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Sexual Risk and Bridging Behaviors Among Young People in Hai Phong, Vietnam

Cong Thanh Duong,
National Institute of Hygiene and Epidemiology, No. 1, Yersin Street, Ha Noi 10000, Vietnam

Tran Hien Nguyen,
National Institute of Hygiene and Epidemiology, No. 1, Yersin Street, Ha Noi 10000, Vietnam

Thi Thanh Ha Hoang,
National Institute of Hygiene and Epidemiology, No. 1, Yersin Street, Ha Noi 10000, Vietnam

Van Vi Nguyen,
Hai Phong Service of Health, No. 20 Le Dai Hanh Street, Hai Phong, Vietnam

Thi Minh Nguyet Do,
Hai Phong Service of Health, No. 20 Le Dai Hanh Street, Hai Phong, Vietnam

Van Han Pham, and
Hai Phong Medical School, Lach Tray Street, Hai Phong, Vietnam

Roger Detels
Department of Epidemiology, UCLA School of Public Health, Box 951772, Los Angeles, CA 90095-1772, USA

Roger Detels: detels@ucla.edu

Abstract

The risk of the HIV epidemic spreading from high-risk groups to the general population in Vietnam depends on sexual risk and bridging behaviors between high- and low-risk individuals. A cross-sectional study was used to describe sexual activities of youth aged 18–29 years. Nearly half (41.4%) were sexually active. Premarital sex was reported by 43.3% of them; 78.3% of sexually active males and 13.5% of sexually active females. Multiple sex partners were reported by 31.0%; 56.7% of males and 9.2% of females. Almost 27% of males and 5% of females engaged in sexual bridging behaviors. Being unmarried was significantly associated with having sex with non-regular partners. Being unmarried and early age at first intercourse were associated with having sex with a sex worker. Consistent condom use was high with commercial sex workers but low with regular partners. Education to delay early sexual debut, increased employment, and strategies to inform young sexually active people to adopt safer behaviors are urgently needed.

Keywords

Sexual risk; Bridging behaviors; Young people; Hai Phong; Vietnam

Correspondence to: Roger Detels, detels@ucla.edu.

Introduction

Transmission of HIV beyond the core risk groups (reservoirs) depends on the patterns of mixing between the core group and other members of the population (Anderson et al. 1991; Morris 1995). Young people play a critical bridging role for HIV transmission, as they usually have more sexual partners (Morris et al. 1996). Thus, the risk of HIV epidemic spread from high-risk groups to the general population in Vietnam will probably depend on sexual risk and bridging behaviors among young Vietnamese.

Hai Phong city is located in the economic developmental triangle encompassing Quang Ninh-Hai Phong-Ha Noi, the center of the HIV epidemic in the north. HIV prevalence in the north remained low until late 1997/early 1998. An explosive increase in HIV prevalence among injecting drug users (IDUs) began when the prevalence in Hai Phong jumped from 0.9% in 1997 to 32.5% in 1998 and to 72% in 2001, and in Ha Noi, from 2.4% in 1997 to 13.3% in 1999, and to 25.3% in 2002. Quang Ninh province has been hardest hit by the epidemic among IDUs in the north, where the prevalence escalated to 75.2% by 2002. The HIV prevalence among commercial sex workers (CSWs) in Hai Phong rose from 1.1% in 1998 to 7.7% in 2002, and in Ha Noi, from 3.7% in 1998 to 14.5% in 2002. The prevalence among STD clients in these two provinces had reached 7% by 2001 (NIHE 1994–2005).

Compared to the neighboring countries of Cambodia and Thailand, Vietnam has experienced a slower rate of spread to the general population. However, the age of HIV/AIDS patients in Vietnam is increasingly younger (Vietnamese Ministry of Health 2005). Not much is known about the sexual risk and bridging behaviors among young Vietnamese. The Behavioral Surveillance Survey (BSS) program focuses only on selected target groups, including IDUs, CSWs, migrant construction workers, and long-distance drivers, but not young people per se (NASB and FHI 2001). Several studies on sexual behavior and practices that focused on STDs and high-risk groups such as CSWs showed that many young, single Vietnamese men often have their first sexual experience with CSWs and visit CSWs frequently (Belanger and Hong 1998; Gammeltoft 2002; Thuy et al. 1999). A publication on commercial sex practices in Ha Noi reported a high demand for sex among young Vietnamese men (Walters 2003). Vietnamese society expects women to be sexually inexperienced virgins at marriage, and they are taught to be submissive. Thus, they have difficulties negotiating safe sex with their boyfriends and husbands. As a result, Vietnam has one of the highest rates of abortion in the world (Nguyen 2001). Despite the relative openness shown by officials on the HIV/AIDS issue, there is still a tendency at different political levels to link HIV with “social evils”, putting the entire responsibility of the infection on vulnerable people such as IDUs and CSWs, and not looking at the HIV issue as a problem of the entire society.

There is a need to understand the sexual risk and bridging behaviors of the young population in order to design and implement effective intervention strategies to control the HIV epidemic in Vietnam. Therefore, we conducted a cross-sectional study among young men and women in Hai Phong city to obtain more information on sexual risk and bridging behaviors. This information is expected to contribute to the development of effective interventions to control the spread of HIV transmission from the high-risk groups into the general population.

Methods

Study Population and Sampling Methods

A cross-sectional study was carried out among young men and women 18–29 years of age in Hai Phong. A modified two-stage cluster survey method was used. In the first stage, 30

residential groups, including households in a census block in the downtown area in the three main districts, Hong Bang, Ngo Quyen, and Le Chan, were sampled from the list of all 465 residential groups (combined population of 417,229), with probability proportionate to the size (PPS) using the C-survey software (Ariawan et al. 1996). Sampling with PPS allows larger clusters to have a greater chance of being selected. In the second stage of sampling, the field team randomly selected the first household to visit. All eligible residents who were at home at the time of the visit were invited to participate in the study. If the selected household had no eligible persons, eligible persons were not at home, or they refused to participate, the team proceeded to the next nearest household. The team re-visited those households with eligible persons who were not at home at the time of the visit until the end of the study period. This process continued until the number of participants required for each cluster was reached. The total number of participants required for each cluster was 21.

An eligible participant was defined as a person 18–29 years of age who currently resided in Hai Phong. Persons who were not residents were excluded. If the eligible persons were deaf, mentally incompetent, or otherwise unable to communicate in Vietnamese, they were also excluded.

Data Collection

Data were collected in the spring of 2005 by field teams, using a specially designed questionnaire. The teams collected information on socioeconomic and demographic characteristics; HIV/AIDS/STD-related knowledge; sexual behavior; knowledge, attitudes and practices regarding condom use; alcohol and drug use; history of STDs; and prior HIV testing.

Participation was completely voluntary and anonymous. Before the questionnaire was administered, participants were given an information sheet explaining the purpose and procedures of the study and gave verbal informed consent to participate. The verbal informed consent stated that they had the right to refuse participation, to skip questions that they did not want to answer, or to withdraw at any time during the interview. No names or other identifying information was collected. All information provided by participants was kept confidential.

Each field team was comprised of students from the Hai Phong School of Medicine. Training for team members included the methods for selecting participants, introducing themselves to participants, communication skills, obtaining informed consent, and data collection. A unique ID number was assigned by the interviewers at the beginning of the interview for each participant. An audio CD player with earphones was used to present the questions (Liu et al. 1998). All questions were read slowly and clearly in the local dialect. An audio CD allowed users to skip or replay questions by changing tracks. Separate CDs were used for male and female participants, because the questionnaire content was worded to be semantically appropriate to gender. The interviewers instructed the participants about using the CD player. The participants were given an answer sheet with corresponding question numbers without the questions. The participants wrote down the answers on the answer sheet in response to each question read on the CD. Therefore, no one knew what was asked or what the respondents' answers were. The participants were free to play and re-play the CD if they needed questions to be repeated. To assure anonymity, the completed questionnaires were deposited by the participants into a large locked box containing other questionnaires. This was done to demonstrate to the participants that their answers were really anonymous. The box was then opened by the field supervisor after the data collection in each cluster was completed.

The field teams collected the data in the participants' homes. The participants were left alone to complete their answer sheet after they understood how to use the CD player and how to choose the appropriate answers. The interviewers were available nearby to help participants with problems. If a person was illiterate, the interviewers assisted him/her in completing the answer sheets.

Before conducting the main study, we randomly selected one cluster and recruited 21 eligible persons to test the proposed questionnaire and interview techniques. The pilot study helped us to identify potential problems with the proposed questionnaire and interview techniques, so that we were able to make appropriate adjustments and modifications for the final questionnaire and interview techniques.

The study was reviewed and approved by the Institutional Review Boards of the University of California in Los Angeles, USA and the National Institute of Hygiene and Epidemiology, Hanoi, Vietnam.

Data Management and Analysis

The data collected from the questionnaires were entered into Epi Info, version 6.04d. The data were cleaned before entering. The data were double-entered to guarantee the accuracy of the data entry. Epi Info, version 6.04d, and SAS, version 8.0 were used to manage and analyze the data.

Initially, descriptive analyses were performed. AIDS knowledge scores were calculated based on the responses to 10 knowledge questions about the routes of HIV transmission and methods of prevention. One point was given for each correct answer. Therefore, the possible score ranged from 0 to 10 points.

Logistic regression was performed to measure the association between potential factors for engaging in sex with CSWs and non-regular partners with and without consistent condom use, which were to be bridging behaviors. Multivariate logistic regression analysis was used to examine the associations of independent variables with the outcome, adjusting for potential confounders. Variables were selected into the multivariate model based on the prior knowledge of the relationship between them and the outcome, the magnitude of the odds ratio in univariate logistic analysis, and specific research interests. The stepwise method was applied in the selection of the variables into the multivariate model.

Results

General Characteristics of the Study Sample

There were 643 eligible residents in the 522 households visited. Thirteen residents refused to participate (2.0%). Thus 630 persons, 98% of those eligible, participated in this study.

The socio-demographic characteristics of the 630 participants are presented in Table 1. Of the 630 participants, 272 (43.2%) were male and 358 (56.8%) were female. Over half (53.8%) were 20–24 years old. The mean age was 22.8 years. Most (80%) had completed high school or higher education. One percent had no schooling, 1.5% of men and 0.6% of women. Wage laborers and students accounted for over half (51.8%) of the respondents. Ten percent were unemployed. Over half (59.4%) of the respondents had an income level per month below 500,000 VND ($31 U.S.). The mean monthly income was 563,160 VND ($35 U.S.). Most respondents were single (71.9%). The mean age at first marriage among those who were married was 23.2 years (SD, 2.3 years). The mean AIDS knowledge score was 7.7 (SD, 1.02), ranging from 4 to 10.

Sexual Risk and Bridging Behaviors

Less than half of all participants (261; 41.4%) reported having had sexual intercourse (Table 2). This proportion was slightly higher in males (44.1%) than in females (39.4%). The mean age at first sexual intercourse was 22.0 years (SD, 2.67); 21.3 years (SD 2.79) for males and 22.7 years (SD 2.4) for females. Among sexually active respondents, premarital sex was reported by 43.3%. Among those reporting sexual experience, premarital sex was reported almost sixfold more frequently among males (78.3%) than females (13.5%). Thirty-one percent of those sexually active reported having multiple sex partners; 56.7% of males and 9.2% of females. Among those sexually active, only 27.5% of males reported their spouse as their first sexual partner, compared to 83.7% of females. Almost 6% of males reported that their first partner was a CSW, although 30.8% reported having had sex with a sex worker. The average number of CSW partners was 3.6 (SD, 3.28) among those sexually active with CSW partners. Just over 8% of sexually active respondents reported sex with an IDU; 10.8% among males and 6.4% among females. Eight of the married participants (4.8%), 15.6% of married males, and 0.8% of married females, reported extramarital partners.

Among those who were sexually experienced, without considering the factor of condom use, almost 15% reported sexual bridging behaviors (sex with a high-risk partner such as sex worker or drug user, as well as a low-risk partner), 26.7% of males and 5.0% of females (data not shown in the table).

The proportion of those who were sexually active reporting sexual encounters under the influence of alcohol use was 43.1%; 64.2% and 16.3% among male and female respondents, respectively. Nine of those who were sexually active (3.4%) reported having sexual intercourse while under the influence of drugs.

Condom Use

Among those who were sexually active, condom use at first sexual intercourse was reported by 20.7%; 32.8% among males and 10.2% among females (Table 2). Consistent condom use among participants overall was 42.9% with non-regular partners, 47.5% among male respondents compared to 22.2% among female respondents. Of the male participants who reported having sex with CSWs, 33 (89.2%) reported consistent condom use. Consistent condom use with spouse or regular partner was only 21.2%.

History of STDs and Prior HIV Testing

The proportion of participants who reported a history of STDs was 2.3%; 1.7% among male respondents versus 2.8% among female respondents. One hundred and two participants (16.2%) had had a prior HIV test; 52 (19.3%) males and 50 (14.0%) females.

Drug and Alcohol Use

There were 463 (73.5%) participants who reported ever using alcohol; 245 males (90.1%) and 218 females (60.9%) (Table 3). Eighteen respondents (2.9%) reported ever having used drugs; 5.9% among male respondents, and 0.6% among female respondents. Seven of those 18 drug-using participants (38.9%) reported injecting drugs. All were male respondents.

Univariate Logistic Regression Analysis of Factors Associated with Sex with Non-regular Partners and CSWs

The results of univariate and multivariate logistic regression analyses for factors associated with sex with non-regular partners (excluding CSWs, spouses, and regular partners such as girlfriends) are presented in Table 4. This crude analysis demonstrated significant associations with not yet being married, age less than 22 years at first sexual intercourse,

having premarital sex, and having ever seen pornographic items. Only being unmarried remained significant in the multivariate adjusted model. The univariate and multivariate analyses of factors associated with having sex with a CSW are presented in Table 5. Associations were found with not being married, being currently unemployed, and having first sexual intercourse before the age of 22 years in univariate analysis. Not being married and early age at first sexual intercourse remained significant in the adjusted model.

Although less than a high school education, not being married, having had premarital sex, having seen pornographic material, and having had an HIV test were associated with inconsistent condom use with non-regular partners, only not being married remained significant in the adjusted model (Table 6). Due to small numbers, we were not able to determine factors associated with inconsistent condom use with CSWs in a multivariate model.

Discussion

Vietnam's HIV epidemic is still concentrated primarily among IDUs and CSWs (Nguyen et al. 2004). The results of behavioral surveillance and other studies suggest that there may be sexual links between the commercial sex and IDU networks that may result in further spread of HIV outside these two core groups (NASB and FHI 2001; Tran et al. 2004). Thus, there is a potential risk for the epidemic to spread from these groups into the general population. Although the risk of HIV transmission through sharing needles and syringes is very high among IDUs in many countries, sexual transmission is still the major mode of HIV transmission worldwide.

This study reported risky sexual behaviors among young males and females, including premarital sex, multiple partners, extramarital sex, and having sex with high-risk partners. Over 43% of the sexually active respondents reported premarital sex; 78.3% among male respondents and 13.5% among female respondents. This prevalence is much higher than previously reported among adults 15–49 years of age in other parts of Vietnam (Bui et al. 2001; Rekart 2002; SAVY 2004). Almost 40% of the sexually active males reported having premarital sex versus less than 20% among sexually active females. Young people are now influenced by recent government, social, and economic reforms that promote development of factories and other industries. Under these reforms, there are more opportunities to engage in sex before marriage. Many young people consider sexual relationships to be a "natural" part of a romantic relationship, as perceptions and views of young people are becoming more open about premarital sex (Hoang et al. 2002; Khuat 1998; SAVY 2004).

More than 15% of married males reported sex outside marriage, sixfold more than among sexually active females. As in many countries of Southeast Asia and Asia, Vietnamese females are expected to be virgins when they marry, and to have only one sexual partner, their husbands, but males are expected to have sex with multiple partners both prior to and after marriage (Detels 2004; Nguyen 2001).

More than thirty percent of the sexually active males reported having ever visited CSWs in their lifetime. This prevalence of commercial sex among sexually active males is similar to that reported among long-distance truck drivers and migrant workers in a previous survey in Haiphong (NASB and FHI 2001), and six times higher than previously reported among youth (SAVY 2004). In addition, a recent survey of Vietnamese youth showed that urban males 22–25 years of age were least likely to agree that sex work was immoral (SAVY 2004). Further, a considerable proportion of males and females reported having sex with partners who inject drugs.

Our study shows a significant proportion of males as well as females acting as bridgers from high-risk groups to the general population. Twenty-seven percent of sexually active males reported that they had sex with both commercial and non-commercial partners and/or with both injecting and non-injecting drug-using partners. Only five percent of sexually active females act as bridges from injecting drug-using partners and non-injecting drug-using partners. Consistent condom use with CSWs was reported to be high. This could in part explain why the HIV epidemic in Haiphong is currently largely limited to high-risk groups such as IDUs and CSWs. However, consistent condom use was low with non-regular partners, spouses, and regular partners. Thus, if HIV enters these latter groups, rapid spread is likely. Therefore, condom use with other partners should be emphasized in intervention programs. Although premarital sex is common, not many young people know about practicing safer sex (Hoang et al. 2002). These days, young people are vulnerable to the consequences of unsafe sexual activity, such as STDs, including HIV/AIDS, unwanted pregnancy, and abortion (Brown et al. 2001). As we observed, sex among young people has recently become more common, but many of them do not know how to protect themselves from its consequences. Attitudes regarding condom use among young people are generally negative, because condoms are perceived to reduce pleasure and to be appropriate only for prostitutes and people engaging in extramarital affairs (SAVY 2004).

The interview technique of using a CD player in this study was designed to make participants feel more comfortable when answering sensitive questions about sexual behaviors and drug use, etc. That strategy should reduce social desirability bias so that participants are more likely to give honest answers. Our study also has some limitations: this is a cross-sectional study, and the information regarding condom use and high-risk sexual behaviors were measured cross-sectionally at one point in time. This type of study limits the ability to make causal inferences. Despite the use of a CD player and earphones, some underreporting of high-risk activities was likely. Thus, some of the findings in this study may also be subject to inaccurate recall and/or deliberate concealment. Another limitation is potential selection bias. The respondents may differ from the non-respondents on important predictors of the outcome; thus, the resulting estimates may be biased. However, our refusal rate was very low (2%). Furthermore, the traditional reluctance to discuss sexual behaviors may result in underreporting of sexual behaviors, especially among females in this study.

The information from this study demonstrates the role of young people in facilitating the transmission of HIV/STDs from high-risk or core groups to the general population in Vietnam. Our study suggests that there is clearly a risk of the epidemic spreading to the general population in Vietnam. According to our results, young unmarried Vietnamese are the most likely to engage in risk activities. Studies have demonstrated that a delay of a few years for initiation of sexual activity is associated with a reduction of HIV prevalence among young people (Asiimwe-Okiror et al. 1997). Therefore, delaying early sexual intercourse until marriage is an appropriate intervention strategy. Young people are the center of the HIV/AIDS epidemic in terms of transmission, impact, vulnerability, and potential for change. Thus, behavioral intervention strategies need to be focused on young people. Education to delay sexual debut until marriage and to use condoms, not only with CSWs, but with all partners, is urgently needed to prevent further expansion of the HIV/AIDS epidemic to the general public in Vietnam.

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Table 1

Socio-demographic characteristics and knowledge about HIV/AIDS/STDs

Characteristics	Men No. (%)	Women No. (%)	Total No. (%)
No. of respondents	272 (43.2)	358 (56.8)	630
Age group			
≤19 years	45 (16.5)	68 (19.0)	113 (17.9)
20–24 years	154 (56.6)	185 (51.7)	339 (53.8)
25–29 years	73 (26.8)	105 (29.3)	178 (28.3)
Mean age (SD)	22.7 (2.9)	22.7 (3.1)	22.8 (3.1)
Education			
Never in school	4 (1.5)	2 (0.6)	6 (1.0)
Primary school	6 (2.2)	6 (1.7)	12 (1.9)
Secondary school	42 (15.4)	61 (17.1)	103 (16.4)
High school	134 (49.3)	139 (38.9)	273 (43.4)
Vocational/diploma	43 (5.8)	77 (21.6)	120 (19.1)
Bachelor's degree	42 (15.4)	66 (18.5)	108 (17.2)
Graduate study	1 (0.4)	6 (1.7)	7 (1.1)
Kinh ethnicity	268 (98.9)	352 (99.2)	620 (99.0)
Occupation			
Student	86 (31.6)	114 (31.9)	200 (31.8)
Agriculture	5 (1.8)	5 (1.4)	10 (1.6)
Wage-labor	68 (25.0)	58 (16.2)	126 (20.0)
Officer	22 (8.1)	50 (14.0)	72 (11.4)
Business	23 (8.5)	49 (13.7)	72 (11.4)
Others	37 (13.6)	50 (14.0)	87 (13.8)
Unemployed	31 (11.4)	32 (8.9)	63 (10.0)
Monthly income level (VND)			
<500,000	151 (55.5)	223 (62.3)	374 (59.4)
500,000–1,000,000	81 (29.8)	115 (32.1)	196 (31.1)
>1,000,000	40 (14.7)	20 (5.6)	60 (9.5)
Mean income level	616,200	523,627	563,160
Marital status			
Single	226 (83.1)	227 (63.4)	453 (71.9)
Married	43 (15.8)	123 (34.4)	166 (26.3)
Divorced	0	3 (0.8)	3 (0.5)
Separated	3 (1.1)	5 (1.4)	8 (1.3)
Mean knowledge score (SD)	7.8 (0.93)	7.7 (1.08)	7.7 (1.02)

Totals do not add up to 100% for some variables because of missing values

Table 2

Prevalence of sexual risk, bridging behaviors, and condom use

	Men No. (%)	Women No. (%)	Total No. (%)
No. of respondents	272	358	630
Ever had sex	120 (44.1)	141 (39.4)	261 (41.4)
Mean age at first marriage (among married)	24.1 (2.17)	22.9 (2.29)	23.2 (2.32)
Mean age at first sexual intercourse (SD)	21.3 (2.79)	22.7 (2.4)	22.0 (2.67)
Among sexually active			
Premarital sex	94 (78.3)	19 (13.5)	113 (43.3)
Multiple sex partners	68 (56.7)	13 (9.2)	81 (31.0)
First sexual partner			
Girlfriend/boyfriend	73 (60.8)	24 (17.0)	97 (37.2)
Spouse	33 (27.5)	118 (83.7)	151 (57.9)
Friend	8 (6.7)	0	8 (3.1)
Commercial partner	7 (5.8)	0	0
Same gender partner	0	0	0
Others	8 (6.7)	0	8 (3.1)
Lifetime number of partners (mean, SD)			
Spouse/girlfriend/boyfriend	1.4 (1.1)	1 (0.4)	1.2 (0.8)
Non-regular partner	0.7 (1.3)	0.1 (0.2)	0.3 (0.9)
Commercial partner	1.1 (2.5)		
Number of partners last 12 months (mean, SD)			
Spouse/girlfriend/boyfriend	1.1 (0.8)	1 (0.2)	1 (0.6)
Non-regular partner	1.3 (1.4)	0.6 (0.5)	1.2 (1.3)
Commercial partner	1.7 (2.8)		
Oral sex	26 (21.8)	13 (9.3)	39 (15.1)
Anal intercourse	6 (5.0)	13 (9.2)	19 (7.3)
Ever had commercial sex	37 (30.8)		
Number of CSWs (mean, SD)	3.6 (3.28)		
Ever had sex with IDU partner	13 (10.8)	9 (6.4)	22 (8.4)
Among married respondents			
Extramarital sex	7 (15.6)	1 (0.8)	8 (4.5)
Sexual experience under influence of drug use			
Sometimes	8 (6.7)	1 (0.7)	9 (3.4)
Never	112 (93.3)	140 (99.3)	252 (96.6)
Ever had a STD	2 (1.7)	4 (2.8)	6 (2.3)
Condom use at first sexual intercourse	39 (32.8)	14 (10.2)	53 (20.7)
Condom use with spouse/girlfriend/boyfriend			
Always	22 (21.2)	2 (1.5)	24 (10)
Sometimes	62 (59.6)	95 (69.3)	157 (65.1)
Never	20 (19.2)	40 (29.2)	60 (29.9)
Consistent condom use with non-regular partner	19 (47.5)	2 (22.2)	21 (42.9)

	Men No. (%)	Women No. (%)	Total No. (%)
Consistent condom use with commercial sex partner	33 (89.2)		
Sexual experience under influence of alcohol use			
Always	7 (6.4)		7 (3.6)
Sometimes	63 (57.8)	14 (16.3)	77 (39.5)
Never	39 (35.8)	72 (83.7)	111 (56.9)
Ever had prior HIV testing	52 (19.3)	50 (14.0)	102 (16.2)

Totals may vary due to missing values

SD standard deviation

Table 3

Drug and alcohol use and prior HIV testing

	Men No. (%)	Women No. (%)	Total No. (%)
No. of respondents	272	358	630
Ever used alcohol	245 (90.1)	218 (60.9)	463 (73.5)
Ever used drugs	16 (5.9)	2 (0.6)	18 (2.9)
Individual types of drugs among drug users			
Sedative drugs	6 (37.5)	0	6 (33.3)
Opium	2 (12.5)	0	2 (11.1)
Marijuana	6 (37.5)	0	6 (33.3)
Heroin	9 (56.3)	1 (50.0)	10 (5.6)
Amphetamine	5 (31.3)	2 (100.0)	7 (38.9)
Others	1 (6.3)	0	1 (5.6)
Ever injected drugs among drug users	7 (43.8)	0	7 (38.9)

Totals may vary due to missing values

Table 4

Logistic regressions analysis of factors for engaging in sex with non-regular partners

	UORs	95% CI UORs	AORs	95% CI AORs
Gender				
Male	7.33**	3.38–15.91	1.68	0.58–4.91
Female				
Education				
Less than high school	2.24	0.54–9.29		
High school and up				
Marital status				
Unmarried	10.82**	5.23–22.40	3.40*	1.14–10.19
Married				
Current employment				
Unemployed	1.39	0.59–3.30		
Employed				
Age at first sexual intercourse				
<22	4.01**	2.07–7.77	2.18	1.02–4.63
≥22				
Premarital sex				
Yes	11.92**	5.09–27.86	1.96	0.48–7.99
No				
Saw pornographic material				
Yes	6.43**	2.88–14.38	1.61	0.57–4.51
No				
Ever had a STD symptom				
Yes	2.20	0.39–12.38		
No				
Ever had an HIV test				
Yes	1.49	0.77–2.90		
No				

OR odds ratio, *UOR* unadjusted odds ratio, *AOR* adjusted odds ratio, *CI* confidence interval

* $p < 0.05$,

** $p < 0.01$

Table 5

Logistic regressions analysis of factors for engaging in sex with sex workers

	UORs	95% CI UORs	AORs	95% CI AORs
Education				
Less than high school	6.15	0.62–61.09		
High school and up				
Travel to outside area				
Yes	2.54	0.79–8.11		
No				
Marital status				
Unmarried	5.98**	2.26–15.81	4.36**	1.58–12.02
Married				
Current employment				
Unemployed	4.46**	1.51–13.16	2.24	0.71–7.09
Employed				
Age at first sexual intercourse				
<22	3.80**	1.67–8.66	2.73*	1.13–6.58
≥22				
Ever had an HIV test				
Yes	1.55	0.69–3.48		
No				

OR odds ratio, *UOR* unadjusted odds ratio, *AOR* adjusted odds ratio, *CI* confidence interval

* $p < 0.05$,

** $sp < 0.01$

Table 6

Logistic regression analysis of factors for engaging in unprotected sex (non-consistent condom use) with non-regular partners

	UORs	95% CI UORs	AORs	95% CI AORs
Gender				
Male	4.06**	1.66–9.93	1.70	0.58–5.01
Female				
Education				
Less than high school	4.54*	1.07–19.28	2.41	0.43–13.52
High school and up				
Marital status				
Unmarried	6.60**	2.77–15.74	4.54*	1.36–15.16
Married				
Current employment				
Unemployed	1.51	0.54–4.34		
Employed				
Age at first sexual intercourse				
<22	2.16	0.98–4.77		
≥22				
Premarital sex				
Yes	5.72**	2.23–14.65	2.01	0.47–8.66
No				
Saw pornographic material				
Yes	4.97**	1.83–13.52	1.42	0.49–4.12
No				
Ever had a STD symptom				
Yes	4.38	0.77–25.11		
No				
Ever had an HIV test				
Yes	2.43*	1.09–5.39	1.47	0.67–3.22
No				

OR odds ratio, *UOR* unadjusted odds ratio, *AOR* adjusted odds ratio, *CI* confidence interval

* $p < 0.05$,

** $p < 0.01$