



Published in final edited form as:

J Acquir Immune Defic Syndr. 2005 August 15; 39(5): 581–586.

HIV Infection and Risk Characteristics Among Female Sex Workers in Hanoi, Vietnam

Trung Nam Tran, MD, PhD^{*}, Roger Detels, MD, MS^{*}, Hoang Thuy Long, MD, PhD[†], Le Van Phung, MD, PhD[‡], and Hoang Phuong Lan, MD[§]

^{*} Department of Epidemiology, University of California, Los Angeles, School of Public Health, Los Angeles, CA

[†] National Institute of Hygiene and Epidemiology, Hanoi, Vietnam

[‡] Central Laboratory of Medicine and Biology, Hanoi Medical University, Hanoi, Vietnam

[§] Hanoi Dermatology and Venerology Center, Hanoi Health Department, Hanoi, Vietnam

Summary

The prevalence of HIV/sexually transmitted diseases (STDs) was determined, the risk characteristics examined, and factors associated with HIV infection identified among noninstitutionalized female sex workers (FSWs), using a cross-sectional survey with 2-stage cluster sampling. Four hundred FSWs were interviewed face to face using a structured questionnaire and tested for HIV, syphilis, *Chlamydia* infection, and gonorrhea. HIV seroprevalence was 12%, syphilis 17% (using the treponemal pallidum hemagglutination assay), *Chlamydia* infection 3.8% (using polymerase chain reaction [PCR]), and gonorrhea 6.3% (PCR). Lower-class FSWs averaged 2 clients per day, and middle-class FSWs about 1.2. Median duration in sex work was 2.3 years. Consistent condom use was 63% with irregular clients, 41% with regular clients, and only 4.8% with “love mates.” Fifty-five percent had had sex with a drug user(s). Thirty-eight percent used drugs, of whom 83% injected. Factors associated with HIV included being young, having a low level of education, longer residence in Hanoi, being a lower-class FSW, having higher income compared with peers, perception of self being at low risk for HIV, poor knowledge of HIV, and sharing injecting equipment. Intervention strategies should include reduction of both stigmatization and sharing of drug paraphernalia, promotion of nonstigmatizing voluntary testing and counseling, and aggressive marketing and promotion of condoms.

Keywords

HIV; sex workers; drug use; correlates; Vietnam

Despite well-documented and successful HIV prevention programs in a few countries, the HIV epidemic continues to spread in Asia and the Pacific. In fact, the region had the 2nd highest number of people living with HIV/AIDS after sub-Saharan Africa—an estimated 7.4 million HIV/AIDS cases at the end of 2003, including more than 1 million adults and children who were newly infected in that year.¹ Many of the countries in this region are experiencing high HIV infection rates, mainly among injecting drug users (IDUs) and

female sex workers (FSWs). High-risk behaviors are common in the general populations in many of these countries.^{1–7}

Vietnam, a Southeast Asian country, has also experienced a dramatic increase in HIV infections. According to Vietnam's Ministry of Health, by January 2004, the cumulative number of HIV-infected people reported by 61 provinces throughout the country was 77,088, of whom 11,758 were AIDS patients and 6635 who had died. In 2002 alone, 12,540 new infections were detected nationwide.⁸ The results of HIV sentinel surveillance in 30 provinces in Vietnam indicate that even though the HIV epidemic is in the concentrated stage, HIV continues to increase in all surveillance population groups. HIV prevalence among IDUs increased from 9.4% in 1996 to 29.3% in 2002. Among sexually transmitted disease (STD) patients and army conscripts, HIV prevalence increased from 0.5 and 0% in 1994 to 2 and 0.7% in 2002, respectively. Among pregnant women, the prevalence increased from 0.03% in 1995 to 0.39% in 2002. In Ho Chi Minh City, the prevalence among FSWs increased from 3.1% in 1998 to 24.3% in 2002 and in Hanoi from 2.5% in 1998 to 14.5% in 2002.^{9,10} It has been reported that FSWs in Hanoi and Ho Chi Minh City are using drugs and that there are social interactions between drug users and FSWs.^{11–14}

The recent rapid rise of HIV infection rates among FSWs in Hanoi and other cities in Vietnam raises serious concerns about the spread of HIV from them to the general community, as occurred in Thailand.¹⁵ In Vietnam, prostitution is illegal, and the government has issued many decrees and resolutions to control it. Along with drug use, commercial sex is considered a “social evil” that comes under jurisdiction of the Department of Social Evils Control within the Ministry of Labor, War Invalid, and Social Affairs (MOLISA). In Vietnamese society, prostitution has long been viewed as a degradation of morality, a factor in the disintegration of the traditional family, and a threat to public health.¹⁶ The stigmatization and outlaw status of the sex workers, however, have created enormous challenges and obstacles to identifying, approaching, and delivering interventions to this high-risk group. Thus, there have been few studies among FSWs. Further, most research among FSWs has been conducted among subjects in rehabilitation centers, who might not be representative of the general FSW population.^{16–19} To date, HIV and STD rates are not documented for the general FSW population (outside of rehabilitation centers in Hanoi). We conducted a cross-sectional study among working FSWs in Hanoi in 2002 to examine their HIV/STD risk characteristics. This quantitative study was based on our prior qualitative study among FSWs in Hanoi.¹³ Here we report the prevalence of HIV and different STDs among working FSWs not in rehabilitation centers in Hanoi, their knowledge levels of HIV, risk behaviors and practices, as well as the correlates of HIV infection.

METHODS

Subjects and Procedures

From June to September 2002, 400 FSWs working in the community in Hanoi were recruited in a cross-sectional survey using 2-stage cluster sampling. In the first stage, the outreach workers identified and mapped a total of 832 sex establishments/venues, including both establishment- and street-based locations, in one suburban and all urban districts of Hanoi. The establishments included karaoke bars, hotels, massage parlors, guest houses, and coffee shops. The street-based locations included streets, parks, and around the lakes, where the sex workers recruit their clients. Participants who work in establishment- and street-based locations are classified as middle- and lower-class sex workers, respectively. We then used this map as a sampling frame for randomly selecting 80 clusters (40 each from establishment- and street-based groups). In the 2nd stage, the outreach workers approached individuals in the selected clusters, described the study to them, and invited all potential eligible subjects at each cluster to participate. The only inclusion criterion was that the

subject was an FSW in Hanoi who had traded sexual intercourse for money or gifts within the past 30 days.

Subjects were invited to the study center located in the Hanoi Center for Dermatology and Venerology, which serves both STD patients and those with other skin-related conditions. Locating the study clinic in that facility offered some anonymity and helped reduce their apprehension and fear of stigmatization. At the center, subjects were interviewed face to face, using a pretested structured questionnaire. Interviewers were all female medical doctors, who were carefully trained about the questionnaire and interviewing techniques. After the interview, the participant was initially tested for HIV by an HIVoral fluid quick test. Five milliliters of venous blood were drawn for syphilis and HIV-1 testing, and 15 mL of first-void urine were collected for *Chlamydia* and gonorrhea testing. If the subject did not want to go to the center, a mobile team went to a place she selected to conduct the interview and obtain the specimens. Participants could decide whether to obtain their HIV and STD test results. If they wanted to know their results, they could either go in person or call the center. They were also offered appropriate counseling after receiving their test results. The study was conducted with the understanding and consent of each participant and was approved by the institutional review boards of the University of California, Los Angeles, and the Vietnam National Institute of Hygiene and Epidemiology.

Laboratory Tests

Since it was possible that subjects might not give blood for HIV testing, we first used the HIV oral fluid quick test (OraQuick Rapid HIV 1+2, OraSure Technologies, Inc., Bethlehem, PA). HIV-1 antibodies were detected in serum using an enzyme-linked immunosorbent assay (ELISA) test (Bio-Rad Laboratories, Marnes-la-Coquette, France). ELISA positives were confirmed by an agglutination test (SFD HIV-1/2, BioRad Laboratories) and an ELISA (Organon Teknika, Durham, NC), according to strategy III of the World Health Organization.²⁰ We tested all sera with *Treponema pallidum* hemagglutination assay (TPHA; Sanofi Diagnostics Pasteur, Paris, France) and rapid plasma reagin (RPR; Sanofi Diagnostics Pasteur) for syphilis. If a specimen was positive by RPR, it was diluted to measure the titer. Subgroups were defined for the markers of syphilis: TPHA positivity was regarded as a lifetime marker of past or present syphilis infection, both TPHA and RPR positivity an indicator of active syphilis, and TPHA positivity and an RPR titer of $\geq 1/8$ as an indicator of high-titer active syphilis.²¹ *Neisseria gonorrhoea* and *Chlamydia trachomatis* were detected in urine by polymerase chain reaction (PCR), according to a previously described method.²² Except for the HIV quick test, which was conducted at the study site, all other tests were performed at the Central Laboratory of Medicine and Biology at the Hanoi Medical University.

Statistical Analysis

Data were entered using Epi Info 6.04d and analyzed using STATA 7 (STATA, Inc., College Station, TX). Comparisons between groups were performed using the χ^2 or Fisher exact tests for proportions and the student's *t* test for continuous variables. Multivariate logistic regression was used to examine the associations of independent variables with the outcome, simultaneously adjusting for potential confounders. Confidence intervals of the prevalence odds ratios (ORs) were adjusted for the design effects of the stratified cluster sampling. Variables were selected into the multivariate model based on prior knowledge. If there was no prior knowledge, variables were selected depending on how much their presence/absence affected the confidence intervals of other variables in the model. A 10% cutoff was used.

RESULTS

General Characteristics

Table 1 summarizes the general characteristics of the study sample. Of the 400 study participants, 160 (40%) were middle-class sex workers who worked in karaoke bars, hotels, massage parlors, guest houses, or dance clubs or stayed home and waited for calls from the above establishments (wholesale service girls). The remainder (60%) were lower-class FSWs who worked on the street or in brothels. The mean and median ages of subjects were 30.4 and 28.5 years, respectively, with age ranging from 16–56 years. Seventy-eight percent of subjects had attended secondary school or higher. The majority of subjects worship ancestors and do not follow any organized religion (65%). Most subjects were of Kinh (Vietnamese) ethnicity (96%). The majority was either living with boyfriends or alone (43 and 47%, respectively). Three-quarters (76%) of the subjects reported a moderate income, and only 6% said they had a high income compared with other sex workers. A total of 140 subjects (35%) supplemented their income with extra jobs. The others depended entirely on sex work for their income. Only 27% of the studies FSWs were native to Hanoi, with the remainder coming from all over the country, but mostly from the northern provinces. The mean and median ages at first sexual experience were both 19 years (range 12–33).

Prevalence of HIV, Syphilis, Gonorrhea, and *Chlamydia* Infection

Among the 400 study participants, 392 (98%) gave a blood specimen, and 399 (99.8%) subjects underwent the HIV oral fluid quick test. When comparing the results of the 2 HIV tests among those who underwent both (391) and considering the blood test to be the gold standard, the quick test's sensitivity and specificity were $42/45 = 93.3\%$ and $345/346 = 99.7\%$, respectively. The positive and negative predictive values were $42/43 = 97.7\%$ and $345/348 = 99.1\%$, respectively. Of the 8 participants who did not give a blood specimen, 6 were negative and 2 were positive according to the HIV quick test. Since the quick test had very high positive and negative predictive values, we substituted its results for the missing blood tests in this study. Using this substitution, there were 47 HIV positives, accounting for 12% of participating FSWs (95% CI: 8.6–15). The HIV prevalence among injecting drug users was 33% (95% CI: 25–41), 3.9% (95% CI: 0–12) among noninjecting drug users, and 1.6% (95% CI: 0–3.2) among non-drug-using FSWs. The HIV prevalence among those who had entered rehabilitation centers previously was 17% (95% CI: 7.2–27), compared with 11% (95% CI: 7.5–14) among those who had not.

Sixty-six of 392 subjects (17%, 95% CI: 13–21) were positive by TPHA. Twenty-seven subjects (7%, 95% CI: 4.5–10) had active syphilis (TPHA+/RPR+), and only 5 subjects (1.3%, 95% CI: 0.4–3.0) had high-titer active syphilis (TPHA+/RPR titer $\geq 1/8$). Fifteen of 397 (3.8%, 95% CI: 1.9–5.7) and 25 of 397 (6.3%, 95% CI: 3.9–8.7) participants were positive for gonorrhea and *Chlamydia* PCR testing, respectively. Ninety (23%, 95% CI: 19–27) of the FSWs were positive for syphilis, gonorrhea, and/or *Chlamydia* infection.

Knowledge of HIV and Self-Perceived Risk

To assess participants' knowledge of HIV infection, we developed a set of 10 questions (Table 2). For scoring, we gave 1 point for each correct response and no points for an incorrect or "do not know" response. The sum of the score represents the subject's knowledge level of HIV and its transmission. The coefficient alpha (Cronbach alpha) of these questions was 0.68. About half (53%) of the subjects correctly answered at least 8 questions. On average, each question was answered correctly by 74% of the subjects; however, only 31% of the subjects recognized that their faithfulness to their partners is not enough to protect them from infection, due to the risk of infection from their partners. Participants showed less understanding of noninfectious than infectious routes. Only 68% of

the participants knew that mosquitoes, diet, and sharing public toilets do not transmit HIV infection, compared with 78% who identified HIV infection risks as resulting from having more sex partners, unsafe sex, sharing drug-injecting equipment, and having STDs ($P = 0.001$).

Of the participants, 11, 23, 21, 36, and 9%, respectively, rated themselves into high, medium, low, no risk, and “do not know” risk categories. When looking more carefully at those who perceived having no risk of HIV infection (145/400), 24 and 51% used condoms inconsistently with irregular and regular clients, respectively. Twenty-three percent of the FSWs who perceived themselves not to be at risk had a laboratory-confirmed STD; 52% of them reported having signs and symptoms of an STD, 21% injected drugs, and 11% had borrowed used drug-injecting equipment. This clearly indicates that there are misconceptions of vulnerability for HIV among FSWs.

Sexual Risk Characteristics

Clients' characteristics and the average number per day for middle- and lower-class FSWs are presented in Table 3. Men aged 31–40 years (59%) and middle-class office workers (54%) were the most frequent client group for the middle-class FSWs. For the lower-class FSWs, men aged 41–60 years and “migrant workers and simple laborers” were their most frequent client groups, at 45 and 41%, respectively. A lower-class FSW generally reported 2 clients per day, while a middle-class FSW reported about 1.2 clients per day ($P = 0.0001$). HIV-infected FSWs served more clients than noninfected FSWs. The mean numbers of clients served by each of these groups in the last working month were 52 and 40, respectively ($P = 0.01$). On average, a middle-class FSW charged VND 200,000 (\$US 13.20) and VND 310,000 (\$US 20.60) for quick sex with irregular and regular clients, respectively, which was much higher than for a lower-class FSW (VND 40,000 (\$US 2.70) and VND 53,000 (\$US 3.60), respectively).

The median duration in sex work was 2.3 years and ranged from 1 month to 21 years. Of the participants, 220 (55%) had had sex with a drug user(s). A total of 109 subjects (27%) did not know whether their partners used drugs. Condom use during the last sex act with irregular clients was high (94%), lower with regular clients (78%), and very low with husbands or boyfriends (16%). The proportions of FSWs who always use condoms (100% usage) with irregular, regular clients, and love mates (husbands/boyfriends) in the last month were lower: 63, 41, and 4.8%, respectively.

Drug Use

In this study sample, 153 (38%) used drugs. Lower-class FSWs were more likely than middle-class FSWs to use drugs (46 vs. 27%; $P = 0.0001$). However, among the drug-using FSWs, up to 83% injected drugs (representing 32% of all the FSWs). The prevalence of injecting did not differ greatly between drug-using middle- and lower-class FSWs (79 vs. 85%; $P = 0.42$). Sharing of injecting equipment was defined as using (borrowing) equipment previously used by others. Among those who injected drugs (127), 81 (64%) had shared (representing 20% of all the FSWs). Sharing of needles and syringes was more common among lower than middle-class FSWs (69 vs. 50%; $P = 0.05$).

HIV Testing and Counseling

Among the study participants, 134 (34%) had had an HIV test, but only 60 subjects (15%) had been voluntarily tested. Among those who were tested for HIV, 107 (80%) knew their test results, but only 14 and 11% had had pre- and posttest counseling, respectively. More than one-third (36%) of those who responded cited stigmatization-related reasons for being unwilling to be tested. Thirty percent of the responding subjects thought that the test's cost

and inconvenience were an impediment. One-third of the subjects (34%) did not test for HIV because they thought they were risk-free.

Correlates of HIV Infection Among Female Sex Workers

Multivariate logistic regression analyses demonstrated a number of factors that were independently associated with HIV seropositivity (Table 4), including young age, low education (grade 7 or less), longer residence in Hanoi, being lower class, having high income compared with peers, perceiving oneself to be at low risk for HIV, very poor knowledge of HIV (lowest scores on HIV knowledge questions), consistent condom use with regular clients, and sharing of injecting equipment. Other factors such as having a STD, inconsistent condom use with irregular clients and love mates, religion, cohabitation status, having other occupations, age at first sexual experience, number of clients, and drug use of love mates were not found to be associated with HIV infection.

DISCUSSION

HIV infection is prevalent among FSWs in Hanoi. HIV prevalence among those who had previously entered rehabilitation centers was 17%. This prevalence was higher than that found previously in HIV serosentinel surveillances (in Hanoi rehabilitation centers) in 2000 (10%), 2001 (11.5%), and 2002 (14.5%). The rate among previously incarcerated FSWs in our study was 6% higher than among those never incarcerated, suggesting that the true prevalence observed in rehabilitation centers may overestimate the prevalence in FSWs.

Our results suggest that sharing injecting equipment is the primary cause of the rapid increase of HIV infection among the FSW population in Hanoi (OR = 32; 95% CI: 9.2–109). Drug injection is a unique characteristic of the FSWs in Vietnam and differentiates the HIV epidemic from the rest of the southeast Asian region, although informal reports suggest that FSWs in southern China may also be injecting (R. Detels, personal communication). Our study confirmed prevalent drug use and injection practices among both middle- and lower-class FSWs in Hanoi.^{11,13} The majority (64%) of drug-injecting FSWs in our study shared needles and syringes. The combination of drug use and sex work in this population of FSWs not only puts them at very high risk but also makes them an important source of infection to others. HIV prevalence was only 1.6% among non-drug-using FSWs compared with 33% among injectors, indicating that the sexual risk for HIV among FSWs was much lower than the injecting risk. Thus, FSWs who inject drugs should be a major focus of intervention efforts. However, there are many difficulties in implementing interventions for this particular group of FSWs. Being both sex workers and drug users, they face even greater stigmatization, which isolates them from the rest of society and even from their sex-working peers. Low social status, feelings of inferiority, and stigmatization make this group of FSWs often less concerned about their potential infection risks (eg, low condom use with regular clients and private partners and sharing of injecting equipment) and harder to reach with intervention messages.¹³ Intervention should promote their self-image, reduce stigmatization, and reduce their risk behaviors.

In our study, condom use with irregular clients was not found to correlate with HIV infection, which could be due to frequent condom use with their clients. Subjects who always used condoms with regular clients were more likely to be HIV infected. It is likely that many infected FSWs know that they are infected or suspect it, and therefore use condoms to avoid infecting their known clients. Interestingly, subjects who considered themselves to have higher income compared with their peers were also more likely to be infected. Those who perceived themselves as having a higher income were younger than those who considered themselves to have low incomes. The mean ages of the high and medium income groups were 27 and 29 years, respectively, compared with 36 years in the

low income group ($P = 0.0003$ and $P < 0.0001$, respectively). Similar to findings from other studies,^{14,18} young and lower-class FSWs with a low level of education and poor knowledge of HIV/AIDS are a very vulnerable group for HIV infection. Many of them come from rural areas and have little education and knowledge of city life, making them extremely vulnerable to unsafe sex and drug involvement. The longer they work, the more they are exposed to drugs and drug users. Further, as found in our previous qualitative study, once they begin injecting drugs, they lose direction, give up, and are less concerned about their potential risks.¹³ Their powerlessness and poor understanding of their own risk probably also make them more likely to engage in high-risk drug use and unsafe sexual practices. HIV/AIDS intervention strategies must pay special attention to this group of FSWs and find appropriate ways to approach and deliver effective interventions. The best intervention would be to prevent young women from becoming sex workers. This can only be possible if living standards in rural areas are improved, so that daughters of poor families are not forced to turn to sex work for survival. In addition, the power relationship between women and men needs to be changed. Innovative intervention strategies that rely less on the individual power of FSWs, such as interventions for clients of FSWs or interventions including primary sexual partners of FSWs, are also needed.

HIV-positive FSWs are still working in the community. Our study indicates that many do not know their infection status, engage in high-risk behaviors and practices, and perceive themselves to be at low risk for HIV infection. They are likely to be spreading the virus to their clients and sexual and injecting partners. Among the 47 HIV-positive FSWs in our study, only 15 (32%) knew their infection status, and 21 (45%) reported having lent their used injecting equipment to other injecting partners in the past 6 months. Further, HIV-infected FSWs have even more clients than the noninfected FSWs.

Few of the FSWs tested received appropriate counseling. Further, less than half among those tested had been voluntarily tested. The lack of an effective voluntary counseling and testing system is one of the factors contributing to the spread of HIV. Early knowledge of HIV infection is now recognized as a critical component for controlling the spread of HIV infection.²³ Many studies have demonstrated that many infected persons decrease behaviors that transmit infection to sex or drug-sharing partners once they are aware of their positive HIV status.^{24–27} Other studies have shown that HIV-infected persons who are unaware of their infection do not reduce risk behaviors.^{28,29} Clearly, the development of an effective, accessible, and reliable testing and counseling system for HIV in Vietnam is urgently needed. However, stigmatization and lack of treatment are important factors that discourage people from seeking voluntary counseling and testing and must be addressed.

There are a number of limitations to the study. We were unable to enumerate the number of potential participants at all the selected establishments (middle class) and street corners or parks (lower class). Thus, we were not able to obtain the actual participation rate. It is possible that we did not enroll every potential participant at some clusters. Those who participated may be different from those who did not, which could make the study sample unrepresentative of the general FSW population.

Vietnam is in a critical period. HIV is spreading rapidly among the risk groups, but the country can prevent a widespread epidemic if it acts quickly. The country must take the opportunity to act wisely and to make sound decisions. Strategies to reduce HIV in FSWs should include reduction of stigmatization, reduction of sharing drug paraphernalia, promotion of nonstigmatizing voluntary counseling and testing, and aggressive marketing and promotion of condoms. To achieve these goals, the government should adopt a multisectoral response that includes other government agencies, nongovernment organizations, and the vulnerable populations.

Acknowledgments

The authors thank Dr. Nguyen Tran Hien, Mr. Nguyen Anh Tuan, the outreach workers, and the staffs of the Hanoi Dermatology and Venerology Center and DKT Vietnam for their valuable support and contributions to the conduct of the study, and Wendy Aft for preparation of this manuscript.

Supported by a grant from the National Institutes of Health/Fogarty International Center (#TW00013).

References

1. UNAIDS/WHO. AIDS Epidemic Update 2003 :18–22.
2. Gorbach PM, Ryan C, Saphonn V, et al. The impact of social, economic and political forces on emerging HIV epidemics. *AIDS* 2002;16(Suppl 4):S35–S43. [PubMed: 12698998]
3. Gupta P, Kingsley L, Sheppard H, et al. High incidence and prevalence of HIV-1 infection in high-risk population in Calcutta, India. *Int J STD AIDS* 2003;14:463–468. [PubMed: 12869226]
4. Ryan CA, Vathiny OV, Gorbach PM, et al. Explosive spread of HIV-1 and sexually transmitted diseases in Cambodia. *Lancet* 1998;351:1175. [PubMed: 9643690]
5. Saengwonloey O, Jiraphongsa C, Foy H. Thailand report: HIV/AIDS surveillance 1998. *J Acquir Immune Defic Syndr* 2003;32:S63–S67. [PubMed: 12571517]
6. Thuy NT, Lindan CP, Phong TH, et al. Predictors of visits to commercial sex workers by male attendees at sexually transmitted clinics in southern Vietnam. *AIDS* 1999;13:719–725. [PubMed: 10397567]
7. World Health Organization (WHO). STD/HIV/AIDS Surveillance Report. Regional Office Western Pacific, Region #10; 1997. p. 12-19.
8. AIDS Committee. HIV/AIDS Monthly Report. Hanoi, Vietnam: Ministry of Health; 2003.
9. United Nation General Assembly Special Session on HIV/AIDS: UNGASS. Country Report on Follow-up to the Declaration of Commitment on HIV/AIDS, Reporting. Period January–December, 2002. 2003
10. Subcommittee on HIV/AIDS Surveillance. HIV Sentinel Surveillance Report. Hanoi, Vietnam: Ministry of Health; 2003.
11. National AIDS Standing Bureau (NASB), Family Health International (FHI). HIV/AIDS Behavioral Surveillance Survey, Vietnam 2000. Hanoi, Vietnam: 2001.
12. Tran NT, Detels R, Hien TN, et al. Drug use, sexual behaviors and practices among male drug users in Hanoi, Vietnam: a qualitative study. *Int J Drug Policy* 2004;15:182–188.
13. Tran NT, Detels R, Hien TN, et al. Drug use, sexual behaviors and practices among female sex workers in Hanoi, Vietnam: a qualitative study. *Int J Drug Policy* 2004;15:189–195.
14. Tuan NA, Hien NT, Chi PK, et al. Intravenous drug use among street-based sex workers: a high-risk behavior for HIV transmission. *Sex Transm Dis* 2004;31:15–19. [PubMed: 14695953]
15. Weniger BG, Limpakarnjanarat K, Ungchusak K, et al. The epidemiology of HIV infection and AIDS in Thailand. *AIDS* 1991;5(Suppl 2):71–85.
16. Rekart LM. Sex in the city: sexual behavior, societal change, and STDs in Saigon. *Sex Transm Infect* 2002;78(Suppl 1):i47–i54. [PubMed: 12083447]
17. Hong, KT.; Van, NT.; Phuong, LT., et al. Sex workers in northern provinces of Vietnam: social aspects and risk behavior related to STDs and HIV/AIDS. Hanoi, Vietnam: National AIDS Committee, UNDP, Institute of Sociology; 1997.
18. Thuy NT, Nhung VT, Thuc NV, et al. HIV infection and risk factors among female sex workers in southern Vietnam. *AIDS* 1998;12:425–432. [PubMed: 9520173]
19. Thuy NT, Lindan CP, Hoan NX, et al. Sexual risk behavior of women in entertainment services in Vietnam. *AIDS Behav* 2000;4(Suppl 1):93–101.
20. World Health Organization. Global Program on AIDS. 1992. WHO/GPA/INF/93.2
21. Todd J, Munguti K, Grosskurth H, et al. Risk factors for active syphilis and TPHA seroconversion in a rural African population. *Sex Transm Infect* 2001;77:37–45. [PubMed: 11158690]

22. Mahony JB, Jang D, Chong S, et al. Detection of *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, *Ureaplasma urealyticum*, and *Mycoplasma genitalium* in first-void urine specimens by Multiplex polymerase chain reaction. *Mol Diagn* 1997;2:161–167. [PubMed: 10462605]
23. Valdiserri RO, Holtgrave DR, West GR. Promoting early HIV diagnosis and entry into care. *AIDS* 1999;13:2317–2330. [PubMed: 10597773]
24. Cleary PD, Van Devanter N, Rogers TF, et al. Behavior changes after notification of HIV infection. *Am J Public Health* 1991;81:1586–1590. [PubMed: 1746654]
25. Doll LS, O'Malley PM, Pershing AL, et al. High-risk sexual behavior and knowledge of HIV antibody status in the San Francisco City Clinic Cohort. *Health Psychol* 1990;9:253–265. [PubMed: 2340817]
26. Rhodes, F.; Malotte, CK. HIV risk interventions for active drug users. In: Oskamp, S.; Thompson, S., editors. *Understanding HIV Risk Behavior: Safer Sex and Drug Use*. Thousand Oaks, CA: Sage Publications; 1996. p. 297-336.
27. Rietmeijer CA, Kane MS, Simons PZ, et al. Increasing the use of bleach and condoms among injecting drug users in Denver: outcomes of a targeted, community-level HIV prevention program. *AIDS* 1996;10:291–298. [PubMed: 8882669]
28. Desenclos JC, Papaevangelou G, Ancelle-Park R. Knowledge of HIV serostatus and preventive behavior among European injecting drug users. *AIDS* 1993;7:1371–1377. [PubMed: 8267911]
29. Wenger NS, Kusseling FS, Beck K, et al. Sexual behavior of individuals infected with the human immunodeficiency virus: the need for intervention. *Arch Intern Med* 1994;154:1849–1854. [PubMed: 8053754]

TABLE 1

Demographic Characteristics of the Study Sample

	Characteristics	n (%)
Age (ys)	≤20	44 (11)
	21–25	93 (24)
	26–30	81 (20)
	31–40	109 (27)
	>40	73 (18)
Education	No School	11 (3)
	Primary	75 (19)
	Secondary	216 (54)
	High School	86 (21)
	College or Postgraduate	12 (3)
Religion	Buddhist	77 (19)
	Catholic	13 (3)
	Ancestor worship	257 (65)
	No religion	53 (13)
Ethnicity	Kinh	383 (96)
	Others	17 (4)
Cohabitation	With husband	26 (7)
	With boyfriend	171 (43)
	With both	14 (3)
	With no male partner	189 (47)
Place of work	Karaoke/barbershop/hotel	138 (34)
	Wholesale service	15 (3.8)
	Street, parks	232 (58)
	Dancing clubs	1 (0.2)
	Brothels	8 (2.0)
	Others	6 (2.0)
Income levels compared to peers	High	23 (6)
	Medium	304 (76)
	Low	73 (18)
Have another occupation	Yes	140 (35)
	No	260 (65)
Place of origin	Hanoi	107 (27)
	Other provinces	293 (73)

TABLE 2

Proportion of Study Population Correctly Answering Each Knowledge Question

Questions	n (%)
1. HIV is not transmitted by mosquito bites	294 (74)
2. If an IDU shares syringes with only 1 partner, he or she is not at risk through injecting	326 (82)
3. Having a good diet can protect you from infection	262 (66)
4. If you have sex with only 1 person, you will not get HIV	122 (31)
5. Avoiding using public toilets will decrease your risk	252 (63)
6. Having fewer sex partners will decrease your risk	364 (91)
7. Sharing with new drug users is safe from infection	332 (83)
8. Once you already share syringes, you are not at risk of infection through other routes	325 (81)
9. Because the infection risk per single sex act is small, it is not necessary to always use condoms to prevent HIV/AIDS	358 (90)
10. Having an STD increases your risk of infection through the sexual route	338 (85)

TABLE 3

Client Characteristics and Average Number per Day by Class of FSWs

	Class of FSWs		
	Middle Class	Lower Class	Total
Most frequently served age group of clients	n (%)	n (%)	n (%)
<20	1 (0.6)	1 (0.4)	2 (0.5)
20–30	16 (10)	34 (14)	50 (12)
31–40	94 (59)	92 (38)	186 (47)
41–60	49 (31)	108 (45)	157 (39)
>60	—	5 (2)	5 (1)
Most frequently served types of clients			
Migrant workers and simple laborers	2 (1.2)	98 (41)	100 (25)
Middleclass (blue and white collar) workers	87 (54)	64 (27)	151 (38)
Wealthy official-looking men	36 (23)	2 (0.8)	38 (9.6)
Businessmen	22 (14)	44 (19)	66 (17)
Foreigners	7 (4.4)	2 (0.8)	9 (2.3)
Others	6 (3.7)	27 (11)	33 (8.3)
Average number of clients per day	1.2	2	1.7

TABLE 4

Multivariate Logistic Regression for Correlates of HIV Seropositivity Among FSWs in Hanoi

Adjusted ORs and 95% CIs*	
Income levels compared to peers	
High	278 (9–8465)
Medium	10 (1.2–82)
Low	1
Borrowed used injecting equipment	
Yes	32 (9.2–109)
No	1
Self-perceived risk	
No idea	1.3 (0.1–14)
High risk	2.0 (0.4–10)
Medium risk	1.6 (0.3–7.2)
Low risk	9.7 (2–47)
No risk	1
Condom use with regular clients	
Always	7.7 (2.5–23)
Not always	1
Class of FSWs	
Lower class	6.0 (1.7–21)
Middle class	1
Knowledge of HIV (score)	
≤5	4.3 (1–19)
6–7	1.9 (0.7–5.2)
8	2.1 (0.7–6.6)
9–10	1
Education	
Grade 7 or less	3.4 (1.0–11)
Grade 8 or more	1
Longer vs. shorter residency in Hanoi (5 years' difference)	1.3 (1.1–1.6)
Younger vs. older age	1.2 (1.1–1.4)

* Adjusted for stratified cluster sampling's design effect.