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U.S. Drug Use and Migration experiences of Mexican Female Sex Workers who are injection Drug Users

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Abstract

Objective—To describe U.S.-based drug/sex behaviors and correlates of lifetime U.S. drug use by Mexican female sex workers who inject drugs (FSW-IDUs).

Methods—Between 2008–2010, 315 migrant FSW-IDUs residing in Tijuana and Ciudad Juarez, Mexico responded to questionnaires.

Results—Twenty-seven percent (n=85) of FSW-IDUs were U.S. migrants; of these, 46% (n=39) were deportees. One-half of U.S.-migrant FSW-IDUs consumed illicit drugs in the U.S., and two-thirds of these injected drugs in the U.S. Among U.S. injectors, over 75% ever received or shared used injection equipment. The majority (92%) of U.S.-migrant FSW-IDUs never obtained U.S. drug treatment services. HIV prevalence was 4% among U.S.-migrant and 5% among non-U.S. migrant FSW-IDUs; 100% of U.S.-migrant and 75% of non-U.S. migrant FSW-IDUs were unaware of their HIV status.

Conclusions—Binational coordination to improve access to substance use treatment and HIV testing services in Mexico and the U.S. among marginalized binational migrants may be critical to containing HIV transmission.

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Keywords

Mexico; United States; HIV; female sex workers; drug use; migration; sexual behaviors

Migration has been linked with substance use and HIV infection, including among Mexicans migrating to the United States.^{1,2} Nearly 11.5 million Mexico-born individuals reside in the U.S., accounting for 30% of all immigrants.³ Migrants' participation in risky sexual and drug use behaviors may be connected to poverty, marginalization, and exposure to new social networks, norms, and environments.⁴⁻⁶ These factors may modify and elevate migrants' HIV risk profile.⁷ In the U.S., Latinos are disproportionately burdened by HIV/AIDS.⁸ Among women, Latinas are at high risk for HIV. In 2009, Latinas represented 21% of new HIV infections among all Latinos, and Latinas' rate of HIV infection was four times that of non-Latino White women (11.8 vs. 2.6 per 100,000, respectively).⁸ While research on Mexican males' migration to and from the U.S. and their HIV risk behaviors abounds,⁹⁻¹¹ studies examining the HIV risk behaviors of Mexican female migrants are scarce.^{6,12-14} Given the significant public health impacts of HIV for the Latino community, especially Mexican migrants,⁵ this study examines the drug and HIV risk behaviors of Mexican women who report a lifetime history of U.S. migration and reside in Tijuana and Ciudad Juarez, Mexico. Both cities abut the United States.

The U.S.-Mexico border region is characterized by high volumes of cross-border traffic.¹⁵ In 2010, the Southern U.S. border with Mexico registered 168 million vehicular, bus, and pedestrian entries into the U.S.,¹⁵ reflecting the interconnectedness of U.S. and Mexican border states. The Mexican states of Baja California and Chihuahua, which border California and Texas, respectively, attract domestic and international migrants, serving as both destinations for migrants and migration corridors.¹⁶⁻¹⁸ Mexico's 2010 Census reported that 52% of Tijuana, Baja California's 1.6 million residents and 32% of Ciudad Juarez, Chihuahua's 1.3 million residents are migrants.^{17,18} Tijuana and Ciudad Juarez continuously receive thousands of people from the United States and Mexico;¹⁹ these population flows support sex and drug tourism.²⁰ Regulation of sex work varies in Mexico. For example, Tijuana's female sex workers (FSWs) ages 18 years and older may obtain a government permit to work in the city's *zona roja* [red light districts]; quarterly, women undergo HIV/sexually transmitted infection (STI) testing. Conversely, Ciudad Juarez lacks a permit system, although sex work is tolerated. Both cities host sizeable sex worker communities (Tijuana: ~6,000 FSWs and Ciudad Juarez: ~4,000 FSWs).²¹ One study found that of 924 FSWs in Ciudad Juarez and Tijuana, 61% are migrants (i.e., were born outside of either city).²² A recent study of 620 female sex workers who inject drugs (FSW-IDUs) in Tijuana and Ciudad Juarez found that U.S. migration was common (51%), including among those who are HIV-positive (i.e., 52%; 17 of 33 women).²³ However, this study could not determine where infection occurred. These data reflect the high prevalence of domestic and international migration among Mexican women who engage in sex work, including those who are IDUs.

Published studies propose that migrants may serve as "epidemiological bridges,"²⁴ whereby communities are linked *via* migrants' sexual and drug use behaviors. Historically, Mexico's

HIV epidemic has been tied to migrants returning from the U.S.,^{5,9,10} in a process known as “circular” or “return” migration.²⁵ The potential for bridging populations also exists among sex workers, including those who are migrants.²³ Recent studies find that clients of sex workers are also implicated as potential avenues of infection transmission due to their behaviors (e.g., drug use, inconsistent condom use, violence, multiple sex partners, untreated STIs).^{26,27} These diverse circumstances may play a role in STI transmission among migrants and their partners in sending and receiving communities.

Recent statistics suggest that Mexico's emerging HIV epidemic on the Mexico-U.S. border, is being influenced by migration, sex work, and injection drug use (IDU). Notably, Mexico has historically reported low levels of drug use,^{7,28–30} although regional variations are now evident. The northern border region reports the highest rate of lifetime substance use (7.45%).³¹ This outcome is associated with northern states' locations on cocaine, methamphetamine, and heroin drug trafficking routes.^{31–33} Illicit drug use is common among FSWs in Tijuana and Ciudad Juarez: nearly one in five FSWs in both cities reported any lifetime injection drug use.²⁰ Additionally, a recent study of 620 Mexican FSWs who are IDUs reported an HIV prevalence rate of 5.3%.²³ HIV risk is heightened among FSWs given their engagement in risky sexual behaviors (e.g., unprotected sex with clients and intimate partners, drug use before/during vaginal sex, multiple injection drug using (IDU) sex partners in the prior month).²² Mexico's Ministry of Health has noted that AIDS is becoming feminized;³⁴ in 2009, women accounted for 23% of Mexico's HIV cases.³⁵ These statistics collectively suggest that additional studies of factors that place female migrants, including sex workers, at increased risk for drug use and HIV are needed and may inform public health policies designed to improve the health profile of female migrants.

Given the high rates of migration from Mexico to the U.S. and scarcity of data on Mexican female migrants, this study describes the migration and substance use experiences of Mexican female sex workers who inject drugs (FSW-IDUs) and have migrated to the United States. We also identify factors associated with drug use in the U.S. Results from this study may inform our understanding of binational drug use behaviors in this population, while identifying factors that may be amenable to change in order to protect individuals' and communities' health and well-being. We anticipate that among women who have ever visited the U.S., the number of years of U.S. residence will be positively associated with U.S. drug use.

Methods

As noted previously, between October 2008 and July 2010, 620 FSW-IDUs were recruited into a behavioral intervention study in Tijuana and Ciudad Juarez aiming to reduce injection and sexual risk behaviors associated with HIV and sexually transmitted infection (STI) acquisition.²³ Women appearing to work as FSWs were approached by outreach workers at bars, street corners and motels to determine their interest in and eligibility for the study. Recruitment sites were selected in part based on the study team's experience in working with female sex workers and IDUs in prior studies as well as the recruiters' knowledge of the community where the study occurred.^{30,36} In Tijuana, the Tijuana Bar Association provided our team with a list of bars situated in the *Zona Norte*.^{30,36} Eligibility criteria included:

being 18 years old or older; having unprotected vaginal/anal sex with a male client in the prior month; injecting illicit drugs and sharing syringes and/or other injection equipment within the past month; speaking Spanish or English; being able to provide informed consent; having no plans to leave the city permanently within 18 months, and agreeing to undergo free treatment for STIs.

At baseline, participants underwent interviewer-administered surveys and biological HIV/STI testing. Surveys elicited data on sociodemographic characteristics, lifetime and past month drug behaviors, and HIV testing history. We employed interviewer-administered surveys due to the low educational attainment levels of the study population.^{23,37,38} The Determine® rapid HIV antibody test was administered to determine the presence of HIV antibodies (Abbott Pharmaceuticals, Boston, MA). All reactive samples were tested using an HIV-1 enzyme immunoassay and immunofluorescence assay at the County of San Diego, Public Health Laboratory. Women testing HIV-positive were referred to the local municipal health clinic for monitoring and care. In accordance with the Centers for Disease Control (CDC) recommendations, our study protocol required that pre and post-test counseling be provided to all participants, including when participants were notified of their test results. We also followed CDC counseling guidelines.³⁹ These procedures are consistent with Mexico's HIV test result notification policies.⁴⁰

Participants were scheduled to return at one month following the baseline interview to obtain their HIV test results and complete a questionnaire focused on lifetime migration experiences occurring prior to participating in the present study, as described below. Our team determined that administering the migration questionnaire at the one-month follow-up visit would reduce the burden on the participant. To promote contact with this longitudinal study, we developed detailed locator forms that are tailored to the study population. We collected information such as identifying marks (e.g., tattoos), cell phone number, address/neighborhood of residence, and other information in order to facilitate outreach activities. However, we lack data regarding how many participants returned to the study site independently for their HIV test results *versus* how many participants were tracked using other methods.

One month after the baseline visit, women responded to an interviewer-administered migration questionnaire that documented historical events around substance use and sex work behaviors, social relationships with people in U.S. and Mexico communities, and testing for HIV and sexually transmitted infections, in the context of Mexico and U.S.-based migration experiences. We defined migrant FSW-IDUs as living in more than one city during their lifetime and not being lifetime residents of Tijuana or Ciudad Juarez (n=325); of these, 95 participants reported ever migrating to the United States. However, for this study, we excluded 10 participants for whom we lacked complete U.S. migration data; thus, this analysis is based on data for 85 participants for whom we had complete U.S. migration records.

We conducted descriptive analyses of sociodemographic characteristics, drug use, and HIV seroprevalence, stratifying by U.S.-migrant status. Fisher's exact, chi-squared test, and t-test were used to calculate the statistical significance of differences between proportions for

categorical and continuous variables. In building the multivariate logistic model that examined factors associated with FSW-IDUs' use of illicit drugs in the United States, we controlled for age, interview site, and other migration and health-related variables. This study was approved by the Institutional Review Board at the University of California, San Diego, the General Hospital of Tijuana, and the Autonomous University of Ciudad Juarez.

Results

Sociodemographic characteristics and migration experiences

Table 1 presents selected sociodemographic, HIV, family relationship data and migration experiences of female sex workers who are injection drug users, stratified by U.S. migration experiences. Twenty-seven percent (n=85) of FSW-IDUs ever migrated to the United States. U.S. migrant FSW-IDUs were more likely than non-U.S. migrants to speak any English (48% vs. 23%, $p = .01$). Women who had ever migrated to the U.S. were significantly more likely to report U.S. migration experiences by other family members (73% vs. 42% among non-U.S. migrants, $p = .01$). Women with U.S. migration experiences were significantly more likely than non-U.S. migrant FSW-IDUs to remain in contact with family currently residing in the U.S. (63% vs. 42%, $p = .01$). Overall, 5% of migrant FSW-IDUs were HIV+ (n=15; data not shown). HIV prevalence was 4% among U.S. migrant FSW-IDUs (n=3) and 5% among non-U.S. migrant FSW-IDUs (n=12). Significantly, of women who tested positive for HIV at baseline, 100% of U.S. migrant FSW-IDUs were unaware of their HIV status at the time of the interview, as were 75% of non-U.S. migrant FSW-IDUs (n=3 and 9, respectively, $p = .33$).

U.S. HiV risk behaviors

We examined U.S. migrant FSW-IDUs' migration and social relationships, drug use, sexual behaviors, and STI testing practices (Table 2). U.S. migrant FSW-IDUs resided in the United States for about eight years. Nearly one-half of U.S. migrant FSW-IDUs (46%, n=39) reported ever being deported (i.e., expelled from the U.S.). On average, women reported nearly three lifetime deportations. Although California was the most popular destination, Texas also attracted deported FSW-IDUs.

Overall, one-half of U.S. migrant FSW-IDUs ever consumed illicit drugs in the U.S. (n=44) (Table 2). Poly-drug use was pervasive, and drugs consumed included heroin with cocaine (23%, n=10), methamphetamine (27%, n=12), marijuana (41%, n=18), cocaine (61%, n=27) and heroin (64%, n=28). Two-thirds of drug-using migrant FSW-IDUs ever injected drugs in the U.S. (n=29), most commonly, heroin (86%, n=25), heroin with cocaine (41%, n=12), and cocaine (41%, n=12). More than three-quarters of injectors (n=23) reported receiving used injection equipment or sharing injection equipment that they had previously used with others (n=24, 83%). The majority (92%) of U.S.-migrant FSW-IDUs who used drugs in the U.S. reported never obtaining drug treatment services there.

Migrant FSW-IDUs also reported on lifetime sexual behaviors in the U.S. (Table 2). One-half of migrants reported ever engaging in vaginal/anal sex in the U.S.; of these, almost two-thirds consumed alcohol or drugs before or during sex. Unprotected sexual encounters were

common. About one-half of U.S. migrant FSW-IDUs ever exchanged sex for drugs in the U.S. and two-thirds ever traded sex for money. In contrast, exchanging sex for housing/food or other goods or favors was less common. Among U.S. migrant FSW-IDUs, 26% (n=22) reported ever being tested for HIV in the United States and one-fifth were ever tested for other STIs (n=18).

Factors independently associated with illicit drug use in the U.S

We constructed multivariate logistic regression models of lifetime drug use in the United States by migrant FSW-IDUs, controlling for sociodemographic, migration, sexual behaviors and HIV testing practices (see Table 3). For every one year of U.S. residence, the odds of consuming illicit drugs in the U.S. increased (adjusted odds ratio [AOR]: 1.18, 95% confidence interval [CI]: 1.05, 1.32). Women who reported ever having vaginal/anal sex in the U.S. were significantly more likely to report ever consuming illicit drugs in the U.S. (AOR: 24.64; 95% CI: 5.79, 104.85), however, this estimate should be interpreted with caution given its wide confidence interval. Unfortunately, we cannot determine whether U.S. sex behaviors were performed in the context of sex work activities or within the context of intimate relationships. Women who reported being ever tested for HIV in the U.S. were significantly less likely to consume drugs there (AOR: 0.09; 95% CI: 0.01, 0.79). Other covariates (i.e., age, Tijuana interview site, U.S. family migration experience, undocumented U.S. travel, ever deported) were statistically non-significant in the multivariate model.

Discussion

This study extends prior research on cross-border injection drug use among a predominantly Mexican male IDU population.^{41,42} We found that U.S. migration is prevalent among Mexican FSW-IDUs. Twenty-seven percent of our study participants ever migrated to the United States, reflecting the historically high levels of emigration from Mexico to the U.S. Currently, ~11% of all Mexico-born people (i.e., ~13 million people) reside in the U.S.⁴³ Nearly one-half of U.S.-migrant FSW-IDUs were ever deported at least once. Mexican statistics also show that the number of permanent or temporary return migrants exceeded 400,000 people in 2007.⁴⁴ Collectively, these statistics indicate that circular U.S.-Mexico migration is pervasive. Multivariate analyses revealed that migration (i.e., number of years in the U.S.) and one sexual health behavior (i.e., lifetime sex in the U.S.) were associated with increased likelihood of lifetime U.S. drug use. In contrast, utilization of U.S. HIV testing services was protective against lifetime U.S. drug use among U.S.-migrant FSW-IDUs. Unfortunately, the majority of the study participants reported no use of drug rehabilitation services in the U.S. Furthermore, lack of awareness of HIV status among those who tested positive was pervasive. These findings imply that protecting the health status of migrant women, including female deportees, is a binational concern given women's ongoing relationships with people in both countries. Study findings reinforce the importance of access to drug rehabilitation and HIV testing for female migrants.

In the U.S., migrant FSW-IDUs engaged in unsafe drug and sexual behaviors (e.g., poly-drug use, receptive/distributive injection equipment sharing; unprotected sex) that are

associated with HIV transmission.⁸ Among sexually active U.S. migrant FSW-IDUs, condom use was low and substance use and trading sex for drugs/money were prevalent. While we cannot determine the ordering of these behaviors, they have important public health implications since FSW-IDUs may link populations in both countries that might otherwise be unconnected.⁴⁵ While immigrant Latinos' drug use is often lower than that of U.S.-born Latinos,^{46,47} some studies have reported higher rates of drug use by later generational status people and among long-term immigrants,^{46,48,49} as observed in our study. For example, one national study of adolescents found that U.S.-born Latinos were significantly more likely to congregate with substance-using peers; over time, adolescents reported also consuming illicit drugs,⁵⁰ thus reflecting the influence of peer contacts in drug use behaviors among youths.⁵¹ Understanding the specific contexts (e.g., country/age of initiation into drug/injection use, especially *vis-à-vis* deportation) of migrant FSW-IDUs' drug use merits further inquiry. With respect to unsafe sex behaviors, Salgado-Snyder et al., also documented a wider range of sexual practices (e.g., greater number of lifetime sex partners, receiving/giving oral sex, anal intercourse) that may elevate the risk for HIV/STIs, among Mexican rural women who migrated to the U.S. (vs. spouses of migrants, non-migrant women).⁶ Although she did not examine drug use, Salgado-Snyder's study suggests that sexual behaviors may evolve post-migration. Additional research is needed to understand the factors that contribute to drug use and engagement in risky sex practices among migrant women. Nevertheless, we concur with Salgado-Snyder et al.,⁶ who suggest that HIV risk behaviors should be contextualized within the cultural milieu of the individual to produce effective interventions.

A concentrated HIV epidemic is defined as a prevalence rate more than 5% in a high-risk population (e.g., FSWs, IDUs).⁵² We documented an HIV prevalence rate of 4% in our sample of U.S. migrant FSW-IDUs. Strathee et al., reported an HIV prevalence rate of 5.3% in the parent study from which this subsample was derived.⁵² Significantly, in comparison with non-Latino White women, U.S. Latinas are disproportionately burdened by HIV/AIDS.^{8,53} While the U.S. Centers for Disease Control and Prevention (CDC) recommends opt-out testing for patients in health care settings,⁵⁴ Latinas report low HIV testing rates in community-based studies.^{55,56} Nationally, less than 50% of all Latinas have ever been tested.⁵⁷ One study in Baltimore found that Latinas were less likely than Latino males to be tested for HIV.⁵⁶ Other studies have found self-reported HIV risk behaviors even among male and female Latinos who do not perceive themselves to be at risk for HIV,^{56,58} suggesting that improving Latinos' knowledge of HIV risk factors may be important to increasing testing in this population subgroup. The CDC reports that 1.2 million persons are living with HIV; an estimated one in every five are unaware of their status.⁵⁹ We found that the majority of FSW-IDUs, including U.S.-migrant FSW-IDUs, who tested positive at baseline were unaware of their HIV-positive status. Latinas, especially immigrants, are likely to be identified as HIV-positive late in the course of the illness, potentially resulting in poorer prognoses and limiting options for early treatment interventions.^{57,60} In the U.S., Latinas (especially undocumented immigrants) experience substantial barriers in accessing health insurance. Foreign-born Latinas currently account for one in five of all uninsured persons.⁶¹ Consequently, undocumented people will constitute a large uninsured population that experiences social and economic barriers to obtaining care

and receiving health information in a timely manner.^{62–65} The National HIV/AIDS Strategy for The United States has identified Latinos and Latinas as priority target populations for mechanisms that will improve testing uptake and reduce new infections and HIV-related disparities.⁵⁹ Innovative strategies to improve timely HIV testing among Mexican migrants, including unauthorized populations, are warranted in order to improve connections to care and health outcomes. Novel approaches such as community-based HIV testing in non-standard sites (e.g., homes, bars, fairs, sporting events, mobile clinics) may be needed. One study found that door-to-door outreach that combined home-based rapid HIV testing was acceptable to Mexican migrants in U.S.⁵⁸ Such strategies may be useful for reaching migrants, especially the indigent, in both countries. Other strategies, such as bundling of HIV tests with other services,⁶⁶ may be less effective in reaching uninsured and marginalized populations that are disconnected from the health care system, but still merit further investigation.

Migrant FSW-IDUs reported ongoing contact with U.S. people, despite undergoing numerous deportations. We found that nearly one-half of U.S. migrant FSW-IDUs were ever deported from the U.S., demonstrating that U.S. re-entry by deportees as documented by Weeks et al.,⁶⁷ is also prevalent among Mexican FSW-IDUs. Deportation often imposes significant emotional and economic tolls on migrants and their families due to separation from loved ones in the U.S.^{68,69} Separation from family residing in the U.S. was also reported by U.S.-migrant FSW-IDUs, which may motivate women's return to the U.S. (circular migration). Several studies of migrant Latinos have linked circular migration to HIV transmission in receiving communities.^{1,9} Various studies with Mexican IDUs residing in Tijuana have documented cross-border social and drug-using relationships with U.S. people,^{41,42} demonstrating the fluidity and diversity of social ties and HIV risk behaviors across and despite geopolitical boundaries. Mehta et al. examined the HIV-1 sequences sampled from cohorts in Tijuana and San Diego, California and found that the HIV epidemics are distinct, implying that populations may not be mixing as freely as has been assumed.⁷⁰ The authors note that variations in the sample population characteristics (e.g., FSWs and IDUs in Tijuana *versus* men who have sex with men in the San Diego sample), may have influenced their findings. Further studies with similar populations are needed to understand better the potential relatedness of the HIV epidemic in the U.S.-Mexico border region. Additional research can also elucidate women's migration decisions, particularly in light of major life events, including deportation. Such data may shed light on how cross-border migration events by high-risk populations influences the HIV epidemic in the U.S.-Mexico border region and may inform protocols for HIV testing of high-risk migrants^{54,71} and triaging binational HIV-positive⁷² patients into care that considers migrants' patterns of mobility. We also found that use of substance abuse treatment services by U.S.-migrant FSW-IDUs was scarce, reflecting Latinos' low access to substance use treatment services in the U.S.-Mexico border region.⁷³ The U.S.-Mexico Border Health Commission has identified the critical need for improved access to mental health and substance use treatment services in border communities. Ensuring that disparities in access to drug abuse treatment services are eliminated⁷⁴ likely constitutes another important component in the United States' and Mexico's multilevel plans to reduce substance use and the impact of the HIV epidemic.

Our findings should be considered in light of several limitations. Our study is based on data collected in two U.S.-Mexico border cities; results may not be representative of all Mexican FSW-IDUs. We excluded 10 participants due to incomplete migration data. The small sample of migrant FSW-IDUs may have affected our ability to detect differences in behaviors and experiences of U.S. and non-U.S. migrant participants. Drug and sexual behaviors may be under-reported due to participants' polydrug use, the self-reported and retrospective nature of the study, and the use of interviewer-administered surveys, which may have limited disclosure. Although we could not determine where HIV infection occurred, the data suggest that prospective longitudinal studies of high-risk migrants are needed to fill data gaps and inform public health interventions and policies. We lacked data on sexual/drug use behaviors among participants' social networks, thus limiting our understanding of FSW-IDUs' social networks role in binational HIV transmission. We lacked data on participants' legal and socioeconomic status while in the U.S., including access to health insurance coverage, which may have affected access to drug treatment and HIV-services. Despite these limitations, this study provides novel data regarding U.S. migration, including patterns of circular migration between Mexico and the U.S., among U.S. migrant FSW-IDUs, including deportees. This study also sheds light on drug use and sexual behaviors in U.S. communities by a highly vulnerable female migrant subgroup.

Conclusions

Eliminating barriers to accessing drug rehabilitation and HIV testing and treatment services in the U.S. and Mexico is critical, especially for undocumented migrants, who are often marginalized due to their legal status in both countries.^{69,75} Timely use of HIV testing services by binational migrants may be critical to containing HIV transmission in the U.S. and Mexico,⁷⁶ and is recommended among high-risk populations, including substance users.^{54,71} The U.S. Affordable Care Act of 2010 addresses disparities in access to health insurance coverage. However, undocumented immigrants are expected to remain at high risk for being uninsured given that they will be excluded from public and proposed programs.⁷⁷ Mexico has attempted to address health care coverage inequities among the poor and indigent by implementing in 2004 the *Seguro Popular* [People's Insurance]. Beginning in the Fall, 2010, Mexican migrants in the U.S. could register themselves and their families residing in Mexico for *Seguro Popular*.^{78,79} However, migrants returning from the U.S. may be unable to meet the enrollment criteria (e.g., proof of residence, access to an official government identification),^{69,80} further discouraging them from accessing this program and health care in Mexico. Identifying mechanisms to finance the health insurance coverage of Mexican migrants in the U.S. constitutes an important public health priority given that they are expected to account for a large proportion of the uninsured.⁷⁷ Similarly, expediting linkages to insurance mechanisms for migrants returning to Mexico may promote timely use of preventive and therapeutic care.

Prior studies have documented the binational lives of residents from the U.S.-Mexico border region, including in their drug use behaviors.^{41,42,72,81} An increasing body of evidence substantiates the need for a coordinated binational HIV strategy that also addresses drug abuse prevention. It is critical to facilitate migrants' access to affordable and sound substance use treatment services⁸² in both Mexico and the U.S. Notably, Mexico has

historically lacked a strong network of drug use treatment services.⁸³ Investing in strengthening safety-net substance use treatment services, particularly for those most in need (e.g., the poor, FSW-IDUs, and migrant/deported substance abusers) warrants consideration as a component of Mexico's multilevel strategy to contain the HIV epidemic, particularly in light of its current drug policy reforms.⁸⁴ Additional prospective cohort data are needed to elucidate the substance use and HIV trajectories of high-risk populations such as migrant FSW-IDUs; such data can inform public policies and HIV and drug abuse interventions and health services targeting binational populations.

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Table 1

SELECTED SOCIODEMOGRAPHIC CHARACTERISTICS AND HIV SEROSTATUS OF MEXICAN FEMALE SEX WORKERS WHO ARE INJECTION DRUG USERS (FSW-IDU) BY U.S. MIGRATION STATUS (N=315), TIJUANA AND CIUDAD JUAREZ, MEXICO, 2008-2010^a

	Non-U.S. Migrant FSW-IDU n=230 (73%)	U.S. Migrant FSW-IDU n= 85 (27%)	p-value
Sociodemographics			
Mean age, years (Standard deviation: SD)	34 (8.6)	36 (7.9)	.97
Marital status: Married/common law partner	89 (39)	43 (51)	.06
Highest Educational Attainment			
Up to and Complete Primary (Through 6th grade)	120 (52)	34 (40)	.06
More than Primary Education	110 (48)	51 (60)	
Average Monthly Income, Past Year			
\$2499 pesos	77 (34)	28 (33)	.85
\$2500 pesos	149 (66)	57 (67)	
Has Any Children	216 (94)	78 (92)	.50
Speaks Any English	53 (23)	41 (48)	.01
Contextual Factors			
Interview location			
Tijuana	129 (56)	54 (64)	.24
Ciudad Juarez	101 (44)	31 (36)	
HIV Serostatus			
HIV Positive, Based on Testing at Baseline	12 (5)	3 (4)	.53
Unaware Is HIV Positive at Baseline (Among Those Testing HIV+)	9 (75)	3 (100)	.33
Relationships With Family Members in the United States			
Any Family Member Has Ever Migrated to the United States	96 (42)	62 (73)	.01
Currently Has Family Members in the United States (Among Those With U.S. Migrants in Family)	89 (93)	60 (97)	.28
Maintains Contact With Family Members in the United States	37 (42)	38 (63)	.01

*p<.1

**p<.05

***p<.01

^a Level of statistical significance between proportions comparing U.S. vs. Non-U.S. migrants

Table 2

MIGRATION AND DRUG USE EXPERIENCES OF MEXICAN FEMALE SEX WORKERS WHO ARE INJECTION DRUG USERS WITH U.S. MIGRATION EXPERIENCES, TIJUANA AND CIUDAD JUAREZ, MEXICO, 2008-2010

	U.S. Migrant n=85 (%)
U.S. Migration Experiences	
U.S. Entry Without Documentation	66 (78)
Average Number of Years Lived in the U.S. (Standard Deviation: SD)	8.2 (10.9)
Deportation Experiences	
Ever Deported from the United States	39 (46)
Average Number of Lifetime Deportations (SD)	2.9 (4.0)
U.S. State Last Visited (Among Deportees)	
California	21 (54)
Texas	11 (28)
Other State	7 (18)
U.S. Drug Use	
Ever Consumed Any Illicit Drugs in the U.S.	44 (52)
Drugs Consumed In U.S. (Among Drug Users)	
Marijuana	18 (41)
Heroin (alone)	28 (64)
Cocaine (alone)	27 (61)
Crack Cocaine (alone)	8 (18)
Heroin 1 Cocaine	10 (23)
Methamphetamine (alone)	12 (27)
Methamphetamine 1 Heroin	3 (7)
Methamphetamine 1 Cocaine	2 (5)
Tranquilizers	6 (14)
Barbiturates	0
Angel Dust/PCP	3 (7)
Ever Injected Drugs in the U.S. (Among U.S. Drug Users)	29 (66)
Heroin (alone)	25 (86)
Cocaine (alone)	12 (41)
Crack Cocaine (alone)	3 (10)
Heroin 1 Cocaine	12 (41)
Methamphetamine (alone)	1 (3)
Methamphetamine 1 Heroin	4 (14)
Methamphetamine 1 Cocaine	0
Tranquilizers	1 (3)
Barbiturates	0
Angel Dust/PCP	0
Other Drugs	0
Receptive Sharing of Injection Equipment: Participant Ever Used Previously Used Injection Equipment in the U.S. (e.g., syringe, rinse water, filters, cookers) (Among U.S. Injectors)	23 (79)

	U.S. Migrant n=85 (%)
Distributive Sharing of Injection Equipment: Participant Gave Another Person Injection Equipment that She had Ever Used Previously in the U.S. (e.g., syringe, rinse water, filters, cookers) (Among U.S. Injectors)	24 (83)
U.S. Drug Treatment	
Never Obtained Drug Treatment Services in the United States	78 (92)
Lifetime Sexual Behaviors In The U.S.	
Ever had Vaginal/Anal Sex	44 (52)
Never Used Condoms During Vaginal Sex	23 (52)
Never Used Condoms During Anal Sex	19 (43)
Ever Exchanged Sex For Drugs	21 (48)
Ever Exchanged Sex For Money	29 (66)
Exchanged Sex For Housing/Food	11 (25)
Exchanged Sex For Favors/Clothing/Jewelry	5 (11)
Ever Used Alcohol Before/During Sex	27 (61)
Used Drugs Before/During Sex	31 (70)
HIV/STI Testing	
Ever Tested for HIV in the United States	22 (26)
Ever Tested for Sexually Transmitted Infections in the United States	18 (21)

Table 3

FACTORS INDEPENDENTLY ASSOCIATED WITH EVER CONSUMING DRUGS IN THE UNITED STATES AMONG MEXICAN FEMALE SEX WORKERS WHO ARE INJECTION DRUG USERS WITH U.S. MIGRATION EXPERIENCES (N=85), TIJUANA AND CIUDAD JUAREZ, MEXICO, 2008-2010

	Odds Ratio	95% Confidence Interval
Sociodemographics		
Age	1.08	0.99, 1.17
Contextual Factors		
Interview site: Tijuana	3.02	0.79, 11.59
Migration Characteristics		
U.S. Family Migration Experience	0.30	0.06, 1.51
Ever Traveled to U.S. Without Documentation for Entry	2.21	0.35, 13.92
Number of Years Lived in the U.S. **	1.18	1.05, 1.32
Ever Deported (Lifetime)	1.43	0.34, 5.97
U.S. Sexual Health Behaviors		
Ever Had Vaginal or Anal Sex in the U.S. **	24.64	5.79, 104.85
Use of U.S. Health Services		
Ever Tested for HIV in the U.S. *	0.09	0.01, 0.79

*
p<.05

**
p<.01