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Assessment of Risk Factors for HIV Infection in Female Sex Workers and Men who have Sex with Men in Ciudad del Este, Paraguay

Horizons Program/Population Council

National AIDS Program, Ministry of Public Health and Welfare, Paraguay

Regional AIDS Program of Alto Parana

Assessment of Risk Factors for HIV Infection in Female Sex Workers and Men who have Sex with Men in Ciudad del Este, Paraguay

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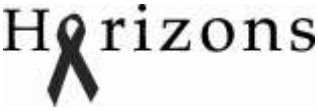

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Abbreviations

CDE	Ciudad del Este
CI	Confidence interval
FSW	Female sex worker
HIV	Human immunodeficiency virus
MSM	Men who have sex with men
MSOM	Men who have sex with men only
MSMW	Men who have sex with men and women
RDS	Respondent-driven sampling
STI	Sexually transmitted infection
VDRL	Venereal Diseases Research Laboratory

Executive Summary

The HIV epidemic in Paraguay is concentrated in groups traditionally considered to be most at-risk. For example, the HIV prevalence is estimated to be 2.6 percent in sex workers (Bautista et al. 2006) and 12 percent in men who have sex with men (MSM) (Bautista et al. 2004). The epidemic is concentrated in urban areas, with the highest prevalence found in the capital city, Asunción, and in the border areas with Brazil and Argentina (Alto Paraná, Itapua, and Amambay departments).

Ciudad del Este (CDE), the capital city of the Department of Alto Paraná, is located in the eastern region of Paraguay bordering Brazil and Argentina. This border city is strategically important for HIV because of the high concentration of high-risk populations such as truck drivers, sex workers, and drug users, and the social and economic conditions, such as significant legal and illegal trade, economic inequality, and violence, create the structural conditions for high transmission of HIV and other sexually transmitted infections (STIs). There is also high flow of people between CDE and its Brazilian neighboring city of Foz de Iguaçu, located in the southern region of the country, which is the Brazilian region that has the highest AIDS incidence rate (26.3 cases per 100,000) (Ministerio da Saude 2006).

Formative research conducted by Population Council/Brazil, supported by the USAID-funded Horizons Project, found that the populations at greatest risk for HIV and STIs include men who have sex with men (MSM), female and male sex workers, adolescent victims of sexual exploitation, and men in prison. It also found that there was an urgent need for implementation of effective STI and HIV prevention interventions in these populations.

To respond to this need, the USAID Mission in Paraguay and Population Council/Brazil, in collaboration with Horizons and National AIDS Program of Paraguay, conducted a study to estimate HIV and syphilis prevalence among female sex workers (FSW) and MSM in CDE; examine knowledge, attitudes, and risk behaviors related to HIV and STIs; and describe the contextual and behavioral factors influencing HIV and STI transmission among MSM and FSWs in CDE. Findings provide guidance to the development of HIV and STI prevention and care interventions and further operations research to test strategies and interventions to reduce the spread of HIV and STIs in these groups.

Methods

One hundred and sixty FSW and 296 MSM who were living in CDE or a neighboring city who were at least 16 years of age and willing to undergo a syphilis test were recruited in CDE between July and December 2006 through respondent-driven sampling (RDS), a method based on participants recruiting their peers into the study. FSW included women who reported having sex in exchange for money, drugs, or gifts in the past 12 months; MSM included men or transexuals who reported having sex with a man at least once during the past 12 months.

Data collection consisted of a HIV-related risk behavior questionnaire and a blood sample for syphilis and HIV testing. The latter test was optional. Topics in the questionnaire included knowledge, attitudes, perceptions, and behaviors related to HIV, HIV/STI testing and diagnosis history; condom use, drug and alcohol use, social network, physical and sexual abuse, and exposure to HIV prevention activities. MSM were also asked about sexual self-identity.

Characteristics of the Sample

Female sex workers

The median age of FSWs was 24 years, and about three-quarters were single. Almost all of the respondents were born in Paraguay, and about two-thirds indicated CDE and a third indicated the neighboring city of Presidente Franco as current place of residence. Skin color was based on self-report; 56 percent identified themselves as brown/mulatto and 40 percent as white.

The majority of FSWs worked independently; only 20 percent reported working as a sex worker for another person. The most common place for sex work was the street (54 percent), followed by hotel or motel (29 percent) and brothels (26 percent), with 32 percent reporting working in more than one type of place. Sex work was the primary job and source of income for a large proportion of FSWs: 63 percent worked as a sex worker for more than six months of the year, and over two-thirds earned income exclusively from sex work.

Men who have sex with men

The median age of MSM respondents was 21 years, and the majority were single (86 percent). Almost all of the respondents were born in Paraguay; about half lived in CDE and less than half lived in Presidente Franco. Half of MSM identified themselves as white and 49 percent as brown/mulatto.

Key Findings

Female sex workers

Commercial sex was initiated at a very early age.

More than half of the women interviewed declared that they started working as sex workers in their childhood or adolescence, with the median age being 18 years.

Most FSWs reported having sex with regular or new clients in the past 30 days; FSWs also had non-paying sex partners.

Almost all FSWs reported having had sex in the past 30 days. Of those, more than 80 percent had sex with new clients, nine out of ten had sex with regular clients, and 71 percent had sex with non-paying partners. Among those who had sex in the past 30 days, nearly a quarter reported having sex with 16 or more new clients, and about a tenth reported 16 or more regular clients. On the other hand, most of those who reported having had sex with non-paying partners declared having had only one non-paying partner in the last 30 days.

There is insufficient use of condoms among FSWs regardless of type of partner and sexual activity.

Consistent condom use during vaginal sex in the last 30 days was significantly more common with new clients (70 percent) than with regular clients (58 percent; $p = 0.034$) and non-paying partners (18 percent; $p < 0.001$).

Approximately a third of FSWs reported anal sex with clients. Rates of condom use with new or regular clients in the last 30 days were similar, with approximately half using condoms consistently. However, consistent condom use with non-paying partners was significantly lower at 26 percent ($p = 0.008$).

The most common reason for not using a condom the last time FSWs had sex with any type of partner was the partner not wanting to use a condom.

Condom use is higher among those with more clients.

Consistent condom use varied by age, type, and number of sex partners. Among younger FSWs (16 – 24 years), those with fewer partners (0 – 10) were significantly less likely to consistently use condoms with new clients compared to those with more than 10 partners (38 percent vs. 75 percent; $p < 0.01$). However, among older FSWs (≥ 25 years), this difference in condom use with new clients between those with fewer sex partners (67 percent) and more than 10 partners (79 percent) was not significant.

However, with regular clients, consistent condom use was significantly lower among those with fewer partners compared to those with more than 10 partners in both younger FSWs (32 percent vs. 62 percent; $p < 0.01$) and older FSWs (27 percent vs. 67 percent; $p < 0.01$). Therefore, among younger FSWs, consistent condom use with either new or regular clients was less common among those with fewer sex partners. However, among older FSWs, consistent condom use was lowest during sex with regular clients.

HIV testing is low among FSWs and few are exposed to other HIV prevention activities.

Half of FSWs reported ever being tested for HIV, and only half of those who tested actually received their last test results. Three-quarters of those tested reported they received the HIV test for free, and the public health service of CDE was mentioned as the most common place where they had tested for HIV.

A low percentage of FSWs indicated being exposed to any HIV and STI prevention programs in the preceding 12 months: about a quarter had received any educational materials about HIV specifically for sex workers or participated in any kind of discussion about HIV. Less than 20 percent reported any contact with an NGO that promotes HIV prevention.

FSWs reported striking childhood sexual abuse.

Almost half of the FSWs mentioned that they had experienced sexual abuse when they were children (41 percent), when they were a median age of 11 years and the perpetrator's median age was 32 years. Approximately 16 percent of them were sexually abused several times. Almost 25 percent of them were abused either by their father or their stepfather, 27 percent by another relative, and less than 20 percent by a stranger.

HIV prevalence was low but syphilis prevalence was high among FSWs.

Approximately one percent of FSWs were found to be HIV seropositive and 38 percent tested positive on the VDRL test, an indication of current or past syphilis infection, hence indicative of lifetime risk of syphilis.

Those who tested positive for syphilis were significantly more likely to be older (> 24 years), married, and have fewer years of education. Syphilis prevalence was significantly higher among FSWs who worked on the street than those who did not. Syphilis prevalence did not differ in FSWs who reported working in other types of venues, such as hotel/motel, bar, brothel, or house/apartment.

Men who have sex with men

Most MSM did not identify themselves as homosexual; a large proportion of MSM self-identified as heterosexual or bisexual, and they have distinct sexual behaviors.

Understanding sexual identity is important in explaining sexual behaviors of MSM, and ultimately in designing appropriate interventions. A large proportion of MSM identified themselves as bisexual (54 percent; CI: 45.6 – 62.7) or heterosexual (34 percent; CI: 24.7 – 43.4); slightly more than 10 percent of MSM identified themselves as homosexuals (12.1 percent; CI: 6.9 – 18.1).

The majority of self-identified heterosexuals reported having sex with both females as well as males in the past six months (95 percent; CI: 88.7 – 98.8), and almost 40 percent (39 percent; CI: 22.1 – 55.4) of the self-identified homosexual MSM had sex with both males and females in the past six months. Further, there was a distinct pattern of the type of sexual activity practiced depending on sexual self-identity. Insertive anal intercourse (IAI) was significantly more common among self-identified bisexual (95 percent) and heterosexual MSM (98 percent) than among self-identified homosexual MSM (68 percent; $p < 0.001$), and receptive anal intercourse (RAI) was more common among self-identified homosexual MSM, with 83 percent practicing RAI compared to 43 percent of self-identified bisexual MSM and 40 percent of self-identified heterosexual MSM ($p < 0.001$).

MSM tended to have occasional sex partners more often than permanent partners but condom use is low with all types of partners.

Respondents were asked about their different types of sex partners. Occasional partners are those with whom the respondent had sex only once or from time to time and with whom he did not exchange money, drugs, or gifts for sex. A permanent partner was defined as someone who the respondent considers to be an established partner.

Nearly 90 percent of MSM reported having had occasional sex partners in the last six months. Of those with occasional partners, 86 percent had occasional male partners, and 73 percent had occasional female partners in the last six months. Less than 20 percent reported consistent condom use with occasional male partners in IAI (20 percent; CI: 10.3 – 28.9), about a third in RAI (35 percent; CI 10.2 – 57.6), and less than 20 percent reported consistent condom use in vaginal sex (12 percent; CI: 5.7 – 18.9) and anal sex (17 percent; CI: 7.7 – 26.8) with occasional female partners.

Having sex with a permanent sex partner was less common than with occasional partners, with 30 percent (CI: 24.1 – 37.5) of all MSM reporting having had sex with a permanent male partner, and half reporting having had sex with a permanent female partner (50 percent; CI: 42.8 – 58.0)). Consistent condom use again was very low; about 20 percent reported consistent condom use during IAI and during RAI with permanent male partners, and less than 10 percent used condoms consistently during vaginal sex (5 percent; CI: 1.4 – 12.7) and anal sex (8 percent; CI: 0.7 – 24.4) with permanent female partners.

A modest subset of MSM paid to have sex with commercial partners; sex with female commercial partners was the most common.

MSM were also asked whether they paid (with money, drugs, or gifts) to have sex with someone (e.g., a commercial sex partner). Less than a quarter of all MSM reported having had sex with a commercial partner in the last six months. Of those, 15 percent (CI: 1.5 – 24.0) had sex with a male commercial partner, less than a third with a transvestite commercial partner, and about three-quarters with a female commercial partner. Condom use with commercial male partners was low, with approximately a third reporting consistent condom use during IAI and almost half reporting consistent condom use during RAI.

The majority of MSM have sex with both men and women.

More than 80 percent of MSM (83 percent; CI: 75.8 – 88.3) reported having sex with both men and women in the last six months. A comparison of men who had sex with only men in the past six months (MSOM) and men who had sex with both men and women in the past six months (MSMW) showed that MSOM had a younger age of sexual debut compared to MSMW, had completed more years of education, and were more likely to currently live in CDE (than other cities or Presidente Franco) compared to MSMW.

MSOM tended to engage in receptive anal intercourse while MSMW tended to engage in insertive anal intercourse; however, condom use was very low regardless of type of partner or type of sexual activity.

There were a number of differences in sexual behaviors practiced by MSOM and MSMW. Having sex with occasional male partners was equally common for both MSOM and MSMW, with three-quarters of them reporting having an occasional male sex partner in the past six months. However, MSOM were significantly more likely to have engaged in RAI compared to MSMW (77 percent; CI: 57.2 – 93.6 vs. 25 percent; CI: 17.3 – 35.1) and significantly less likely to have engaged in IAI (61 percent; CI: 46.0 – 86.8 vs. 99 percent; CI: 95.9 – 100.0).

There was a significant difference between MSOM and MSMW with respect to having permanent male partners. MSOM were significantly more likely to have had sex with a permanent male partner compared to MSMW (59 percent; CI: 42.7 – 75.9 vs. 24 percent; CI: 17.5 – 30.7). Again, similar to sexual practices with occasional partners, MSOM were more likely to have engaged in RAI with permanent male partners than were MSMW (90 percent; CI: 72.4 – 100.0 vs. 49 percent; CI: 18.6 – 70.8).

Consistent condom use was extremely low in both MSOM and MSMW (less than 30 percent) and did not differ significantly between MSOM and MSMW, regardless of the kind of sex partner and type of sex.

A high proportion of MSM engage in sex work; male sex workers mainly had male clients, but also served female and transvestite clients.

Almost 21 percent of all MSM indicated that they currently work as a male sex worker. Nearly half of male sex workers reported also engaging in sex work in another city outside of CDE in the last year, most often either Asunción or another Paraguayan city. [Note: This may be a slight overestimation in the prevalence of male sex workers; see *Concluding Remarks*.]

Nearly all male sex workers (98 percent) reported having a male client in the last six months. Male sex workers also reported having female clients (31 percent) and transvestite clients (54 percent) in the past two months. Consistent condom use was low with all types of clients (33 percent in IAI and 46 percent in RAI with male clients, and 35 percent in vaginal sex and 33 percent in anal sex with female clients).

HIV testing is low among MSM and few are exposed to other HIV prevention activities.

Only 12 percent (CI: 8.5 – 17.0) of MSM had ever tested for HIV, about 40 percent of whom did not receive their test results. Almost three-quarters received their HIV test for free, and the most common places where MSM had tested for HIV were the public health services of Asunción (24 percent) and CDE (19 percent).

About a quarter or less had received any educational materials about HIV and STI prevention or participated in workshops about HIV. Among all MSM, only half reported receiving any free condoms in the last 12 months from a public service, NGO, or bars/night clubs.

Although HIV prevalence was low among MSM, syphilis prevalence was high.

Population estimates of HIV prevalence was 0.5 percent (CI: 0.0 – 1.2) among MSM (confirmed cases based on two HIV ELISA tests and a confirmatory Western Blot) and 1.2 percent (CI: 0.2 – 2.5) based on only one HIV ELISA test (since respondents did not return for confirmatory testing). Therefore, it is likely that the HIV prevalence among MSM is between 0.5 and 1.2 percent.

The estimated prevalence of syphilis was considerably higher at 13 percent (CI: 8.9 – 17.8). Those who tested positive on the VDRL syphilis test were significantly more likely to be older and be from CDE compared to those who tested negative.

MSOM were more likely to be seropositive for syphilis compared to MSMW.

MSOM had a significantly higher prevalence of syphilis compared to MSMW (34 percent; CI: 20.1 – 50.8 vs. 8 percent; CI: 5.1 – 12.2).

Type of sexual activity (IAI or RAI) was associated with testing positive for syphilis.

Those who practiced insertive anal intercourse with an occasional partner were more likely to be seropositive for syphilis. There was no difference in syphilis prevalence by RAI and condom use.

Concluding Remarks

- Consistent condom use is very low among FSWs, with condom use being significantly lower with regular partners and non-paying partners.
- The MSM population also had very low rates of condom use; MSM who have sex exclusively with men and have a high frequency of receptive anal sex are the most vulnerable sub-groups, as reflected in the higher lifetime risk of syphilis.
- In both FSW and MSM populations, there was a relatively low HIV prevalence, although it was higher than the prevalence in the general population. However, syphilis prevalence was very high. This finding, combined with low levels of condom use, the high level of bisexual behavior, and the low coverage of HIV/STI prevention and care services, creates a ripe environment for a rapid expansion of the HIV epidemic within and beyond these groups (through bridging behaviors) if aggressive educational prevention campaigns are not implemented and access to services is not significantly improved.
- Because the RDS recruitment method relies on participants recruiting their peers, the sample may be biased by the recruitment patterns of the participants. Therefore, inferences to the larger population of FSWs and MSM should be made with caution. Among the MSM sample, male sex workers may have been oversampled due to their larger network sizes and greater tendency to recruit other male sex workers. Among FSWs, the sample was not large enough to overcome the bias that FSWs had a high tendency to recruit other FSWs from the same place of work (i.e., brothel-based vs. non-brothel based). Therefore, the sample attained may not be representative of the larger population of FSWs and MSM.

Recommendations

Based on the results of this study we propose to:

- Intensify the promotion and ensure the wide availability of condoms in the public sector network to all vulnerable populations, including female and male sex workers, men who have sex with men, and transvestites. Condom distribution must be supplemented with other risk reduction education activities, including building motivation and skills to use condoms, promoting HIV testing, and preventing drug and alcohol use.

- Maintain the physical study site structure created for the study to offer education and services on STI and HIV/AIDS that are non-discriminatory toward these most-at-risk populations.

- In addition to establishing non-discriminatory services for these groups, consider making existing health and social services non-discriminatory and friendly to these marginalized groups, as some FSWs and MSM may not attend points of services that are known to be for FSWs or MSM. Service providers will need to be educated and sensitized on providing services to these marginalized groups, including educating them on ways to reduce stigmatizing attitudes and discriminatory behaviors towards patients in these target populations.

- Promote the implementation of or strengthen educational activities directed at FSWs and MSM, especially the most-at risk sub-groups identified in the study, such as younger FSWs, FSWs who work on the street, and men who have sex exclusively with men.

- Develop and implement HIV and STI prevention interventions targeted at the sex partners of FSWs and MSM.

- Implement a research strategy including operations research and participatory action research projects to define and evaluate intervention strategies with the objective of decreasing the risk of these vulnerable populations, including sex partners of these populations.

Introduction

HIV and AIDS in Paraguay

Reliable epidemiological data on the HIV epidemic in Paraguay is limited. Available information from UNAIDS indicates that by the end of 2005, the estimated HIV prevalence in the general population was low at 0.4 percent among 15–49 year olds (UNAIDS 2006). However, infections are concentrated in groups traditionally considered to be most at-risk; HIV prevalence is estimated to be 2.6 percent in sex workers (Bautista 2006) and 12 percent in men who have sex with men (MSM) (Bautista 2004). Approximately 40 percent of reported AIDS cases are due to heterosexual transmission and 34 percent of AIDS cases are in MSM. An estimated 74 percent of the approximately 15,000 people living with HIV are men; however, HIV prevalence appears to be increasing among women. The epidemic is concentrated in urban areas, with the highest prevalence found in the capital city, Asunción, and in the border areas with Brazil and Argentina (Alto Paraná, Itapua, and Amambay departments).

National Response

Recognizing the importance of the HIV/AIDS epidemic, the National Commission on AIDS, chaired by the National Program against HIV/AIDS (PRONASIDA) was created in 1986. However, due to economic constraints, this committee has played a limited role in combating the epidemic, especially in rural areas. Lack of trained personnel and limited managerial capacity has also hindered program implementation. Human and financial resource constraints mean that HIV prevention, testing, and treatment have not been available through public sector services in most of the country.

The strategies and interventions implemented to date have had little or no effect because they have not identified and responded to the needs of the most at-risk populations. The National Strategic Plan for the period of 2005 – 2009 states that there is an urgent need for improved epidemiological surveillance and other types of research to understand how to most effectively respond to HIV/AIDS in Paraguay. Additionally, in 2006, the Paraguay Ministry of Health was awarded a grant from the Global Fund to support projects to increase STI/HIV preventative behaviors among vulnerable populations, reduce the risk of maternal-to-child transmission of HIV and syphilis by increasing access to information and services to pregnant women, and increase the quality of life of people living with HIV/AIDS.

Importance of Targeting Vulnerable Populations in Border Areas

Ciudad del Este (CDE), the capital city of the Department of Alto Paraná, is located in the eastern region of Paraguay bordering Brazil and Argentina. This border city is strategically important because it presents the conditions for rapid expansion of the HIV/AIDS epidemic.

First, there is a concentration of vulnerable populations such as truck drivers, sex workers, and drug users. Second, prevailing social and economic conditions, such as significant legal and illegal trade; marked economic inequality; violence; and trafficking of drugs, goods, and persons create the structural conditions for HIV transmission. One of the distinctive characteristics of CDE is that it is the center of a very large and active contraband network. Additionally, CDE is separated from Foz de Iguaçu, Brazil, by the Paraná River and the Friendship Bridge, a legal border that allows free transit between the two countries, with thousands of people crossing the bridge every day in both directions for work, drug

trafficking, contraband of other goods, and leisure. Foz de Iguaçu is in the southern region of Brazil, which has the highest AIDS incidence rates in the country. In 2005, the AIDS incidence in this region was 23.8 cases per 100,000 inhabitants, while the national incidence was 18.0/100,000 (Ministério da Saúde 2006). In 2006, AIDS prevalence among adults in Foz do Iguaçu was 0.6 percent (personal communication of the Coordinator of the AIDS service in Foz do Iguaçu based on service statistics), similar to the national prevalence rate. Proximity to Foz de Iguaçu and significant legal and illegal traffic between the two cities may represent an important epidemiological HIV risk for the Department of Alto Paraná and Paraguay in general. Finally, the limited services that exist are insufficient to provide adequate HIV prevention and care programs to the local population, and the deficiencies are exacerbated by the relatively highly mobile population. The Regional Program for the fight against AIDS (*Programa Regional de Lucha contra del SIDA)* is officially responsible for HIV/AIDS related care, yet the program is still in its implementation phase and has few human and financial resources.

Figure 1 Paraguay-Brazil-Argentina triple border

Responding to the Needs of Vulnerable Populations

The Horizons Program of Population Council carried out formative research to explore the social context of the city and to identify vulnerable populations' perceptions of the most prevalent health problems, quality of social support and health services, and other factors that may influence the spread of HIV. This research, conducted among truck drivers, female adolescent shelter residents, MSM, male sex workers (MSW), street-based adolescents, FSWs, transvestites, drug users, young men in prison, health providers, adolescent victims of sexual exploitation, and local authorities, showed that the most vulnerable populations included MSM, female and male sex workers, adolescent victims of sexual exploitation, and men in prison. It also found that there was an urgent need to implement effective STI and HIV prevention interventions in these populations.

In general, the population has limited access to information and prevention services related to HIV/AIDS and other STIs. Condoms are available only in limited amounts and are restricted to FSWs, transvestites, and drug users who attend educational activities undertaken by outreach workers from the Regional AIDS Program or NGOs. At the time of the formative research, access to diagnostic tests was also very limited; HIV tests were only available to people with clinical signs or symptoms and to FSWs and transvestites.[1] The only STI treatment available was for syphilis.

To respond to this need, the USAID Mission in Paraguay and the Population Council office in Brazil, in collaboration with the USAID-funded Horizons Program and National AIDS Program of Paraguay,

[1]In November 2005, the municipal AIDS program established an HIV diagnosis and treatment service with support from the National AIDS Program. The service received equipments, diagnostic kits, and antiretroviral drugs to be offered to the general population, with emphasis on preventing mother-to-child transmission.

conducted a study to assess HIV prevalence and describe the contextual and behavioral factors influencing HIV transmission among MSM and FSWs in CDE. Findings will guide the development of further operations research projects to test strategies and interventions to reduce the spread of HIV and STIs in these groups.

Objectives

The objectives of the study were to:

1) Examine attitudes, behaviors, and perceptions of risk related to HIV and STIs among female sex workers and men who have sex with men in Ciudad del Este.
2) Estimate HIV and syphilis prevalence among FSWs and MSM.
3) Explore the relationships between sociodemographic, behavioral, and environmental factors and syphilis and HIV prevalence among these groups.
4) Characterize the social networks of FSWs and MSM and the interconnections within the subgroups and with other non-MSM or FSW populations.
5) Design an operations research project to test strategies and interventions aimed at promoting healthier behaviors.

Methods

Study Design

The study employed a cross-sectional design. Data collection consisted of an interviewer-administered structured questionnaire and a blood sample collection to test for syphilis and HIV infections in FSWs and MSM recruited into the study. Researchers used respondent-driven sampling (RDS), a method based on participants recruiting their peers into the study. Interviews and blood sample collections were undertaken between July and December 2006. Interviews were conducted in Spanish using a handheld Pocket PC to immediately record the responses. Ethical approval was obtained from the ethical review boards of Population Council and of the National AIDS Program of Paraguay (PRONASIDA).

Study Site and Staff

The study took place in Ciudad del Este (CDE), a city in southern Paraguay located at the border with Argentina and Brazil. The data collection site for interviews and the site for specimen collection for both FSWs and MSM were located in the same office, which was accessible to both groups by public transport, which was deemed important during formative assessments with these groups. The data collection site operated from 3:00 PM to 9:00 PM from Monday to Saturday. The study team consisted of a coordinator, one full-time and three part-time psychologists to conduct interviews and pre- and post-test counseling, two laboratory technicians to perform blood sample collection and centrifugation, two receptionists, and one security officer. Before the implementation of the study, the staff received a 40-hour training in quality of care; a 12-hour training in HIV/STI counseling; and a 28-hour training in study procedures, instruments, and computer-assisted interviews.

Study Populations

Female sex workers

Inclusion criteria for participation of FSWs in the study consisted of being a woman; living in CDE or neighboring cities in the department of Alto Paraná; and reporting having had sex in exchange for money, drugs, or gifts in the past 12 months.

Men who have sex with men

To be included in the study as an MSM, a man must have had sex with a man at least once during the past 12 months and be living in CDE or one of the neighboring cities. Transvestites were also eligible to participate in the study as MSM. The classification of transvestite was made by the interviewer during the eligibility process.

Classification in one of the above categories was based on self-report. In addition to the above eligibility criteria, respondents had to be at least 16 years of age, able to provide consent, able to understand and speak Spanish, and be willing to undergo a syphilis test. Written informed consent was obtained from all participants. For individuals between 16 and 17 years of age, parental consent was also obtained.

Respondents were excluded if they had participated in the study previously (determined by direct questioning) and/or if they were obviously under the influence of drugs or alcohol.

Data Collection

Those who were eligible and willing to participate in the study went through the informed consent procedures in a private area. The participant received information about the study and the informed consent procedure and was asked to sign (or mark an "X" on) the informed consent form once the study staff member confirmed that the individual understood the content. Following the informed consent process, the participant was asked to complete a structured, computer-assisted, interviewer-administered questionnaire.

The questionnaire included information on:

- Sociodemographic characteristics.
- Knowledge, attitudes, perceptions, and practices around HIV/STI risk behaviors, modes of transmission, means of prevention, and self-perceived HIV risk.
- HIV/STI testing and diagnosis history.
- Sexual debut.
- Number and types of sexual partners.
- Type of sex work.
- Condom use.
- Barriers to obtaining and using condoms.
- Drug and alcohol use.
- Social network.
- Violence and coercion.
- Participation in prevention activities. MSM were also asked about sexual self-identity and sexual self-orientation.

Pre-test counseling

After the interviewer-administered survey was completed, participants were administered individual pre-test counseling before blood sample collection, in order to ensure that they were aware of the risks and benefits of being tested for syphilis and HIV.

Laboratory procedures

Participants provided a venous blood sample following pre-test counseling. Five mL of blood were collected for HIV testing, if accepted, and for VDRL. Blood samples were centrifuged at 4000 rpm for 10 minutes in the office unit and the sera was refrigerated at 4 to 8°C until being transported to the Regional Laboratory, located at the Regional Hospital's blood bank, the following morning. Results were returned to the study site within seven days.

The Regional Laboratory performed HIV and syphilis tests according to Ministry of Health of Paraguay's diagnostic guidelines. Antibodies to HIV were detected by ELISA (Murex Biotech Limited, Dartford, Kent, England) and reactive sera were confirmed using Western Blot (Geneslab Diagnostics, Singapore). Antibodies to Treponema pallidum were measured by the qualitative and quantitative Venereal Disease Research Laboratory (VDRL) test (Wiener Lab, Buenos Aires, Argentina).

Post-test counseling and referrals

All participants who gave a blood sample for a syphilis test, and/or who chose to undergo HIV testing were scheduled for a follow-up visit to receive post-test counseling one week later. After receiving his/her test results at the post-test counseling session, those who tested positive on the VDRL syphilis test were referred to the Regional Hospital for syphilis treatment.

Participants with positive HIV test results from the ELISA test were requested to provide more blood for confirmatory testing (Western Blot). If the Western Blot was also positive, participants were referred to the Regional Hospital.

By the end of data collection, 247 participants (54 percent) had returned to receive their test results. A total of 108 FSWs (68 percent) and 262 MSMs (89 percent) gave authorization to be contacted by staff, and those who failed to pick up their VDRL or ELISA HIV test results within 30 days were contacted, using contact information gathered during pre-test counseling. Tests results of those who did not come for post-test counseling were given to the coordinator of the Regional AIDS Program for further contact and to schedule a visit. Of the total participants that received tests results, 142 (58 FSW and 94 MSM) were referred to the Regional Hospital for treatment; by the end of the study, 36 participants had received care from Regional AIDS Program staff. In addition, approximately 60 participants were referred to other health services, including gynecology and obstetrics, general care, and laboratory.

Recruitment

Recruitment of respondents was conducted using the respondent-driven sampling (RDS) method. The RDS sampling method has been increasingly used in research with hard-to-reach or "hidden" populations such as MSM and sex workers for whom a sampling frame is difficult to define. This method uses participants to perform the recruitment by inviting their peers to participate, and is based on a dual system of incentives, i.e., for participating and for recruiting other participants from among their peers. This method of sampling can provide unbiased population estimations of the variables studied based on a model that takes into account the network size of participants and the recruitment patterns (Thompson 1996; Thompson 2000; Salganik 2004; Heckathorn 1997).

For recruitment and analysis, FSWs and MSM were treated as two separate samples, and the data were stored in two different databases. In other words, each group could only recruit participants into the same group; FSWs could not recruit MSM and vice versa. The initial recruiters, called "seeds," were selected non-randomly and separately for each study population. Each seed received three unique, non-replicable recruitment coupons to give to their peers who also fit the eligibility criteria for the study. Those people meeting the inclusion criteria who came to the study venue with a recruitment coupon were eligible to participate in the study. These participants in turn received coupons to invite their peers to participate. Respondents received a compensation equivalent to US$6.50 for participating in the study and the

equivalent to US$3.50 for each person invited by the participant who was considered eligible and who agreed to participate in the study.

The seeds were selected based on sociodemographic characteristics so as to mirror the diversity of the members of the MSM and FSW populations. The potential seeds were identified during formative research and at the beginning of data collection, based on their characteristics, and were invited to an interview with the project coordinator to determine if s/he was eligible, would be able to recruit people, and would agree to participate. Those who were considered acceptable after the interview and agreed to participate were invited to participate in the study, complete the questionnaire, give a blood sample for HIV and syphilis tests, and accept three coupons to invite their peers to participate in the study.

Recruitment results for FSWs

The recruitment started with three seeds, and subsequent seeds were added to boost recruitment after the first month (two in the second month and four in the fourth month) for a total of nine seeds. The target sample size was 425, but only 160 FSWs (including seeds) were recruited between July 1 – December 7, 2006. A total of 480 coupons were given to participants to recruit their peers, and 165 were brought back to the study site by people who were recruited by participants. Of them, 11 were ineligible for reasons listed in Table 1 and three did not return after re-scheduling their visit, yielding a total of 160 FSW participants (including seeds). There were no refusals among FSWs who arrived at the study site and were found to be eligible. None reported being recruited by a stranger, selling coupons to someone else, or pressuring someone to participate in the study. Three participants reported having received additional coupons from other participants.

A total of 49 FSW participants returned to the study site to collect their secondary compensation for recruiting their peers and agreed to complete a brief self-administered questionnaire about their experience recruiting their peers, including the number of refusals by FSWs they tried to recruit and reasons for refusals. Of the 49 respondents, 14 (29 percent) indicated that at least one of their peers refused to take the recruitment coupon. The most common reasons reported by FSWs who reported on their peers' refusal of recruitment coupons were that their peers feared the lack of confidentiality with participation or with test results (29 percent), feared disclosure of their status as sex workers (18 percent), and had a lack of interest (8 percent).

Recruitment results for MSM

The recruitment started with five seeds and one seed was added to boost recruitment in the third month for a total of six seeds. The target sample size was 400, but 296 were recruited (including seeds) between July 6 and December 5, 2006. Eight hundred eighty-eight coupons were given to participants and 378 invited peers arrived with a valid coupon; 88 (23 percent) were ineligible for reasons listed in Table 1, yielding a total of 290 MSM (excluding seeds) recruited and registered as participants. There were no refusals among MSM who arrived at the study site and were found to be eligible. Among the study participants, four reported being recruited by a stranger, and none reported selling coupons to someone else or pressuring someone to participate in the study. Six participants reported having received additional coupons from other participants; of these, one did not remember what happened with the additional coupon received, four had not handed out any additional coupons received, and one handed out both coupons received to an acquaintance.

A total of 133 MSM participants returned to the study site to collect their secondary compensation for recruiting their peers and agreed to complete a brief self-administered questionnaire about their recruitment experience. Of those, 28 (21 percent) mentioned that the coupon was refused by at least one acquaintance. The main reasons for refusal were fear of disclosure of their status as an MSM (68 percent), fear about lack of confidentiality with participation or test results (43 percent), lack of time (25 percent), and not wanting to be tested for syphilis (25 percent).

Table 1 Reasons for ineligibility

Reasons	FSW #	MSM #
Does not speak/understand Spanish	3	10
< 16 years of age	0	1
16 – 17 years of age without parents' permission and does not speak/understand Spanish	1	6
Did not exchange sex for money or gifts at least once in CDE in last 12 months	7	N/A
Non-MSM or did not have sex with man/transvestite in last 12 months	N/A	53
Participated before	0	3
Unknown	0	15
Total	**11**	**88**

Data Analysis

Preliminary data analysis consisted of examining network structures and recruitment patterns based on key attributes of respondents, including city of residence, place of sex work (for FSWs), self-identified sexual orientation (for MSM), and age, using NetDraw 2.33, a network illustration program. Both databases were analyzed using STATA 9.0 to obtain the estimation of the samples. RDS population estimates were obtained from RDS Analysis Tool version 5.6 (RDSAT); the parameters used were 15,000 bootstraps and imputation of 5 percent of the outliers for the network size.

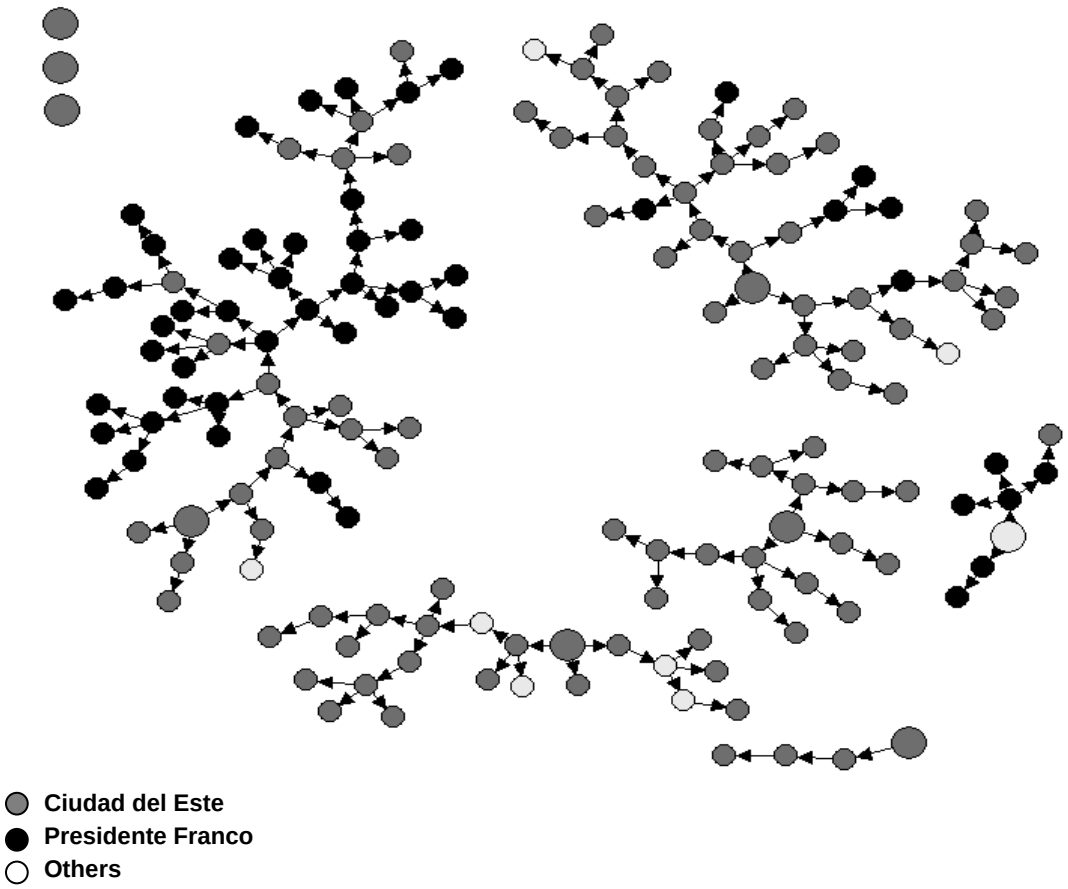
In order to analyze the data using RDSAT to produce population estimates, certain requirements must be met. In the FSW dataset, the data did not reach equilibrium[2] based on city of residence (CDE and Presidente Franco), which would result in biased population estimates. The lack of equilibrium was due to the strong tendency of participants to recruit others from their respective cities and the small number of recruitment waves, as illustrated in the recruitment pattern in Figure 2. Further, the city of residence was significantly related to some key behavioral indicators, such as number of sex partners and place of sex work. Those in CDE were significantly more likely to have more sex partners and to work in brothels. Therefore, because the FSW dataset did not reach equilibrium on an important variable such as city of residence, the data was not analyzed using RDSAT. Instead, sample percentages from STATA are presented.

The MSM data, however, did attain equilibrium on key variables such as city of residence and self-identified sexuality. Therefore, population estimates and 95 percent confidence intervals (CI) from

[2]A sample is considered to have reached equilibrium when the composition of the sample no longer changes with additional waves of recruitment.

RDSAT are presented for most variables. For some variables, the sample was too small to calculate valid population estimates, in which case sample percentages from STATA are presented.

Figure 2 Recruitment pattern of female sex workers by city of current residence*



* The 9 larger circles represent seeds and smaller circles represent subsequent recruitees. The three seeds at the top left of the figure were unproductive seeds (i.e., they did not recruit any participants).

Study Limitations

This is a cross-sectional study, and as such, no causal relationships can be determined from the results.

RDS is superior to convenience sampling methods in that it allows for findings to be generalized to the larger reference population. However, as with any other statistical methods, some requirements must be met. With the FSW sample, one of the requirements was violated, as it appeared that, despite their close geographical proximity, participants primarily recruited others from their own cities, indicating that there are separate and distinct networks, rather than one larger network. This, coupled with a refusal rate of 29 percent, may limit the generalizibility of the findings. Therefore the results represent the 160 FSW sampled, and should be interpreted with caution when generalizing to the larger population of FSWs in CDE.

Another study limitation for FSWs was related to the inclusion criteria adopted. Due to the need of parental consent for enrollment of those aged 16 or 17, this age group was probably under-represented in the sample, especially in light of the fact that the results showed that girls initiate commercial sex at a very young age. Another study limitation was related to potential communication barriers, because to be able to speak and understand Spanish was one of the inclusion criteria of the study, and a few people were rejected under this criterion. In addition, some of those who participated in the study had limited comprehension of Spanish. The inadequate understanding of Spanish, combined with their low level of education, could have caused some misinterpretation and misunderstanding of some questions, as reported by staff members during monitoring visits.

On the other hand, the MSM sample met all the RDS assumptions, and the target sample size for the study was obtained, therefore, sampling bias is minimal or non-existent. However, one should bear in mind when interpreting the results that this MSM population included a surprisingly high percentage of participants who self-identified as bisexual or heterosexual. A high percentage of MSM reported having female partners as well. Further, the sample also included MSM who engage in sex work. They represent a subset of MSM that should ideally be analyzed separately, as they engage in very different risky behaviors than those MSM who do not engage in sex work and may have different perceptions regarding their sexual identities. However, this sample was too small to conduct a separate analysis for this subset of MSM sex workers.

To assess statistical significance of differences between dependent variables (consistent condom use, syphilis test result) and independent variables, chi-square and Fisher's tests were used for categorical variables, and the Wilcoxon Rank Sum (non-parametric) test was used for continuous variables using STATA. Where RDS population estimates are given, statistical significance was determined based on non-overlapping 95 percent CIs.

Results

Female Sex Workers

Characteristics of the sample

The sociodemographic profile of the sample (n = 160) of FSWs is presented in Table 2. The median age of the respondents was 24 years, about three-quarters were single, and the majority (86 percent) reported having less than 10 years of education. Almost all of the respondents were born in Paraguay, and about two-thirds indicated CDE and a third indicated Presidente Franco as their current city of residence. FSWs reported living in a rented house or apartment (50 percent), their own house or apartment (16 percent), their parent's house (12 percent), or a hotel/brothel/bar (11 percent). Few lived on the street. Skin color was based on self-report, and 56 percent identified themselves as brown/mulatto and 40 percent as white.

The majority of FSW respondents worked independently; only 20 percent reported working as a sex worker for another person. The most common place for sex work was the street (54 percent), followed by hotel or motel (29 percent) and brothels (26 percent), with 32 percent of them reporting working in more than one type of place. A small proportion reported working in another city outside of CDE. Sex work was the primary job and source of income for a large proportion of FSWs, with almost two-thirds working as a sex worker at least six months of the year, and over two-thirds earning income exclusively from sex work, with a median monthly income of US$185. Among those who earned income from other sources outside of sex work, approximately 60 percent of their monthly income was from sex work. See Table 3 for further information about occupational characteristics of FSWs.

Table 2 Sociodemographic characteristics of FSWs (n = 160)[†]

	Sample %
Age (in years)	
16 – 17	5
18 – 19	18
20 – 24	34
25 – 29	19
≥ 30	24
Median age (IQR)*	24 (20, 29)
Education (in years)	
0 – 9	86
10 – 12	11
> 12	4
Country of birth	
Paraguay	92
Brazil	6
Other	1
City of residence	
Ciudad del Este	63
Presidente Franco	32
Other	5
Place of residence or where most often sleeps	
Own house/apartment	16
Rented house/apartment	50
Parents' house	12
Someone else's house	8
Hotel/brothel/bar	11
Street	1
Other	3
Skin color	
White	40
Brown/mulatto	56
Others	4
Marital Status	
Single	72
Married/cohabiting	19
Separated/divorced	9

[†] Sample size varies slightly due to missing data.

*IQR: Interquartile range.

Table 3 Occupational characteristics of FSWs (n = 160)[†]

	Sample
Works as sex worker for someone else (%)	20
Place of work (%)	
Brothel	26
Bar	12
Street	54
Hotel/motel	29
House/apartment	20
Other	6
Works as a sex worker in another city besides Ciudad del Este (%)	28
Proportion of the year working as sex worker in last 12 months (%)	
≤ 3 months	20
4 – 6 months	17
> 6 months	63
Income aside from sex work (%)	
Yes, formal	3
Yes, informal	27
Yes, formal and informal	2
No	68
Median monthly income (US$) from sex work past 3 months for FSWs with no other job (IQR)* (n = 99)	185 (92, 277)
Median total monthly income (US$) past 3 months for FSWs with other jobs (IQR)* (n = 49)	217 (129, 388)
Median income from SW (IQR)	129 (69, 240)
Median age when began working in commercial sex (IQR)*	18 (16, 22)
Age when began working in commercial sex (in years)	
11 – 14	10
15 – 19	56
20 – 24	21
≥ 25	13
Years working as sex worker	
0 – 1	25
2 – 5	33
≥ 6	42

[†] Sample size varies slightly due to missing data.

*IQR: Interquartile range.

Commercial sex is initiated at a very early age

More than half of the women interviewed declared that they started working as sex workers in their childhood or adolescence, with the median age being 18 years (see Table 3). Almost half had been working as sex workers for six or more years.

FSWs reported a range of sexual behaviors

Table 4 presents findings on sexual behaviors of FSWs with different types of sex partners. New clients were partners with whom the FSW had sex for the first time in exchange for money, drugs, or gifts during the specified period of time. Regular clients were defined as partners who paid the FSW for sex at least three times in their lifetime. Non-paying partners were defined as those whom the respondent had sex with once or a few times, and with whom the respondent did not exchange sex for money, drugs, or gifts.

Almost all FSWs reported having had sex in the last 30 days. Of those, more than 80 percent had sex with new clients, about 90 percent had sex with regular clients, and 71 percent had sex with non-paying partners. Among those who had sex in the past 30 days, nearly a quarter reported having sex with 16 or more new clients, and about a tenth reported 16 or more regular clients. On the other hand, most of those who reported having had sex with non-paying partners declared having had only one non-paying partner in the last 30 days.

Insufficient use of condoms among FSWs regardless of type of partner and type sexual activity

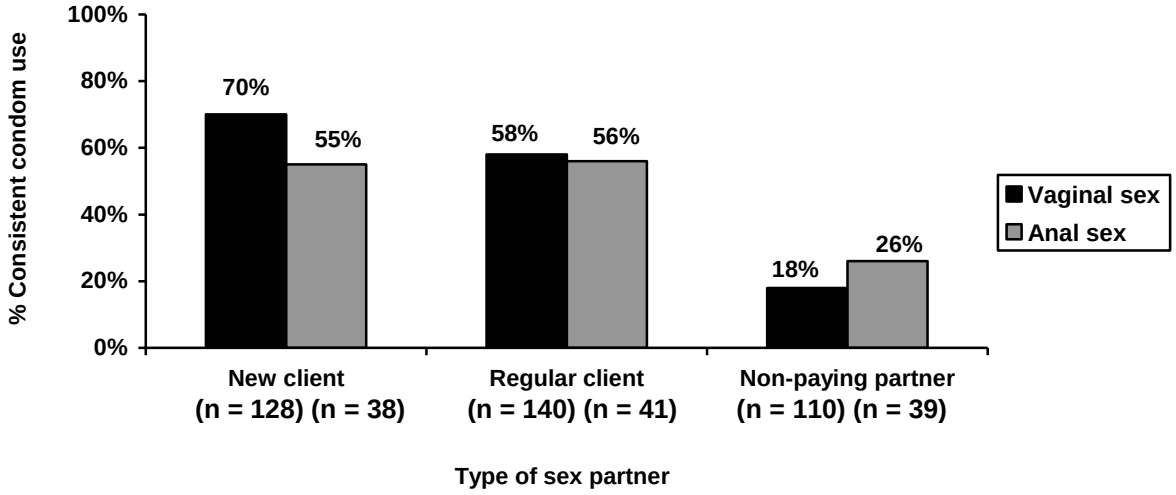
Consistent condom use was defined as always using condoms in the last 30 days plus reported condom use during last sexual intercourse. Consistent condom use during vaginal sex in the last 30 days was significantly more common with new clients (70 percent) than with regular clients (58 percent; $p = 0.034$) and non-paying partners (18 percent; $p = 0.00001$) (see Figure 3). This trend is also reflected in findings about condom use at last sexual vaginal or anal sex (data not shown). Over three-quarters (78 percent) of the respondents who had sex with new clients indicated that they always negotiated condom use with new clients in the past 30 days (data not shown).

Table 4 Sex partnerships in the last 30 days

	Sample
Had sex the last 30 days (n = 160) (%)	98
Median total number of partners (IQR)* (n = 157) (%)	10 (6, 25)
Total number of partners (n = 157) (%)	
0 – 5	25
6 – 10	26
11 – 25	25
26 or more	25
Had sex with new clients (n = 157) (%)	82
Had sex with regular clients (n = 157) (%)	89
Had sex with non-paying partners (n = 157) (%)	70
New clients (n = 157)	
Median number of new clients (IQR)* (#)	4 (2, 15)
Number of new clients (%)	
0	18
1 – 5	41
6 – 15	19
16 or more	22
Regular clients (n = 157)	
Median number of regular clients (IQR)* (#)	4 (2, 10)
Number of regular clients (%)	
0	11
1 – 5	53
6 – 15	24
16 or more	12
Non-paying partners (n = 157)	
Median number of non-paying partners (IQR)* (#)	1 (0, 1)
Number of non-paying partners (%)	
0	30
1	60
2 or more	10

*IQR: Interquartile range.

Figure 3 Consistent condom use during vaginal and anal sex in the past 30 days, by type of sex partner



Consistent condom use during vaginal sex: New client vs. regular client, p = 0.034; New client vs. non-paying partner, p = 0.00001
Consistent condom use during anal sex: New client vs. regular client, p = 0.94; New client vs. non-paying partner, p =0.008

Approximately a third of the respondents reported anal sex with the respective types of clients; of those, equal proportions (about half) used condoms with new clients and with regular clients in the last 30 days. However, FSWs with non-paying partners were significantly less likely to use condoms consistently in anal sex in the last 30 days compared to those with new clients (26 percent vs. 55 percent; p = 0.008). Although not statistically significant, FSWs were slightly more likely to use condoms consistently for vaginal sex than for anal sex with new clients (70 percent vs. 55 percent; p = 0.08). There was no statistically significant difference in consistent condom use between vaginal and anal sex during sex with regular clients and non-paying partners.

Condom use was most often exclusively suggested by the FSW than by both or exclusively by the partner, particularly during sex with new clients (see Table 5). Three-quarters of the FSWs reported it was exclusively her idea at last sex with a new client, and about half indicated it was exclusively her idea with regular clients and non-paying partners.

The most common reason for not using a condom the last time they had sex with any type of partner was the partner not wanting to use a condom, followed by condoms not being available, and the FSW not liking condoms (see Table 5). However, another common reason for not using condom at last sex with regular clients and non-paying partners was thinking it was not necessary because the partner was safe.

Table 5 Condom use initiation and reasons for not using condoms at last sex, by type of partner

	Sex with			
	New client sample %	**Regular client sample %**	**Non-paying partner sample %**	**p-value**
Condom use at last sex suggested by:	**(n = 104)**	**(n = 83)**	**(n = 29)**	
Her exclusively	75	52	52	< 0.005
Partner exclusively	11	19	28	< 0.005
Both	14	29	21	0.052
Reasons for non-use of condom at last sex:	**(n = 25)**	**(n = 57)**	**(n = 83)**	
Partner didn't want to use it	48	42	41	NS
Not available	24	18	13	NS
FSW doesn't like them	20	19	16	NS
Not necessary, partner is safe	4	18	41	0.0001
FSW doesn't have time to get one	4	--	--	-
Forgot/didn't think about it	8	4	2	0.21
Used other contraceptive method/want baby	--	--	4	-
Don't know how to use it	4	2	--	0.54
Don't know	--	2	1	0.64
Other	--	2	--	-

When respondents were asked about how they generally obtain condoms (whether for free or purchased), half of the respondents indicated that they exclusively buy and a quarter indicated that they exclusively get condoms for free (see Table 6). The rest obtained condoms through both means. Almost half of the respondents indicated that they received free condoms in the last one month (median of 15 condoms).

Table 6 Condom access by FSWs (n = 160)[†]

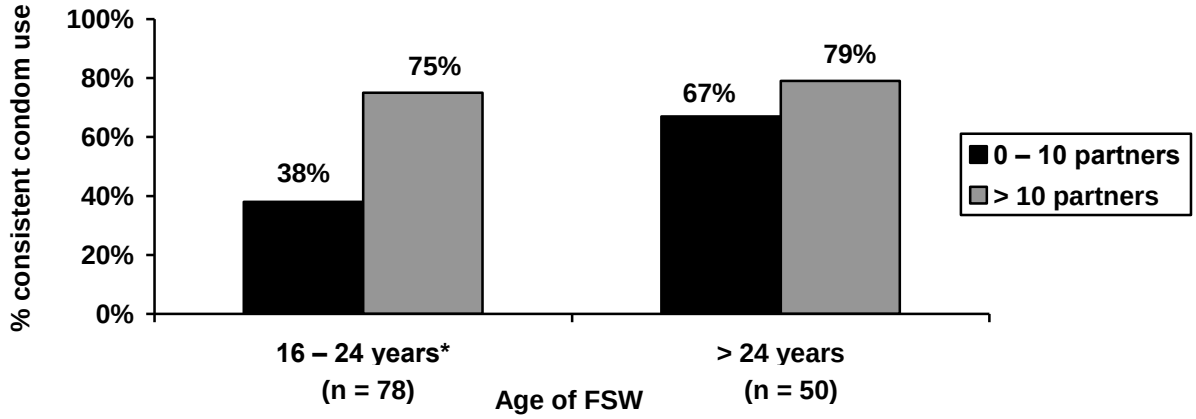
	Sample %
Method of obtaining condoms	
Purchased	53
For free	29
Both purchased and for free	18
Received condoms for free last month	48
Median number of condoms received last month (IQR)	15 (5, 40)

[†] Sample size varies slightly due to missing data.

Condom use is higher among those with more clients

Consistent condom use varied by age, type, and number of sex partners. As shown in Figure 4, among younger FSWs, those with fewer partners (0 - 10) were significantly less likely to consistently use condoms with new clients compared to those with more than 10 partners ($p < 0.01$). However, this difference in condom use with new clients by number of sex partners was not significant among older FSWs.

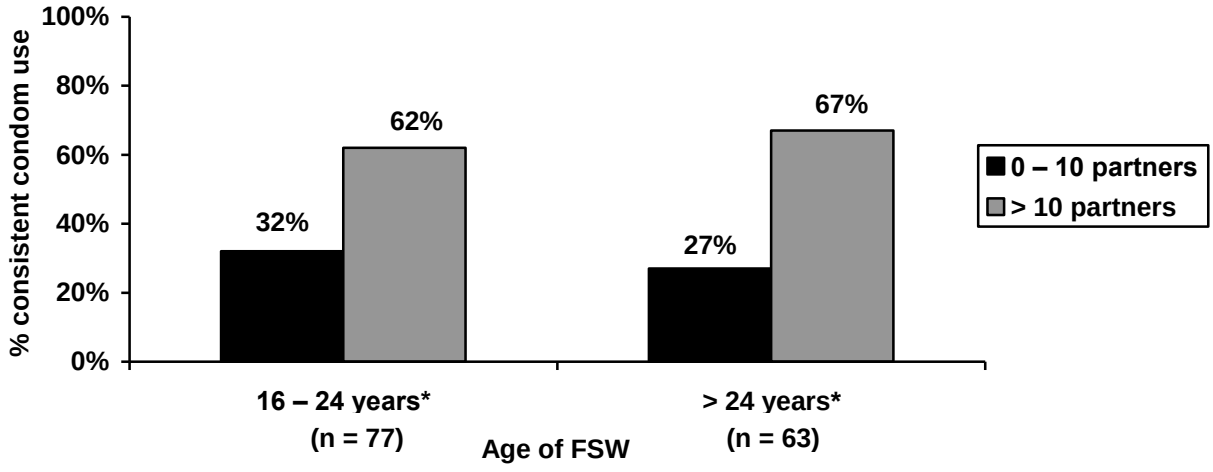
Figure 4 Consistent condom use with new clients in the past 30 days among FSWs, by number of partners and age of FSW



* p ≤ 0.01 comparing groups: 0 – 10 partners vs. > 10 partners

However, Figure 5 illustrates that with regular partners, consistent condom use in the past 30 days was significantly lower among those with fewer partners compared to those with more than 10 partners, regardless of the age of the FSW (p = 0.01). Therefore, among younger FSWs, regardless of whether the partner is a new or a regular client, consistent condom use was less common among those with fewer partners.

Figure 5 Consistent condom use with regular clients in the past 30 days among FSWs, by number of partners and age of FSW



* p ≤ 0.01 comparing groups: 0 – 10 partners vs. > 10 partners

Misuse of condoms is high among FSWs

Condoms slipping off or breaking in the past 30 days was reported by a high proportion of FSW respondents (see Table 7). Approximately a quarter reported slippage of or broken condoms during

vaginal sex with new and regular clients, and about 20 percent reported so with non-paying partners. Few reported slippage of or broken condoms during anal sex (data not shown).

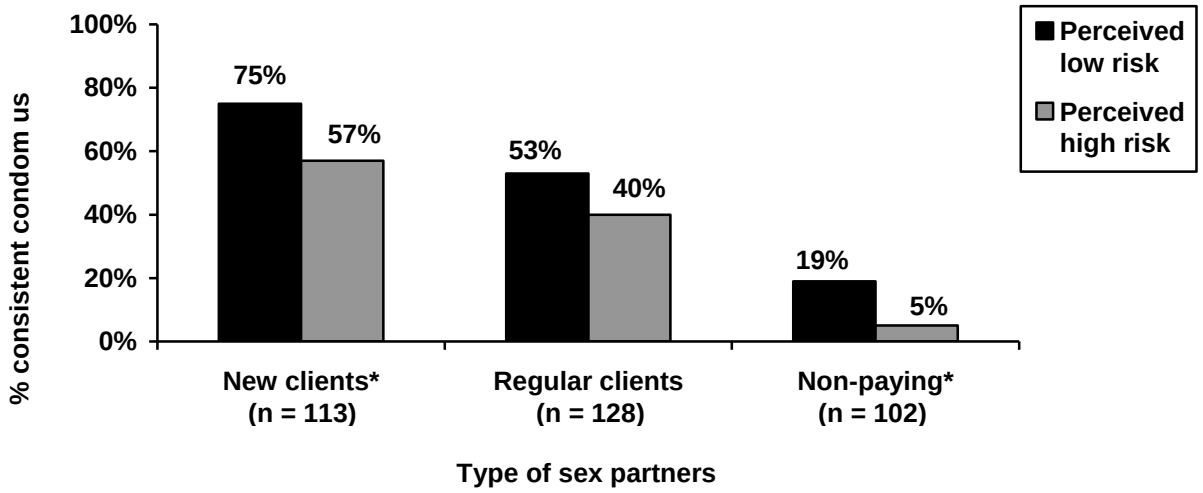
Table 7 Self-reported condom slippage/breakage during vaginal sex in the past 30 days

	Sample %
New clients (n = 118)	27
Regular clients (n = 117)	28
Non-paying clients (n = 50)	18

Inconsistent condom users correctly perceive themselves to be at high risk for HIV

Respondents were asked what they think their chances are of getting infected with HIV. Nearly two-thirds of FSWs perceived themselves to be at low risk for HIV, despite low condom use with all types of sex partners (data not shown). Those who thought they had a high chance of getting infected were significantly more likely to be inconsistent condom users in the past 30 days, particularly with new clients and non-paying partners (see Figure 6).

Figure 6 Self-perceived risk of HIV infection and consistent condom use, by type of sex partners



* p < 0.05 comparing self-perceived low risk vs. high-risk groups

Misconceptions about HIV transmission by FSWs could create stigma toward HIV-positive people

Almost all FSWs sampled were aware that HIV can be transmitted through unprotected sex, and the majority knew about vertical transmission and needle sharing (see Table 8). On the other hand, they seemed to believe that the HIV virus can also be transmitted by other means than by contact with contaminated blood or body fluids. In addition, almost 80 percent of them still believed that HIV could be acquired by mosquito bites. Their misconceptions about HIV transmission may cause fear of casual transmission and rejection of people living with HIV or AIDS.

Table 8 Knowledge about HIV transmission among FSW (n = 157)[†], % correct

	Sample %
A person can get HIV/AIDS from:	
Having sex without condom (Yes)	92
Sharing needles (Yes)	79
Sharing a meal with a person who has AIDS (No)	52
Mosquito bites (No)	23
A baby can get AIDS from her mother (Yes)	81
HIV/AIDS has a cure (No)	80
Having STI increases chances of become infected by HIV (Yes)	70
A person who looks healthy may be infected with HIV (Yes)	67

[†] Sample size varies slightly due to missing data.

Illicit drug use is low among FSWs

A third of FSWs sampled reported having ever used illicit drugs and only 16 percent declared having used in the past six months. Eight percent reported snorting cocaine, 8 percent used marijuana, and 8 percent used crack (see Table 9). Less than 1 percent reported having ever injected a drug in their lifetime. However just over a third consumed alcoholic drinks regularly in the past six months.

Table 9 Illicit drug use and alcohol use among FSWs (n = 158)

	Sample %
Ever used any illicit drugs	29
Used any illicit drug in last 6 months	16
Smoked marijuana in last 6 months	8
Used crack in last 6 months	8
Snorted cocaine in last 6 months	8
Ever injected any illicit drugs	1
Frequency of alcohol use in last 6 months	
Many times a week/everyday	34
Once a week or less	59
Never	8

HIV testing is low among FSWs and few receive their test results

Only half of all the respondents had ever tested for HIV and 30 percent of those had their last HIV test over one year ago (see Table 10). Those who tested for HIV had tested a median of three times, and only about half of them actually received their last test results, but all declared that the test result was negative (data not shown). Three-quarters reported they had received the HIV test for free; the public health service of CDE was mentioned as the most common place where they had tested for HIV.

Table 10 HIV testing behaviors of FSWs

	Sample %
Ever been tested for HIV (n = 160)	48
When was last HIV test (n = 75)	
Last 3 months	12
Between 3 months and 1 year ago	58
Between 1 and 5 years ago	30
Median number of times tested for HIV (IQR) (n = 75)	3 (1, 5)
Received HIV test result (n = 75)	57
HIV test free/paid (n = 75)	
Paid	28
Free	72
Where was tested for HIV (n = 75)	
Public health service CDE	44
Blood bank CDE	21
Public health service Asunción	3
Testing center Foz do Iguaçu	9
Private lab CDE	11
Other place	12

There was striking childhood sexual abuse reported by FSWs

Sexual abuse was defined to them as "having any person older than herself touching her in a sexual way or in a place she did not want to be touched, or did something sexually to her which they did not want done." Almost half of the sex workers interviewed mentioned that they had experienced sexual abuse when they were children, at a median age of 11 years; the perpetrator's median age was 32 years (see Table 11). Approximately 16 percent of them were sexually abused several times. About one-third of them were abused either by their father or their stepfather, 27 percent by a different relative, and less than 20 percent by a stranger.

Table 11 Childhood sexual abuse experienced by FSWs

	Sample %
Ever touched sexually by an older person (n = 160)	
No, never	59
Yes, 1 to 2 times	25
Yes, 3 to 10 times	8
Yes, more than 10 times	8
Median age when suffered sexual abuse (IQR)	11 (9, 13)
Median age of perpetrator (IQR)	32 (25, 40)
Perpetrators (n = 64)	
Other relative	27
Stepfather	23
Stranger	19
Acquaintance	14
Father	11
Others	6

Some FSWs also reported sexual violence

Sexual violence is defined as "being forced to have sex when they did not want to." Approximately one in five FSW respondents reported having experienced sexual violence in their lifetime, with 10 percent of them reporting that rape happened once or twice and 6 percent at least three times in the previous 12 months (see Table 12). Clients were the main perpetrator, being responsible for over half of the forced sex acts.

Table 12 Sexual violence experienced by FSWs

	Sample %
Frequency of experiencing sexual violence (n = 160)	
Never	78
None in the last 12 months	5
1 to 2 times in the last 12 months	11
3 to 10 times in the last 12 months	5
More than 10 times in the last 12 months	1
Perpetrators (n = 35)	
Client	54
Acquaintance	14
Relative	6
Ex-partner	6
Stranger	3
Others	17

Attitudes toward people living with HIV and AIDS by FSWs were mixed

The FSWs sampled showed compassion and concern toward people living with HIV and AIDS, with the majority having positive attitudes toward them (see Table 13). On the other hand, more than half agreed with statements that were judgmental toward those with HIV, and several blamed people living with HIV and AIDS and their families for the HIV transmission.

Table 13 Positive and negative attitudes toward HIV-positive people by FSW (n = 139)[†]

	Sample %
Positive attitudes	
People living with HIV/AIDS deserve treatment and care	98
People living with HIV/AIDS deserve sympathy	95
God wants us to care for everyone, even those with HIV/AIDS	91
Our society does not do enough to help people living with HIV	71
Negative attitudes	
People living with HIV/AIDS have been promiscuous	60
HIV is a punishment from God	57
Women get HIV because they are prostitutes	51
The family of the person living with HIV/AIDS should also be blamed	60
The family of the person living with HIV/AIDS is cursed and should be avoided and isolated	58
People living with HIV/AIDS should be ashamed of themselves	39
People living with HIV/AIDS are blamed for bringing the disease into the community	32
People living with HIV/AIDS present a threat to their own health and that of their family	25

[†] Sample size varies slightly due to missing data.

HIV prevalence is low but syphilis prevalence is high among FSWs

Two of the 157 respondents (one percent) who agreed to take the HIV test were found to be HIV seropositive and 60 of 158 (38 percent) were VDRL positive, an indication of active syphilis infection or previously treated syphilis infection.

Table 14 HIV and syphilis prevalence estimates among FSWs

	Sample % (n)
Confirmed HIV seropositive[‡] (n = 157)	1 (2)
VDRL positive for syphilis (n = 158)	38 (60)

[‡] Confirmed HIV seropositive persons tested positive on both the first and second HIV ELISA tests and Western Blot.

Table 15 compares the sociodemographic characteristics of those who tested positive and negative for VDRL. Testing positive for syphilis on the VDRL test is a biomarker for high-risk lifetime sexual behavior. In fact, this was reflected in the findings from this study in that syphilis prevalence increased with increasing age. Additionally, those who tested positive for syphilis were significantly more likely to be married and have fewer years of education. Although not significant, syphilis prevalence among those

who were white (30 percent) was slightly lower than among brown/mulatto (42 percent) or other ethnic groups (71 percent). There was no significant difference by income.

Syphilis prevalence was significantly higher among FSWs who worked as sex workers on the street than those who did not. Syphilis prevalence did not differ in FSWs who reported working in other types of venues, such as hotel/motel, bar, brothel, or house/apartment. Although not statistically significant, there was increasing syphilis prevalence with increasing number of years working as a sex worker.

Table 15 Sociodemographic and occupational characteristics of FSWs, by VDRL test result

	VDRL positive (n = 60) % (n)	VDRL negative (n = 98) % (n)	p-value
Age (years)			
16 – 24	31 (28)	69 (62)	**0.04**
> 24	47 (32)	53 (36)	
Age (median)	26	23	**0.01**
Education (years)			
0 – 9	41 (56)	59 (80)	**0.04**
≥ 10	18 (4)	82 (18)	
Skin color			
White	30 (19)	70 (44)	0.068
Brown/mulatto	42 (36)	58 (50)	
Other	71 (5)	29 (2)	
Marital status			
Single/separated or divorced	34 (44)	66 (84)	**0.037**
Married/cohabiting	55 (16)	45 (13)	
Income aside from sex work			
Yes	29 (14)	71 (35)	0.09
No	43 (46)	57 (62)	
Years working as sex worker			
0 – 1	28 (11)	72 (28)	0.130
2 – 5	35 (18)	65 (34)	
≥ 6	47 (31)	53 (35)	
Worked as sex worker in street last 3 months	49 (40)	51 (42)	**0.011**
Yes	29 (20)	71 (50)	
No			

Few FSWs are exposed to HIV prevention activities

Table 16 shows responses to questions about respondents' participation in or exposure to any HIV and STI prevention programs that were conducted in CDE in the past 12 months. A low percentage of respondents indicated being exposed to such programs: about a quarter had received any educational materials about HIV specifically for sex workers or participated in any kind of discussion about HIV. Less than 20 percent reported any contact with an NGO that promotes HIV prevention. Of those who had contact, the most common types of services obtained were receiving information about HIV and STIs and receiving condoms.

Table 16 Exposure to HIV and STI prevention activities in the last 12 months in CDE among FSWs

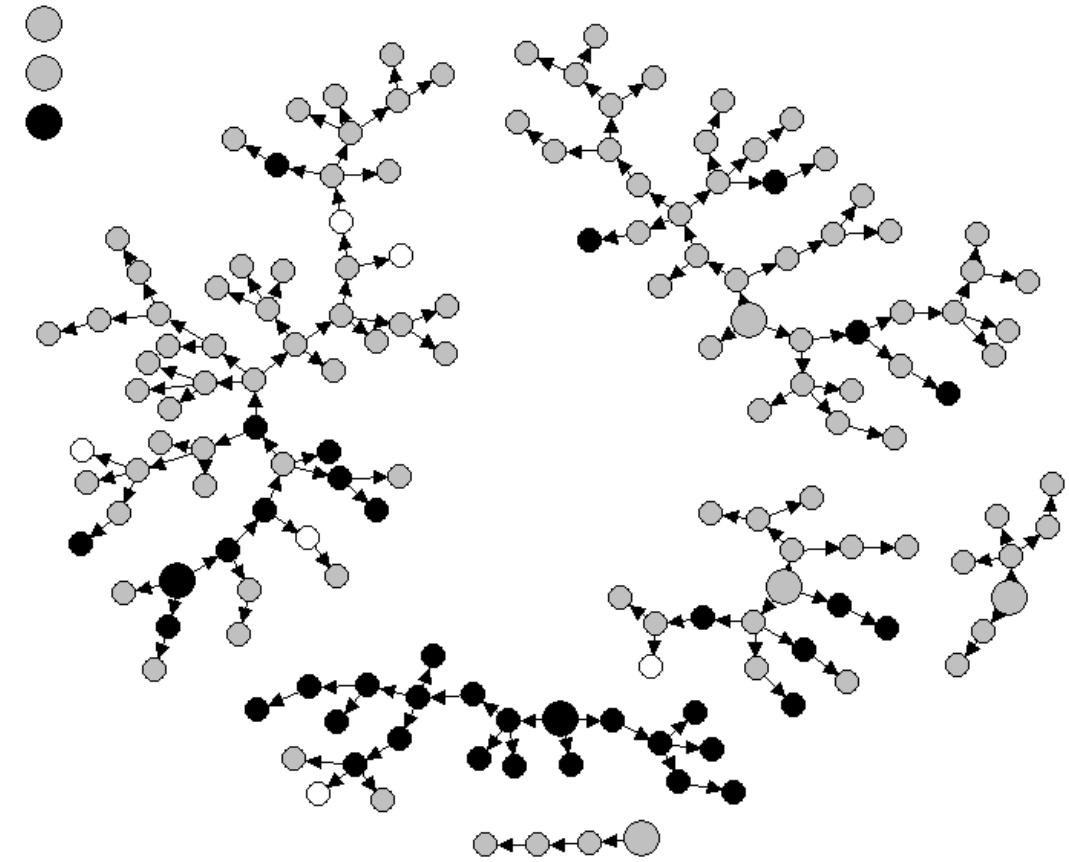
	Sample %
Received educational materials on HIV (n = 156)	27
Participated in talks about HIV (n = 156)	28
Contact with NGO that promotes HIV prevention (n = 156)	18
Type of contact (n = 28)	
Received information	79
Received condoms	75
Educational classes	46
Support group	18
Worked as volunteer	14
Other	7

Network characteristics of FSWs

Understanding the network structure of a population can be useful for informing interventions. For the purpose of this study, the social network of each participant was defined as the number of FSWs they knew in CDE whom they had seen in the past month. FSWs reported a median network size of seven FSWs [IQR: 5, 15]. Almost all of them (85 percent) mentioned that all the FSWs they knew were part of the same social network (e.g., peers of FSW respondents knew each other), and 15 percent reported that the FSWs they knew did not know each other. FSWs were also asked about some characteristics of their fellow FSWs in their network. Within their network of FSWs, an average of 14 percent were thought to be 17 years of age or younger, less than one percent were indigenous, 6 percent were perceived by the FSW to be HIV-positive, and 3 percent were reported as being homeless.

Those who worked in brothels preferentially recruited those who also worked in brothels 66 percent of the time (see Figure 7), and non-brothel-based FSWs recruited non-brothel-based FSWs 93 percent of the time, while there did not seem to be a preferential recruitment by age group (see Figure 8).

Figure 7 Recruitment chain of FSWs by place of work

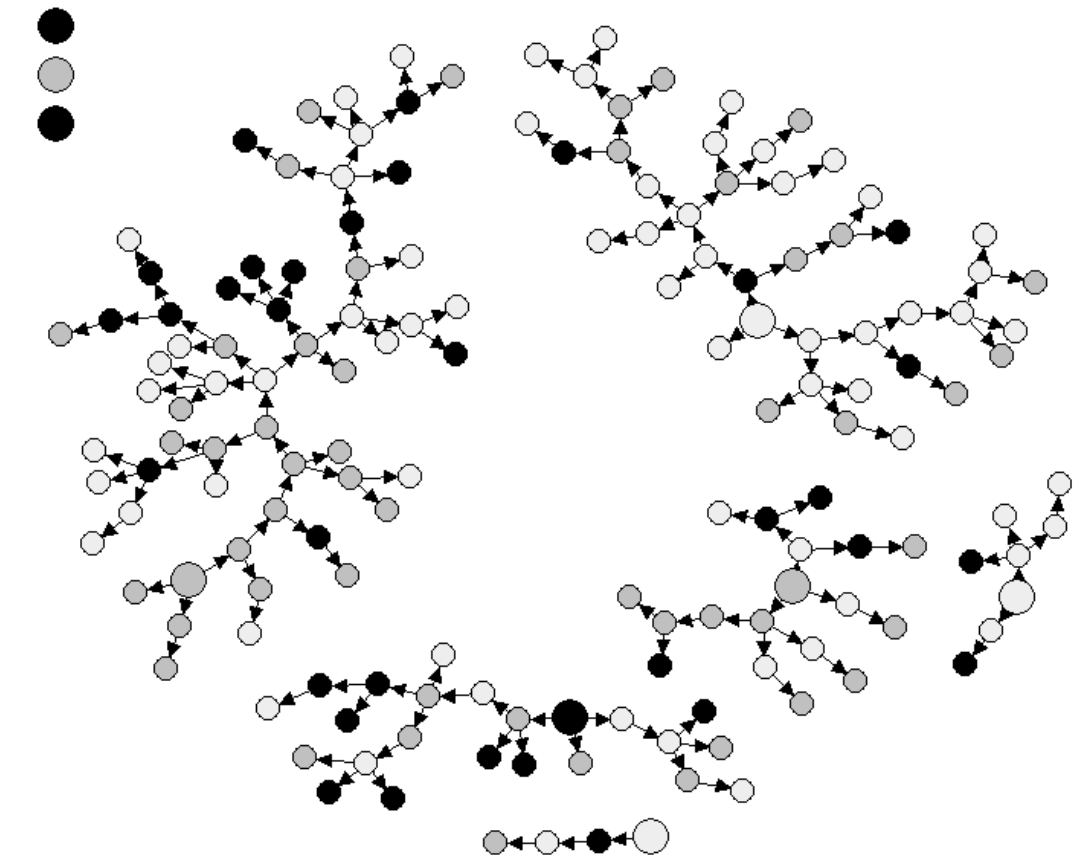


FSWs who do not work in brothels.

FSWs who work in brothels.

[Larger circles indicate seeds and smaller circles are subsequent recruitees. The three seeds at the top left of the figure were unproductive seeds (i.e., they did not recruit any participants). White circles represent those with missing data on this variable.]

Figure 8 Recruitment chain of FSWs by age



● 16 – 19 years
● 20 – 24 years
○ 25+ years

[Larger circles represent seeds and smaller circles represent subsequent recruitees. The three seeds at the top left of the figure were unproductive seeds (i.e., they did not recruit any participants.]

Men Who Have Sex with Men

Characteristics of the sample

The sociodemographic characteristics of the sample (n = 296) of MSM and the population estimates, calculated with RDSAT, are presented in Table 17. The population estimates were adjusted for the recruitment patterns among study participants and their personal network sizes, and the estimates reflect the distribution of the respective characteristics of the larger population of MSM in CDE.

The median age of the respondents was 21 years with an estimated third of MSM being 16 – 19 years of age, and the majority of MSM were single. About half of the respondents had completed up to 9 years of schooling, and slightly more than 10 percent had more than 12 years of schooling. Almost all of the respondents were born in Paraguay, about half lived in CDE and less than half lived in Presidente Franco.

Skin color was based on self-report; half of the respondents identified themselves as white and 49 percent as brown/mulatto.

Mobility into CDE was more common than that out of CDE. About three-quarters of those who lived in CDE indicated that they left CDE only two or fewer times in the last three months. However, MSM who did not live in CDE reported they frequently came to CDE in the last three months. About three-quarters of them reported coming to CDE on a weekly basis, the majority of them (90 percent) staying for brief stays of less than one week (data not shown). This pattern of mobility can be explained by the fact that Presidente Franco, where almost half of the respondents reported living, is a neighboring municipality and it is typical for residents of Presidente Franco to visit CDE for commercial, occupational, and leisure activities.

Table 17 Sociodemographic characteristics of MSM in CDE (n = 296) †

	Sample %	Population estimates % (95% CI)
Age (in years)		
16 – 19	39	38 (31 – 46)
20 – 24	35	37 (30 – 44)
≥ 25	27	25 (19 – 31)
Median age (IQR)	21 (19, 25)	NA
Education (in years)		
1 – 9	51	57 (49 – 64)
10 –12	35	32 (25 – 39)
> 12	14	12 (6 – 18)
Country of birth		
Paraguay	98	98 (97 – 99.5)
Brazil	1	0.3 (0.1 – 0.7)
Other	1	1.3 (0.4 – 3.0)
City of residence		
Ciudad del Este	53	50 (39 – 60)
Presidente Franco	42	46 (35 – 58)
Other	5	4 (1 – 8)
Skin color		
White	51	50 (44 – 57)
Brown/mulatto	46	49 (42 – 55)
Others	2	1 (0.2 – 2)
Legal marital status		
Single	89	86 (81 – 92)
Married/cohabiting	11	10 (6 – 14)
Separated/divorced	4	4 (1 – 7)
Frequency of CDE residents leaving CDE in last 3 months (n = 151)		
At least every month	32	27 (18 – 40)
Only once or twice	44	47 (34 – 60)
Never	23	26 (16 – 36)
Frequency of non-CDE residents going to CDE in last 3 months (n = 128)		
Every week	77	79 (69 – 87)
Every month	13	12 (6 – 20)
Only once or twice	10	9 (4 – 16)
Never	0	NA

† Sample size varies slightly due to missing data.

MSM who identified themselves as heterosexual or bisexual made up a large proportion of MSM and had distinct sexual behaviors

MSM respondents were asked whether they considered themselves to be homosexual, heterosexual, or bisexual. Population estimates indicate that the majority of MSM self-identified their sexual orientation as bisexual (54 percent) or heterosexual (34 percent) and 12 percent as homosexual (see Table 18).

Table 18 Gender of sex partners in the last 6 months among MSM, by self-identified sexual orientation

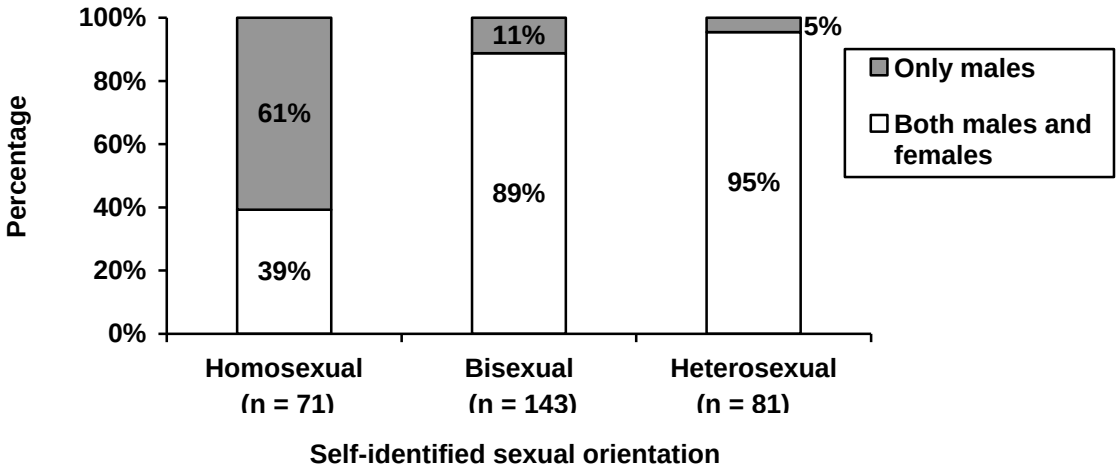
Self-identified sexual orientation	Total		Sex with only males (n = 76)		Sex with males and females (n = 217)	
	Sample %	Population estimates % (95% CI)**	Sample %*	Population estimates % (95% CI)**	Sample %*	Population estimates % (95% CI)**
Homosexual (n = 71)	24	12 (7 – 18)	77	61 (45 – 78)	23	39 (22 – 55)
Bisexual (n = 143)	49	54 (46 – 63)	13	11 (7 – 18)	87	89 (82 – 93)
Heterosexual (n = 81)	28	34 (25 – 43)	4	5 (1 – 11)	96	95 (89 – 99)

* Sample percentages represent the proportion of the study population with the characteristic.

** Adjusted percentages represent the population estimates based on analysis in RDSAT, which is adjusted for personal network sizes and recruitment patterns.

There was a statistically significant difference in the gender of the sex partners of MSM depending on how MSM identified their sexual orientation (see Figure 9). *[Table 18 includes the sample percentages and 95% CIs for the values shown in Figure 9.]* The majority of self-identified heterosexuals reported having sex with both females and males in the last six months. About two-thirds of self-identified homosexual MSM had sex only with males, and a third had sex with both males and females.

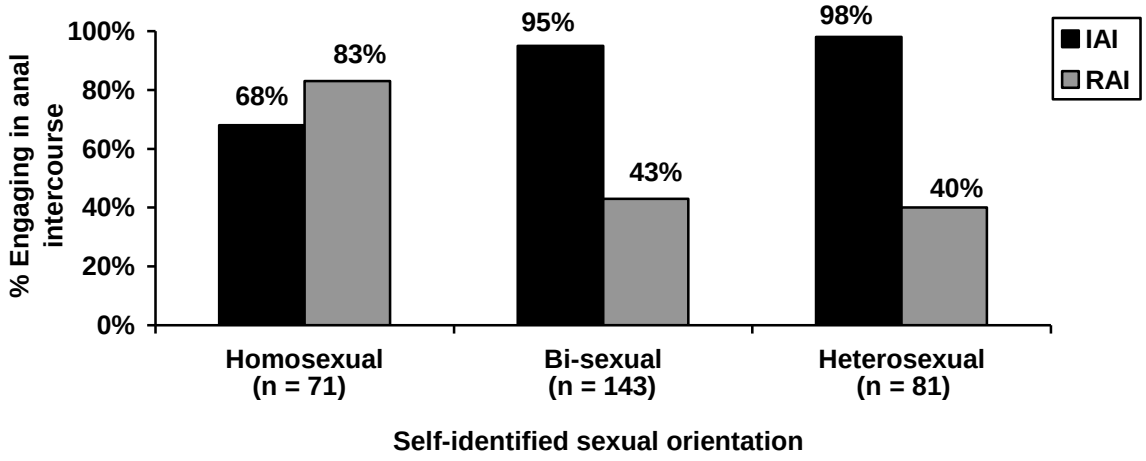
Figure 9 Gender of sex partners in the last 6 months among MSM respondents, by self-identified sexual orientation (Population estimates)



Further, there was a distinct pattern of the type of sex practiced by how MSM identified their sexual orientation (see Figure 10), in that insertive anal intercourse (IAI) was more common among self-identified bisexual and heterosexual MSM and receptive anal intercourse (RAI) was more common among self-identified homosexual MSM. Population estimates for insertive sex could not be calculated; therefore the comparison was done only with sample data. While nearly all those who identified themselves as bisexuals or heterosexuals reported having IAI, about two-thirds of the self-identified homosexual MSM reported IAI ($p < 0.001$). Further, while the majority of self-identified homosexual

MSM practiced RAI, less than half of the self-identified bisexual (43 percent) and heterosexual (40 percent) MSM practiced RAI ($p < 0.001$).

Figure 10 Practice of insertive and receptive anal intercourse in last 6 months among MSM, by self-identified sexual orientation (Sample percentages)



IAI: Insertive anal intercourse ; RAI: Receptive anal intercourse

MSM tended to have more occasional sex partners than permanent or commercial partners but condom use is low with all types of partners

Respondents were asked about the different types of sex partners they had. Occasional partners are those with whom the respondent had sex only once or from time to time and with whom he did not exchange money, drugs, or gifts for sex. A permanent partner was defined as someone who the respondent considers to be an established partner. A commercial partner was defined as someone with whom the respondent paid with money, drugs, or gifts to have sex.

Occasional sex partners were the most common type, independent of sexual orientation or self-identity. Nearly 90 percent reported having had an occasional sex partner in the last six months (see Table 19). Of those with occasional partners, close to 20 percent did not have any occasional partners that were male, about half reported 1 – 2 occasional partners that were male, and the remaining third had at least three occasional partners that were male in the last six months. Insertive anal intercourse was more common than receptive anal intercourse with occasional male partners (over 90 percent had IAI), and about a third practiced RAI in the last six months. Condom use was very low for both types of sexual activity, with only a quarter of respondents reporting consistent condom use.

Among those with occasional sex partners, approximately 80 percent had occasional female partners. A third of those with occasional partners reported having one occasional female partner, and nearly half reported having three or more occasional female partners in the last six months. Consistent condom use was very low during vaginal sex with occasional female partners (12 percent). Close to three-quarters with occasional female partners reported having anal sex, and again, consistent condom use was extremely low (17 percent).

Table 19 Sexual behaviors of MSM with occasional partners in the last 6 months[†]

	Sample %[*]	Population estimates[**] % (95% CI)
Had sex with occasional sex partners (n = 289)	88	89 (85 – 93)
Occasional male partners		
Number of occasional male partners (n = 254)		
0	14	19 (13 – 25)
1 – 2	45	48 (40 – 56)
3 – 5	25	21 (16 – 27)
6 and more	16	12 (8 – 17)
Had insertive anal intercourse with occasional male partner (n = 217)	91	92 (87 – 97)
Used condom with occasional male partner during insertive anal intercourse (n = 191)		
Consistent	26	20 (10 – 29)
Inconsistent	43	41 (31 – 54)
Never	31	39 (26 – 52)
Had receptive anal intercourse with occasional male partner (n = 216)	43	36 (26 – 47)
Used condom with occasional male partner during receptive anal intercourse (n = 86)		
Consistent	27	35 (10 – 58)
Inconsistent	52	55 (35 – 83)
Never	21	11 (0.0 – 22)
Occasional female partners		
Number of occasional female partners (n = 254)		
0	27	21 (14 – 30)
1 – 2	27	31 (24 – 38)
3 – 5	31	32 (25 – 39)
6 and more	15	16 (10 – 21)
Used condom with occasional female partner during vaginal intercourse (n = 182)		
Consistent	17	12 (6 – 19)
Inconsistent	43	41 (30 – 52)
Never	40	47 (37 – 59)
Had anal sex with occasional female partner (n = 185)	72	76 (67 – 85)
Used condom with occasional female partner during anal intercourse (n = 131)		
Consistent	18	17 (8 – 27)
Inconsistent	38	34 (20 – 48)
Never	44	49 (36 – 65)

[†] Sample size varies slightly due to missing data.

[*] Sample percentages represent the proportion of the study population with the characteristic.

[**] Adjusted percentages represent the population estimates based on analysis in RDSAT, which is adjusted for personal network sizes and recruitment patterns.

Table 20 shows the sexual behaviors of MSM who reported having sex with permanent partners in the last six months. Having sex with a permanent partner was less common than with occasional partners.

About a third of all MSM reported having had sex with a permanent male partner, and half reported having had sex with a permanent female partner in the last six months. Among those with permanent male partners, the majority (82 percent) practiced IAI, and 70 percent practiced RAI. Consistent condom use was very low during both IAI and RAI, with less than a quarter reporting consistent condom use. Consistent condom use was also low with permanent female partners; less than 10 percent used condoms consistently during vaginal sex and anal sex.

Table 20 Sexual behaviors of MSM with permanent partners in the last six months[†]

	Sample %[*]	Population estimates[**] % (95% CI)
Permanent male partners		
Had sex with permanent male partners (n = 293)	36	30 (24 – 38)
Had insertive anal intercourse with permanent male partner (n = 104)	79	82 (64 – 94)
Used condom with permanent male partner during insertive anal intercourse (n = 79)		
Consistent	22	16 (4 – 31)
Inconsistent	44	47 (30 – 64)
Never	34	37 (21 – 52)
Had receptive anal intercourse with permanent male partner (n = 104)	64	70 (48 – 86)
Used condom with permanent male partner during receptive anal intercourse (n = 65)		
Consistent	23	22 (6 – 41)
Inconsistent	43	37 (10 – 60)
Never	34	42 (19 – 73)
Permanent female partners		
Had sex with permanent female partners (n = 294)	47	50 (43 – 58)
Used condom with permanent female partner during vaginal intercourse (n = 139)		
Consistent	9	5 (1 – 13)
Inconsistent	50	48 (37 – 60)
Never	41	47 (33 – 57)
Had anal sex with permanent female partner (n = 139)	61	63 (52 – 75)
Used condom with permanent female partner during anal intercourse (n = 83)		
Consistent	17	8 (1 – 24)
Inconsistent	33	24 (8 – 50)
Never	50	68 (41 – 82)

[†] Sample size varies slightly due to missing data.

[*] Sample percentages represent the proportion of the study population with the characteristic.

[**] Adjusted percentages represent the population estimates based on analysis in RDSAT, which is adjusted for personal network sizes and recruitment patterns.

A modest subset of MSM paid to have sex with commercial partners; sex with female commercial partners was the most common

MSM were also asked whether they paid to have sex with someone (i.e., a commercial sex partner). Population estimates show that close to a quarter of MSM reported having had sex with a commercial partner in the last six months (see Table 21). Although population estimates could not be calculated, based on the sample of MSM respondents, having female commercial partners was more common (67 percent) than having a male (39 percent) or transvestite partner (29 percent). Of the MSM respondents who had commercial male partners in the last six months, condom use with commercial male partners was fairly low, with approximately a third reporting consistent condom use during IAI and half reporting consistent condom use during RAI.

Table 21 Sexual behaviors of MSM with commercial partners in the last six months

	Sample %[*]	Population estimates[**] % (95% CI)
Had sex with commercial partners (n = 292)	24	23 (17 – 11)
Commercial male sex partners		
Number of commercial male partners (n = 69)		
0	61	NA[§]
1 – 2	23	NA[§]
3 and more	16	NA[§]
Had insertive anal sex with commercial male partner (n = 69)	36	15 (2 – 24)
Used condom with commercial male partner during insertive anal intercourse (n = 23)		
Consistent	30	NA[§]
Inconsistent	44	NA[§]
Never	26	NA[§]
Had receptive anal sex with commercial male partner (n = 69)	26	5 (1 – 5)
Used condom with commercial male partner during receptive anal intercourse (n = 17)		
Consistent	47	NA[§]
Inconsistent	41	NA[§]
Never	12	NA[§]
Other commercial sex partners		
Number of commercial transvestite partners (n = 69)		
0	71	64 (58 – 90)
1 – 2	19	27 (5 – 32)
3 and more	10	9 (1 – 19)
Number of commercial female partners (n = 69)		
0	23	NA[§]
1 – 2	41	NA[§]
3 and more	36	NA[§]

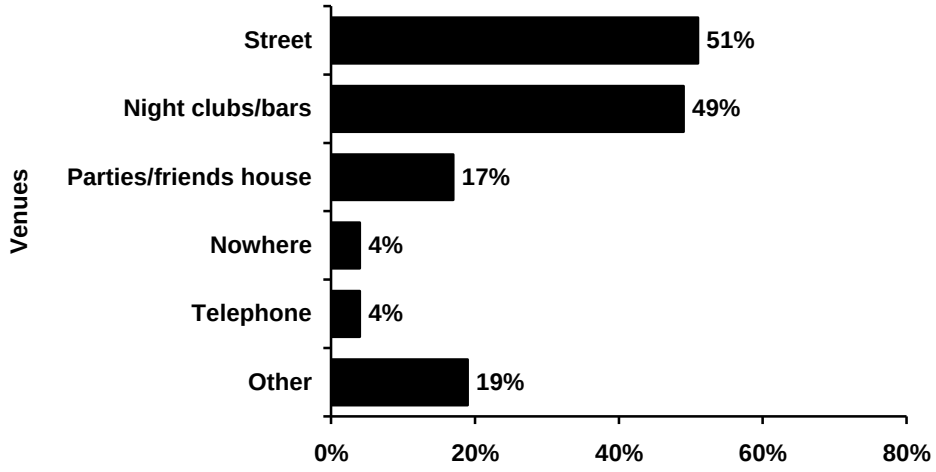
[*] Sample percentages represent the proportion of the study population with the characteristic.

[**] Adjusted percentages represent the population estimates based on analysis in RDSAT, which is adjusted for personal network sizes and recruitment patterns.

[§] Population estimates cannot be calculated in RDSAT due to lack of cross-group recruitments.

Figure 11 shows the common places MSM find their commercial sex partners (population estimates not available). MSM respondents who had commercial partners in the last six months found their commercial partners at night clubs (49 percent), streets/public parks (51 percent), and parties (17 percent) in CDE. Respondents were also asked if they found commercial sex partners in Foz do Iguaçu in the last six months; 74 percent indicated they did not find commercial sex partners in Foz do Iguaçu (data not shown).

Figure 11 Places to find commercial sex partners in CDE (Sample %)* (n = 69)



* Population estimates cannot be calculated in RDSAT due to small sample size.

Most MSM did not use lubricants or used inappropriate ones in anal sex

Use of lubricants was not common; only an estimated 28 percent of MSM reported lubricant use during insertive anal intercourse with either a man or a woman and 16 percent reported lubricant use during receptive anal intercourse (see Table 22). Of those, only about half reported using the right kind of lubricant (water-based gel) and the remainder use inappropriate ones such as petroleum oil (Vaseline), moisturizer lotions, baby oil, saliva, or hair conditioner/cream (data not shown).

Table 22 Lubricant use among MSM during anal intercourse (n = 296†)

	Sample %	Population estimates** % (95% CI)
Use any lubricant during insertive anal intercourse with male or female	30	28 (22 – 35)
Use any lubricant during receptive anal intercourse	22	16 (11 – 22)

† Sample size varies slightly due to missing data.

* Sample percentages represent the proportion of the study population with the characteristic.

** Adjusted percentages represent the population estimates based on analysis in RDSAT, which is adjusted for personal network sizes and recruitment patterns.

The majority of MSM had sex with both men and women

An estimated 83 percent of MSM had sex with both men and women in the last six months; the remainder had sex with only men (see Table 23). This section compares men who have sex only with men (MSOM) and men who have sex with men and women (MSMW). MSOM include respondents who reported having only male sex partners in the past six months, regardless of their sexual orientation, and MSMW include respondents who had sex with both men and women in the past six months, regardless of their sexual orientation. Understanding the distinction in sociodemographic characteristics and risk behaviors of MSOM and MSMW is crucial for tailoring interventions appropriate for the different sexual behaviors.

The main differences between the two groups were their age of sexual debut, educational levels, and current residence. MSOM were significantly more likely to currently live in CDE (than other cities or Presidente Franco) compared to MSMW. Although not statistically significant, MSOM had a younger sexual debut age than MSMW, with more than 15 percent of MSOM reporting age of sexual debut between 4 – 9 years of age compared to approximately 5 percent of MSMW. Additionally, MSOM had completed more years of education. There were no differences in age, country of birth, skin color, or marital status.

Table 23 Sociodemographic characteristics of men who have sex with men only (MSOM) and men who have sex with men and women (MSMW)[†]

	MSOM (n = 76) %	Population estimates[**] % (95% CI)	MSMW (n = 217) %	Population estimates[**] % (95% CI)
	26	17 (12 – 24)	74	83 (76 – 88)
Age (in years)				
16 – 19	32	36 (23 – 51)	41	39 (31 – 48)
20 – 24	33	34 (16 – 48)	35	38 (30 – 45)
≥ 25	36	30 (18 – 46)	24	24 (17 – 31)
Age at sexual debut (in years)	17	17 (7 – 29)	5	5 (2 – 9)
4 – 9	50	52 (36 – 66)	50	51 (45 – 58)
10 – 14	33	31 (19 – 45)	45	44 (37 – 51)
15 – 20				
Education (in years)				
1 – 9	31	45 (28 – 63)	58	59 (51 – 67)
10 –12	40	31 (19 – 44)	33	32 (25 – 39)
> 12	29	23 (9 – 40)	9	9 (4 – 14)
Country where born				
Paraguay	96	NA[§]	98	NA[§]
Brazil	3		1	
Other	1		1	
Current city of residence				
Ciudad del Este	76	**78 (65 – 89)**	45	**42 (31 – 54)**
Presidente Franco	15	**17 (6 – 31)**	52	**54 (41 – 65)**
Other	9	5 (1 – 9)	3	4 (1 – 9)
Skin color				
White	59	56 (41 – 73)	49	49 (41 – 56)
Brown/mulatto	37	41 (24 – 55)	50	51 (43 – 58)
Others	4	3 (0.3 – 10)	2	1 (0.1 – 1.2)
Marital status				
Single	86	91 (82 – 98)	84	84 (78 – 91)
Married/cohabiting	13	9 (2 – 18)	10	10 (6 – 16)
Separated/divorced	1	0	6	5 (2 – 9)

[†] Sample size varies slightly due to missing data.

[*] Sample percentages represent the proportion of the study population with the characteristic.

[**] Adjusted percentages represent the population estimates based on analysis in RDSAT, which is adjusted for personal network sizes and recruitment patterns.

[§] Population estimates cannot be calculated in RDSAT due to lack of cross-group recruitments.

A greater percentage of MSOM engage in receptive than in insertive anal sex and in MSMW a greater proportion engage in insertive anal sex

While sociodemographic characteristics of MSOM and MSMW did not vary considerably, there were a number of differences in sexual behaviors practiced by MSOMs and MSMW (see Table 24). Having sex with occasional male partners was equally common for both MSOM and MSMW, with three-quarters of them reporting having an occasional male sex partner in the past six months. However, MSOM were

significantly more likely to have engaged in receptive anal intercourse compared to MSMW (77 percent vs. 25 percent) but significantly less likely to have engaged in insertive anal intercourse (61 percent vs. 99 percent).

There was a significant difference between MSOM and MSMW with respect to having permanent male partners. MSOM were significantly more likely to have had a permanent male partner compared to MSMW (59 percent vs. 24 percent; CI do not overlap). Again, similar to sexual practices with occasional partners, MSOMs were more likely to have engaged in receptive anal intercourse with permanent male partners than were the MSMWs (90 percent vs. 49 percent; CI do not overlap) and less likely to have engaged in insertive anal intercourse compared to MSMWs (67 percent vs. 94 percent; not significant).

Condom use was extremely low in both MSOM and MSMW and did not differ significantly between MSOM and MSMW, regardless of the kind of sex partner and type of sex. Consistent condom use was defined as always using condoms in the last six months and using a condom during the last time respondent had sex. Consistent condom use was reported by approximately a quarter to a third of MSOM and MSMW. In addition to consistent condom use, non-use of condoms ever in the past six months was also examined, as it likely is a more accurate measure of condom use. A fairly high proportion of both MSOM and MSMW respondents reported having never used condoms in the past six months regardless of the type of partner and sexual activity.

Table 24 Sexual behaviors among men who have sex with men only (MSOM) and men who have sex with men and women (MSMW)[†]

Sexual behaviors in the last 6 months	MSOM n = 76 % (n)	Population estimates[**] % (95% CI)	MSMW n = 217 % (n)	Population estimates[**] % (95% CI)
Sex with occasional male partner	74 (54)	74 (67 – 81)	75 (163)	77 (63 – 90)
Had RAI	89 (48)	**77 (57 – 94)[‡]**	28 (45)	**25 (17 – 35)[‡]**
Used condom consistently in RAI	25 (12)	24 (4 – 48)	24 (11)	30 (6 – 66)
Never used condom in RAI	17 (8)	14 (0.0 – 20)	25 (11)	18 (0.0 – 46)
Had IAI	70 (37)	**61 (46 – 87)[‡]**	98 (159)	**99 (96 – 100)[‡]**
Used condom consistently in IAI	31 (11)	26 (4-47.9)	26 (41)	18 (9 – 29)
Never used condom in IAI	22 (8)	28 (7 – 54)	35 (55)	43 (30 – 56)
Sex with permanent male partner	62 (47)	**59 (43 – 76)[‡]**	27 (58)	**24 (18 – 31)[‡]**
Had RAI	85 (39)	**90 (72.4-100.0)[‡]**	47 (27)	**49 (19 – 71)[‡]**
Used condom consistently in RAI	21 (8)	15 (1 – 39)	27 (7)	NA[§]
Never used condom in RAI	41 (16)	NA[§]	22 (6)	NA[§]
Had IAI	61 (28)	67 (41 – 86)	93 (54)	94 (77 – 99)
Used condom consistently in IAI	12 (3)	11 (0.0 – 24)	26 (14)	25 (0.0 – 43)
Never used condom in IAI	39 (11)	23 (3 – 63)	30 (16)	41 (16 – 64)

[*] Sample percentages represent the proportion of the study population with the characteristic.

[**] Adjusted percentages represent the population estimates based on analysis in RDSAT, which is adjusted for personal network sizes and recruitment patterns.

[§] Population estimates cannot be calculated in RDSAT due to lack of cross-group recruitments.

[‡] Statistically significant at the 0.05 level.

IAI: Insertive anal intercourse; RAI: Receptive anal intercourse

MSM did not seek medical care or report to police after abusive anti-gay incidences

Respondents were asked if they had experienced any abuse (verbal, physical, or sexual) because they were perceived to be homosexual or a transvestite. Approximately a third of MSM had ever been insulted, approximately 15 percent had been threatened or physically hurt, and nearly 20 percent had been forced to have sex against their will (see Table 25). Among those who had been victims of physical or sexual violence, less than 10 percent sought medical care after the incidents and almost none of the victims reported the incident to the police.

Table 25 Anti-gay violence experienced by MSM

	Sample %* n = 296†	Population estimates** % (95% CI)
Ever been insulted because they were perceived to be gay	36	32 (26 – 39)
Ever been threatened because they were perceived to be gay	17	14 (10 – 18)
Ever been physically hurt because they were perceived to be gay	14	11 (7 – 16)
Ever been forced to have sex against their will	18	18 (13 – 23)
Sought medical care after abusive incidence(s) (n = 127)	9	11 (4 – 21)
Reported abusive incidence(s) to the police (n = 114)	2	NA§

† Sample size varies slightly due to missing data.

* Sample percentages represent the proportion of the study population with the characteristic.

** Adjusted percentages represent the population estimates based on analysis in RDSAT, which is adjusted for personal network sizes and recruitment patterns.

§ Population estimates cannot be calculated in RDSAT due to lack of cross-group recruitments.

Although MSM had high level of knowledge about HIV transmission, they still held misconceptions about HIV

Knowledge on HIV transmission was high, with the majority of MSM respondents being aware of the risks of unprotected sex, needle sharing, and of mother-to-child transmission (see Table 26). However, misconceptions on how the virus in not transmitted was also very high, with two-thirds of MSM still believing that mosquitoes can transmit HIV. In addition, their misconceptions could potentially lead to discrimination toward HIV-positive people, as only about half agreed that HIV could not be transmitted through sharing a meal with someone who has HIV. Despite the low levels of condom use with all types of sex partners in this population of MSM, nearly two-thirds perceived themselves to be at low risk for HIV.

Table 26 Correct knowledge about HIV/AIDS among MSM

Knowledge of HIV/AIDS (Correct response)	Sample %* n = 296†	Population estimates** % (95% CI)
A person can get HIV/AIDS from:		
Having sex without condom (Yes)	97	96 (93 – 98)
Sharing needles (Yes)	91	91 (87 – 95)
Sharing a meal with a person who has AIDS (No)	62	55 (48 – 63)
Mosquito bites (No)	33	33 (27 – 40)
A baby can get AIDS from her mother if she has HIV/AIDS (Yes)	85	84 (79 – 88)
A person who looks healthy may be infected with HIV (Yes)	76	71 (65 – 78)
A person can get AIDS by working with someone who has AIDS (No)	65	62 (57 – 69)
Having STI increases the chances of become infected with HIV (Yes)	65	64 (57 – 70)
HIV/AIDS has a cure (No)	75	77 (72 – 82)
Self-perceived risk of HIV infection		
Low risk	61	63 (56 – 70)
Moderate-to-high risk	40	37 (31 – 44)

† Sample size varies slightly due to missing data.

* Sample percentages represent the proportion of the study population with the characteristic.

** Adjusted percentages represent the population estimates based on analysis in RDSAT, which is adjusted for personal network sizes and recruitment patterns.

Few MSM had ever been tested for HIV

Only 12 percent of all participants had been tested before participating in the study (see Table 27). Of those who ever had an HIV test, approximately half took the test more than a year ago. Further, only 60 percent of those who tested for HIV received their test results. About three-quarters received their HIV test for free, and the most common places of HIV testing were the public health services of Asunción (24 percent) and CDE (19 percent) (population estimates not available). The majority who had an HIV test indicated that their result was negative; the remainder had not received their test results (adjusted population estimates).

Table 27 HIV testing utilization by MSM

	Sample %[*]	Population estimates[**] % (95% CI)
Has ever been tested for HIV (n = 296)	18	12 (8.5 – 17)
Time of most recent HIV test (n = 53)		
Within the last 3 months	15	16 (10 – 55)
3 months – 1 year ago	33	41 (9 – 71)
1 – 5 years ago	37	35 (11 – 54)
More than 5 years ago	15	7 (1 – 17)
Received the result of the most recent HIV test (n = 53)	74	60 (34 – 88)
How most recent HIV test obtained (n = 53)		
Free	68	73 (28 – 100)
Paid	32	27 (7 – 83)
Location of most recent HIV test (n = 53)		
Public health service, Asunción	25	
Public health service, CDE	19	
Private lab, CDE	13	NA[§]
Blood bank, CDE	9	
HIV counseling and testing center (Foz do Iguaçu)	6	
Private lab, Asunción	4	
Other	25	
Result of most recent HIV test		
Negative	80	NA[§]
Didn't get the result	20	
Did not answer	0	

[†] Sample size varies slightly due to missing data.

[*] Sample percentages represent the proportion of the study population with the characteristic.

[**] Adjusted percentages represent the population estimates based on analysis in RDSAT, which is adjusted for personal network sizes and recruitment patterns.

[§] Population estimates cannot be calculated in RDSAT due to lack of cross-group recruitments.

Drug use was high among MSM

About half of all MSM had ever used any illicit drugs (including cannabis, crack, cocaine, amphetamines, ecstasy, and non-prescribed drugs); however, almost no MSM reported ever having injected non-prescribed drugs (see Table 28).

In the past six months, about a third reported having used some kind of drugs, with a third reporting having smoked marijuana, less than 20 percent snorting cocaine, and few reporting crack use. A fairly high proportion (35 percent) reported alcohol intake at least several times a week or more in the last six months.

Table 28 Drug and alcohol use among MSM

	Sample %* n = 296†	Population estimates** % (95% CI)
Ever used any drug	50	50 (42 – 57)
Used any drug last 6 months	34	36 (28 – 42)
Used marijuana last 6 months	32	32 (25 – 39)
Used cocaine last 6 months	19	18 (13 – 23)
Used crack last 6 months	9	10 (6 – 14)
Ever injected non-prescribed drugs	1	3 (0 – 3)
Alcohol last 6 months		
None/once a month or less	21	20 (15 – 26)
Approximately once a week	44	45 (38 – 52)
Several times a week/daily	35	35 (28 – 42)

† Sample size varies slightly due to missing data.

* Sample percentages represent the proportion of the study population with the characteristic.

** Adjusted percentages represent the population estimates based on analysis in RDSAT, which is adjusted for personal network sizes and recruitment patterns.

A high proportion of MSM engage in sex work

MSM were asked if they currently engaged in sex work (i.e., receiving money, drugs, or gifts in exchange for anal or oral sex), and about 20 percent indicated they were doing so (see Table 29). The sociodemographic profile (age, marital status, city of residence, place of birth) of current male sex workers did not differ significantly from MSM who did not engage in sex work (data not shown). The only exception was the level of education; a significantly lower estimated proportion of male sex workers had completed 12 years of education or more compared to non-male sex workers (2 percent vs. 19 percent; $p < 0.05$).

More than half of those currently engaged in sex work reported having initiated sex work as an adolescent (< 18 years of age). Approximately a third of current male sex workers (MSWs) had been engaged in sex work for one year or less and 17 percent for at least six years. About half of male sex workers reported also engaging in sex work in another city outside of CDE in the last year, most often in another Paraguayan city, Asunción, or Foz do Iguaçu in Brazil. Population estimates were not available; however, MSWs in the study indicated that the most common places for sex work were hotel or motel (37 percent) or the street (33 percent). The majority did not work for another person. The median monthly income from sex work was USD$83.

Table 29 Characteristics of male sex workers (n = 87)

	Sample* %	Population estimates** % (95% CI)
Currently working as a male sex worker (n = 296)	29	21 (14 – 29)
Age at beginning sex work		
< 18	56	51 (39 – 60)
18 – 24	39	45 (37 – 57)
25+	5	4 (1 – 8)
Number of years engaging in sex work		
≤ 1 year	29	34 (18 – 54)
2 – 5 years	46	50 (33 – 65)
6 or more years	25	17 (7 – 27)
Engaged in sex work in another city outside of CDE	47	50 (32 – 64)
City where worked as sex worker outside of CDE last year (n = 41)		
Asunción	44	32 (12 – 55)
Foz do Iguaçu	30	30 (6 – 68)
Puerto Iguazu	5	NA§
Other Paraguayan cities	49	67 (35 – 88)
Other city in another country	12	4 (2 – 11)
Where worked as sex worker in CDE last 3 months		
Hotel/motel	37	NA§
Street	33	NA§
A house/apartment	14	NA§
Client's house	13	NA§
Bar	10	NA§
Friend/acquaintance's house	5	NA§
Brothel	4	NA§
Partner's house	1	NA§
Contacted by phone	8	NA§
Other	16	NA§
Works as sex worker for someone	5	NA§
Median monthly income from sex work in US$ (IQR)	83 (55, 184)	NA§

* Sample percentages represent the proportion of the study population with the characteristic.

** Adjusted percentages represent the population estimates based on analysis in RDSAT, which is adjusted for personal network sizes and recruitment patterns.

§ Population estimates cannot be calculated in RDSAT due to lack of cross-group recruitments.

Male sex workers mainly had male clients, but also served female and transvestite clients

In the last six months, nearly all MSM who engaged in sex work reported having a male client, and they engaged more frequently in IAI (91 percent) than RAI (30 percent) with male clients (Table 30). The sample of current MSWs also reported having female clients (31 percent) in the last two months, with whom consistent condom use was practiced only a third of the time. Additionally, approximately half of current MSWs were estimated to have had transvestite clients in the last two months. Information on condom use with transvestites was not collected as it was assumed to be low.

Table 30 Sexual behaviors of male sex workers with their clients

	Sample %	Population estimates % (95% CI)
Had male clients in last 6 months (n = 87)	98	NA[§]
Had receptive anal intercourse with male clients in last 6 months (n = 86)	38	30 (14 – 50)
Condom use during receptive anal intercourse with male clients in last 6 months (n = 33)		
Consistent	46	NA[§]
Inconsistent	42	NA[§]
Never	12	NA[§]
Had insertive anal intercourse with male clients in last 6 months (n = 87)	94	91 (81 – 98)
Condom use during insertive anal intercourse with male clients in last 6 months (n = 81)		
Consistent	33	22 (7 – 44)
Inconsistent	45	53 (40 – 68)
Never	22	25 (8 – 37)
Had female clients in last 2 months[†] (n = 87)	31	NA[§]
Used condom during vaginal intercourse with female clients in last 6 months (n = 26)[†]		
Consistent	35	NA[§]
Inconsistent	39	NA[§]
Never	27	NA[§]
Used condom during anal intercourse with female clients in last 6 months (n = 24)[†]		
Consistent	33	NA[§]
Inconsistent	38	NA[§]
Never	29	NA[§]
Had transvestite clients in last 2 months	54	52 (37 – 69)

[†] Incorrect skip pattern did not allow us to calculate sex with female clients in the last 6 months. Rather, sex with female clients is reported for the past 2 months and condom use in the last 6 months is reported only for those who had a female client in the last 2 months.

[§] Population estimates cannot be calculated in RDSAT due to lack of cross-group recruitments.

Although HIV prevalence was low among MSM, syphilis prevalence was high

All MSM respondents who participated in the study agreed to do a syphilis and HIV test, the results of which are shown in Table 29. Population estimates show that HIV prevalence was less than one percent (0.5 percent; CI: 0.2 – 2.5). However, it should be noted that this prevalence was based only on confirmed cases of HIV (4/296), which was defined as testing seropositive on both the first and second HIV ELISA tests, as well as on the confirmatory test (Western Blot).

In fact, a higher number of MSM participants tested positive on the first HIV ELISA test (8/296), resulting in an estimate of 1.2 percent (CI: 0.2 – 2.5) HIV prevalence in the MSM population. However, of the eight who tested positive on the first ELISA test, only four returned to do a confirmatory HIV test, all of whom tested positive on the second ELISA and Western Blot tests. Therefore, it is likely that the estimated population HIV prevalence is between 0.5 and 1.2 percent (see Table 31).

Table 31 HIV and syphilis prevalence estimates among MSM

	Sample %* n = 296†	Population estimates** % (95% CI)
Confirmed HIV seropositive†	1.4 (4)	0.5 (0.0 – 1.2)
One ELISA HIV seropositive‡	2.7 (8)	1.2 (0.2 – 2.5)
VDRL positive for syphilis	14 (42)	13 (9 – 18)

† Sample size varies slightly due to missing data.

* Sample percentages represent the proportion of the study population with the characteristic.

** Adjusted percentages represent the population estimates based on analysis in RDSAT, which is adjusted for personal network sizes and recruitment patterns.

‡ Those who tested positive on one HIV ELISA test are considered unconfirmed HIV seropositive as they did not have a confirmatory HIV test. Confirmed HIV seropositive persons tested positive on both the first and second HIV ELISA tests and Western Blot.

The estimated prevalence of syphilis was considerably higher than estimated HIV prevalence, with an estimated 13 percent (CI: 9 – 18) of MSM having a history of syphilis infection.

Comparison among MSM study participants showed that there is a significant difference by age. Those who tested positive on the VDRL syphilis test were significantly more likely to be older compared to those who tested negative; this is not surprising given that the VDRL test is an indication of lifetime experience with syphilis infection (data not shown). Although not statistically significant, syphilis-positive MSM earned slightly more income than syphilis-negative MSM. There were no statistically significant differences between syphilis-positive and -negative persons in city of residence, education, country of birth, skin color, or marital status (data not shown).

Men who have sex only with men (MSOM) were more likely to be seropositive for syphilis than those who have sex with both men and women (MSMW)

Table 32 shows the comparison of HIV and syphilis population estimates among MSOM and MSMW. HIV prevalence was similar between MSOM and MSMW (< 1 percent). For syphilis, MSOM were significantly more likely to have tested positive for syphilis than MSMW: while 34 percent of MSOM tested positive for syphilis, 8 percent of MSMW did. Syphilis prevalence was not statistically different between male sex workers and non-male sex workers (17 percent vs. 13 percent), nor was HIV prevalence (1.2 percent vs. 1.4 percent) (data not shown).

Table 32 HIV and syphilis prevalence among men who have sex with only men (MSOM) and men who have sex with men and women (MSMW)

	MSOM % (proportion)	Population estimates % (95% CI)	MSMW % (proportion)	Population estimates % (95% CI)
Confirmed HIV seropositive	4 (3/76)	0.9 (0.2 – 2.2)	0.5 (1/217)	0.4 (0.4 – 1.6)
One ELISA HIV seropositive	7 (5/75)	1.4 (0.3 – 2.8)	1.4 (3/214)	1.1 (0.2 – 2.8)
VDRL positive for syphilis	29 (22/76)	**34 (20 – 51)**	9 (20/217)	**8 (5 – 12)**

† Sample size varies slightly due to missing data.

* Sample percentages represent the proportion of the study population with the characteristic.

** Adjusted percentages represent the population estimates based on analysis in RDSAT, which is adjusted for personal network sizes and recruitment patterns .

Syphilis status was associated with sexual behaviors

Table 33 shows syphilis VDRL seropositive estimates by sexual behaviors in the last six months. Although not statistically significant, MSM who practiced RAI (20 percent) were more likely to test positive for syphilis than those who did not practice RAI (7 percent) with occasional male partners and similarly with permanent male partners (33 percent vs. 22 percent). There was a statistically significant association, however, between IAI with occasional male partners and testing syphilis-positive. MSM who practiced IAI with occasional male partners were significantly less likely to be seropositive for syphilis than those who did not practice IAI. Those who had IAI with permanent partner were also more likely to be seropositive for syphilis, although the association was not statistically significant.

There was no statistically significant difference in testing positive for syphilis by number of occasional or permanent male partners and by condom use with these partners. Engaging in sex work was also not found to be associated with testing positive for syphilis (data not shown).

Table 33 Syphilis prevalence by sexual behavior in the last six months among MSM

Sexual behaviors in the last 6 months	Sample % VDRL positive	Population estimates % (95% CI)
Occasional male partners		
Sex with occasional male partner (n = 289)		
Yes	14	13 (9 – 20)
No	17	13 (6 – 23)
Number of occasional male partners (n = 254)		
0	11	10 (3 – 22)
1 – 2	9	11 (5 – 19)
3 – 5	22	22 (9 – 36)
6 and more	15	10 (2 – 22)
Had receptive anal intercourse (RAI) (n = 216)		
Yes	24	20 (8 – 34)
No	7	7 (3 – 14)
Condom use in RAI (n = 93)		
Always	17	20 (3 – 64)
Not always	26	32 (14 – 61)
Condom use in RAI (n = 93)		
Never	26	NA
Ever	23	NA
Had insertive anal intercourse (IAI) (n = 217)		
Yes	11	**8 (4 – 14)**
No	45	**47 (18 – 79)**
Condom use in IAI (n = 191)		
Always	8	3 (1 – 12)
Not always	12	10 (5 – 17)
Condom use in IAI (n = 197)		
Never	14	13 (5 – 25)
Ever	9	6 (1 – 13)
Permanent male partners		
Sex with permanent male partner (n = 293)		
Yes	22	20 (10 – 30)
No	10	9 (6 – 14)
Had receptive anal intercourse (RAI) (n = 104)		
Yes	26	33 (18 – 57)
No	13	22 (4 – 48)
Condom use in RAI (n = 65)		
Always	7	NA[§]
Not always	32	NA[§]
Condom use in RAI (n = 66)		
Never	32	24 (1 – 42)
Ever	23	24 (3 – 45)
Had insertive anal intercourse (IAI) (n = 104)		
Yes	13	18 (6 – 41)
No	50	73 (32 – 96)

Table 33 Syphilis prevalence by sexual behavior in the last six months among MSM (continued)

Sexual behaviors in the last 6 months	Sample % VDRL positive	Population estimates % (95% CI)
Condom use in IAI (n = 79)		
Always	6	NA[§]
Not always	16	NA[§]
Condom use in IAI (n=82)		
Never	15	18 (4 – 41)
Ever	13	28 (16 – 59)

[†] Sample size varies slightly due to missing data.

[*] Sample percentages represent the proportion of the study population with the characteristic.

[**] Adjusted percentages represent the population estimates based on analysis in RDSAT, which is adjusted for personal network sizes and recruitment patterns.

[§] Population estimates cannot be calculated in RDSAT due to lack of cross-group recruitments.

Although MSM had positive attitudes toward people living with HIV and AIDS, they still harbored judgment and blame toward them

The vast majority of MSM showed compassion and concern toward people living with HIV and AIDS (see Table 34). At the same time, many of them also had views that were judgmental and blaming of those with HIV, with approximately half having negative attitudes toward individuals with HIV and about a third having negative attitudes toward family members of HIV-infected persons.

Table 34 Attitudes of MSM toward people living with HIV and AIDS

	Sample %[*] n = 296[†]	Population estimates[**] % (95% CI)
Positive attitudes		
People living with HIV/AIDS deserve treatment and care	97	97 (94 – 99)
People living with HIV/AIDS deserve sympathy	93	92 (89 – 96)
God wants us to care for everyone, even those with HIV/AIDS	94	94 (90 – 97)
Our society does not do enough to help people living with HIV/AIDS	78	76 (69 – 82)
Negative attitudes		
People living with HIV/AIDS present a threat to their own health and that of their family	60	63 (55 – 69)
People living with HIV/AIDS are blamed for bringing the disease into the community	58	60 (52 – 67)
People living with HIV/AIDS have been promiscuous	51	55 (47 – 63)
Women get HIV because they are prostitutes	49	53 (45 – 59)
People living with HIV/AIDS should be ashamed of themselves	49	56 (47 – 62)
AIDS is a punishment from God	33	35 (28 – 41)
The family of the person living with HIV/AIDS should also be blamed	30	33 (26 – 38)
The family of the person living with HIV/AIDS is cursed and should be avoided and isolated	29	31 (25 – 38)

[†] Sample size varies slightly due to missing data.

[*] Sample percentages represent the proportion of the study population with the characteristic.

[**] Adjusted percentages represent the population estimates based on analysis in RDSAT, which is adjusted for personal network sizes and recruitment patterns.

HIV prevention programs are not reaching MSM

Few MSM were exposed to HIV prevention activities in the last 12 months (see Table 35). Less than a quarter of MSM had received any educational materials about HIV and STI prevention or participated in workshops about HIV in the past 12 months. A small percentage reported receiving free condoms from public service (23 percent), NGOs (9 percent), and bars/nightclubs (27 percent). Among all MSM, only about 2 out of 5 reported receiving free condoms in the last 12 months from at least one of these organizations or sites.

Table 35 Participation in HIV prevention activities in the last 12 months by MSM

	Sample % [*] n = 296 [†]	Population estimates [**] % (95% CI)
Received educational materials on HIV and STIs aimed at MSM	20	14 (10 – 20)
Participated in talks or workshops on HIV	25	24 (18 – 30)
Received free condoms from public service	25	23 (18 – 28)
Received free condoms from NGOs	13	9 (5 – 14)
Received free condoms from bars/night clubs	29	27 (22 – 33)
Received any free condoms	47	41 (34 – 48)

[†] Sample size varies slightly due to missing data.

[*] Sample percentages represent the proportion of the study population with the characteristic.

[**] Adjusted percentages represent the population estimates based on analysis in RDSAT, which is adjusted for personal network sizes and recruitment patterns.

Network characteristics of MSM

The social network of each participant was defined as the number of men or transvestites they knew that had at least one sexual encounter (anal or oral) with a man or transvestite whom they had seen in the past month. MSM reported a median network size of 10.5 (IQR: 5, 21).

Network sizes of MSM differed by self-defined sexual orientation or identity, involvement in sex work, and syphilis test result (see Table 36). Population estimates for median network size could not be calculated; therefore the comparison was done only with sample data. MSM who self-identified as homosexuals had the largest social network (21), followed by bisexual (10), and self-identified heterosexuals had the smallest network size (8) ($p < 0.001$). Additionally, MSM who engaged in sex work and those who tested positive on the syphilis test had significantly larger networks than those who did not engage in sex work and tested negative on the syphilis test, respectively.

Table 36 Network sizes of MSM in CDE

	Median network size (IQR)	p-value
Self-identified sexuality		
Homosexual	21 (10, 40)	p < 0.001
Bisexual	10 (5, 19)	
Heterosexual	8 (4, 14)	
Engaged in sex work last 6 months		
Yes	18 (9, 28)	p < 0.001
No	9 (5, 18)	
Result of study syphilis test		
Positive	16 (9, 22)	p < 0.05
Negative	10 (5, 20)	

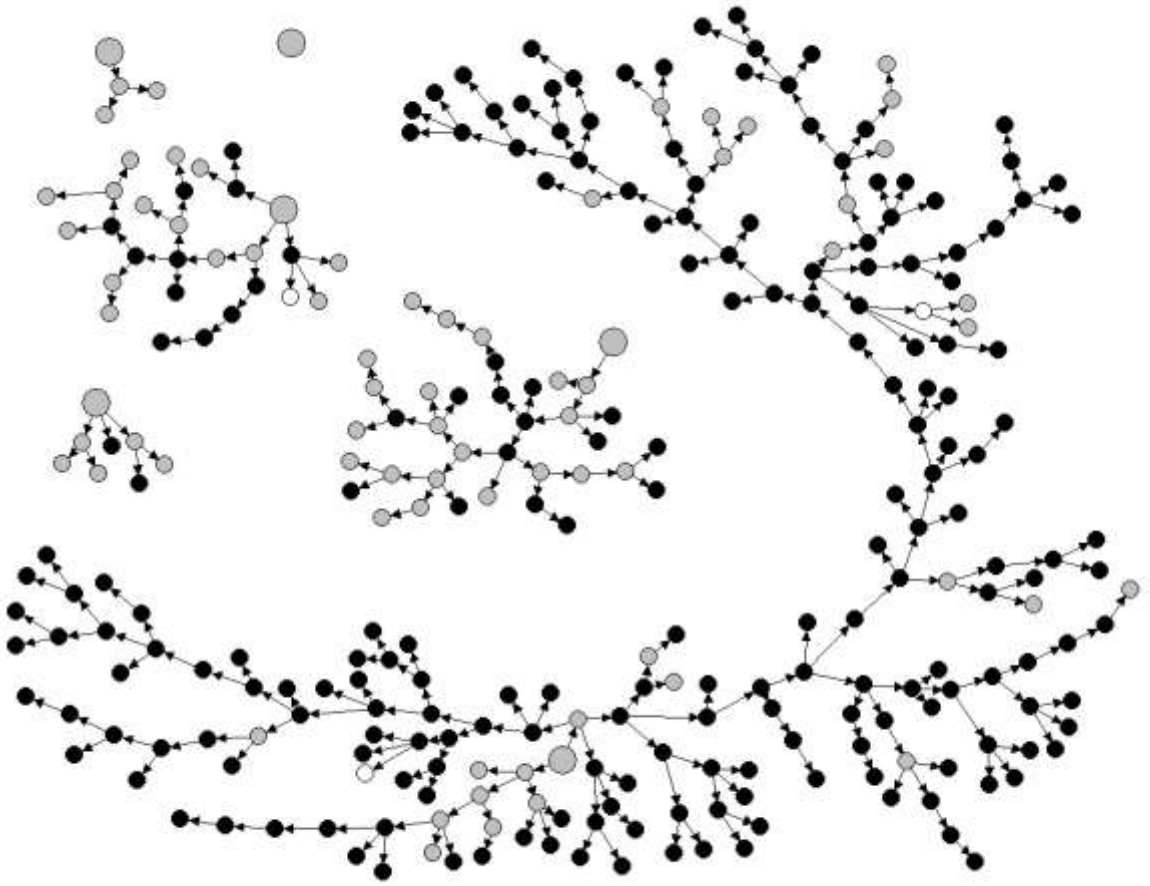
Note: The percentages in this table reflect sample percentages.

The majority of MSM (89 percent) mentioned that all the MSM they knew were part of the same social network (e.g., the MSM in the respondents' social network know each other), and 69 percent mentioned that they had sex with at least one acquaintance from their social network.

MSM were also asked about some characteristics of the acquaintances in their network. Within their network of MSM, an average of 10 percent were thought to be less than 18 years old, less than one percent were indigenous, 10 percent were perceived by respondents to be HIV-positive, and 46 percent were reported as being homeless.

Figure 12 shows the recruitment pattern of MSM which was initiated with six seeds (as shown by the larger circles). This figure shows that although all the seeds were men who have sex with only men (MSOM), only 27 percent of the resulting sample (79/296) were MSOM and three-quarters were men who had sex with men and women (MSMW). This is because MSOMs recruited MSMWs 49 percent of the time, and there was a high tendency for MSMWs to recruit other MSMWs (86 percent of the time).

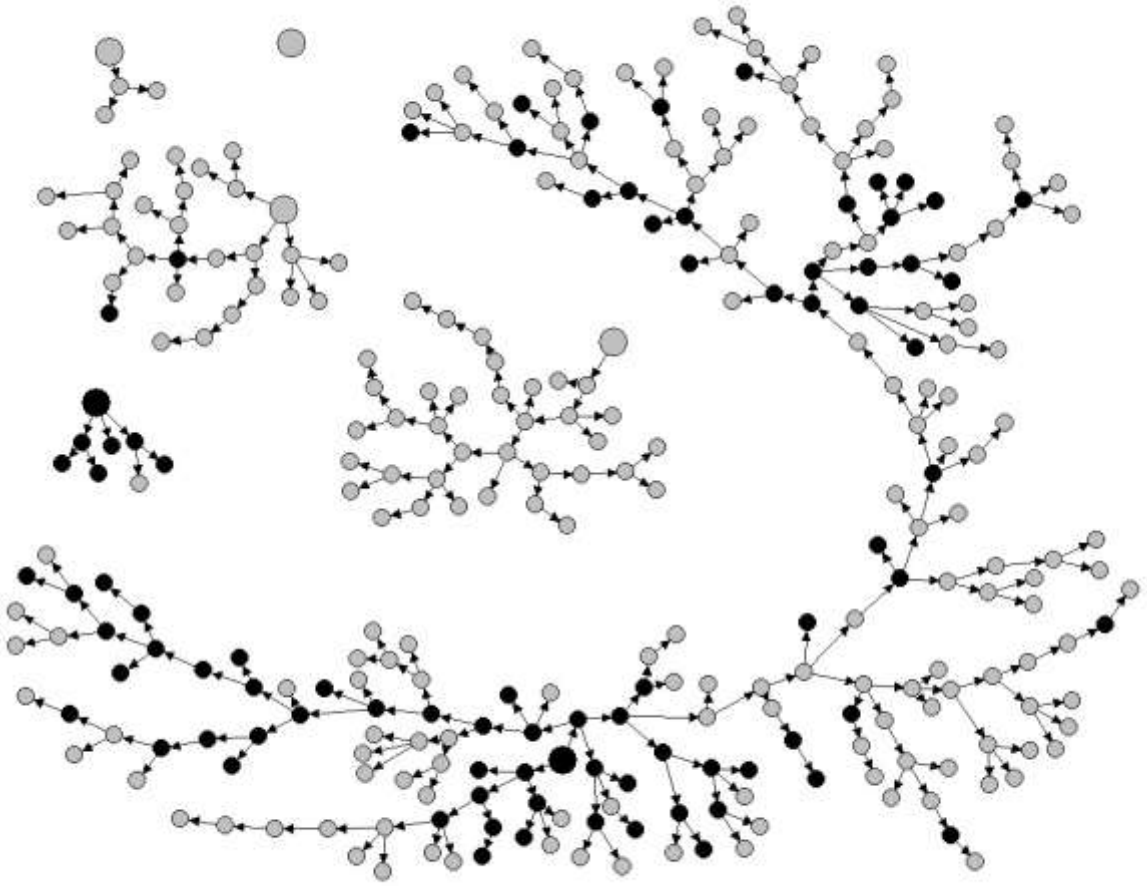
Figure 12 Recruitment pattern of men who have sex with only men (MSOM) and men who have sex with men and women (MSMW), (n = 296)



○ Men who have sex with only men (MSOM)
● Men who have sex with men and women (MSMW)
[Larger circles indicate seeds and smaller circles are subsequent recruitees. White circles represent those with missing data on this variable.]

Figure 13 compares the recruitment pattern of those engaged in sex work in the last six months and those who did not. This figure illustrates the high tendency for in-group recruitment, especially in the group not involved in sex work.

Figure 13 Recruitment pattern of MSM who engaged in sex work in the last 6 months and MSM who did not (n = 296)



● Men who engaged in sex work in the last 6 months
○ Men who did not engage in sex work in the last 6 months
[Larger circles indicate seeds and smaller circles are subsequent recruitees.]

Discussion

Experience with RDS Recruitment Methodology

The recruitment process, using RDS, was surprisingly slow for FSWs given that FSWs interviewed in the formative research reportedly had great interest in participating in the study. All FSWs interviewed in the formative research declared their interest in the study and stated that it would be very important for them. They emphasized that they had limited access to services and that educational activities were not reaching most of them. Therefore, in addition to receiving education and information on how to protect themselves against sexually transmitted infections, they welcomed the opportunity to be tested for HIV and syphilis. Municipal authorities also agreed on this and predicted that FSWs would easily be recruited in the study and that with MSM the situation would be very different. Unfortunately, recruitment for both MSM and FSW was not as robust as predicted. Still, a suitable sample was recruited, allowing population-based estimates to be determined for many of the variables. There are some reasons that could explain the slow enrollment. Despite the fact that the study site was located in a neighborhood frequented by sex workers, many indicated that they did not feel comfortable visiting the site because they feared being exposed as sex workers to the general community. Another possible reason mentioned by some participants was the fact that the study site was the same for FSWs and MSM.

The analysis of the recruitment process also showed that FSWs in CDE do not constitute a single network, but rather several small independent networks. It was very clear that FSWs working in brothels do not meet those working in the street or even in other brothels, and those working in night clubs meet other FSWs working in the same place. Similarly, FSWs living in other cities, specifically Presidente Franco, were independent from those living in CDE. The difficulties in recruitment resulted in a smaller sample size than was originally intended, reducing the statistical power of the findings. In addition, the fact that the sample was not drawn from a network but from several small networks limited statistical analysis with RDSAT, the method recommended for analyzing samples using RDS. Therefore valid population-based estimates representing the FSW population in CDE could not be made.

Conversely, the recruitment of MSM was brisk and led to a sample large enough to be representative of the MSM population in the city, which allowed for population-based estimates for most variables. This was surprising because in the formative research, interviews suggested that MSM would be reluctant to participate because of fear of exposure and reprisal. We attribute the success of MSM recruitment to the high quality and friendliness of the study team offering a warm, non-judgmental, and confidential environment where MSM felt comfortable. In addition, the possibility of getting free syphilis and HIV tests was a very important stimulus for participants, because this population has very limited access to sexual health services. Although a systematic qualitative evaluation was not performed, participants praised study staff, declaring that this was the first time that many had an opportunity to discuss sexual health without feeling discriminated against. Several MSM participants stated that these kinds of services should be maintained after the research project ended because it is very difficult to have access to health education, prevention activities, and STI care and treatment. This was reflected in the very low proportion of participants that had been reached by prevention activities and the low rate of HIV testing among both the MSM and FSW populations (less than half of FSWs had ever been tested for HIV and only 60 percent of those who were tested received the result despite having been the focus of several HIV prevention campaigns in the city).

Knowledge and Attitudes Related to HIV and Other STIs

Despite the fact that most participants had only a primary education, knowledge of STI and HIV transmission was fairly good. Most were aware that the main transmission risk is unprotected sex with an infected person and that the best protection is to use condoms. On the other hand, there were some myths or misconceptions about HIV transmission that may contribute to the discrimination of people living with HIV and AIDS, but would not have a big influence on the adoption of preventive behaviors. The most common misconceptions were that HIV can be acquired by sharing food with an HIV-positive person or that mosquitoes may also transmit HIV. In addition, while 90 percent declared that people living with HIV and AIDS deserve sympathy and need solidarity and support, approximately 60 percent felt that HIV-positive people are promiscuous, that they got HIV because they are prostitutes, or that AIDS is a punishment from God for bad behavior. This is not surprising, as there is a large amount of misinformation in the general population, sometimes reinforced by local groups that condemn what they see as immoral behavior.

The most striking inconsistency between knowledge and practice was observed with condom use. Although most participants understood that condoms provide the best protection against STIs and HIV, the proportion of participants who reported consistent use was less than 50 percent, regardless of the type of partner. Furthermore, the pattern of condom use showed that these populations do not have a clear understanding of the risks associated with different sex acts, as condom use in anal sex was as low or lower than in vaginal sex and the use in RAI and IAI was equally low. It is clear that the HIV prevention educational efforts are not having the desired impact, as highlighted by the high percentage of MSM who declared never using condoms in RAI (more than 20 percent) and in IAI (more than 10 percent).

The lack of adequate HIV/STI prevention education is also reflected in the inconsistency between self-risk assessment and sexual behaviors. Although FSWs and MSM indicated knowing that condom use is important in HIV/STI prevention and only a small proportion of them use condom consistently, the majority perceived themselves to be at low risk for HIV (nearly two-thirds of FSWs and MSM).

Self-identified Sexual Orientation and Sexual Behavior among MSM

When MSM were asked to define their sexual orientation (homosexual, bisexual, or heterosexual), only 12 percent declared themselves to be homosexual, over half as bisexual, and a third as heterosexual. This distribution of sexual identity appears to be typical among MSM in Latin cultures, where a large proportion of MSM self-identify as heterosexual or bisexual (Tabet 2002; Tabet 1996; Caceres 2002).

Sexual identity was important in defining the type of partner and type of sex practiced. As expected, a majority of MSM who self-identified as heterosexual or bisexual had sex with male and female partners (89 percent and 95 percent, respectively), much higher than the 39 percent of self-identified homosexuals who reported having sex with men and women. In addition, a larger proportion of self-identified homosexual MSM than heterosexual and bisexual MSM practiced receptive anal sex. This, along with the relatively low rate of condom use, make this subgroup one of the most vulnerable groups to HIV transmission (Doll & Ostrow, 1999; Buchbinder et al, 2005; Koblin et all, 2006). Understanding self-identified sexual orientation is critical. The majority of MSM, particularly those who self-identified as bisexual and heterosexual, reported having sex with both women and men; this represents a possible "bridge" group that can facilitate the transmission of HIV and other STIs to the general population. Prevention efforts should consider that the majority of MSM do not identify as homosexual or gay and should design interventions accordingly.

Initiation of Sex Work

One of the inclusion criteria for participation in the study was being 16 years of age and older, and for those under 18 years old, parental consent was required. Therefore, this study likely underestimated the proportion of sex workers < 18 years, who made up only 5 percent of the sample. It is also worth noting that 10 percent of the sample began sex work before the age of 15, and over half initiated sex work between the ages of 15 and 19, indicating that the proportion of young sex workers is most likely higher than the 5 percent represented in this study.

History of Violence and Childhood Sexual Abuse among FSWs

Regarding childhood sexual abuse, findings showed that 40 percent of FSWs had been molested at least once, at a median age of 11 years. This finding appears to be consistent with other information on this topic. Unfortunately, there is no reliable national or regional data for comparison. All the data from Paraguay refers mainly to sexual exploitation of children, which is seen as a big problem in Paraguay. The problem is aggravated by the fact that most sexual exploitation is initiated within the family and usually the parents are the ones who introduce their daughters to prostitution (Sistema de Información Regional sobre Trabajo Infantil, Paraguay 2002).

Based on our own formative research, one of the most striking results was the perceived high rate of childhood sexual abuse. Almost without exception, people interviewed, which included health providers, social workers, police, and other authorities, referred to sexual abuse against girls and boys as one of the most important problems in the city. Cases of sexual initiation with family members when a child was around 10 years old are common, as are families that prostitute their daughters as a subsistence strategy. However, there are no reliable data on the frequency of child abuse in Paraguay aside from the findings from our formative research.

Homophobic Attitudes and Violence

Formative research for this study found that homophobic attitudes are very common in CDE and the gay population is greatly stigmatized. A third of MSM had been insulted for being perceived as gay, and more than 10 percent had suffered some kind of physical abuse because of these perceptions. It is also important to note that only 2 percent of those who suffered physical abuse sought help or reported the incident to the police. It is a general feeling among MSM that it is pointless to report such incidents to the police, as they feel discriminated against by the police themselves.

Drug Use

It was not surprising to find that only one FSW participant reported having ever injected illicit drugs. Studies in the region have shown that the prevalence of injectable drug use has decreased sharply during the last few years throughout the region (UNODC 2007). On the other hand, the use of other illicit drugs such as cocaine, crack, or marijuana was found to be much higher in this group of sex workers than in the general population in Paraguay (< 1 percent) (UNODC 2007) In this study, more than 7 percent of FSWs

reported having used marijuana in the last six months, with similar figures for cocaine and crack use in the last six months.

Drug use patterns among MSM were very similar to that in FSWs, with few reporting the use of injectable drugs, but the use of marijuana and cocaine was more common (approximately a third had used these drugs in the past six months). In addition, about 10 percent had used crack in the last six months. Paraguay is one of the most important producers of marijuana (cannabis), but the annual prevalence of consumption in the country is estimated by UNODC at 0.5 percent of the population (UNODC 2007). In a school survey of seven Latin American countries, Paraguay had the second lowest levels of annual cannabis use (1.7 percent), second to the most popular drug, *jarra loca* (a mix of wine and tranquilizers), that was used by more than 2 percent of students of the sixth grade in a recent survey (OEA et al. 2004).

Alcohol consumption among FSWs and MSM was higher than in the general adult population in Paraguay. A third of the FSW respondents were frequent alcohol consumers (drinking many times a week or every day). Only 8 percent of the sample reported never having consumed any alcohol, lower than the national estimate for female lifetime abstainers (33 percent) (WHO 2004). Approximately a third of MSM reported alcohol use several times a week or daily.

While HIV risk from injection drug use is well known, the consumption of other drugs has also been shown to increase the risk of HIV infection through negative behavioral changes (Lampinen et al. 2007; Taylor et al. 2007). The level of drug and alcohol use found in this study is another factor that make these two groups highly vulnerable to HIV and STIs.

Although there are policies in Paraguay aimed at reducing drug and alcohol consumption, very few have been effective. Programs targeted at FSWs and MSM must also include drug and alcohol abuse prevention as part of a comprehensive risk reduction package.

Coverage of Prevention Programs

Male and female sex workers are officially included as a priority group for HIV/AIDS prevention activities as part of the national HIV/AIDS program in Paraguay. Even before the implementation of the Regional Program of the Fight against HIV/AIDS in 2003, the municipal health services had been providing HIV and STI prevention services including education, condom distribution, and free HIV tests; and some NGOs have been offering educational assistance to female sex workers. Nonetheless, the coverage and impact of these activities have been modest at best. Less than 30 percent of FSW respondents reported having participated in any educational activity related to HIV/STI prevention in the last year and only 18 percent had some contact with an NGO. In addition, less than half of FSW participants had ever had an HIV test.

On the other hand, MSM have not been a priority group for the national or regional HIV prevention program and this is clearly evident by the small proportion of MSM (less than a quarter) who reported receiving any kind of prevention messages or services in the last year. Nevertheless, based on feedback from the MSM participants to study staff, MSM seem to be interested in participating more actively in prevention services.

These finding clearly indicate the critical need to intensify HIV and STI prevention efforts among these high-risk populations.

Sexual Behavior of Female Sex Workers

The majority of FSWs reported having sex during the 30 days prior to the survey with new and regular clients as well as with non-paying partners. Despite the fact that more than 90 percent knew that sexual transmission of HIV can be prevented by condoms, almost a third did not use condoms consistently with new clients, and more than 40 percent had unprotected sex with regular clients in the last 30 days. Consistent use of condoms with non-paying partners was low, less than 20 percent for vaginal sex and 25 percent for anal sex, which is consistent with other studies (Barrientos et al. 2007; Voeten et al. 2007; Ministério da Saúde 2004). Further, consistent condom use during anal sex with new clients was slightly lower than in vaginal sex, indicating a lack of knowledge about the increased risk of HIV and STIs with anal sex compared to vaginal sex. Although it is encouraging to see that FSWs with more partners were more likely to condoms consistently in the past 30 days, there is much room for improvement. At best, consistent condom use with new clients among FSWs with more than 10 sex partners in the past month was better, but still not optimal, with 75-80 percent reporting consistent condom use. The low rates of consistent condom use among FSWs with fewer partners is quite concerning.

Interventions should increase the availability of condoms and emphasize building motivation and skills to negotiate the use of condoms, particularly when the client does not want to use one.

Concluding Remarks

These findings confirm that FSWs and MSM are particularly vulnerable to HIV and STIs due to their large number of sex partners, frequency of sexual acts, and low consistent use of condoms. In addition, factors increasing their social vulnerability to HIV are low educational level, poverty, and social marginalization. FSWs are also affected by programmatic factors, such as the poor health care system in CDE and the lack of or inadequate HIV/AIDS programs. FSWs and MSM are especially affected by the lack of adequate services because they have very limited access to culturally appropriate HIV/STI prevention, diagnosis, and treatment services. The high syphilis prevalence observed in this study, together with the alarming rates of incidence of congenital syphilis (Valderrama et al. 2004), are indicators that all the conditions for a rapid spread of HIV and other STIs are in place.

For these reasons, although the HIV prevalence was very low in both groups, and was very similar to the one observed in the general population in Paraguay (UNAIDS 2004), the results of the study indicate that all the conditions for the spread of the HIV epidemic are in place and that there is an urgent need to improve prevention activities with FSWs, MSM, and their partners. Maintaining the current conditions, there is a great risk of having an explosive spread within these groups, as well as a more generalized spread of the epidemic. In addition, anecdotal data suggests an increased incidence of STIs and HIV infections amongst young adolescents (e.g., 10–15 years), particularly females, a group whose members are frequently victims of abuse and sexual exploitation.

Recommendations

The main recommendation emerging from this study is to increase access to non-discriminatory STI/HIV prevention, diagnosis, and treatment programs for these vulnerable groups. In addition to establishing non-discriminatory services, making existing health and social services more welcoming to these marginalized groups should be considered, as some FSWs and MSM may not attend points of services that are known to be exclusively for FSWs or MSM. When establishing services for FSWs and MSM that

are more welcoming, a number of issues should be considered, such as location, hours, language, attitude of staff, handling of sensitive issues, educational materials, décor, signage, advertising, and staffing. Formative research on these issues is critical before establishing such services for MSM or FSWs.

Additionally, especially since many MSM do not identify themselves as homosexual or gay, regular service providers who see male patients should be educated on the sexual health needs of men who have sex with men and how to communicate effectively with MSM. Education of service providers must include a program to reduce stigmatizing attitudes and discriminatory behaviors of service providers toward sexuality, and various types of sexual practices (including anogenital sex and symptoms). Service providers will need to learn how to formulate safer sex messages and convey information about STIs to ensure clarity and accuracy, including information about transmission and risk reduction methods. A training curriculum should first be developed that incorporates all these issues.

In addition, there is an urgent need to improve the impact of educational activities, making them more visible and attractive, creating tailored messages aimed at increasing knowledge of HIV and STIs, and making efforts to counteract stigma and discrimination in order to make services more accessible to all vulnerable groups. Advocacy specifically aimed at reducing stigma and discrimination and violence against young people, is especially crucial.

Condom distribution, along with education, despite being an official priority of the program, is still not reaching key target groups. The recommendation is to increase access to condoms, by strengthening the condom distribution in the public sector and giving support to NGOs to complement the efforts and reach all the potential users in need. Condom distribution must be supplemented with other risk reduction education, including building motivation and skills to use condoms, promoting HIV testing, and preventing drug and alcohol use.

A better understanding of sex work is needed given the heterogeneity of this population. Those engaged in sex work include both male and female sex workers, those coerced into sex work, young sex workers, brothel-based sex workers, and street-based sex workers, just to name a few. It is important to better understand this diversity of sex workers and the context in which sex work occurs, in order to better target behavior change messages and provide services for these populations. Innovative programs for sex workers include implementing interventions directed at the male clients of sex workers (Leonard et al. 2000); interventions based in various settings such as bars, clubs, brothels, the street, and truck stops (UNAIDS 2000); and prevention education delivered through outreach and peer education (Walden 1999).

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