



Published in final edited form as:

Int J STD AIDS. 2020 August ; 31(9): 866–875. doi:10.1177/0956462420929463.

Correlates of trichomoniasis among female sex workers who inject drugs in two Mexico-US border cities

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Abstract

This paper evaluates correlates of trichomoniasis among female sex workers who inject drugs (FSWIDs) in two Mexico-US border cities. HIV-negative FSWIDs aged 18 years or older were enrolled in a study between 2008 and 2010 in Tijuana and Ciudad Juarez (Cd.), Mexico. All participants underwent a baseline interviewer-administered survey and did a rapid test for trichomoniasis. Using regression to estimate prevalence ratios, we examined sociodemographics, sex work characteristics, sexual health and behavior, substance use, and police and violence exposures as potential correlates of trichomoniasis. Of 584 women (284 in Tijuana, 300 in Cd. Juarez), prevalence of trichomoniasis was 33.6%. Factors associated with trichomoniasis in multivariable analysis were having money stolen by police in the past six months (adjusted prevalence ratio [aPR] = 1.448, 95% confidence interval [CI] = 1.152–1.821), recent methamphetamine use (aPR = 1.432, CI = 1.055–1.944), lifetime syphilis infection (aPR = 1.360, CI = 1.061–1.743), ever use of a home remedy to treat vaginal symptoms (aPR = 1.301, CI = 1.027–1.649), and number of regular clients in the past month (aPR = 1.006 per client, CI = 1.004–1.009), while controlling for age and city of interview. Alongside the need for trichomoniasis surveillance and treatment programs, findings indicate that both structural and behavioral factors serve as primary correlates of trichomoniasis among FSWIDs in these cities.

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Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Keywords

Trichomoniasis; female sex workers; injection drug use; police violence; methamphetamine; sexually transmitted infections; Mexico

Introduction

More than 160 million people worldwide are infected annually by *Trichomonas vaginalis* and according to the WHO, this infection accounts for almost half of all curable sexually transmitted infections (STIs).¹ Globally, it is the most prevalent non-viral STI, surpassing gonorrhea and chlamydia prevalence combined.^{2–5} In low- and middle-income country contexts, trichomoniasis prevalence of 15% or higher is common among women.⁶ Importantly, female sex workers (FSWs) are frequently more vulnerable to both HIV and STIs, including trichomoniasis, than other groups^{7–9}; however, we know little about trichomoniasis in this population, particularly at the Mexico–US border where rates of STI/HIV among FSWs are elevated and even higher among FSWs who inject drugs (FSWIDs).^{10,11}

Although few studies look at trichomoniasis specifically, STIs among FSWs are generally associated with behavioral factors, like a higher number of condomless sex acts, number of partners, co-infection with another STI, and substance use.^{11–14} Studies have also found that sociodemographic factors, like education level and homelessness, can place women at greater risk, and increasingly, there is attention to structural factors that heighten risk, including stigma, poverty, gender inequities, violence, as well as punitive policies that restrict FSW rights and prevent access to needed health and social services.¹⁵ Notably, FSWIDs are placed at even greater risk for STI/HIV infection than FSWs who do not inject as a result of higher levels of condomless sex, sex in the context of substance use, and experiences of violence, stigma, and incarceration.^{11,16,17}

Although trichomoniasis is asymptomatic in up to 50% of cases among women, the consequences, if left untreated, are potentially severe, including infertility, and in pregnant women, premature delivery, low birth weight, and neonatal death.^{5,18} Infection with *T. vaginalis* is also linked to HIV, with one study estimating that HIV transmission increased two-fold when trichomoniasis was present.¹⁹ Studies have also shown that HIV infection may increase the prevalence of trichomoniasis, especially among women.²⁰ Research from the US found that approximately 20% of all HIV infections presented with *T. vaginalis* co-infection, but up to 53% of HIV-infected women were co-infected with *T. vaginalis*.^{21,22} There are several possible mechanisms linking trichomoniasis and HIV, such as the disruption of the mucosal barrier, the inflammatory process, the impaired immune response, and the change in the vaginal microbiota.^{4,23} Among women with co-infections, vaginal shedding of HIV is also increased, despite antiretroviral treatment.²⁴ Importantly, treatment for trichomoniasis has been shown to decrease vaginal HIV-1 shedding; therefore, there is a need to address trichomoniasis in HIV sero-discordant couples.^{24,25}

Along the Mexico–US border, the correlates of trichomoniasis, either in the general population or among key populations, have not been previously examined. Currently, there

are no screening or reporting guidelines for trichomoniasis in Mexico, resulting in a lack of prevalence data at national and state levels. However, previous work in the south of Mexico suggests that trichomoniasis prevalence may be as high as 23%, but the study did not evaluate potentially high-risk groups, such as FSWs or women who use drugs.²⁶ Given that FSWIDs at the Mexico–US border have elevated STI rates, including trichomoniasis (previously reported for this study), and an HIV prevalence of 12.3%, which is three times higher than other FSWs who do not inject, there is a need to better understand trichomoniasis in this population.^{10,11} The aim of this analysis was therefore to evaluate the correlates of trichomoniasis among FSWIDs in two Mexico-US border cities in order to inform prevention and treatment efforts in this context.

Materials and methods

Study setting

The study was a multi-site project conducted in two Mexico-US border cities (Tijuana and Ciudad [Cd.] Juarez) to test a behavioral intervention; its methods have been described elsewhere.²⁷ Tijuana is the largest Mexico–US border city and has the busiest border-crossing worldwide. Tijuana has a red light district where sex work is quasi-legal and both cities are drug trafficking corridors and points of deportation for undocumented migrants. The estimated number of FSWs in Tijuana and Cd. Juarez is 9000 and 4000, respectively.^{28,29} In Tijuana, FSWs are required to obtain permits, but more than half operate without one, and in Cd. Juarez a permit is not required.¹¹ The proximity of these cities to the U.S. draws sex tourists at a binational level.

Study sample

Recruitment occurred between October 2008 and July 2010 in Tijuana and Cd. Juarez using targeted sampling techniques. Inclusion criteria were: (1) biologically female; (2) 18 years or older; (3) report having exchanged sex for money, drugs, shelter, or goods in the past month; (4) report having injected drugs at least once in the past month; (5) test HIV-negative at baseline; and (6) report having had unprotected vaginal or anal sex with male clients at least once during the previous month. This protocol was approved by the University of California San Diego ethics committee, the Centro Nacional para la Prevencion de VIH/SIDA, the Universidad Autonoma de Ciudad Juarez, and the Hospital General de Tijuana.

Data collection

The baseline interview took approximately 40 min to complete and was administered using computer-assisted personal interviewing (NOVA Software, MD, USA), and elicited information on sociodemographics, sex work characteristics (e.g. age of initiation, primary working location), alcohol and substance use behaviors (e.g. patterns of use, using drugs or alcohol with clients), sexual health (e.g. access to gynecological care), sexual behaviors (e.g. number of clients by type, condom use), and experiences with police and violence (e.g. arrest history, negative police/client encounters, physical or sexual abuse).

Diagnosis

T. vaginalis, the parasite that causes trichomoniasis, was detected by vaginal swab using the OSOM Rapid Test (Genzyme Diagnostics, San Diego, CA), which detects antigens and has a sensitivity of 83–92%.^{30,31} Study participants were also tested for bacterial vaginosis using the OSOM BVBlue rapid test (Sekisui Diagnostics, Burlington, MA). For HIV diagnosis, the Determine rapid antibody test was used (Abbott Pharmaceuticals, Boston, MA). All reactive samples were confirmed using an HIV-1 enzyme immunoassay and immunofluorescence assay. Syphilis serology used rapid plasma reagin (RPR). Positive samples underwent confirmatory testing using the *Treponema pallidum* particle agglutination (TPPA) assay (Fujirebio, Wilmington, DE, USA). Those with a confirmatory test for syphilis (active, based on RPR titers 1:8 and reactive TPPA results, and inactive cases) were considered for the purpose of our analysis. GC/CT screening was done using the Aptima Combo 2 assay (Hologic, San Diego, CA). The San Diego County Health Department performed all confirmatory tests. Women who tested positive for STI/HIV were provided with referrals to receive free treatment at local clinics.

Statistical analysis

The analysis was conducted using baseline data and focused on comparisons between participants who obtained a positive *T. vaginalis* result and those who did not. Descriptive statistics were calculated for all variables using SAS statistical software (Version 9.4, Cary, NC). Due to the relatively high prevalence of the outcome variable, we chose to calculate prevalence ratios (PRs) rather than odds ratios to ensure that we did not overestimate the strength of associations. Bivariate analyses were conducted using the PROC GENMOD procedure with a binomial distribution and a log link to calculate PRs and identify possible candidates for a multivariate model. In situations where convergence problems arise, we used Poisson regression and (modified) Poisson regression with robust standard errors.^{32–36} All variables attaining significance levels of $p < 0.10$ in the bivariate analysis were considered for inclusion in the multivariate model, which also controlled for age and interview city. All variables were assessed for multicollinearity using condition index and variance inflation factors before entering the multivariate model.

Results

Among 584 FSWIDs at the Mexico–US border ($n = 284$ in Tijuana, $n = 300$ in Cd. Juarez), the prevalence of trichomoniasis was 33.6%, with a similar prevalence in both cities (36% in Tijuana versus 31% in Cd. Juarez, $p = 0.241$). About two-fifths of participants entered sex work when they were younger than 18 and the majority worked primarily in street settings (68%). Past month substance use was high, with about 90% of women reporting at least daily drug injection, half reporting past month use of methamphetamine, 19% reporting alcohol use with clients, and 58% indicated drug use before or during sex with a client. Less than one-fifth of participants had ever had a gynecological checkup and prevalence of STIs was high overall. Women reported an average of 9 regular and 39 casual clients in the past month, but condom coverage was only 32% of vaginal sex acts with regular clients and 39% of vaginal sex acts with casual clients. Police interactions were common – 75% of FSWIDs had been arrested – and many women reported that police stole money (42%), asked for

sexual favors (33%), or sexually abused them (17%). Half of participants reported that they had ever experienced forced sex (rape) and almost half had ever experienced physical abuse. Sample characteristics are reported in Table 1.

As shown in Table 2, in bivariate analysis, FSWIDs who reported use of methamphetamine in the past month, tested positive for any syphilis infection, ever used home remedies to treat vaginal symptoms, had a larger number of regular clients, or who had police steal their money were at greater risk of having trichomoniasis. In multivariable analysis (see Table 2), all relevant variables from the bivariate models remained significant. After controlling for age and interview location, factors independently associated with trichomoniasis were having money stolen by police in the past six months (adjusted prevalence ratio [aPR] = 1.448, 95% confidence interval [CI] = 1.152–1.821), recent methamphetamine use (aPR = 1.432, CI = 1.055–1.944), any syphilis infection (aPR = 1.360, CI = 1.061–1.743), ever use of a home remedy to treat vaginal symptoms (aPR = 1.301, CI = 1.027–1.649), and number of regular clients in the past month (aPR = 1.006 per client, CI = 1.004–1.009).

Discussion

The prevalence of trichomoniasis in this population of FSWIDs was about 34% using a rapid test, which is higher than previous studies in Mexico and than studies using PCR testing with women placed at high risk in other contexts.^{8,9,26} To the best of our knowledge, ours was the first study in Mexico evaluating factors associated with trichomoniasis among a large sample of women subject to substantial structural vulnerabilities. Our findings indicate that active surveillance and treatment of trichomoniasis, in conjunction with other STIs, is needed in Mexico, especially among key populations, like FSWs and FSWIDs. Results also suggest that behavioral factors related to substance use and sex work that are associated with trichomoniasis cannot be addressed without explicit attention to the structural factors that potentiate STI risk in this population.

The health consequences of negative police interactions were a primary factor associated with trichomoniasis among FSWIDs in this study; specifically, women who had money stolen by police were more likely to have trichomoniasis. This association may stem from the fact that such interactions diminish women's earnings, which not only threatens their survival, but which also can create the need to have more sexual encounters, accept more money for condomless sex, or take on riskier clients.³⁷ Studies also show that police practices, like forcing FSWs to pay bribes to avoid arrest, are linked to decreased condom use with clients and increased exposure to violence.^{38,39} Indeed, punitive policing practices frequently displace FSWIDs to more isolated areas to avoid police interactions, which affords women less protection from dangerous clients, limits condom negotiation power, and which also translates into physical distance from key health services.⁴⁰ This is consistent with other studies showing that police misconduct prevents engagement in services, like HIV prevention and care, syringe programs, and substance use treatment,^{41–46} and increases PWID mortality.⁴⁷ It is also possible that police target more marginalized women who are also at greater risk of STI infection, thus compounding existing vulnerabilities. At the Mexico–US border, as elsewhere, police encounters for FSWIDs are frequent – 75% of respondents reported a history of arrest and 42% had money stolen – however, these results

suggest that such interactions jeopardize women's safety, contribute to trichomoniasis, and threaten public health. Interventions aimed at reducing police misconduct and violence are a necessary part of STI control efforts, especially for FSWIDs.

In this study, we also found that recent use of methamphetamine occurred among half of participants and the proportion of FSWIDs with trichomoniasis was 1.4-fold greater if a woman used methamphetamine. Previous qualitative work from our team found that methamphetamines were used occupationally as tool to stay awake and enhance sexual performance.⁴⁸ This and other work also highlights the role that methamphetamine use may play in facilitating sexual risk, like number of partners and condomless sex.^{10,49–51} For instance, methamphetamine use was associated with a three-fold elevated odds of HIV infection among FSWIDs in this context,⁵² which may result from sex without a condom, thereby increasing risk for trichomoniasis as well. Studies from Canada indicate that methamphetamine use among FSWs was associated with polydrug use, having a male partner who procured drugs, working in marginalized public spaces, and living on the street.⁵³ These social and physical dynamics can lead to isolation, can limit women's power, and can exacerbate sexual risk and vulnerability, more broadly, all of which could lead to trichomoniasis. The high rates of methamphetamine use and its association with trichomoniasis in this study suggest a need for interventions that reduce the potential harms associated with methamphetamine use, including support for safer work environments⁵³ and for integrated substance use and STI/HIV prevention and treatment services.

Along the northern Mexican border, prevalence of syphilis was previously reported to be 14.5% in 2008 among FSWs,⁵⁴ but in this study, the overall prevalence of syphilis infection among FSW–PWID was 24.3% and about 9% had active syphilis (RPR titer 1:8). This is of great public health concern on its own, but both syphilis and trichomoniasis are also associated with an increased risk of HIV transmission.^{19,55} However, it is unknown whether co-infection with syphilis and *T. vaginalis* has a combined effect on increased HIV transmission. In this analysis, we found an association between lifetime syphilis infection (inactive or active) and trichomoniasis, but are unable to draw temporal inferences due to the cross-sectional nature of the study. Although the proportion of sex acts covered by a condom did not reach statistical significance in the multivariable model, these findings may suggest that STI co-infection serves as a proxy measure for women engaging in condomless sex. Supporting women to use condoms consistently, however, must involve the creation of safer sex work environments, as discussed above, and must target clients. For instance, studies in other settings have found that condom negotiation is often compromised for fear of abuse and was associated with an increased risk for STI/HIV infection.^{56,57} Importantly, these results also suggest that trichomoniasis prevention and control should go hand in hand with treatment for other STIs, like syphilis, which means strengthening STI services and FSWID's engagement in care. Collectively, this may be an important tool for preventing HIV transmission and protecting women's health.

We also found an association between use of home remedies for vaginal symptoms and trichomoniasis, which raises concerns about the availability and accessibility of health care for FSWIDs and the potential for a high prevalence of untreated STIs in this population. In this study, we found that less than 20% of women had ever had a gynecological checkup,

despite many women testing positive for STIs, and that almost a quarter had used home remedies if they were unable to receive treatment for an STI. The reliance on home remedies may stem from multiple factors, including limited utilization of health care systems by FSWIDs, but also structural constraints that make engagement in care untenable. For instance, previous research, at both the Mexico–US border and other settings, has documented poor access to sexual and reproductive health services among FSWs,^{58–62} and in Mexico, studies show especially low uptake of linkage to care for PWID.⁶³ More importantly, FSWID's fear or distrust of medical professionals, including concerns around confidentiality and stigma, may lead women to avoid visiting a doctor or clinic or to delaying care. Although free health care is provided in Mexico through municipal clinics, and sex work is quasi-legal, substance use is not and both are highly stigmatized. Within health care settings, studies from around the globe, including Mexico, show that FSWs, especially FSWIDs, face substantial stigma from providers and staff, ranging from disclosure of sex worker or STI/HIV status, to abusive treatment, to outright denial of services.^{64–68} In addition to expanded services to prevent and treat trichomoniasis and other STIs, there is thus a need to address the barriers to engagement in care for FSWIDs, including training health care workers to provide equitable and non-prejudicial care.

Finally, we also found that having a higher number of regular clients was associated with testing positive for trichomoniasis. In general, number of clients need not increase risk for STIs unless condoms are not used consistently; however, women with a higher volume of clients may experience greater tearing in the vaginal tract, which can increase risk for acquisition of an STI if condoms are not used.⁶⁹ In this study, it is notable that number of regular, and not casual, clients was statistically significant. FSWs often have more established and intimate relationships with regular clients, which can translate into greater trust, lower risk perception, and also lower levels of condom use than with casual clients.⁷⁰ Given this, we hypothesize that our finding around number of regular clients and trichomoniasis is a proxy for condomless sex.⁷¹ Promoting condom use among FSWIDs is thus important, but this also means accounting for the structural factors that impede condom use.^{16,72,73} For instance, it is necessary to ensure that women have consistent access to free condoms,⁷⁴ that they work in environments where condom use is supported, and that they work in conditions that mitigate violence from clients and that empower FSWIDs.^{16,73,75} Given that women with greater economic need, like those who also inject, may need to take on more clients or accept more money for sex without a condom, addressing the structural factors that place women at greater risk is also needed.³⁷ For instance, there is a need for improved access to quality drug treatment programs, to reduce violence against FSWIDs, and to develop economic programs that support FSW's ability to save money, get loans, or lower their reliance on sex work, if they want.^{16,75}

This study is subject to several limitations. The data were collected between 2008 and 2010, so they may not represent the most up to date prevalence estimates; yet, they are the most recent available data and provide useful information for improving public health efforts. Additionally, we used the OSOM Rapid Test for diagnosis of trichomoniasis, which has a sensitivity of 83–92%, compared to nucleic acid amplification with a higher sensitivity (>95%), suggesting that our prevalence may be underestimated and that there may be a moderate amount of misclassification that could have impacted our results, but this would

bias toward the null.^{30,31} However, compared to microscopy, which is a diagnostic process used in many resource-limited settings, this rapid test may have higher sensitivity to detect *T. vaginalis*. The study sample is composed of FSWIDs who also reported recent condomless sex and thus, results may not be extrapolated to the general population and likely overestimate the prevalence in the general population. Despite this, our findings are among the first on trichomoniasis in Mexico and could help to inform prevention and treatment efforts in this context. Further, the study was focused on a HIV-negative population, which could have affected the trichomoniasis prevalence since it tends to be higher among people living with HIV. Despite these limitations, our findings offer important insight into the need for screening and prevention efforts for trichomoniasis in Mexico, especially since active surveillance is still not in place.

Conclusion

Studies that examine correlates of trichomoniasis alone are rare, so we know little about the epidemiology, especially in high-risk groups. In Mexico, there are no screening guidelines for trichomoniasis and reporting is not mandatory, making this research an important step in developing prevention and treatment planning tools.^{23,76} Given the high prevalence of trichomoniasis and syphilis among FSWIDs in this study, more attention to the factors driving STIs at the Mexico-US border is needed. More importantly, our findings point to a number of structural, rather than behavioral, factors as primary correlates of trichomoniasis, which should be addressed alongside larger trichomoniasis surveillance program efforts.

Acknowledgements

The authors gratefully acknowledge the contributions of study participants and staff, including Prevencasa A.C., and Federacion Mexicana de Asociaciones Privadas (FEMAP), UACJ, COLEF, and UCSD for assistance with data collection, as well as the Instituto de Servicios de Salud de Estado de Baja California (ISESALUD).

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This study was funded through NIDA grant R01DA0923877. Becerra and West were supported by NIH Research Training Grant (R25TW009343) funded by the Fogarty International Center and the National Institute of Drug Abuse, as well as the University of California Global Health Institute. West was also supported by a NIDA K01 (K01DA041233). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or the University of California Global Health Institute.

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Table 1.

Descriptive characteristics of female sex workers who inject in Tijuana and Ciudad Juarez, Mexico (N = 584).

Sociodemographic characteristics	n (%)
Mean age (years) (SD)	33.7 (8.60)
Currently married	218 (37.3%)
Mean years of education (SD)	7.1 (2.92)
Interview city Tijuana (versus Cd. Juarez)	284 (48.6%)
Sex work characteristics	
Initiated sex work <18 years old	240 (41.1%)
Primary sex work location street-based	398 (68.2%)
Income 3500 pesos per month	276 (47.3%)
Alcohol and substance use behaviors	
Heavy drinking (5+ drinks half the time or more), past month	170 (29.2%)
Injected drugs daily, past month	525 (89.9%)
Used methamphetamine/crystal, past month	293 (50.2%)
Used alcohol before/during sex with client, past month (often/always versus sometimes/never)	109 (18.7%)
Used drugs before/during sex with client, past month (often/always versus sometimes/never)	343 (58.7%)
Sexual health and behaviors	
Ever had a gynecological checkup	108 (18.5%)
Had genital warts, past six months	58 (9.9%)
Genital lesions, past six months	26 (4.4%)
If unable to go to a doctor/clinic to receive treatment, ever used a home remedy to treat vaginal symptoms	141 (24.2%)
Tested positive for syphilis (not just active)	142 (24.3%)
Tested positive for <i>Neisseria gonorrhoeae</i>	13 (2.4%)
Tested positive for bacterial vaginosis	228 (39.0%)
Tested positive for <i>Chlamydia trachomatis</i>	70 (12.0%)
Mean number of regular clients, past month (SD)	8.8 (15.1)
Mean proportion of vaginal sex acts with regular clients where a condom was used, past month (SD)	0.32 (0.37)
Mean number of casual clients, past month (SD)	39.2 (47.29)
Mean proportion of vaginal sex acts with casual clients where a condom was used, past month (SD)	0.39 (0.36)
Police and violence exposure	

Sociodemographic characteristics	n (%)
Ever arrested	434 (74.5%)
Police stole money, past six months	247 (42.4%)
Police asked for sexual favors, past six months	192 (32.9%)
Police sexually abused you, past six months	88 (17.0%)
Ever experienced forced sex	293 (50.6%)
Ever experienced physical abuse	280 (47.9%)

Bivariate and multivariable models examining correlates of infection with *Trichomonas vaginalis* among female sex workers who inject in Tijuana and Ciudad Juarez, Mexico.

Table 2.

Sociodemographic characteristics	Bivariate models		Multivariable model	
	Prevalence ratio (95% confidence interval)		Prevalence ratio (95% confidence interval)	
Age	1.008 (0.995–1.020)			
Currently married	0.975 (0.769–1.236)			
Years of education	1.000 (0.961–1.041)			
Interview city Tijuana (versus Cd. Juarez)	1.146 (0.912–1.440)			
Sex work characteristics				
Initiated sex work <18 years old	1.123 (0.886–1.423)			
Conducted street-based sex work	0.921 (0.724–1.170)			
Income 3500 pesos per month	0.820 (0.650–1.034)			
Alcohol and substance use behaviors				
Heavy drinking (5+ drinks half the time or more), past month	0.979 (0.760–1.261)			
Injected drugs daily, past month	1.183 (0.779–1.798)			
Used methamphetamine/crystal, past month	1.352 (1.072–1.706)		1.432 (1.055–1.944) *	
Used alcohol before/during sex with client, past month	0.788 (0.567–1.094)			
Used drugs before/during sex with client, past month	0.899 (0.715–1.130)			
Sexual health and behaviors				
Ever had a gynecological checkup	1.242 (0.951–1.621)			
Had genital warts, past six months	1.023 (0.706–1.493)			
Genital lesions, past six months	1.397 (0.907–2.151)			
Ever used a home remedy to treat vaginal symptoms	1.327 (1.042–1.690)		1.301 (1.027–1.649) *	
Tested positive for syphilis	1.319 (1.035–1.681)		1.360 (1.061–1.743) *	
Tested positive for <i>Neisseria gonorrhoeae</i>	0.467 (0.130–1.680)			
Tested positive for bacterial vaginosis	1.077 (0.855–1.357)			
Tested positive for <i>Chlamydia trachomatis</i>	0.961 (0.664–1.391)			
Number of regular clients, past month	1.006 (1.003–1.008)		1.006 (1.004–1.009) ***	
Proportion of sex acts with regular client where a condom was used, past month	0.735 (0.514–1.052)			

Sociodemographic characteristics	Bivariate models		Multivariable model	
	Prevalence ratio (95% confidence interval)		Prevalence ratio (95% confidence interval)	
Number of casual clients, past month	0.999 (0.997–1.002)			
Proportion of sex acts with a casual client where a condom was used, past month	1.042 (0.741–1.465)			
Police and violence exposure				
Ever arrested	1.330 (0.992–1.783)			
Police stole money, past six months	1.413 (1.126–1.772)		1.448 (1.152–1.821)**	
Police asked for sexual favors, past six months	1.104 (0.871–1.398)			
Police sexually abused you, past six months	1.024 (0.59–1.382)			
Ever experienced forced sex	1.024 (0.814–1.290)			
Ever experienced physical abuse	1.072 (0.853–1.347)			

Note: Multivariable model controlled for age and city of interview.

* p < 0.05;

** p < .01;

*** p < 0.001.