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## Individual, Interpersonal, and Social-Structural Correlates of Involuntary Sex Exchange Among Female Sex Workers in Two Mexico–U.S. Border Cities

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### Abstract

**Objective**—To investigate individual, interpersonal, and social-structural factors associated with involuntary sex exchange among female sex workers (FSWs) along the Mexico–U.S. border.

**Methods**—In 2010–2011, 214 FSWs from Tijuana (n=106) and Ciudad Juarez (n=108) aged 18 who reported lifetime use of heroin, cocaine, crack, or methamphetamine, having a stable partner, and having sold/traded sex in the past month completed quantitative surveys and HIV/STI testing. Logistic regression was used to identify correlates of involuntary sex exchange among FSWs.

**Results**—Of 214 FSWs, 31 (14.5%) reported involuntary sex exchange. These women were younger at sex work entry (Adjusted odds ratio [AOR]: 0.84/1 year increase, 95% CI: 0.72–0.97) and were significantly more likely to service clients whom they perceived to be HIV/STI-infected (AOR: 12.41, 95% CI: 3.15–48.91). Additionally, they were more likely to have clients who used drugs (AOR: 7.88, 95% CI: 1.52–41.00), report poor working conditions (AOR: 3.27, 95% CI: 1.03–10.31), and report a history of rape (AOR: 4.46, 1.43–13.91).]

**Conclusions**—Involuntary sex exchange is disproportionate among FSWs who begin to exchange sex at a younger age, and these women experience elevated risk of violence and HIV/STIs related to their clients' behaviors and their working conditions. These data suggest the critical need for evidence-based approaches to preventing sexual exploitation of women and girls and to reducing harm among current sex workers. Multi-level interventions for sex workers and their clients that target interpersonal and social-structural risks (e.g., measures to improve safety and reduce exploitation within the workplace) are needed.

### Keywords

female sex workers; forced sex work; HIV; sexually transmitted infections; Mexico

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### Conflicts of Interest

The authors declare no conflict of interest.

## INTRODUCTION

Globally, female sex workers (FSWs) experience disproportionately high risk of HIV infection,<sup>1</sup> and the reasons for and context of women's involvement in the sex industry have key implications for HIV risk and prevention<sup>2-7</sup>. Involuntary sex exchange is a widely recognized human rights violation and is considered by the UN Palermo Protocol to be a principal component of trafficking in persons, along with the sexual exploitation of minors<sup>8</sup>. Involuntary sex exchange carries serious health and social consequences, including increased risk of HIV and other sexually transmitted infections (STIs).<sup>2,7,9,10</sup>

Data on the nature and impacts of involuntarily exchanging sex highlight its importance in shaping HIV vulnerability in South and South East Asia, where this and other forms of sexual exploitation confer elevated risk of HIV<sup>2,7,9-12</sup>. For example, among FSWs in eastern India, almost 25% were coerced or deceived to engage in sex work; these participants were more likely to report violence at sex work entry, which was associated with higher odds of HIV infection.<sup>11</sup> In a national sample of FSWs in Thailand, those who reported trafficking (i.e., involuntary or adolescent sex work) were more likely to report sexual violence at sex work initiation, workplace violence or abuse, and condom failure or non-use<sup>12</sup>. However, empirical data regarding the health impacts of involuntary sex exchange in other regions, including Latin America, are lacking.

This study was conducted along the Mexico-U.S. border, where intense population mobility and thriving sex trades create a high-risk setting. Large numbers of women and children from Central America and southern and central Mexico are reported to be exploited in sex tourism locations, including cities along the Mexico-U.S. border<sup>13,14</sup>.

Situated adjacent to San Diego, CA and El Paso, TX, Tijuana (pop: 1,483,992) and Ciudad Juarez (pop: 1,313,338), Mexico, host large sex industries that attract clients from the U.S., Mexico, and other international locations<sup>15-17</sup>. Approximately 9000 FSWs operate in Tijuana; an estimated 6,500 work in Ciudad Juarez<sup>18-20</sup>. The Mexico-U.S. border is also experiencing an emerging HIV epidemic, which disproportionately affects FSWs and their clients. HIV prevalence has increased six-fold from <1% to 6% among FSWs in Tijuana and Ciudad Juarez in the past decade, and is >12% among FSWs who inject drugs<sup>21</sup>. The risks posed by sex work in these cities are exacerbated by prevalent drug use in both cities<sup>22-25</sup>. Methamphetamine, cocaine, and heroin use are growing problems in Tijuana and Ciudad Juarez<sup>26,27</sup>, and have been linked to increased HIV/STI risk among FSWs and clients<sup>28-30</sup>. Gender-based violence is also widespread, as exemplified by the unsolved murder, abduction, torture, rape, and disappearance of hundreds of women and girls in Ciudad Juarez<sup>31-33</sup>. FSWs in Mexico-U.S. border cities are highly affected by such violence, who frequently report rape, assault, threats, and other abuse<sup>33-35</sup>.

Globally, sex workers' HIV/STI vulnerability is shaped by individual, interpersonal/behavioral, and social-structural factors<sup>1</sup>. *Individual factors* related to involuntary sex exchange, such as young age, may increase risk of HIV/STIs. For example, among women and girls with a history of adolescent or involuntary sex exchange in Nepal, young age of initiation was associated with over three and a half times the odds of HIV infection,<sup>9</sup> which may be related to biological factors (e.g., larger areas of cervical ectopy/trauma to an immature genital tract) among younger women<sup>9,36</sup>. *Interpersonal and behavioral factors* such as drug use and interactions with clients and intimate partners also influence the risks associated with sex work, such as drug use and condom use with clients<sup>12,16,37-43</sup>. For instance, forced initiation of injection drug use is associated with early sex work entry among FSWs in Mexico<sup>4</sup>, and in South and South East Asia, trafficked women often report difficulties negotiating safer sex with clients<sup>9,12</sup>. Lastly, *social-structural factors* exogenous

to the individual, such as work environment (e.g., sex work venue, manager/pimp roles) and exposure to gender-based violence<sup>7,43–45</sup> have been linked to sexual exploitation and HIV<sup>40,46–48</sup>. For example, HIV/STIs and involuntary sex exchange are often concentrated in ‘open’ sex markets that overlap with drug markets<sup>11,48–50</sup>.

Whereas prior research has identified associations between early sex work entry and sexual and drug-related risks among FSWs<sup>7,9,49,51</sup>, there remains a paucity of empirical data regarding the experiences and health of those involuntarily involved in the sex industry. Our objective was to investigate individual, interpersonal/behavioral, and social-structural factors associated with involuntary sex exchange in Tijuana and Ciudad Juarez, Mexico.

## METHODS

### Data collection

Data were drawn from an observational study of the context and epidemiology of HIV/STIs among drug-using FSWs and their primary non-commercial male partners. From May 2010–September 2011, 214 FSWs and their partners completed baseline questionnaires and HIV/STI testing in Tijuana (n=106) and Ciudad Juarez (n=108), Mexico, as previously described<sup>52</sup>. Procedures were approved by IRBs at the University of California San Diego and El Colegio de la Frontera Norte in Tijuana.

Since our aim was to understand correlates of involuntary sex exchange among current FSWs, analyses were limited to FSWs (N=214). Eligibility criteria included being at least 18 years old; having traded sex in the past 30 days; reporting lifetime use of heroin, cocaine, crack, or methamphetamine; and having a stable partner for at least 6 months, reporting sex with that partner in the last 30 days, and being able to recruit that partner to participate in the study. Exclusion criteria included reporting high levels of current intimate partner violence (IPV).

Due to the challenges of employing probability sampling methods in studies of hidden populations such as FSWs<sup>53</sup>, participants were recruited through targeted<sup>54</sup> and snowball sampling<sup>55</sup>, as previously described.<sup>52</sup> During targeted sampling, street-based outreach workers worked in pairs to target areas where sex work and drug use visibly occur (e.g., street corners, bars) in Tijuana and Cd. Juarez. After spending time informally in such venues, outreach workers unobtrusively approached women to explain the study and assess interest in participation. During snowball sampling, FSWs enrolled in the study referred other sex workers they were acquainted with from the street, bars and other establishments. Outreach workers invited potential female participants to the study office for screening. 335 women were screened, of whom 245 (73.1%) were eligible<sup>52</sup>; primary reasons for ineligibility included failure to meet the criteria for drug use, no recent sex work, and planning to break up with their partner.<sup>52</sup> 239 couples were screened, of whom 230 (96.2%) were eligible. Of the nine ineligible couples (3.8%), two were excluded due to IPV and seven were determined not to be real couples. Sixteen eligible couples failed to enroll, of whom 14 did not return and two due to fatalities, and 214 couples were enrolled<sup>52</sup>. All participants provided written informed consent prior to participating.

Questionnaires were administered by trained interviewers using computer-assisted personal interviewing with QDS software<sup>56</sup>, which were programmed into laptops at research offices. Questionnaires were conducted in Spanish or English in private research offices. No participants were excluded due to insufficient language proficiency.

**Dependent variable**—The dependent variable was **involuntary sex exchange**, which was defined as a ‘yes’ response to either of the following questions: ‘Have you ever been sold or

traded for sexual purposes?’ or ‘Have you ever been forced to exchange sex for money, drugs, or other goods at the orders of another person?’ These measures were designed based on the UN Palermo Protocol definition of trafficking in persons and formative qualitative research conducted with FSWs, and were pilot-tested.

**Independent variables**—Covariates of interest included *individual socio-demographic characteristics* (e.g., country, languages spoken, education, age) and age at sex work entry. The questionnaire also covered *interpersonal factors* such as **client interactions**, including sexual and drug-related behaviors (e.g., number and % of unprotected sex acts with clients; drug use with clients; perceived HIV/STI status of clients) and client drug use (e.g., had clients who used/injected drugs); **drug use** (e.g., types of drugs used and injection drug use); and **intimate partner interactions**, including sexual risks (e.g., partner insisted on sex without a condom; believes partner is HIV+) and partner control over sex work (e.g., partner mostly/completely decides sex work days and times). *Social-structural factors* measured included sources of income, places exchanged sex, which was measured by the question, ‘[In the last 6 months] have you traded sex or worked as a prostitute in any of the following locations?’ (Response options: bar/cantina, street, hotel/motel, brothel, vehicle, shooting gallery). Other features of **work environment** including perceived working conditions, which was assessed by asking, ‘How would you rate your overall working conditions?’ (Responses recoded as good/neutral vs. bad/extremely bad); living and working in the same place (yes vs. no); and having to pay a manager, administrator, pimp, or someone else a percentage of earnings from sex work. History of **gender-based violence** was also assessed, including rape (ever forced or coerced to have non-consensual sex) and physical abuse.

**HIV/STI testing**—Blood specimens were obtained by venipuncture, centrifuged on site, and split into two aliquots. One urine sample was self-collected for gonorrhea and Chlamydia testing. To ascertain HIV status, standard approved rapid antibody testing was used. All reactive samples were tested using an HIV-1 enzyme immunoassay and immunofluorescence assay. Syphilis serology used the standard approved rapid plasma reagin (RPR) qualitative test. Positive samples were subjected to confirmatory testing using the Treponema pallidum particle agglutination assay (TPPA) (Fujirebio, Wilmington, DE, USA). Testing for Gonorrhea (GC) and Chlamydia (CT) was conducted using the Genprobe Transcription-Mediated Amplification assay (TMA; San Diego, CA). The San Diego County Health Department conducted GC/CT analyses and confirmatory tests for HIV and syphilis. All women received HIV pre- and post-test counseling. Results of rapid HIV and syphilis tests were available immediately; Chlamydia, gonorrhea, and confirmatory HIV and syphilis test results were available after one month at which time, all participants received their test results. Free STI treatment was provided based on U.S. and Mexican guidelines; confirmed HIV cases were referred to municipal clinics for free treatment and follow-up care. Participants were compensated \$20 for the baseline survey and testing.

### Data analysis

To evaluate differences in individual, interpersonal, and social-structural factors between women who experienced involuntary sex exchange versus those who did not; we used Wilcoxon rank sum tests for continuous outcomes, and Fisher’s exact test for binary outcomes. To identify factors associated with involuntary sex exchange, we performed univariate and multivariate logistic regressions. Multivariate models were restricted to 180 participants for whom complete data were available regarding variables of interest. We used Little’s test (1988) to ensure that data were missing completely at random (MCAR) in the final model<sup>57</sup> and evaluated sources of missing data to ensure that these were related to covariate rather than outcome data.

Models were developed using a manual procedure where all variables of interest with a significance level of less than 10% in a univariate analysis were considered in order of most to least significant to ensure that a reasonable set of variables were considered for model-building. Nested models were compared using the likelihood ratio statistic, retaining variables that were significant at the 5% level. All two-way interactions were examined for the final model by including both independent variables and their interaction term (the product of the two independent variables). Multicollinearity was assessed for variables retained in the final model by evaluating collinearity diagnostic factors, including the tolerance, variance inflation factor, and the condition index. Our final model was checked by backward selection, which achieved the same model and had sufficient power, with all 5 covariates retaining significance at the 0.05 level.

## RESULTS

### Individual socio-demographic characteristics and HIV/STI prevalence

Of 214 FSWs, 31 (14.5%) reported involuntary sex exchange. Women who experienced involuntary sex exchange were significantly more likely than those who did not to be U.S.-born (9.7% vs. 4.4%), speak English (32.3% vs. 16.4%), and younger (median: 28 vs. 33) (Table 1). Across the sample, most women were married (98.6%) and Latina/Hispanic (97.7%); the median level of education was 6 years.

Prevalence of HIV and any STI/HIV across the sample were 4.2% and 21.4%, respectively. HIV and STI/HIV prevalence were higher among FSWs who reported involuntary sex exchange, at 6.5% and 23.3%, although these differences were not statistically significant.

### Interpersonal and behavioral factors

Women who experienced involuntary sex exchange were more likely to report early sex work entry (71.0% vs. 32.8%; median age at entry: 16 vs. 20), as well as interpersonal risks such as having clients who they believed had HIV or an STI (40.0% vs. 3.0%) and who used drugs (90.0% vs. 43.6%), and using drugs with clients (77.4% vs. 28.4%) (Table 2). Intimate partner risks, such as having a partner believed to be HIV-positive (13.8% vs. 3.3%), who controls their sex work (12.9% vs. 2.7%), or who insists on sex or sex without a condom (35.5% vs. 14.2%) were also more common among women reporting involuntary sex exchange as compared to their peers not reporting this experience.

### Social-structural factors

Across the sample, primary sources of income included sex work (85.0%), other informal work (7.5%), and spouse/partner's job (5.7%), with no significant differences noted between groups (Table 3). Women who reported involuntary sex exchange were more likely to work in hotels/motels (35.5% vs. 19.2%), live and work in the same location (19.4% vs. 4.9%), and rate their working conditions as bad/extremely bad (41.9% vs. 18.0%) as compared to women who did not report involuntary sex exchange. They were also more likely have a manager/pimp with whom they had to share their earnings (16.1% vs. 2.7%) and to have been raped (64.5% vs. 22.4%).

### Univariate and multivariate analyses

In univariate analysis (Table 4), women who experienced involuntary sex exchange were more likely to speak English and initiate sex work at a younger age. Unadjusted analyses highlighted consistent associations between involuntary sex exchange and a higher-risk client and intimate partner profile, including having clients or intimate partners believed to be HIV/STI positive, clients who used drugs, and intimate partner control over sex work. Though no significant differences were found in women's individual drug use, those who

reported involuntary sex exchange were more likely to use drugs with clients. Women who experienced involuntary sex exchange were also more likely to report poor working conditions and to pay a manager or pimp a portion of their earnings.

In multivariate analysis (Table 4), involuntary sex exchange was independently associated with young age at sex work entry (Adjusted Odds Ratio (AOR): 0.84/1 year increase, 95% CI: 0.72–0.97), having clients believed to have HIV or an STI (AOR: 12.41, 95% CI: 3.15–48.91) and who used drugs (AOR: 7.88, 95% CI: 1.52–41.00), reporting bad/extremely bad working conditions (AOR: 3.27, 95% CI: 1.03–10.31), and history of rape (AOR: 4.46, 1.43–13.91).

## DISCUSSION

In this study, approximately one in seven current female sex workers in Tijuana and Ciudad Juarez had ever experienced involuntary sex exchange (i.e., sold/traded or forced to exchange sex); approximately one in four of these women were positive for HIV/STIs. These findings are highly concerning given the lack of current attention to the issue of involuntary sex exchange within the HIV prevention and harm reduction fields, which have primarily focused their attention to the development of interventions for women assumed to exchange sex on a voluntary basis. Involuntary sex exchange was independently associated with early sex work entry, having clients who were perceived to be HIV/STI infected and who use drugs, poor working conditions, and sexual violence. These findings suggest that females involuntarily involved in the sex industry may experience additional vulnerabilities beyond those posed by voluntary sex work, and highlight the need for multi-level HIV prevention interventions tailored to this sub-population.

Women who experienced involuntary sex exchange had a substantially higher-risk profile of clients; for instance, they were over twelve times more likely to perceive that their clients were HIV/STI positive. Previous research in Mexico has linked client attributes to sex workers' health, and may explain why being U.S.-born and speaking English were also associated with involuntary sex exchange. In Tijuana and Ciudad Juarez, FSWs with U.S. clients were more likely to earn more for unprotected sex, have a higher burden of clients, have syphilis titers  $> \text{ or } = 1:8$ , and inject drugs.<sup>16</sup> In this study, the relationship between involuntary sex exchange, being U.S.-born and speaking English may be explained by an increased propensity for these women to have higher-risk clients (e.g., U.S.-based clients who use drugs). Furthermore, although women who reported involuntary sex exchange had higher numbers of clients and sex acts with them, they were also more likely to use condoms. This may be due to the greater perceived threat of HIV/STI infection by clients, and may explain the lack of significant differences in HIV/STIs and involuntary sex industry involvement.

Participants who experienced involuntary sex exchange were more likely to have clients who recently used drugs, including injection drugs. Drug use within the context of commercial sex has key implications for HIV prevention, as it may inhibit safer sex considerations and increase the likelihood of acquiescing to unprotected sex<sup>42</sup>. Among FSWs and their clients, drug use is associated with elevated HIV/STI prevalence and risk behaviors in Mexico<sup>28,29,58</sup> and internationally<sup>59–61</sup>. This study builds on prior research focusing primarily on condom non-use, gender-based violence, and their associations with HIV among sexually exploited females<sup>5,9,11</sup>, and uniquely demonstrates the linkages between involuntary sex exchange, client characteristics and their relevance for ongoing HIV and STI prevention efforts.

Involuntary sex exchange was also associated with social-structural risks, including poor working conditions. These women may be more likely to work in venues where they feel unsafe, are exposed to higher-risk clients, and/or experience exploitation by management, which could be tied to limited agency surrounding their sex industry involvement. This interpretation is supported by our recent qualitative research in Tijuana, which indicated that having a history of involuntary sex exchange may exacerbate the social-structural risks experienced by current sex workers<sup>62,63</sup>. Further, this work builds on prior research with FSWs in Mexico and Canada linking other closely related experiences, such as early sex work entry, to police arrest and street entrenchment<sup>4</sup>.

This study found that women who reported involuntary sex exchange were younger at sex work entry and were more likely to report gender-based violence. These findings are supported by studies documenting a close relationship between early sex work involvement, prior sexual abuse, and involuntary sex exchange<sup>4,5,9</sup>. A recent review of research on adolescents who exchange sex found great consistency in the increased risk of HIV and violence they experience relative to their older counterparts<sup>43</sup>. These data indicate the urgent need to establish health, social, and legal services tailored to the needs of younger sex workers, who may be particularly vulnerable to involuntary sex exchange, gender-based violence, and related harms.

### Strengths & Limitations

This study is limited by several factors. We analyzed cross-sectional data, which cannot be used to infer causality. Data were gathered among FSWs participating in a study with their intimate partners. Due to safety concerns, women who reported high levels of IPV were ineligible; thus, our sample may represent a lower-risk population in terms of the risks posed by intimate partners. Given that women were recruited via targeted and snowball sampling, our findings may over-represent more visible FSWs with greater social support. In contrast, as participants were required to report drug use, bias towards higher-risk individuals is also possible.

Measures of involuntary sex exchange were selected to analyze the most precise indicator available. Given the trauma and stigmatization often experienced by those who involuntarily exchange sex, participants may have under-reported these experiences. Although 64.5% of women who experienced involuntary sex exchange reported prior rape, this figure is lower than expected given the close ties between involuntary sex exchange and nonconsensual sex; however, it is possible that women who reported being sold/traded did not equate sex work involvement with rape. These considerations reflect the nuances of agency in sex work, and suggest the need for future research aimed at exploring such subtleties and their public health impacts.

Although our findings suggest that involuntary sex exchange may facilitate exposure to interpersonal and social-structural factors that increase HIV/STI risk, it was not independently associated with HIV/STIs. Moreover, due to the limitations of existing data, measurement of social-structural factors (e.g., gender-based violence) relied on individual-level data. Since the study from which these findings were generated was not designed to investigate the relationship between involuntary sex exchange, multi-level factors, and HIV/STIs, additional studies are needed to understand broader determinants of FSWs' health. Studies that gather more detailed data regarding the context and nature of involuntary entry and assessments of the complexities of reasons for sex work involvement are especially needed.

## Conclusions

Findings of this study indicate that involuntary sex exchange is unacceptably prevalent among FSWs along the Mexico-U.S. border, and may be closely related to younger age of sex work initiation, risky client interactions, and poor working conditions. Although clients' attributes have been linked to HIV risk among FSWs, to our knowledge, this is the first study to examine how client characteristics relate to involuntary sex industry involvement. These data suggest the critical need to engage FSWs and clients in the development and testing of evidence-based HIV/STI prevention interventions targeting the interpersonal and social-structural levels. At the social-structural level, legal and social supports are needed to provide current FSWs with opportunities to exit sex work, reduce exploitation, and enhance sex workers' HIV/STI prevention capacities.

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**Table 1**

Relationship between individual socio-demographic characteristics, HIV/STI prevalence and involuntary sex exchange among female sex workers (N=214) in Tijuana and Ciudad Juarez, Mexico, 2010–2011

Variable	Involuntary sex exchange		Total N=214	P-Value
	Yes N=31 N (%)	No N=183 N (%)		
Interview site				
<i>Tijuana, Baja California</i>	16 (51.6%)	90 (49.2%)	106 (49.5%)	0.848
<i>Ciudad Juarez, Chihuahua</i>	15 (48.4%)	93 (50.8%)	108 (50.5%)	
Country of Birth				
<i>Mexico</i>	27 (87.1%)	175 (95.6%)	202 (94.4%)	<b>0.037</b>
<i>United States</i>	3 (9.7%)	8 (4.4%)	11 (5.1%)	
Speaks English	10 (32.3%)	30 (16.4%)	40 (18.7%)	<b>0.046</b>
Age, years (Median, IQR)	28 (24–36)	33 (28–41)	33 (26–39)	<b>0.015</b>
Married/Common-law Relationship	31 (100.0%)	180 (98.4%)	211 (98.6%)	<b>1.000</b>
Education, years (Median, IQR)	6 (6–7)	6 (6–9)	6 (6–9)	<b>0.412</b>
Race				
<i>Latina/Hispanic</i>	30 (96.8%)	179 (97.8%)	209 (97.7%)	0.546
<i>White/Caucasian</i>	1 (3.2%)	1 (0.5%)	2 (0.9%)	
Positive for HIV	2 (6.5%)	7 (3.8%)	9 (4.2%)	0.621
Positive for any STI/HIV	7 (23.3%)	38 (21.1%)	45 (21.4%)	0.811

NOTE: Data are N (%) of women, unless otherwise indicated. Certain percentages may reflect denominators smaller than the N value give in the column head. Except as specifically noted, these discrepancies are due to missing data.

**Table 2**

Relationship between interpersonal/behavioral factors and involuntary sex exchange among female sex workers (N=214) in Tijuana and Ciudad Juarez, Mexico, 2010–2011

Variable	Involuntary sex exchange			P-Value
	Yes N=31 N (%)	No N=183 N (%)	Total N=214	
Age at sex work entry (Median, IQR)	16 (15–19)	20 (17–25)	19 (16–24)	<0.001
Client interactions				
<i>Has clients who believes has HIV or an STI</i>	10 (40.0%)	5 (3.0%)	15 (7.9%)	<0.001
<i>Ever used drugs with a client</i>	24 (77.4%)	52 (28.4%)	76 (35.5%)	<0.001
<i>Had clients who used drugs<sup>1</sup></i>	27 (90.0%)	75 (43.6%)	102 (50.5%)	<0.001
<i>Had clients who inject drugs<sup>1</sup></i>	16 (55.2%)	19 (11.7%)	35 (18.2%)	<0.001
<i># of clients in a typical week<sup>1</sup> (Median, IQR)</i>	8.5 (4.5–20)	7 (4–14)	7.5 (4–15)	0.428
<i># of vaginal sex acts with clients<sup>2</sup> (Median, IQR)</i>	28 (10–70)	24 (10–48)	24 (10–48)	0.224
<i># of non-regular clients<sup>2</sup> (Median, IQR)</i>	16 (5–48)	5 (0–29)	8 (0–30)	0.007
<i>% of unprotected vaginal sex acts with clients<sup>2</sup> (Median, IQR)</i>	12.3 (0–50)	20.8 (0–100)	20 (0–75)	0.163
Intimate partner interactions				
<i>Believes partner is HIV+ or has AIDS</i>	4 (13.8%)	6 (3.3%)	10 (4.8%)	0.035
<i>Partner mostly/completely decides how much of your earnings from sex work each of you gets to keep</i>	4 (12.9%)	5 (2.7%)	9 (4.2%)	0.027
<i>Partner ever insisted on sex or sex without a condom</i>	11 (35.5%)	26 (14.2%)	37 (17.3%)	0.008
Drugs used <sup>1</sup>				
<i>Heroin</i>	18 (58.1%)	119 (65.0%)	137 (64.0%)	0.544
<i>Methamphetamine</i>	14 (48.3%)	57 (31.5%)	71 (33.8%)	0.092
<i>Ever injected drugs</i>	22 (71.0%)	129 (70.5%)	151 (70.6%)	1.000

<sup>1</sup>In the past 6 months

<sup>2</sup>In the past month

NOTE: Data are N (%) of women, unless otherwise indicated. Certain percentages may reflect denominators smaller than the N value give in the column head. Except as specifically noted, these discrepancies are due to missing data.

**Table 3**

Relationship between social-structural factors and involuntary sex exchange among female sex workers (N=214) in Tijuana and Ciudad Juarez, Mexico, 2010–2011

Variable	Involuntary sex exchange			P-Value
	Yes N=31 N (%)	No N=183 N (%)	Total N=214	
Places exchanged sex <sup>1</sup>				
<i>Bar or cantina</i>	5 (16.1%)	30 (16.5%)	35 (16.4%)	1.000
<i>Street</i>	24 (77.4%)	146 (80.2%)	170 (79.8%)	0.809
<i>Hotel or motel</i>	11 (35.5%)	35 (19.2%)	46 (21.6%)	0.057
Primary source of income <sup>2</sup>				0.443
<i>Sex work</i>	27 (87.1%)	155 (84.7%)	182 (85.0%)	
<i>Other informal work</i>	2 (6.5%)	14 (7.7%)	16 (7.5%)	
<i>Spouse/steady partner's work</i>	1 (3.2%)	9 (4.9%)	10 (5.7%)	
<i>A legal or official job</i>	0 (0.0%)	2 (1.1%)	2 (0.9%)	
Lives and works in the same location	6 (19.4%)	9 (4.9%)	15 (7.0%)	<b>0.011</b>
Evaluation of working conditions				
<i>Bad/Extremely bad</i>	13 (41.9%)	33 (18.0%)	46 (21.5%)	<b>0.008</b>
<i>Good/Neutral</i>	18 (58.1%)	150 (82.0%)	168 (78.5%)	
Must pay a manager/pimp or share % of earnings	5 (16.1%)	5 (2.7%)	10 (4.7%)	<b>0.007</b>
Exposure to gender-based violence				
<i>Ever raped</i>	20 (64.5%)	41 (22.4%)	61 (28.5%)	<b>&lt;0.001</b>

<sup>1</sup>In the past 6 months;

<sup>2</sup>In the past month;

NOTE: Data are N (%) of women, unless otherwise indicated. Certain percentages may reflect denominators smaller than the N value give in the column head. Except as specifically noted, these discrepancies are due to missing data.

**Table 4**

Factors associated with involuntary sex exchange among female sex workers (N=214) in Tijuana and Ciudad Juarez, Mexico, 2010–2011

Variable	Univariate Analysis		Multivariate Analysis (N=180)	
	Unadjusted OR	Unadjusted 95% CI	Adjusted OR	Adjusted 95% CI
<b>Individual factors</b>				
Speaks English	2.43	1.04–5.67		
Age	0.94	0.90–0.99		
Age at sex work entry	0.85	0.77–0.94	<b>0.84</b>	<b>0.72–0.97</b>
<b>Interpersonal factors</b>				
Client interactions				
<i>Has clients who believes has HIV or an STI</i>	21.20	6.40–70.17	<b>12.41</b>	<b>3.15–48.91</b>
<i>Had clients who used drugs<sup>I</sup></i>	11.64	3.40–39.82	<b>7.88</b>	<b>1.52–41.00</b>
<i>Had clients who inject drugs<sup>I</sup></i>	9.33	3.89–22.37		
<i>Ever used drugs with a client</i>	8.64	3.51–21.27		
Intimate partner relationships				
<i>Believes partner is HIV+ or has AIDS</i>	4.64	1.22–17.59		
<i>Partner mostly/completely decides how much of your earnings from sex work each of you gets to keep</i>	5.28	1.33–20.88		
<i>Partner ever insisted on sex or sex without a condom</i>	3.32	1.43–7.73		
<b>Social-structural factors</b>				
Places exchanged sex <sup>I</sup>				
<i>Hotel or motel</i>	2.31	1.01–5.26		
Lives and works in the same location	4.64	1.52–14.15		
Evaluation of working conditions				
<i>Bad/Extremely bad</i>	3.28	1.47–7.36	<b>3.27</b>	<b>1.03–10.31</b>
Must pay a manager/pimp or share % of earnings	6.85	1.85–25.28		
Exposure to gender-based violence				
<i>Ever raped</i>	6.30	2.79–14.21	<b>4.46</b>	<b>1.43–13.91</b>

<sup>I</sup>In the past 6 months

NOTE: Data are N (%) of women, unless otherwise indicated. Certain percentages may reflect denominators smaller than the N value give in the column head. Except as specifically noted, these discrepancies are due to missing data.