# Integrated HIV, STD and Behavior Surveillance (IHSBS) Survey in Banteay Meanchey Province, Cambodia

***Baseline Findings***

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# I- INTRODUCTION

AIDS is the leading cause of death for people aged 15-29 in the world (1) and although rates have declined slightly in recent years, Cambodia still has the highest HIV seroprevalence in Asia. Although HIV can be transmitted through blood products and injection drug use, heterosexual contact, primarily through the sex trade, remains the major route of HIV transmission in Cambodia.

HIV epidemics can be characterized as nascent, concentrated or generalized. A nascent epidemic occurs where HIV prevalence is <5% in all known high-risk sub-populations. When HIV prevalence is >5% in one or more high-risk sub-populations, but still <5% among pregnant women, the epidemic is characterized as concentrated. An epidemic is considered generalized when HIV prevalence reaches 5% or more among antenatal care women (1)**.** The epidemic in Cambodia appears to be moving slowly from a concentrated to a generalized epidemic. Although the HIV prevalence in all groups surveyed in Cambodia has declined recently, Cambodia is still one of the most severely affected countries in Asia. The most recently conducted HIV Seroprevalence Survey (HSS) found HIV seroprevalence of 28.8% among direct female sex workers, 14.8% among indirect female sex workers, 3.1% among police, 8.4% among TB patients and 2.8% among women attending antenatal care clinics. Approximately 157,500 people in Cambodia were estimated to be living with HIV in 2002 (2).

***Brief geo-demographic profile, health status and HIV/AIDS in Banteay Mean Chey province***

Banteay Meanchey province (BMC), located in northwestern Cambodia, bordering Battambang, Siem Reap, Pailin, and Thailand. BMC has a population of 577 772 (49% male) and is divided into eight administrative districts and three operational districts (ODs). The provincial town, Serei Sophorn, accounts for 17.1% of the total population. According to the 1998 Cambodia Census, migrant workers accounted for the 33.4% of the total population. The main leading reasons cited for migration were family mobility and search for better jobs (3).

The Provincial Health Department (PHD) has played an important role in improving the people's health status through its three operational districts, three referral hospitals, and 54 health centers which provide health care services to the public (4). Overall, BMC has 1,015 health staff based on the nation health statistics report 2001(5) among whom 56 are medical doctors, 78 are medical assistants, and 14 are pharmacists and pharmacist assistants. Similar to other provinces, the leading causes of mortality and morbidity in the province are malaria, tuberculosis, gastrointestinal infections, AIDS, dengue and acute respiratory infections (ARI).

Concerning the HIV epidemic, warning signs of serious HIV/AIDS and sexually transmitted disease (STD) epidemics have been documented in BMC for several years. BMC is among the Cambodia's provinces with the highest HIV prevalence. The latest HIV sentinel survey conducted in BMC (HSS 2002) showed HIV seroprevalence of 37.4% among brothel based sex

workers, 20% among indirect female sex workers, 4.1% among men in the police force, 15.6% among TB patients, and 4.4% among women attending ANC clinics.

In response to these reports of high seroprevalence, the PHD, in conjunction with the National Center for HIV/AIDS, Dermatology, and STDs (NCHADS), developed comprehensive strategies and interventions. The comprehensive intervention components include information, education, and communication (IEC)/behavior change communication (BCC); peer education for high risk groups; AIDS care; voluntary counseling and testing (VCT); and a 100% condom use program. In 2002, with support from the US Centers for Disease Control and Prevention (USCDC) Global AIDS Program, Cambodia (GAP-CAMBODIA), a demonstration project designed to integrate the major technical strategies of a comprehensive HIV prevention and care program, was implemented in BMC's three ODs. However, the establishment of this integrated effort requires the establishment of a reliable baseline against which to measure the success of the integration project. Because infection with STD has been linked to increased risk of HIV acquisition for biologic and behavioral reasons, information on STD prevalence over time is necessary to monitor STD transmission patterns can provide early clues to the pathways through which HIV transmission is likely to occur. The Integrated HIV, STD, and Behavioral Survey (IHSBS) was designed to respond to the need for surveillance of and associations among behavior, STDs, and HIV. Results from the 2003 IHSBS will serve as a baseline against which to measure the success of the demonstration project's key prevention components. Repeating the survey at various intervals while the demonstration project is ongoing will show whether high risk behavior, and prevalence of HIV and STD has changed across different risk groups which will help to evaluate the effectiveness of current HIV/STD prevention programs, identify appropriate new intervention points and provide information that can be used to appropriately target prevention messages.

## II- OBJECTIVES

The goal of the 2003 IHSBS was to establish a baseline against which to measure the impact of program interventions implemented in BMC over the next five years.

The objectives were to collect data on the prevalence of reported sexual risk behaviors HIV, and STI biomarkers among sentinel groups. These data would serve as a baseline from which to detect and monitor changes in the prevalence of risk behaviors STIs, and HIV in different sentinel groups. Moreover, the linkage of risk behavior and biomarker data would be used to provide information needed to guide programmatic decisions.

IHSBS measured the prevalence of STDs, HIV, and related high-risk behaviors among groups considered to be at high, medium, and low risk of acquiring HIV or STDs. Individuals representing six subgroups considered to be at low, medium, and high risk for HIV were surveyed about behavioral risk and tested for *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, syphilis, and HIV infection; associations between risk behaviors and prevalence of STIs and HIV among the groups were measured.

## III- METHODS

### *1- Study design and study population*

This cross-sectional IHSBS was designed to collect data on sexual risk behaviors and the prevalence of HIV infection and other STIs, including syphilis, gonorrhea and chlamydia. The survey will be repeated every 2-3 years to monitor changes in behavior and in STI and HIV prevalence. The baseline survey was conducted in January 2003 among high, medium and low-risk groups in each of the three operational districts of Banteay Meanchey Province: Monkul Borey, Thmor Puork, and Poipet. The Operational District (OD) of Monkul Borey covers Sisophon, which is the provincial capital and population center of the province. The Thmor Pouk OD covers the Thmor Puork administrative district, which is much more rural, but nevertheless still a high-risk area for drug use and, increasingly, for commercial sex workers. Poipet is a border town with significant cross-migration to and from Thailand each day. As many as 10,000 Cambodians travel to Thailand daily to work in the Norng Kloeur markets, or to labor in the agricultural fields. Conversely, large numbers of Thai and other foreigners cross the border to visit the casinos in Poipet, or the temples in Siem Reap.

In order to be consistent and comparable with data from the national surveillance system, the IHSBS was conducted on the same groups as the national surveillance survey including the traditional high-risk core groups (direct and indirect commercial sex workers), police, military, TB clinic patients and ANC clinic attendees. The survey also tested male and female casino workers in Poipet because most of the casino workers are mobile people from other provinces in search of better employment with better income. Though mobility is not clearly a direct risk factor for HIV/AIDS, the situations encountered and the behaviors adopted during the mobility interval might contribute to a person's vulnerability to sexual risk behavior, drug use, and disease, including HIV and other STIs (6). The survey involves no more than minimal risk to the subject.

**Table 1: Summary of target groups to be surveyed**

| Target groups | Characteristics |
|---|---|
| Direct female sex workers (brothel-based sex workers)) | Core group including in the national HSS, BSS, SSS |
| Indirect female sex worker (beer girls and karaoke workers) | High risk groups including in the national HSS, BSS and SSS |
| ANC | Proxy general population included in the HSS and SSS |
| TB patients (male and female) | Used to be included in the HSS, common opportunistic infection among AIDS patient<br>TB-HIV implementation will be piloted |
| Police | High risk group including in the HSS, BSS and SSS |
| Military | High risk group, including in the BSS and SSS (used to be included in the HSS) |
| Casino workers (male and female) | Vulnerability to HIV/STI and risk behavior due to their mobility status<br>Baseline for intervention planning |

### *2- Team recruitment and training of personnel*

The national team from NCHADS consisted of a study coordinator, a supervisor and 4 interviewers; also a lab supervisor from the National STD Clinic was involved with the national team. They all have had experienced in conducting HSS, BSS and other surveys for many years. Provincial team, which consisted of interviewers and lab technicians, was recruited from different units of the Provincial Health Department in advance and trained by the National team and USCDC.

Overall, the survey team was divided in to team 1 and team 2: each team consisting of the following:

- Team 1: six female interviewers, two lab technicians and one supervisor.
- Team 2: six male interviewers, two lab technicians and one supervisor.
- Interviewers were responsible for registering participants and administering questionnaires.
- Laboratory technicians were responsible for finger sticks of blood, urine collection, appropriate handling of specimens on-site, and ensuring correct transport of specimens to the assigned destination.
- Supervisors supervised the collection of biologic specimens and the interview process and help checking the questionnaires in the field.
- A study coordinator was responsible for overall coordination, management and all technical aspects with regards to the whole survey.

As planned before starting the fieldwork, listing exercise was conducted (mapping and developing the sampling frames) and a two-day interviewer's training was held from December 17-18, 2002, at the Provincial Training Center of the PHD of Banteay Meanchey province. In total, there were 20 participants including facilitators, national supervisors, national interviewers, provincial interviewers and lab-technicians (list of participants is attached at the end of the report). Training sessions were led and facilitated by Drs. Heng Sopheab and Mun Phalkun from Surveillance Unit of NCHADS. The main objective of the training was to make all team members understand the study same way and follow the same process. It covered purpose of the study, role of interviewers, interviewing technique, importance of the confidentiality, privacy and informed consent process, data collection process, questionnaires explanation and fieldwork test.

### *3- Sample size and sampling procedure*

To determine approximate sample sizes for each group, the expected percent change in prevalence of any STD expected between subsequent surveys was used. Because this survey included low, medium, and high-risk groups, the expected percent change in any STD varied by risk group. Two groups at high-risk, four at medium risk, and one at low risk were surveyed.

To select participants from DFSW, IDFSW, military and police groups, two-stage cluster sampling was used with random sampling of clusters in the first stage and a take-all approach per cluster in the second stage. This approach, also used in BSS, produces a self-weighted sample. For these target groups, lists of clusters and the numbers of individuals in each cluster were developed during the listing and mapping exercise conducted by NCHADS staff in collaboration with the Banteay Meanchey PAO. DFSW clusters were brothels where women lived and worked. IDFSW clusters comprised the beer companies that employed beer promotion girls and karaoke bars. Military and police clusters comprised battalions, units, or bureaus. Consecutive sampling was used to select ANC and TB patients.

Sample sizes for subsequent surveys will be adjusted based on the prevalence of indicators found in this baseline survey. The IHSBS survey will be repeated in Banteay Meanchey province every two to three years.

***4- Data collection***

The IHSBS data was collected by well trained and committed interviewers under the strict supervision of NCHADS supervisors and the study coordinator who were present at all times in the field to ensure adherence to the protocol in terms of informed consent procedures, confidentiality, and privacy of interview and bio-specimen collection. Each participant had a unique identification number (ID), which was recorded on the questionnaire, on the bio-specimen and on the STD result card. No names were taken. Administrative procedures and fieldwork arrangements were coordinated and prearranged by local coordinators with support from the PHD and Provincial AIDS Program. Data were collected as follows:

*Step1:* Obtain informed consent from prospective participants by clearly explaining the survey's purpose and procedures and explain their rights to refuse to participate.

*Step 2:* Use questionnaire to interview participants face to face and matched on gender

*Step 3:* Request urine sample and 2-3 drops of blood collected by finger stick according to their level of consent *(described below)*

*Step 4:* Provide gifts and a card for free of charge syndromic STD treatment, and a card to be used for getting STD test results at designated health centers. HIV test results were not provided to the participants; however, survey staff referred those who wanted to learn their HIV status t to the VCT site in Sisophon. They would be retested and provided the result according to the counseling and testing standards used at the VCT site.

Levels of informed consent in the survey are listed below. Individuals could choose any level of consent with which they felt comfortable.

Consent level #1: questionnaire only

Consent level #2: questionnaire and urine testing for *N. gonorrhoeae* and *C. trachomatis*;

Consent level #3: questionnaire, urine testing, and blood test for syphilis;

Consent level #4: questionnaire, urine testing, blood testing for syphilis and HIV.

Persons, who had given their consent to answer the questionnaire were administered a target-group specific questionnaire in as private a setting as possible. The questionnaire collected demographic characteristics, assessed the length of time in commercial sex work, reason for being sex workers, duration in the profession (military and police), number of sex partners in the past twelve months, condom usage, treatment seeking behavior, previous treatment for STDs, experience with STD clinics, ever testing for HIV, counseling experience, and migration patterns. Depending on their level of consent, the participant then proceeded to provide: 1) a urine sample: 2) a urine sample and a drop of blood for syphilis testing; 3) a urine sample and a drop of blood spot for syphilis testing and HIV; or 4) none of the above. The participants who consented to answer only the questionnaire and those that consented to both the questionnaire and any one or all of the biologic sampling received incentives (a pack of beauty soap, toothpaste, toothbrush, and condoms).

***5- Data entry and analysis***

Double data entry (to maximize accuracy) and data cleaning were performed by the Surveillance Unit staff using Epi Data software program (Denmark). Data analysis was conducted by the survey coordinator using STATA statistical software program. A copy of the cleaned dataset was sent to CDC, GAP Cambodia. Descriptive statistics including mean, median, range and frequency distribution were used to describe each variable characteristic and to determine prevalence. Chi square test and Fisher exact test were used to test associations of categorical variables. Unadjusted odds ratios were calculated using univariate logistic regression. Student's *t* test was used to assess the continuous variables.

***6- Testing for STDS and HIV***

HIV and syphilis were tested on site using Abbott Determine HIV1/2 and Determine Syphilis TP.A few drops of whole blood from the fingerstick were put on the test strips and the results were read in less than 15 minutes. According to the manufacturer, the sensitivity of Determine HIV1/2 is 100% and the specificity is 99.75%, whereas the sensitivity of the Determine syphilis is 92.3% and specificity is 100%. Urine specimens were stored in a cool box and transported daily (every morning) to the MOPH-CDC laboratory in Bangkok. Nucleic acid amplification tests (NAATs) were used to detect *Chlamydia trachomatis* and *Neisseria gonorrhoeae*. The Roche Amplicor (manufactured by Roche Diagnostics Corporation) uses polymerase chain reaction (PCR) to amplify specific sequences of *C. trachomatis* and *N.* gonorrhoeae DNA. Because the reported specificity of these tests has consistently been above 99%, confirmatory tests were not conducted.

**Table 2: Summary of Laboratory Tests**

| **Organism** | **Test** | **Biological Sample** |
|---|---|---|
| *Neisseria gonorrhoeae* | PCR (NAAT—Roche Amplicor) | Urine |
| *Chlamydia trachomatis* | PCR (NAAT—Roche Amplicor) | Urine |
| Syphilis | Rapid test (Determine Syphilis TP) | Whole blood |
| HIV | Rapid test (Determine HIV1/2) | Whole blood |

## IV- RESULTS AND DISCUSSION

Target sample size, sample size obtained, and the number of refusals for each target group are listed in Table 3 below.

**Table 3: Targeted sample size, collected sample size, and number of refusals**

| *High Risk Groups* | **Targeted sample size** | **Sample size obtained** | **Number of refusals** |
|---|---|---|---|
| Direct sex workers | 160 | 158 | 0 |
| Indirect sex workers | 160 | 165 | 2 |
| *Medium Risk Groups* | | | |
| Policemen | 250 | 252 | 0 |
| Military | 250 | 248 | 0 |
| TB clinic patients | 150 | 140 | 0 |
| Casino Workers | | | |
| Male | 135 | 134 | 2 |
| Female | 160 | 160 | 1 |
| *Low Risk Group* | | | |
| Antenatal clinic attendees | 300 | 300 | 0 |
| TOTAL SAMPLE SIZE | 1565 | ***1557*** | 5 |

The results section comprises nine parts: socio-demographic characteristics; HIV and other STI prevalence; behavior related to alcohol, smoking, and drug use; HIV/AIDS knowledge; exposure to people living with AIDS; HIV testing and counseling; sexual behavior, condom use and condom accessibility; STI health seeking behavior; mobility and the risk factors associated with HIV infection and other STIs. All analyses were stratified by sex and findings are presented as such. Of note is that when the number of TB patients were stratified by sex, numerators for many of the variables analyzed were too small for meaningful interpretation.

### *1- Socio-demographic characteristics*

**Male groups**

Socio-demographic characteristics of the male groups (military, police, casino workers and TB patients) are summarized in Table 4. Mean age varies from 25 years for male casino workers to almost 41 years for TB patients. Significantly, military had two years less education than police (5.7 vs. 7.9) and the casino worker group had the highest education with more than 9 years in school while TB patients had the lowest education with less than 4 years and almost 16% of them had no schooling at all. Marital status varied by group, with 90% of TB patients were married and currently living with their wives, whereas only 32% of the casino workers were married because they were the younger age group. Yes, because the casino workers was the younger age group. A substantial proportion of the Military group was married but not currently live together with wives (separate, 15%) indicating the nature of their work and mobility. Frequently, they had to live away from families or travel away from homes. Also, it was clearly indicated when asking about their living status, about one third of them did not live with families. Similarly, a large proportion of casino workers were not living with families (44.4%) because of their work. They live apart from their families in rented apartments or rooms with friends, or in workplace dormitories. This mobile younger group with higher income and not under parent's control, these factors created vulnerable environment that might put them expose to various risk behaviors including drug use. Military, police and TB patients had an average of 3 children, and casino workers had an average of about 1 child. Arranged marriage in Cambodia is still common. In all groups, more than half of the males surveyed reported that their marriages had been arranged. With regard to monthly income, casino workers earned on average USD 122 (median, USD 95); this income was three times higher than military and police groups. Income of the TB patients was less than USD 10 per month (median= 0) indicating that they were not the main financial support in the family because of their chronic illnesses. Slightly more than 10% of TB patients reported being the breadwinner of their family compared with more than 30% of men in the other groups.

**Table 4: Socio-demographic characteristics of male groups**

| | Military n=248 | Police n=252 | Casino n=134 | TB Patients n=70 |
|---|---|---|---|---|
| Mean age, years | 35.4 | 36.8 | 25.6 | 40.7 |
| Range | 20-53 | 19-53 | 19-46 | 18-68 |
| Educational attainment, years | 5.7 | 7.9 | 9.2 | 3.7 |
| No schooling, % | 7.3 | 0.4 | 0.7 | 15.9 |
| Marital status, % | | | | |
| Married | 64.5 | 72.6 | 29.9 | 90.0 |
| Divorced | 7.3 | 2.8 | 1.5 | 2.9 |
| Separated | 14.9 | 10.7 | 4.5 | 1.4 |
| Non-married | 13.3 | 13.9 | 64.2 | 5.7 |
| Number of children | 3 | 3 | 1.3 | 3.5 |
| Range | 0-9 | 0-10 | 0-6 | 0-10 |
| Arranged marriage, % | 51.2 | 67.3 | 69.4 | 61.3 |
| Former jobs, % | | | | |
| Farmer | 38.7 | 13.1 | 4.4 | 68.6 |
| Seller | 2.8 | 3.2 | 17.0 | 1.4 |
| Military | 10.9 | 18.3 | 6.7 | 4.3 |
| Police | 3.2 | 8.3 | 2.2 | 1.4 |
| Other | 8.5 | 17.9 | 30.4 | 20.0 |
| No former job | 29.4 | 26.6 | 33.3 | 2.9 |
| Mean money earned last month-USD-(Median) | 31.5 (24) | 37 (28) | 122 (95) | 7.2 (0) |
| Living status, % | | | | |
| With family (wife, relative, parents) | 69.8 | 87.2 | 55.6 | 94.3 |
| Not with family | 30.2 | 12.8 | 44.4 | 5.7 |
| Breadwinner in the family, % | 43.6 | 34.5 | 33.6 | 11.4 |

**Female groups**

DFSW, IDFSW and casino worker groups were fairly young (mean age was about 22 years), whereas ANC women and TB patients were 27 and 40 respectively. DFSW and TB patients had the least education with less than 2 years in school. More than half of these two groups had no schooling at all. The level of education in IDFSW and ANC was slightly twice that of the DFSW. Casino workers w had the highest educational level compared with other groups with 6.8 years in school. A large proportion of DFSW, IDFSW and casino worker groups were not married--56.6%, 40% and 58.1%, respectively. About one third of the casino workers reported being married and currently living with their spouse. Among ANC women, approximately 85% of them reported being married and currently living with their spouse, while 14.5% reported being married but living apart from their spouse among the spouses, more than one fourth had jobs as farmers (26.4%), followed by workers (20%), and others (20%). About 40% of DFSW and 50% of IDFSW reported being divorced from their spouses before coming to their current jobs. Low educational level, no specific skill, and poverty were reasons reported for entering the sex industry. In addition, some women reported to have been lured by their friends or neighbors to become sex workers. Among sex workers and casino workers who had been or were currently married, the median number of children was one; ANC women and TB patients had a median of 2 and 3 children, respectively. Similar to the male groups, arranged marriage was common among the female groups; more than 60% of all women reported that their parents chose husbands for them. Sixteen percent of DFSW reported that previously working in entertainment places as beer girls, karaoke workers, masseuses, and other positions. Almost one fourth of IDFSW reported previously working as direct sex workers suggesting movement back and forth between these two groups. This behavioral pattern was consistent with another study conducted elsewhere in late 2000 (7). About 6% of DFSW and 2% of IDFSW reported previous employment as factory workers. However, we do not know how many percentages of sex workers have become factory workers. Hypothetically, sex workers were unlikely to work as factory workers once they become involved in the sex industry. More than 20% of casino workers and sex workers mentioned that they previously worked as vendors. The monthly income was specified in the past month and the mean monthly income was highest among DFSW (USD 122.6, median 95) and casino workers (USD 98.9) and lowest among ANC women and TB patients. The mean monthly income of IDFSW (USD 72, median 50) was lower than DFSW. It is possible that most of the IDFSW did not report additional income earned from clients paying for sex. A majority of sex workers, both direct and indirect, were not originally from Banteay Meanchey, and less than a quarter had family living in the province, whereas more than 80% of the women in other groups were living with their husband, parents, or relatives in the province (Table 5).

**Table 5: Socio-demographic characteristics of the female groups**

| | DFSW n=158 | IDFSW n=165 | Casino n=160 | ANC n=300 | TB n=69 |
|---|---|---|---|---|---|
| Mean age- years | 22.2 | 22.5 | 22.8 | 26.9 | 40.4 |
| Range | 18-34 | 15-35 | 16-39 | 18-48 | 14-74 |
| Educational attainment- years | 1.7 | 4.3 | 6.8 | 4.6 | 1.8 |
| Range | 0-12 | 0-20 | 0-12 | 0-14 | 0-10 |
| No schooling, % | 53.8 | 18.2 | 1.9 | 13.6 | 59.4 |
| Marital status, % | | | | | |
| Married | 2.5 | 7.9 | 32.5 | 84.8 | 59.4 |
| Divorce | 40.3 | 49.7 | 8.1 | 0.7 | 20.3 |
| Separate | 0.6 | 2.4 | 1.3 | 14.5 | 10.1 |
| Non-married | 56.6 | 40.0 | 58.1 | 0.0 | 10.1 |
| Number of children (Median) | | | 0.9 (1) | 2.2 (2) | 3 (3) |
| Arranged marriage, % | 63.0 | 69.3 | 74.6 | 66.9 | 61.7 |
| Former jobs, % | | | | | |
| Farmer | 23.3 | 4.2 | 7.5 | 23.7 | 47.8 |
| Seller | 22.6 | 23.0 | 33.1 | 23.0 | 2.9 |
| Factory worker | 5.7 | 1.8 | 4.4 | 0.7 | 1.5 |
| Entertainment places | 16.4 | - | 0.0 | 0.3 | 0.0 |
| Sex worker | - | 24.9 | 0.0 | 0.0 | 0.0 |
| Other job | 6.3 | 34.6 | 11.9 | 11.8 | 8.7 |
| No job | 25.8 | 0.0 | 43.1 | 40.5 | 39.1 |
| Money earned last month-USD-(Median) | 122.6 (95) | 72 (50) | 98.9 (95) | 26.5 (12) | 13.2 (0) |
| Range | 0-1500 | 0-476 | 36-357 | 0-476 | 0-238 |
| Have family in Banteay Meanchey | 19.0 | 23.6 | - | - | - |
| Living with family (parents, husband, relative) | - | - | 81.3 | 95.9 | 82.6 |
| Breadwinner in the family | 46.0 | 50.3 | 27.5 | 4.7 | 5.8 |

### *2- Prevalence of HIV and other STIs*

Estimated prevalences of HIV infection, syphilis, chlamydia, and gonorrhea are summarized in Table 6. Among male groups, TB patients had the highest prevalence of HIV infection followed by military and police. Among military, police, and TB patients, syphilis prevalence was greater than 5%, while chlamydia and gonorrhea prevalence was 2% or less. Among female groups, HIV prevalence was highest among DFSW, followed by TB patients and IDFSW. HIV prevalence among female casino workers (3.8%) was higher than among male casino workers (2.2%) and was twice as high as ANC women. Chlamydia prevalence was similar for DFSW (15.3%) and IDFSW (16.2%). The prevalence of gonorrhea among DFSW (8.9) was almost five times that among IDFSW (1.9). Neither *N. gonorrhoeae* and *C. trachomatis* were detected among ANC women or TB patients. Fewer than 2% of specimens from female casino workers were found to be positive for *C. trachomatis* and none were positive for *N. gonorrhoeae*.

**Table 6: Prevalence of HIV and other STIs**

| | HIV (95% CI)* | Syphilis (TPHA) (95% CI) | Chlamydia (95% CI) | Gonorrhea (95% CI) |
|---|---|---|---|---|
| ***Male groups*** | | | | |
| Military | 6.9 (3.7-10.0) | 7.3 (4.0-10.5) | 2.4 (0.5-4.3) | 1.2 (0.2-2.6) |
| Police | 6.8 (3.7-9.9) | 6.4 (3.3-9.4) | 0.8 (0.3-1.9) | 0.8 (0.3-1.9) |
| Casino worker | 2.2 (0.3-4.8) | 0.0 | 1.5 (0.6-3.5) | 0.0 |
| TB patient | 12.7 (5.0-20.7) | 8.6 (2.0-15.1) | 0.0 | 0.0 |
| ***Female groups*** | | | | |
| DFSW | 30.2 (23.1-37.3) | 7.6 (3.4-11.6) | 15.3 (9.7-20.9) | 8.9 (4.5-13.4) |
| IDFSW | 11.7 (6.8-16.7) | 0.0 | 16.2 (10.5-21.8) | 1.9 (0.2-4.0) |
| Casino worker | 3.8 (0.8-6.7) | 0.0 | 1.3 (0.5-3.0) | 0.0 |
| ANC | 1.4 (0.04-2.7) | 2.0 (0.4-3.6) | 0.0 | 0.0 |
| TB patient | 15.7 (7.2-24.2) | 8.6 (2.0-15.1) | 0.0 | 0.0 |

** 95% Confidence Interval*

To note that HIV and syphilis were tested on site using Abbott Determine HIV 1/2 and Determine Syphilis TA. Confirmation was not conducted. Many reasons were behind this issue included the high sensitivity and specificity of the tests, the feasibility and logistic problems. For groups with high prevalence (> 10%): DFSWS, IDFSW and TB patients, there is no question about positive predictive value (PPV). However, for groups with low prevalence (<10%): Military, police, casino workers, and ANC women, a question about PPV has been an issue ie: in a population of 1000 with the HIV prevalence ranges from 1%-10%, the PPV of Determine HIV test would ranges from 77.1%- 97.4%.

### *3- Behavior related to alcohol, smoking and drug use*

#### Male groups

A majority of the men in the male groups, with the exception of TB patients, have used alcohol. Approximately 80% of them consume alcohol frequently or sometimes. None of men admitted alcohol use before having sex. Smoking was common among uniformed services. Prevalence of ever smoking among the Military was twice that among casino workers and TB patients. Except for TB patients, men in the other groups reported having smoked drugs. Prevalence of drug smoking among the military was about 5 times that among police and 2 times that among casino workers. Marijuana and Yama (amphetamine, methamphetamine) were the most commonly reported drugs smoked. Many Cambodia newspapers have reported many cases of drug smuggling especially amphetamine typed drug in this northwestern province and also Banteay Meanchey was one of the four provinces on the list of increased drug use (UNODCCP Report 2003). Only one military and one casino worker reported using opium or heroin. Peers' behavior related to drug use was also explored. Similar patterns of drug use were reported when men were asked about their friends' behavior. More military and casino workers reported their friends using some kind of illegal drug, especially marijuana and amphetamines, compared with police and TB patients. Smoking was the most common form of usage reported. Other forms of drug use such as sniffing, inhaling, and injection drug use (IDU) were rarely reported. Although IDU, a risk factor associated with HIV infection, was not common in Banteay Meanchey at the time of the baseline survey, this mode of HIV exposure will be important to monitor in the event that patterns of drug use evolve from smoking to injecting.

**Table 7: Alcohol consumption, smoking and drug use among male groups**

| | Mil n=248 | Police n=252 | Casino n=134 | TB n=70 |
|---|---|---|---|---|
| Alcohol consumption, % | | | | |
| Daily | 10.9 | 7.6 | 1.5 | 0.0 |
| Frequently | 25.0 | 28.0 | 15.5 | 7.1 |
| Sometime | 55.2 | 56.4 | 70.4 | 20.0 |
| Before sex | 0.0 | 0.0 | 0.0 | 0.0 |
| No alcohol | 8.9 | 8.0 | 12.6 | 72.9 |
| Smoking, % | 77.6 | 60.8 | 35.9 | 32.9 |
| Drug use, % | | | | |
| Injection | 0.0 | 0.0 | 0.0 | 0.0 |
| Drink | 0.0 | 0.0 | 1.5 | 0.0 |
| Smoke | 17.4 | 3.2 | 8.2 | 1.4 |
| Sniff | 0.0 | 0.0 | 1.5 | 0.0 |
| Type of drug used, % | | | | |
| Marijuana | 10.5 | 3.2 | 3.7 | 0.0 |
| Heroin | 0.0 | 0.0 | 0.7 | 0.0 |
| Yama (amphetamine) | 10.9 | 1.6 | 6.7 | 0.0 |
| Opium | 0.4 | 0.0 | 0.0 | 0.0 |
| Knowing friend who use drug, % | 35.9 | 13.9 | 28.9 | 5.7 |
| Drug use by friend, % | | | | |
| Injection | 0.4 | 0.8 | 0.0 | 0.0 |
| Drink | 0.0 | 0.4 | 3.0 | 0.0 |
| Smoke | 35.9 | 13.1 | 24.4 | 5.7 |
| Sniff | 0.0 | 0.0 | 2.2 | 0.0 |
| Type of drug used by friend, % | | | | |
| Marijuana | 22.2 | 6.0 | 4.4 | 4.3 |
| Yama | 21.8 | 9.1 | 23.0 | 1.4 |
| Heroin | 0.0 | 0.0 | 0.7 | 0.0 |
| Opium | 0.4 | 0.0 | 0.7 | 0.0 |
| Others | 0.0 | 0.4 | 3.7 | 0.0 |

**Female groups**

More than 70% of IDFSW reported consuming alcohol daily as opposed to less than 5% of DFSW and 3% of ANC women. IDFSW, including karaoke workers and beer promotion girls, are directly involved in promoting, selling, and serving alcohol, especially beer. Voluntarily or involuntarily, these workers drink with clients in order to sell their products. Only 2.4% of IDFSW reported not using alcohol at all, whereas about 50% of DFSW, casino workers, and ANC patients reported not consuming alcohol. More than 80% of TB patients reported not consuming alcohol. The prevalence of drug smoking was high among DFSW. One fourth of DFSW reported using Yama (amphetamine) followed by 6.7% IDFSW (Table 8). When asking about their friends' behavior related to drug use, more than 25% of direct and indirect sex workers reported knowing their friends smoked drugs. Drug smoking and Yama (amphetamine

and methamphetamine) use were most commonly reported by sex workers. IDU was not reported by women in any of the groups.

**Table 8: Alcohol consumption, smoking and drug use among female groups**

| | DFSW n=158 | IDFSW n=165 | Casino n=160 | ANC n=300 | TB n=69 |
|---|---|---|---|---|---|
| Alcohol consumption, % | | | | | |
| Daily | 4.4 | 72.7 | 0.6 | 3.0 | 0.0 |
| Frequently | 5.7 | 12.1 | 0.6 | 2.4 | 0.0 |
| Sometime | 45.3 | 12.7 | 44.4 | 39.2 | 17.4 |
| Before sex | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| No alcohol | 43.4 | 2.4 | 54.4 | 55.4 | 82.6 |
| Smoking, % | 37.1 | 5.5 | 0.6 | 6.1 | 1.5 |
| Drug use, % | | | | | |
| Injection | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Drink | 2.5 | 5.5 | 0.6 | 0.0 | 0.0 |
| Smoke | 25.0 | 5.5 | 0.0 | 0.3 | 0.0 |
| Sniff | 0.0 | 3.6 | 0.0 | 0.0 | 0.0 |
| Type of drug used, % | | | | | |
| Marijuana | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Yama (amphetamine) | 25.2 | 6.7 | 0.0 | 0.3 | 0.0 |
| Heroin | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Opium | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 |
| Knowing friend who use drug, % | 33.3 | 26.7 | 6.9 | 4.7 | 2.9 |
| Drug use by friend, % | | | | | |
| Injection | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 |
| Drink | 0.0 | 2.4 | 2.5 | 0.7 | 0.0 |
| Smoke | 32.1 | 21.2 | 4.3 | 4.0 | 0.0 |
| Sniff | 0.0 | 4.2 | 0.0 | 0.3 | 0.0 |
| Type of drug used by friend, % | | | | | |
| Marijuana | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Yama | 30.8 | 22.4 | 4.3 | 3.4 | 0.0 |
| Heroin | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 |
| Opium | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 |

### *4- HIV/AIDS knowledge, exposure to HIV/AIDS, HIV testing and counseling*

#### Male groups

A majority of male groups believed that AIDS could not be cured. The percent of men who believed that AIDS could not be cured was lowest for TB patients (71.4%) and highest for police and casino workers (94.8%) (Table 9). More than one half of men in each group, and more than three quarters of police and casino workers reported that a healthy looking person can transmit HIV. Military men were significantly far less likely than police to answer this question correctly (64.1% vs. 79.3%, p=0.001). At least 10% of men in each group reported having family members or relatives with AIDS. The proportion of men who had ever been tested for HIV was highest among police (57.9%), followed by casino workers 29.6%), military (18.2%) and TB patients (20%). However, it should be kept in mind that the police group has been included in HSS for the past few years. This might result in a higher proportion of police ever having been tested for HIV compared with other groups. Of those who reported ever having been tested, 77.4% of police and 55.6% of military reported the HSS system as the facility of their last HIV test. HSS participants, however, do not learn their HIV status when tested for HSS. Therefore, in the table below, HSS was also excluded from the facility of last HIV testing. It should be noted that although casino workers have not been recruited for participation in the national HSS, about 10% reported HSS as the facility of their last test. Respondents may have confused HSS with their regular health check-up conducted by the Department of Provincial Social Affairs, which includes a routine health exam, requiring collection of blood and urine specimens. The predominant setting for HIV testing was private laboratories or clinics while only a few men reported having an HIV test at a Voluntary Counseling and Testing Center (VCT). Though a higher proportion of casino workers reported getting counseling either formally at the VCT or informally by the private lab/clinics compared with other groups, the proportion was still very low indicating the need for counseling services and VCT sites, which serve as entry points to HIV/AIDS prevention services and care, to be expanded. Findings from the VCT Efficacy Study Group in three counties in Africa showed the decrease in reports of unprotected sex with primary partners and commercial sex partners among those received VCT services was greater the decrease among those who received only basic health information (8)**.**

**Table 9: HIV/AIDS knowledge, exposure to HIV/AIDS, HIV testing and counseling**

| | Military n=248 | Police n=252 | Casino n=134 | TB n=70 |
|---|---|---|---|---|
| AIDS is an incurable disease, % | 89.9 | 94.8 | 94.8 | 71.4 |
| Have family member /relative get AIDS, % | 13.8 | 17.9 | 14.1 | 10.0 |
| Can a healthy looking person transmit HIV, % | | | | |
| Yes | 64.1 | 79.3 | 75.6 | 55.7 |
| No | 16.2 | 13.5 | 12.5 | 15.7 |
| Don't know | 19.7 | 7.2 | 11.9 | 28.6 |
| Ever have HIV test, % | 18.2 | 57.9 | 29.6 | 20.0 |
| Facility for last HIV testing, % | | | | |
| Private lab/clinic | 24.4 | 15.1 | 60.0 | 35.7 |
| Public hospital/clinic | 11.1 | 5.5 | 7.5 | 42.7 |
| HSS | 55.6 | 77.4 | 12.5 | 21.4 |
| VCT | 2.2 | 0.7 | 2.5 | 0.0 |
| Other | 6.7 | 0.7 | 17.5 | 0.0 |
| *Facility for last HIV testing (exclude HSS)* | *n=20* | *n=33* | *n=35* | *n=11* |
| Private lab/clinic | 55.0 | 66.7 | 68.6 | 45.5 |
| Public hospital/clinic | 25.0 | 24.3 | 8.6 | 54.5 |
| VCT | 5.0 | 3.0 | 2.8 | 0 |
| Other | 15.0 | 6.0 | 20.0 | 0 |
| Counseling when HIV testing, % | 11.1 | 8.2 | 17.5 | 14.3 |

**Female groups**

Similar to the finding among male groups, a large proportion of women in each female group reported that AIDS was an incurable disease, ranging from 58.0% of female TB patients to 92.6% of antenatal clinic attendees. Although only 43.5% of female TB patients reported that a healthy-looking person could transmit HIV, more than 60% of women in the other female groups answered this question correctly. The percent of women in each group who reported having a family' member or relative with HIV/AIDS ranged from 7.5% among casino workers to 15.7% among antenatal care clinic attendees. More than one half of direct and indirect sex workers reported ever having been tested for HIV, compared with about 30% of casino workers, 15% of TB patients, and 10% of ANC clinic attendees, similar to the men in the uniformed services, a large proportion of women in the sex worker groups who had reported ever having had an HIV test, had their last test as an HSS participant and would not have received the results. Excluding female TB patients, the overall proportion of women who reported receiving counseling when being tested for HIV was greater than the proportion of men. Despite this fact, the proportion who received counseling was still low, and ranged from 11.1-41.4%. Although 90% of the TB patients who reported ever having been tested for HIV were tested in a public hospital or clinic, none reported having received counseling.

**Table 10: HIV/AIDS knowledge, exposure to HIV/AIDS, HIV testing and counseling**

| | FSW n=158 | IDFSW n=165 | Casino n=160 | ANC n=300 | TB n=69 |
|---|---|---|---|---|---|
| AIDS is an incurable disease, % | 91.1 | 91.0 | 85.0 | 92.6 | 58.0 |
| Have family member /relative get AIDS,% | 10.8 | 13.3 | 7.5 | 15.7 | 10.1 |
| Can a healthy looking person transmit HIV | | | | | |
| Yes | 77.9 | 75.8 | 63.5 | 65.2 | 43.5 |
| Don't know | 19.0 | 23.0 | 33.3 | 33.8 | 53.6 |
| Ever have HIV test, % | 55.4 | 53.9 | 28.8 | 9.8 | 14.5 |
| Facility for last HIV testing, % | | | | | |
| Private lab/clinic | 19.3 | 45.6 | 21.7 | 37.9 | 0.0 |
| Public hospital/clinic | 30.7 | 21.1 | 15.2 | 37.9 | 90.0 |
| HSS | 42.1 | 21.1 | 41.3 | 3.5 | 0.0 |
| VCT | 5.7 | 7.8 | 8.7 | 13.8 | 0.0 |
| Other | 2.3 | 4.4 | 13.0 | 6.9 | 10.0 |
| *Facility for last HIV testing (exclude HSS)* | *n=51* | *n=71* | *n=27* | *n=28* | *n=10* |
| Private lab/clinic | 33.3 | 57.7 | 37.1 | 39.3 | 0 |
| Public hospital/clinic | 53.0 | 26.8 | 25.9 | 39.3 | 90 |
| VCT | 9.8 | 9.9 | 14.8 | 14.3 | 0 |
| Other | 3.9 | 5.6 | 22.2 | 7.1 | 10 |
| Counseling when HIV testing, % | 26.7 | 41.1 | 11.1 | 41.4 | 0.0 |

### *5- Sexual behavior*

#### Male groups

Table 11 summarizes reported sexual behavior of men surveyed in each of the male groups. Mean age at first sexual intercourse was similar across the groups, ranging from 20 to 22 years old. Mean age at first married was 23 to 24, suggesting that men may have been sexually active for a few years before marriage. This is also consistent with the findings in the BSS and other surveys (9, 10)**.** The type of partners with whom they had first sex was strikingly different among male groups. A smaller proportion of casino workers reported having first sex with wives comparing to military and police groups when considering only even married men (22.9% for casino worker 53% for military, 43.3% for police) however a larger proportion reported having first sex with other partners including girlfriends (50%) and sex workers (27.1%). Conversely, a large proportion of TB patients reported having sex with wife as a first partner (71.2%). A moderate proportion of men in the military and police groups reported having sex with wife as a first partner. This pattern reflects the different practices in sexual initiation between the younger (casino worker), middle (military and police) and the older (TB patient) groups. Moreover, except for TB patients, the majority of non-married men reported sexual activity. When asked about what types of women they have ever had as sex partners, a small proportion of men in each group reported only wives as partners. These data suggest a mixed and complicated pattern of male risk sexual behaviors which may serve as a potential bridge between low and high risk populations.

Approximately 40% of male casino workers reported having a sweetheart in the past yearcompared with 15% of military and police. However when stratified by married vs. non married, there was similar pattern regarding the proportion sweetheart in the past year. Non

married men were more likely to report higher proportion of sweetheart than the married. Still the casino worker reported higher proportion of sweetheart (51.2% for casino worker, 38% for military and 28.6% for police). Among those who reported having sweethearts, almost 35% of military, about 40% of police, and almost 44% of casino workers reported having had sex with their sweethearts or girlfriends. The number of current sweethearts or girlfriends varied by group, ranging from one to eight; however, more than 90% of men in the military and casino worker groups reported having only one sweetheart currently. Nearly 45% of men in the police group reported having more than one current sweetheart.

More than half (56.3%) of men in the casino worker group, more than one third of men in the military and police groups, but only 5.7% of male TB patients reporting having had commercial sex in the past year. Again the proportion of men who reported having sex with commercial sex workers in the past month was highest among casino workers (23.0%), followed by police (11.9%), and military (8.1%); none of the TB patients reported having had commercial sex in the past month.

Reports of having sex with other men were uncommon among the men surveyed, and ranged from none among men in the TB patient group to 1.5% among casino workers. The proportion of men who reported knowing that their male friends had had sex with men was three to seven times the proportion who reported having sex with other men themselves. However, the (English translation of the) question reads, “Have you ever known that your friends have sex with men?” without specifying sex of the friend. Some respondents may have thought the question pertained to female friends.

Watching sex videos or pornography was common among men. Except for TB patients at least three-quarters of men in each group reported watching sex videos frequently or sometimes. Although sex videos and pornography are not allowed to be shown publicly in Cambodia, some coffee-video shops have pornography on their video schedule in order to attract more customers. So far, there has been no evidence to indicate an association between watching pornography and high risk sexual behavior. Anecdotally, some people believe that viewing sex videos or pornography stimulates sexual desire and leads to an increase in sexual activity especially with commercial sex partners. Furthermore, many reported rape cases have been connected with pornography.

The predominant kind of sexual intercourse practiced was vaginal intercourse (also called “normal sex”) only, ranging from 90.2% to 100.0%.

Although none of the TB patients reported ever having sex with non-brothel-based sex workers such as dancing girls or beer girls, more than one fifth of men in each of the other groups reported sex with non-brothel sex workers. Karaoke women were the predominant group of non-brothel-based sex workers with whom men reported having sex, followed by beer girls and dancing girls.

**Table 11: Sexual behavior of the male groups**

| | Military N=248 | Police N=252 | Casino N=134 | TB N=70 |
|---|---|---|---|---|
| Mean age at first sex- Yr | 21.2 | 22.0 | 20.1 | 22 |
| Range | 15-37 | 16-35 | 14-27 | 16-35 |
| Mean age at first married- Yr | 23.7 | 24.2 | 23.7 | 22.8 |
| Range | 16-39 | 18-35 | 19-31 | 16-35 |
| Partners whom they had first sex, % | | | | |
| Wife | 46.7 | 38.4 | 9.0 | 70.2 |
| Girlfriend/sweetheart | 27.5 | 32.7 | 48.8 | 13.4 |
| Sex worker | 23.4 | 22.0 | 39.0 | 10.5 |
| Casual partner | 2.5 | 6.9 | 2.4 | 6.0 |
| | *n=244* | *n=245* | *n=122* | *n=67* |
| *First sex partner as wife, % (*)* | *53* | *43.3* | *22.9* | *71.2* |
| Unmarried sexually active, % | 87.9 | 80.0 | 86.1 | - |
| Type of women as sex partners in life time, % | | | | |
| Girlfriend, wife, sex worker | 30.6 | 30.6 | 14.8 | - |
| Girlfriend and wife | 7.9 | 8.2 | 5.7 | - |
| Wife and sex worker | 30.2 | 32.2 | 15.6 | - |
| Girlfriend and sex worker | 6.6 | 4.1 | 27.8 | - |
| Only girlfriend | 0.0 | 0.0 | 9.8 | - |
| Only wife | 19.0 | 15.1 | 5.0 | - |
| Sex worker | 5.8 | 7.8 | 20.5 | - |
| Type of women as sex partners in past month, % | | | | |
| Girlfriend, wife, sex worker | 0.5 | 1.0 | 0.0 | - |
| Girlfriend and wife | 0.5 | 2.9 | 1.4 | - |
| Wife and sex worker | 1.6 | 8.3 | 9.7 | - |
| Girlfriend and sex worker | 0.0 | 0.0 | 0.0 | - |
| Only girlfriend | 1.1 | 1.5 | 11.1 | - |
| Only wife | 87.2 | 79.5 | 44.4 | - |
| Sex worker | 9.1 | 6.3 | 33.3 | - |
| Having sweetheart in the past year, % | 15.8 | 13.2 | 37.8 | 0.0 |
| Having sex with girlfriend/sweetheart, % | 34.6 | 39.5 | 43.9 | 0.0 |
| Number of girlfriends/sweetheart now, % | | | | |
| One sweetheart | 90.9 | 57.1 | 92.7 | 0.0 |
| More than one sweetheart | 9.1 | 42.9 | 7.3 | - |
| Range | 1-8 | 1-4 | 1-3 | - |
| Ever have commercial sex in past year, % | 32.3 | 33.7 | 56.3 | 5.7 |
| Ever have commercial sex in the past month, % | 8.1 | 11.9 | 23.0 | 0.0 |
| Number of partner past month (median) | 0.9 (1) | 1 (1) | 0.8 (1) | - |
| Range | 0-11 | 0-10 | 0-4 | - |
| One partner in past month, % | 94.6 | 85.4 | 73.6 | - |
| More than one partner in past month, % | 5.4 | 14.6 | 26.4 | - |
| Ever having sex with men, % | 0.8 | 1.2 | 1.5 | - |
| Know friend ever sex with men, % | 3.6 | 3.6 | 7.4 | - |
| Watching sex video, % | | | | |
| Frequently or sometime | 74.6 | 77.4 | 88.9 | 40.0 |
| Never | 24.6 | 22.6 | 11.1 | 60.0 |
| Vaginal sexual practice, % | 97.5 | 97.6 | 90.2 | 100 |
| Oral and vaginal | 0.8 | 2.5 | 5.9 | 0.0 |
| Having sex with non- brothel sex workers, % | 20.2 | 25.8 | 27.4 | 0.0 |
| Dancing girl | 10.2 | 13.9 | 5.4 | - |
| Masseuse | 0.0 | 6.2 | 10.8 | - |
| Beer girl | 14.3 | 3.1 | 8.1 | - |
| Karaoke woman | 59.2 | 52.3 | 64.9 | - |
| All above | 14.3 | 15.4 | 8.1 | - |

*(*) Excluding those never married*

**Female group**

The average age at first sex among sex workers was around 17 years old, whereas it was about 20 among women in the other groups. That there was no difference between the age at first sex and age at first marriage, might suggest that first sex for most women is at marriage as opposed to a large proportion of men who reported first sex with other partners and sexual activity before marriage. Apart from sex workers, more than 90% of women reported having first sex with their husbands. Slightly less than one third of indirect sex workers and 9% of brothel-based sex workers reported first sex either with a boyfriend, sweetheart, or client.

The group with the largest proportion of women who reported having sweethearts in the past year was IDFSW (63.6%), followed by the brothel based sex workers (52.2%), casino workers (22.5%), ANC women (5.7%). Among the IDFSW who reported having a boyfriend, nearly 9 out of 10 reported having sex with their boyfriend. In recent years, an upward trend in the proportion of IDFSW who report having sex with their boyfriend has been observed *(BSS 2001 Report)*. In the BSS, in 1997, less than 50% of IDFSW who had a sweetheart reported having sex with their sweetheart, but in the 2001, the proportion increased dramatically to 99.5% (9)**.** In contrast, only 12% of casino workers reported having sex with their sweethearts. Frequently sex workers have two concurrent or a series of sweethearts. The number of current boyfriends/sweethearts reported by sex workers ranged from one to five, with about 20% of sex workers reporting having more than one sweetheart. Among women who reported have a boyfriend or sweetheart in each group; the majority had only one current boyfriend or sweetheart—100% of casino workers, 88.1% of IDFSW, and 82.7% of DFWS

DFSW reported an average of 5.4 clients a day, ranging from 1 to 15. More than one half of IDFSW also reported having sex for money in the past year. This prevalence was about 20 percentage points higher than that observed in the BSS 2001. Only 2 of 160 casino workers reported having sex with clients.

The predominant kind of sexual intercourse practiced was vaginal intercourse. Less than 2% of women in each group reported practicing any other type of sexual activity. It should be noted that women in the ANC and TB patient groups were not asked questions about the types of sexual activity practiced.

**Table 12: Sexual behaviors of female groups**

| | FSW n=158 | IDFSW n=165 | Casino n=160 | ANC n=300 | TB n=69 |
|---|---|---|---|---|---|
| Mean age at first sex- Yr | 17 | 17.8 | 19.3 | 20.9 | 20.3 |
| Median | | | 19 | 20 | 19 |
| Range | 12-26 | 13-25 | 16-24 | 15-37 | 15-38 |
| Mean age at first married- Yr | 17 | 17.3 | 19.3 | 20.9 | 20.3 |
| Median | | | 19 | 20 | 19 |
| Range | 13-28 | 13-25 | 16-24 | 15-37 | 15-38 |
| Partners whom they had first sex, % | | | | | |
| Husband | 34.0 | 61.5 | 90.4 | 99.3 | 98.4 |
| Boyfriend/sweetheart | 32.1 | 16.7 | 9.6 | 0.7 | 1.6 |
| Client | 27.0 | 14.7 | 0.0 | 0.0 | 0.0 |
| Unmarried sexually active, % | 100 | 86.4 | 6.5 | - | - |
| Having boyfriends in the past year, % | 52.2 | 63.6 | 22.5 | 5.7 | 1.5 |
| Having sex with boyfriend, % | - | 88.6 | 12.0 | - | - |
| Number of boyfriends/sweetheart now, % | | | | | |
| One sweetheart | 82.7 | 88.1 | 100 | - | - |
| More than one | 17.3 | 11.9 | 0 | - | - |
| No regular clients, % | 37.1 | - | - | - | - |
| Number of regular clients | 3.1 | - | - | - | - |
| Range | 0-20 | - | - | - | - |
| Ever sex with clients in past year, % | - | 55.8 | 0.6 | - | - |
| Number of clients per day | 5.4 | | - | - | - |
| Range | 1-15 | | | | |
| Watching sex video, % | | | | | |
| Frequently or sometime | 49.1 | 32.7 | 10.0 | - | - |
| Never | 49.1 | 67.3 | 90.0 | | |
| Vaginal sexual practice, % | 98.1 | 97.4 | 98.6 | - | - |

### *6- Condom use and condom availability*

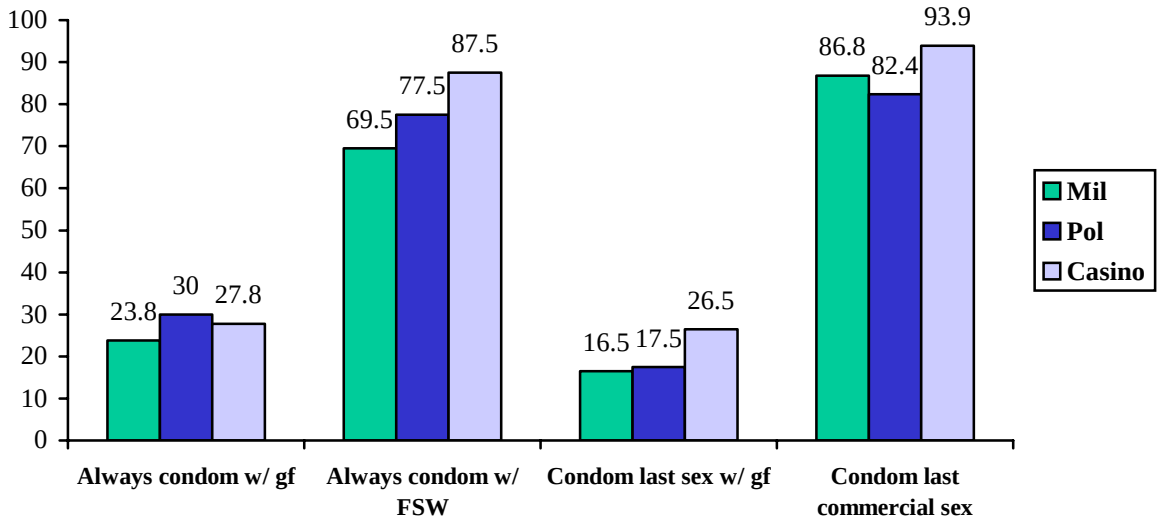
#### Male groups

Perhaps one of the important indicators for behavioral monitoring related to HIV/STI is condom use. Men in each group were asked about the consistency of condom use during commercial sex and with their sweethearts in the past three months, the past year, and at last sex. Figure 1 illustrates how consistent condom use varied by male group and sex partner (i.e, FSW or sweethearts and girlfriends). Consistent condom use was defined as “always” using a condom in every sexual encounter. The proportion of men in each group who used always used condoms with FSWs in the past year (69.5-87.5%) was much greater than the proportion who used condoms with girlfriends and sweethearts in the last three months (23.8-27.8%). Likewise, the proportion who used a condom during their last commercial sexual encounter (82.4-93.9%) was much greater than those who used a condom during last sex with their sweetheart or girlfriend (16.5-26.5%). These findings are consistent with other studies (9, 12) that have shown that

condom use during commercial sexual encounters is much more common than during sex with sweethearts. Figure 1 shows that consistent condom use with FSW was greatest among casino workers, followed by police and military. Although the prevalence of consistent condom was high across male groups, except among TB patients, the prevalence of consistent condom use with sweethearts or girlfriends was 30% or less. For each group, the prevalence of consistent condom use with FSW was about 3 times that as with sweethearts or girlfriends. This pattern has been documented not only in Cambodia (7, 9, 13) but in other countries as well (14-16).

Condom use during last sex might indicate recent sexual behavior. Except for the TB patient group, at least 80% of men in each male group reported using condoms during their last commercial encounter.

**Figure 1: Always condom use and last condom use by types of partner**




** Always condom with girlfriends (gf) specified in the past 3 months*

*** Always condom with sex workers specified in the past year*

The "Number One" brand of condom that has been marketed in Cambodia for many years by Population Services International (PSI) was the predominant type used (18.0-86.5%). Most men in each group (14.3-58.7%) reported obtaining condoms from brothels and pharmacies (2.8-52.6%). About 40% of sex workers both direct and indirect reported access to free of charge condom through distribution outlets providing probably by the outreach and peer education program or by NGOs.

Although most men in each group reported using condoms consistently with FSW, about 70% of them still did not use condoms consistently with sweethearts or girlfriends. When asked why they or anybody they knew would not want to use a condom, the most common reason reported was lack of pleasure or sensitivity while wearing condoms (28.6-58.3%) or being drunk (4.3-38.8%). The proportion of men in each group who felt that condoms were difficult to use ranged from 1.4% of TB patients to 14.2% of military (Table 13).

Preliminary data from a recently conducted qualitative study on sex work, safe sex, and health seeking behavior among Cambodian men shows that prettiness of women with whom they had sex, confidence in safety of one's sex partner, extreme emotional attachment, lack of control when drunk, decreased pleasure or sensitivity, and difficulty in maintaining erection when using condoms were commonly mentioned factors which deterred condom use (17)**.**

**Table 13: Type of condoms used and places condoms obtained in male groups**

| | Military n=248 | Police n=252 | Casino N=134 | TB n=70 |
|---|---|---|---|---|
| **Type of condoms used, %** | | | | |
| Number one | 86.5 | 84.3 | 78.2 | 18.0 |
| Honey moon | 2.3 | 3.2 | 0.8 | 0.0 |
| Romantic | 0.0 | 0.0 | 0.8 | 0.0 |
| Family | 0.6 | 2.7 | 2.5 | 1.5 |
| Hairy condom | 0.0 | 1.1 | 1.7 | 0.0 |
| Sandy condom | 3.9 | 4.7 | 1.7 | 0.0 |
| No brand and other | 6.7 | 3.3 | 2.5 | - |
| At least two of above | 0.0 | 0.5 | 11.8 | - |
| **Condoms obtained from, %** | | | | |
| Pharmacy | 26.7 | 31.8 | 52.6 | 2.8 |
| Brothel | 58.7 | 58.3 | 54.1 | 14.3 |
| Street vendor | 0.0 | 0.4 | 0.0 | 0.0 |
| Distributed free of charge | 44.9 | 42.1 | 12.6 | 7.1 |
| Buy from other sources | 2.4 | 7.5 | 3.7 | 0.0 |
| Don't know | 12.6 | 10.7 | 8.9 | 77.1 |
| **Reason for not using condom from what they know, %** | | | | |
| Lack of pleasure/sensitive | 58.3 | 53.2 | 52.6 | 28.6 |
| Feel difficult to use | 14.2 | 11.9 | 7.4 | 1.4 |
| Do not believe I can get AIDS | 5.3 | 5.2 | 8.2 | 1.4 |
| Drunk | 38.8 | 31.4 | 32.6 | 4.3 |
| Don't know | 28.4 | 27.8 | 34.1 | 70.0 |
| Other reasons | 8.9 | 9.9 | 7.4 | 70.0 |

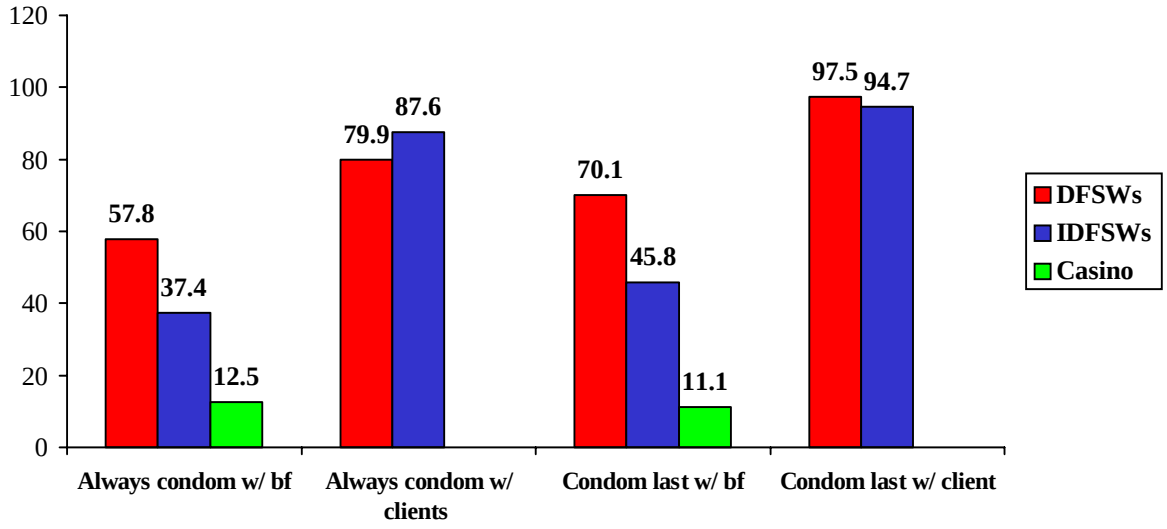
** Only one TB patient reported frequently use condom when sex with girlfriend in past 3 months.*

*** Only one TB patient reported always use condom when sex with FSWS in past year.*

### Female groups

Patterns of condom use with sweethearts and clients observed among female groups were similar to those observed among male groups. Figure 2 shows that the highest prevalence of consistent condom use with sweethearts or boyfriends was among DFSWs (57.8%). Among DFSWs and IDFSWS, however, the prevalence of consistent condom use with sweethearts or boyfriends (57.8-37.4%) was lower than prevalence of condom use with clients (79.9-87.6%). DFSWs were asked about condom use with regular clients, defined as those clients who visited her at least five separate times. The proportion of those who reported consistent condom use (82.0%) and condom use at last sex (90.1%) with regular clients was comparable to the proportions reported with casual clients.

**Figure 2: Always condom use and last condom use by types of partner**




** Always condom use specified in the past month with DFSWs and in the past 3 months with IDFSW*

PSI's Number One brand condom was the predominant type used by FSWs—98.7% of DFSW and 72.7% of IDFSW reported using this brand. About 70% of DFSW reported obtaining condoms in brothels and less than 20% reported obtaining them free of charge from the outreach program. However, across all female groups, the pharmacy was a common source for obtaining condoms. Close to one half of IDFSWs reported obtaining condoms from sources other than pharmacies and free condom distribution programs. About 70% of casino workers and ANC clinic attendees, and 90% of TB patients reported that they don't know where they could get condoms.

Reasons that they or their friends did not use condoms included decreased pleasure and sensitivity (reported by 48.4% of DFSW and 26.7% of IDFSW) A large proportion of women reported that they did not know (22.0% of DFSW, 59.4% of IDFSW, and 89.4% of casino workers) the reason why they or their friends would not use condoms. Few reported difficulty of use or being drunk as reasons for not using condoms. These results are similar to a study which found the main reason for not using condoms with clients was difficulty in persuading clients and the main reason for not using condoms with sweethearts or boyfriends was the belief that their sweetheart or boyfriend loved them (13).

**Table 14: Type of condom used and places condoms obtained in female groups**

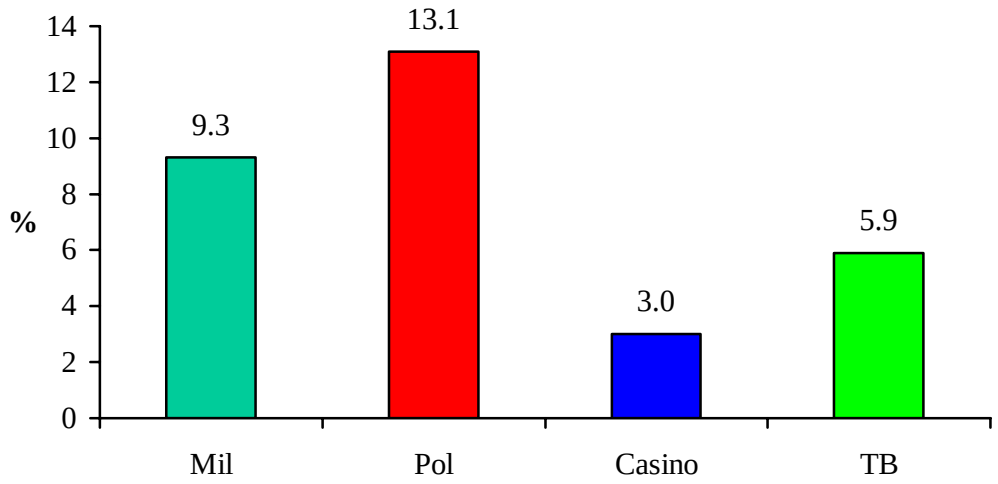
| | DFSW n=158 | IDFSW n=165 | Casino n=160 | ANC n=300 | TB n=69 |
|---|---|---|---|---|---|
| **Type of condoms used, %** | | | | | |
| Number one | 98.7 | 72.7 | 17.7 | - | - |
| Honey moon | 10.1 | 4.0 | 0.0 | - | - |
| Romantic | 2.5 | 2.7 | 0.0 | - | - |
| Family | 1.3 | 0.0 | 1.6 | - | - |
| **Condom obtained from, %** | | | | | |
| Pharmacy | 34.6 | 20.0 | 22.5 | 20.4 | 5.8 |
| Brothel | 70.4 | 6.1 | 0.0 | 0.3 | 1.5 |
| Street vendor | 9.4 | 1.8 | 0.0 | 1.0 | 0.0 |
| Distributed free of charge | 17.6 | 9.7 | 5.0 | 11.9 | 1.5 |
| Buy from other sources | - | 47.9 | 2.5 | 5.1 | 2.9 |
| Don't know | - | 25.5 | 71.9 | 67.4 | 89.9 |
| **Reason for not using condom, %** | | | | | |
| Lack of pleasure/sensitive | 48.4 | 26.7 | 3.1 | - | - |
| Feel difficult to use | 6.3 | 1.8 | 1.3 | - | - |
| Do not believe I can get AIDS | 4.4 | 1.2 | 0.0 | - | - |
| Drunk | 1.3 | 2.4 | 0.6 | - | - |
| Don't know | 22.0 | 59.4 | 89.4 | - | - |
| Other reasons | 18.9 | 22.4 | 55.6 | - | - |

### *7- STI health seeking behavior*

#### Male groups

STI symptoms self-reported by survey participants are not particularly useful indicators for estimating STI prevalence, but they are useful for assessing the health seeking behavior of those who perceive themselves to have had a recent STI. Therefore, participants were asked if they had had an unusual discharge from or ulcer on their penis, symptoms of an STI. As illustrated in Figure 3, the police group had the largest proportion of men reporting urethral discharge or any genital ulcer in the past year (13.1%), followed by the military (9.3%) and TB patients (5.9%). Only 3.0% of the male casino workers reported having these STI symptoms in the past year.

**Figure 3: Self-reported urethral discharge or genital ulcer in the past year**




Those who reporting having STI symptoms in the past year were asked where they went first for treatment the last time they experienced urethral discharge or genital ulcers. Sources of STI care varied widely. Pharmacies or drug stores were the most commonly reported source among men in all male groups, followed by the private clinics, whereas the use of STD clinics and public services was low. Except for TB patients, only about one in ten men in each male group reported that public hospitals or STD clinics were there first choice for STI treatment and care. The proportion of men who did not seek any treatment or care services was relatively high among military, police and casino workers (Table 15). Importantly, the predominant reason for selecting the reported source of treatment was that it was easy to access.

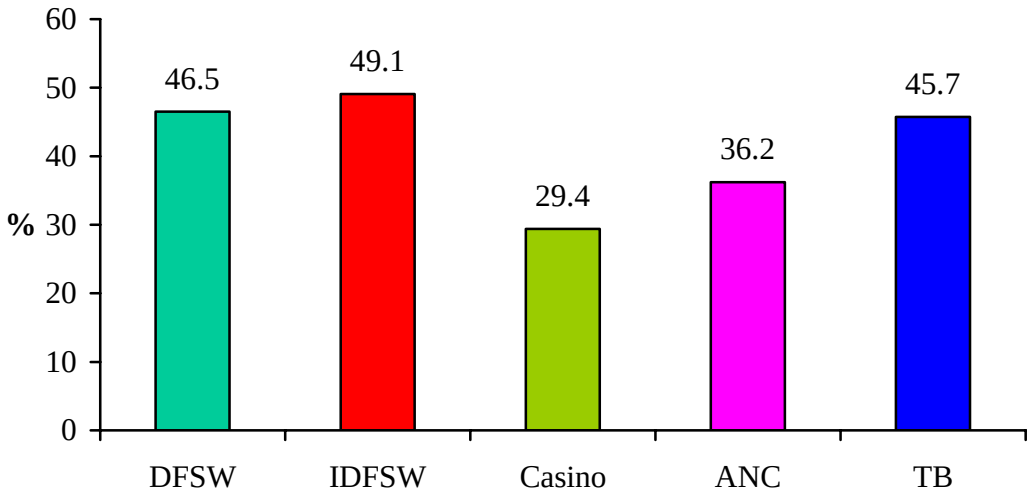
**Table 15: STI health seeking behavior among male groups**

| **Source of Treatment** | Military n=23 | Police n=33 | Casino n=8 | TB patient n=4 |
|---|---|---|---|---|
| Pharmacy | 34.8 | 30.4 | 40.0 | 25.0 |
| Private clinic | 8.7 | 21.7 | 30.0 | 0.0 |
| Public hospital/ clinic | 8.7 | 13.0 | 10.0 | 0.0 |
| Traditional healer | 8.7 | 10.9 | 0.0 | 50.0 |
| Friend's help | 0.0 | 2.2 | 0.0 | 0.0 |
| Did not get care | 21.7 | 15.2 | 20.0 | 0.0 |
| Other | 17.4 | 6.5 | 0.0 | 25.0 |
| **Reasons visiting the places above** | | | | |
| Have money | 4.4 | 0.0 | 0.0 | 0.0 |
| No money | 26.1 | 11.1 | 10.0 | 50.0 |
| Keep secret | 4.4 | 8.9 | 20.0 | 50.0 |
| Easy to access | 39.1 | 48.9 | 40.0 | 0.0 |
| Others | 26.1 | 31.1 | 30.0 | 0.0 |

**Female group**

As indicated in Figure 4, a large proportion of women in each female group reported having had abnormal vaginal discharge in the past year—46.5 % of direct and 49.1% of indirect sex workers, 45.7% of female TB patients, 36% of women seeking antenatal care, and 29% of female casino workers. Surprisingly, the proportion of women in two low-risk female groups, i.e., casino workers and ANC women, who reported discharge was higher than the proportion of men who reported urethral discharge or genital ulcers. However, vaginal discharge is not as good an indicator of recent STI among women as is urethral discharge among men (18). A large proportion of the vaginal discharge episodes reported might have been caused by non-STI pathogens, such as *Candida albicans* and bacterial vaginosis (18).

**Figure 4: Report vaginal discharge or genital ulcer in the past year**




Regarding the source of STI care, the pharmacy was the first choice for IDFSWs. Most brothel-based sex workers sought treatment from public STI services, while most casino workers sought STI care from private clinics (Table 16). Traditional medicine was not popular among either direct or indirect sex workers; however, it seems that it is still by some women in other female groups. A large proportion (one to two fifths) of women in each group except DFSWs reported not seeking STI care. Easy accessibility to services was commonly reported as the reason that a chosen treatment source was selected. A high proportion of DFSWs seeking STI care at the public services possible related the 100% Condom use program where all brothels based sex workers have to be regularly checked.

**Table 16: STI health seeking behavior among female groups**

| | DFSW n=74 | IDFSW n=81 | Casino n=47 | ANC n=107 | TB n=32 |
|---|---|---|---|---|---|
| Pharmacy | 12.2 | 32.1 | 12.8 | 15.9 | 6.3 |
| Private clinic | 5.4 | 9.9 | 14.9 | 5.6 | 3.1 |
| Public hospital/ clinic | 77.0 | 23.5 | 17.0 | 31.8 | 40.6 |
| Traditional healer | 2.7 | 8.6 | 14.9 | 11.2 | 9.4 |
| Friend's help | - | - | 2.1 | 0.0 | 0.0 |
| Did not get care | 2.7 | 22.2 | 38.3 | 28.0 | 40.6 |
| **Reasons visiting the places above** | | | | | |
| Have money | 6.8 | 6.2 | 2.1 | 4.7 | 3.1 |
| No money | 13.5 | 6.9 | 0.0 | 13.1 | 43.8 |
| Keep secret | 4.1 | 9.9 | 12.8 | 3.7 | 0.0 |
| Easy to access | 64.9 | 45.7 | 34.0 | 41.1 | 31.3 |
| Others | 10.8 | 33.3 | 51.1 | 37.4 | 21.9 |

### *8- Mobility*

Many studies have identified an association between mobility or migration with sexual risk behavior and the potential risk of HIV exposure for several reasons: high prevalence of alcohol and other drug use, limited access to public services and information, and high incidence of rape and violence (19). Therefore, IHSBS included questions related to mobility.

#### Male groups

Table 17 describes factors related to mobility, such as duration of living in the current place of residence, duration of working in the current job, and travel away from home in the past month. No common pattern of mobility among male groups was identified by this survey. The most stable groups were TB patients and police, with an average duration of at least 15 years living in the current city or province, followed by military with an average duration of about 9 years in the current place of residence. Male casino workers were the least stable group, having lived in Banteay Meanchey an average of only about three years, and having worked in their current job an average of two years, a duration which coincides with the opening of the gambling business in the Poipet area. Though military and police were stable groups, a fairly high proportion of them reported always or frequently traveling and sleeping away from family (37.3% and 26.2%, respectively). An even higher proportion of male casino workers (52.6%) reported always or frequently traveling and sleeping away from families. The household male survey conducted in 2002 by NCHADS, and other studies have shown clearly an association between travel and the demand for commercial sex (20, 21).

**Table 17: Mobility of the male groups**

| | Military n=248 | Police n=252 | Casino n=134 | TB n=70 |
|---|---|---|---|---|
| Mean duration living in this area, months | 115.7 | 181 | 35.5 | 281.9 |
| Range | 3-630 | 7-636 | 2-264 | 1-768 |
| Mean duration in the current job, months | 152.4 | 134 | 21.7 | - |
| Range | 3-384 | 7-348 | 1-60 | |
| Mean duration intend to stay here, months | 28 | 40.8 | 15.7 | - |
| Range | 1-80 | 24-72 | 5-36 | - |
| Not sure | 51.4 | 33.3 | 76.3 | 20.0 |
| Live permanently | 47.4 | 64.7 | 19.3 | 80.0 |
| **Working and sleep away from family, %** | | | | |
| Always | 15.4 | 7.1 | 30.4 | 0.0 |
| Frequently | 21.9 | 19.1 | 22.2 | 0.0 |
| Sometime | 29.6 | 36.9 | 11.9 | 15.7 |
| Never | 33.2 | 36.9 | 35.5 | 84.3 |
| **Frequency of visiting family, %** | | | | |
| Once a year | 4.5 | 2.4 | 20.0 | 0.0 |
| Once every two year | 3.6 | 0.8 | 2.2 | 0.0 |
| Often | 34.4 | 34.1 | 31.1 | 10.0 |
| Never | 8.5 | 3.6 | 10.4 | 0.0 |
| Live with family | 49.0 | 59.1 | 36.3 | 90.0 |

**Female groups**

Table 18 shows that women seeking ANC and female TB patients were the most stable groups in terms of mobility, with 16 and 19 years, respectively, average duration of living in the current place. On the contrary, other female groups including sex workers and casino workers were more likely to be newcomers to work and live in Banteay Mean Chey. Most DFSWs (78.6%) and IDFSWs (75.2%) had been living in the current location for one year or less. Female casino workers reported having lived in the current place for, on average, almost four years. The shorter duration in the current place for sex worker groups suggests recent mobility to Banteay Mean Chey, perhaps to search for better jobs and income. Mean duration for working in the current job was about one year and a half (range=1 month to 11 years) for brothel-based sex workers and about eight months (range=1 month to 4 years) for IDFSWs. Duration of work reported by female casino workers was similar to that reported by male casino workers with mean and median duration close to two years.

**Table 18: Mobility among female groups**

| | FSW | IDFSW | Casino | ANC | TB |
|---|---|---|---|---|---|
| Mean duration living in this area, months | 15.7 | 18.7 | 47 | 191.7 | 232 |
| Range | 1-240 | 1-276 | 1-288 | 1-492 | 1-888 |
| Mean duration in the current job, months | 16.9 | 8.3 | 22.4 | - | - |
| Range | 1-132 | 1-48 | 1-120 | | |
| Mean duration intend to stay here, months | 4.1 | 3.4 | 14 | 11.5 | - |
| Range | 1-12 | 1-12 | 8-24 | 1-36 | - |
| Not sure | 44.2 | 11.5 | 75.6 | 14.9 | 17.4 |
| Live permanently | 10.3 | 52.7 | 21.9 | 83.4 | 81.2 |
| **Frequency of visiting family, %** | | | | | |
| Once a year | 10.1 | 7.9 | 13.1 | - | - |
| Once every two-year | 6.9 | 0.6 | 2.5 | - | - |
| Often | 43.4 | 57.0 | 28.8 | - | - |
| Never | 39.6 | 26.7 | 6.9 | - | - |
| Live with family | 0.0 | 7.9 | 48.8 | - | - |

### *9- Risk factors for HIV infection and other STIs*

Calculation of sample size was based on expected prevalences of HIV and other STIs that were higher than the prevalences found by the survey among male and female casino workers, antenatal care women, and TB patients. Consequently, for these groups, the statistical power needed to detect associations between dependent and explanatory variables was insufficient. . Estimation of the association between HIV and risk or preventive factors was only possible for the groups with higher HIV prevalence, i.e., DFSWs, IDFSWs, and military and police groups combined. The military and police groups were combined to achieve a sample size of 500 thereby increasing the statistical power to measure associations. Univariate logistic regression was used to estimate the strength of association between risk or preventive factors and HIV infection. Results are presented in Tables 19 and 20.

#### Male groups

In male high risk group (military and police), HIV positive status was found to be significantly associated with ever having been tested for HIV, ever having a sweetheart, ever having multiple sex partners (wives, sweethearts and sex workers), having had commercial sex in the past year, and having had an STI (self-reported) in the past year (Table 19). Although the survey did not find an association between income and HIV infection, monthly income was still one of the main factors which determined the purchase of commercial sex services. High-risk male group members who had monthly incomes greater than $50 were more likely to report seeking commercial sex services in the past year than those who had monthly incomes lower than $50 (46% vs. 31%, *p* value= 0.02). However, for the male casino worker where majority of average monthly income surpass 50$ (less than 7% in male casino worker had monthly income <50$ in comparison with 87% in military and police), no significant difference was found in terms of purchased of sex services indicating the clear association of high income and commercial sex among male group. Also, men not living with wives/relatives/parents were more likely to have purchased commercial sex in the past year than men who were living with their wives/relatives/parents (51.7% vs. 24.8%, p value=0.001 for military-police and 66.7% vs. 48%,

*p* value= 0.03 for casino worker) suggesting the HIV related risk behavior vulnerability while men living away from families. Among this military-police group, men who reported watching pornography were more likely to have purchased commercial sex than men who did not watch pornography (35.1% vs. 26.3%, *p* value= 0.075).

**Table 19: Association between HIV and risk factors in military-police group**

| **Selected variables** | **High risk male group (N=500)** | |
|---|---|---|
| | ***OR*** | ***95% CI*** |
| Past and current syphilis | 0.84 | 0.2-3.69 |
| *Chlamydia trachomatis* | - | - |
| *Neisseria gonorrhoeae* | - | - |
| | | |
| Age groups | | |
| 31-35 years old | 1.13 | 0.44-2.88 |
| > 35 years old | 0.77 | 0.33-1.83 |
| ≤ 6 years in school (primary school) | 1.8 | 0.89-3.64 |
| Monthly income > $50 | 0.63 | 0.19-2.12 |
| Not living with wives | 0.75 | 0.33-1.7 |
| | | |
| Alcohol consumption daily or frequently | 1.2 | 0.57-2.43 |
| Drug use (majority smoking form) | 1.95 | 0.77-4.97 |
| | | |
| Not having family infected with HIV | 1.39 | 0.47-4.07 |
| Ever tested for HIV | *2.16* | *1.07-4.37* |
| | | |
| Sex with wife, sweetheart and sex workers* | *5.76* | *1.36-24.42* |
| Ever having sweetheart | *2.53* | *1.02-6.24* |
| Having commercial sex in the past year | 1.89 | 0.94-3.81 |
| | | |
| Not always use condom with sex workers | 0.62 | 0.20-1.95 |
| Report STIs in the past year | *3.2* | *1.41-7.26* |

* Sex with wife, sweetheart and sex worker vs. sex with wife and sweetheart

**Female groups**

Factors found significantly associated with HIV among DFSWs included age older than 20 and ever test for HIV. Data from the HSS and other study support this evidence (2, 22)**.** The older the sex workers and the longer they work as sex workers a higher chance to be HIV infected. In IDFSWs, the following factors found significantly associated with HIV seropositvity: not having family exposed to HIV/AIDS and report STIs in the past year (Table 20). In IDFSWs, though alcohol consumption was not directly correlated with HIV acquisition, it was clearly associated with risk behavior that might lead them to be exposed to HIV/STI at some points in the course of their carriers. From the data given, significantly higher proportion of those who drank alcohol reported providing sex services to clients than those who did not (60.8% vs. 42.2%, *p* value= 0.03). Moreover, interestingly IDFSWs who ever watched pornography or sex video significantly reported higher proportion of having sex with clients in the past year than those who did not (68.5% vs. 49.5%, *p* value= 0.02).

**Table 20: Association between HIV and risk factors in DFSW and IDFSW groups**

| **Selected variables of interest** | **DFSW (N=159)** | | **IDFSW (N=162)** | |
|---|---|---|---|---|
| | ***OR*** | ***95% CI*** | ***OR*** | ***95% CI*** |
| Past and current syphilis | 0.6 | 0.17-1.9 | - | - |
| *Chlamydia trachomatis* | 1.04 | 0.40-2.7 | 2.12 | 0.69-6.55 |
| *Neisseria gonorrhoeae* | 0.75 | 0.24-2.4 | - | - |
| | | | | |
| Current age > 20 years old | *6.5* | *2.41-17.8* | 3.85 | 0.85-17.41 |
| ≤ 6 years in school | 0.55 | 0.12-2.55 | 0.99 | 0.30-3.22 |
| Monthly income ≤ $50 | 1.77 | 0.84-3.70 | 1.73 | 0.65-4.67 |
| | | | | |
| Alcohol consumption | 0.68 | 0.34-1.35 | 0.78 | 0.28-2.20 |
| Drug use (majority smoking form) | 1.22 | 0.57-2.6 | - | - |
| | | | | |
| Not having family infected with HIV | 1.47 | 0.45-4.77 | *0.27* | *0.09-0.81* |
| Ever tested for HIV | *2.94* | *1.4-6.2* | 1.96 | 0.70-5.45 |
| | | | | |
| Having sweetheart in the past year | 1.42 | 0.72-2.82 | 1.00 | 0.37-2.72 |
| Having sex with client in the past year | - | - | 0.89 | 0.34-2.36 |
| Number of client > 5 per day | 1.2 | 0.58-2.43 | - | - |
| | | | | |
| Inconsistent condom use with client in past month | 0.73 | 0.3-1.75 | - | - |
| Inconsistent condom use with sweetheart in past month [(a)] | 1.5 | 0.53-4.1 | 1.2 | 0.33-4.37 |
| Report discharge in the past year | 1.08 | 0.55-2.13 | *3.26* | *1.11-9.54* |
| Duration of work > 12 months | 0.84 | 0.40-1.77 | 1.45 | 0.44-4.79 |

** 95% Confidence interval, Odds ratio*

*(a) Inconsistent condom use with sweetheart indicated in the past three months for IDFSW*

## VI- CONCLUSIONS

- Among all groups, DFSWs had the highest prevalence of HIV (30.2%) and STI (8.9% had at least one STI). Although HIV prevalence among Military and police was comparable, STI prevalence was lower among police.

- HIV prevalence was higher among female casino workers (3.8%) than among ANC women (1.4%).

- Although a high proportion of men in the military (17.4%) and DFSWs (25%) reported drug use (amphetamines), none reported using injection drugs.

- The highest prevalence of daily alcohol consumption was among IDFSWs (72.7%). Among these women, daily alcohol consumption was associated with providing sex services for money.

- Among all groups, only a small proportion reported access to HIV voluntary counseling and testing. However, the proportion of persons who reported ever having been tested ranged from 9.8% to 57.9%.

- At least 10% of all groups surveyed reported their family members or relatives have AIDS related diseases.

- Male casino worker was the youngest age group and the highest proportion of them report their first sex with sweethearts (48.8%) and sex workers (39%). They also reported the highest commercial sex in the past year (56.3%)

- Two-third of IDFSWs reported having had a boyfriend/sweetheart in the past year. Among those who had a boyfriend/sweetheart, 90% reported having had sexual intercourse with their sweetheart (non commercial partner) with low consistent condom use.

- More than 50% of IDFSWs reported selling sex in the past year. The type of sex worker most frequently reported by men who had ever had/in the past year commercial sex, was brothel-based, followed by karaoke woman.

- Less than 30% of all groups (male and female) reported consistent condom use with sweethearts (non commercial sex partners). Such low condom use with this type of partner indicates an area where prevention messages may need to be targeted or enhanced.

- The most commonly reported reason for not using condoms from what respondents have known was lack of pleasure and being under the influence of alcohol.

- Female casino workers were less likely to have knowledge about where condoms could be accessed.

- Although higher proportion (29.4-49.1%) of women reported having had vaginal discharge in the past year, the proportion attributable to STI pathogens cannot be determined. An

unknown, and perhaps substantial, proportion of vaginal discharge cases among women surveyed may have been caused by non-STI pathogens.

- Reported use of public STD services was low among all groups except DFSWs. DFSWs are enrolled in a 100% condom use program in which STD clinic visits are routine. Many persons reported self-medicating and easy access to non-prescription drugs was the most commonly reported reason for self-medication.

- Among men, a clear association was found between travel and extramarital sex, suggesting that married men who travel may be more likely to be at risk for HIV than married men who do not travel.

## VII- RECOMMENDATIONS

- Continue to promote consistent use of condoms with commercial sex partners (100% condom use program).

- New behavioral intervention strategies need to be developed and implemented to increase the use of condoms during sex with non-paying or non-commercial sex partners.

- HIV/STI intervention efforts need to target casino workers to reduce their potential HIV related risk behaviors.

- VCT services need to be improved both qualitatively and quantitatively to be universally accessible. IEC materials about the benefits of VCT services should be appropriately designed, tailored for various target groups, and disseminated widely.

- The Provincial Health Department as well as the Provincial AIDS Program should work to improve public STD services so that anyone, men or women, e have easy access to services.

- Reduction of recreational drug use should be integrated into existing behavioral change interventions targeting sex workers and the military.

- Intervention for traveling men (or other sex partners of men who travel) should be considered. In addition to the 100% CUP which traveling men and other partners have been exposed, intervention at the community sources would be targeted.

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## ANNEXES

List of interviewers, lab technicians and research team

NATIONAL TEAM

| **Name** | **Responsibility** | **Place of Work** |
|---|---|---|
| HENG SOPHEAB | Survey coordinator | NCHADS |
| MUN PHALKUN | Supervisor | NCHADS |
| THENG THITHARA | Supervisor | NCHADS |
| MAM SOVATHA | Support staff | NCHADS |
| SENG SOPHEATA | Supervisor | NCHADS |
| KAO CHANTHA | Supervisor | NCHADS |
| NHEP SIMONG | Lab supervisor | NCHADS |

PROVINCIAL TEAM

| **Name** | **Responsibility** | **Place of Work** |
|---|---|---|
| ROEUN SOTHY | Interviewer | PHD |
| LE CHANSANGVATH | Interviewer | PHD |
| TAUCH BYNA | Interviewer | PHD |
| CHEA YOUTHEARON | Interviewer | PHD |
| KEO SAMNANG | Interviewer | PHD |
| HOEUM SOKHA | Interviewer | PHD |
| CHHOM CHHADA | Interviewer | PHD |
| SEM CHANTHAN | Interviewer | PHD |
| YIN SUNRY | Interviewer | PHD |
| NAU POTMAKKARA | Interviewer | PHD |
| CHHAN CHANSOPHOAN | Interviewer | PHD |

| | | |
|---|---|---|
| HENG KIMSORTH | Lab Technician | PHD |
| YAM CHIFOAN | Lab Technician | PHD |
| KONG PHALLY | Lab Technician | PHD |
| KONG BUN LY | Coordinator | PHD |
| ING SOPHIRUM | Coordinator | PHD |
| PEN RATHA | Coordinator | PHD |
| HENG CHANTHA | Specimen Deliver | PHD |