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MINISTRY OF HEALTH

# Results from the HIV/STI Integrated Biological and Behavioral Surveillance (IBBS) in Vietnam

## 2005 – 2006

IBBS

VIỆT NAM • 2006

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Nhà xuất bản Y học

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# ABBREVIATIONS/ACRONYMS

| | |
|---|---|
| **AIDS** | Acquired Immune Deficiency Syndrome |
| **CDC** | Centers for Disease Control (US) |
| **DOLISA** | Department of Labor, Invalid and Social Affairs |
| **FHI** | Family Health International |
| **FSWs** | Female Sex Worker |
| **HIV** | Human Immunodeficiency Virus |
| **HSS** | HIV Sentinel Surveillance |
| **IBBS** | Integrated Biological and Behavioral Surveillance |
| **IDUs** | Injecting Drug User |
| **KSWs** | Karaoke-based Sex Worker |
| **MARP** | Most at risk population |
| **MOLISA** | Ministry of Labor, Invalid and Social Affair |
| **MSM** | Men who have Sex with Men |
| **NIHE** | National Institute of Hygiene and Epidemiology |
| **PEPFAR** | President's Emergency Plan for AIDS Relief (US) |
| **PSU** | Primary Sampling Unit |
| **RDS** | Respondent-driven Sampling |
| **SSWs** | Street-based Sex Worker |
| **STI** | Sexually Transmitted Infection |
| **TWG** | Technical Working Group |
| **UNGASS** | United Nations General Assembly Special Session on HIV/AIDS |
| **USAID** | US Agency for International Development |
| **VAAC** | Vietnam Administration of HIV/AIDS Control |
| **VCT** | Voluntary Counseling and Testing |

# INTRODUCTION

The rapidly increasing number of people living with HIV/AIDS (PLWHA) during the last years of the 1990s indicated the fast spread of HIV epidemic, with different levels in many high risk populations, especially those in the provinces and cities of Hanoi, Quang Ninh, Hai Phong, Ho Chi Minh City, Can Tho, and An Giang. Although the HIV epidemic in Vietnam is still in the period of a "concentrated" epidemic that affects primarily high risk populations such as injecting drug users, female sex workers and their clients and those who have unsafe sex behaviors with them, it is well documented that the HIV epidemic has spread to lower risk populations and is able to change with unpredictable directions in a short period of time. The results of "HIV/AIDS estimation and projection in Vietnam 2005 – 2010" conducted by the Ministry of Health and Family Health International (FHI) with the support of USAID show that an estimated 263,470 people were HIV infected in 2005 and 311,500 are projected to be HIV infected by the year 2010 in Vietnam.

The HIV/AIDS National Surveillance System set up in 1994 has provided timely updated information for policy planning and the development of HIV/AIDS prevention programs. The "HIV/AIDS estimation and projection in Vietnam 2005 – 2010" was used for the development and implementation of "The National HIV/AIDS prevention strategies 2005- 2010 and the vision to 2020."

An early warning of HIV epidemic development can be gained from behavioral surveillance among high risk populations, and their behavior change is one of the deciding factors in HIV epidemic development. Therefore, along with HIV sentinel surveillance system, the Ministry of Health conducted behavioral surveillance surveys related to HIV/AIDS transmission since 2000. With financial and technical support from the President's Emergency Plan for AIDS Relief (PEPFAR), the Ministry of Health, National Institute of Hygiene and Epidemiology (NIHE) has conducted integrated biological and behavioral surveillance (IBBS) in seven (07) provinces and cities including Hanoi, Quang Ninh, Hai Phong, Ho Chi Minh City, Can Tho, An Giang in 2005-2006. This is community-based systematic surveillance focusing on most-at-risk populations of HIV infection (injecting drug users, female sex workers and men who have sex with men) and providing estimates of HIV and STI prevalence as well as risk behaviors. The major results from the survey have been gathered in the attached report: "Results from HIV/STI Integrated behavioral and behavioral surveillance in Vietnam 2005-2006".

The Ministry of Health takes the honor to introduce this report to HIV prevention, care and treatment agencies in Vietnam and to our colleagues, with the belief that this report will provide valuable information for the development of effective HIV/AIDS prevention and for program monitoring and evaluation.

On the occasion of the dissemination of this report, the Ministry of Health sincerely thanks local AIDS agencies of the survey areas and those officers who were directly involved in the surveillance for their cooperation. The Ministry of Health highly appreciates the financial and technical support from the United States Agency for International Development (USAID), the Center for Disease Control (CDC) and Family Health International (FHI) for their support of the IBBS.

Deputy Minister, Ministry of Health

Prof. Trinh Quan Huan

# EXECUTIVE SUMMARY

From October 2005 to June 2006, integrated HIV biologic and behavioral surveillance (IBBS) was conducted among selected population groups in Hanoi, Quang Ninh, Hai Phong, Da Nang, Ho Chi Minh City (HCMC), An Giang, and Can Tho. The IBBS utilized community-based sampling to estimate the prevalence of HIV and other sexually transmitted infections (STI) and to provide indicators of risk behaviors and intervention exposure among most-at-risk population groups. These included female sex workers (FSWs), injecting drug users (IDUs) and men who have sex with men (MSM). Cluster sampling and respondent driven sampling (RDS) methods were used to recruit 3,547 FSWs and 2,032 IDUs in seven provinces, and 790 MSM in two provinces. Behavioral and other data were collected through individual face-to-face interviews, while the prevalence of HIV and STI were selectively measured by blood, urine, and rectal swab samples.

## Key findings

### *Injecting drug users: young and new users rapidly becoming HIV-infected*

HIV prevalence among IDUs averaged the highest of all population groups measured but varied across provinces. The highest rates were in Hai Phong (66%) and Quang Ninh (59%) and the lowest in Danang (2%) and An Giang (13%). The data showed evidence of rapid HIV transmission among a large new and young injecting population. For example, almost half of IDUs in HCMC (48%) were under 25 years-old and about one-quarter (24%) had injected less than one year. However, HIV was quick to spread among both of these groups, with 33% and 28%, respectively, already HIV-infected. These rates were as high as among older and more experienced injectors, a pattern that was apparent in many other provinces.

Based on self-reports, needle sharing appears to have decreased from previous years but is still unacceptably high. Twelve to 33% of IDUs reported sharing needles in the past six months prior to interviews. Rates were the highest in the Central and Southern provinces where at least one-quarter of IDUs reported needle sharing. When sharing occurred, it was often with multiple users, putting IDUs at even higher risk of HIV infection. In HCMC, data showed that young and new injectors had unsafe injecting behaviors very early after they started injecting, signaling that HIV prevalence will continue to rise above its current level of 34%.

IDUs were also involved in high-risk sexual behavior. Over half of IDUs reported having sex during the past year prior to the survey. Depending on the province, from 20% to 40% of IDUs reported having had sex with a sex worker and from 28% to 60% of IDUs reported having had sex with a regular partner in the previous 12 months. Condom use is uncommon among IDUs, particularly among IDUs who are HIV positive. From 20% to 50% of HIV+ IDUs in Hanoi, HCMC and An Giang reported using condoms inconsistently with their regular partner.

### *Female sex workers: inconsistent condom use and drug injection lead HIV risks*

Over 10% of FSWs were HIV-infected in five out of seven provinces, with street-based sex workers (SSWs) in most areas registering higher HIV prevalence than karaoke-based sex workers (KSWs). The highest HIV prevalence was among SSWs in Can Tho (29%) and Hanoi (23%). HIV infection among sex workers was highly correlated with injection drug use, with injecting sex workers from 3.5 to 31 times more likely to be HIV-infected than non-injectors. For example, among SSWs in Hai Phong, only 3% of sex workers without a history of injection were HIV-infected compared to 55% of those who ever injected.

The prevalence of other sexually transmitted infections (STI) similarly varied by province. The prevalence of chlamydia was highest among SSWs in Hanoi (18%) and KSWs in HCMC (14%) and lower than 10% among KSWs in Hanoi and SSWs in HCMC. Gonorrhea prevalence was much lower, ranging from 0.3% to 2.7% among FSWs in Hanoi and HCMC. Syphilis was more common among FSWs in southern provinces, particularly in HCMC where prevalence was 9% among SSWs and 7% among KSWs.

Reported condom use at last sex with clients was very high, although as is typical with quantitative surveys, this may have been due to reporting bias. However, consistent condom use with clients over the past month was much lower, ranging from 36% among KSWs in Quang Ninh to 89% among SSWs in Can Tho.

Injecting drug use among FSWs was not uncommon, with the highest rates among SSWs in Hanoi and Can Tho (17% in both sites reported ever injecting). As noted earlier, there was a high correlation between HIV prevalence and injection drug at the individual level and that was reflected at the population level as well: where injection drug use was more common among sex workers, so was HIV prevalence. The data also showed that needle sharing was very common, with the proportion of injecting FSWs reporting needle sharing higher than among male injectors in several provinces.

### *Men who have sex with men: high rates of STI and multiple risks*

HIV prevalence among MSM was 5% in HCMC and 9% in Hanoi but these were not statistically significant differences. Other STI were also relatively high among MSM. For example, over one in 10 men in Hanoi (12%) were infected with rectal gonorrhea and 8% had rectal chlamydia. In total, 22% of MSM in Hanoi and 16% in HCMC had at least one STI.

Multiple sexual partnerships among MSM were fairly common, with 44% in Hanoi and 70% in HCMC reporting sex with two or more male partners in the past month prior to the survey. Commercial sex was also frequent, with 22% in Hanoi and 41% in HCMC reporting selling sex in the past year. The prevalence of anal intercourse, the most high-risk sexual activity for MSM, was high: 61% in HCMC and 41% in Hanoi reported anal sex in the past month. Among MSM who sold sex to male partners, the prevalence of anal sex was 82% in Hanoi and 85% in HCMC.

Reported consistent condom use in the last month during anal sex was low, with approximately one-third (31% in Hanoi and 37% in HCMC) reporting use with non-commercial partners and 33 % in Hanoi and 51 % in HCMC reporting use when they sold sex. Approximately four in ten MSM reported sexual behavior with women in the past year, with approximately 15% reporting sex with a FSWs.

Ever use of injection drugs was higher in Hanoi than HCMC (9% versus 4%). This use was highly correlated to HIV infection. For example, in HCMC, approximately one-quarter (26%) of MSM who had ever injected drugs were HIV-positive compared to 5% who had never injected.

### *Coverage of intervention programs: many people with HIV still do not know their status*

The surveys showed that coverage of interventions programs is increasing but still needs to be improved. Use of voluntary counseling and testing (VCT) services was highest among IDUs in Hai Phong (40%) and FSWs and IDUs in Hanoi, 35% and 34%, respectively. In HCMC, where a scale-up of VCT has occurred in recent years, approximately one in five of all high-risk groups reported that they have been HIV tested and know the results.

However, over three-quarters of people living with HIV in the measured high-risk population groups did not know that they are HIV-infected. For example, 90% of HIV+ MSM in Hanoi, 84% of HIV+ IDUs in Can Tho, and 75% of HIV+ SSWs and 85% of HIV+ KSWs in An Giang were unaware of their status.

Outreach exposure among IDUs ranged from 18% in Hanoi to 59% in HCMC while among sex workers, outreach exposure ranged from 34% in Hanoi to 81% in Can Tho. Among MSM, 60% in HCMC and 53% in Hanoi had received some kind of information on risk behaviors related to HIV. The proportion of sex workers who reported receiving a condom in the past six months was similar to outreach exposure. Access to free needles was far lower, with 56% to 97% of IDUs in the measured provinces reporting that they had not received any free needles in the past 6 months.

# BACKGROUND

Epidemiologic evidence suggests that the populations at highest risk of HIV infection in Vietnam are injection drug users (IDUs), female sex workers (FSWs), men who have sex with men (MSM), and the sexual partners of all of these population groups. Historical sentinel surveillance shows a rapidly expanding HIV epidemic starting in HCMC from 1998 to 2001, with HIV prevalence rising first among young, sexually-active male IDUs and then spreading into commercial sex networks and into the general population.

Sentinel surveillance has been primarily conducted in institutions and clinical settings. However, there is an absence of HIV, STI, and risk behavioral estimates and trends in representative and community-based samples of groups at risk.

The integrated biologic and behavioral surveillance (IBBS) results presented here were intended to fill this gap. They consist of HIV, STI, and risk behavior data from IDUs, FSWs and MSM in three of the most severely affected cities and provinces in the north of Vietnam (Hanoi, Hai Phong and Quang Ninh), three in the south (Ho Chi Minh City, Can Tho and An Giang), and Da Nang in the central coastal strip.

# OBJECTIVES

## The overall objectives of the IBBS are to:

- Measure the prevalence of HIV and other STI (syphilis, gonorrhea, chlamydia) among IDUs, FSWs, and MSM in selected sites
- Measure key HIV risk and preventive behaviors
- Provide estimates of intervention exposure and coverage
- Generate key data for advocacy and policy-making

# METHODS

## 1. Study sites and target population

### 1.1. Study sites

Seven provinces and cities were selected for this study including Hanoi, Hai Phong, Quang Ninh, Ho Chi Minh City, Can Tho and An Giang. Six provinces out of those seven (except Da Nang), are focus sites of the US President's Emergency Plan for AIDS Relief (PEPFAR).

This IBBS was focused on three most-at-risk population groups, including IDUs (all provinces), FSWs (including street-based sex workers and karaoke-based sex workers in all provinces), and MSM (in Hanoi and HCMC).

In each city or province, districts considered as "hot-spots" were chosen as sites for recruitment of study participants. This selection was suggested by the design team and local surveillance staff after pre-surveillance assessments in the seven provinces. See Table 1 below.

**Table 1: Study sites for the recruitment of participants.**

| Cities/ Provinces | Districts (study sites) | Location of Study Centers |
|---|---|---|
| Hanoi | Dong Da, Hai Ba Trung, Thanh Xuan, Cau Giay | Dong Da |
| Hai Phong | Le Chan, Hong Bang, Ngo Quyen, Hai An | Le Chan |
| Quang Ninh | Bai Chay, Hon Gai, Cam Pha[1] | Bai Chay, Hon Gai and Cam Pha |
| Da Nang | Hai Chau, Thanh Khe, Lien Chieu | Hai Chau |
| HCMC | District 1, 3, 8 and Binh Thanh | District 1 and District 8 |
| Can Tho | Ninh Kieu, Cai Rang, Binh Thuy | Ninh Kieu |
| An Giang | Long Xuyen, Chau Doc | Long Xuyen, Chau Doc |

For IDUs, the method of respondent-driven sampling (RDS) (described below) was used in Hanoi, Da Nang, HCMC and Can Tho. Therefore, study sites for recruiting IDUs in these cities were not limited to the districts described in this table. MSM were only surveyed in Hanoi and HCMC with the RDS method, so that the study sites of this group in two cities were not geographically limited either.

[1] In Quang Ninh: all IDUs were sampled in Cam Pha. All FSWs who appeared at sample sites were sampled in Hon Gai and Bai Chay.

### 1.2. Target populations and inclusion criteria

***Injecting Drug Users (IDUs):***
This study included male IDUs 18 years or older, currently injecting drugs (this was identified by reported drug injection in the month prior the survey), being at selected locations (Hai Phong, Quang Ninh and An Giang only) at the time of the survey, and willing to participate.

***Female Sex Workers (FSWs):***
This study recruited FSWs based on the following criteria: women who were 18 years or older, who reported having sex for money at least once in the month prior to the survey, and were working on the street (as SSWs) or in establishments such as karaoke bars or massage venues (as KSWs). In some provinces, even though sex workers were identified at some establishments, based on the characteristics and nature of their workplaces, they were considered street-based sex workers. For example, in Hai Phong some sex workers who were working at in-house places were considered street-based since they moved in from the streets to avoid 'social evils' campaigns.

***Men Who Have Sex with Men (MSM):***
MSM who participated in this study included men 15 years or older, who had engaged in sex with men at least once in the previous 12 months and who would consent to the survey.

## 2. Sample sizes

The sample size for each target population was calculated to detect 15% differences in key behaviors, such as consistency of condom use and needle/syringe sharing, over time in trend analysis. For example, if there was actual change in the percentage of FSWs who used condoms consistently, with 300 FSWs recruited at each round, it would be possible to demonstrate that difference statistically through the survey. The sample sizes are presented in Table 2.

**Table 2: Sample sizes of target population.**

| Cities/Provinces | IDUs | SSWs | KSWs | MSM |
|---|---|---|---|---|
| Hanoi | 296 | 275 | 224 | 397 |
| Hai Phong | 301 | 279 | 274 | |
| Quang Ninh | 266 | 161 | 185 | |
| Da Nang | 274 | 175 | 313 | |
| HCMC | 296 | 298 | 302 | 393 |
| Can Tho | 299 | 162 | 300 | |
| An Giang | 300 | 238 | 361 | |
| Total | 2,032 | 1,588 | 1,959 | 790 |

## 3. Sampling procedure

Sampling strategies used in IBBS 2005-2006 are presented in Table 3 below.

**Table 3: Sampling strategies.**

| | IDU | SSW | KSW | MSM |
|---|---|---|---|---|
| Hanoi | * | √ | √ | * |
| Hai Phong | √ | √ | √ | |
| Quang Ninh | x | x | √ | |
| Da Nang | * | x | x | |
| HCMC | * | x | √ | * |
| Can Tho | * | x | x | |
| An Giang | x | x | x | |

| | |
|---|---|
| * | Respondent Driven Sampling (RDS) |
| √ | Cluster sampling |
| x | Take- all method |

### 3.1. Cluster sampling

The survey applied a two-stage sampling procedure including:

- First stage: Development of sampling frames and selection of clusters
- Second stage: Selection of study participants at selected location

**First Stage:** *Development of sampling frames and selection of clusters*

The study developed maps of locations where eligible and potential participants were reachable. The mapping process took about two weeks for each population at selected sites (see Table 1: "Study Sites for Recruitment of Participants"). Before that, a three-day training was provided at each province. This training course covered the topics of how to identify members of target groups, how to reach them, and how to estimate and record numbers of individuals at each location. Interview skills were included in this training. Map developers were selected by local AIDS authorities including staff of Health Services, the Center for Preventive Medicine or Center for AIDS Control, health workers at the district level, social workers, and staff of Women's or Youth Unions.

During fieldwork, map developers went to assigned areas and identified all possible locations of target populations. Map developers started by identifying some index locations through meetings with key informants and then used a "snowball" strategy to find other locations in assigned areas. At each location, information on population size and how to reach target individuals was collected through in-depth interviews with 'gatekeepers' (doormen, establishment owners, and informants) or through direct counting. Information on each location was recorded in a datasheet that included address, special signs for identification purposes, and three estimates of population size: high, medium, and low estimates.

Datasheets were collected and computerized every day during the mapping process. The process ended when there were no new sites introduced or left to map.

By the end of the mapping process, all information on detected locations and on population size at each site was put together to develop a sampling frame for each target population. The 'medium' estimate was used for cluster selection. A cluster or primary sampling unit (PSU) was defined as a group of three individuals. One-hundred clusters of three for each population were randomly selected using Csurvey software (Frerichs, 1999). The lists of selected locations with addresses and specific sample size at each were finalized by central supervisors.

**Second Stage:** *Recruitment of study participants at selected locations*

During the data collection process, assigned staff (who were considered as provincial supervisors at this stage), went to selected locations accompanied by peer educators and identified potential participants.

It was possible to have more than one cluster recruited at one selected location. When the study team visited that location, if there were more potential subjects than sample sizes needed, participants were chosen at random. If not, all participants were selected. In case there were not enough samples at that time, study teams came back on other days and continued to recruit participants until needed the sample size was reached.

Potential participants were briefed on study objectives and given invitation coupons with information about the study, address of study centers where data was collected, and appointment date. If the selected individual did not come within two weeks after the appointment date, another selection was made at the same location. If, after several efforts at recruiting, the desired sample size was not reached, identified people at the next locations in the sampling frame were selected for replacement. All replacements were reviewed and approved by NIHE in consultation with local staff.

### 3.2. 'Take-all' strategy

This is an alternative to cluster sampling. After the mapping process, if the estimated number of population size was smaller than the designed sample size, the 'take-all' strategy was used. Study teams visited all listed locations, sought potential participants with help from peer educators, explained the study objectives, and distributed coupons (the same used in cluster sampling described above).

### 3.3. Respondent Driven Sampling

This method of sampling was used for IDUs in four cities/provinces (Hanoi, Da Nang, HCMC and Can Tho) and MSM in two cities (Hanoi, HCMC). This is a chain-referral sampling method, but unlike the "snowball" method, it gives unbiased estimates of population parameters (Heckathorn, 1997).

The process started with recruiting initial participants who were considered 'seeds'. The criteria for seed recruitment were: those who had different characteristics, at different locations, who had awareness of networks of target populations. Seeds were recruited by study teams with an introduction from local staff.

Once initial participants had completed their interview and were given coupons with which to recruit peers, they were no longer considered 'participants' and were referred to as recruiters. (When a study participant is recruited by a recruiter, but has not yet enrolled in the study, that person is referred to as a 'recruit'.)

The first wave of participants recruited for the study was brought in by 'seeds'. Thereafter, each person recruited for and enrolled in the study received three recruitment coupons with which to recruit their peers into the study as well. Depending on the characteristics of the locality and target population, there were approximately five to eight waves until the sample size was reached.

Each coupon was uniquely coded in order to link recruiters with recruits. The coupon ID numbers were carefully recorded in each questionnaire. The receptionists at study centers were provided a short training on the management of coupons. Every recruit who visited study centers was marked on spreadsheets for coupon management.

## 4. Key indicators in the IBBS

Indicators formulated to conform to international standards and United Nations General Assembly Special Session on HIV/AIDS (UNGASS) indicators included:

- Prevalence of HIV, syphilis, gonorrhea and chlamydia
- Sexual risk behavior, including number and type of sex partners ("commercial", "regular" & "non-regular", male and female)
- Condom use with different types of sex partners
- Other practices related to condom use and safe sex
- Knowledge of STI and STI care-seeking behaviors
- Knowledge and attitudes toward HIV/AIDS
- Drug and substance use (including injecting & needle sharing)
- Perception of HIV and STI risk
- Exposure to HIV/AIDS prevention interventions
- Network questions (for RDS samples only): questions about the participant's network structure, relationship, and knowledge about her/his recruiter are embedded in the questionnaires.

## 5. Data collection

### 5.1. Preparation of data collection

Development and pre-testing of questionnaires: Questionnaires were drafted covering all of the basic indicators described above. These were about 10 pages and took approximately 30 - 40 minutes to administer. Every questionnaire included a unique study identification number (ID). ID numbers were also used to label containers of biological specimens (blood, urine, etc).

All questionnaires were pre-tested by interviewing numbers of IDUs, MSM and FSWs. Adjustments and revisions were made to structure, language use, and wording. Final versions of questionnaires were prepared with mutual agreement from NIHE and FHI.

***Interviewer selection and training:***
Health workers from District Health Centers, Centers for Preventive Medicine, Centers for AIDS Control, and social workers were selected as interviewers based on the following criteria:

- Familiarity with the target population, including sex workers, IDUs, MSM
- Willingness and possible time commitment
- Experience with interviews using structured questionnaires
- Committed to respecting respondents' privacy

Laboratory staff at provincial centers for preventive medicine and centers for AIDS control were selected for the collection of biological samples. Counselors who were responsible for pre and post-test counseling also participated in this study.

Five-day training courses were also provided before field implementation. The training covered topics including interviewing skills, introduction of questionnaires, experiences and guidance in reaching target populations. All the trainees had opportunities for role-playing and for discussion with peer educators from on-going intervention programs. Training courses also covered other sub-topics, such as managing RDS procedures, following procedures at study centers and monitoring the data collection process.

Laboratory staff were trained by NIHE lab staff on sample collection, storage and testing procedures following the national protocol for HIV and STI testing.

## 5.2. Study centers and data collection procedures

Study centers were established for collection of biological and behavioral data, at least one for each target population in each study city or province. The following points were considered for site selection:

- Proximity to the target group population
- Availability of a central site in case of a scattered population
- Sufficient rooms for registering and interviewing participants, and rooms with facilities for sample collection (Privacy was a major concern)
- Presence of electricity, running water, and a toilet
- Easy access

Due to the difficulties in leasing temporary space for data collection, in some provinces drop-in centers used for on-going interventions were chosen as study centers.

Each study center had three different and separate areas: a front-desk for reception, an interview room, and a room for collection of biologic samples, which had separate space for individual counseling.

When potential participants visited study centers, registration was conducted at the reception desk. The receptionists also performed primary screening on potential participants by asking questions following criteria of subject selection. If any one participant did not meet criteria, she/he was passed over for the survey. Potential subjects were also questioned to screen out individuals who had already

participated. In cases where visitors wanted to have an HIV test but did not meet selection criteria, they were referred to one of nearest voluntary counseling and testing (VCT) sites. Reception staff then read an informed consent sheet to potential subjects who satisfied all selection criteria. Other concerns or questions were also explained by staff at the front desk. If individuals then agreed to participate, they signed the consent form, along with reception staff and one witness. The questionnaire, with unique ID number, was assigned at this time.

After registration, the subjects were brought to interview rooms designed to maintain privacy. Face-to-face and individual interviews were conducted in the interview rooms by trained interviewers. Before interviews, staff asked one additional screening question to make sure that all participants met selection criteria. Interviews were based on designed questionnaires but trained interviewers helped participants to fully understand all questions in it. However, there was no "prompting" on any answers. Each interview was about 30- 45 minutes depending on participants.

When the interview was completed, participants were guided to rooms for the collection of biologic samples. At these rooms, pre-test counseling was provided. After that, technicians collected blood and urine and took rectal swabs. As with interview rooms, testing rooms were arranged to ensure privacy of study participants. At each study center, a lab technician was responsible for blood sampling and the rectal swab. Participants were then given a tube and received instructions on how to collect urine samples.

Study ID number was regularly checked at each step to ensure that the numbered questionnaire and biological sample matched. By the end of the data collection process for every individual, receptionists re-checked to ensure that participants fully covered all steps.

All participants were compensated for their time contributed to this study with about 30,000 - 50,000 VND, depending on the target population and city, equivalent to US$ 1.80 - 3.00.

Data collection took approximately two-and-a-half months (training courses were included) in each province. Total data collection time for the seven cities/provinces was from October 2005 to July 2006.

### 5.3. Monitoring and quality assurance

An assigned staff member from NIHE was responsible for monitoring the whole process from the beginning of mapping to the end of data collection in each city or province. FHI, USAID and CDC staff and consultants also made field visits during mapping, interviewer training, and data collection.

In Northern provinces, the Hanoi Medical School was contracted to provide quality assurance (QA) services. QA staff visited study centers on a daily basis and used a checklist to check whether the protocol was fully followed. All findings and recommendations were provided to the study team on the same day.

## 6. Laboratory procedure

- HIV serologic testing was performed using one rapid test and two enzyme-linked immunosorbent assay (ELISA) tests for screening and confirmation of positive results. HIV testing was performed at provincial centers for preventive medicine, where standardized HIV labs are available and qualified lab technicians are certified. Ten per cent of negative samples and 5% of positive samples were randomly selected and re-tested for quality assurance at NIHE.

- Polymerase chain reaction (PCR) for *N.gonorrhea* and *C.trachomatis*: urine from FSWs and MSM and rectal swabs from MSM were stored in a cool box until transportation to the processing laboratories at NIHE in Hanoi. These specimens were frozen at –20°C, batched, and tested according to the manufacturer's directions.
- Syphilis serologic testing was performed on sera transported in a cool box and processed using a quantitative rapid plasma reagin (RPR) screening test with a qualitative Treponema pallidum hemagglutination assay (TPHA) confirmation test. Syphilis was diagnosed and treated with a qualitatively positive RPR and positive TPHA confirmation.

Reasonable access to HIV and syphilis results was offered to participants, with free syphilis treatment offered for those testing positive and referral to HIV care and support for those testing HIV-positive. Counseling and return of the results proceeded as follows:

- At the end of the study consent process, and prior to testing, respondents received pre-test counseling. Additional one-to-one counseling was available for those who requested it.
- The pre-test counseling sheet was signed by the counselor, appended to the consent form, and stored with the other documents.
- All respondents were given a card to return for HIV and syphilis results from the study, which became available two weeks after participation. The card contained the details of the counseling service (address, telephone and opening hours) and the local survey manager's telephone number and address in case of problems.

Trained counselors delivered the results verbally and in person (never in writing or by telephone). No HIV status certificates or other form of written results were given, and individually appropriate counseling accompanied each result. To receive their results, respondents came in individually with their original study card. No results were given without the original card.

## 7. Data management and analysis

Data were computerized using EPI- Info version 6.04 (WHO, 1998). Double entry procedure was performed at NIHE for data cleaning and quality control. Data were entered separately by province and study population. Final datasets were then converted to STATA version 8.2. Frequency was performed to check the validity and logic of all variables in the datasets. Final datasets were kept at NIHE and FHI and only authorized staff allowed access to them. Hard copies of completed questionnaires were kept in a locked cabinet at NIHE.

**Analysis of RDS samples:** Respondent Driven Sampling Analysis Tool (RDSAT, Cornell University, 2003) software was used for analysis of RDS samples. This software was designed to use collected information for taking into account and controlling for three types of potential biases in chain-referral sampling: Affiliation bias, Homophily and Network Size bias (Heckathorn 1998).

Raw data was first prepared using STATA 8.2. This included generating new variables, re-coding missing values following analysis strategy and RDSAT Manual. Datasets were then converted to Microsoft Excel files (Microsoft Corp., 2001) using Stat/transfer (Circle System Inc, 2005), and then to RDS files (Tab Delimitated Text).

Frequency, cross-tabulation, and prevalence estimates of key-indicators were performed in RDSAT. (It is not yet possible to perform calculation of means, modes, or regression analysis in RDSAT.)

**Analysis of clustered and take-all samples:** STATA 8.2 was used for analysis of these samples. Univariate and bivariate analyses were performed following analysis strategies, finalized by the study team. Multiple logistic regressions were used to determine the magnitude of association between behavioral variables with HIV status after adjusting for potential influences from other variables.

## 8. Ethical considerations

Participation of all respondents in the study was strictly voluntary. Emphasis was placed on the importance of obtaining signed, informed consent during training of the field staff. Complete confidentiality of study subjects was also emphasized. Names and addresses of respondents were not recorded.

This study protocol, questionnaires and consent forms for the target groups were approved by the FHI Protection of Human Subjects Committee and by a NIHE Institutional Review Board.

The following general procedures were conducted to protect the participants who may be vulnerable to coercion by society or undue influence:

- Discussions with the employers (such as bar owners) to clarify the purposes of the study, e.g. STI detection and treatment, with a questionnaire; STI counseling and condom distribution and skill development. The interviewers were made aware that all the data forms will have no names, that no information will be provided directly to them, and that participation by all individuals is voluntary. Interviewers will not be involved in any way with recruitment of participants.
- Specific efforts to inform the study population prior to recruitment were done through education by agencies working with the specific groups, educational sessions at worksites, or through peers. At these educational sessions the study was explained and questions answered. Prior to recruitment in a private room, study staff explained to potential study participants the study procedures in detail and answered all questions. They emphasized that should participants decide not to participate or decide to withdraw from the study at any time, their decision would not affect any services they would receive from the NGO or the clinic. The study staff administered witnessed the signed informed consent. The study was anonymous. No names or personal identifiers were recorded process. All questionnaires and biological specimens were labeled with a study number. The study participant was given a card with his/her study number as a way to return for results and for free additional STI treatment and counseling. As there were no identifiers, there was no way to trace any positive laboratory tests or to determine who chose to participate or not participate in the study. At a specified time and place, participants were required to return with the card to receive test results.
- In-country staff closely monitored the consent procedure.

# RESULTS

## 1. Characteristics of study populations

Major characteristics of study populations are presented in Tables 4, 5, 6, and 7 below. More details on this can be found in Table 9 Appendix I, Table 18 Appendix II, Table 26 Appendix III, and Table 34 Appendix IV.

**Table 4: Characteristics of IDUs.**

| Characters | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| Age group (n) | 296 | 297 | 266 | 274 | 296 | 298 | 300 |
| • < 20 | 3.9 | 3.4 | 6.4 | 29.0 | 28.2 | 13.1 | 25.7 |
| • 20-25 | 18.8 | 11.7 | 24.4 | 22.3 | 20.0 | 29.4 | 27.3 |
| • 25- 30 | 28.7 | 28.2 | 33.1 | 7.8 | 13.9 | 24.2 | 23.3 |
| • >=30 | 48.6 | 56.7 | 36.1 | 40.9 | 37.6 | 33.3 | 23.7 |
| Duration of drug injection (n) | 291 | 299 | 260 | 273 | 295 | 293 | 298 |
| • <1 years | 22.2 | 8.7 | 11.1 | 32.2 | 23.9 | 1.4 | 22.2 |
| • 1 year or more | 77.8 | 91.3 | 88.9 | 67.8 | 76.0 | 98.6 | 77.8 |

More than 25% of IDUs in Da Nang, HCMC and An Giang were younger than 20 years old, while this percentage is under 10% in other provinces (13% in Can Tho). Higher percentages of IDUs who started injecting within 12 months prior the survey were also found in these provinces (22% or more) (Table 4). More data on young and new injectors will be described in later sections.

The mean age of FSWs was 30 years for SSWs and slightly younger for KSWs. About 50% of KSWs in Hai Phong, Quang Ninh and Da Nang were over 30 years-old, possibly because they had a longer duration of selling sex than did KSWs in other provinces. The slight difference between characteristics of SSWs and KSWs might be due to the movement between two groups as described in the Methods section.

On average, FSWs had sold sex in study cities for more than two years except in HCMC and Can Tho, where about 50% of KSWs had sold sex for a shorter period of time (Table 5 and Table 6.)

**Table 5: Characteristics of SSWs.**

| Characters | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| Age group (n) | 275 | 279 | 160 | 174 | 298 | 161 | 238 |
| • < 20 | 6.2 | 3.9 | 8.8 | 6.9 | 11.1 | 14.9 | 9.2 |
| • 20 - 25 | 24.0 | 25.1 | 14.4 | 16.7 | 10.7 | 19.9 | 16.4 |
| • 25 - 30 | 29.1 | 25.1 | 31.8 | 10.3 | 12.1 | 12.4 | 23.6 |
| • 30 or more | 40.7 | 45.9 | 45.0 | 66.1 | 66.1 | 52.8 | 50.8 |
| Age (year) (n) | 275 | 279 | 160 | 174 | 298 | 161 | 238 |
| • Mean | 29.3 | 29.6 | 29.5 | 32.4 | 34.5 | 30.8 | 30.3 |
| • Median | 27.6 | 29.3 | 29.3 | 33.5 | 35.4 | 30.9 | 30.1 |
| Duration of selling sex | 274 | 277 | 145 | 162 | 293 | 162 | 238 |
| • Mean | 4.1 | 4.4 | 6.4 | 4.1 | 6.3 | 5.9 | 5.9 |
| • Median | 2.9 | 3.4 | 5.5 | 2.6 | 3.9 | 4.0 | 4.0 |
| Duration of selling sex in current cities (n) | 275 | 279 | 151 | 169 | 297 | 162 | 237 |
| • Mean (year) | 3.7 | 3.7 | 4.6 | 3.9 | 4.5 | 5.2 | 5.37 |
| • Median (year) | 2.4 | 2.6 | 3.5 | 2.6 | 3.0 | 4.0 | 4.0 |

**Table 6: Characteristics of KSWs.**

| Characters | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| Age group (n) | 224 | 274 | 185 | 309 | 301 | 300 | 361 |
| • < 20 | 10.7 | 7.7 | 9.1 | 8.7 | 19.9 | 16.3 | 13.6 |
| • 20- 25 | 33.5 | 30.3 | 21.1 | 27.2 | 24.3 | 33.0 | 26.0 |
| • 25- 30 | 32.1 | 18.6 | 22.2 | 17.2 | 20.9 | 25.0 | 24.4 |
| • >=30 | 23.7 | 43.4 | 47.6 | 46.9 | 34.9 | 25.7 | 36.0 |
| Age (year) (n) | 224 | 272 | 185 | 309 | 301 | 300 | 361 |
| • Mean | 26.4 | 29.4 | 30.1 | 29.8 | 27.4 | 26.4 | 28.1 |
| • Median | 25.8 | 27.3 | 29.2 | 29.3 | 26.0 | 25.2 | 26.8 |
| Duration of selling sex | 223 | 270 | 165 | 309 | 300 | 295 | 361 |
| • Mean | 3.5 | 3.9 | 5.3 | 3.8 | 3.5 | 2.7 | 4.9 |
| • Median | 2.2 | 2.8 | 4.6 | 2. 6 | 1.8 | 1.6 | 3.4 |
| Duration of selling sex in current cities (n) | 224 | 274 | 178 | 312 | 302 | 300 | 361 |
| • Mean (year) | 3.1 | 3.3 | 3.5 | 3.4 | 2.6 | 2.3 | 5.0 |
| • Median (year) | 2.1 | 2.4 | 3 | 2.2 | 1.3 | 1.4 | 3.3 |

A majority of MSM were less than 25 years old (77.4% in Hanoi and 58.6% in HCMC); 35.3% of MSM in Hanoi were students at the time of the interview. This is also a reason for the short duration of residence in Hanoi.

Most MSM (86.89%) in Hanoi self-identified that they were "*Bong Kin*", higher than the figure in HCMC (54.5%). It is worth noting that MSM who considered themselves "*Straight men*" are more likely to sell sex than others in both cities (Table 7).

**Table 7: Characteristics of MSM.**

| Characteristics | Hanoi | HCMC |
|---|---|---|
| **Age groups (n)** | **397** | **393** |
| • <20 | 17.5 | 27.0 |
| • 20- 25 | 60.1 | 31.6 |
| • 25- 30 | 9.5 | 13.2 |
| • 30 or more | 12.9 | 28.0 |
| **Occupation (n)** | **397** | **393** |
| • Government employee | 1.8 | 6.3 |
| • Service employee | 19.5 | 7.0 |
| • Sales/office clerk | 17.7 | 3.2 |
| • Business person | 0.8 | 9.5 |
| • Student | 35.3 | 10.7 |
| • Self-employed | 33.5 | 20.0 |
| • Illegal works | 10.3 | 16.0 |
| • Currently unemployed | 3.9 | 12.6 |
| • Others | 8.3 | 35.1 |
| **Duration of residence in studied provinces (n)** | **397** | **393** |
| • <5 years | 63.9 | 19.5 |
| • 5 years or more | 36.1 | 80.5 |
| **Self- identification (n)** | **397** | **392** |
| • Bong lo[2] | 0.4 | 10.8 |
| • Bong kin[3] | 86.8 | 54.5 |
| • Straight man | 12.5 | 33.9 |
| • Other | 0.3 | 0.8 |

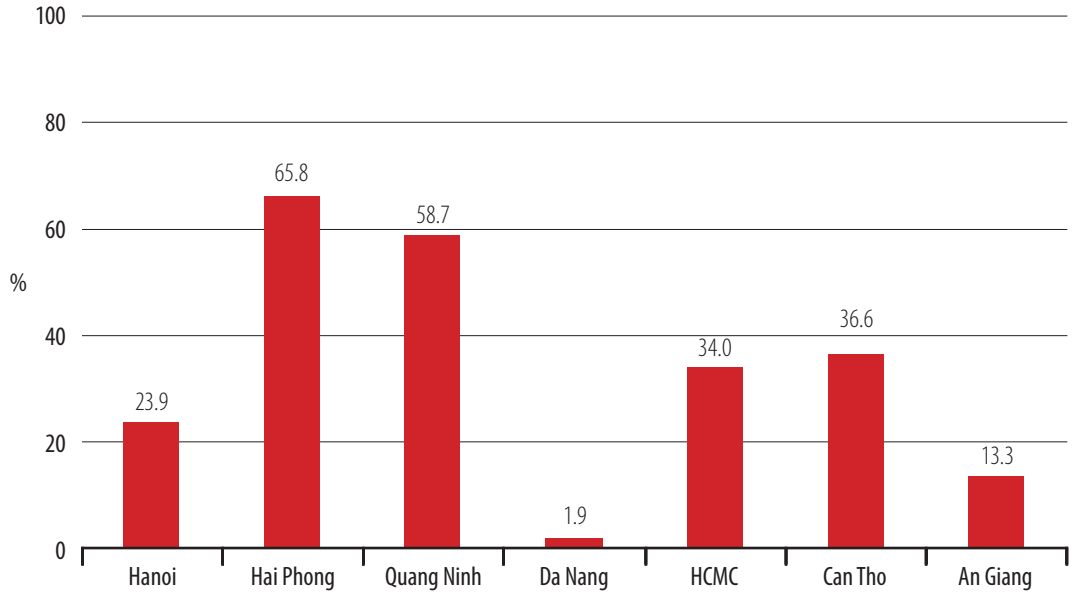
[2] "Bong lo" are MSM whose appearance and behaviors are like those of women.

[3] "Bong kin" are MSM whose appearance is like that of a man.

# 2. HIV and STI prevalence in target populations

## 2.1. HIV prevalence

**Figure 1: HIV prevalence among injecting drug users: very high in Hai Phong and Quang Ninh, high in Hanoi, HCMC, Can Tho, and low in Da Nang.**




HIV prevalence is still at a very high level in Hai Phong and Quang Ninh, with 66% and 59% of IDUs in these two cities HIV-positive. The lowest HIV prevalence was found in Da Nang, with 1.9% of IDUs HIV-positive (Figure 1). In HCMC, HIV prevalence is 34% among IDUs and this is lower than the results from sentinel surveillance in the same group (indicating that about 60% of IDUs are infected). However, this difference should be interpreted with caution since in the city, most drug users, including injectors, have been in rehabilitation centers for years. HIV prevalence in sentinel surveillance was measured in rehabilitation centers where the IDUs population may be very different from that in the community. The majority of the IDUs sampled in this survey were from young and new injectors (this will be discussed at length in the following sections), and the HIV prevalence observed among them may reflect the HIV situation in different populations in comparison with sentinel surveillance and other studies in the past.

The highest prevalence in FSWs was found in SSWs in Hanoi and SSWs in Can Tho, with more than 20% of SSWs HIV-positive. HIV prevalence was also over 10% in SSWs in Quang Ninh and HCMC (Figure 2). These results are much higher than those from HIV sentinel surveillance in 2005, especially in Hanoi and Can Tho.

**Figure 2: HIV prevalence among FSWs: very high among SSWs in Hanoi and Can Tho**

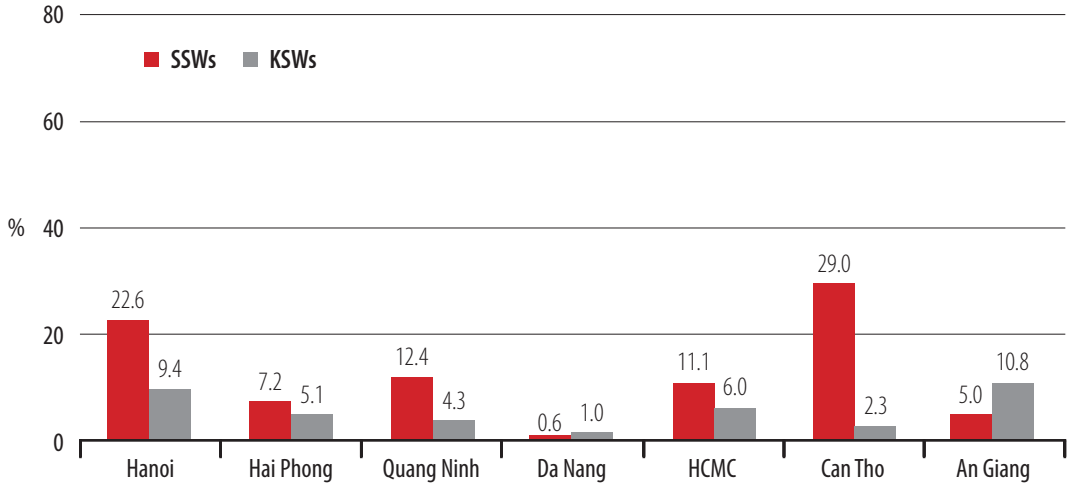
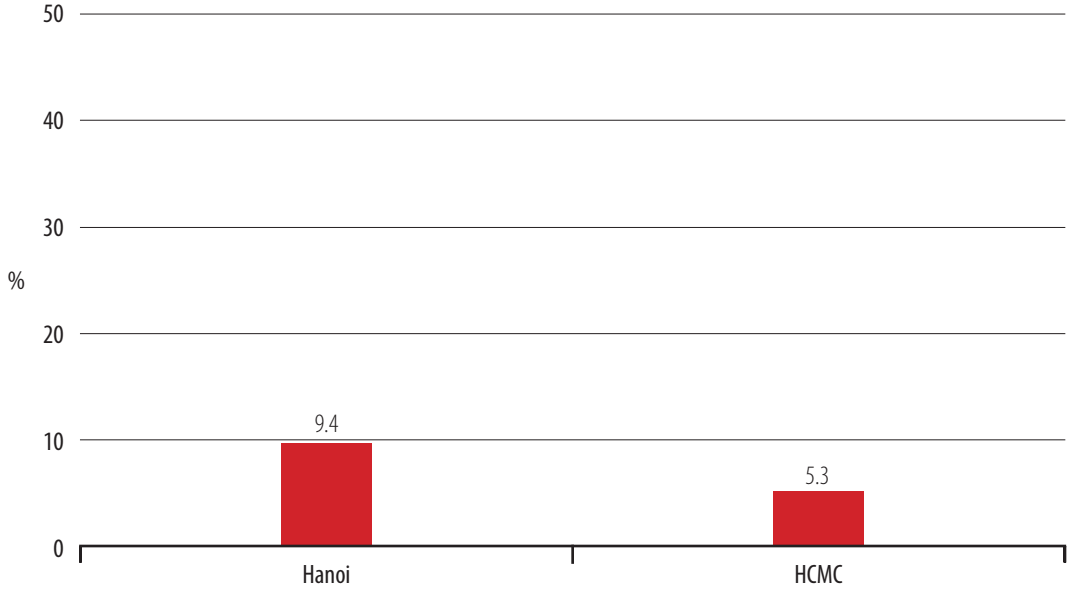



**Figure 3: HIV prevalence among MSM: 9.4% in Hanoi and 5.3% in HCMC**




This is the first time HIV prevalence in MSM in Hanoi has been measured. 9.4% MSM in Hanoi were HIV positive in this study. The prevalence in HCMC is 5.3% (Figure 3), somewhat lower than the result from a study conducted in 2004, though this difference is not statistically significant[4]. The difference between Hanoi and HCMC is also not statistically significant.

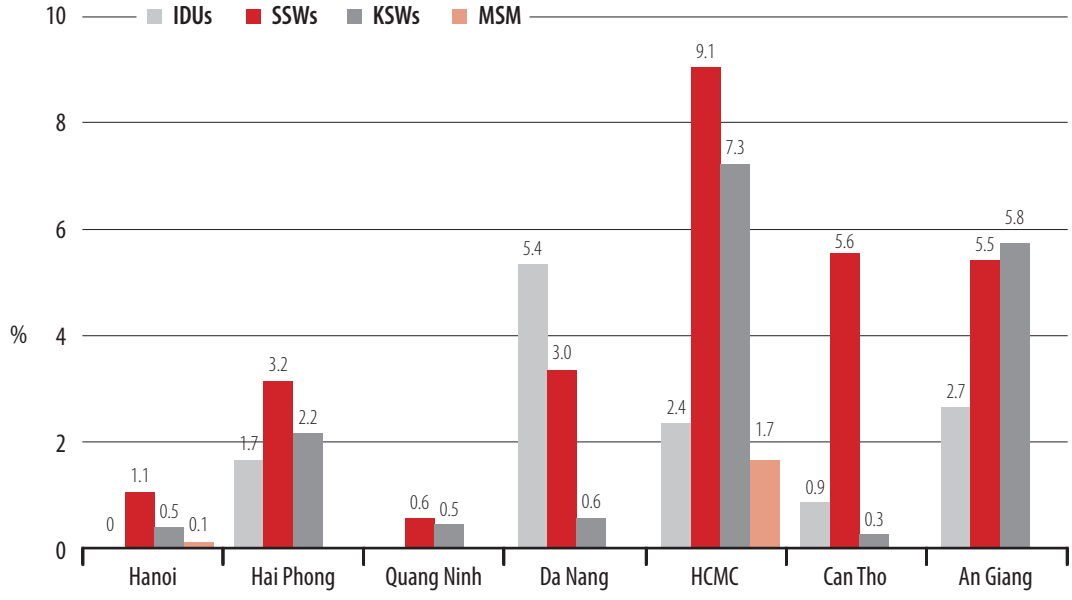
## 2.2. STI prevalence

Syphilis is more common in southern provinces among groups of FSWs. It is highest in SSWs in HCMC, with 9% testing positive for syphilis. It is also high among KSWs in HCMC with more than 7% infected. Syphilis prevalence is very low in MSM in Hanoi and HCMC (Figure 4).

[4] Nguyen Anh Tuan at al. HIV prevalence and risk factors of HIV infection among Men who have Sex with Men in Ho Chi Minh City, Vietnam. 2004

Gonorrhea prevalence is below 3% in all sex worker populations in Hanoi and HCMC but chlamydia was found at much higher rates, ranging from 6.4% among SSWs in HCMC to 17.5% in SSWs in Hanoi. In HCMC, STI in general are more common among KSWs than among SSWs (Figure 5).

**Figure 4: Syphilis prevalence among IDUs, FSWs and MSM**




Genital and rectal gonorrhea and chlamydia were found in both MSM samples in Hanoi and HCMC. More than one in 10 men (11.5%) in Hanoi were found to have rectal gonorrhea. The prevalence of genital chlamydia in this same sample was 7.6%. STI prevalence among MSM in Hanoi was higher than that among MSM in HCMC (Figure 6)

**Figure 5: Gonorrhea and chlamydia prevalence among FSWs in Hanoi and HCMC**

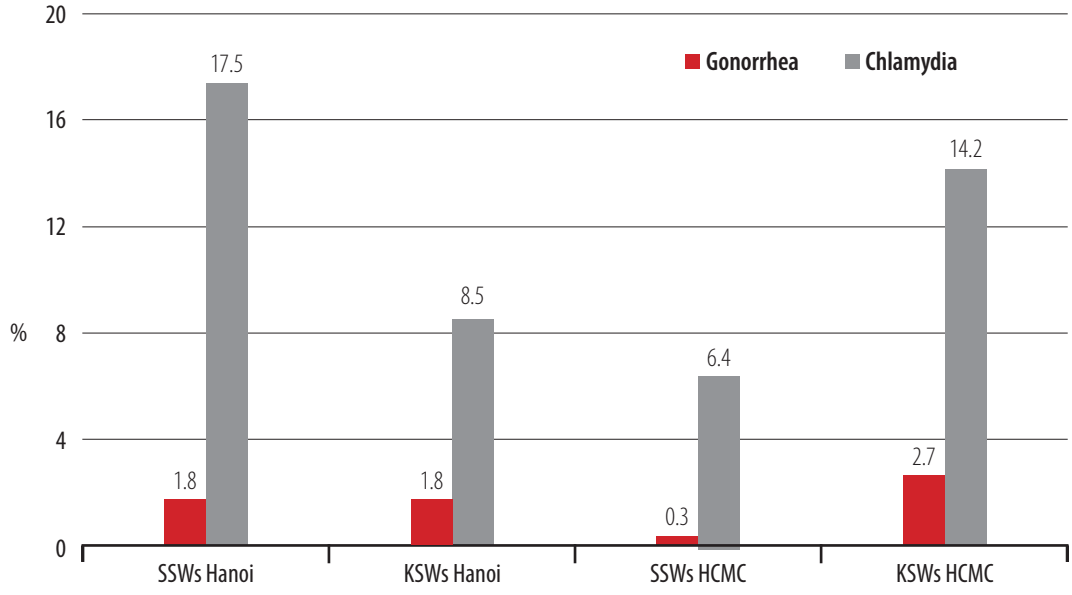
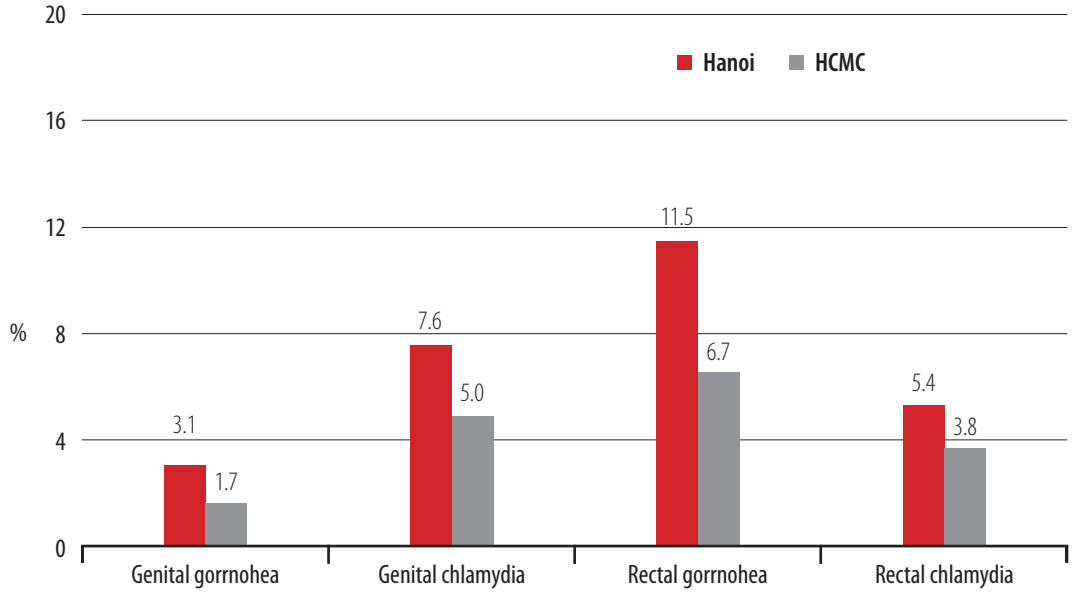


**Figure 6: Gonorrhea and chlamydia prevalence among MSM in Hanoi and HCMC.**




## 3. Behavioral risks of target populations

### 3.1. Injecting drug users

The following are key findings of risk behaviors among IDUs including both injecting and sexually-related risk behaviors. More data on IDUs is presented in Appendix I.

Less than 15% of IDUs in Hanoi, Hai Phong and Quang Ninh reported needle-sharing behaviors in the month prior the survey. More IDUs in Da Nang, HCMC, Can Tho and An Giang reported sharing behaviors, ranging from 25% to 37% (Figure 7). This is notable because even though HIV prevalence in these provinces is still lower than in northern provinces, with a very high level of injecting risk behaviors it will reach higher levels in the near future such as in Hai Phong and Quang Ninh. More information on injecting behaviors in IDUs is presented in Table 11, Appendix I.

Figure 8 shows the number of people with whom IDUs had shared needles at last injection. In southern provinces, more than half of IDUs who reported sharing behaviors shared needles with more than one person. With the high frequency of injection (the majority of IDUs inject two to three times per day) and a high number of people to share with, it is likely that the number of IDUs infected with HIV will increase rapidly if there is no effective intervention implemented in the near future.

**Figure 7: Percentage of IDUs reporting needle sharing at last injection and in the previous six months: more popular in southern provinces than that in the Northern provinces.**

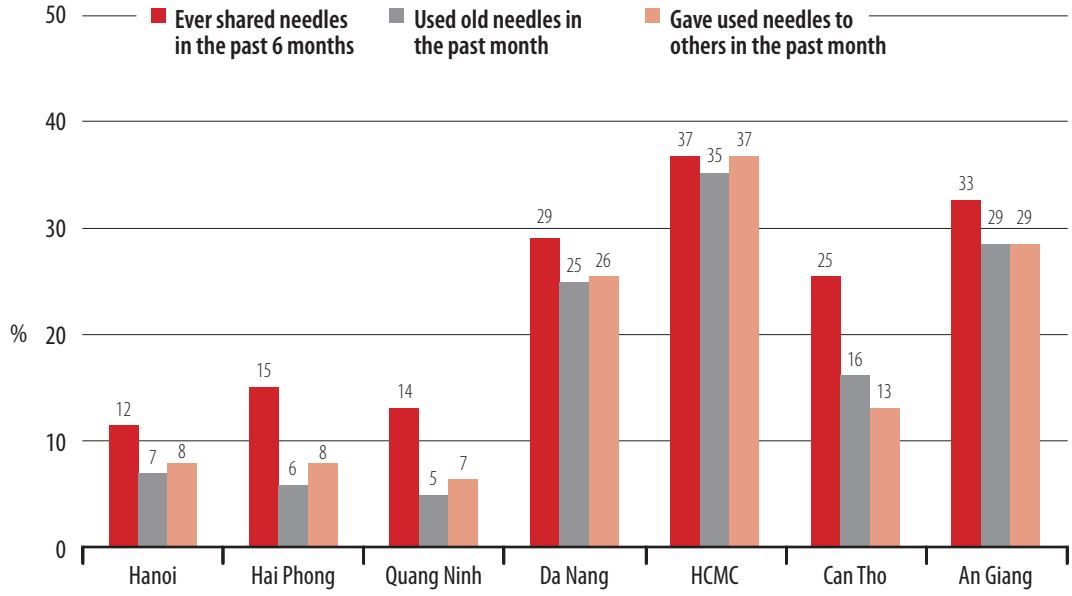
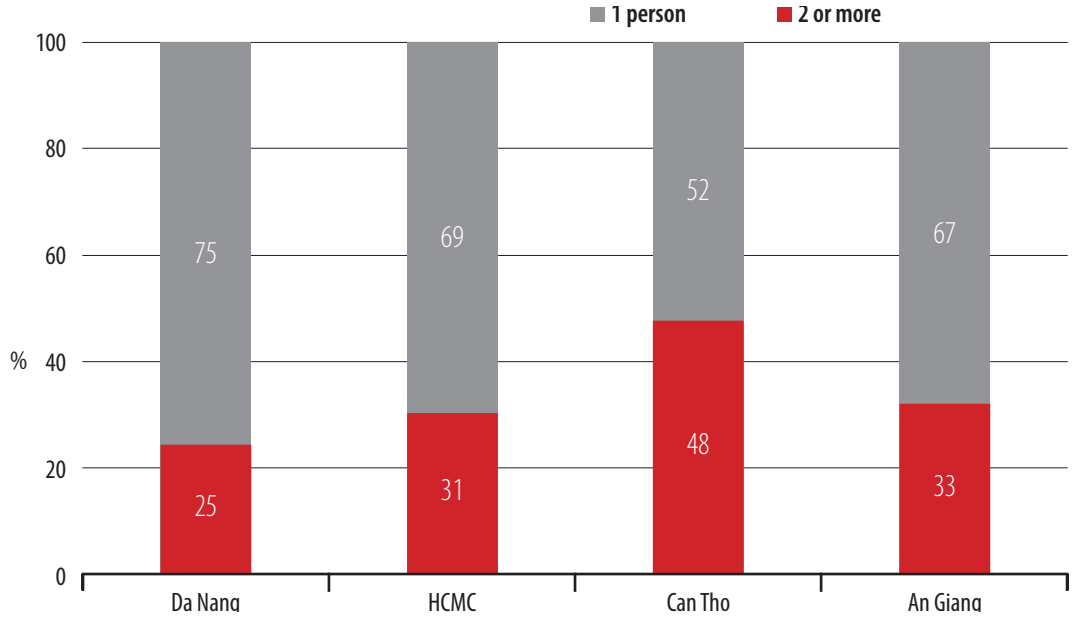
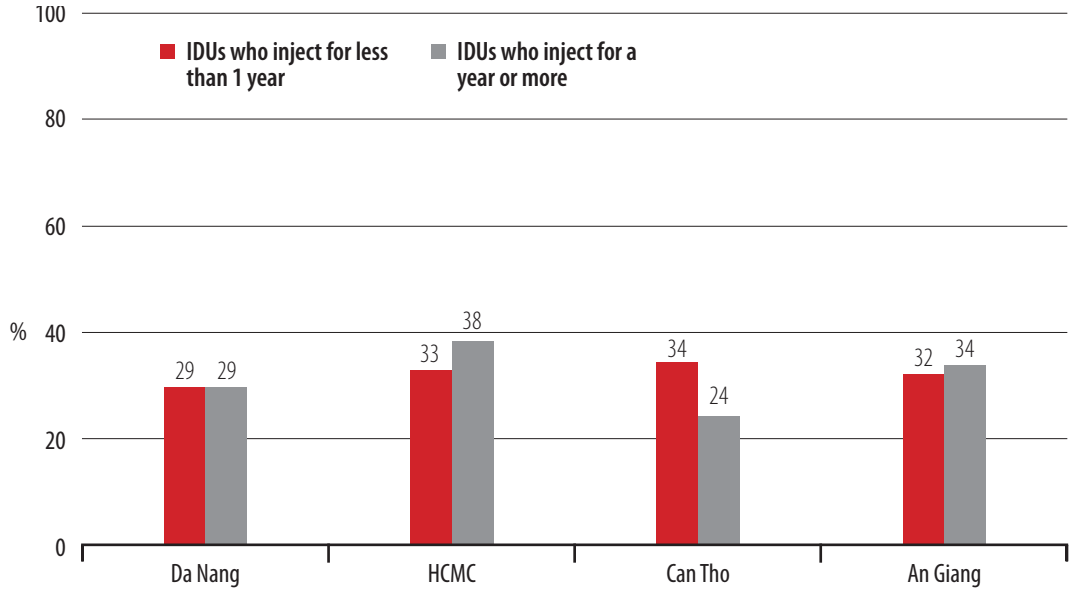



**Figure 8: Number of people IDUs shared needles with among those who shared at last injection.**



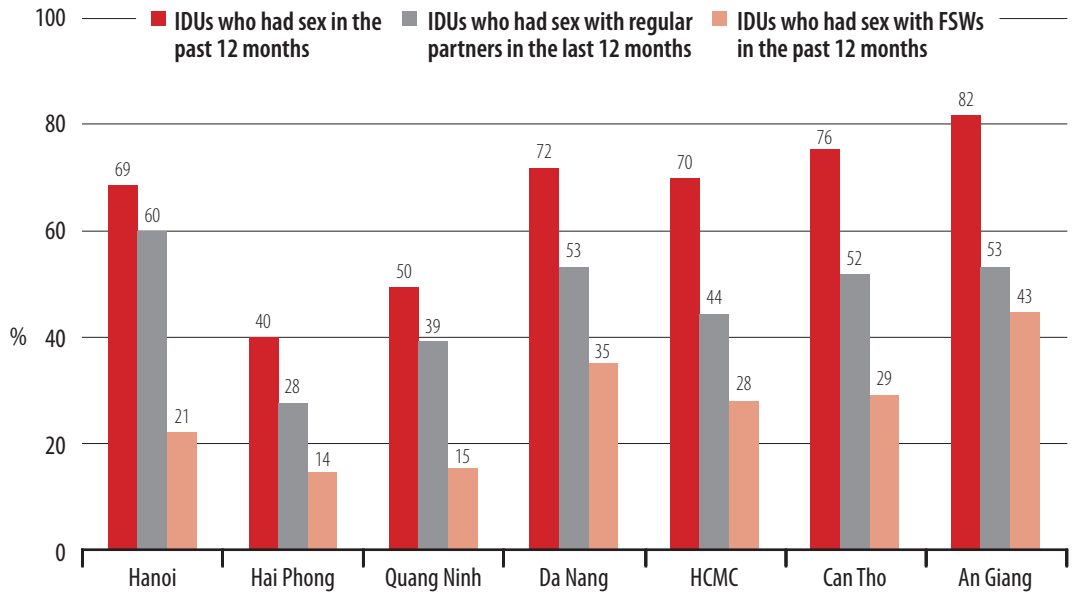

About half of the IDUs surveyed started using drugs in their teens. In HCMC, Can Tho and An Giang, about one-fifth of IDUs had been injecting for less than a year. Figure 9 shows no difference in risk behaviors between new and old injectors (injecting for less than a year and for a year or more). This means that as soon as they started injecting, they faced the risk of HIV infection through sharing behaviors.

**Figure 9: Percentage of IDUs who shared needles in the past six months by duration of injection: IDUs practice risky behaviors early after they started injecting.**




Sharing needles and injecting equipment is not the only risk factor for IDUs, but sexually-related behaviors play a part as well. Over 70% of IDUs had sex with female partners in the previous 12 months in most provinces (Figure 10). Commercial sex was not infrequent, with approximately 30% or more IDUs in Da Nang, HCMC, Can Tho, and An Giang reporting purchasing commercial sex in the same time frame. More data on sexual behaviors of IDUs can be found in Table 12 and Table 13, Appendix I.

**Figure 10: Percentage of IDUs who had sex with female partners: many IDUs still have sex with both FSWs and regular partners (wife or girlfriend).**



The level of condom use was low among both regular and commercial sex partners. Few IDUs reported using condoms consistently when they had sex with their regular partners, with figures from 16% to 36% (Figure 11). In the southern provinces, more IDUs had sex with sex workers and the level of condom use was lower than that in northern provinces. Less than 50% of IDUs in these provinces reported using condoms consistently when they had sex with FSWs (Figure 12).

**Figure 11: Condom use with regular partners among IDUs in the past 12 months: Low condom use both during last sex and consistently.**

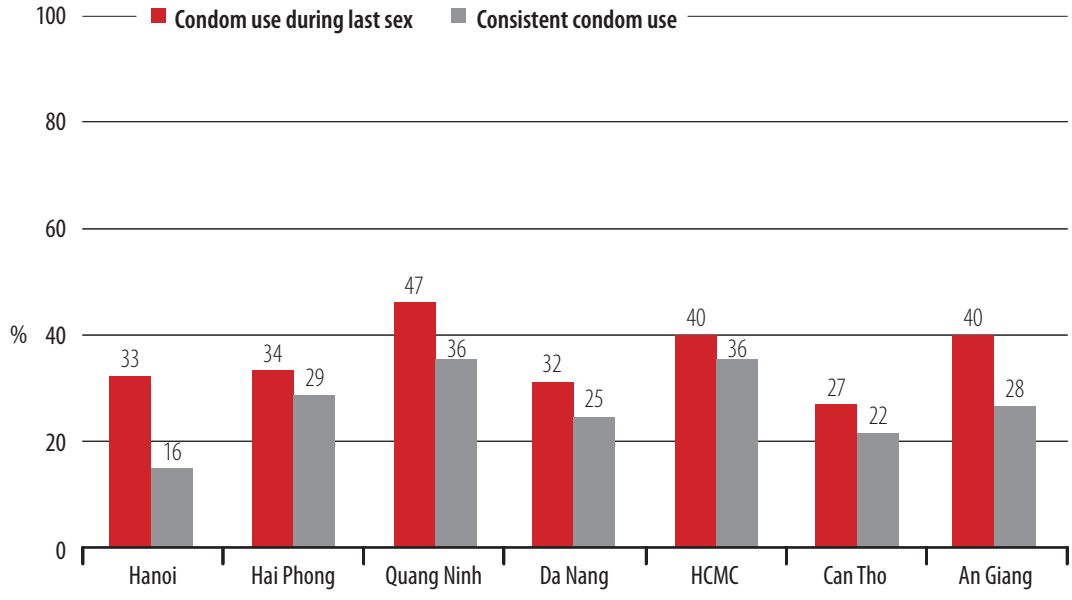



**Figure 12: Condom use with sex workers among IDUs in the 12 months prior to survey.**

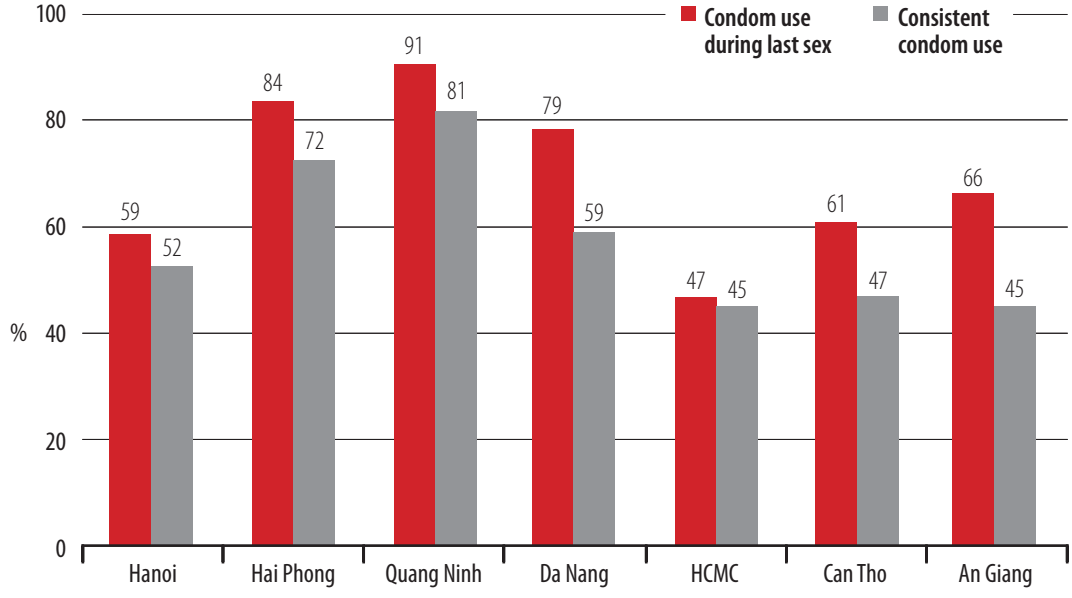
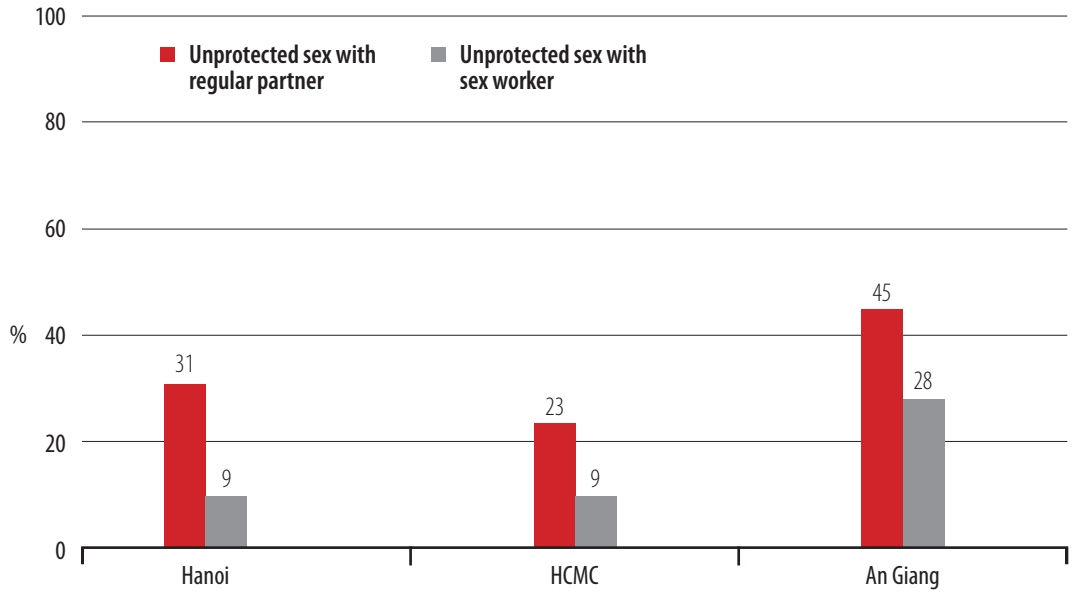


**Figure 13: Unprotected sex with sexual partners among HIV-positive IDUs in selected provinces: many HIV-positive IDUs, particularly in Hanoi, HCMC and An Giang, reported unprotected sex with their sexual partners in the previous 12 months.**




Condom use is particularly low among HIV-positive IDUs, many of whom do not know their status (see intervention exposure section). For example, almost one-third (31.1%) of them in Hanoi and nearly one-half (45%) in An Giang had unprotected sex with their regular partners in the past year. While lower, the proportion of IDUs who reported unprotected sex with commercial sex partners among HIV+ IDUs was also significant, particularly in An Giang (Figure 13).

### 3.2. Female Sex Workers

The followings are data on main indicators of FSWs including sexual and injecting behaviors. More data can be found in Appendix II and Appendix III.

FSWs reported higher numbers of clients in Hai Phong, Can Tho, and An Giang, where FSW had one client per night on average. In other provinces, especially in Da Nang and Quang Ninh, FSW had about four clients per week (Figure 14). This figure may be a low estimate because of reporting and recall bias. More data on clients of FSWs can be found in Table 19, Appendix II and Appendix Table 27 III.

Most FSWs reported condom use with their clients at last sex, with 90% or more reporting condom use at last sex with one-time clients (Figure 15). Last sex condom use with regular clients was also high in all provinces (at more than 85% except for KSWs in Quang Ninh.) (See Table 20 Appendix II and Table 28 Appendix III). However, it is worth noting that social desirability bias may have affected reporting.

**Figure 14: Total number of clients per female sex worker in the week prior to survey.**

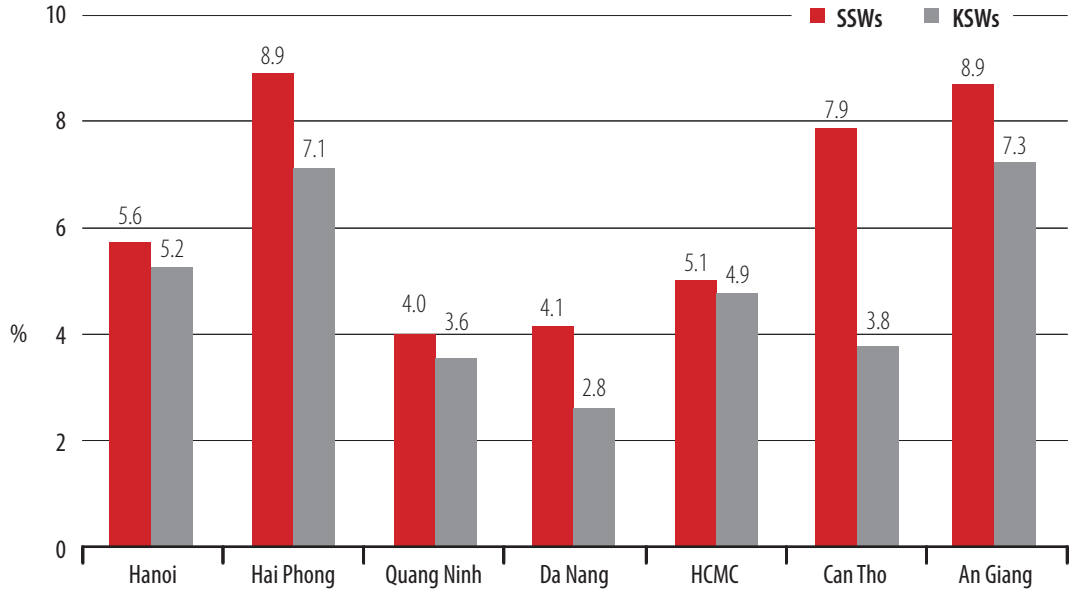



**Figure 15: Condom use at last sex with one-time clients among female sex workers: over 90% reported using condoms at last sex with one-time clients.**

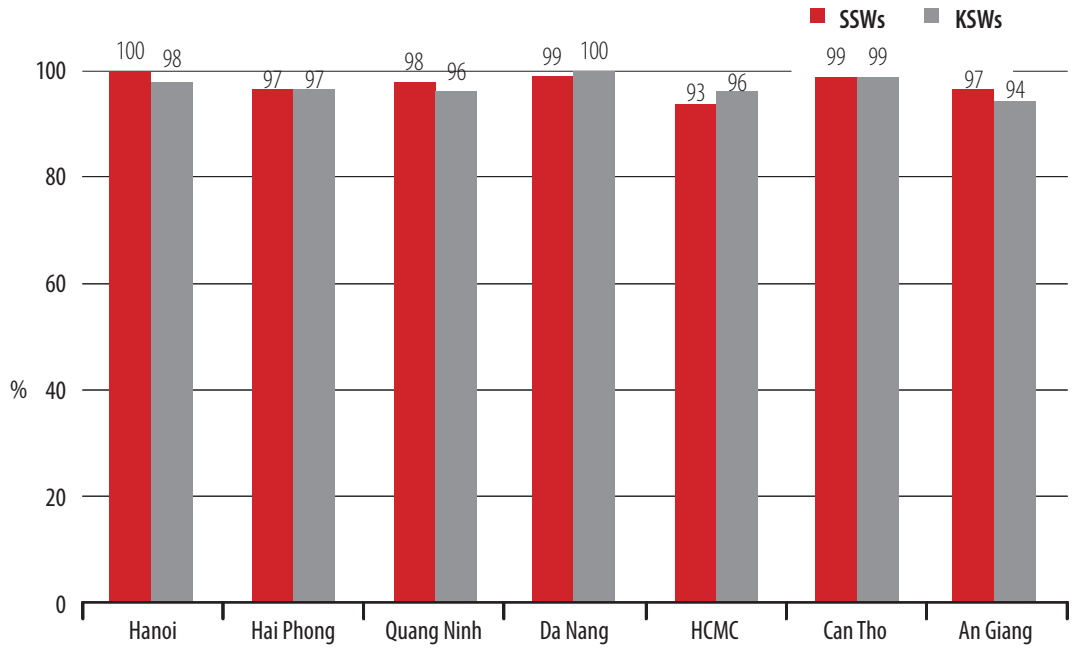


**Figure 16: Consistent condom use with clients (including both one-time and regular clients): many female sex workers had unprotected sex with their clients in the previous month, especially in Quang Ninh.**

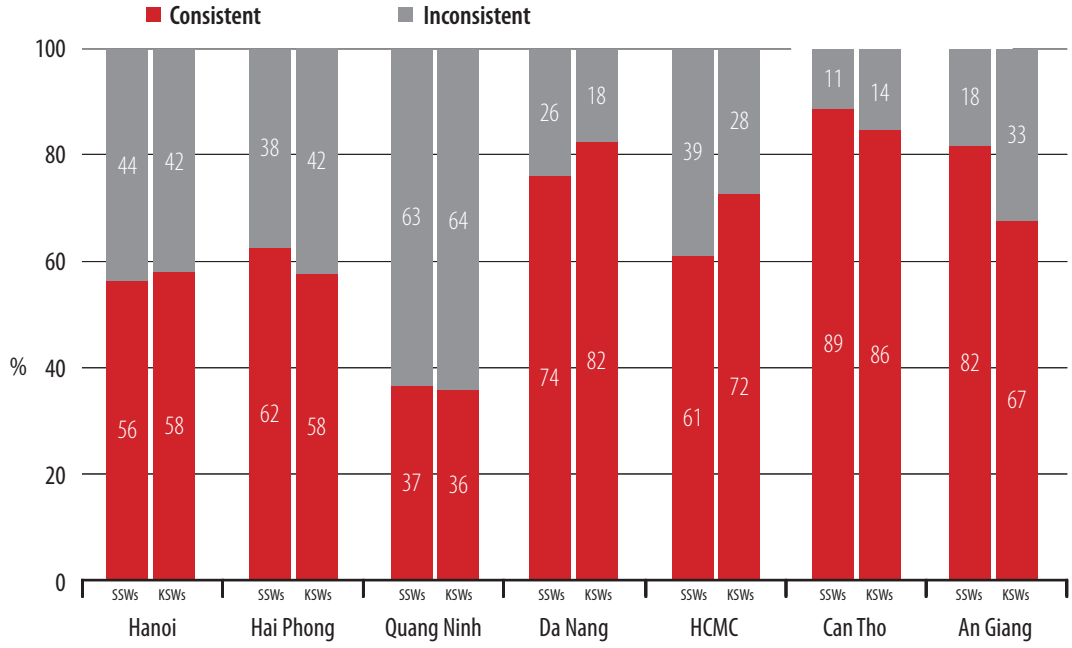
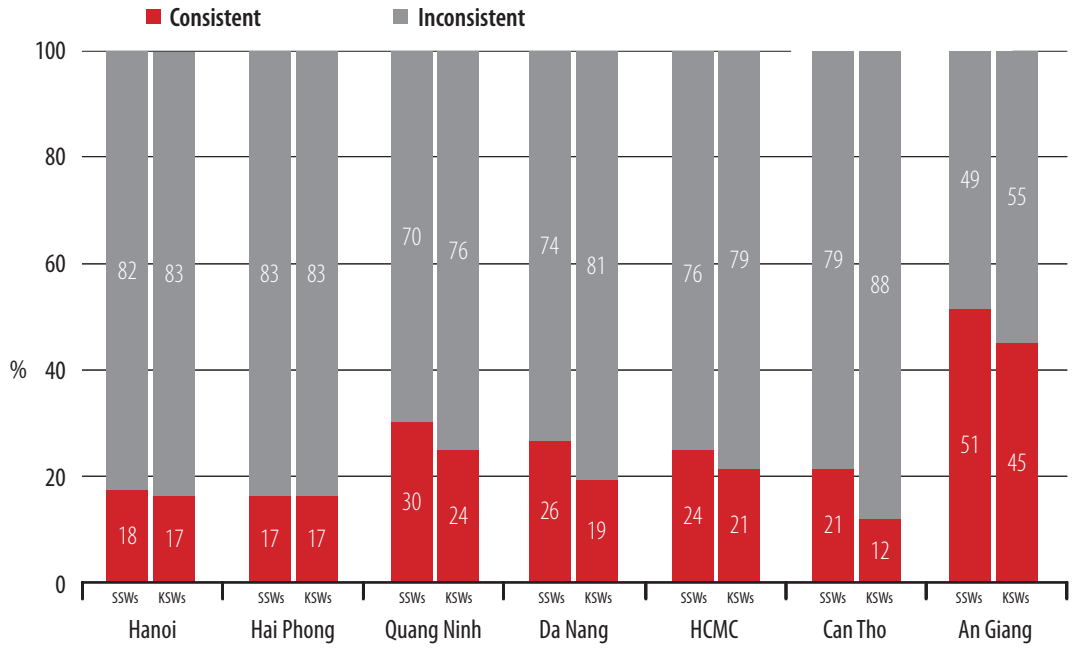



**Figure 17: Consistent condom use with regular partner: few FSWs reported using condoms consistently with their regular partners.**

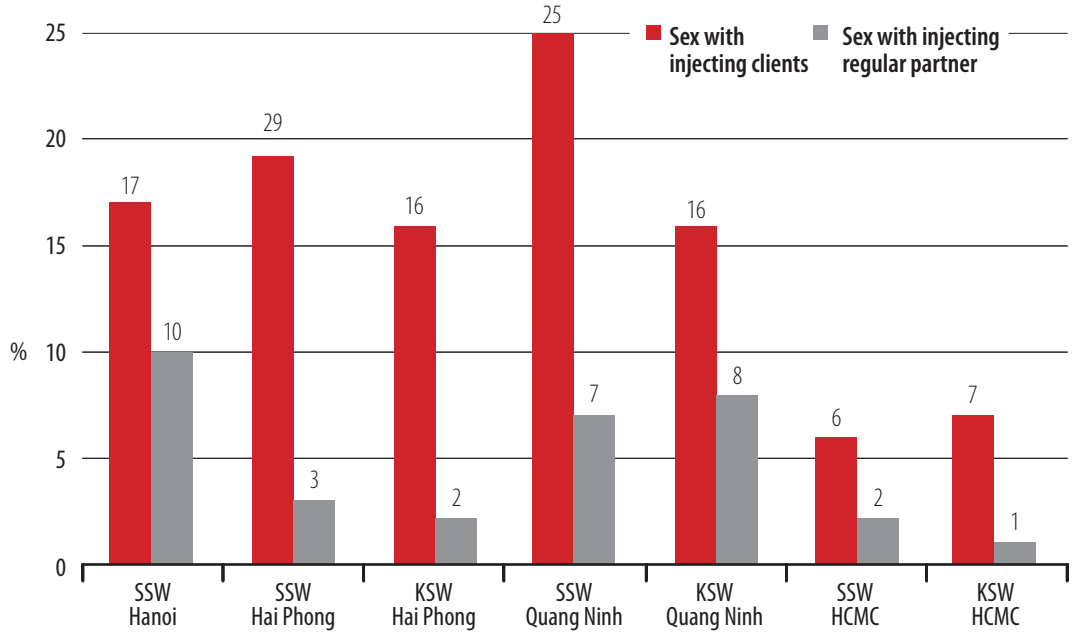


Consistent condom use, however, was much lower, with significant variations across provinces. About 56%-62% of FSWs in Hanoi and Hai Phong reported that they had used condoms consistently with their clients in the month prior to the survey. This figure is about 60% for SSWs and 70% for KSWs in HCMC and around 80% in Can Tho and An Giang. The lowest level of consistent condom use was reported among FSWs, including both KSWs and SSWs, in Quang Ninh (Figure 16).

A low proportion of sex workers reported consistent condom use with regular partners, 30% or below in almost provinces. The highest figure was found in An Giang, with 51% SSWs and 45% KSWs there reporting using condom consistently with their regular partner (Figure 17).

FSWs reported having both clients and regular partners who inject drugs (Figure 18). This was particularly true in Quang Ninh where a quarter (25.5%) of them reported that they have clients who inject (Figure 18). Since condom use is uncommon when sex workers had sex with their regular partners, HIV infection will likely spread very quickly between these two high-risk groups. An example is with SSWs in Hanoi. After controlling for a variety of factors[5], sex workers who had sex with regular partners who also injected were four times more likely to be infected than sex workers who did not.

**Figure 18: Percentage of FSWs reporting sex with injecting clients and injecting regular partners**




[5] Factors controlled for include age, education, time selling sex, number of clients, condom use with client and drug injection. Final ODDS= 4.42, 95% Confidence Interval: 1.58-12.35.

Like other most-at-risk populations, the risk behaviors of female sex workers were not only sexually focused but also injecting-related. Figure 19 shows the percentage of FSWs who inject drugs in each province. The highest levels are among SSWs where approximately 17% in both Hanoi and Can Tho reported injecting drugs.

**Figure 19: Drug injection among FSWs: more than 15% of SSWs Hanoi and Can Tho reported drug injection.**

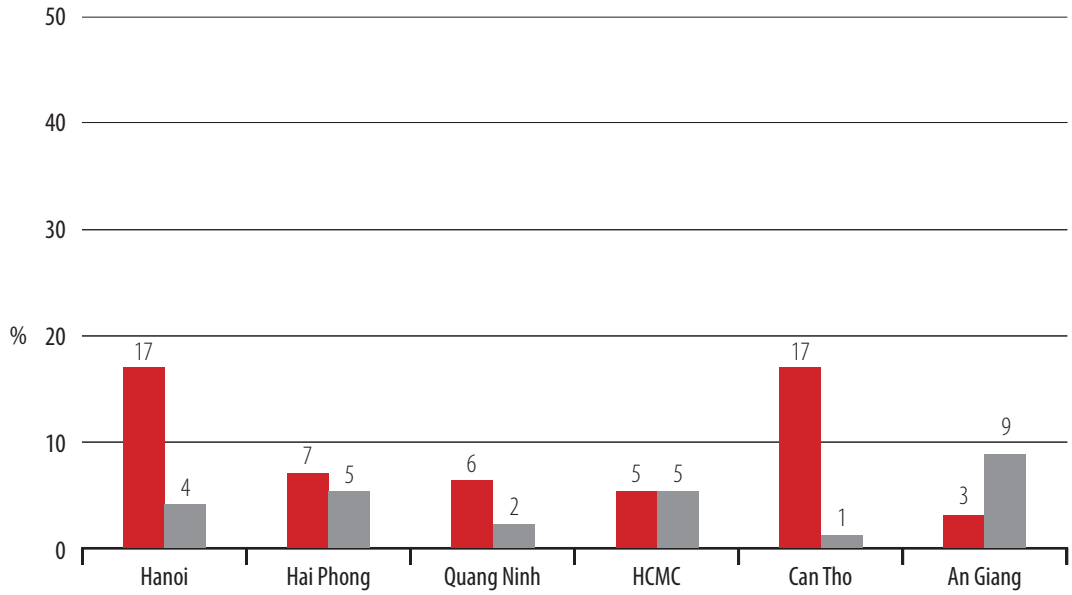
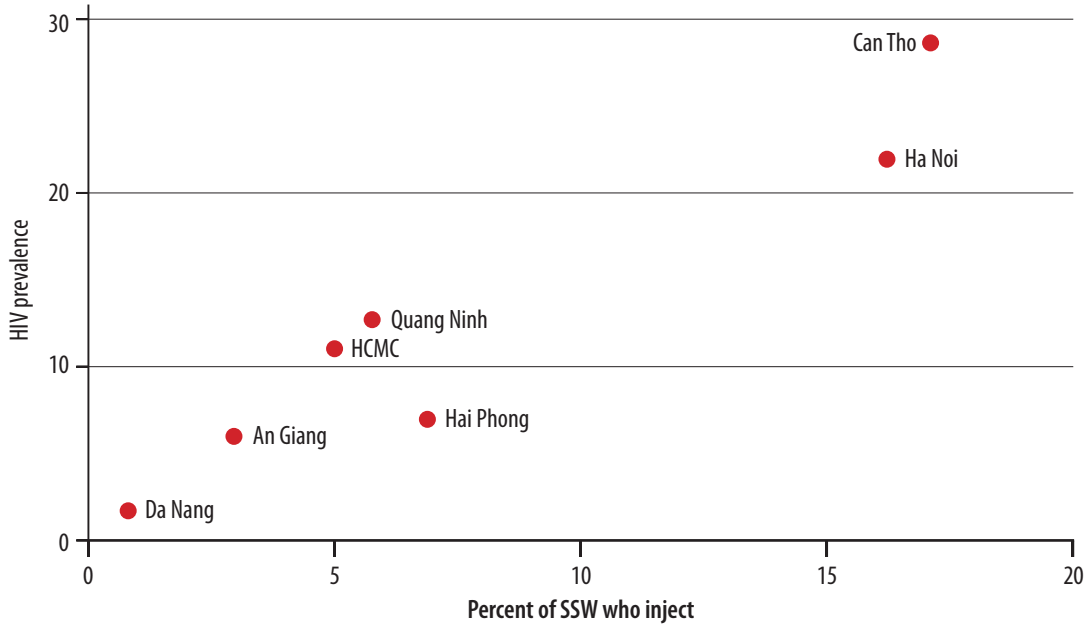



**Figure 20: Relationship between drug injection and HIV prevalence among FSWs: where the percentage of injection drug use among FSWs was higher, so was HIV prevalence.**



There is an association between the level of drug injection and the level of HIV prevalence among FSWs in study sites: the prevalence of HIV is proportional to the proportion of FSWs who inject drugs. With more injecting SSWs in Hanoi and Can Tho, HIV prevalence there is higher than in other provinces (Figure 20).

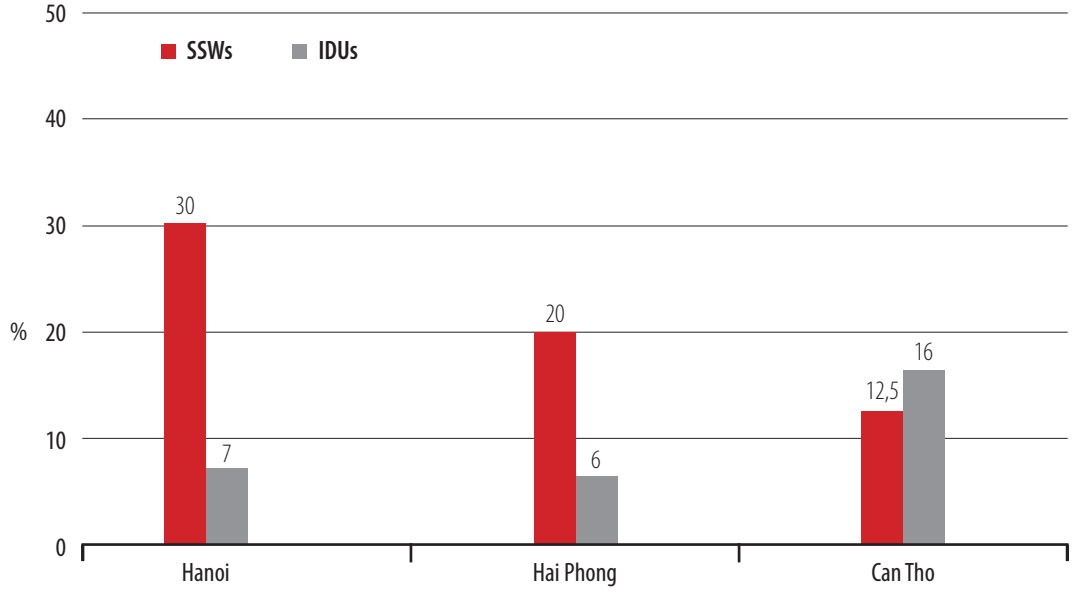
Multiple logistic regressions were performed to access the association between drug injection and HIV-positive status among FSWs including SSWs and KSWs. After controlling for age, education, number of clients, condom use, and duration of selling sex , very strong relations were found for SSWs in Hanoi (OR= 3.5), SSWs and KSWs in Hai Phong (OR= 31.4 and 16.6 respectively), SSWs and KSWs in HCMC (OR= 12.6 and 8.9), and SSWs in Can Tho (OR=10.2) (Table 8). Other strong associations, though not statistically significant, were found for KSWs in Hanoi and for SSWs and KSWs in An Giang.

One of the reasons for the strong association between drug injection and HIV status is sharing behaviors among FSWs: 20-30% of injecting SSWs reported sharing behavior in the six months prior to the survey. This figure among injecting FSWs is even higher than among male IDUs, as shown in Figure 21.

**Table 8: Odds ratio of HIV infection associated with injection drug use among FSWs[6]: FSWs who inject drugs are more likely to be infected with HIV than are FSWs who do not.**

| Sub-groups of sex workers | Odds Ratio | 95% Confidence interval |
|---|---|---|
| SSWs in Hanoi | 3.5 | 1.6 - 7.9 |
| SSWs in Hai Phong | 31.4 | 7.8 - 126 |
| KSWs in Hai Phong | 16.6 | 3.8 - 73.3 |
| SSWs in HCMC | 12.6 | 1.5 - 9.4 |
| KSWs in HCMC | 8.9 | 2.1 - 37.3 |
| SSWs in Can Tho | 10.2 | 3.1 - 34.0 |

**Figure 21: Percentage of SSWs and IDUs who reported needle sharing in the past 6 months: Injecting SSWs reported higher levels of unsafe injection than did male IDUs.**



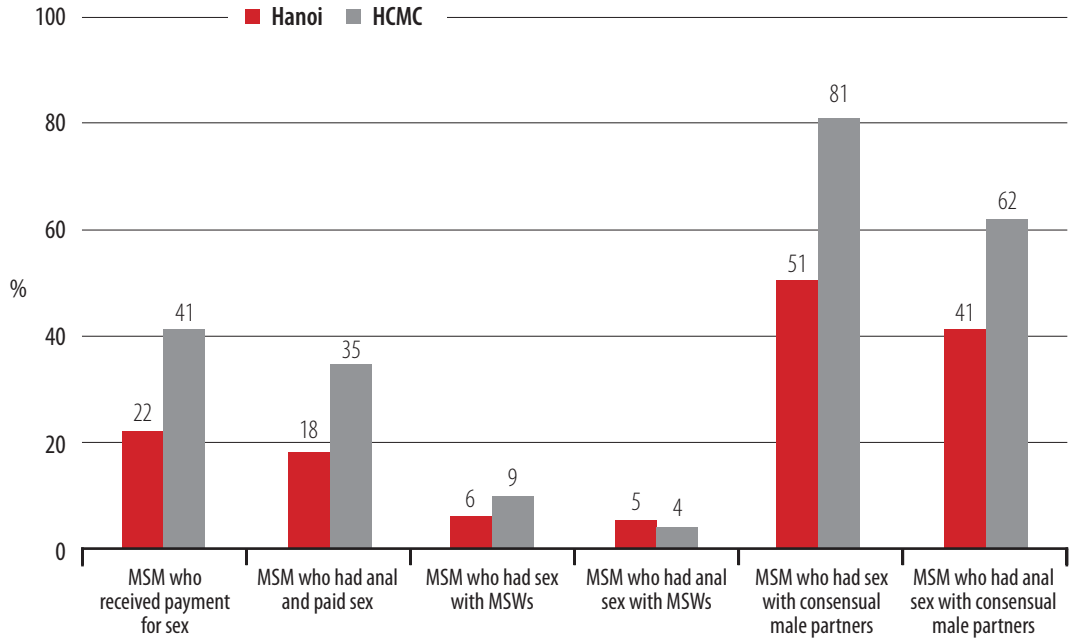

[6] Controlling for age, education, duration of selling sex, number of working day in a month, number of clients, drug injection among sexual partners, and consistent condom use - P-value<0.05

### 3.3. Men who have sex with men

MSM reported sexual relations with multiple types of partners, such as other MSM (including *Bong Lo* and *Bong Kin*), and female partners (including female sex workers). In this study, 99.5% of MSM in HCMC and 64.1% of MSM in Hanoi reported sex with male partners in the past month prior to the survey. Many MSM also reported two partners or more per month, especially those who sold sex. More information on types, with number of sexual partners, is presented in Table 36, Appendix IV.

Figure 22 below shows the percentage of MSM who had sex (including anal sex) with three types of male partners: clients, male sex workers, and consensual male partners. The data also showed that 21.8% of MSM in Hanoi and over 40% of MSM in HCMC reported selling sex in the previous month and that the majority of them reported anal sex with male clients.

**Figure 22: Male sexual partners of MSM: many MSM reported commercial sex in the past month, and anal sex was very high.**




According to qualitative information collected after the survey, "payment for sex" is not considered as commercial sex among MSM. Instead, this is considered as a type of compensation or "gift" after sex with other MSM without any negotiation. Payers and payees do not self-classify as clients and sex workers. Commercial sex is generally considered as sex with male sex workers who are working on the streets after negotiation of a price.

About 40% of MSM also had sex with female partners in the previous 12 months (Table 37, Appendix IV). MSM who sold sex to male partners were also more likely to have sex with FSWs. For example, about 28% of MSM in HCMC who received payment for sex from male partners also bought sex from female sex workers, compared to 6% among MSM who did not receive payment for sex (Figure 23). These individuals should be considered as male sex workers and male clients of female sex workers simultaneously.

In addition, MSM who sold sex to male clients were more likely to report drug injection than were MSM who did not sell sex, as shown in Figure 24.

**Figure 23: Percentage of MSM who had commercial sex with female sex partners: MSM who sold sex to male partners were more likely to have sex with female sex workers.**

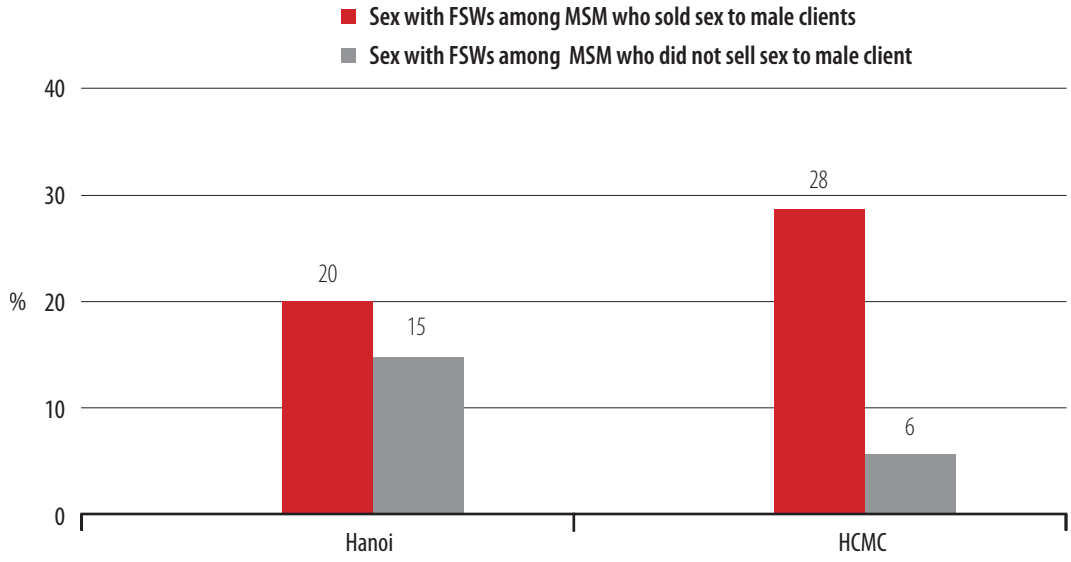



**Figure 24: Drug injection among MSM who reported selling sex and among MSM who did not report selling sex in the past month**

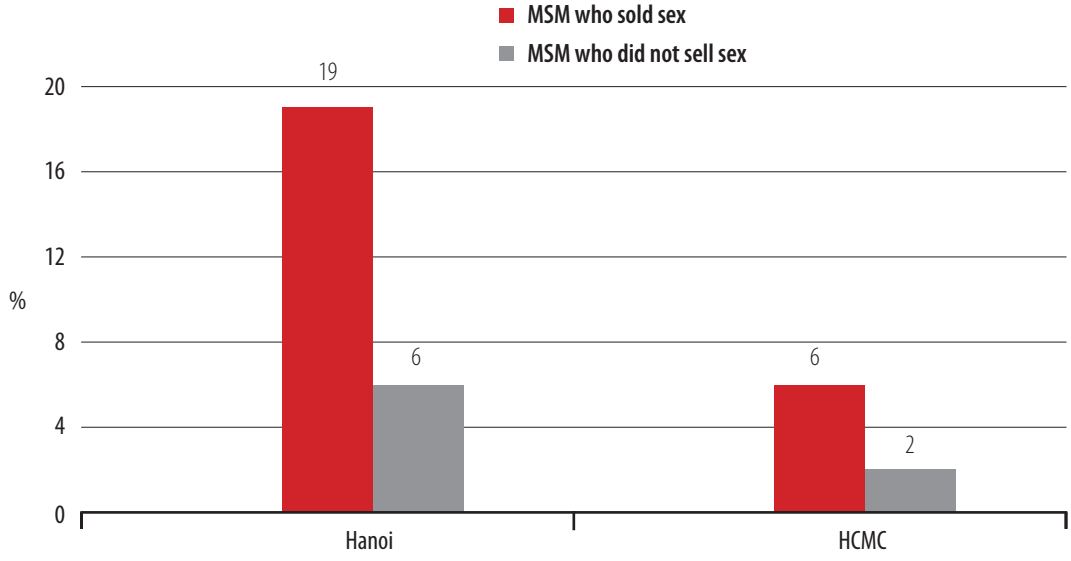
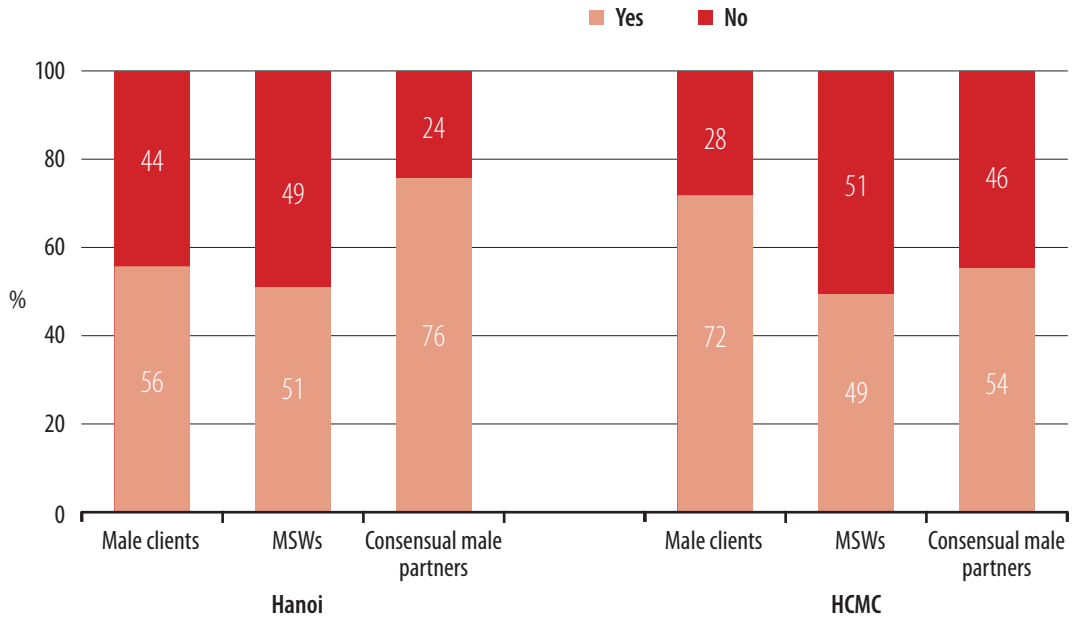


**Figure 25: Condom use during last sex with male partners[7] among MSM.**




Condom use was infrequent among MSM and their partners. Condom use was measured among three types of partnerships: male clients (who paid them for sex), male sex workers (whom they paid for sex) and consensual male sex partners (without any payment). Condom use at last sex with male partners was highest when MSM had sex with consensual male partners in Hanoi and male clients in HCMC, at about 70% (Figure 25). The percentage of MSM reporting consistent condom use with any kind of partner in the previous month was low, and MSM in HCMC used condoms more frequently than MSM in Hanoi, especially when they sold sex to male clients. About 30% of MSM reported using condoms consistently when they had anal sex with their male partners in Hanoi and HCMC. An exception to this was in HCMC, where 50% MSM in HCMC reported using condom consistently when they sold sex (Figure 26). MSM also had unprotected sex with female partners, especially when MSM had sex with a female regular partner (Figure 27).

[7] Percent of condom use during last sex with MSWs in HCMC is unadjusted for the network sizes.

**Figure 26: Condom use with male partners among MSM[8]: Low with every type of male partner.**

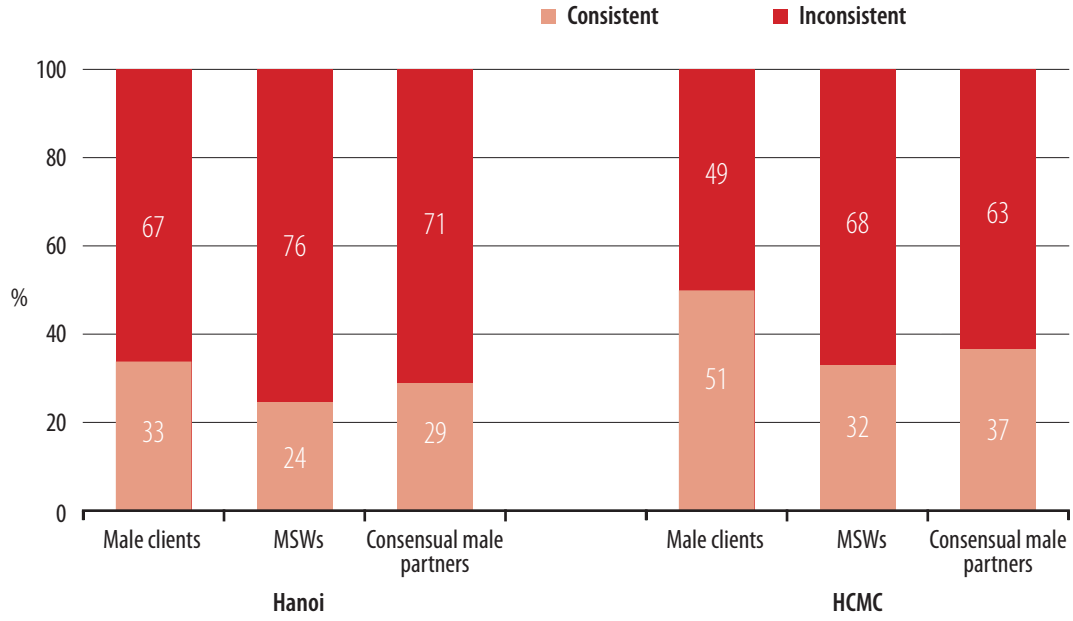
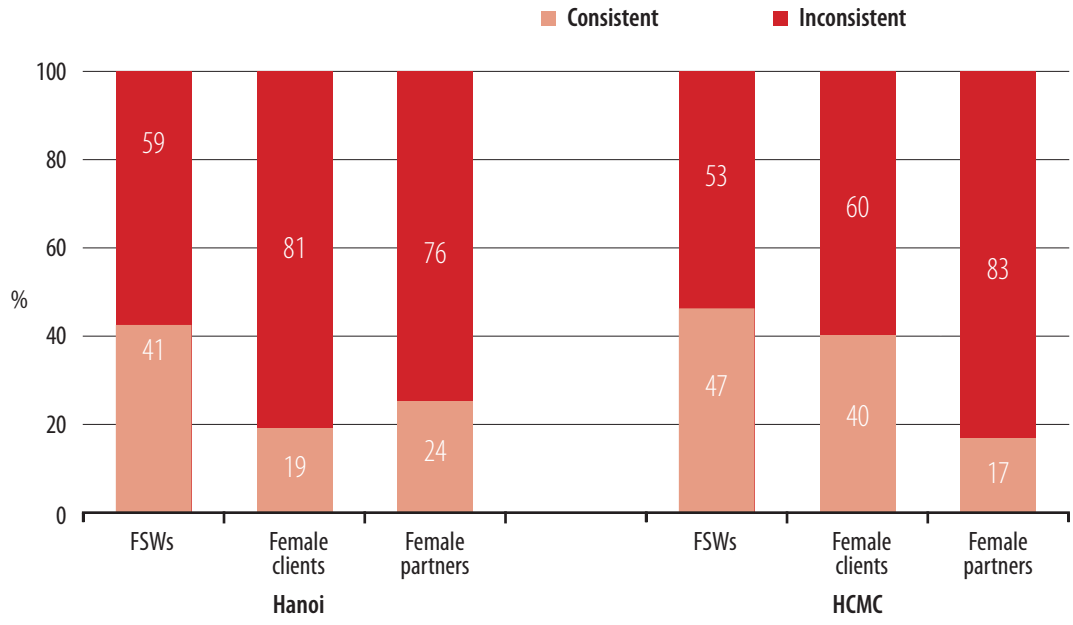



**Figure 27: Condom use with female partners among MSM: very low with female clients and female consensual partners.**




Many HIV-positive MSM reported unsafe sex with their male partners in the previous month in both cities: 63.1% in Hanoi and 64.1% in HCMC (Figure 28). There was not enough evidence to confirm that MSM became infected because of their sexual risk behaviors but it is clear that not using condoms frequently will increase the possibility of HIV infection among MSM and their male and female sexual partners.

[8] Percent of consistent condom use with male clients in Hanoi is unadjusted for the network sizes.

Like other MARPs, drug injection among MSM is one of the risk factors for HIV infection. More than 20% of MSM reported drug use, with 9.2% in Hanoi and 3.8% in HCMC reporting ever injecting drugs (Figure 29).

**Figure 28: Percentage of MSM who reported using condoms inconsistently with male partners in the previous month among HIV-positive MSM.**

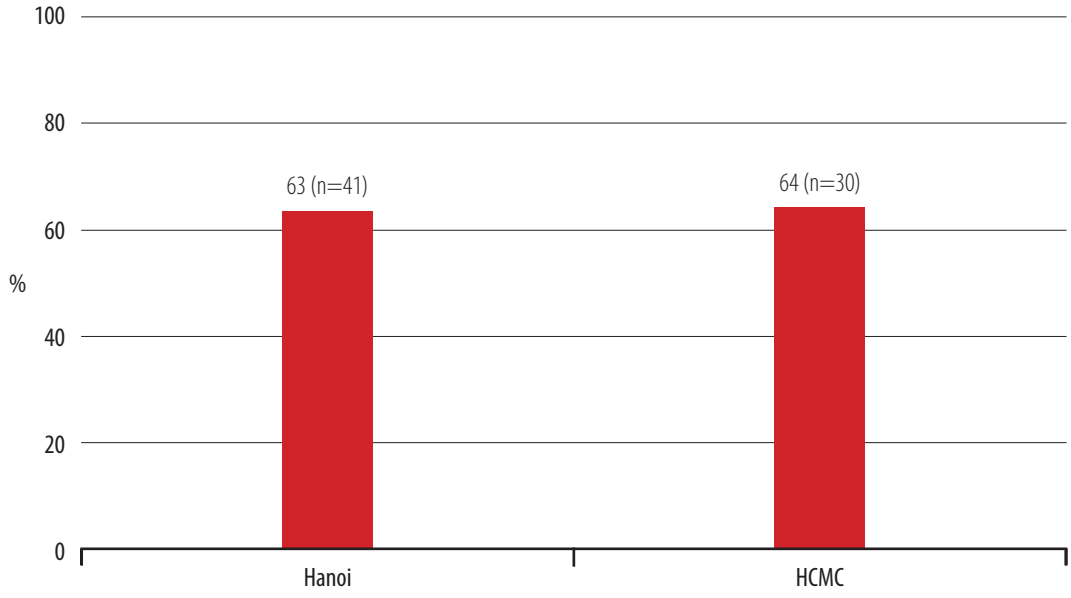



**Figure 29: Percentage of MSM who had ever used drugs and who had ever injected drugs.**

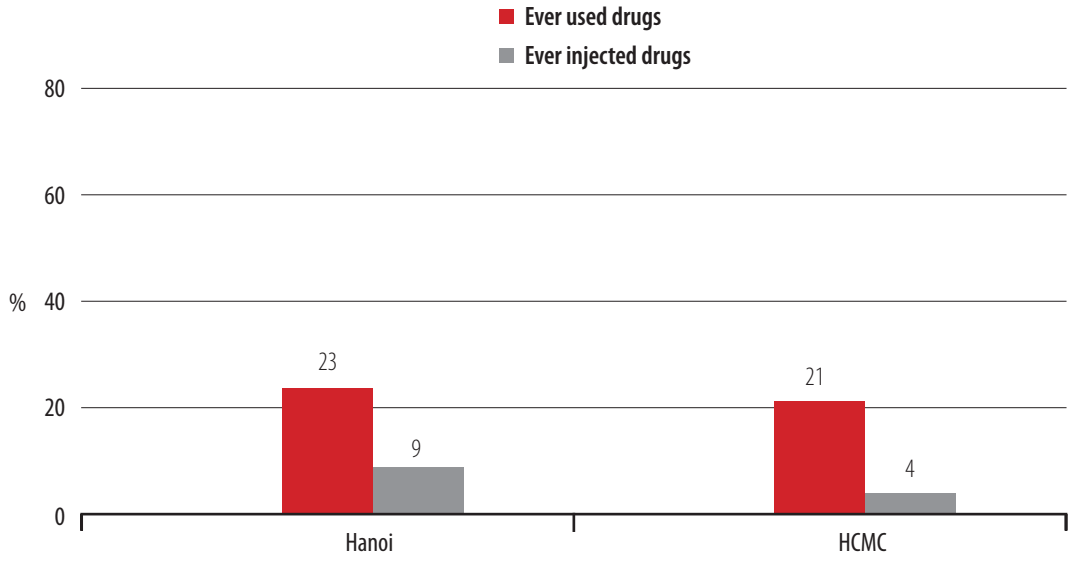
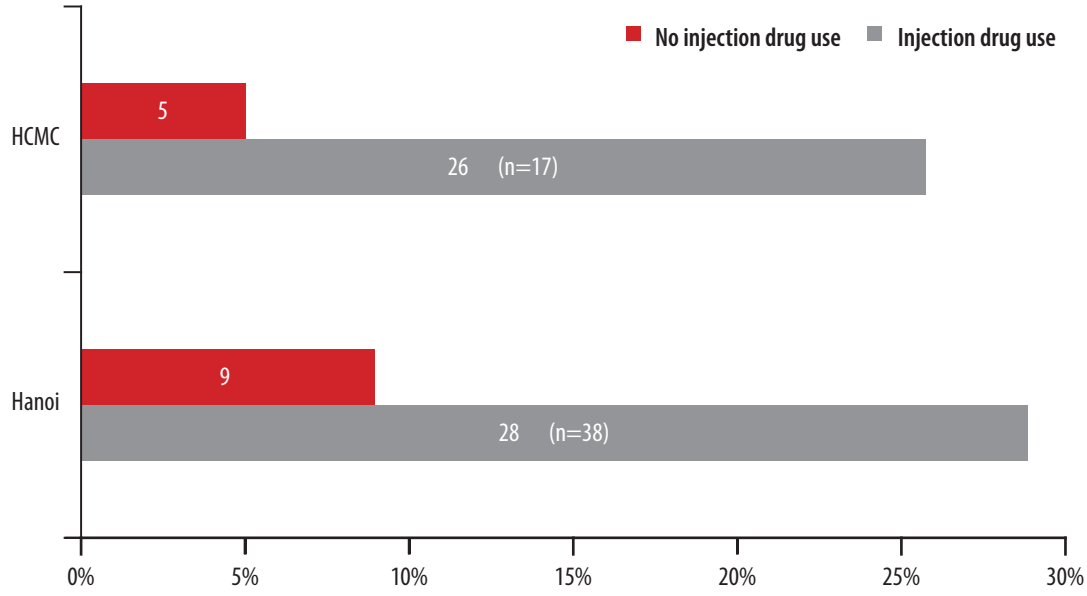


**Figure 30: HIV prevalence by injecting behavior: higher among injecting MSM than non-injecting MSM.**




HIV prevalence among injecting MSM was much higher than that among non-injecting MSM (Figure 30). This suggests that drug injection may play an important role in driving the HIV epidemic in the MSM population. Needle sharing among injecting MSM was not uncommon: 13.16%[9] of injecting MSM in HCMC and 67.1% in Hanoi reported that they had shared needles in the past. Like unprotected sex, sharing needles will increase the risk of acquiring HIV or spreading HIV to others. (More information on injecting behaviors among MSM is presented in Table 41, Appendix IV).

## 4. Exposure to HIV intervention programs

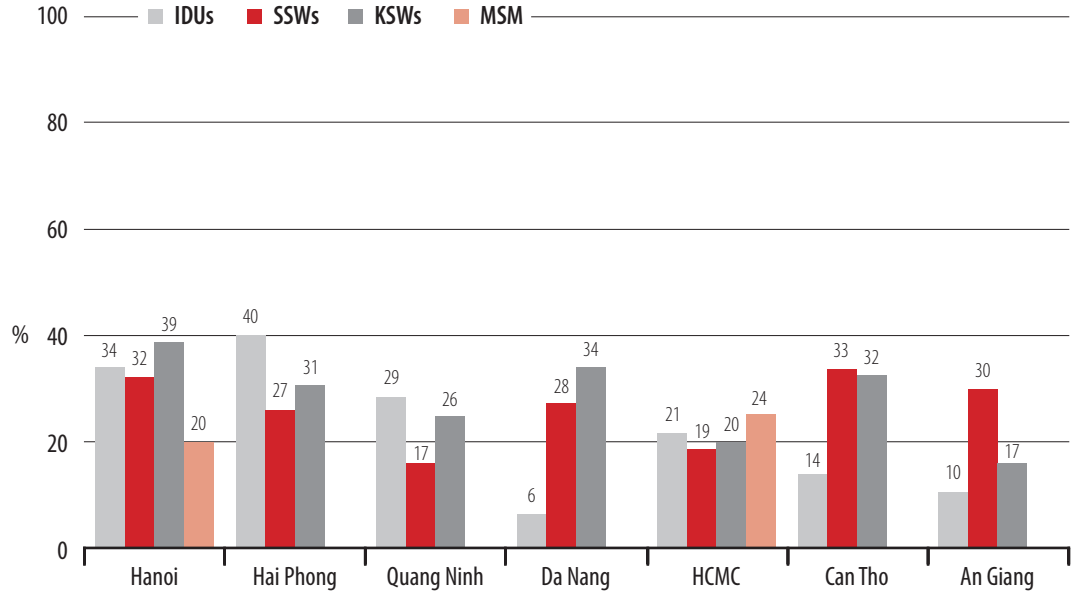
This section provides overall information on the coverage of intervention programs that have been implemented in study sites. The timeframe of this measurement was the six months prior to the survey in each province. Since the time of data collection, however, more interventions may have been launched and therefore the data only reflects the situation in this timeframe. More data can be found in Table 16 Appendix I, Table 24 Appendices II, Table 32 Appendix III and Table 43, Appendix IV.

HIV testing was most common among IDUs in Hanoi and Hai Phong with about 30%-40% having received an HIV test and learned the result. IDUs in southern provinces had a lower level of exposure to HIV testing, possibly due to the shorter duration of injection. These figures do not reflect the counseling components but HIV testing only. If this is taken into account, the percentage of MARPs who received the counseling (pre-test and post-test) with HIV testing was very low, at less than 10%.

Proportions of FSWs who had been HIV tested ranged from 17% (KSWs in An Giang) to 39% (KSWs Hanoi). In HCMC, where VCT is widely available, about 20% of all groups reported having been HIV tested (Figure 31).

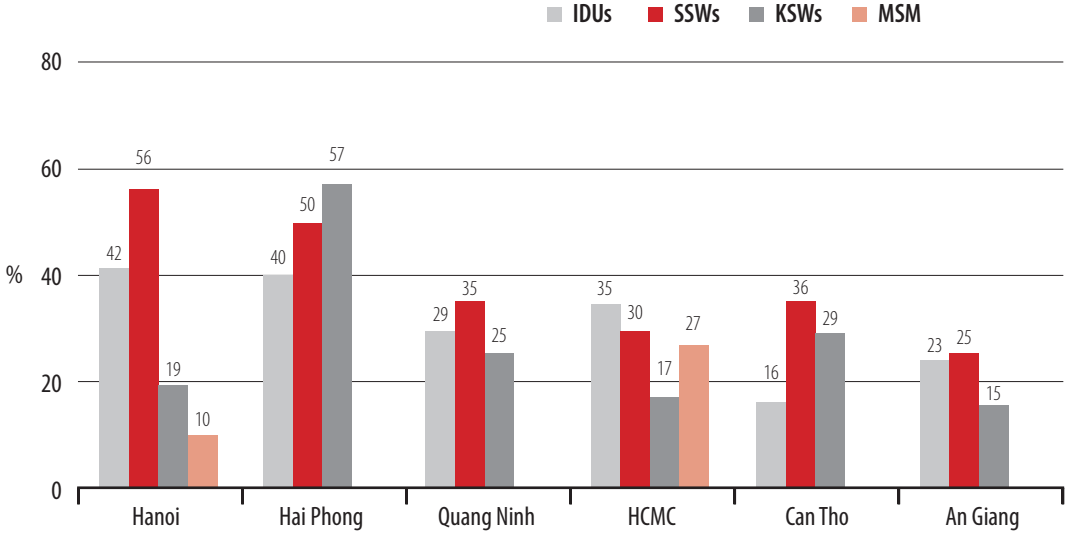
[9] Percentage of injecting MSM who reported needle sharing is unadjusted for the network sizes.

**Figure 31: Percent of study subjects who have been HIV tested and who know the results.**




Prevention of sexual and parenteral HIV transmission from those who are already infected is paramount. However, as Figure 32 illustrates, a vast majority of HIV-positive individuals have not been tested and are unaware of their status, as shown in Figure 32. HIV-positive MSM in Hanoi were the least aware of their HIV status (10%), but most other groups were under one-third (Figure 32).

**Figure 32: HIV testing among HIV-positive participants: few HIV-positive subjects knew their HIV status.**



About 40% of MSM received condoms in the six months prior the survey; lubricant was less common, with about 18% to 23% of MSM receiving it in the same period of time. More than 50% of MSM had been educated on sexual behaviors in both cities (Figure 33). However, one factor that may influence these results is that MSM were interviewed at drop-in centers of on-going intervention projects and figures above might be high estimates. This will be fully discussed in the section of study limitations.

**Figure 33: Percentage of MSM exposed to HIV/AIDS interventions in the previous six months.**

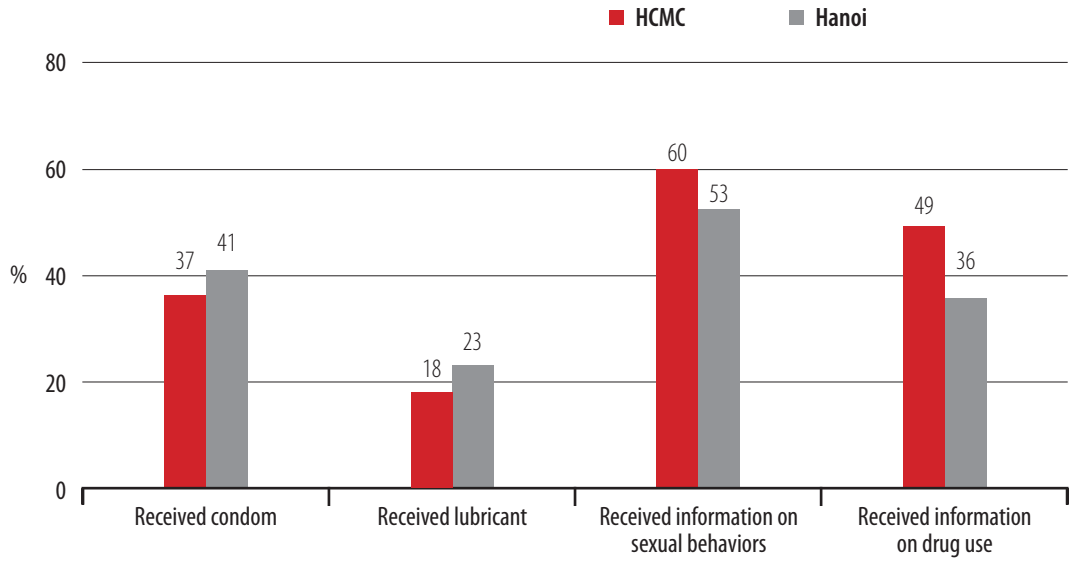
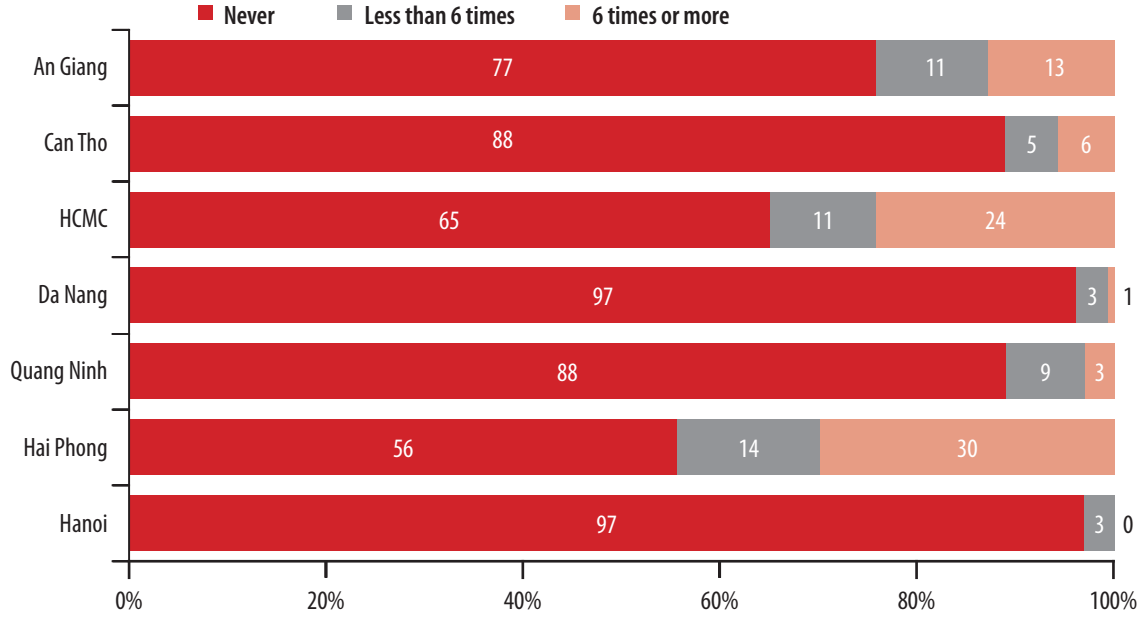



**Figure 34: Percentage of IDUs who obtained free syringes in the previous six months.**



Less than 35% of IDUs reported that they obtained clean needles/syringes in the six months prior to the survey, often less than once per month on average (except Hai Phong) (Figure 34). The indicators on information on sexual behaviors and condom distribution were also low (Figure 35).

**Figure 35: Percentage of sexually active IDUs who received condom and received information on safe sex behaviors.**

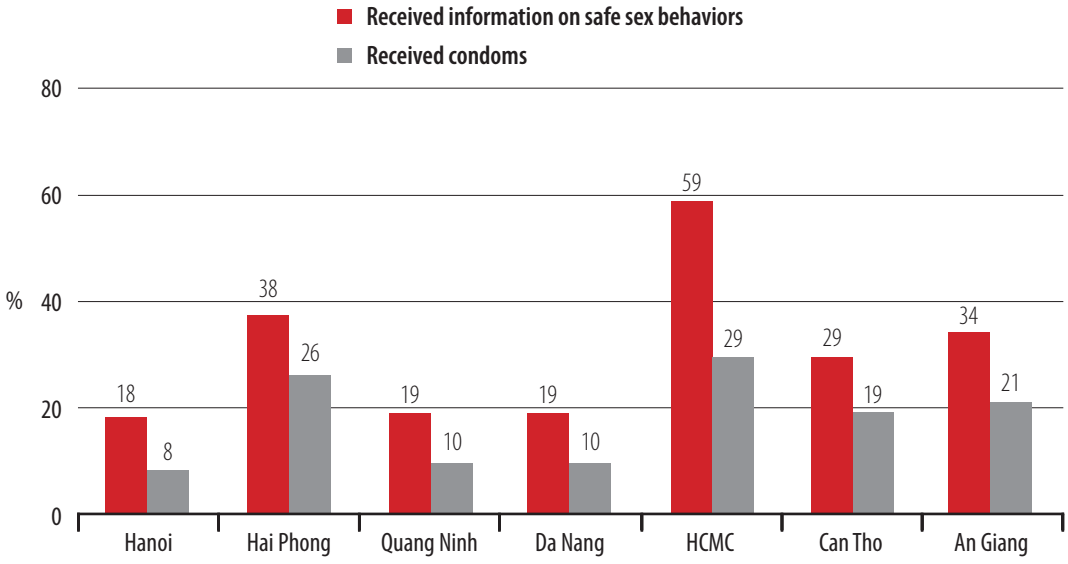
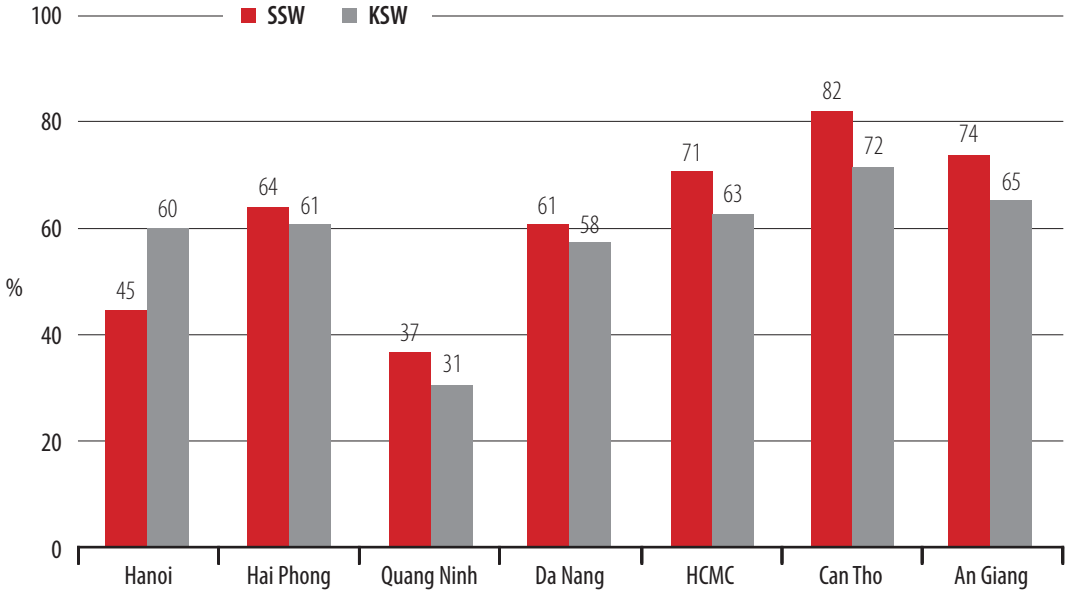
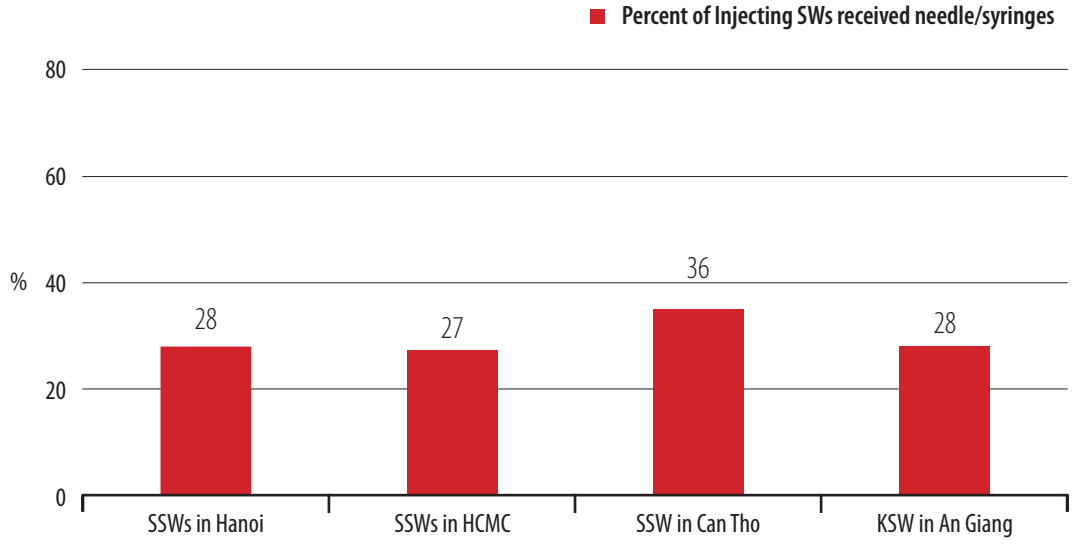



**Figure 36: Percentage of FSWs who obtained condoms in the previous six months.**



About 60% of FSWs reported receiving condoms during the six months prior to the study, except SSWs in Hanoi and both KSWs and SSWs in Quang Ninh (Figure 36). Injection is also one of the risk factors for FSWs in this study, but only about one-third or less of injecting FSWs reported receiving needles or syringes in the past six months (Figure 37).

**Figure 37: Percentage of injecting FSWs who obtained syringes in the previous six months.**



# STUDY LIMITATIONS

The following are limitations of these surveys:

- **Reporting bias:** Like in most other behavioral surveys, the issue of under-reporting risk behaviors among participants of this study must be considered. Due to social stigma, some behaviors, such as condom use, drug injection or needle sharing may be under-reported by respondents. For example, the figure of condom use at last sex among FSWs was over 90% in most provinces, and this needs to be viewed with caution.

  Many efforts were made to limit this bias. All interviews were conducted in private places, surveys were anonymous, and there was no identifying information, and respondents were encouraged to provide accurate responses. Still, some indicators of risk behaviors are likely conservative estimates and some preventive behaviors may be high.

- **Incomplete sampling frames:** Cluster samples were chosen randomly based on sampling frames developed through the mapping process. This process was to identify places where potential subjects could be reached and sampled. Fieldwork for the mapping exercise was performed over two weeks by three to five staff for each group. Due to the limited period, some hidden populations may not be represented in sampling frames.

- **Under-estimating refusal rates:** Potential subjects were invited to participate in the study by visiting study centers. Study coupons were distributed to selected locations and refusal rates were calculated by the number of coupons not brought back to the study center divided by number of coupons distributed. With this method, refusal rates were estimated as less than 20% in all provinces. However, these rates could have been under-estimated since there were a number of subjects who refused to receive coupons. Those coupons may have then been given to other potential subjects.

  Subjects who received coupons were more likely to participate in the study. For RDS samples, the number of people who refused coupons was also unclear. If any potential subject refused a coupon, the recruiters were more likely to find a substitute without taking note of refusals.

- **Study centers were set-up at drop-in centers:** Study centers were set-up at drop-in centers for interviewing respondents. Because drop-in centers were designed to provide a supportive environment for target populations, potential study subjects who had visited drop-in centers previously may have felt more comfortable going to the center and participating in the study than those who had never been before. As a consequence, some indicators, such as coverage of on-going interventions, may be over-estimated while others, such as risk-behaviors, may be under-estimated.

- **Validation of Respondent Driven Sampling method is being evaluated:** One advantage of the RDS method is that the sampling frame is built up during the recruitment process and this helps to avoid incomplete sampling frames, as happened in the cluster sampling method. However, there are several key assumptions and operational issues under evaluation. These include the influence of non-response bias, selection of seeds, an assumption of random selection within a network of target populations, and others[10]. In addition, through the fieldwork, researchers found that the validity of the reported network size is also questionable. Until these issues are clarified, unknown biases may affect estimates generated from samples using RDS.

[10] Robert Magnani, Keith Sabin, Tobi Saidel at al. Review of sampling hard-to-reach and hidden population for HIV surveillance. AIDS 2004, 19 (suppl2): S67-S72.

# CONCLUSIONS AND RECOMMENDATIONS

### *HIV still spreading and entering into new high-risk population groups*

Despite the wave of increased commitment to and implementation of interventions in Vietnam, HIV is continuing to spread, often among the young and vulnerable. For example, young men who have injected drugs for less than one year are becoming HIV-infected very quickly, particularly in Hai Phong and HCMC. HIV infection among sex workers was similarly highly correlated with injection drug use, with injecting sex workers from 3.5 to 31 times more likely to be HIV infected than non-injectors. Finally, as evidenced from the first surveillance survey among MSM in Hanoi, HIV infection has already reached 9% in that group.

### *Drug injection and needle sharing need to be addressed in all groups*

Drug injection and its high correlation with HIV infection was not limited to the IDUs sample but also found among the FSWs and MSM samples where injection risks were not uncommon. Approximately 20% of MSM in Hanoi and HCMC and 10% or more of FSWs in Hanoi, HCMC, and Can Tho reported ever using drugs. Almost one-third of IDUs in Danang, HCMC, Can Tho and An Giang reported needle sharing in the previous six months, with rates even higher among injecting FSWs. The combination of existing HIV infection and needle sharing among those who inject suggest that HIV rates will rise in a short period of time, even where prevalence is lower, such as Danang and An Giang.

Given these drug using and needle sharing behaviors spanning all groups, comprehensive drug prevention and treatment interventions, including harm reduction that can reduce needle sharing, need to strengthened and expanded. These interventions should be promoted not only among traditional drug user networks but among FSWs and MSM networks as well where drug use is occurring.

### *Unprotected commercial sex interacts with other risks to drive HIV infection spread*

Although condom use appears to have increased in recent years between FSWs and their clients, consistent condom use was still unacceptably low, for example, only 36% among KSWs in Quang Ninh. Low condom use levels were particularly common with regular partners. Furthermore, many FSWs reported unprotected sex with IDUs and so in the absence of consistent condom use, HIV will be fueled between these two high-risk groups and to their other sexual partners. The continuing barriers to inconsistent condom use need to be more fully explored with clients of sex workers and then addressed in condom social marketing and outreach to clients.

Commercial sex remains a major HIV risk among MSM and IDUs, with high rates of multiple commercial partners among MSMs and a high proportion of young IDUs reporting unprotected sex with sex workers. Many MSM reported commercial sex with both male and female partners.

Condom use remains low in commercial sex among MSM, with only 33% of men in Hanoi and 51% in HCMC reporting consistent condom use with their clients. Interventions specifically targeting highest-risk male sex workers who are street or internet-based with high rates of client turnover need to be stressed.

Thirty per cent or more of IDUs in Danang, HCMC, Can Tho, and An Giang had visited sex workers in the past year of which approximately one half reported unprotected sex when they did so. Unprotected sex was more common among young IDUs who were also more likely to share needles. Because of these dual HIV infection risks and their quick path to HIV infection, interventions should prioritize this young vulnerable group.

### *High STI prevalence among certain groups suggests need for new treatment strategies*

FSWs and MSM in selected provinces registered high STI prevalence to the extent that new STI control strategies may be warranted. For example, 17% of SSWs in Hanoi and 14% of KSWs in HCMC were infected with chlamydia, suggesting that syndromic management is not sufficient for STI control and that periodic presumptive treatment in selected settings may be appropriate. Furthermore, 9% of SSWs in HCMC were infected with syphilis, suggesting that syphilis screening in VCT and drop-in centers where FSWs congregate should be considered.

STI prevalence among MSM was at alarmingly high levels and likewise suggests that treatment strategies need to be more aggressive. For example, the prevalence of rectal gonorrhea and chlamydia, particularly in Hanoi, is very high, indicating that outreach strategies will need to be augmented to include referrals to a presumptive treatment intervention.

### *VCT among people living with HIV needs to be drastically improved*

Prevention coverage was found to be unacceptably low in most provinces. However, the most alarming finding was that an overwhelming majority of people living with HIV in these groups did not access VCT and therefore did not know that they were HIV-infected. While access to VCT is increasing, it appears to be most predominantly used by individuals who are not HIV-infected. For example, 90% of HIV+ MSM in Hanoi, 84% of HIV+ IDUs in Can Tho, and 75% to 85% of HIV+ FSWs in An Giang were unaware of their status.

People at high-risk of HIV infection often do not want to know their status because they believe that effective treatments are not available to them. Therefore, the most important strategy to increase VCT usage among people with HIV is to scale-up ARV treatment so that people see other individuals with HIV living healthy and productive lives and are eager to experience the same. Secondly, VCT promotion and outreach needs to focus on individuals with the highest HIV risks of multiple sex partners, commercial sex, and drug injection and provide them with convincing information of the benefits of knowing their HIV status and effective treatment.

### *The efficiency of focusing on high-risk groups*

Given the STI and behavioral dynamics of these most-at-risk population groups as summarized above, the HIV epidemic will continue to spread, and not just within these groups but to their sexual partners and ultimately to their children. There was substantial evidence in these data that FSWs, MSM, and IDUs - many of them HIV+ - all have high rates of unprotected sex with their regular and casual partners. In turn, these partners will have unprotected sex with others, thus leading to an on-going chain of infection to the general population.

However, in a concentrated epidemic such as that in Vietnam where a majority of HIV infection in the general population can be traced back to high-risk groups, it is imperative that interventions stay focused on those groups. If interventions can saturate these groups and lead to substantial behavioral change, evidence from neighboring Thailand and Cambodia shows that HIV infection will decline first in the high-risk groups and then consequently also in the general population.

### *IBBS remains an important tool for tracking HIV, STI, and behavioral trends*

This IBBS is the first set of community-based HIV, STI, and behavioral surveillance surveys undertaken simultaneously among FSWs, IDUs, and MSM samples in multiple provinces. Some of the observed HIV rates differed quite substantially from those from existing sentinel surveillance estimates, emphasizing the value of community-based sampling for calculating more accurate HIV estimates.

Conducted repeatedly over time, the IBBS will provide indicators of HIV, STI, and behavioral risk trends that can guide intervention development and provide policymakers with reliable information on intervention successes and areas of continued need and focus. As indicated this year with the major finding of high rates of HIV among young injectors, the IBBS can serve as an early warning system for new emerging epidemics.

APPENDICES

# Appendix I: Descriptive Analysis of IDUs Behavioral and Biological data

**Table 9: Socio-demographic characteristic of IDUs.**

| Characters | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| **Age Group (n)** | **296** | **297** | **266** | **274** | **296** | **298** | **300** |
| • < 20 | 3.9 | 3.4 | 6.4 | 29.0 | 28.2 | 13.1 | 25.7 |
| • 20- 25 | 18.8 | 11.7 | 24.4 | 22.3 | 20.0 | 29.4 | 27.3 |
| • 25- 30 | 28.7 | 28.2 | 33.1 | 7.8 | 13.9 | 24.2 | 23.3 |
| • >=30 | 48.6 | 56.7 | 36.1 | 40.9 | 37.6 | 33.3 | 23.7 |
| **Education level (n)** | **295** | **298** | **265** | **274** | **296** | **299** | **300** |
| • Illiteracy | 1.2 | 0.3 | 0.4 | 2.6 | 12.1 | 7.3 | 13.0 |
| • Primary school (1-5) | 13.9 | 12.8 | 4.2 | 14.5 | 40.0 | 29.4 | 38.3 |
| • Secondary school (6-9) | 51.3 | 51.0 | 44.5 | 49.1 | 29.0 | 47.5 | 38.3 |
| • High school (10-12) | 28.1 | 31.9 | 45.3 | 29.7 | 17.9 | 14.3 | 38.3 |
| • College/University | 5.3 | 4.0 | 5.7 | 3.9 | 0.7 | 1.5 | 10.3 |
| **Percent of IDUs who ever married (n)** | **296** | **299** | **266** | **274** | **296** | **299** | **300** |
| • Percent | 51.7 | 35.5 | 25.9 | 22.9 | 31.5 | 35.2 | 38.0 |
| • Occupation (n) | 296 | 301 | 266 | 274 | 296 | 299 | 299 |
| • Government employees | 1.7 | 0.0 | 7.5 | 0.0 | 0.6 | 2.1 | 0.7 |
| • Entertainment staff | 11.5 | 4.3 | 0.0 | 2.30 | 1.8 | 1.8 | 5.0 |
| • Salesman | 1.2 | 2.0 | 1.9 | 1.0 | 0.0 | 2.3 | 6.0 |
| • Business Owner | 2.9 | 0.7 | 1.9 | 1.0 | 2.6 | 3.3 | 6.3 |
| • Student | 0.5 | 0.0 | 0.8 | 2.0 | 0.0 | 0.0 | 0.0 |
| • Self- employed | 53.6 | 61.5 | 43.2 | 51.0 | 38.2 | 39.2 | 70.6 |
| • Illegal activities | 2.4 | 5.7 | 0.4 | 1.50 | 20.5 | 3.7 | 4.4 |
| • Unemployed | 26.0 | 17.3 | 33.1 | 20.0 | 17.6 | 19.4 | 4.4 |
| • Other | 1.6 | 12.0 | 21.4 | 24.70 | 39.9 | 37.2 | 7.4 |
| **Mean of monthly income (VND)** | **291** | **297** | **266** | **260** | **295** | **295** | **300** |
| • < 500.000 | 25.7 | 25.9 | 11.7 | 24.8 | 7.7 | 15.9 | 10.4 |
| • 500.000 - less than 1.000.000 | 23.4 | 32.0 | 22.2 | 38.6 | 18.2 | 27.7 | 38.4 |
| • 1.000.000 - less than 1.500.000 | 15.2 | 22.9 | 25.6 | 17.9 | 27.2 | 29.8 | 23.9 |
| • 1.500.000 - less than 2.000.000 | 19.9 | 10.1 | 12.4 | 7.1 | 21.0 | 12.9 | 16.2 |
| • 2.000.000 or more | 15.5 | 9.1 | 28.2 | 11.6 | 25.6 | 13.7 | 11.1 |

**Table 10: History of Drug Use among IDUs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| **Age at the first drug use (n)** | **289** | **299** | **263** | **272** | **293** | **296** | **297** |
| • <20 | 38.7 | 35.8 | 44.5 | 44.2 | 54.6 | 40.9 | 50.2 |
| • 20-less than 25 | 26.9 | 27.8 | 32.7 | 18.3 | 16.5 | 33.9 | 24.6 |
| • 25 or more | 34.3 | 36.5 | 22.8 | 37.4 | 28.7 | 25.2 | 25.3 |
| **Duration of drug use (n)** | **289** | **300** | **263** | **272** | **293** | **295** | **297** |
| • < 1 year | 2.3 | 1.7 | 3.4 | 20.9 | 9.9 | 1.3 | 14.5 |
| • 1 year or more | 97.6 | 98.3 | 96.6 | 79.1 | 90.0 | 98.7 | 85.5 |
| **Duration of drug injection (n)** | **291** | **299** | **260** | **273** | **295** | **293** | **298** |
| • <1 years | 22.2 | 8.7 | 11.2 | 32.2 | 23.9 | 21.7 | 22.2 |
| • 1 year or more | 77.7 | 91.3 | 88.9 | 67.8 | 76.0 | 78.3 | 77.9 |
| **Frequency of drug injection in the past month (n)** | **296** | **301** | **266** | **274** | **296** | **299** | **299** |
| • 4 times or more per day | 11.8 | 13.0 | 4.9 | 0.2 | 3.3 | 1.2 | 0.7 |
| • 2-3 time per day | 74.6 | 82.4 | 50.8 | 8.2 | 82.5 | 49.4 | 41.3 |
| • Once per day | 11.5 | 4.0 | 32.3 | 14.2 | 12.6 | 27.9 | 40.6 |
| • Less than once per day | 1.8 | 0.7 | 12.0 | 77.4 | 1.5 | 21.5 | 17.5 |

**Table 11: Injecting behaviors among IDUs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| Ever shared needle/ syringes (n) | N/A | N/A | N/A | N/A | 296 | 299 | 298 |
| • Percent | - | - | - | - | 47.8 | 46.1 | 37.9 |
| Sharing needle/syringes in the past 6 months (n) | 296 | 300 | 266 | 274 | 296 | 299 | 300 |
| • Percent | 11.7 | 15.3 | 13.5 | 29.3 | 36.8 | 25.4 | 33.0 |
| Distributive sharing own needle/syringe in the past month (n) | 296 | 300 | 266 | 274 | 296 | 299 | 300 |
| • Percent | 8.3 | 8.3 | 6.8 | 25.7 | 37.0 | 13.4 | 28.7 |
| Receptive sharing needle/ syringe in the past month (n) | 296 | 300 | 266 | 274 | 296 | 299 | 300 |
| • Percent | 7.2 | 6.3 | 4.9 | 24.9 | 35.4 | 16.3 | 28.7 |
| Sharing needle/syringe in the last injection (n) | 295 | 300 | 266 | 274 | 296 | 299 | 300 |
| • Percent | 1.8 | 1.7 | 0.4 | 15.7 | 14.1 | 10.1 | 17.0 |
| Sharing drugs/injecting equipments in the past six months (n) | 296 | 300 | 266 | 274 | 296 | 299 | 300 |
| • Percent | 48.0 | 33.6 | 72.2 | 61.0 | 13.8 | 35.3 | 30.3 |
| Sharing drug/injecting equipments in the last injection (n) | 296 | 300 | 266 | 274 | 296 | 299 | 299 |
| • Percent | 23.8 | 4.3 | 31.6 | 44.5 | 47.8 | 29.5 | 34.0 |
| Using new (sterilized) syringes in the last injection (n) | 296 | 300 | 266 | 274 | 296 | 299 | 300 |
| • Percent | 90.4 | 93.0 | 98.9 | 87.5 | 92.6 | 91.2 | 85.6 |

**Table 12: Sexual history and number of sexual partners among IDUs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| **IDUs who ever had sex (n)** | **296** | **299** | **265** | **274** | **296** | **299** | **299** |
| • Percent | 96.0 | 93.0 | 82.3 | 76.8 | 89.0 | 95.4 | 91.6 |
| • Age at first sex (n) | 261 | 274 | 211 | 218 | 256 | 274 | 275 |
| • <20 | 54.7 | 49.3 | 40.3 | 47.4 | 58.7 | 62.4 | 68.4 |
| • 20- 25 | 38.1 | 40.5 | 46.5 | 39.3 | 31.3 | 31.6 | 28.4 |
| • 25- 30 | 0.71 | 8.4 | 10.4 | 9.3 | 5.5 | 4.2 | 2.6 |
| • 30 or more | 0.0 | 1.8 | 2.8 | 4.0 | 4.3 | 1.8 | 0.7 |
| **IDUs who reported sex in the past 12 months (n)** | **296** | **301** | **266** | **274** | **296** | **299** | **300** |
| • Percent | 69.0 | 39.9 | 50.0 | 72.4 | 70.0 | 75.0 | 82.0 |
| **Number of partners in the past 12 months (n)** | **293** | **299** | **259** | **267** | **295** | **294** | **297** |
| • 0 | 31.2 | 60.2 | 50.0 | 27.6 | 30.0 | 25.0 | 18.0 |
| • 1 | 39.8 | 25.8 | 30.9 | 30.8 | 30.4 | 46.8 | 26.6 |
| • 2 | 9.7 | 5.4 | 7.3 | 10.9 | 11.1 | 9.9 | 15.5 |
| • 3 | 8.2 | 2.7 | 3.9 | 9.0 | 10.9 | 8.7 | 12.8 |
| • >=4 | 10.8 | 6.0 | 7.0 | 21.7 | 17.1 | 9.5 | 26.9 |
| **IDUs who reported having sex with regular partners in the past 12 months (n)** | **296** | **301** | **266** | **274** | **296** | **299** | **300** |
| • Percent | 60.1 | 27.6 | 39.7 | 53.3 | 44.1 | 51.9 | 53.3 |
| **Number of regular partners in the past 12 months (n)** | **296** | **301** | **266** | **274** | **296** | **299** | **300** |
| • 0 | 40.3 | 72.4 | 61.3 | 46.7 | 54.9 | 60.6 | 46.7 |
| • 1 | 54.7 | 24.9 | 32.7 | 44.7 | 37.6 | 13.4 | 40.0 |
| • 2 | 3.9 | 2.3 | 4.1 | 6.2 | 3.1 | 15.9 | 8.7 |
| • 3 | 0.4 | 0.3 | 1.1 | 1.8 | 1.5 | 6.4 | 3.0 |
| • >=4 | 0.4 | 0.0 | 0.8 | 0.3 | 2.7 | 3.7 | 1.7 |
| **IDUs who reported having sex with sex workers in the past 12 months (n)** | **296** | **301** | **266** | **274** | **296** | **299** | **300** |
| Percent | 20.5 | 14.3 | 15.0 | 34.9 | 27.5 | 28.7 | 43.0 |
| Number of sex workers in the past 12 months(n) | 296 | 300 | 261 | 267 | 295 | 296 | 297 |
| • 0 | 79.5 | 86.0 | 85.1 | 65.1 | 72.5 | 71.3 | 57.0 |
| • 1 | 4.4 | 5.3 | 5.0 | 9.1 | 8.1 | 12.1 | 9.4 |
| • 2 | 8.2 | 1.7 | 3.1 | 7.2 | 4.9 | 7.5 | 10.4 |
| • 3 | 2.9 | 1.7 | 1.9 | 3.8 | 5.4 | 2.3 | 7.4 |
| • >=4 | 4.8 | 5.3 | 5.0 | 14.4 | 8.8 | 6.8 | 15.5 |

**Table 12: Sexual history and number of sexual partners among IDUs (cont).**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| **IDUs who reported having sex with casual partners in the past 12 months (n)** | **296** | **301** | **266** | **274** | **296** | **299** | **300** |
| • Percent | 18.9 | 3.7 | 4.2 | 11.8 | 22.4 | 10.6 | 20.3 |
| **Number of casual partners in the past 12 months (n)** | **293** | **301** | **263** | **274** | **296** | **297** | **296** |
| • 0 | 81.1 | 96.4 | 95.8 | 88.1 | 77.5 | 89.4 | 80.7 |
| • 1 | 8.7 | 2.7 | 2.7 | 4.3 | 8.9 | 7.8 | 11.8 |
| • >=2 | 10.1 | 1.0 | 1.5 | 7.6 | 13.6 | 2.8 | 7.4 |

**Table 13: Condom use with sexual partners among IDUs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| **Condom use during last sex with regular partners in the last 12 months (n)** | **168** | **83** | **103** | **153** | **135** | **154** | **161** |
| • Percent | 32.9 | 33.7 | 46.6 | 31.6 | 39.9 | 27.3 | 40.0 |
| Consistent condom use with regular partners in the past 12 months (n) | 168 | 83 | 130 | 153 | 135 | 154 | 161 |
| • Percent | 16.1 | 28.9 | 35.9 | 25.2 | 35.9 | 22.1 | 27.5 |
| Condom use during last sex with sex workers in the past 12 months (n) | 66 | 43 | 43 | 102 | 92 | 93 | 129 |
| • Percent | 58.7 | 83.7 | 90.7 | 78.7 | 46.6 | 60.7 | 65.9 |
| Consistent condom use with commercial sex workers in the past 12 months (n) | 66 | 43 | 43 | 102 | 92 | 93 | 129 |
| • Percent | 52.1 | 72.1 | 81.4 | 59.1 | 45.2 | 46.8 | 45.0 |
| Condom use during last sex with casual partners in the past 12 months (n) | 51 | 11 | 13 | 36 | 70 | 49 | 60 |
| • Percent | 59.4 | 54.6 | 84.6 | 0.0[11] | 38.4 | 0.0[12] | 41.7 |
| Consistent condom use with casual partners in the past 12 months (n) | 51 | 11 | 13 | 36 | 70 | 49 | 60 |
| • Percent | 14.3 | 54.6 | 61.5 | 0.0[13] | 37.1 | 0.0[14] | 25.0 |

[11] Unadjusted proportion is 0.4166 (41.67%)
[12] Unadjusted proportion is 0.3673 (36.73%)
[13] Unadjusted proportion is 0.3888 (38.89%)
[14] Unadjusted proportion is 0.2857 (28.57%)

**Table 14: Self reported STI symptoms among IDUs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| **IDUs who can mention correctly STI symptoms (n)** | **296** | **298** | **265** | **274** | **296** | **299** | **300** |
| • Abdominal pain | 5.7 | 10.1 | 0.8 | 2.8 | 3.7 | 1.3 | 4.7 |
| • Unusual genital discharge | 16.6 | 30.9 | 38.1 | 20.4 | 64.2 | 41.6 | 37.0 |
| • Pain with urination | 35.3 | 50.0 | 42.3 | 37.3 | 36.9 | 23.5 | 36.0 |
| • Genital uclers/sore | 35.6 | 44.6 | 35.5 | 32.8 | 37.4 | 37.5 | 14.7 |
| • Genital itching | 21.4 | 32.2 | 24.9 | 27.5 | 39.3 | 11.0 | 16.3 |
| **IDUs who reported unusual genital discharge in the past 12 months (n)** | **296** | **298** | **266** | **274** | **296** | **299** | **300** |
| • Percent | 2.9 | 1.0 | 1.9 | 5.5 | 17.8 | 6.1 | 11.0 |
| **IDUs reported genital pain/ulcers in the past 12 months (n)** | **296** | **298** | **266** | **274** | **296** | **299** | **300** |
| • Percent | 0.3 | 0.7 | 1.1 | 5.2 | 23.8 | 5.7 | 11.0 |

**Table 15: HIV knowledge and risk perception among IDUs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| **IDUs correctly identifying ways of preventing HIV infection and rejecting misconception of HIV transmission (n)** | **296** | **301** | **266** | **274** | **296** | **299** | **300** |
| • Percent | 9.2 | 29.9 | 38.4 | 13.4 | 9.2 | 6.2 | 7.0 |
| **IDUs who perceived their risk of HIV transmission** | **295** | **299** | **266** | **274** | **296** | **299** | **300** |
| • Percent | 57.6 | 70.2 | 59.4 | 36.6 | 52.0 | 29.2 | 22.7 |
| **IDUs who did not perceive their risk of HIV infection among:** | | | | | | | |
| 1. IDUs who reported sharing needle in the last 6 months (n) | 36 | 46 | 36 | 101 | 120 | 79 | 99 |
| • Percent | 0.0 | 17.4 | 16.7 | 16.6 | 18.5 | 27.6 | 43.4 |
| 2. IDUs who reported inconsistency of condom use with commercial sex workers (n) | 28 | 12 | 9 | 50 | 50 | 40 | 72 |
| • Percent | 0.0[15] | 0.0 | 0.0 | 24.0 | 8.9 | 42.5 | 44.4 |
| **IDUs ever had voluntarily HIV tested (n)** | **296** | **301** | **266** | **274** | **296** | **299** | **300** |
| • Percent | 24.5 | 29.9 | 23.7 | 4.9 | 14.3 | 9.3 | 9.0 |
| **IDUs who had HIV tested, known results and received both pre and post- test counseling (n)** | **296** | **301** | **266** | **274** | **296** | **299** | **300** |
| • Percent | 9.0 | 23.6 | 7.1 | 4.3 | 11.5 | 2.3 | 3.7 |

[15] Unadjusted proportion is 0.071 (7.1%)

**Table 16: Exposure to HIV/AIDS interventions among IDUs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| Mean number of time in 06 Centers (n) | 295 | 299 | 266 | 274 | 296 | 299 | 300 |
| • 0 | 75.9 | 74.3 | 86.1 | 91.2 | 77.3 | 67.8 | 79.0 |
| • 1 | 20.2 | 20.4 | 10.9 | 7.7 | 17.0 | 19.2 | 14.3 |
| • 2 | 2.3 | 3.3 | 1.9 | 1.0 | 3.7 | 9.4 | 5.3 |
| • 3 | 1.4 | 0.3 | 0.8 | 0.0 | 1.2 | 2.8 | 1.3 |
| • >=4 | 0.0 | 1.7 | 0.4 | 0.0 | 0.5 | 0.5 | 0.0 |
| IDUs who received syringes in the last 6 months (n) | 296 | 300 | 266 | 274 | 296 | 298 | 300 |
| • Percent | 4.1 | 46.0 | 13.5 | 3.2 | 35.2 | 11.5 | 23.7 |
| IDUs who obtained cheap/ free condoms in the last 6 months among sexually active IDUs (n) | 202 | 120 | 133 | 202 | 202 | 227 | 246 |
| • Percent | 11.5 | 26.7 | 17.3 | 10.4 | 29.1 | 19.0 | 21.1 |
| IDUs who received drug education in the past 6 months (n) | 296 | 299 | 266 | 274 | 296 | 299 | 300 |
| • Percent | 16.7 | 48.8 | 30.5 | 19.2 | 66.1 | 28.5 | 43.0 |
| IDUs who received safe sex education in the past 6 months (n) | 296 | 298 | 266 | 274 | 296 | 299 | 300 |
| • Percent | 17.5 | 37.9 | 18.8 | 19.0 | 58.6 | 28.7 | 33.7 |
| IDUs who received IEC materials in the past 6 months (n) | 296 | 300 | 266 | 274 | 296 | 299 | 300 |
| • Percent | 69.1 | 56.0 | 53.0 | 47.4 | 80.0 | 55.2 | 41.3 |

**Table 17: HIV and STI prevalence among IDUs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| HIV (n) | 296 | 301 | 266 | 260 | 296 | 299 | 300 |
| • Percent | 23.9 | 65.8 | 58.7 | 1.9 | 34.0 | 36.6 | 13.3 |
| Syphilis (n) | 296 | 301 | 266 | 260 | 296 | 299 | 300 |
| • Percent | 0.0 | 1.7 | 0.0 | 5.4 | 2.4 | 0.9 | 2.7 |

# Appendix II: Descriptive Analysis of SSWs Behavioral and Biological data

**Table 18: Socio-demographic characteristic of SSWs.**

| Characters | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| Age Group (n) | 275 | 279 | 160 | 174 | 298 | 161 | 238 |
| • < 20 | 6.18 | 3.94 | 8.75 | 6.90 | 11.07 | 14.91 | 9.24 |
| • 20 - less than 25 | 24.00 | 25.09 | 14.38 | 16.67 | 10.74 | 19.88 | 16.39 |
| • 25 - less than 30 | 29.09 | 25.09 | 31.88 | 10.34 | 12.08 | 12.42 | 23.53 |
| • 30 or more | 40.73 | 45.88 | 45.00 | 66.09 | 66.11 | 52.80 | 50.84 |
| Age (Year) (n) | 275 | 279 | 160 | 174 | 298 | 161 | 238 |
| • Mean | 29.31 | 29.63 | 29.45 | 32.39 | 34.52 | 30.77 | 30.25 |
| • Median | 27.62 | 29.31 | 29.26 | 33.50 | 35.40 | 30.93 | 30.11 |
| Education level (n) | 275 | 279 | 157 | 175 | 298 | 162 | 238 |
| • Illiteracy | 0.73 | 1.08 | 1.27 | 4.57 | 14.43 | 19.75 | 16.39 |
| • Primary school (1-5) | 24.73 | 9.68 | 8.28 | 27.43 | 43.62 | 49.38 | 57.56 |
| • Secondary school (6-9) | 48.00 | 57.35 | 47.13 | 52.00 | 34.23 | 28.40 | 23.11 |
| • High school (10-12) | 25.09 | 30.47 | 42.04 | 14.86 | 7.05 | 2.47 | 2.94 |
| • College/University | 1.45 | 1.43 | 1.27 | 1.14 | 0.67 | 0.00 | 0.00 |
| Marital Status (n) | 275 | 279 | 160 | 174 | 298 | 162 | 238 |
| • Never (Single) | 36.73 | 37.28 | 27.50 | 40.80 | 37.92 | 15.43 | 21.01 |
| • Currently married | 20.73 | 15.41 | 21.88 | 12.64 | 14.43 | 30.25 | 24.37 |
| • Divorced | 21.82 | 35.84 | 22.50 | 31.03 | 38.26 | 43.21 | 47.48 |
| • Separated | 13.45 | 8.24 | 1.88 | 7.47 | 2.35 | 3.70 | 4.20 |
| • Widowed | 7.27 | 3.23 | 16.25 | 8.05 | 7.05 | 7.41 | 2.94 |
| Duration of selling sex (sex work) in current cities/ provinces (n) | 275 | 279 | 151 | 169 | 297 | 162 | 237 |
| • Mean (Year) | 3.66 | 3.70 | 4.61 | 3.88 | 4.47 | 5.15 | 5.37 |
| • Median (Year) | 2.42 | 2.58 | 3.50 | 2.58 | 3.00 | 4.00 | 4.00 |
| Ever sold sex in other provinces (n) | 275 | 279 | 160 | 173 | 298 | 162 | 238 |
| • Percent | 6.91 | 5.73 | 22.5 | 8.67 | 6.71 | 20.99 | 20.59 |
| Ever sold sex in other countries (n) | 275 | 279 | 159 | 173 | 298 | 162 | 238 |
| • Percent | 1.09 | 0.72 | 2.52 | 0.00 | 2.35 | 1.23 | 7.14 |

**Table 19: Number of sexual partners of SSWs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| Mean and median number of one-time clients in the past month (n) | 223 | 257 | 158 | 173 | 286 | 158 | 235 |
| • Mean | 15.26 | 21.17 | 6.86 | 9.01 | 8.82 | 16.39 | 16.17 |
| • Median | 10.00 | 10.00 | 2.00 | 5.00 | 5.00 | 10.00 | 13.00 |
| Mean and median number of one-time clients in the past week (n) | 241 | 275 | 160 | 174 | 292 | 159 | 238 |
| • Mean | 3.78 | 6.55 | 2.24 | 2.80 | 3.05 | 4.97 | 5.33 |
| • Median | 3.00 | 4.00 | 1.00 | 2.00 | 2.00 | 4.00 | 4.50 |
| Mean and median number of one-time clients in the last day of selling sex (n) | 274 | 278 | 159 | 175 | 296 | 162 | 238 |
| • Mean | 1.19 | 1.69 | 0.91 | 0.98 | 1.36 | 1.61 | 1.47 |
| • Median | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Mean and median number of regular clients in the past month (n) | 270 | 277 | 159 | 175 | 292 | 160 | 238 |
| • Mean | 4.94 | 4.45 | 3.39 | 4.19 | 4.89 | 7.17 | 10.04 |
| • Median | 3.00 | 4.00 | 2.00 | 2.00 | 3.00 | 5.00 | 8.00 |
| Mean and median number of regular clients in the past week (n) | 272 | 278 | 160 | 175 | 293 | 161 | 238 |
| • Mean | 1.85 | 2.31 | 1.79 | 1.30 | 2.01 | 2.89 | 3.53 |
| • Median | 1.00 | 2.00 | 1.00 | 1.00 | 2.00 | 2.00 | 3.00 |
| Mean and median number of regular clients in the last day (n) | 274 | 278 | 159 | 175 | 298 | 161 | 238 |
| • Mean | 0.78 | 0.96 | 1.18 | 0.73 | 1.13 | 1.30 | 1.24 |
| • Median | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Mean number of non-commercial sex partners in the past month (n) | 275 | 278 | 161 | 175 | 298 | 161 | 238 |
| • Mean | 0.47 | 0.44 | 0.47 | 0.65 | 0.47 | 0.57 | 0.85 |

**Table 20: Condom use among SSWs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| Condom use with one-time client during last sex | 227 | 247 | 96 | 131 | 244 | 153 | 218 |
| • Percent | 100.00 | 96.76 | 97.92 | 99.24 | 93.44 | 98.69 | 96.79 |
| Consistency of condom use with one-time client in the past month | 233 | 252 | 102 | 131 | 244 | 153 | 219 |
| • Percent | 71.67 | 75.40 | 35.29 | 81.68 | 68.85 | 92.16 | 84.93 |
| Condom use with regular client during last sex | 198 | 223 | 121 | 116 | 241 | 135 | 217 |
| • Percent | 93.43 | 91.93 | 89.26 | 94.83 | 85.89 | 96.30 | 92.17 |
| Consistent condom use with regular client in the past month | 230 | 249 | 141 | 123 | 242 | 135 | 218 |
| • Percent | 56.09 | 63.86 | 34.75 | 73.98 | 63.64 | 91.11 | 83.03 |
| Condom use with non-commercial sex partner during last sex | 122 | 117 | 64 | 73 | 116 | 86 | 154 |
| • Percent | 32.79 | 33.33 | 51.56 | 42.47 | 33.62 | 30.23 | 61.04 |
| Consistent condom use with non-commercial sex partner in the past month | 122 | 117 | 64 | 73 | 116 | 86 | 154 |
| • Percent | 18.03 | 17.09 | 29.69 | 26.03 | 24.14 | 20.93 | 50.65 |

**Table 21: Self-reported STI symptoms among SSWs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| SSWs who mentioned correctly STI symptoms (n) | 275 | 279 | 155 | 172 | 298 | 162 | 238 |
| • Abdominal pain | 19.64 | 41.94 | 29.68 | 29.07 | 2.01 | 28.49 | 22.69 |
| • Unusual genital discharge | 63.27 | 77.78 | 63.23 | 54.07 | 20.13 | 72.84 | 59.24 |
| • Pain with urination | 30.18 | 42.29 | 34.19 | 30.23 | 8.39 | 25.31 | 15.55 |
| • Genital pain | 24.36 | 35.13 | 40.65 | 30.81 | 7.72 | 20.99 | 18.49 |
| • Genital ulcers/sore | 19.27 | 36.20 | 41.94 | 32.56 | 11.74 | 24.07 | 4.20 |
| • Genital itching | 66.18 | 70.61 | 54.19 | 50.58 | 15.10 | 61.73 | 24.37 |
| • Other | 1.45 | 0.72 | 2.58 | 6.98 | 34.90 | 4.94 | 1.68 |
| SSWs reported unusual genital discharge in the last 12 months (n) | 275 | 279 | 156 | 172 | 298 | 162 | 238 |
| • Percent | 44.00 | 44.80 | 33.97 | 26.16 | 34.90 | 33.33 | 43.70 |
| SSWs reported genital pain/ ulcers in the last 12 months (n) | 275 | 279 | 155 | 172 | 298 | 162 | 238 |
| • Percent | 20.00 | 18.64 | 21.29 | 16.28 | 17.11 | 17.28 | 24.37 |

**Table 22: Drug use and Injecting behaviors among SSWs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| SSWs who ever used drug (n) | 275 | 279 | 156 | 173 | 298 | 162 | 238 |
| • Percent | 24.36 | 8.24 | 5.77 | 0.58 | 9.40 | 18.52 | 3.78 |
| Duration of drug use (n) | 64 | 22 | 8 | 1 | 28 | 29 | 9 |
| • Mean (years) | 4.42 | 3.40 | 7.48 | 2.52 | 4.49 | 5.64 | 4.04 |
| • Median (Years) | 4.32 | 2.48 | 7.22 | 2.52 | 4.53 | 3.93 | 4.25 |
| SSWs who ever injected drug (n) | 275 | 279 | 156 | 173 | 298 | 162 | 238 |
| • Percent | 16.73 | 7.17 | 5.77 | 0.58 | 5.03 | 17.28 | 2.94 |
| Duration of drug injecting (n) | 44 | 19 | 9 | 1 | 15 | 28 | 7 |
| • Mean (Years) | 3.18 | 2.54 | 4.52 | 2.52 | 3.95 | 4.45 | 4.43 |
| • Median (Years) | 3.01 | 1.51 | 5.35 | 2.52 | 4.00 | 3.52 | 4.58 |
| Frequency of drug injection in the past month (n) | 40 | 20 | 9 | 0 | 7 | 24 | 7 |
| • 4 times or more per day | 20.00 | 5.00 | 11.11 | 0.00 | 0.00 | 4.17 | 0.00 |
| • 2-3 time per day | 40.00 | 70.00 | 66.67 | 0.00 | 42.86 | 45.83 | 28.57 |
| • Once per day | 10.00 | 20.00 | 22.22 | 0.00 | 0.00 | 33.33 | 57.14 |
| • Less than once per day | 25.00 | 5.00 | 0.00 | 0.00 | 57.14 | 16.67 | 14.29 |
| Injecting SSWs who reported using already used-syringes/ needles by another in the last month (n) | 40 | 20 | 9 | 0 | 8 | 24 | 7 |
| • Percent | 30.00 | 20.00 | 33.33 | 0.00 | 62.50 | 12.50 | 57.14 |
| Injecting SSWs who reported giving their used-syringes/ needles to another in the last month (n) | 40 | 20 | 9 | 0 | 8 | 24 | 7 |
| • Percent | 30.00 | 30.00 | 3.33 | 0.00 | 37.50 | 16.67 | 71.43 |
| Injecting SSWs who shared needles, drugs or other equipments in the last injection (n) | 42 | 20 | 9 | 1 | 6 | 27 | 6 |
| • Percent | 33.33 | 5.00 | | 0.00 | 16.67 | 18.52 | 66.67 |
| SSWs who reported that their one-time client injected drugs (n) | 233 | 252 | 102 | 131 | 244 | 153 | 219 |
| • Percent | 13.30 | 13.49 | 27.45 | 0.76 | 4.92 | 3.27 | 2.74 |
| SSWs who reported that their regular client injected drugs (n) | 230 | 249 | 142 | 123 | 242 | 135 | 218 |
| • Percent | 12.61 | 12.45 | 28.17 | 1.63 | 4.55 | 2.22 | 3.21 |
| SSWs who reported that their regular partners injected drugs (n) | 122 | 117 | 64 | 73 | 116 | 86 | 154 |
| • Percent | 22.13 | 6.84 | 18.75 | 2.74 | 4.31 | 8.14 | 4.55 |

**Table 23: HIV Knowledge, risk perception, and HIV testing among SSWs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| SSWs who correctly identified ways of preventing HIV infection and rejecting misconception of HIV transmission (n) | 275 | 279 | 161 | 175 | 298 | 162 | 238 |
| • Percent | 7.64 | 14.70 | 5.59 | 15.43 | 9.40 | 22.22 | 8.40 |
| SSWs who perceived their risk of HIV transmission (n) | 275 | 279 | 156 | 175 | 298 | 162 | 238 |
| • Percent | 53.82 | 62.72 | 72.44 | 39.43 | 27.18 | 42.59 | 5.04 |
| SSWs who ever had voluntarily HIV tested (n) | 275 | 279 | 161 | 175 | 298 | 162 | 238 |
| • Percent | 24.00 | 17.39 | 17.39 | 19.43 | 11.74 | 27.16 | 23.11 |
| SSWs who ever had voluntarily HIV tested, known their results and received post-test counseling (n) | 275 | 279 | 161 | 175 | 298 | 162 | 238 |
| • Percent | 2.18 | 10.39 | 6.83 | 15.43 | 1.68 | 13.58 | 7.14 |

**Table 24: Exposure to HIV Interventions among SSWs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| SSWs who have ever been in 05 Centers (n) | 275 | 279 | 156 | 175 | 298 | 162 | 238 |
| • Percent | 17.45 | 0.36 | 1.92 | 9.14 | 18.46 | 33.33 | 10.50 |
| SSWs who obtained cheap/ free condoms in the last 6 months (n) | 275 | 279 | 156 | 173 | 298 | 161 | 237 |
| • Percent | 44.73 | 63.80 | 36.54 | 60.69 | 70.81 | 81.99 | 74.37 |
| SSWs who received safe sex education in the last 6 months (n) | 275 | 279 | 156 | 173 | 298 | 161 | 238 |
| • Percent | 33.82 | 67.74 | 46.79 | 57.80 | 66.44 | 81.37 | 71.85 |
| SSWs who used drugs received drug education in the last 6 months (n) | 67 | 23 | 9 | 1 | 28 | 30 | 9 |
| • Percent | 44.78 | 52.17 | 66.67 | 0.00 | 57.14 | 66.67 | 11.11 |
| SSWs who received drug education in the last 6 months (n) | 275 | 279 | 156 | 174 | 298 | 161 | 238 |
| • Percent | 19.64 | 37.63 | 19.87 | 14.94 | 33.22 | 25.47 | 44.54 |
| SSWs who received IEC materials in the last 6 months (n) | 275 | 279 | 156 | 174 | 298 | 161 | 238 |
| • Percent | 48.36 | 70.97 | 38.46 | 70.69 | 74.50 | 83.23 | 72.27 |
| Injecting SSWs who received syringes in the last 6 months | 46 | 20 | 9 | 1 | 15 | 28 | 7 |
| • Percent | 28.26 | 55.00 | 22.22 | 0.00 | 26.67 | 35.71 | 0.00 |

**Table 25: HIV and STI prevalence in SSWs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| HIV (n) | 275 | 279 | 161 | 175 | 298 | 162 | 238 |
| • Percent | 22.55 | 7.17 | 12.42 | 0.57 | 11.07 | 29.01 | 5.04 |
| Syphilis (n) | 275 | 279 | 161 | 175 | 298 | 160 | 238 |
| • Percent | 1.09 | 3.23 | 0.62 | 3.43 | 9.06 | 5.63 | 5.46 |
| Gonorrhea * (n) | 275 | N/A | N/A | N/A | 298 | N/A | N/A |
| • Percent | 1.8 | N/A | N/A | N/A | 0.3 | N/A | N/A |
| Chlamydia * (n) | 275 | N/A | N/A | N/A | 298 | N/A | N/A |
| • Percent | 17.5 | N/A | N/A | N/A | 6.4 | N/A | N/A |

* Only for Hanoi and HCMC

# Appendix III: Descriptive Analysis of KSWs Behavioral and Biological data

**Table 26: Socio-demographic characteristic of KSWs.**

| Characters | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| **Age Group (n)** | **224** | **274** | **185** | **309** | **301** | **300** | **361** |
| • < 20 | 10.71 | 7.66 | 9.19 | 8.74 | 19.93 | 16.33 | 13.57 |
| • 20-less than 25 | 33.48 | 30.29 | 21.08 | 27.18 | 24.25 | 33.00 | 26.04 |
| • 25-less than 30 | 32.14 | 18.61 | 22.16 | 17.15 | 20.93 | 25.00 | 24.38 |
| • >=30 | 23.66 | 43.43 | 47.57 | 46.93 | 34.88 | 25.67 | 36.01 |
| **Age (Year) (n)** | **224** | **272** | **185** | **309** | **301** | **300** | **361** |
| • Mean | 26.40 | 29.36 | 30.14 | 29.78 | 27.42 | 26.37 | 28.1 |
| • Median | 25.77 | 27.30 | 29.24 | 29.31 | 25.97 | 25.16 | 26.77 |
| **Education level (n)** | **224** | **274** | **185** | **313** | **302** | **300** | **361** |
| • Illiteracy | 0.89 | 0.73 | 0.00 | 2.56 | 9.93 | 6.67 | 16.34 |
| • Primary school (1-5) | 17.86 | 10.22 | 3.78 | 28.43 | 36.75 | 42.00 | 48.48 |
| • Secondary school (6-9) | 53.13 | 56.20 | 56.22 | 52.72 | 40.73 | 41.33 | 27.70 |
| • High school (10-12) | 25.89 | 30.66 | 37.84 | 14.70 | 12.58 | 10.0 | 7.48 |
| • College/University | 2.23 | 2.19 | 2.16 | 1.60 | 0.00 | 0.00 | 0.00 |
| **Marital Status (n)** | **224** | **274** | **185** | **313** | **302** | **300** | **361** |
| • Never (Single) | 48.21 | 36.50 | 31.35 | 43.77 | 50.33 | 41.33 | 32.96 |
| • Currently married | 20.98 | 21.17 | 34.59 | 14.06 | 11.59 | 14.33 | 16.07 |
| • Divorced | 18.75 | 27.37 | 16.22 | 29.07 | 29.14 | 38.33 | 43.49 |
| • Separated | 8.93 | 12.04 | 8.11 | 5.43 | 3.97 | 3.00 | 5.26 |
| • Widowed | 3.18 | 2.92 | 9.73 | 7.67 | 4.97 | 3.00 | 2.22 |
| **Duration of selling sex (sex work) in current cities/ provinces (n)** | **224** | **274** | **178** | **312** | **302** | **300** | **361** |
| • Mean (Year) | 3.11 | 3.26 | 3.53 | 3.40 | 2.62 | 2.27 | 4.96 |
| • Median (Year) | 2.08 | 2.41 | 3 | 2.17 | 1.25 | 1.42 | 3.25 |
| **Ever selling sex in other provinces (n)** | **224** | **274** | **183** | **313** | **302** | **300** | **361** |
| • Percent | 8.04 | 8.39 | 18.03 | 7.35 | 4.30 | 7.33 | 24.65 |
| **Ever selling sex in other countries (n)** | **224** | **274** | **183** | **313** | **302** | **300** | **361** |
| • Percent | 0.00 | 0.73 | 2.73 | 0.00 | 0.99 | 0.00 | 7.2 |

**Table 27: Number of sexual partners: One -time clients.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| Mean and median number of one-time clients in the past month (n) | 182 | 259 | 174 | 312 | 286 | 299 | 361 |
| • Mean | 14.14 | 14.57 | 7.18 | 5.07 | 8.29 | 7.06 | 14.41 |
| • Median | 7.5 | 7 | 4 | 3 | 6 | 3 | 12 |
| Mean and median number of one-time clients in the past week | 194 | 269 | 183 | 313 | 301 | 298 | 361 |
| • Mean | 3.40 | 4.90 | 2.37 | 1.63 | 2.87 | 2.10 | 4.57 |
| • Median | 2 | 3 | 1 | 1 | 2 | 1 | 4 |
| Mean and median number of one-time clients in the last day (n) | 223 | 273 | 181 | 313 | 302 | 298 | 361 |
| • Mean | 1.26 | 1.26 | 0.87 | 0.85 | 1.26 | 0.81 | 1.57 |
| • Median | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Mean and median number of regular clients in the past month (n) | 219 | 274 | 181 | 313 | 297 | 298 | 361 |
| • Mean | 6.26 | 4.47 | 2.31 | 4.44 | 5.03 | 4.87 | 7.3 |
| • Median | 3 | 3 | 1 | 2 | 4 | 4 | 5 |
| Mean and median number of regular clients in the past week (n) | 223 | 273 | 182 | 313 | 302 | 298 | 361 |
| • Mean | 1.83 | 2.23 | 1.23 | 1.15 | 1.98 | 1.74 | 2.75 |
| • Median | 1 | 2 | 1 | 1 | 1 | 1 | 2 |
| Mean and median number of regular clients in the last day (n) | 224 | 274 | 183 | 313 | 302 | 298 | 361 |
| • Mean | 0.84 | 0.96 | 0.80 | 0.76 | 1.33 | 0.86 | 1.09 |
| • Median | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Mean number of non-commercial sex partners in the past month (n): | 224 | 313 | 302 | 300 | 361 | | |
| • Mean | 0.56 | 0.46 | 0.78 | 0.50 | 0.40 | 0.64 | 0.78 |
| • Median | 0.50 | 0 | 1 | 0 | 0 | 1 | 1 |

**Table 28: Condom use among KSWs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| Condom use with one-time client during last sex (n) | 193 | 244 | 128 | 221 | 256 | 240 | 339 |
| • Percent | 97.93 | 96.72 | 96.09 | 100.00 | 96.09 | 99.17 | 94.4 |
| Consistent condom use with one-time client in the past month (n) | 197 | 246 | 133 | 224 | 256 | 241 | 346 |
| • Percent | 81.22 | 77.24 | 43.61 | 90.63 | 81.25 | 94.61 | 76.3 |
| Condom use with regular client during last sex (n) | 164 | 207 | 98 | 235 | 252 | 252 | 309 |
| • Percent | 92.07 | 91.30 | 76.53 | 94.89 | 90.87 | 98.41 | 86.08 |
| Consistent condom use with regular client in the past month (n) | 189 | 228 | 133 | 242 | 255 | 256 | 318 |
| • Percent | 57.14 | 58.77 | 24.19 | 79.34 | 72.16 | 88.67 | 68.55 |
| Condom use with non-commercial sex partner during last sex (n) | 112 | 119 | 125 | 144 | 114 | 182 | 221 |
| • Percent | 36.61 | 34.45 | 43.20 | 36.81 | 28.95 | 22.53 | 54.75 |
| Consistent condom use with non-commercial sex partner in the past month (n) | 112 | 119 | 124 | 144 | 114 | 182 | 221 |
| • Percent | 16.96 | 16.81 | 24.19 | 19.44 | 21.05 | 11.54 | 45.25 |

**Table 29: Self-reported STI symptoms among KSW.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| KSWs who mentioned correctly STI symptoms (n) | 224 | 274 | 183 | 312 | 302 | 300 | 361 |
| • Abdominal pain | 20.98 | 48.91 | 27.87 | 25.96 | 2.65 | 23.00 | 34.07 |
| • Unusual genital discharge | 64.29 | 72.99 | 57.38 | 59.29 | 17.22 | 51.33 | 65.65 |
| • Pain with urination | 25.89 | 41.24 | 39.89 | 27.56 | 5.63 | 20.33 | 17.45 |
| • Genital pain | 9.38 | 29.20 | 35.52 | 28.21 | 5.63 | 29.00 | 16.07 |
| • Genital ulcers/sore | 8.48 | 28.47 | 38.80 | 36.86 | 11.59 | 23.00 | 5.26 |
| • Genital itching | 60.71 | 67.15 | 57.38 | 60.58 | 14.57 | 52.67 | 30.75 |
| • Other | 0.45 | 0.36 | 1.64 | 7.37 | 32.45 | 0.67 | 0.83 |
| KSWs reported unusual genital discharges in the last 12 months (n) | 224 | 274 | 182 | 312 | 302 | 300 | 361 |
| • Percent | 49.55 | 37.59 | 28.02 | 25.00 | 34.44 | 26.33 | 43.21 |
| KSWs reported genital pains, ulcers in the last 12 months (n) | 224 | 274 | 183 | 312 | 302 | 300 | 361 |
| • Percent | 4.02 | 17.15 | 14.21 | 15.06 | 15.56 | 8.00 | 25.21 |

**Table 30: Drug use and Injecting behaviors among KSWs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| KSWs who ever used drug (n) | 224 | 274 | 184 | 313 | 302 | 300 | 361 |
| • Percent | 10.27 | 5.84 | 2.17 | 0.64 | 15.23 | 1.33 | 13.85 |
| KSWs who ever injected drug (n) | 224 | 274 | 185 | 313 | 302 | 300 | 361 |
| • Percent | 4.02 | 4.74 | 2.16 | 0.64 | 5.30 | 1.00 | 8.86 |
| Duration of drug injection (n) | 9 | 11 | 3 | 2 | 16 | 3 | 32 |
| • Mean (Years) | 3.42 | 2.21 | 6.28 | 2.05 | 2.54 | 2.29 | 3.35 |
| • Median (Years) | 3.84 | 1.89 | 5.91 | 2.05 | 1.16 | 2.00 | 2.48 |
| Frequency of drug injection in the past month (n) | 5 | 13 | 3 | 2 | 10 | 3 | 29 |
| • 4 times or more per day | 0.00 | 23.08 | 0.00 | 0.00 | 20.00 | 0.00 | 0.00 |
| • 2-3 time per day | 40.00 | 69.23 | 100.0 | 0.00 | 40.00 | 33.33 | 20.69 |
| • Once per day | 20.00 | 7.69 | 0.00 | 0.00 | 10.00 | 33.33 | 31.03 |
| • Less than once per day | 40.00 | 0.00 | 0.00 | 100.00 | 30.00 | 33.33 | 48.28 |
| Injecting KSWs who reported using already used-syringes/ needles by another in the last month (n) | 5 | 13 | 4 | 1 | 10 | 3 | 29 |
| • Percent | 20.00 | 15.38 | 50.00 | 0 | 40 | 0.00 | 3.45 |
| Injecting KSWs who reported giving their used-syringes/ needles to another in the last month (n) | 5 | 13 | 4 | 1 | 10 | 3 | 29 |
| • Percent | 20.00 | 7.69 | 50.00 | 0 | 10 | 0.00 | 3.45 |
| Injecting KSWs who shared needles, drugs or other equipments with others in the last injection (n) | 9 | 13 | 4 | 1 | 12 | 3 | 27 |
| • Percent | 11.11 | 7.69 | 0.00 | 0.00 | 25.00 | 0.00 | 37.04 |
| KSWs who reported that their one-time clients injected drugs (n) | 197 | 246 | 134 | 224 | 256 | 241 | 346 |
| • Percent | 6.09 | 11.79 | 15.67 | 1.34 | 5.08 | 0.83 | 6.07 |
| KSWs who reported that their regular clients injected drugs (n) | 189 | 228 | 125 | 242 | 255 | 256 | 317 |
| • Percent | 5.29 | 9.65 | 21.60 | 0.83 | 6.67 | 0.0 | 6.62 |
| KSWs who reported that their regular partners injected drugs | 112 | 117 | 125 | 144 | 114 | 182 | 221 |
| • Percent | 10.71 | 4.27 | 11.20 | 4.86 | 3.51 | 1.65 | 9.5 |

**Table 31: HIV Knowledge, risk perception, and HIV testing among KSWs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| KSWs who correctly identified ways of preventing HIV infection and rejecting misconception of HIV transmission (n) | 224 | 274 | 185 | 313 | 302 | 300 | 361 |
| • Percent | 8.04 | 13.14 | 7.03 | 25.24 | 5.96 | 21.67 | 11.08 |
| KSWs who perceived their risk of HIV transmission (n) | 224 | 274 | 184 | 313 | 302 | 300 | 360 |
| • Percent | 38.84 | 63.87 | 83.70 | 29.71 | 19.54 | 61.00 | 6.67 |
| KSWs who ever had voluntarily HIV tested (n): | 224 | 274 | 185 | 313 | 302 | 300 | 361 |
| • Percent | 33.04 | 27.37 | 23.24 | 17.25 | 15.56 | 14.33 | 15.29 |
| KSWs who ever had voluntarily HIV tested, known their results and received post-test counseling (n): | 224 | 274 | 185 | 313 | 302 | 300 | 361 |
| • Percent | 3.57 | 9.85 | 7.57 | 19.49 | 2.65 | 11.33 | 3.32 |

**Table 32: Exposure to HIV Interventions among KSWs.**

| | Hanoi | Hai Phong | Quang Ninh | Da Nang | HCMC | Can Tho | An Giang |
|---|---|---|---|---|---|---|---|
| KSWs who have ever been in 05 Centers (n) | 224 | 274 | 184 | 313 | 302 | 300 | 361 |
| • Percent | 3.12 | 1.46 | 0.00 | 2.24 | 14.24 | 2.33 | 9.97 |
| KSWs who obtained cheap/ free condoms in the last 6 months (n) | 224 | 274 | 184 | 313 | 302 | 300 | 361 |
| • Percent | 60.27 | 60.95 | 30.98 | 58.47 | 63.25 | 72.00 | 65.4 |
| KSWs who received safe sex education in the last 6 months (n) | 224 | 274 | 184 | 313 | 302 | 300 | 361 |
| • Percent | 45.98 | 58.03 | 41.30 | 66.45 | 61.92 | 77.33 | 60.94 |
| KSWs who used drug received drug education in the last 6 months (n) | 23 | 16 | 4 | 2 | 46 | 4 | 50 |
| • Percent | 17.39 | 68.75 | 100.00 | 50.00 | 50.50 | 100.00 | 34.00 |
| KSWs who received drug education in the last 6 months (n) | 224 | 274 | 184 | 313 | 302 | 300 | 3.78 |
| • Percent | 15.18 | 33.94 | 19.57 | 11.18 | 25.83 | 8.33 | 0 |
| KSWs who received IEC materials in the last 6 months (n) | 224 | 274 | 184 | 313 | 302 | 300 | 361 |
| • Percent | 57.59 | 61.31 | 32.07 | 68.05 | 75.17 | 75.67 | 6.31 |
| Injecting KSWs who received syringes in the last 6 months (n) | 9 | 13 | 4 | 2 | 16 | 3 | 32 |
| • Percent | 0 | 46.15 | 75 | 0 | 18.75 | 0.00 | 28.13 |

**Table 33: HIV and STI prevalence among KSWs.**

| | Hà Nội | Hải Phòng | Quảng Ninh | Đà Nẵng | TP HCM | Cần Thơ | An Giang |
|---|---|---|---|---|---|---|---|
| HIV (n) | 224 | 274 | 185 | 313 | 302 | 300 | 361 |
| • Percent | 9.38 | 5.11 | 4.32 | 0.96 | 5.96 | 2.33 | 10.80 |
| Syphilis (n) | 224 | 274 | 185 | 313 | 302 | 299 | 361 |
| • Percent | 0.45 | 2.19 | 0.54 | 0.64 | 7.28 | 0.33 | 5.82 |
| Gonorrhea * (n) | 224 | N/A | N/A | N/A | 302 | N/A | N/A |
| • Percent | 1.8 | N/A | N/A | N/A | 2.7 | N/A | N/A |
| Chlamydia * (n) | 224 | N/A | N/A | N/A | 302 | N/A | N/A |
| • Percent | 8.5 | N/A | N/A | N/A | 14.2 | N/A | N/A |

* Only for Hanoi and HCMC

# Appendix IV: Descriptive Analysis of MSM Behavioral and Biological data

**Table 34: Socio demographic characteristics of MSM.**

| Characteristics | Hanoi | HCMC |
|---|---|---|
| **Age groups (n)** | **397** | **393** |
| • <20 | 17.3 | 27.0 |
| • 20- less than 25 | 60.1 | 31.6 |
| • 25- less than 30 | 9.5 | 13.2 |
| • 30 or more | 12.9 | 28.0 |
| **Education (n)** | **397** | **386** |
| • Illiteracy | 0.4 | 1.9 |
| • Primary school | 3.8 | 11.1 |
| • Secondary school | 15.7 | 34.0 |
| • High school | 41.1 | 33.1 |
| • Universities, colleges | 38.8 | 19.6 |
| **Occupation (n)** | **397** | **393** |
| • Farmer | 0.0 | 0.1 |
| • Government employee | 1.8 | 6.3 |
| • Entertainment employee | 19.5 | 7.0 |
| • Sales/office clerk | 17.7 | 3.2 |
| • Business person | 0.8 | 9.5 |
| • Student | 35.3 | 10.7 |
| • Self-employed | 33.5 | 20.0 |
| • Illegal works | 10.3 | 16.0 |
| • Currently unemployed | 3.9 | 12.6 |
| • Others | 8.3 | 35.0 |
| **Ever married with a female (n)** | **397** | **392** |
| • Percent | 8.1 | 5.0 |
| **Whom to live with (n)** | **397** | **393** |
| • Alone | 17.2 | 14.0 |
| • Male partners | 27.2 | 13.2 |
| • Friends | 27.5 | 10.4 |
| • Relatives | 24.9 | 59.0 |
| • Others | 2.9 | 3.2 |
| **Monthly income (n)** | **397** | **393** |
| • <500,0000 | 17.4 | 8.8 |
| • 500,000- 1,000,000 | 45.3 | 37.7 |
| • 1,000,000- 2,000,000 | 29.6 | 38.2 |
| • >2,000,000 | 7.5 | 15.2 |

**Table 35: Sexual Characteristics of MSM.**

| | Hanoi | HCMC |
|---|---|---|
| **Sexual orientation (n)** | **397** | **393** |
| • Prefers men as partners only | 35.6 | 43.2 |
| • Prefers men to women as partners | 39.9 | 22.9 |
| • Prefers women as much as men | 15.1 | 9.9 |
| • Prefers women to men as partners | 7.0 | 21.0 |
| • Prefer women as partners only | 2.2 | 2.7 |
| **Self- identification (n)** | **397** | **392** |
| • Bong lo | 0.3 | 10.8 |
| • Bong kin | 86.8 | 54.5 |
| • Straight man | 12.5 | 33.9 |
| • Other | 0.3 | 0.7 |
| **Age at the first sex (n)** | **393** | **391** |
| • <20 | 73.8 | 77.9 |
| • 20- less than 25 | 24.3 | 14.9 |
| • 25 or more | 1.7 | 7.1 |
| **Who MSM have first sex with (n)** | **397** | **393** |
| • Male partner (consensual) | 64.4 | 60.4 |
| • Male sex worker | 0.0 | 1.8 |
| • Girlfriend/wife | 29.5 | 29.1 |
| • Female sex worker | 4.9 | 6.3 |
| • Transgender | 1.0 | 2.2 |
| • Others | 0 | 0 |
| **Having male sexual partners in the past month (n)** | **397** | **393** |
| • Percent | 64.1 | 99.5 |
| **Being "giver" or "receiver" when having sex with male partners in the past 12 months (n)** | **397** | **393** |
| • Always a giver | 4.2 | 15.8 |
| • A giver most of the time | 14.2 | 14.9 |
| • About half a giver and half a receiver | 61.6 | 20.4 |
| • A receiver most of the time | 10.4 | 16.3 |
| • Always a receiver | 1.4 | 21.3 |
| • No anal sex | 7.8 | 8.5 |

**Table 36: Sexual contacts with male partners among MSM.**

| | Hanoi | HCMC |
|---|---|---|
| Number of male partners in the past month (n) | 391 | 393 |
| • 0 | 35.9 | 0.5 |
| • 1 | 20.2 | 29.1 |
| • 2 | 20.7 | 24.6 |
| • 3 | 9.1 | 13.2 |
| • >=4 | 13.9 | 32.4 |
| MSM who sold sex to male partners in the past month (n) | 397 | 393 |
| • Percent | 21.8 | 40.7 |
| Number of male partners MSM had anal sex when they sold sex in the past month (n) | 396 | 393 |
| • 0 | 82.4 | 65.0 |
| • 1 | 5.2 | 15.5 |
| • 2 | 6.4 | 10.3 |
| • 3 | 2.7 | 3.7 |
| • >=4 | 2.9 | 5.5 |
| MSM who had sex with male sex workers in the past month(n) | 397 | 393 |
| • Percent | 5.8 | 8.6 |
| Number of male sex workers who MSM had anal sex with in the past month (n) | 396 | 393 |
| • 0 | 94.6 | 95.8 |
| • 1 | 1.5 | 2.4 |
| • >=2 | 3.8 | 1.8 |
| MSM who had consensual sex with male partner in the past month (n) | 397 | 393 |
| • Percent | 50.5 | 80.7 |
| Number of consensual male partner who MSM had anal sex with in the past month (n) | 396 | 393 |
| • 0 | 58.8 | 38.3 |
| • 1 | 25.7 | 40.8 |
| • 2 | 11.5 | 13.2 |
| • 3 | 1.5 | 1.0 |
| • >=4 | 2.5 | 6.7 |
| MSM who had oral sex with male partner in the past month (n) | 397 | 393 |
| • Percent | 49.5 | 93.6 |
| MSM who had anal sex with foreigners including oversea Vietnamese (n) | 397 | 391 |
| • Percent | 7.4 | 15.2 |

**Table 37: Sexual contacts with female partners among MSM.**

| | Hanoi | HCMC |
|---|---|---|
| MSM who had sex with female partners in the past 12 months (n) | 397 | 393 |
| • Percent | 39.5 | 40.0 |
| MSM who had sex with female sex workers in the plast 12 months (n) | 397 | 392 |
| • Percent | 15.6 | 14.7 |
| MSM who sold sex to female partners in the last 12 months (n) | 396 | 392 |
| • Percent | 5.6 | 3.5 |
| MSM who had consensual sex with female partners in the last 12 months (n) | 396 | 393 |
| • Percent | 27.9 | 34.8 |

**Table 38: Condom use with male partners among MSM.**

| | Hanoi | HCMC |
|---|---|---|
| MSM who reported using condom in the last time they sold sex to male partner (n) | 94 | 143 |
| • Percent | 55.8 | 71.5 |
| MSM who reported using condom during last sex with male sex worker (n) | 33 | 33 |
| • Percent | 51.2 | 0.0[16] |
| MSM who reported using condom during last sex with consensual partner (n) | 179 | 260 |
| • Percent | 75.5 | 54.4 |
| MSM who reported using condom consistently when they sold sex to male partners in the last month (n) | 94 | 143 |
| • Percent | 4.3[17] | 50.6 |
| MSM who reported using condom consistently with male sex workers in the last month (n) | 33 | 32 |
| • Percent | 24.4 | 31.8 |
| MSM who reported using condom consistently with consensual male partners in the last 1 month (n) | 179 | 261 |
| • Percent | 29.0 | 37.2 |

[16] Unadjusted percent is 48.48 (16/33)
[17] Unadjusted percent is 32.98% (31/94)

**Table 39: Condom use with female partners among MSM.**

| | Hanoi | HCMC |
|---|---|---|
| MSM who reported using condom during last sex with female sex workers in the last 12 months (n) | 43 | 38 |
| • Percent | 66.7 | 48.4 |
| MSM who reported using condom in the last time they sold sex to female partners in the last 12 months (n) | 27 | 16 |
| • Percent | 100.0[18] | 52.8 |
| MSM who reported using condom during last sex with consensual female partners in the last 12 months (n) | 114 | 116 |
| • Percent | 65.3 | 22.5 |
| MSM who reported using condom consistently with female sex workers in the last 12 months (n) | 43 | 38 |
| • Percent | 40.8 | 47.1 |
| MSM who reported using condom consistently when they sold sex to female partner in the last 12 months (n) | 27 | 16 |
| • Percent | 19.5 | 40.4 |
| MSM who reported using condom consistently with consensual female partners (n) | 114 | 116 |
| • Percent | 23.8 | 16.7 |

**Table 40: Self-reported STI symptoms among MSM.**

| | Hanoi | HCMC |
|---|---|---|
| MSM who mentioned correctly STI symptoms (n) | 396 | 392 |
| • Abdominal pain | 18.0 | 6.2 |
| • Unusual genital discharge | 53.2 | 28.9 |
| • Pain with urination | 51.3 | 37.6 |
| • Genital ulcer/sore | 65.9 | 38.1 |
| • Unusual anal discharge | 29.3 | 3.2 |
| • Other | 3.1 | 41.7 |
| MSM who reported sores, ulcers or unusual discharge in the genital area (n) | 396 | 392 |
| • Percent | 14.3 | 6.3 |
| MSM who reported sores, ulcers or unusual discharge in the anal area (n) | 396 | 392 |
| • Percent | 8.3 | 3.8 |

[18] Unadjusted percent is 70.37% (19/27)

**Table 41: Alcohol and Drug use among MSM.**

| | Hanoi | HCMC |
|---|---|---|
| MSM ever had sex when they were drunk (n) | 397 | 393 |
| • Percent | 44.7 | 44.1 |
| MSM who reported using condom during last sex when they were drunk (n) | 192 | 201 |
| • Percent | 35.4 | 27.1 |
| MSM who ever used drugs (n) | 397 | 393 |
| • Percent | 22.8 | 21.0 |
| MSM who ever injected drug (n) | 397 | 393 |
| • Percent | 9.2 | 3.8 |
| MSM who ever used needles and syringes which was already used by others (n) | 38 | 17 |
| • Percent | 0.0[19] | 67.1 |
| MSM who reported that their sexual partners inject drugs (n) | 397 | 393 |
| • Percent | 18.0 | 10.3 |

**Table 42: HIV knowledge, risk perception, and HIV testing among MSM.**

| | Hanoi | HCMC |
|---|---|---|
| MSM who correctly identify ways of preventing HIV infection and rejecting misconception about HIV transmission (n) | 397 | 393 |
| • Percent | 45.7 | 18.2 |
| MSM perceived their risk of HIV infection (n) | 379 | 387 |
| • Percent | 53.8 | 30.1 |
| MSM who ever had HIV test (n) | 397 | 393 |
| • Percent | 20.1 | 24.0 |
| MSM who ever had HIV test voluntarily (n) | 397 | 393 |
| • Percent | 15.4 | 16.0 |
| MSM who had HIV tested, result informed and received counseling (n) | 397 | 393 |
| • Percent | 7.1 | 2.8 |

[19] Unadjusetd percent is 13.16%

**Table 43: Expose to HIV/AIDS interventions among MSM.**

| | Hanoi | HCMC |
|---|---|---|
| MSM who received condoms in the last 6 months (n) | 397 | 393 |
| • Percent | 40.5 | 37.0 |
| MSM who received lubricant in the last 6 months (n) | 397 | 393 |
| • Percent | 22.7 | 17.6 |
| MSM who received information on safe sex in the last 6 months (n) | 397 | 393 |
| • Percent | 52.8 | 60.1 |
| MSM who received information about MSM and safe injection in the last 6 months (n) | 397 | 393 |
| • Percent | 35.7 | 48.6 |

**Table 44: HIV, Syphilis, Gonorrhea and Chlamydia Prevalence among MSM.**

| | Hanoi | HCMC |
|---|---|---|
| HIV (n) | 397 | 393 |
| • Percent | 9.4 | 5.3 |
| Syphilis (n) | 397 | 393 |
| • Percent | 0.1 | 1.7 |
| Genital gonorrhea (n) | 397 | 393 |
| • Percent | 3.1 | 1.7 |
| Rectal gonorrhea (n) | 397 | 393 |
| • Percent | 11.5 | 6.7 |
| Genital chlamydia (n) | 397 | 393 |
| • Percent | 7.6 | 5.0 |
| Rectal chlamydia (n) | 397 | 393 |
| • Percent | 5.4 | 3.8 |

# REFERENCES


1. MOH, NIHE. HIV sentinel surveillance in 2005.
2. Iwan Ariawan and Ralph R. Frerichs. Csurvey User Manual. http://www.ph.ucla.edu/epi/csurvey.html. March 1996.
3. FHI, NIHE, MOH. What we can we do to control the HIV epidemic in Vietnam- Using behavioral surveillance results from high-risk groups. Hanoi, July 2004.
4. Vu Ngoc Bao, Do Van Binh, Donn Colby. Reaching Men who have Sex with Men in Ho Chi Minh City: sexual identities and HIV prevention opportunities. Working papers on HIV prevention, care and Treatment in Vietnam.
5. Nguyen Anh Tuan at all. HIV prevalence and risk factors of HIV transmissions among Men who have Sex with Men in Ho Chi Minh City, Vietnam. Hanoi, 2005.
6. NIHE, MOH, WHO. Survey on behaviors and HIV, Syphilis and Chlamydia prevalence among high-risk groups in Khanh Hoa province, Vietnam. Hanoi, 2005.
7. Vu Manh Loi, Nguyen Huu Minh, Tran Vu Hoang. "I want to quit but I can't": Drug addiction, networks, and HIV risks in Hai Phong and Cam Pha. FHI, March 2006.
8. Nguyen Nguyen Nhu Trang, Hang Thi Xuan Lan. Risky Business: Female Sex Work Lifestyle and Network in Ho Chi Minh City and implication for HIV prevention. November 2005.
9. Matthew J. Salganik, Douglas D.Heckathorn. Sampling and estimation in hidden populations using respondent-driven sampling. Sociological Methodology 34:193-239.
10. Douglas D. Heckarthorn, Salaam Semaan, Robert Broadhead et al. Extensions of Respondent-Driven Sampling: A new Approach to the study of Injection Drug Users Aged 18-25. AIDS and behavior, Vol 6, No.1, March 2003.
11. Douglas D. Heckarthorn. Respondent-Driven Sampling: A new approach to the study of hidden populations. Social Problems, Vol 44, No.2, May 1997.
12. Robert Magnani, Keith Sabin, Tobi Saidel at all. Review of sampling hard-to-reach and hidden populations for HIV surveillance. AIDS 2005, 19 (suppl 2): S67-S7.

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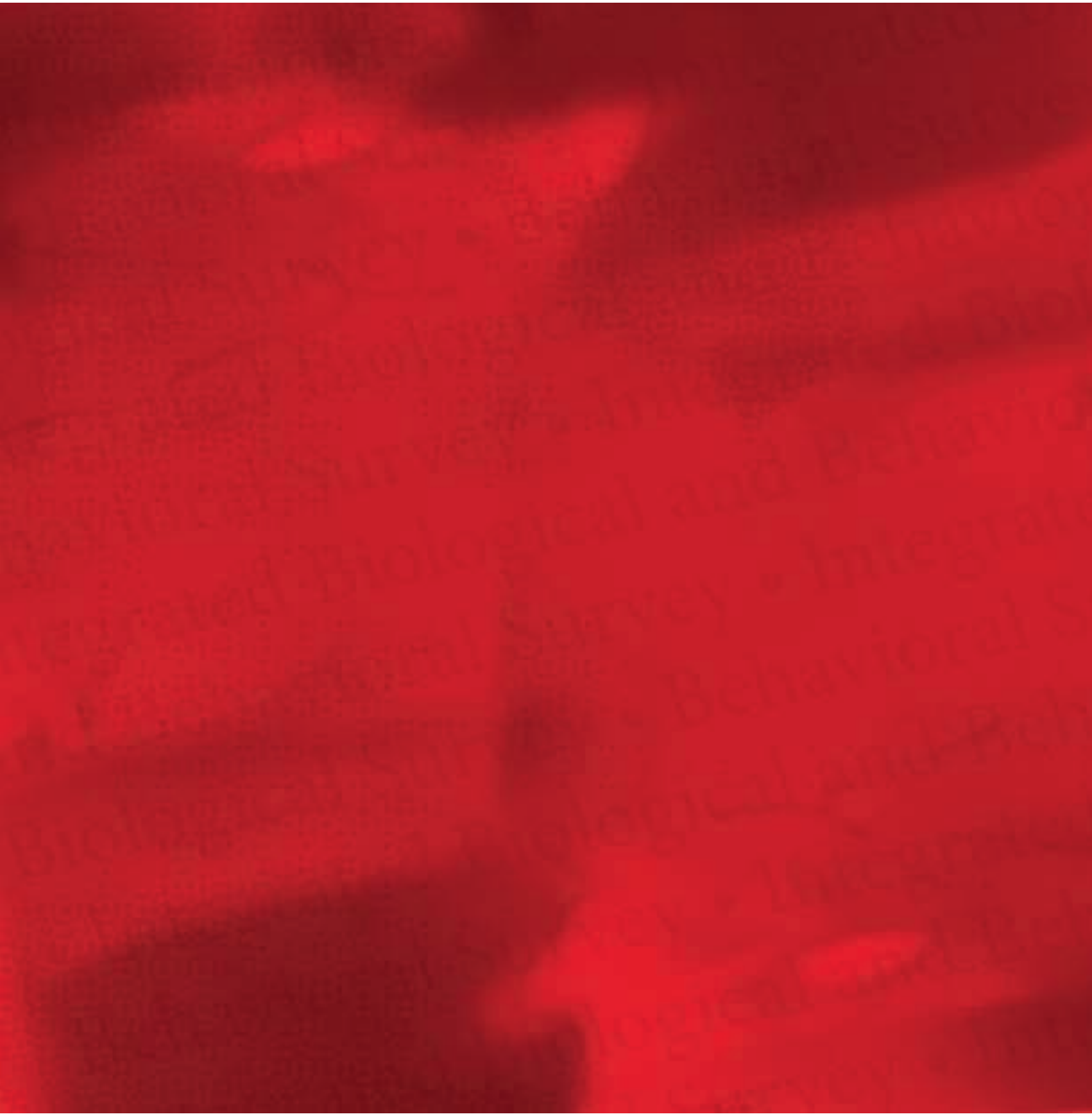

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