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High-Risk Sexual and Drug Using Behaviors Among Male Injection Drug Users Who Have Sex With Men in 2 Mexico-US Border Cities

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Abstract

Objectives—The population of Latino men who have sex with men (MSM) and who are also injection drug users (IDUs) is understudied. We explored risk behaviors of MSM/IDUs compared with other male IDUs in 2 Mexican border cities.

Study Design—In 2005, IDUs who had injected within the previous 30 days were recruited using respondent-driven sampling (RDS) in Tijuana and Ciudad Juárez. They underwent antibody testing for HIV, HCV, and syphilis and interviewer-administered surveys. Men were categorized as MSM if they reported ≥1 lifetime male partners. Logistic regression was used to compare MSM/IDUs with non-MSM/IDUs.

Results—A third (31%) of 377 male IDUs were categorized as MSM (47% in Tijuana and 13% in Ciudad Juárez, $P < 0.01$). Combined RDS-adjusted prevalence of HIV and Hepatitis C was 3% (95% CI: 1, 5) and 96%, (95% CI: 94, 99) respectively, while 17% (95% CI: 2, 36) of MSM and 8% (95% CI: 3, 12) of non-MSM tested positive for syphilis antibody. In multivariate logistic regression adjusted for site, MSM/IDUs were more likely than non-MSM/IDUs to have ever used inhalants (OR: 3.4; 95% CI: 1.8, 6.2) or oral tranquilizers (OR: 2.4; 95% CI: 1.3, 4.6), received treatment for a drug problem (OR: 1.9; 95% CI: 1.1, 3.2) shared needles in the last six months (OR: 2.1; 95% CI: 1.0, 4.2) and also had higher numbers of lifetime female partners (log-transformed continuous variable, OR: 1.6; 95% CI: 1.2, 2.1).

Conclusions—In these Mexican cities, the proportion of MSM among male IDUs was high. Compared with other male IDUs, MSM/IDUs were more likely to engage in behaviors placing them at risk of acquiring HIV/STIs. Culturally appropriate interventions targeting Latino MSM/IDUs are warranted.

The profile of Latino injection drug users (IDUs) who are also men who have sex with other men (MSM) has been understudied. Two US studies found that homosexual/bisexual behavior

was an independent risk factor for HIV infection among male IDUs, even after accounting for needle sharing behaviors.^{1,2} In both Europe and North America, studies suggest that male IDUs who are also men who have sex with men (MSM/IDUs) are more likely to report high-risk behaviors including receptive and distributive needle sharing,^{3–5} exchange of money or drugs for sex,^{3,5–8} unprotected anal intercourse,^{3–7} and use of shooting galleries.⁹ A recent study on Brazilian MSM/IDUs demonstrated a similar risk profile and also found that MSM/IDUs were more likely to be HIV seropositive than IDUs without male sexual partners (non-MSM/IDUs).¹⁰ To date, however, there is a relative paucity of data from this group from low- or middle-income countries.

Mexico is generally considered a “low-prevalence, high-risk” nation for HIV/AIDS,¹¹ although the distribution of HIV varies widely by region and population. Mexican cities situated along the US border pose unique risks as they are located along prominent drug trafficking routes with highly mobile populations. In Tijuana, which is located on the northwest Mexican border near San Diego, CA, a recent study estimated that up to 1 in 125 adults aged 15 to 49 may be HIV-infected, nearly 3 times the national average.¹² The prevalence of active syphilis among 295 female sex workers in Tijuana and Ciudad Juárez (a city on the north central Mexican border near El Paso, TX) was 12% and 31%, respectively,¹³ whereas the lifetime prevalence of syphilis among samples of mostly male IDUs in Tijuana and Ciudad Juárez was 14% and 3%, respectively.¹⁴ Baja California and Chihuahua, Mexican states which include the cities of Tijuana and Ciudad Juárez, respectively, also have the highest per capita rates of congenital syphilis in Mexico.¹⁵ In Mexico-US border cities, HIV prevalence is estimated to be 11% to 20% among MSM^{12,16,17} and 3% to 7% among IDUs,¹² which is consistent with the epidemiology of reported AIDS cases in Mexico.^{18,19} These disparities in HIV prevalence suggest that the subgroup of MSM who inject drugs could represent an HIV transmission bridge from a high prevalence to a lower prevalence population.²⁰ Given that nearly half of male IDUs in 1 Tijuana study reported sexual intercourse with both women and men and high levels of needle sharing,¹⁹ increased HIV transmission between MSM and IDUs is likely. Because Mexican border communities also represent highly mobile populations, shifts in HIV transmission dynamics could influence the spread of HIV and other STIs elsewhere in Mexico, the United States, and Central America.

This study sought to characterize and compare the sexual and drug use behaviors and prevalence of HIV, syphilis, and hepatitis C among male IDUs who reported sex with other males versus those who did not in 2 Mexico-US border cities. An advantage of the current study was the use of respondent-driven sampling (RDS),²¹ which facilitated the rapid recruitment of the “hidden” IDUs population and enabled the calculation of less biased estimates of self-reported homosexual/bisexual activity and risk behaviors in this study.

Materials and Methods

We conducted a cross-sectional study of behavioral and contextual factors associated with HIV, HCV, and syphilis infections among IDUs in the Mexican border cities of Tijuana (population 1.3 million) and Ciudad Juárez, México (population 1.2 million).²² Both cities are located on major drug trafficking routes and have large, predominantly male IDUs populations.²³ Eligibility criteria for the study included having injected illicit drugs within the past 30 days, confirmed by inspection of injection stigmata (track marks); aged 18 years or older; willing and able to provide informed consent; and not having previously been interviewed for the study. Subjects gave their written informed consent to participate in the study. Study methods were approved by the Ethics Board of the Tijuana General Hospital, and the Human Research Protection Program of the University of California, San Diego. Programa Compañeros, a trusted nongovernmental organization (NGO) that has provided services and conducted studies

among IDUs in Ciudad Juárez for decades, also reviewed the protocol as it pertained to this city and approved it on ethical grounds.

Between February and April 2005, RDS was used to recruit IDUs in Tijuana (15 seeds, 207 recruits over 8 waves) and Ciudad Juárez (9 seeds, 197 recruits over 8 waves), as described previously.¹⁴ Briefly, RDS is a chain-referral sampling method used to study hidden populations and has been validated among both IDUs^{21,24} and Latino gay men.²⁴ In our study, a diverse group of “seeds” heterogeneous in age, gender, drug of choice, and recruitment venue who met study eligibility criteria were interviewed and given 3 uniquely coded coupons to refer their peers, receiving \$5 compensation for each seed recruited.

Interviews were conducted in Spanish at the NGO-sponsored clinic of Programa Compañeros in Ciudad Juárez and in the mobile clinic of the NGO COMUSIDA in Tijuana. All participants received \$20 compensation for completing the survey, administered by trained staff who elicited information on sociodemographic and behavioral characteristics, including socioeconomic and demographic profiles, drug use history and practices, information on needle/syringe sharing and acquisition, experience with drug treatment, incarceration history, and medical history including HIV/STI knowledge. Subjects were asked to identify themselves as heterosexual, homosexual, or bisexual and were also asked to provide total numbers of lifetime male and female sexual partners, along with total male/female partners in the last 6 months. Our survey distinguished between time spent in a “preventiva” (jail), and “penitenciaria” (prison) as rules and norms differ for these institutions, and the extent to which men may engage in sex with other men in such settings could differ.

Participants were screened on-site for HIV antibody with the Determine Rapid Test (Abbott Laboratories, Abbott Park, IL). Blood samples were obtained by venipuncture and serum was stored at the municipal health clinic in Tijuana or Ciudad Juárez before being shipped frozen to the San Diego County public health laboratory or New Mexico State Laboratory, respectively. HIV-seropositive and indeterminate results were confirmed with a Western blot, HIV enzyme immunoassay (EIA), and/or HIV immunofluorescence assay. Pre- and posttest counseling and referrals were provided to all participants. All samples were tested for anti-HCV antibodies by an EIA test (Ortho Diagnostic Systems EIA 3.0, Raritan, NJ) and for syphilis antibody with the rapid plasma reagin (RPR) test (Macro-Vue, Becton Dickinson, Franklin Lakes, NJ). Reactive HCV samples were retested with an EIA to confirm, and reactive syphilis samples were confirmed using a *Treponema pallidum* particle agglutination assay (TPPA) (Serodia, Fujirebio Diagnostics, Malvern, PA). In the absence of clinical information, samples with syphilis titers $\geq 1:8$ were considered suggestive but not conclusive of incident syphilis.

Because the current study was a subanalysis of data obtained in the cross-sectional survey of IDUs described above, female subjects were excluded ($n = 35$) as were male subjects who did not answer a question on their lifetime sexual activity with other men ($n = 16$). Continuous variables were compared using the Mann-Whitney or t test where appropriate, and dichotomous variables with the Pearson χ^2 or Fisher exact test. Two-sided P values < 0.05 were considered statistically significant.

To adjust for possible bias in sampling, RDS adjustments of HIV, syphilis, Hepatitis C, and MSM prevalence were calculated in RDSAT software (version 5.6.0, October, 2006, Cornell University). RDSAT applies overall sampling and degree weights to account for the effects of differential recruitment and network size and to estimate an “equilibrium” ratio applied to the sample frequencies of each group.²⁵ This estimate corresponds to the ratio that would have been obtained if recruitment had continued for a large number of sampling “waves.” To determine whether it was necessary to perform RDS-adjustments in the univariate and

multivariate analyses, we conducted a preliminary analysis to compare MSM/IDUs with non-MSM/IDUs in our sample. Through cross-tabulation of recruitments, plotting network sizes of each group, and using the Kolmogorov-Smirnov test to determine if MSM/IDUs and non-MSM/IDUs differed significantly, we found similar network sizes, numbers of recruits, and lack of homophily (homogeneity between recruiters and recruits) between the groups, indicating that RDS-adjustments were not necessary to calculate odds ratios.

All univariate tests were repeated using a cutoff of ≥ 2 lifetime partners with no difference in observed trends (data not shown). Because the proportion of MSM in Tijuana was higher than in Ciudad Juárez, tests were repeated separately for each city to determine whether trends were similar. Forward, stepwise logistic regression was used to manually construct a multivariate model for the combined cities to determine factors independently associated with MSM behavior among IDUs. The number of lifetime female partners was entered as a log-transformed continuous variable in the multivariate model to account for its non-normal distribution. We checked for significant two-way interactions and overdispersion (observed variance greater than the predicted variance) in the final model.

Results

Of 393 male IDUs who were studied in both cities, 377 (96%) provided information on their lifetime sexual activity with other men. Of these, 31% reported at least one lifetime male sexual partner and were classified as MSM/IDUs for the purposes of this study [RDS-adjusted value: 35% (95% CI: 27, 43)]. By city, 13% of men were classified as MSM/IDUs in Ciudad Juárez [RDS-adjusted value 17% (95% CI: 11, 24)] and 47% in Tijuana [RDS-adjusted value: 49% (95% CI: 39, 62)]. Based on similar network sizes and numbers of recruits, RDS-adjusted and crude estimates of the frequency of MSM did not differ significantly, and RDS-based adjustments were not conducted in subsequent univariate/multivariate analyses. The median number of lifetime male sexual partners among MSM/IDUs was 2 [interquartile range (IQR), 1, 4], and approximately 4% of MSM/IDUs reported sexual activity with another man in the last 6 months (Table 1). Fewer than 2% of MSM/IDUs reported commercial sex work in the last 6 months.

MSM/IDUs and non-MSM/IDUs did not differ significantly in their demographic profiles, with the following exceptions: for Tijuana, MSM/IDUs were more likely to report monthly incomes above 3000 pesos (approximately \$275 US) (49% vs. 33%, $P < 0.05$) and history of juvenile incarceration (33% vs. 19%, $P < 0.05$), while the median age in Ciudad Juárez was 4 years younger among MSM/IDUs than non-MSM/IDUs (29 vs. 33, $P < 0.05$) (Table 1). Also, compared with other male IDUs, MSM/IDUs in Ciudad Juárez were more likely to have crossed the US-Mexico border in the last 6 months (38% vs. 16%, $P < 0.05$) (Table 1). Overall, MSM/IDUs had significantly greater likelihood (Mann-Whitney z-statistic 2.2, $P < 0.05$) of having high numbers of female sexual partners in their lifetimes [median 10 (IQR 6, 24)] than non-MSM/IDUs [median 10 (IQR 6, 15)] (Table 1). Overall, MSM/IDUs and non-MSM/IDUs did not differ significantly in migration patterns, education, age of first sexual experience and injection drug use, or lifetime history of incarceration/arrest (Table 1).

Overall prevalence of Hepatitis C virus infection was 96%, (RDS-adjusted: 95% CI: 94, 99) and there was no significant difference between MSM/IDUs and non-MSM/IDUs (Table 2). Overall HIV prevalence was 2.6% (RDS-adjusted: 95% CI: 0.7, 4.5), with RDS-adjusted values of 3% among non-MSM/IDUs (95% CI: 1.0, 6.0) and 1.0% among MSM/IDUs (95% CI: 0.2, 2.0). History of syphilis infection as indicated by RPR/TPPA testing was 17% for MSM/IDUs (RDS-adjusted, 95% CI: 2, 36) and 8% for non-MSM/IDUs (RDS-adjusted, 95% CI: 3, 12). Differences in network size among MSM/IDUs and non-MSM/IDUs caused slight variation from crude data in HIV and syphilis prevalence (Table 2). Among subjects who tested positive

for syphilis antibody, 40% of MSM/IDUs ($n = 10$) and 69% of non-MSM/IDUs ($n = 13$) had antibody titers $\geq 1:8$, though the total sample was too small to perform RDS-adjustments.

Examining sexual and drug risk behaviors, MSM/IDUs reported significantly higher lifetime prevalence of drug overdose and were more likely to engage in risk behaviors including needle sharing (both receptive and distributive), use of shooting galleries, sex in jail/prison and being paid for sex (Table 3). MSM/IDUs also had higher self-reported history of tuberculosis and STIs (Table 3), most commonly syphilis or gonorrhea (data not shown). MSM/IDUs also reported marginally higher usage of needle exchange programs than other male IDUs ($P = 0.07$). As observed trends for risk behaviors were similar between cities, only combined results are presented.

MSM/IDUs also reported significantly higher percentages of lifetime use of a number of drugs compared with non-MSM/IDUs (Table 4). There was a higher lifetime prevalence of methamphetamine use among all men in Tijuana relative to Ciudad Juárez, either when injected alone (68% vs. 5%, $P < 0.01$) or in combination with cocaine (17% vs. 1%, $P < 0.01$) or heroin (81% vs. 3%, $P < 0.01$). Within each city, patterns of methamphetamine use were similar between MSM/IDUs and non-MSM/IDUs, with the exception that MSM/IDUs were more likely to smoke or inhale methamphetamine in Ciudad Juárez and to inject methamphetamine with cocaine in both cities (Table 4).

Drug use and behavioral factors which were independently predictive of having ≥ 1 lifetime male sexual partners (Table 5) included living in Tijuana as opposed to Ciudad Juárez (OR: 7.2, 95% CI: 4.0, 13.0), lifetime use of inhalants (OR: 3.4, 95% CI: 1.8, 6.2) and oral tranquilizers (OR: 2.4, 95% CI: 1.3, 4.6), having more lifetime female partners (log-transformed continuous variable, OR: 1.6, 95% CI: 1.2, 2.1), ever receiving treatment for a drug problem (OR: 1.9, 95% CI: 1.1, 3.2) and needle sharing within the last 6 months (receptive or distributive: OR: 2.1, 95% CI: 1.0, 4.2). We found no evidence of overdispersion in the final model (deviance 0.94, $P = 0.7$), indicating that our regression was correctly modeled.

Discussion

In our study of male IDUs in Tijuana and Ciudad Juárez, MSM/IDUs were more likely to have recently engaged in a number of risk behaviors compared with non-MSM/IDUs, including needle sharing, shooting gallery use and receiving something in exchange for sex. In their lifetimes, MSM/IDUs also had higher odds of ever having sex in jail and prison, overdosing, seeking drug treatment, or using certain drugs. Lifetime prevalence of syphilis was also marginally higher for MSM/IDUs than non-MSM/IDUs as demonstrated in both crude and RDS-adjusted data. Although the prevalence of HIV infection did not differ significantly between these groups, HIV positivity of 12% to 20% among MSM in Mexico has been reported elsewhere,^{16,17} suggesting that MSM/IDUs could represent a bridge population through which HIV and other blood-borne or sexually transmitted infections (STIs) could be transmitted to other male and female IDUs and non-IDUs through sexual risk.

Approximately one-third of male IDUs in our survey and nearly half of IDUs in Tijuana reported having had sex with men in their lifetime, although very few reported recent sexual activity with men. The high percentage of MSM among Tijuana IDUs reported here is similar to results of a previous study which used time location sampling to describe IDUs characteristics in Tijuana,¹⁹ providing confidence that our respondent-driven sample accurately reflects the subpopulation of MSM/IDUs in this city. Interestingly, most MSM/IDUs reported having both male and female partners, and the number of lifetime female partners was an independent predictor of MSM behavior. The high level of bisexuality observed in our study is similar to other studies of MSM in developing nations^{10,26,27} including a Thai

study where a higher number of female partners was also independently associated with MSM behavior.²⁸

The sexual risks described by MSM/IDUs in our study included having had sex in jail or prison along with having received something in exchange for sex. These behaviors have been identified as significant risk factors for HIV/STI transmission since they often take place within the context of unprotected anal sex.^{29–32} While neither group consistently used condoms, MSM/IDUs reported marginally lower rates of condom use with casual partners than non-MSM/IDUs. MSM/IDUs were also significantly more likely to have been diagnosed with an STI at some point in their life, with the most commonly reported STIs among both groups being syphilis and gonorrhea, both of which have been associated with increased HIV transmission.^{33,34}

The importance of needle sharing in the transmission of HIV among IDUs is well documented.^{35–37} Our study's findings parallel several reports that have found high prevalence of sharing among MSM/IDUs,^{3,38} although the observed level of sharing among all IDUs in our study (>65%) is concerning. Shooting gallery use has also been associated with higher rates of needle sharing^{39,40} and HIV infection.^{2,41} We found that MSM/IDUs were more likely to attend shooting galleries than other male IDUs, which may reflect the constellation of higher-risk behaviors we observed among this subgroup; alternatively, the venues may serve as informal meeting places for men who might not identify themselves as homosexual/bisexual. Since high prevalence of shooting gallery usage has played an important role early in HIV epidemics in several North American cities^{36,42–44} and may play a role in emerging epidemics in developing countries,^{45,46} the fact that MSM/IDUs are more likely to seek out these venues is cause for concern.

MSM/IDUs exhibited different drug use patterns than non-MSM/IDUs, including greater tendency to have ever used marijuana, crack cocaine, inhalants, oral tranquilizers and injectable cocaine. Substance abuse has been associated with sexual risk taking among MSM⁴⁷ and gay methamphetamine users in particular.⁴⁸ The use of drugs during sex, highly prevalent among both MSM/IDUs and non-MSM/IDUs in our study, has also been found to be an independent risk factor for HIV transmission in other settings.^{33,48,49} Our data reinforce the notion that sexual risk taking, in addition to needle sharing, is likely to be an important factor in STI transmission among MSM/IDUs.^{1,2,50}

Our study had several limitations. First, our study is cross-sectional and therefore causal inferences with regard to risk behaviors and MSM/IDUs cannot be drawn. Second, as fewer than 3% of the MSM/IDUs in our survey self-identified as homosexual or bisexual, we employed a behavioral categorization of MSM, which is often necessary among studies of Latino and Latin American MSM where self-identification as gay/bisexual is less common.⁵¹ Latino sexual identity is often context-dependent and in large part conferred to by family and community; a man may not define himself as gay, because he is considered heterosexual by his family.⁵² The association between lack of self-identification as gay/bisexual and higher sexual risk behaviors varies among different populations^{53–55} but remains unstudied among Latin American MSM. However, discordance between knowledge of HIV transmission and behavior among Latino and Latin American MSM has been well described.^{56,57}

Finally, as our study was a subanalysis from a broader study not originally designed for the purpose of studying MSM/IDUs, we did not obtain detailed sexual histories which would better enable us to understand the context under which much of the sexual contact between men had occurred. The use of RDS lends confidence that our estimates of MSM prevalence have minimized potential sources of bias, though this subpopulation may differ from MSM/IDUs in other settings. Low numbers of lifetime male partners and sparse recent sexual activity

suggest that in at least some cases, the sexual contacts of MSM/IDUs with other men may be occasional; nevertheless, variables relating to “situational” behavior—sex exchange or sex in jail/prison—were not independent predictors of MSM status in our study. Irrespective of the frequency of MSM behavior, our data demonstrate that having one or more lifetime male sexual partners did differentiate this group as having a higher profile of risk behaviors than men who had never had sex with other men, placing this group at special risk for HIV/STI transmission.

This study has several implications for the design of future interventions. Because MSM/IDUs often engage in multiple risk behaviors, interventions targeting this group are especially warranted. Fortunately, MSM/IDUs in this study and others display a willingness to seek drug treatment and public health interventions, including needle exchange programs and HIV testing sites,¹⁰ which could be used as locations for additional preventive and educational interventions. Furthermore, since MSM/IDUs are also more likely to attend shooting galleries, these venues may serve as an important location for intensified interventions. Given the prevailing condition of “low-prevalence, high-risk” for HIV in Mexico, a focus on high risk subgroups such as MSM/IDUs may help to thwart continued spread of HIV and other sexually transmitted or bloodborne infections.

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TABLE 1
Demographics, Drug Use, and Sex Behaviors of Injection Drug Users by City and MSM* Category

	Overall		Tijuana		Cd. Juárez	
	MSM (n = 115)	Non-MSM (n = 262)	MSM (n = 91)	Non-MSM (n = 103)	MSM (n = 24)	Non-MSM (n = 159)
Median age (IQR) [†]	34 (28, 40)	34 (29, 41)	35 (29, 41)	35 (30, 40)	29 (24, 38) [‡]	33 (28, 42) [‡]
Median yr of school (IQR)	6 (5, 9)	7 (6, 9)	6 (5, 9)	7.5 (6, 10)	7 (6, 9)	7 (6, 9)
Earn >\$3000 pesos (\$275 US) monthly (%) [§]	48	42	49 [‡]	33 [‡]	41	47
Lived/worked outside Mexico in last 10 yr (%)	36	37	36	44	33	33
Have crossed border in last 6 mo (%)	16	13	10	8	38 [‡]	16 [‡]
Ever arrested (%)	96	94	97	96	92	92
Have been to juvenile detention (%)	32	36	33 [‡]	19 [‡]	29	46
Have been to jail (%)	94	89	95	89	92	89
Have been to prison (%)	74	64	77	68	63	61
Drug and sexual history						
Median age of first injected drug use (IQR)	18 (16, 24)	20 (16, 25)	18 (15, 24)	18 (15, 24)	21 (17, 24)	20 (16, 26)
Median age of first sexual experience (IQR)	15 (13, 16)	15 (14, 16)	15 (13, 16)	15 (13, 16)	14 (13, 15)	15 (14, 17)
Median no. lifetime male partners (IQR)	2 (1, 4)	0 (0, 0)	2 (2, 4)	0 (0, 0)	2 (1, 3)	0 (0, 0)
Had male sexual partners in last 6 mo (%)	4	0	3	0	4	0
Number of lifetime female partners (IQR) ^{//}	10 (6, 24) [‡]	10 (6, 15) [‡]	10 (6, 20)	10 (6, 15)	11 (7, 30)	10 (6, 15)

* Men who have sex with men.

[†] Interquartile range.

[‡] $P < 0.05$.

[§] n = 105, 83, 22 for MSM and 241, 91, 150 for non-MSM in cities combined, Tijuana and Cd. Juárez, respectively.

^{//} n = 112, 89, 23 for MSM and 253, 101, 151 for non-MSM in cities combined, Tijuana and Cd. Juárez, respectively.

TABLE 2
Disease Prevalence among MSM/IDU* and Non-MSM/IDU (Crude Values and RDS†-Adjusted)

Infection Prevalence	Crude Data		P	RDS Adjusted		P
	MSM (n = 115)	Non-MSM (n = 262)		MSM (n = 115) 95% CI	Non-MSM (n = 262) 95% CI	
HIV Positive (%)	4.3	2.7	0.40	1.0 (0.2, 2.0)	3.0 (1.0, 6.0)	0.37
Hepatitis C positive (%)	97.4	96.1	0.53	99 (98, 100)	95 (92, 99)	0.49
Syphilis positive (%)	8.8	5.6	0.24	17 (2, 36)	8 (3, 12)	0.09

* Men who have sex with men and who are also injection drug users.

† Respondent-driven sampling.

TABLE 3
Univariate Associations Between Sexual and Drug Risk Behaviors Among MSM/IDU* and non-MSM/IDU

	MSM (n = 115) %	Non-MSM (n = 262) %	Odds Ratio (95% CI)	χ^2P
Lifetime drug use behaviors				
Ever overdosed [†]	53	42	1.6 (1.0, 2.5)	0.039
Ever received drug treatment [‡]	62	40	2.4 (1.5, 3.8)	<0.01
Drug use behaviors in past 6 mo				
Injected in shooting gallery [‡]	74	56	2.3 (1.4, 3.6)	0.001
Sometimes/often lends used needles/ syringes [‡]	80	66	2.1 (1.2, 3.5)	0.006
Sometimes/often borrows used needles/ syringes [‡]	87	66	3.5 (1.9, 6.4)	<0.001
Arrested for carrying used needles/ syringes [‡]	70	57	1.8 (1.1, 2.8)	0.020
Aware of needle exchange program	9	11	0.8 (0.4, 1.6)	0.479
Of these, used program [§]	90	57	6.9 (0.8, 61.4)	0.070 ^{//}
Medical history				
Ever diagnosed with an STI [†]	11	4	2.6 (1.1, 6.2)	0.021
Ever diagnosed with tuberculosis [‡]	7.0	1.5	4.8 (1.4, 16.3)	0.006
Lifetime sexual behaviors				
Had sex in jail [†]	7	2	3.8 (1.2, 12)	0.013
Had sex in prison [‡]	40	15	3.9 (2.3, 6.1)	<0.001
Sexual behaviors in past 6 mo				
Sometimes/often received something in exchange for sex [‡] [¶]	46	18	3.7 (1.6, 8.4)	0.001
Did not always use a condom with regular partner [#]	98	90	5.0 (0.6, 40.2)	0.111 ^{//}
Had sex with a casual partner	38	32	1.3 (0.8, 2.1)	0.213
Did not always use a condom with casual partner [¶]	88	75	2.5 (0.8, 7.1)	0.084
Used drugs during casual sex [¶]	96	83	4.3 (0.9, 20.0)	0.052 ^{//}

* Men who have sex with men and who are also injection drug users.

[†] $P < 0.05$.

[‡] $P < 0.05$.

[§] n = 10 for MSM and n = 30 for non-MSM.

^{//} Fisher Exact test P -value.

[¶] n = 44 for MSM and n = 82 for non-MSM.

[#] n = 44 for MSM and n = 110 for non-MSM.

TABLE 4

Significant Lifetime Drug Use Patterns ($P < 0.05$) of Combined Cities as Univariate Associations Among MSM/IDU* and non-MSM/IDU, With Data by City

Drug	Overall			Tijuana			Cd. Juárez		
	MSM (n = 115) %	Non-MSM (n = 262) %	Odds Ratio (95% CI)	MSM (n = 91) %	Non-MSM (n = 103) %	Odds Ratio (95% CI)	MSM (n = 24) %	Non-MSM (n = 159) %	Odds Ratio (95% CI)
Smoked marijuana/hash	96	88	3.1 (1.2, 8.1)	96	88	2.9 (0.9, 9.2)	96	87	3.3 (0.4, 25.9)
Smoked crack cocaine	65	44	2.4 (1.5, 3.8)	68	49	2.2 (1.2, 4.0)	54	40	1.8 (0.7, 4.2)
Snorted or sniffed heroin	30	16	2.2 (1.3, 3.7)	30	20	1.6 (0.9, 3.2)	29	13	2.7 (1.0, 7.3)
Used inhalants	78	51	3.5 (2.1, 5.8)	76	47	3.5 (1.9, 6.5)	88	53	6.2 (1.8, 21.5)
Smoked/inhaled meth	69	39	3.6 (2.2, 5.7)	79	77	1.1 (0.6, 2.2)	33	14	3.1 (1.2, 8.1)
Used oral tranquilizers	82	59	3.1 (1.8, 5.3)	83	54	4.2 (2.1, 8.3)	75	61	1.9 (0.7, 5.0)
Injected									
Cocaine alone	77	65	1.7 (1.1, 2.9)	77	64	1.9 (1.0, 3.5)	75	66	1.5 (0.6, 4.1)
Meth alone	56	29	3.1 (2.0, 4.8)	68	67	1.1 (0.6, 1.9)	8	4	2.0 (0.4, 10.1)
Meth/cocaine	22	3	7.8 (3.5, 17.3)	25	9	3.5 (1.5, 8.0)	8	0	N/A
Meth/heroin	65	33	3.8 (2.4, 6.1)	81	80	1.1 (0.5, 2.2)	4	3	1.7 (0.2, 15.7)

* Men who have sex with men and who are also injection drug users.

TABLE 5

Multivariate Analysis of Factors Independently Associated With MSM Status Among Injection Drug Users in Tijuana and Ciudad Juárez, Mexico, 2005

	Exp(B) (95% Confidence Interval) *	P
City of interview	7.2 (4.0, 13.0)	<0.001
Ever used inhalants	3.4 (1.8, 6.2)	<0.001
Ever used oral tranquilizers	2.4 (1.3, 4.6)	0.005
Number of female partners (log-transformed continuous variable)	1.6 (1.2, 2.1)	0.002
Ever received drug treatment	1.9 (1.1, 3.2)	0.024
Shared needles in the last 6 mo (receptive or distributive)	2.1 (1.0, 4.2)	0.042

* B = coefficient (B), Exp(B) = Wald statistic or estimated odds ratio.