Published in final edited form as:

AIDS. 2009 August 24; 23(13): 1765–1771. doi:10.1097/QAD.0b013e32832f08a1.

Correlates of HIV, STIs and Associated High Risk Behaviors among Male Clients of Female Sex Workers in Tijuana, Mexico

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Abstract

Objectives—To determine sociodemographic and behavioral correlates of HIV infection among male clients of FSWs in Tijuana.

Methods—400 men aged 18 or older who had paid or traded for sex with a FSW in Tijuana during the past 4 months were recruited in Tijuana’s “zone of tolerance,” where prostitution is practiced openly under a municipal permit system. Efforts were made to balance the sample between residents of the U.S. (San Diego County) and of Mexico (Tijuana). Participants underwent interviews and testing for HIV, syphilis, gonorrhea, and Chlamydia. Logistic regression identified correlates of HIV infection.

Results—Mean age was 36.6. One quarter had injected drugs within the previous 4 months. Lifetime use of heroin, cocaine and methamphetamine was 36%, 50% and 64%, respectively. Men had frequented FSWs for an average of 11 years, visiting FSWs an average of 26 times last year. In the past four months, one half reported having unprotected sex with an FSW; 46% reported frequently being high when having sex with an FSW. Prevalence of HIV, syphilis, gonorrhea, and Chlamydia was 4%, 2%, 2.5% and 7.5%; 14.2% were positive for at least one infection. Factors independently associated with HIV infection were living in Mexico, ever using methamphetamine, living alone, and testing positive for syphilis.

CONFLICT OF INTEREST STATEMENT: The authors have no conflicts of interest to declare.

PRESENTATION OF RESULTS: Preliminary results of this research were presented as a poster at the Harm Reduction 2009 Conference in Bangkok, Thailand, in April, 2009. The poster abstract was published as #939 in the conference proceedings volume.

AUTHOR CONTRIBUTIONS: All authors read and commented on drafts of the article and assisted in interpreting results. In addition, Patterson supervised the analysis and interpretation of the data and co-drafted the article; Goldenberg supervised data collection; Gallardo and Lozada provided institutional support for subject recruitment and data collection; Orozovich co-supervised data collection; Semple contributed to the statistical analyses and co-drafted the article; Abramovitz performed the statistical analyses; Strathdee assisted in study design, interpretation of results and manuscript writing and revision.

Conclusions—Male clients of FSWs in Tijuana had a high sex and drug risk profile. While STI prevalence was lower than among FSWs, HIV prevalence was comparable, suggesting the need for interventions among clients to prevent spread of HIV and STIs.

Keywords

male clients; HIV sexual risk behavior; STI sexual risk behavior; prostitution; HIV seroprevalence

INTRODUCTION

Tijuana, located in northwestern Mexico, has a thriving sex industry and is a popular destination for U.S. and foreign sex tourists [1]. The city's Municipal Health Service licenses female sex workers (FSWs) on condition that they be tested regularly for HIV and STIs. However only about 5,000 FSWs are licensed of an estimated 9,000 FSWs [2]. In recent years, Tijuana has experienced alarming increases in HIV prevalence and incidence among FSWs [1,3]. Baja California has the second highest cumulative AIDS incidence of any Mexican state [4]. In 2006, HIV prevalence among FSWs in Tijuana rose from <1% to 6% [1]. The same year, it was estimated that as many as one in 116 persons aged 15–49 in Tijuana was HIV-infected [5]. Male clients of FSWs have been recognized as a possible 'bridge' for transmitting STIs to other sex partners including their wives [6,7] and other FSWs, but data are scarce on HIV prevalence and risk behaviors among this subgroup, especially in the Americas.

Existing literature on male clients of FSWs worldwide documents generally high STI prevalences. Of 378 male clients of FSWs in Haiti, prevalence was as follows: HIV was 7.2%; syphilis 13.4%; and HSV-2 was 22%. Clients also reported high sexual risk profiles: only 59% of clients reported always using condoms with an FSW, whereas 32.8% did so with their stable partners, and 44.9% with casual partners. Clients who had tried marijuana, were practicing Voodoo, had a history of STI, or were HSV-2 infected were more often HIV-positive [8]. Xu, Wang et al [9] gathered data on HIV and STIs among 339 clients of FSWs in mining regions of Gejiu City, China, and found that HIV prevalence was 1.8%, HSV-2 14.9%, syphilis 2.4%, *N. gonorrhoeae* 2.1%, *C. trachomatis* 6.5%, and that 23.2% were infected with any STI. Independent risk factors for HIV infection were illegal drug use, STI symptoms, early sexual debut, and visiting four or more FSWs in the last year. Self-report data of HIV and STI diagnoses from the U.S. suggest that those who engaged in sex purchasing were more likely to be HIV or STI infected [10].

Tijuana attracts large numbers of migrants from within Mexico as well as visitors from the U.S. A high proportion of Mexican migrant men report frequenting FSWs [11], and 70% of FSWs residing in Tijuana report having U.S. clients. Data collected from a behavioral intervention study between 2004 and 2006 in Tijuana and Ciudad Juarez [12] revealed that FSWs with U.S. clients had higher prevalence of active syphilis and were more likely both to inject drugs and to provide unprotected sex in exchange for higher pay [13]. The present study compares the STI and HIV prevalences and sexual risk behaviors of male clients of Tijuana FSWs who resided in Tijuana with those of male clients who resided in San Diego County. We also examine correlates of HIV infection that may be helpful for guiding future prevention interventions.

METHODS

Between June and October 2008, male client participants were recruited in Tijuana's *Zona Roja* (zone of tolerance), where sex workers work openly. To be eligible, men had to be residents of Tijuana or San Diego County, 18 or older, and to have paid or traded for sex with a FSW in Tijuana during the past four months. We aimed for approximately equal numbers of

Mexico-residing and U.S.-residing participants. Clients who patronized bar-, brothel-, or street-based sex workers in the area were approached by outreach workers and asked if they would be willing to participate in a survey of sexual behavior and to receive free HIV/STI testing. We also enlisted the help of *jaladores* (touts, i.e., men who "hook up" clients, especially visiting Americans, with FSWs) and of male clients who were willing to refer their peers. Eligible men received \$30 for participating in the study. They also received free HIV and STI results, with pre-and post-test counseling and referrals for HIV and STI care where appropriate. All participants provided written informed consent prior to participating. The study was approved by the Human Research Protections Program of the University of California, San Diego and by the Ethics Committee of Tijuana General Hospital.

Data Collection

Interviews were conducted in private offices and administered via a computer-assisted programmed interview (CAPI) using QDS software (Nova, Bethesda, MD). Trained, bilingual, female interviewers queried participants about their demographic information, past and current sexual risk behavior, illicit drug use, mood, personality, and other factors known from prior studies to be associated with clients' risk behavior. Clients reported the number of times during the last four months they had engaged in vaginal, oral and anal sex without a condom with a variety of partner types (spouse or steady, casual female or male partners, and female prostitutes). Interviews were conducted in either Spanish or English.

Laboratory Testing

The "Determine"[®] rapid HIV antibody test was administered to detect the presence of HIV antibodies (Abbott Pharmaceuticals, Boston, MA) via collection of a single drop of blood. All reactive samples were then tested by the San Diego County Health Department using HIV-1 antibody by EIA and Western Blot. Participants who were uncomfortable with the blood draw were given the option of the Oraquick[®] rapid HIV antibody test (Abbott Pharmaceuticals, Boston, MA), but only 3 participants requested this method. Syphilis serology used the rapid plasma reagin (RPR) test (Macro-Vue, Becton Dickinson, Cockeysville, MD, USA) on a single drop of blood. Urine samples were tested for *C. trachomatis* and *N. gonorrhoeae* using DNA Strand Displacement Amplification (SDA) at the San Diego County Health Department. Rapid test results were provided to participants immediately; Chlamydia, gonorrhea, and confirmatory HIV test results were available to participants after one month. Free treatment for Chlamydia and gonorrhea was provided on site to those testing positive, and those testing positive for HIV or syphilis were referred to local clinics for free medical care.

Statistical Analysis

Statistical analyses compared HIV-positive and HIV-negative clients of FSWs. The main behavioral outcomes were defined as follows: frequency of unprotected sex (vaginal and anal) with FSWs; ratio of protected sex acts with FSWs (number of protected acts divided by total number of acts); and number and type of STIs. We also examined group differences in demographic characteristics and other risk behaviors (including alcohol and drug use). Continuous outcomes were examined using the Wilcoxon rank sum test for differences in group distributions and binary outcomes were examined using Fisher's exact test.

Univariate and multivariate logistic regressions, adjusted for either under- or over-dispersion, by the scaled deviance, were performed to identify factors associated with HIV-positive serostatus. All variables attaining a significance level of 10% in univariate models were considered for inclusion in multivariate models. The likelihood ratio test was used to compare nested models, using a significance level of 5%.

RESULTS

Staff outreach workers approached 226 men on the street and invited them to participate. Of these, 93 refused to answer any questions; 65 did not meet study criteria; 11 eligible individuals refused participation; and 57 agreed to participate. A total of 405 men referred via touts and other clients were screened for eligibility in the research office, and of those, 343 met study criteria and agreed to participate.

In keeping with our goals for the diversity of the sample, of the 400 enrolled clients, approximately half ($n=189$, or 47.3%) were residents of San Diego, while the remainder ($n=211$, or 52.7%) resided in Tijuana. The average age for the sample was 36.6 years (range: 19 to 68); almost two-thirds were unemployed (60.5%); and the majority were Mexican or Hispanic (79.8%; other ethnicities: 13% white, 4.5% African American, and 2.8% other) (see Table 1). The majority was single, never married, or divorced (57.5%), while 32.3% said they were separated and 10.3% stated they were married. The sexual orientation of the majority of clients was heterosexual (87.7%), with 12.3% identifying themselves as bisexual and 6.8% saying they did not have a gender preference for sex. As seen in Table 1, participants testing HIV-positive were more likely to live alone compared to HIV-negative participants, but otherwise there were no significant differences in sociodemographics between these groups ($p>0.05$).

Sexual Risk Behavior

On average, participants first had sex with an FSW when they were 21.7 years old, and at the time of the interview they had been having sex with FSWs for 10.8 years (Table 2). During the past year, clients had sex with an FSW an average of 25.5 times, and during the past four months about once every two weeks. Half (50.1%) of clients reported having unprotected sex with an FSW in the previous four months, with the average number of unprotected vaginal sex acts during that period being approximately 4 and number of unprotected anal sex acts being 2.5. The ratio of protected acts to total acts was 0.62. The majority (64%) of clients reported that they never visited the same FSW.

Compared to HIV-negative clients, HIV-positive clients were marginally more likely to have had unprotected vaginal and anal sex with an FSW in the previous four months.

Prevalence of STIs and HIV—One-half of clients reported that they had previously been tested for HIV (Table 3). Fourteen percent (14.2%) tested positive for at least one STI (Chlamydia, gonorrhea, syphilis, or HIV). Four participants refused to provide a blood sample. Of the 396 remaining participants, 16 (4.1%) tested HIV-positive on the rapid test and were confirmed positive by Western blot, and 2.3% tested positive for syphilis. Of the total sample, 7.5% were positive for Chlamydia, and 2.5% were positive for gonorrhea. HIV-positive clients were more likely to test positive for gonorrhea (OR 7.61: CI 1.45–40.02) and syphilis (OR 7.53: CI 1.43–39.59).

Substance Use

The majority (88.3%) of clients reported having used illicit drugs during their lifetime, and 25% reported injecting drugs in the past four months (Table 4). The most frequently injected drug was methamphetamine (63.8%), followed by cocaine (50%) and heroin (36.3%). Two-thirds (66.5%) reported that they drank alcohol, and 38.3% reported that they drank at least 5 drinks at one sitting. One-third reported “frequently” being high on drugs when they had sex with an FSW, one-third reported being high “once in a while” or “fairly often,” and the remaining third reported “never” being high on drugs when they had sex with an FSW. Clients reported that they had sex with FSWs who were high on drugs “frequently” (24%), “once in a

while” or “fairly often” (34.1%), or never (42.5%). Being drunk while having sex with an FSW was reported less frequently: “never” (56.7%); “once in a while” (21.2%); “fairly often” (7.3%); and “frequently” (14.8%). Similarly, sex with FSWs who were drunk occurred less often than did sex with FSWs who were high on drugs: 62.4% of clients reported “never” having sex with an FSW who was drunk; 20.5% “once in a while”; 7.3% “fairly often”; and 9.8% of clients “frequently.”

The vast majority of both HIV-positive (93.8%) and HIV-negative (87.9%) clients reported having used drugs in their lifetimes, though this difference was not statistically significant. Compared to HIV-negative clients, HIV-positive clients were more likely to report having used methamphetamine (OR 4.22; CI: 1.05–18.85). No differences were noted in patterns of alcohol use, other drug use, or use of drugs during sex with an FSW.

Factors Independently Associated with HIV Infection

After controlling for all other variables, the following factors were significantly related to being HIV-positive: testing positive for syphilis (OR 9.36; CI: 2.41–36.42); ever used methamphetamine (OR 4.34; CI: 1.31–14.36); living alone (OR 2.88; CI: 1.23–6.71); residing in Mexico (OR 2.26; CI: 0.91–5.58).

DISCUSSION

This study of both Mexican and U.S. clients of FSWs in Tijuana found a relatively high HIV prevalence, mirroring that of FSWs in the same city [1]. Clients reported a high frequency of unprotected sex with FSWs, suggesting the potential for bridging of HIV and STIs to clients’ other sex partners, including other FSWs. Independent risk factors for HIV infection were using methamphetamine, living alone, and testing positive for syphilis. While the cross-sectional nature of this study precludes inferences regarding the direction of STI transmission between clients and FSWs, it is clear that the high risk profile of FSWs’ clients in this region warrants targeted interventions.

Methamphetamine production and use are growing problems in Mexico, especially in Tijuana [2,14]. We previously reported that methamphetamine use among FSWs in Tijuana and Ciudad Juarez was independently associated with HIV infection [1], and use of methamphetamine has previously been associated with high-risk sexual behavior in U.S. heterosexual men [15]. In the present study, methamphetamine use was associated with a four-fold increased odds of HIV infection, which corroborates earlier studies [16]. To our knowledge, this is the first report to document the relationship between HIV and methamphetamine use among clients of sex workers, suggesting that safer sex messages directed to FSWs’ clients should address the risks associated with the use of this powerful stimulant. Interestingly, despite the high rate of injection drug use in our sample, it was not associated with HIV infection. Although Tijuana now has a formally recognized needle exchange program [17], coverage of this program remains relatively limited and is unlikely to explain this lack of association alone.

We recently reported the results of a behavioral intervention conducted among FSWs in Tijuana and Ciudad Juarez that significantly reduced incidence of HIV/STIs and rates of unprotected sex [12]. Overall cumulative STI incidence in the intervention group decreased 40% relative to the didactic control group. The intervention group did not experience a single incident HIV infection, whereas in the control group HIV incidence was 2.01 per 100 person-years. Our earlier work suggests that interactions with clients can be a critical barrier to the adoption of safer sex practices by FSWs. FSWs reported that clients are willing to pay approximately twice as much for unprotected sex [18]. While a main focus of the intervention was to teach women to negotiate safer sex in the face of economic disincentives, FSWs often do not have full control over condom use [19,20]. While reductions in unsafe sex and incident HIV/STIs among

Mexican FSWs in our behavioral intervention were associated with increases in self-efficacy, they were not associated with increases in outcome expectancies [21], which may reflect FSWs' perceived lack of control over their condom use. Due to adverse financial circumstances, many FSWs are likely to succumb to offers of more money for unprotected sex, especially if they are drug-dependent and are experiencing withdrawal [22,23]. While efforts to assist FSWs in negotiating condom use with clients should continue, the logical next step is to develop an intervention aimed at increasing condom use among their clients.

Interventions designed to reduce risk of infection among clients of FSWs are still rare. Some interventions that do not specifically target clients, for example those conducted in STI clinics [24], may capture a segment of this population. A pilot intervention in Benin, West Africa, that followed up condom demonstrations in an STI clinic with surveys of clients at brothels showed promise [6]. The highly successful "100% condom use" campaign in Thailand targeted primarily FSWs but indirectly affected clients, since sex work establishments lost their licenses if they did not comply [25,26]. Presumptive STI treatment has been evaluated among FSWs as an HIV prevention measure with mixed and often only short-term results [27,28]. Higher mobility of many clients, along with the secretive nature of sex purchasing, suggests this strategy would be difficult to implement and unlikely to succeed in our setting, unless offered as part of a more comprehensive intervention approach.

Our data suggest an urgent need to develop and test behavioral interventions that increase clients' knowledge of STI and HIV risks, taking into account prevalent drug use and traditional concepts of masculinity. To optimize efficacy, it would be advantageous to tailor interventions not only to specific cultural contexts but also to each client's personal situation, allowing him to actively identify barriers to safer sex in his own life and provide potential solutions as part of his goal-setting with a counselor. Such an approach has already been taken in several interventions that have been shown efficacious with other populations [12,29,30].

A surprising finding is that while HIV prevalence in clients was similar to that of FSWs working in the same area of Tijuana [1], clients' prevalence of other STIs was much lower than among FSWs. The U.S. has partner notification requirements that draw more people into care, which may explain this finding. It is also possible that STI prevalence was lower among male clients due to males' lower physiological susceptibility to STIs compared to females; fewer exposures to STIs; or some other factor. Despite the low STI prevalence in our sample, syphilis was independently associated with HIV infection. While our cross-sectional analysis cannot establish causality, syphilis is well known as a cofactor of HIV transmission, and its eradication should be a critical component of HIV prevention in Tijuana, where it has also been closely associated with HIV infection among FSWs and IDUs [1,21].

Our findings must be interpreted with caution, since the clients we enrolled in Tijuana are likely not representative of clients in other cities or countries. Though we made an effort to recruit a representative sample, it is unlikely that our findings can be generalized beyond the *Zona Roja* in Tijuana. FSWs work in a variety of settings and in ways that we did not access (e.g., as hair dressers, call girls, and in massage parlors), and men who access these different populations may exhibit different risk profiles. Finally, although the present analysis focused solely on clients' risk behavior with FSWs, it will be important to examine risk behavior with other sex partners as well (e.g., spouses, girlfriends).

Our study adds to the growing body of literature that suggests high prevalence of HIV and STI risk behaviors among clients of FSWs in Tijuana. In addition, of the HIV-positive clients, only 2 out of 16 were previously aware of their serostatus. These data point to the urgent need for interventions tailored to this high-risk group, and indicate that intensified efforts to "test and treat" should reach out to this important subpopulation, which appears to have been missed by

prevention programs. Significant challenges to the development of such interventions include the unwillingness of many men to recognize that sexual health is a shared responsibility, as well as the difficulty of reaching and communicating with clients in a meaningful way. Given the constellation of high-risk behaviors among clients in this setting, overcoming these barriers is a public health imperative for both Mexico and the United States.

Acknowledgments

STATEMENT OF SUPPORT: This research was supported by the National Institute of Allergy and Infectious Disease through the UCSD Center for AIDS Research (NIH P30 AI036214, D. Richman, Director) and by the National Institute of Drug Abuse (NIH R01 DA23877-02S1, S. Strathdee, P.I.). The content is solely the responsibility of the authors and does not necessarily represent the official views of NIAID or NIDA.

This research was supported by the International Pilot Program of the UCSD Center for AIDS Research, grant number P30AI036214 (D. Richman, Director) from the National Institute Of Allergy And Infectious Diseases. Additional support was received from an administrative supplement to NIH grant number R01DA23877 (S. Strathdee, P.I.) from the National Institute of Drug Abuse. The authors would also like to thank the study staff for their efforts and participants for their time; Brian Kelly for editing assistance; and the following organizations for their cooperation: the Municipal and State Health Department of Tijuana, Baja California; Patronato Pro-COMUSIDA, Tijuana; and the County Health Department of San Diego for its assistance with STI and HIV testing.

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Table 1
Sociodemographic Characteristics of HIV -positive and HIV -negative Male Clients of FSWs in Tijuana, Mexico

Variable	HIV-positive (n=16)	HIV-negative (n=380)	Total (N=396)	Odds Ratio	95% CI	p-value
Latino, Hispanic, or White, n (%)	12 (75.0%)	355 (93.4%)	367 (92.7%)	0.21	0.06–0.70	0.01
Speaks English, n (%)	11 (68.8%)	309 (81.3%)	320 (80.8%)	0.51	0.17–1.50	0.21
Age, mean (range)	39.94 (29, 55)	36.39 (19, 68)	36.53 (19, 68)	1.03	1.00–1.07	0.08
Resides in Mexico, n (%)	12 (75.0%)	197 (51.8%)	209 (52.8%)	2.79	0.88–8.79	0.06
Living alone, n (%)	11 (68.8%)	165 (43.4%)	176 (44.4%)	2.87	1.00–8.41	0.05
Married or common law, n (%)	0 (0.0%)	41 (10.8%)	41 (10.4%)	0.60	0.20–1.76	0.35
Employed, n (%)	10 (62.5%)	228 (60.0%)	238 (60.1%)	1.11	0.30–3.12	0.84
Heterosexual, n (%)	14 (93.3%)	333 (87.9%)	347 (88.1%)	1.93	0.25–15.05	0.42
Bisexual, n (%)	1 (6.7%)	46 (12.1%)	47 (11.9%)	0.52	0.07–4.02	0.42

Table 2
Sexual Risk Behaviors among HIV-positive and HIV-negative Male Clients of Female Sex Workers (FSWs) in Tijuana, Mexico

Variable	HIV-positive (n=16)	HIV-negative (n=380)	Total (N=396)	Odds Ratio	95% CI	p-value
Age when first had sex with a FSW, mean (SD)	23.69 (11.0)	21.58 (7.7)	21.67 (7.9)	1.03	0.97–1.10	0.36
How many times in the last year had sex with a FSW, mean (SD)	27.75 (37.2)	25.41 (52.2)	25.51 (51.7)	1.00	0.99–1.01	0.79
Number of FSWs had sex with in the past 4 months, mean (SD)	7.00 (9.4)	8.07 (11.6)	8.03 (11.5)	0.99	0.94–1.04	0.70
Had only safe sex (vaginal and anal) with FSWs, past 4 months, n (%)	9 (64.3%)	183 (49.1%)	192 (49.6%)	1.87	0.61–5.68	0.27
Number of times had vaginal sex w/o condom with FSW in Tijuana, past 4 months, mean (SD)	17.40 (61.7)	3.52 (9.4)	4.06 (15.2)	1.02	1.01–1.03	<0.001
Number of times had anal sex w/o condom with FSW in Tijuana, past 4 months (among those who had any anal sex), mean (SD)	16.43 (36.9)	2.02 (5.0)	2.56 (8.7)	1.05	1.01–1.10	0.03
Had anal or oral sex with a man in the past 4 months, mean (SD)	3 (18.8)	51 (13.4)	54 (13.6)	1.49	0.41–5.40	0.55

Table 3

Prevalence of STIs among Male Clients of FSWs in Tijuana

Variable	HIV-positive (n=16)	HIV-negative (n=380)	Total (N=396)	Odds Ratio	95% CI	p-value
Ever tested for HIV, <i>n</i> (%)	7 (43.8%)	192 (50.5%)	199 (50.3%)	0.76	0.28–2.09	0.60
Chlamydia test result positive, <i>n</i> (%)	1 (6.3%)	29 (7.6%)	30 (7.6%)	0.81	0.10–6.33	0.84
Gonorrhea test result positive, <i>n</i> (%)	2 (12.5%)	7 (1.8%)	9 (2.3%)	7.61	1.45–40.02	0.02
Syphilis rapid test result positive, <i>n</i> (%)	2 (12.5%)	7 (1.9%)	9 (2.3%)	7.53	1.43–39.59	0.02
Any STI status positive (HIV excluded), <i>n</i> (%)	4 (25.0%)	39 (10.3%)	43 (10.9%)	2.89	0.89–9.39	0.08

Table 4
Substance Use among HIV-positive and HIV-negative Male Clients of FSWs in Tijuana, Mexico

Variable	HIV-positive (n=16)	HIV-negative (n=380)	Total (N=396)	Odds Ratio	95% CI	p-value
Ever used any drug, <i>n</i> (%)	15 (93.8%)	334 (87.9%)	349 (88.1%)	2.07	0.27–16.01	0.36
Injected any drug past 4 months, <i>n</i> (%)	3 (18.8%)	96 (25.3%)	99 (25.0%)	0.68	0.19–2.45	0.52
Ever used methamphetamine, <i>n</i> (%)	14 (87.5%)	237 (62.4%)	251 (63.4%)	4.22	1.05–18.85	0.02
Drinks at least 5 drinks when drinking, <i>n</i> (%)	3 (18.8%)	148 (38.9%)	151 (38.1%)	0.36	0.10–1.29	0.07
Was drunk during sex with FSW fairly often or frequently, past 4 months, <i>n</i> (%)	1 (6.3%)	86 (22.8%)	87 (22.1%)	0.22	0.03–1.73	0.15
Was high on drugs during sex with FSW fairly or very often, past 4 months, <i>n</i> (%)	7 (43.8%)	174 (45.9%)	181 (45.8%)	0.92	0.33–2.51	0.86