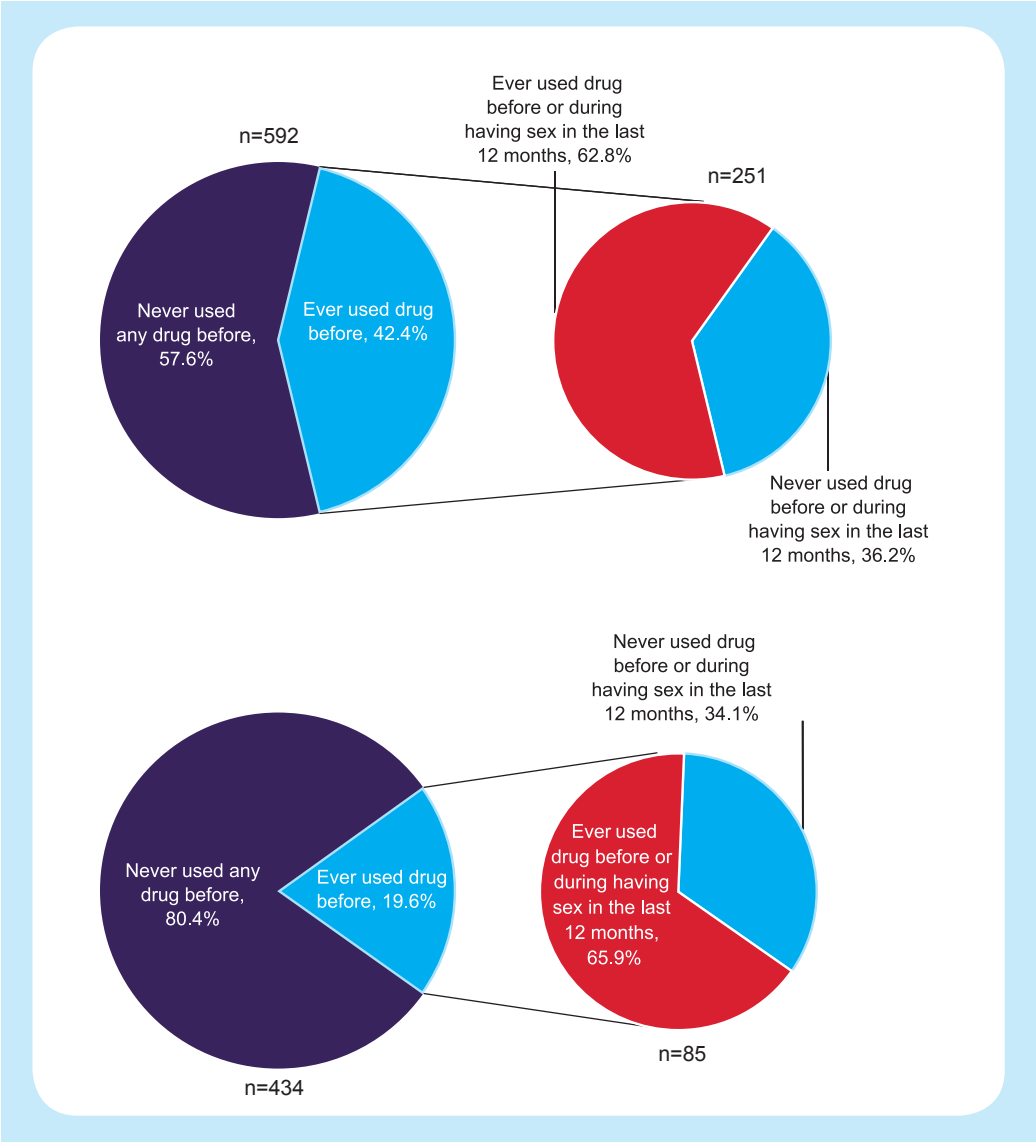
Figure17: Types of drug used by MSMW and MSMO



Injection drug use among MSMW in the last 12 months was statistically higher than MSMO (36.3% vs. 30.6%, p<0.05).

Figure 18 shows that drug use was more commonly reported by MSMW than MSMO (42.4% vs. 19.6%, p<0.001). Among those who have ever used drugs, MSMW were less likely than MSMO to use drug before or during have sex in the last 12 months (62.8% vs. 65.9%, p<0.001).

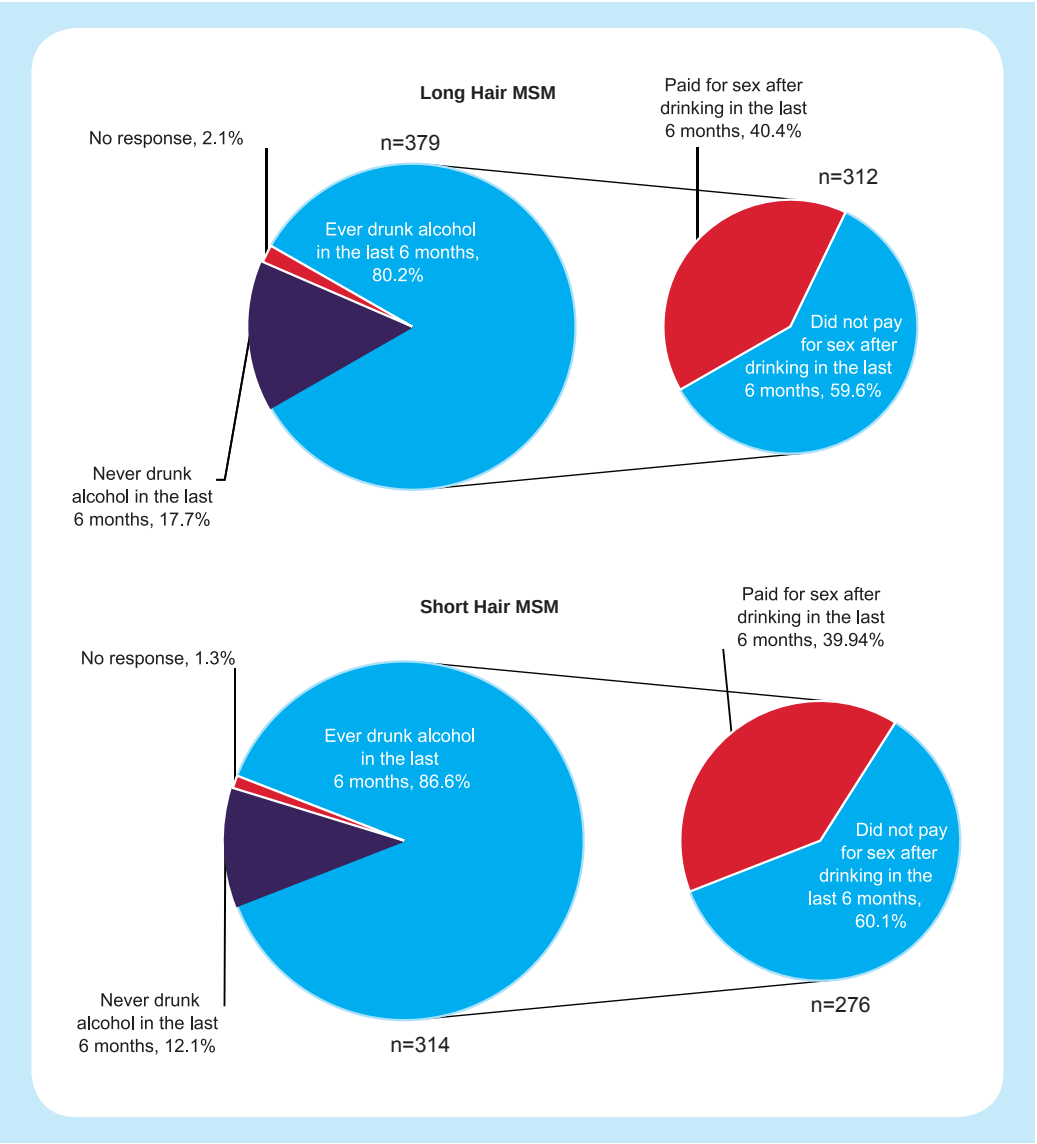
Figure 18: Injection drug use before or during had sex in the last 12 months among MSMW and MSMO



4.6.2 MSM (Long-hair MSM and Short-hair MSM)

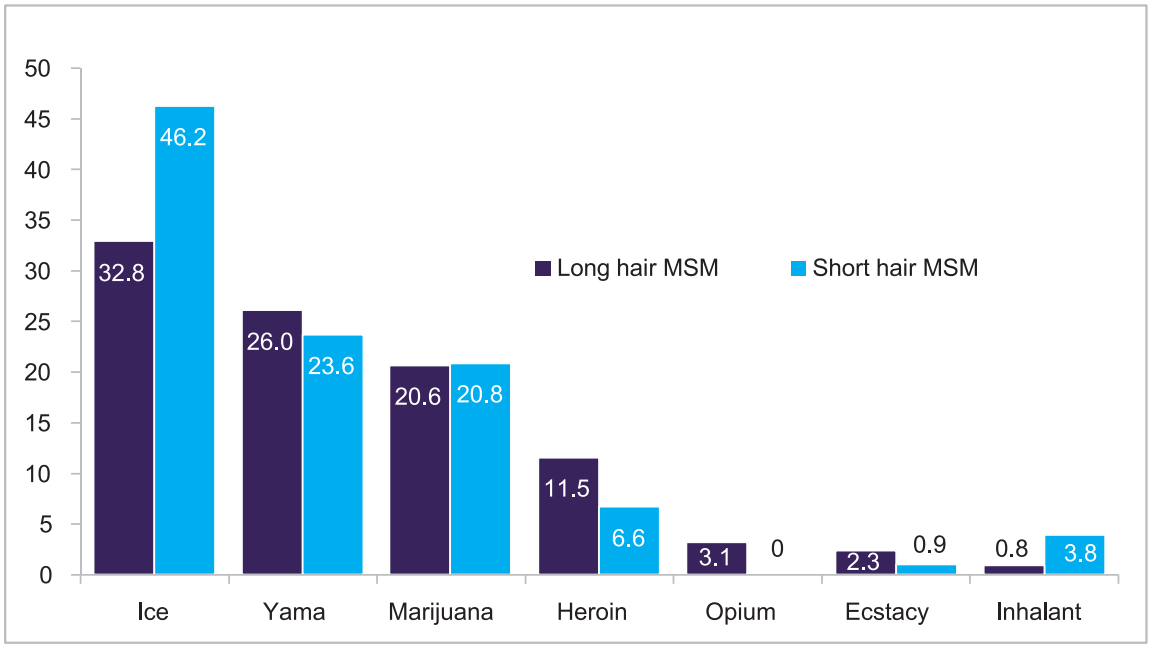
The proportion of long hair MSM who reported that they had ever drunk alcohol in the last 6 months was relatively lower than short hair MSM (80.2% vs. 86.6%), but both MSM groups had a similar proportion of reporting paid for sex after drinking in the last 6 months (40.4% vs. 39.9%).

Figure 19: Alcohol use and paying for sex after drinking in the last 6 months among long-hair and short-hair MSM



The drug use behavior of both short-hair and long-hair MSM who reported ever drug use were similar: 34.6% long-hair MSM and 33.8% short-hair MSM. Three most popular drug types for both groups were included ice (amphetamine), yama, marijuana, and then followed by heroin (see Figure 20).

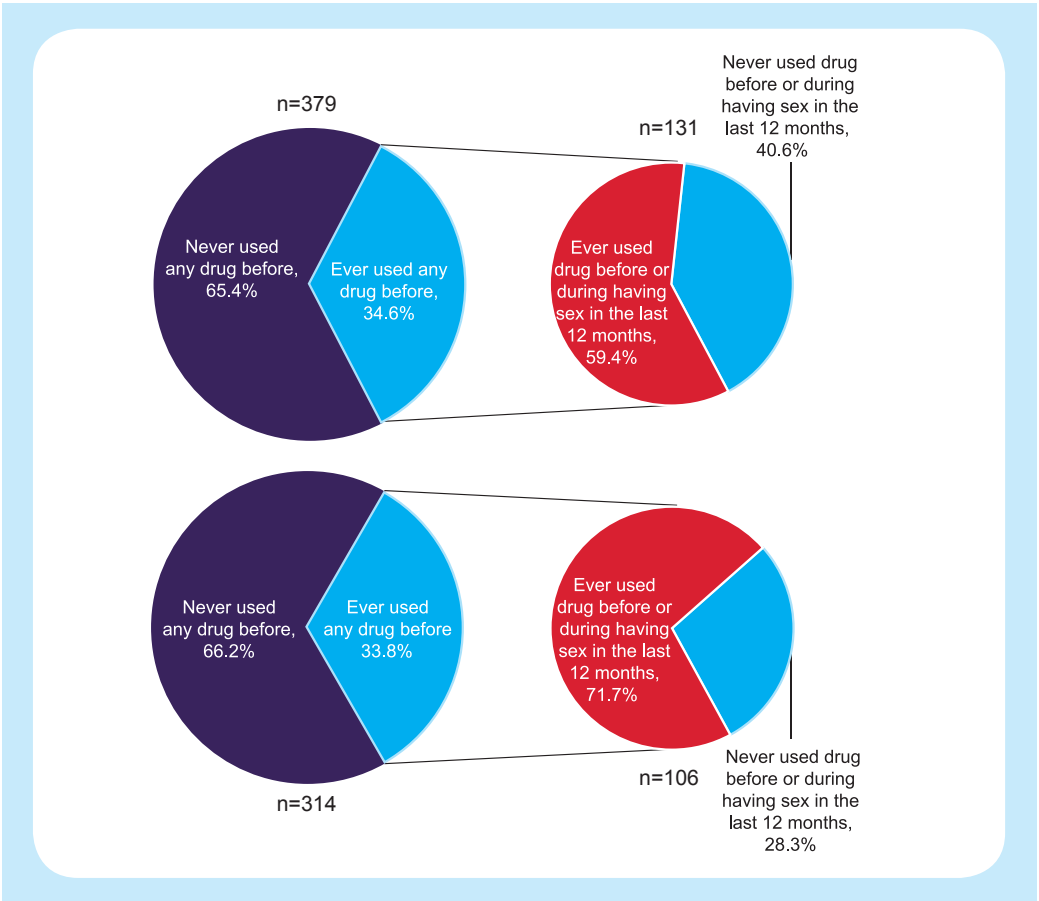
Figure 20: Types of drug used by long-hair and short-hair MSM



Injection drug use among long-hair MSM in the last 12 months was statistically higher than short-hair MSM (38.9% vs. 35.9%, p<0.05).

Figure 21 shows that drug use was relatively high among long-hair MSM than short-hair MSM (34.6% vs. 33.8%). Among those who have ever used drug, long-hair MSM were more likely than short-hair MSM to use drug before or during have sex in the last 12 months (59.4% vs. 71.7%, p<0.05).

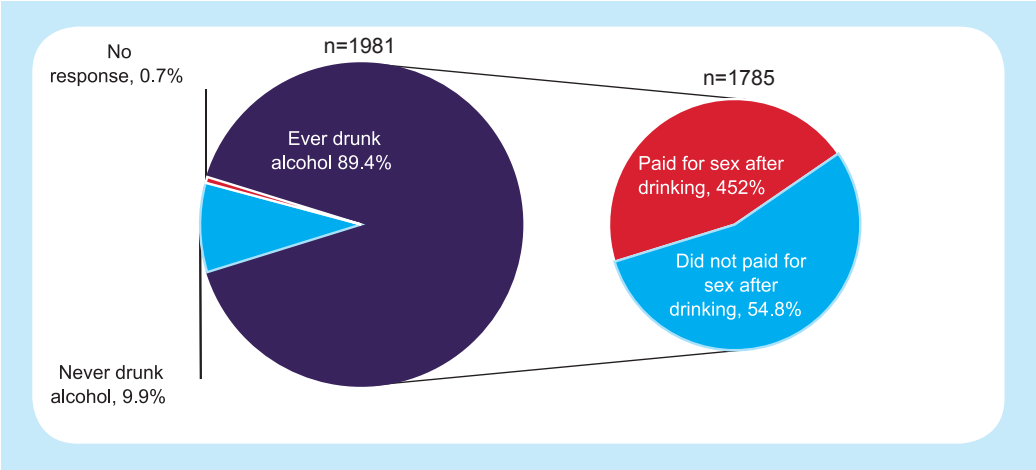
Figure 21: Drug used before or during had sex in the last 12 months among MSML and MSMS



4.6.3 MSW

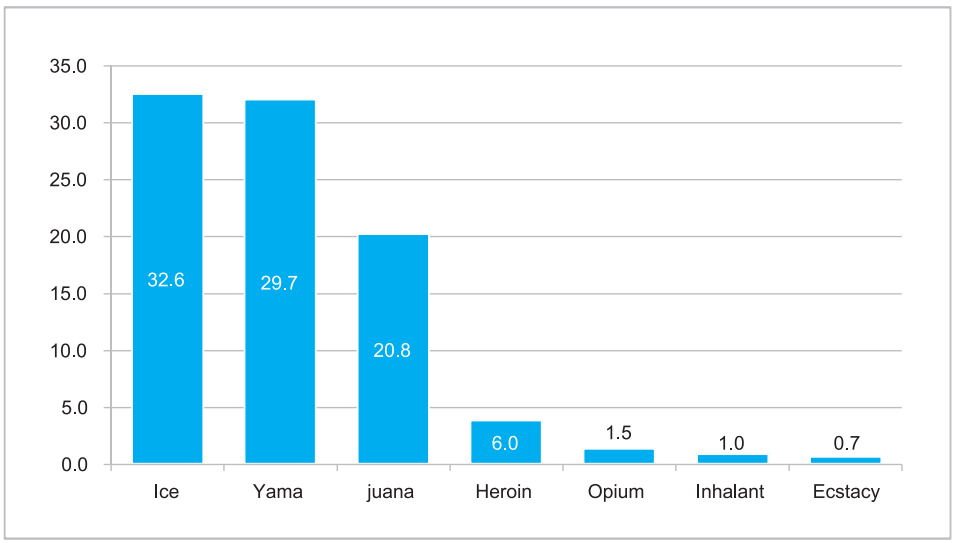
Alcohol use in the last six months was high among MSW: 89.4% drank alcohol one to two times per month (Figure 22). Almost half of MSW (45.2%) who had drunk alcohol reported paying for sex in the last 6 months after consuming alcohol.

Figure 22: Proportions of MSW using alcohol and having sex after drinking in the last 6 months



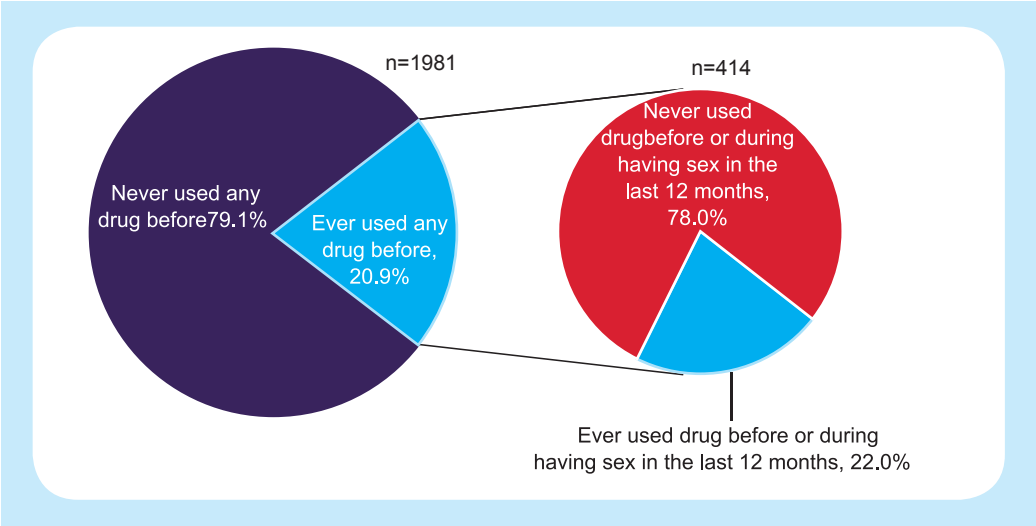
One-fifth of MSW (20.9%) reported ever used drug before. Among those MSW reported drug use, the most common types of drug use were ice/amphetamine, yama, and marijuana, followed by heroin, opium, inhalant, and ecstasy (see Figure 23). Among MSW who have ever used drug, 22.0% had injected drugs in the last 12 months.

Fighure23: Proportion of types of drug used by MSW



About 21% of MSW reported ever used drug before. Among those drug users, approximately 22.0% reported ever using drug before or during having sex in the last 12 months (Figure 24).

Figure 24: Percentage of MSW who used drug before or during sex in the last 12 months



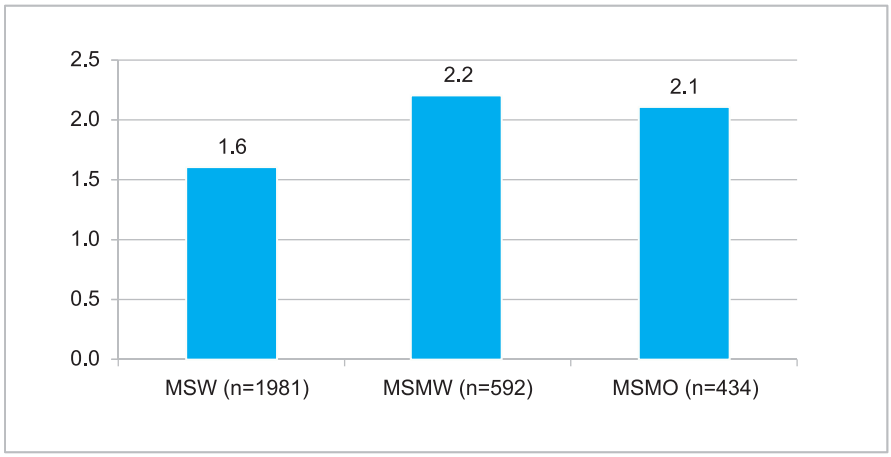
5. HIV Mobile Testing Result

The 'crude' proportions of HIV testing positive described in this section are directly from the samples in BROS Khmer study, without weighting by provincial population size.

5.1 Type of Sexual Partner

When the HIV positive proportions were compared by sexual partner (MSW, MSMW, MSMO), there were some small differences seen, with MSM having a higher proportion of HIV positive individuals (1.6 % in MSW, 2.2% in MSMW and 2.1% in MSMO, shown in Figure 25). None of the differences were statistically significant.

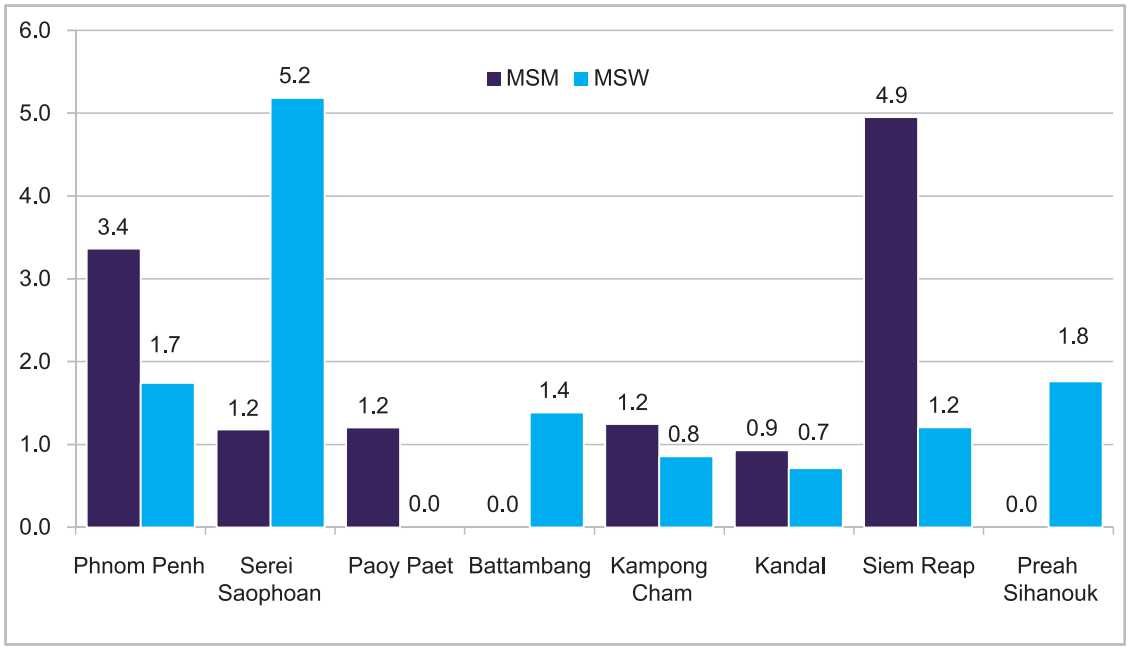
Figure 25: HIV positive proportions among MSW, MSMW, and MSMO



5.2 Geographical Differences

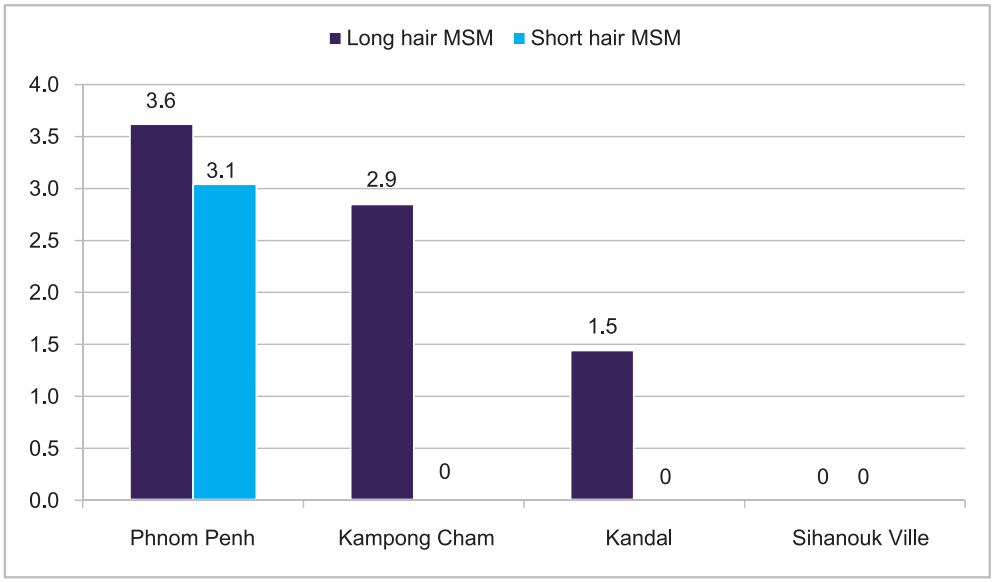
There were differences in the proportions of participants who were HIV seropositive in different cities. Within MSM, the highest proportion in this study was in Siem Reap (4.9%), followed by Phnom Penh (3.4%). There were no HIV-positive MSM recruited into our study in Preah Sihanouk and Battambang. For MSW, the highest proportion in this tudy was in Serei Saophoan (5.2%). None of the MSW in Paoy Paet was seropositive for HIV and in the other cities the HIV positive proportions ranged between 0.8-1.8% (see Figure 26).

Figure 26: HIV positive proportions among MSM and MSW from BROS Khmer study (without weighting), by city



HIV testing data of long-hair and short-hair MSM were available in only 4 cities, included Kandal, Kampong Cham, Phnom Penh, and Sihanouk Ville. The proportion of HIV positive of long-hair MSML was relatively higher than the MSMS (2.6% vs. 1.9%). Geographically, HIV positive proportions in each MSM group varied by provinces, ranged from 0 to 3.6% for long-hair MSM and 0 to 3.1% for short-hair MSM. HIV positive proportion of long-hair MSM was relatively higher than short-hair MSM, especially in Phnom Penh (3.6% vs. 3.1%), Kampong Cham (2.9% vs. 0%), and Kandal (1.5% vs. 0%) provinces (see Figure 27).

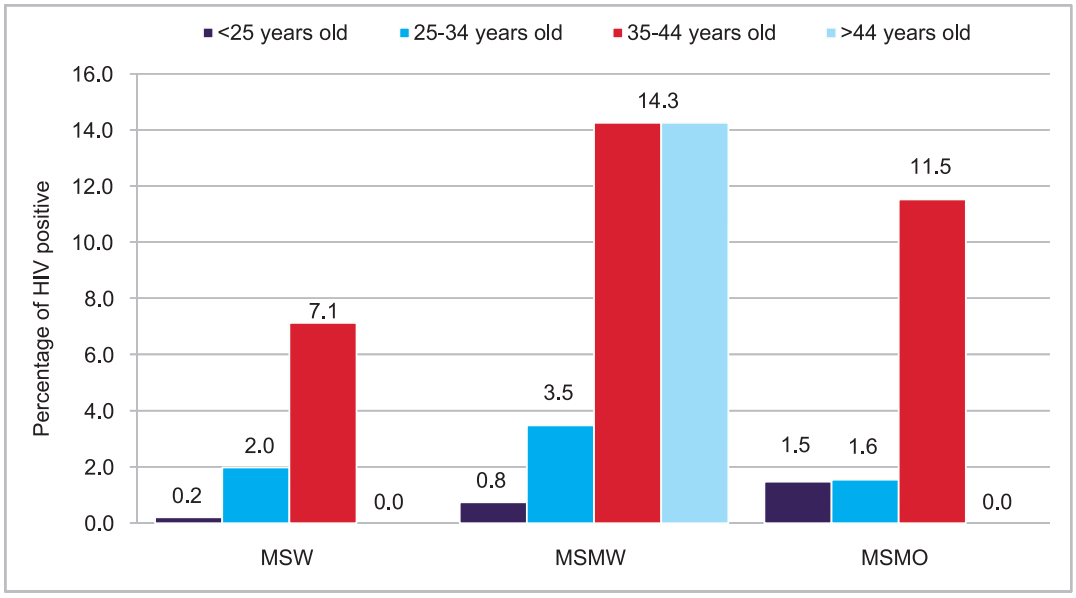
Figure27: HIV positive proportions among long-hair MSM and short-hair MSM



5.3 Age Distribution

In all groups, men aged 35-44 years had the highest proportions of HIV at 7.1% in MSW, 11.5% in MSMO and 14.3% in MSMW (Figure 28). For MSMO and MSW, this proportion was much higher than any of the other age groups, for MSMW, men over 44 years also had a high HIV positive proportion (14.3%). There was no HIV reported in MSW or MSMO who were aged over 44 years.

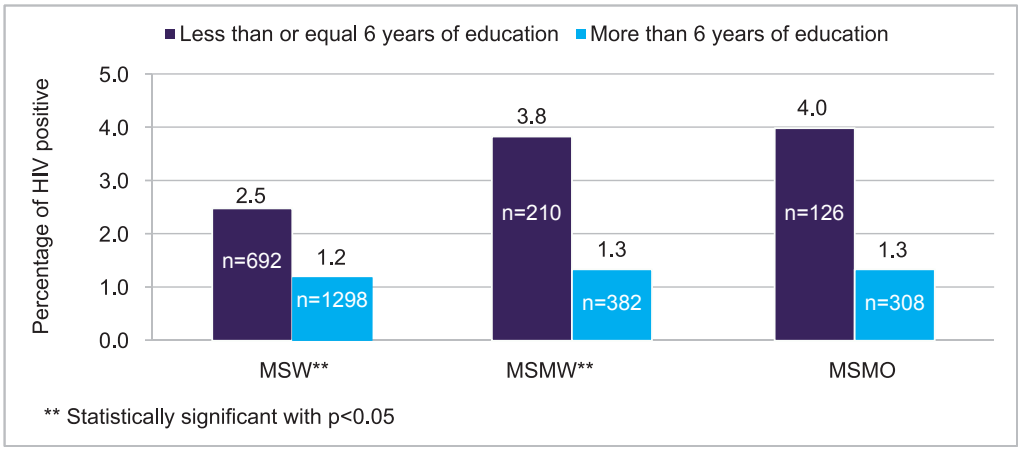
Figure 28: Percentage of MSW, MSMW and MSMO who tested positive for HIV



5.4 Education

Interestingly, in all groups, HIV positive proportion was higher in those who had been in education for six years or less than in those who had been in education for more than six years. This relationship was statistically significant in MSW (2.5% vs. 1.2%, p<0.05) and in MSMW (3.8% vs. 1.3%, p<0.05) but not in MSMO (see Figure 29).

Figure 29: Percentage of MSW, MSMW, and MSMO who were HIV positive, by level of education



5.5 Consistent Condom Use

5.5.1 Sex with Male Partners

Table 31 shows that there are associations between condom use and HIV serostatus. For non-transactional sex, men who never used condoms were six times as likely to be HIV-positive as those who always used condoms (5.8% compared to 0.0%), and men who sometimes used condoms were three times as likely to have HIV as those who always used condoms (3.1% compared to 0.0%). This relationship between HIV serostatus and condom use was statistically significant (p<0.05).

For men who were buying sex, those who used condoms occasionally were actually more likely to have HIV than those who never used condoms (1.5 times as likely as those who never use condoms, 5.0% compared to 3.2%, and six times as likely as those who always used condoms, 5.0% compared to 0.8%).

For sex with clients, those who never used, or used condoms inconsistently were at a similarly elevated risk of HIV compared to those who always used condoms (3.1% and 3.4% compared to 0.6%).

Table 31: Percentage of infected MSM by type of male partner and condom use status

	HIV positive proportion		
Type of sexual partner	**Never used condom**	**Sometimes used condom**	**Always used condom**
Men who had sex with male non-paid partners in the past 6 months**	5.8	3.1	0.0
	(n=69)	(n=295)	(n=164)
Men who had sex with male paid partners in the past 6 months	3.2	5.0	0.8
	(n=31)	(n=181)	(n=125)
Men who had sex with male clients in the past 6 months	3.1	3.4	0.6
	(n=32)	(n=264)	(n=167)

*** Statistically significant with p<0.05*

5.5.2 Sex with Female Partners

The data in Table 32 show that men who did not use condoms, or used them inconsistently were associated with HIV infection. However, these associations are not causal relations because of the cross-sectional study design.

The HIV positive proportion among men who never used condoms during sex with a non-paid partner was higher than that among men who always used condoms (4.2% vs. 0.7%, p<0.05). The percentage of MSW who had HIV among those who sometimes used condoms was a bit higher than that in those who always used condoms (1.6% vs. 0.7%, p<0.05).

This association was mirrored when examining transactional sex. The HIV positive proportion among MSW who never used condoms with FSW was higher than the HIV positive proportion among MSW who always used condoms with FSW (3.6% vs. 0.5%). HIV positive proportion among MSW who used condoms infrequently was higher than proportion among MSW who always used condoms (3.0% vs. 0.5%).

Table32: Percentage of HIV positive among MSW who had sex with female partner and condom use status

	HIV positive proportion		
Type of sexual partner	**Never used condom**	**Sometimes used condom**	**Always used condom**
Men who had sex with female non-paid partners**	4.2	1.6	0.7
	(n=165)	(n=675)	(n=304)
Men who had sex with female paid partners**	3.6	3.0	0.5
	(n=223)	(n=532)	(n=387)

*** Statistically significant with p<0.05*

6. BROS Khmer Study Format Evaluation

6.1 BROS Khmer Mobile Testing Bus Uptake

The BROS Khmer bus was parked in public parks or near entertainment venues for seven to nine hours from 15:00. Table 33 shows that the majority of men interviewed reported coming for HIV testing on the mobile bus because the testing service was close to their home or work (54.8%) or near where they go out (25.8%), and 15.3% said it was because the bus provided a faster HIV test result. The majority of the participants reported that their friends and other men would be very likely (60.4%) or likely (32.1%) to come to a mobile bus for an HIV test. Almost all men interviewed (93%) said they would recommend the mobile bus to their male friends.

Table 33: Satisfaction of BROS Khmer study model among MSW, MSMW and MSMO

Indicators	MSW	MSMW	MSMO	Overall
	%	%	%	%
	n=1981	n=592	n=434	n=3007
Reasons for coming to mobile van for HIV testing				
*Near my home or work**	58.2	49.5	47.0	54.8
*Near where I go out***	24.3	28.9	28.6	25.8
For faster HIV result	15.6	12.0	18.4	15.3
Easy to get here	14.7	13.4	17.3	14.9
*Referred by outreach workers**	8.8	10.3	18.0	10.4
*Referred by friends**	8.5	11.7	16.4	10.2
Worried about my HIV status	7.9	6.9	8.3	7.8
More private	7.3	6.8	9.0	7.4
For incentive	6.7	5.6	11.1	7.1
*Have many sexual partner**	6.4	7.3	10.6	7.2
Not an official health center	6.3	6.9	6.9	6.5
Did not use condom in sex recently	5.3	6.6	4.8	5.5
*Had sex with sex worker recently**	4.5	3.2	0.9	3.8
Not a medical facility	3.3	2.4	2.1	3.0
Would recommend the mobile van approach for HIV testing to a male fiend				
Very likely	68.0	68.4	63.4	67.4
Likely	25.2	25.2	28.8	25.7
Unlikely	2.1	1.9	3.2	2.2
Very unlikely	1.3	0.7	0.9	1.1
No response	1.0	1.7	2.1	1.3
Don't know	2.4	2.2	1.6	2.3
How likely is it that your friends or other men would come to a mobile van for HIV testing				
Very likely	60.0	64.7	56.0	60.4
Likely	33.0	27.7	33.9	32.1
Unlikely	1.7	1.5	3.5	1.9
Very unlikely	0.6	0.7	0.5	0.6
No response	0.9	1.5	1.2	1.1
Don't know	3.8	3.9	5.1	4.0

** Statistically significant with p<0.001* *** Statistically significant with p<0.05*

Table 33 highlights that the reasons for accessing the mobile bus differed among these three groups. MSW were more likely to come because of the distance between mobile bus and their homes or work place (58.2% vs. 49.5% for MSMW and 47.0% for MSMO, p<0.001). MSW were also more likely than MSMW to have become because they recently had sex with female sex worker (4.5% vs. 3.2%, p<0.001). MSMO were more like to report coming to the mobile bus because of referral by an outreach worker (18.0% vs. 10.3% for MSMW vs. 8.8% for MSW, p<0.001), or being referred by friends (16.4% vs. 11.7% for MSW vs. 8.5% for MSMW, p<0.001). Reasons for MSMW to visit the bus were similar to those of the MSW group.

6.2 ACASI Interview Format

Among 3,007 participants, 2,990 (99.4%) completed ACASI interviews and only 17 (0.6%) chose the face-to-face interviews. The mean and median time to complete ACASI was 25.1 and 24.0 minutes. Participants with greater than 6 years of education spent less time to complete ACASI than those who had only 6 years or less in education (24.7 vs. 26.0 minutes, p<0.001). Younger participants also spent a shorter time to complete ACASI than older participants (from 24.5, 25.6 to 28.1 minutes, p<0.001) (see Table 34).

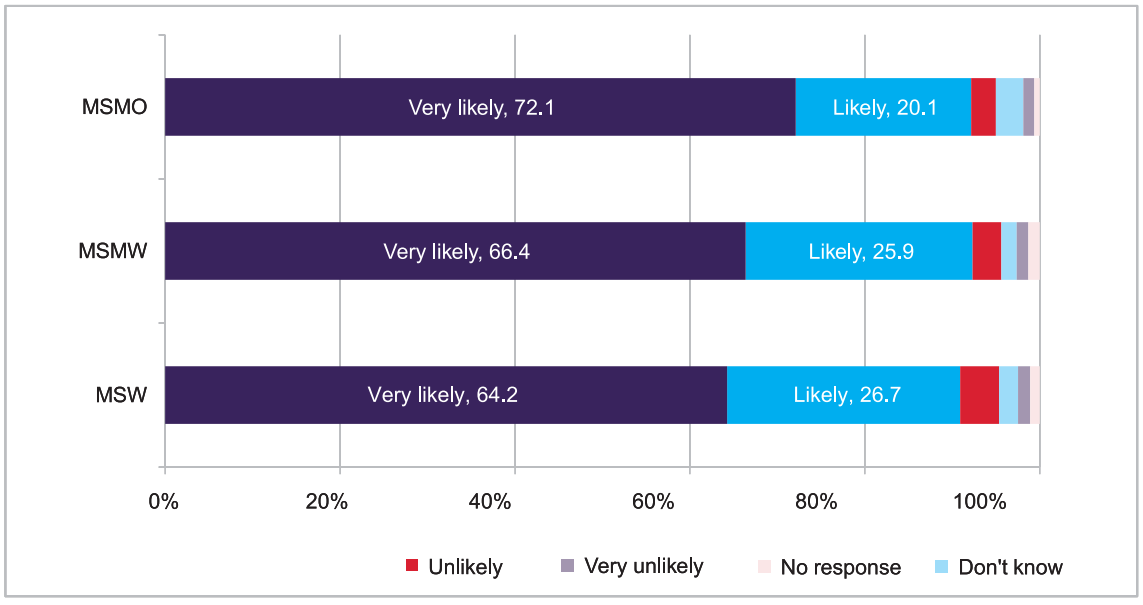
Table 34: Durations of ACASI by year of education and age

Indicator	Duration of ACASI process (in minutes)			
	Mean	Median	Min	Max
Duration of ACASI process	25.1	24.0	5	88
Year of education*				
<=6 years	26.0	24.0	5	88
>6 years	24.7	23.0	8	73
Age group*				
<25 years	24.5	23.0	8	88
25-44 years	25.6	24.0	5	73
45 years and over	28.1	27.0	7	60

**Statistically significant with p<0.001*

Figure 30 demonstrates that over 90% of the participants reported that they were more likely to answer questions using the ACASI than they would if they were answering to a face-to-face interviewer.

Figure 30: Likelihood of each group answering questions more honestly if using ACASI as opposed to in a face-to-face interview



DISCUSSIONS

Sociodemographics

The mean age of MSW was slightly higher than that of MSM (both MSMW and MSMO) with more 30-34 year olds being recruited and fewer under 20 year olds. The MSW were also more likely to be married or in a stable partnership.

Education level of study participants was relatively higher than other MARPs (about 13% have not attended school). However, access to knowledge and information regarding prevention and treatment of disease could be hampered by illiteracy or with less reading capability as many IEC campaigns include written text. A low level of education also limits employment opportunities forcing individuals into poorly paid or dangerous jobs. With a reduced income, people's access to healthcare is often affected, whether this is through user-fees, the cost of travel to heath facilities or just a general lack of empowerment.

There is an interesting association between level of education and HIV status. This potentially supports the idea that reduced literacy skills impact on access to health-related information and services, but confounding factors need to be controlled and adjusted for and advanced logistic analysis will be done in the near future.

The impact of the reported low education levels was also seen on socio-economic status as just over a half of all participants said that their monthly expenses exceeded their monthly income. Without the ability to create savings or have money to spend on medical care, an unforeseen illness can be financially crippling.

Many of the participants, at-risk Cambodian men, were recent migrants; a population frequently documented to be at greater risk of HIV infection. Men who work away from home and families for extended periods of time have access to more disposable income and might often spend their free time drinking alcohol and visiting sex workers. They therefore risk transmitting HIV or STIs to their wives or sweethearts when they return home.

Overall, the majority of MSW were aged 24-34 years, had low education levels and were working in poorly paid positions, many of them working away from home. The MSM recruited tended to be a little younger and still had low incomes.

STI Symptoms

Proportions of men who reported having had STI symptoms varied greatly among groups, with MSMW being most affected and many MSW also being affected, both important bridging populations to the general public.

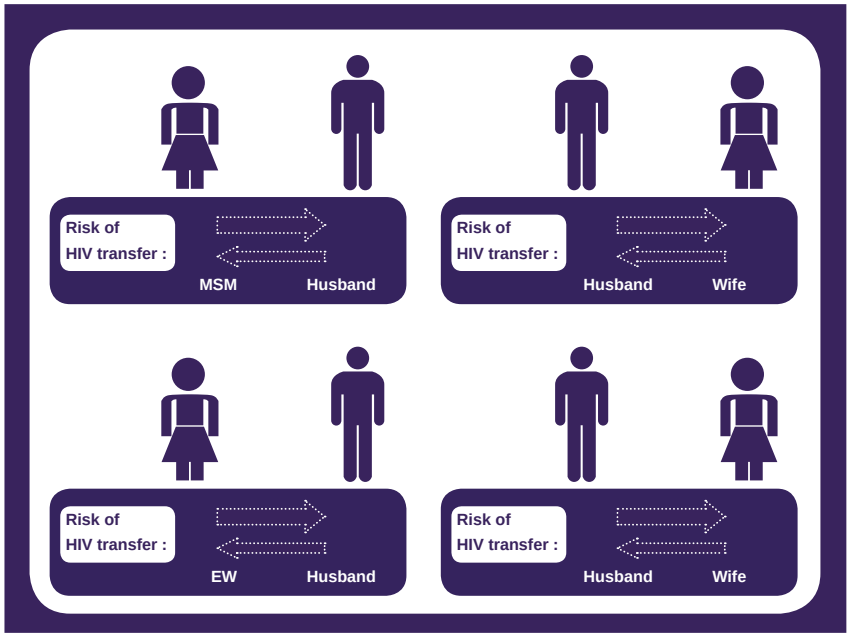
The most common place people sought STI treatment was the public hospital or clinic, but 10% of MSMW and 14% MSW who had an STI symptom in the last 12 months did not seek any treatment, leaving them vulnerable to HIV transmission. More MSMO sought treatment (mostly at the public clinic), a difference that could be reasonably attributed to the previous program efforts spent in outreach program for MSM in Cambodia.

Many STIs result in breaks in the skin in the form of cuts and sores so facilitate transmission of HIV by increasing the risk of blood coming into contact with semen or vaginal fluid. Having an STI will also increase the number of CD4 blood cells in circulation and at the site of infection (e.g., genitals). As this is the cell the HIV virus targets it means that if HIV viral particles enter the body there is more opportunity to successfully infect that person.

MSMW are a particularly important bridging population because, as a man, the risk of acquiring HIV through unprotected anal sex (insertive or receptive) is much higher than the risk during unprotected vaginal sex [13]. During unprotected vaginal sex, women are more at risk of acquiring HIV than men. This means that if HIV is introduced to an MSM network and an EW network at the same time, and condoms are not used consistently, HIV from the MSM network is likely to reach wives and partners before HIV from the EW network.

Figure 20 indicated that HIV transfers more readily from a man than from a woman. An EW is more likely to get HIV from an HIV infected male than a male is likely to get HIV from an HIV infected EW.

Figure 20. HIV transmission patterns among sexual partners



The fact that a high proportion of MSMW have reported STI symptoms is concerning for two reasons: firstly that the presence of cuts or sores in the genitals further aides HIV transmission in an already risky bridging population, and secondly, it acts as evidence that condoms are not being used (only 50% MSMW reported using a condom correctly last time they paid a male or female for sex). Furthermore, many STIs tend to be asymptomatic for the majority of affected patients so if 51.5% of the MSMW are accurately reporting a symptom, it is likely that many more MSMW have asymptomatic infections. Previous research show that approximately 45% gonorrhea infections [14] and 70% Chlamydia infections in women and 50% in men [15,16] are asymptomatic.

The questions regarding STI symptoms are proxies for presence and diagnosis of an STI. Although this is a common indicator of screening at health facilities, it cannot be used for accurate screening. An additional study into screening and diagnosis of different STIs in Cambodian at-risk males would be useful to validate this proxy measure or try to identify a more efficient screening method.

Knowledge of HIV and Services

Knowledge of HIV was lower than previous data from other studies. One-fifth of participants thought that they could get HIV from a mosquito bite and a quarter of them did not think that a healthy looking person could be infected. Alarmingly, but less surprisingly when considering previous years' BSS data, only 54% thought that having sex with one infected partner would reduce your risk.

Three-quarters of people knew where to go for HIV testing if they wanted it but this percentage was statistically higher in MSMO (84% compared to 72.4% in MSW). This could be explained by the difference in sources of HIV IEC reported. In all groups, the most common source was mass media. MSM, however, were far more likely to report having received IEC from outreach workers or NGO activities as well.

Lower proportions of knowledge of HIV and STI services might be associated with less STI and HIV service uptake, with a third fewer MSW than MSM reporting having had an HIV test. This clearly shows that MSW are disadvantaged by a lack of appropriate awareness materials or programs.

Many NGOs work with MSM to minimize HIV risky behaviors and promote HIV testing as this is a known 'at-risk' population. It is very difficult to target clients of sex workers (the MSW population in this study) for HIV interventions although they are also known to be at an elevated risk of HIV transmission. PSI has wide campaigns for normalizing condom use which have supported the increase in condom use during transactional sex, but outreach workers do not approach male clients in the same way that they do to MSM and EW populations.

The reason for the popularity of outreach programs targeting EW and MSM could be due to the 'marginalized' status of EW and MSM, resulting in these populations having more to 'gain' from attending NGO events and interacting with peer educators. It is beneficial for them to know more about their rights, or support groups and as part of these messages, they receive health messages. Alternatively it could be because there has not been the political will, international or national, to specifically target male clients (MSW) for intervention activities and messages so far. Perhaps if additional activities or outreach workers targeted male clients, a rise in knowledge of HIV or available services would be observed.

VCCT Uptake

The impact of the knowledge level of HIV services was clearly seen in the proportion of individuals in each group who had tested for HIV previously; 76.8% MSMO, 73.9% and only 55.1%, again demonstrating the clear need for programmatic focus on MSW. The most popular place for all groups was the VCCT site (more so for MSM than MSW). People who received testing at government VCCT sites were satisfied with services there indicating that quality of VCCT services may not be a reason for low uptake levels.

In 2009, the MoH started to introduce linked response services throughout Cambodia where people can receive HIV tests at many more health centers than before. It will be interesting to see how testing rates within the general population and high risk groups change over the next few years. More HIV testing centers, cutting down travel and waiting times for clients, could well increase testing rates. Alternatively the people who go for regular HIV testing will just travel a shorter distance to get their test, so testing rates will not be affected.

The data from this study show that people who felt 'at-risk' of having HIV were less likely to get tested than those who did not feel at risk of HIV. It is known that people with higher SES and education levels access screening services more regularly than people have lower SES and education. Likewise HIV risky behaviors (such as MSM and frequent sex with sex workers) tend to be considered clandestine so people who practice these are likely to not come forward for screening. This means that the people most at risk of HIV often do not come for screening unless there is a reason for them to suspect they have HIV. Alternatively, it could be that the questions are not phrased clearly enough and people that had tested for HIV previously (and are seronegative) do not feel that they may have HIV, because they know that they do not have HIV.

The reasons for the BROS Khmer bus being popular, such as rapid results, flexible operation hours in evenings and on weekends, and shorter travel distances can be taken into account when trying to increase testing rates. Opening more VCCT testing sites can help reduce travel times but if it is not possible to open services during evenings and weekends, a mobile testing approach could potentially fill this gap to provide HIV screening to at-risk populations. Likewise, a mobile unit that is private or NGO-led, could encourage people who are nervous about reporting behaviors to 'official' institutions to have access to testing. After being reassured by VCCT counselors in a less 'official' role within the mobile team, they may feel more comfortable attending formal VCCT sites in the future.

Sexual Partners and Condom Use

Overall, correct condom use (using one condom for the full duration of intercourse) was low. Within all groups it ranged from 50.0% (MSMW and male paid partners) and 68.8% (MSMO in group sex). Many men, particularly MSMO, also reported using two condoms at a time, highlighting a key message to be incorporated into existing programs.

Condom use was lowest for MSMW (although more MSMW reported using a condom with a non-paid male partner than MSW reported using a condom with a non-paid female). Trends of MSMO and MSMW condom use were similar, but with more MSMO reporting correct condom use than MSMW with every type of sexual partner. Interestingly, MSW had higher condom use rates with paid partners than non-paid partners while MSMW had higher rates of condom use with paid (female) partners than non-paid (female) partners.

The most common reason for not using a condom with a paid partner was that they were in a relationship. This highlights that complicated networks among clients, sex workers and sweethearts in Cambodia. It repeats what is known about sweetheart relationships being risky as consistent condom use decreases.

Group sex was relatively common among MSW (38%) and condom use during this was low (60%) suggesting that these men are high risk of HIV acquisition. There was also no distinction in the questionnaire between consensual group sex and the practice of 'bowk' or gang rape, which is an extremely high risk activity for HIV transmission for the woman involved. Previous qualitative research has tried to explore this growing phenomenon in Cambodia, particularly the reasons for it [17], but additional extensive quantitative research is needed to determine how wide-spread an issue this is.

Interestingly, levels of condom use from this study were lower than levels reported from the NCHADS surveillance data. Rates of correct condom use reported by MSW with paid partners were very different to rates reported by entertainment workers in the BSS. These differences could be explained by the difference in populations recruited into the studies. The BSS 2007 and 2010 use moto-dop drivers or moto-taxi drivers as a proxy for male clients where the BROS Khmer study screened participants to ensure they are at-risk males. This suggests that the data in this study could be a wider representation of a 'male client' population.

The differences could also be explained by the removal of reporting bias due to the use of the ACASI. In BSS, data are collected via face-to-face interviews and it is known that the information is for the surveillance use. This will naturally lead to some reporting bias as participants want to report 'good' or 'socially desirable' behavior. The anonymous nature if the ACASI allows participants to report clandestine activities without fear of negative repercussions is shown in Figure 14.

Alternatively, the results may have been affected by interview fatigue. The questionnaire aims to answer many questions unambiguously. Perhaps the automated nature of the ACASI set up, as opposed to the personal interaction of an actual interviewer, results in participants rushing through some sections and not answering as accurately. It is important to adapt the ACASI so that it is more interactive. Future studies can benefit from the reduced reporting (and interviewer) bias and more interaction and stimulation than with a face-to-face interviewer.

It was also interesting to see that the relationship was not direct for MSM with transactional partners. In these cases, men who used condoms inconsistently were more at risk of HIV than those who never used condoms. One possible reason for this would be that men who use condoms occasionally feel that they are protecting themselves from HIV so practice more risky behaviors.

This phenomenon has been compared to the use of seatbelts: when people wear seatbelts, they drive much faster and so although the rate of death due to road traffic accidents decreases, the overall number of road deaths stays static[18]. The authors argue that while some risk-adverse individuals who were unlikely to contribute to the HIV epidemic will be protected, many individuals will compensate for an increase in condom use with an increase in number of sexual partners. By increasing the number of sexual partners, but not dramatically increasing condom use, the individual is actually putting themselves at a greater risk of HIV infection.

Alcohol and Drug Use

Injection drug use is a high risk activity in its own right, but non-injection drug use and alcohol use are also known to negatively affect condom use. Alcohol use was much more common among MSW and MSMW: 25% MSMO never drinking compared to 10% MSW and MSMW. MSMO were also only half as likely as MSMW and MSW to pay for sex after drinking alcohol. MSMW were much more likely than the other groups to have tried non-injection drugs or injected drugs in the last 12 months. Using drugs during sex was more common for MSM (including MSMW) than MSW. Alcohol use demonstrates again the need to differentiate between MSMW and MSMO when discussing HIV-risky activities.

HIV Rapid Testing

The proportion of participants who were HIV seropositive varied considerably, but inconsistently, by gender of sexual partner and geographic distribution. The quality control samples confirmed the laboratory procedures worked well so the accuracy should not be disputed.

HIV-Seropositive proportions in MSW in Serei Saophoan (Sisophon) and in MSM in Siem Reap stood out as much higher than the other groups. According to the field notes, there were a large proportion of high-risk

males that joined the study in Serei Saophoan from the same entertainment establishment. Many of the participants were known to be living in slum areas and many others were drug users. It is possible that were many other factors involved.

In Siem Reap, many of the MSM were sex workers whose clients included international tourists who were reported to pay more for sex. It is possible that with increased earning potential, some may be more inclined to not use condoms. They may also be in a weaker position to negotiate condom use.

Study Acceptability

The mobile screening bus was extremely popular in all study cities. Men from various socioeconomical backgrounds and social standings came and several waited up to three hours to be able to take part. Feedback was extremely positive and future teams can be confident in this recruitment method and have as many interview ACASI stations as logistically possible to cut down waiting times. Men came on their own, were referred by friends, peer outreach workers and in several cases were accompanied by their wives.

The most significant reasons for coming to the bus related to the ease of the service. It was close to where they live, work or go out and the HIV test was rapid. Many more MSMO than MSW (or MSMW) were referred to the bus by outreach workers, which was to be expected as there are many outreach programs targeting MSM with strong focus on the use of outreach workers.

Mobile screening offers a different venue for people to receive HIV tests and therefore often attract a different population. Evaluations of mobile HIV testing have shown that people who come to them tend to be either negative for HIV, or if they are seropositive, are at a much earlier stage than those who test at stationary clinics, defined by CD4 counts [10]. This suggests that people who suspect they are at higher risk or might be already sick with HIV related illnesses will travel to VCCT clinics, but that many other people do not. If it is easier for these people to get a test, they will do. Although many of these people will be negative, it represents an important screening opportunity for those who are not to access services in a more timely and flexible fashion than they may do otherwise.

CONCLUSIONS

Fundamentally, it has become apparent that MSM cannot be described and treated as one, homogenous group. There are distinct differences between MSMO and MSMW. Whereas some MSMW benefit from MSM targeted interventions so have better knowledge of HIV services; however, many MSMW do not self-identify as MSM that they may not be reached by any MSM prevention programs. The MSMW interviewed in this survey had higher risk sex (e.g., low condom use with all partners and reduced access to STI services) and represent a major "bridging" population in the Cambodian context. Therefore, some programmatic prevention approaches would be needed to target this high-risk male population.

The MSW in this study repeatedly had lower levels of knowledge about HIV, including prevention and treatment available which directly impacted on service uptake. The increased knowledge of MSM could be attributable to the outreach work focused on this population and it is important to try and look at ways MSW could benefit from a similar model or strengthen existing programs focused on male clients of sex workers if the outreach worker model is not effective. Male-clients of sex workers represent a key population in the Cambodian HIV epidemic, and with only 51-61% of MSW reporting correct condom use at last sex (percentage depending on type of partner) and only 55% reporting having had an HIV test in the past 12 months, more needs to be done to encourage these men to take responsibility for their health and the health of their sexual partners.

The Bros Khmer bus model was extremely effective and more can be done to strengthen the ACASI framework. If questionnaires need to be more than thirty minutes, they must be made more interactive to reduce interviewer fatigue. This method of recruitment offers a new and exciting opportunity to carry out research with some hard-to-reach populations. FHI 360 will seek further collaboration with NCHADS to conduct more research on the risk behaviors among at-risk male population, such as the second phase of BROS Khmer study by using a cohort study design to continue to observe risk behaviors among this at-risk male population in urban areas.

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APPENDIX 1. SUMMARY FIELD NOTES OF BROS KHMER STUDY

Prepared by: Dr. EM Sovannarith, Study Coordinator
Timeframe of BK study: March to November 2010

On behalf of the BK team, I Dr. Em Sovannarith, would like to express our sincere thanks to Dr. Kai-Lih Liu, SI AD, Mr. Prum Virak and Mrs Ngor Somany, officers in SI department and any other staff involved. In particular I would like to thank the BK team members who have worked hard to achieve huge results from 1st March to the end of October 2010.

I would like to present my summary report of this field data collection process from the beginning to the end-period of the study:

From 22 – 28 February:

During this period, we conducted some start-up activities:

- During the fourth week of February, BK Coordinator reviewed the study protocol and questionnaire in order to finalize all Khmer-versions as well as to understand all process of the study technically.
- To arrange schedule for meetings and orientation with key IAs and Provincial AIDS Office and provincial authorities.
- To plan and procure some related materials/equipments for laboratory blood testing and van equipped with electric system, air-conditioning, ACASI tables and sound-proof room.

From 1 – 5 March 2010:

- We had arranged to go for site visits and orientation meetings with Provincial Health Department of Battambang and Banteay Mean Chey and IAs.
- To finalize and print out all mapping sites/locations of MSMs and EWs for BTB , Poi Pet and BTM.
- To arrange all training materials for BK team.
- Arrange and request laboratory materials for the field work

From 8 – 19 March 2010:

During this period, we carried out the following activities:

- Training for BK study, these include: Lab procedure for HIV testing, and ACASI management, field work procedure and management, understanding the questionnaire, research methodology and objectives, tasks and roles to manage in the field data collection process, counseling skill, data management and computer maintenance.

- Preparation of all related materials/equipments for field work.
- Presented all key processes and methodology of the study to staff from MSM and EW IAs at Tonlebasak Restaurent.

From 23 March – 2 April 2010: Field data collection in Battambang city

In Battambang City, the BK team had spent around 10 days in this city in order to collect all 300 sample size. We started work on 23rd March and finished on 1st April.

In the process of field data collection, we observed that:

- We had orientated PAO and IAs in advance about all process of the study in order that they could understand and collaborate with us well before going to the field.
- We had distributed T-shirts, referral cards, mapping sheet to our IAs and PAO staff.
- We had sent a letter to get permission from the Provincial Governor in order that we could proceed well to work in the field without disturbance.
- CWPD, MHSS and PAO staff had good collaboration with the BK team in every step of the task.

As a result, in this city we noted that:

- We collected 100 MSM and 200 Men that included 3 HIV-Serum Positive (all are MSW)
- It is noted that in this city, many MSM and high risk men were attracted by our mobile van.
- Most MSM who had participated in the study, were observed to be referred by their outreach workers.
- The parking locations were frequently near city-parks, big streets and entertainment places like massage parlors, Karaoke, restaurants, beer gardens. Mapping brothels were observed to shut down.
- The working time was mostly between 15h 30 and 22h 300.
- Blood testing - was noted to have proceeded well with majority using venous- puncture, because according to the protocol with 10 drops for DBS and Rapid-tests.
- Finger-prick was observed to be in minority of participants, because they were scared of the finger-prick method.
- All blood samples (DBS) were stored in appropriate condition like cool room temperature (below 25 oC) in order to maintain quality.
- Every day, each team member, needed to prepare a lot of things; all materials, lab materials, cool-boxes, incentives for participants, computers/I-pods, data back-up, medical waste management, as well as other printing materials for the next day.
- ACASI – Interview questionnaire – seems to be taking longer than later on – but most participants could do it well.
- Some MSM were observed not to respond properly to question 103 regarding having sex with men.

From 4 April – 22 April 2010: Data collection in Poipet city

The team traveled from Battambang city to Poipet city on 4th April 2010 in order to start up the field work of data collection in this city. On 5th April 2010, our team started the field work with the support from PHD staff and director of Banteay Meanchey and our IAs (MHC and PFD) in order to continue data collection in that city.

We parked our mobile van at 5 different hot-spots for MSM and high-risk men.

Overall results and observation:

- We enrolled at around 100 MSM and 100 Regular Man.
- Identification of 1 MSM as HIV-Serum positive

- Smooth participation from MSM and high risk men
- Some MSM are still referred by outreach workers.
- Some high risk men referred by walked-in
- It is noted that there was good support and collaboration from Provincial AIDS Office, MHC and PFD outreach workers.
- Working time is started around 16h00 to 23hoo.
- In this city, some MSM and high risk men were mobile between Cambodia and Thailand land.
- Some MSM and high risk men in this city were reported that selling sex for money is their first choice.
- Many high risk men from slum areas seem to use drugs and substances
- Long-hair MSMs prefer selling sex through the channel of rural dancing (Thong Bass).
- Many high risk men were coming from city slum areas where they used drugs.
- It was difficult to find a good room for storing our materials and blood samples.
- Parking places were mostly at national route No.5, nearby pagodas and Casino parks. City streets are mostly too narrow and small that could not allow our van to park.

From 24 April – 5 May 2010: Data collection in Sisophon city

The team of BK traveled from Poipet city to Sisophon city on 24th April 2010, in order to begin the field work on 25th April 2010. Before going to field work, the team had the meeting with MHC, PFD and PHD staff in order to inform them the process of collaboration.

We started the first day of our data collection on 25th April 2010 in the city at a Railway location where many brothels/massage houses are surrounded by low-class hidden sex workers and high-risk men and drug users.

From 25th April - 5 May 2010, our team accomplished the enrollment of around more than 204 participants. Among these participants, we identified 7 cases as HIV positive.

Overall results and observation/constraints:

- 100 MSM and 104 high-risk men were enrolled in the city sample size.
- 7 HIV –Positive blood-tested identification with 2 MSM
- The starting time for recruitment of participants was between 15hoo and 22h00.
- Some MSM were still referred by outreach workers from hot-spot places
- In this city, there were many long-hair MSM who had participated in our study.
- The parking location was mostly at city park and railway station.
- During this period, the government just issued a special PRAKAS to shut down the entertainment places.
- Finger-Prick method was still difficult with 10 drops of blood needed for DBS.
- It is appeared that all participants recruited and screened - no one refused to join the study.
- Well support from PAO managers and MHC staff to facilitate the recruitment of participants.
- Many high risk men from slum areas seem to use drugs and substances
- Get permission letter from provincial governor to proceed with the field study in appropriate manner.
- All blood samples (DBS) and Rapid-test kit were stored in appropriate environment like cool room temperature (below 25 oC) in order to maintain its quality.
- Every day, each team member, need to prepare well prior going to field work, all materials, lab materials, cool-boxes, incentives for participants, computers/I-pods, data back-up, medical waste management, as well as other printing materials for tomorrow day.
- Hot-season is also the main challenge to team members.

From 6 May – 18 May 2010: Data collection in Siem Reap city

On 6th May, the Team had traveled from Sisophon to Siem Reap city, in the afternoon we had a meeting with PAO staff and MHC/CWPD managers/staff and outreach workers in order to involve all partners to arrange the field data collection.

In collaboration with the Provincial Health Department Director we informed and got permission from local authorities and Provincial Governor to issue a permission letter and support our study.

On 7th May, BROS KHMER STUDY team had begun the field data collection in Siem Reap city. There were 12 days for the data collection and our team has accomplished all 250 sample size recruitment in this city that included 100 MSM and 150 Regular Men.

Among these 250 participants, we had identified 6 HIV-Sero positive through blood testing by using Finger-Prick and Veni-puncture method. We identified 4 HIV Sero-Positive among general MSM recruited.

Overall results and observation/constraints:

- We identified 4 HIV Serum-Positive as MSMs and 2 HIV-Serum Positive as high risk men
- Most blood drawings were observed to use finger-prick method
- Most MSM could not come during the day to their hot-spot park or riverside, this is due the police.
- Small and narrow streets in the city made it difficult to park our van.
- Some long-hair MSM were referred by walked-in from city centre, night market or cafe shop or restaurants that are locating nearby the survey sites.
- Many long-hair MSMs seems to prefer and engage in sexual sale for international tourists because they would gain higher incomes.
- We had good support and collaboration from our IAs' staff (MHC and CWPD) as well as the Provincial Health Department to accomplish our task in a timely schedule which was completed on 18 May 2010.
- All field data collection in this city has been observed to be operated between 15hoo to 23hoo at the most concentrated venues and gathering places of MSM and high risk men, in particular at the riverside venue.
- We updated and added more questions into ACASI on 7th May 2010, after updating, we have observed most participants could understand and respond well with the ACASI.

From 19th May to 30th May 2010 in Kampong Cham city:

The team of BK traveled from Siem Reap city to Kampong Cham city on 19th May 2010 in order to start up the field work.

On 20th May – we orientated meeting with MHC and PSAD staff/volunteers in the purpose for how to organize the schedule and recruitment of voluntary participation for the study.

We begun our field data collection on 21st May 2010 in Kampong Cham city at Riverside park where is surrounded by high risk men and MSM.

From 21 to 30 May 2010, our team had accomplished:

- The enrollment of 200 participants. Among these participants, we had identified 2 cases of HIV positive (all MSM).
- Most blood drawings were observed to use finger-prick method
- In general, we completed all target sample size as planned schedule.
- Most high risk men were referred by walked-in
- Some MSM were referred by outreach workers

- All field data collection in this city has been observed to be operated between 15hoo to 22hoo at the most concentrated venues and gathering places of MSM and high risk men, in particular at the riverside venue.
- We have observed that in this city, not so many MSM gathering in the park or riverside like other cities,
- PE/PF of MHC could help to inform our van locations to them.
- Almost all participants could do ACASI.
- We had good support from our PHD partners as well as IAs volunteers and staff.

From 3 to 14 June 2010 in Sihanouk city:

In general, we our field work ran smoothly here. In collaboration with CUD (KHANA'S MDM-Implementing agency) and Provincial Health Department (PAO) we parked our mobile van as scheduled, however, it was challenging to recruit MSM in this city. The main reason for this was that PSI just conducted a behavior survey and provided 3$ cash incentive for every individual.

The overall results:

- On 2nd June, BROS KHMER TEAM has prepared necessary materials/equipments related to the study in order to plan and traveled for Sihanouk city.
- From 3rd to 14th June, for 11 days of data collection, we have recruited 100 MSM and 100 regular men.
- Identified 2 HIV-serum-positives among high risk men only
- MSM – all 100 are negative with HIV
- For Finger-Prick, we had 176 over 200 (87%) participants who are taken through this route.
- Getting permission and support by the Provinical Governor to continue our study.
- We had a good collaboration and support from PHD director/staff and implementing partners (CUD-NGO).

General observation:

- Many MSM were ashamed to join our study; this is might be because they were of a high status of economic class, even-though, the outreach workers tried to inform them about the study.
- Raining season had disturbed the team to recruit target MSM and high risk men in the city
- Real number of MSM in Sihanouk city seems to be over-estimated as this is difficult to look for MSM recruitment.
- It is very hard to look for recruitment of MSMs in this city

From 17 to 30 June 2010 in Kandal city:

- On 16nd June, BROS KHMER TEAM has prepared necessary materials/equipments related to the study in order to plan and traveled for Takhmoa city.
- On 17 June 2010, the team of BK has started up the field work in Takhmoa city and Kien Svay district During 14 days, our mobile van has parked at different location in Takhmoa and Kien Svay district. We had proceeded well with the support from PAO, KANHA and CWPD staff and PE/PF to screen for 100 MSM and 150 regular men.

Overall results:

- 250 participants were recruited for the study including 100 MSM.
- There was at least 2 HIV-Serum positive through Rapid-Test – 1 MSM and 1 regular man
- For Finger-Prick, we had over 90% participants use this method.
- Good collaboration with KANHA, MHC, CWPD AND PHD/Operational district of Kien Svay

General observation:

- All field data collection in this city has been observed to be operated between 15hoo to 22hoo at the most concentrated venues and gathering places of MSM and high risk men, in particular at the riverside venue and city parks.
- MSM population is not staying only in the city – They are spread around and along Kien Svay district and Mekong River.
- Some other MSMs from other district, knew about this study so they want to join our study in particular from PSI –NGOs

From 6 July – 27 October – Data collection in Phnom Penh city:

On 1st and 2nd and 3rd July:

We had 4 meetings with Provincial AIDS office, MHC, KHEMARA, CWPD, MHSS in order to inform and orientate them on the data collection process and field facilitation to recruit target population.

On 6th July: we had prepared and arranged our lab materials/equipments/ incentives ahead of field data collection in Phnom Penh.

From 7 July onward:

BROS KHMER STUDY team started on 7th July the field data collection in Khan Daun Penh, in collaboration with Municipal AIDS manager, in order to inform local authorities and Municipal Hall to support and permit for our study process.

Overall results:

- Following the duration of 4 months for the data collection in Phnom Penh, our team accomplished recruiting all 1400 people needed (including 300 MSM).
- The blood testing has been taken through Finger-Prick to be observed at around 87% of overall 1400 participants.
- 31 HIV- Serum positive among 1400 participants
- 12 HIV – Serum positive among MSMs – it is observed long-hair MSM is higher risk and higher HIV positive proportion than short-hair.

General observation:

- All field data collection in this city has been observed to be operated between 16hoo to 23hoo at the most concentrated venues and gathering places of MSM and high risk men, in particular at the centre of the city such as national parks, big streets, MSM hot-spots, pagoda, riverside and national stadium.
- We extended our time schedule for data collection to nearly 4 months because of many holidays, raining days and it was difficult to find MSM groups.
- MSM population in Phnom Penh seems to have higher levels of risky behavior than the provinces, in particular long-hair MSMs.
- HIV Positive men seemed to be at hot-spots like parks, railway stations, Wat Phnom Park.
- We collaborated with KANHA, MHC, KHEMARA, MHSS AND KDSO, some other MSM were recruited from community hot-spots.

General CHALLENGES and CONSTRAINTS encountered from the Study:

- Encountered 6 months period of heavy rain falls
- Small and Narrow locations for Bus parking
- Time constraint between cities to inform authorities

- Some very high risk MSM not participated in the study
- Scared about security in some place at night-time
- In some cities, it is difficult to recruit for MSM

Lessons Learned:

- Dedication and Devotion to the task and Spiritual Team Work is a key success for study like this.
- Sharing knowledge and experience among team is very important
- Helping each other among the team is very important
- Collaboration with partners is needed to achieve our results – in particular with different authorities, government health authorities and local NGOs.
- Quality Control of sample – it shows that all random DBS cards were good in quality
- Storage Management of DBS and Rapid –test kits need to be well arranged and managed
- How to keep cold-chain for storing rapid-test and DBS.
- How to prepare and manage for infection control in the process inside of Van.
- All step and process inside the van need to be taking into attention and appropriate management.

All the above descriptions in my summary report are drawn from and reflect my own field observations, implementations and experience.

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