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Circular Migration by Mexican Female Sex Workers Who are Injection Drug Users: Implications for HIV in Mexican Sending Communities

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Abstract

Background—Circular migration and injection drug use increase the risk of HIV transmission in sending communities. We describe female sex workers who are injection drug users' (FSW-IDUs) circular migration and drug use behaviors.

Methods—Between 2008-2010, 258 migrant FSW-IDUs residing in Tijuana and Ciudad Juarez, Mexico responded to questionnaires.

Results—24% of FSW-IDUs were circular migrants. HIV prevalence was 3.3% in circular migrants and 6.1% in non-circular migrants; 50% of circular and 82% of non-circular migrants were unaware of their HIV infection. Among circular migrants, 44% (n=27) consumed illicit drugs in their birthplace; 70% of these (n=20) injected drugs and one-half of injectors shared injection equipment in their birthplace. Women reporting active social relationships were significantly more likely to return home.

Discussion—Circular migrant FSW-IDUs exhibit multiple HIV risks and opportunities for bridging populations. Regular HIV testing and treatment and access to substance use services is critical for FSW-IDUs and their sexual/drug-using contacts.

Keywords

Mexico; HIV; sex workers; drug use; migration

INTRODUCTION

Circular migration, defined as migrants' return to their community of origin, may foster HIV transmission due to the bridging of populations that may not otherwise interact via migrants' sexual and drug use practices.(1) Isolation, poverty, marginalization, and exposure to new social networks and environments may facilitate migrants' engagement in risky sexual and drug use practices, thereby raising their HIV risk profile.(2) Mexican males' migration/circular migration and HIV risk behaviors are extensively documented. (3-5) Mexican female migration (6, 7) and *Mexican migrant women's* HIV risk and substance use behaviors are significantly understudied.(8-10) Notably, Mexico's Ministry of Health recently declared that AIDS is becoming a feminized condition.(11) In 2009, women accounted for 23% of Mexico's HIV cases (12) and women account for one-half of Mexico's internal migrants.(13) However, the health consequences of women's migration are understudied. Moreover, the implications for HIV transmission within Mexico by high-risk female circular migrants, including sex workers and injection drug users, are poorly understood.

Migration within Mexico is prevalent;(13) Baja California and Chihuahua, which border California and Texas, United States, respectively, are popular destinations for internal migrants.(14-16) The 2010 Census found that 52% of Tijuana, Baja California's nearly 1.6 million residents and 32% of Ciudad Juarez, Chihuahua's 1.3 million residents are migrants. (15, 16) Both cities are characterized by regular population flows from the United States and Mexico that support sex and drug tourism, particularly in each city's *zonas rojas* [red light districts].(17) Regulation of sex work varies: Tijuana's sex workers 18 years may obtain a government permit to work in the city's *zona roja*; quarterly, women undergo HIV/STI testing. No permit system exists in Ciudad Juarez, but sex work is tolerated. Tijuana is home to approximately 6000 and Ciudad Juarez to about 4000 female sex workers (FSWs).(18) Patterson et al., found that of 924 FSWs in Ciudad Juarez and Tijuana, 61% are migrants, (19) implying that diverse communities may be affected by migrants' health status and behaviors, as identified in other settings with other populations (e.g., truck drivers, migrant workers).(20, 21)

While Mexico has historically reported low levels of drug use, the emerging HIV epidemic on the Mexico-U.S. border (2, 22-24) is influenced by migration, sex work, and injection drug use. The northern border region has the highest rate of any lifetime substance use (7.45%), cocaine use (3.05%) and marijuana use (5.83%)(25), in part because of northern states' locations on drug trafficking routes of cocaine, methamphetamine, and heroin (25-27). Illicit drug use is common among FSWs in Tijuana and Ciudad Juarez: 18% of 924 FSWs reported any lifetime injection drug use.(17) Among FSWs who are HIV-positive (n=55), one-quarter reported injecting illicit drugs in the prior month, including heroin (35%), cocaine (15%) and "speedballs" (20%) (i.e., heroin with cocaine) and 33% reported ever sharing needles/injection equipment. HIV risk is further heightened among FSWs given their engagement in risky sexual behaviors (e.g., unprotected sex with clients, using drugs before/during vaginal sex, having IDU sex partner in the prior month). (19)

Given the paucity of data on drug use and related HIV risks among migrant FSWs who are injection drug users (i.e., FSW-IDUs), this study aims to enhance our understanding of potential avenues of HIV transmission among high-risk Mexican female circular migrants. We report on the circular migration and drug/injection behaviors in birth communities among FSW-IDUs' reporting Tijuana and Ciudad Juarez, Mexico as their current city of residence. We also examined factors associated with FSW-IDUs' circular migration, anticipating that women who maintain contact with their birth communities or who report a positive current financial situation are more likely to return.

METHODS

In brief, between October, 2008 and July, 2010, 620 FSW-IDUs were recruited into a behavioral intervention study, *Mujer Más Segura*, in Tijuana and Ciudad Juárez aiming to reduce injection and sexual risk behaviors associated with HIV and sexually transmitted infection (STI) acquisition.(28) 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. Eligibility criteria included: being >18 years; having unprotected vaginal/anal sex with a male client in the previous 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 permanently leave the city 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 sociodemographics, lifetime and past month drug behaviors, and HIV testing history. 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.

One month after the baseline visit, women completed a migration questionnaire that documented substance use and sex work in the context of migration. This study is limited to Mexico-born FSW-IDUs who were classified as migrants if they were not born and had not lived in Tijuana or Ciudad Juárez their entire lives (n=258); of these, circular migrants were defined as FSW-IDUs who had ever returned to their birth city (n=62). Women who never returned to their birth-community are classified as non-circular migrants.

We conducted descriptive analyses of sociodemographic characteristics, drug use, and HIV seroprevalence, stratifying by circular migrant status. Fisher’s exact, chi-square 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’ self-reported return to their birth communities, we controlled for age and interview site and also retained independent variables that were significant in descriptive analyses at the $p \leq 0.10$ level. This study and the parent grant were approved by the Institutional Review Board at the University of California, San Diego, the General Hospital of Tijuana, and the Autonomous University of Ciudad Juárez.

RESULTS

Among 258 migrant FSW-IDUs in Tijuana and Ciudad Juárez, 24% were circular migrants (n=62), ever returning to their birth-community. Nearly three-quarters (n=45) of circular migrant FSW-IDUs visited their birth city within 5 years of the study interview (Table 1). Circular migrants were on average 35 years of age (Standard Deviation: 8.4 years), 37% were partnered, 94% had at least 1 child, about one-half completed through a primary education (i.e., up to 6th grade), 55% reported a bad/extremely bad current financial situation, and 59.7% financially supported at least 1 person. On average, migrant FSW-IDUs resided in 2.8 cities (Range, 1 to 14; Standard Deviation: 1.69; data not shown). Overall, of the 31 states and 1 federal district which comprise Mexico, migrant FSW-IDUs reported a lifetime residence (i.e., residence for more than 3 months) in 26 states and the federal district; five states were not reported within participants’ migration trajectories (i.e.,

Aguascalientes, Hidalgo, Tabasco, Tlaxcala, and Yucatan; data not shown). HIV prevalence was 5% in all migrant FSW-IDUs (data not shown), 3.3% (n=2; Table 1) among circular migrants, and 6.1% (n=12) among non-circular migrants; of these, at least 50% in each group were unaware of their HIV status.

Social Relationships with Birth Community

Circular migrant FSW-IDUs were more likely than non-circular migrant FSW-IDUs to report ongoing relationships with persons in birth communities. Circular migrants were more likely than non-circular migrants to have children in their birth city (40.3% vs. 25.8% among non-circular migrants, $p<0.05$, Table 1) and to be visited by their children in Tijuana or Ciudad Juarez. The majority (95%) of circular migrant FSW-IDUs reported having other family members (e.g., parents, extended family) in the birth city and being visited by other family members in Tijuana or Ciudad Juarez (72%, n=42). In contrast, non-circular migrants (n=115, 69%) were less likely to report any family in their birth city and to receive visits from family in Tijuana or Ciudad Juarez. Circular migrants originated from throughout Mexico, although states in Northern Mexico (i.e., Baja California, Chihuahua, Coahuila, Durango, Sinaloa, and Sonora) were well represented (Table 2).

Lifetime Illicit Drug Use

All migrant FSW-IDUs reported consuming multiple drugs in their lifetime (Table 1). In particular, circular migrant FSW-IDUs reported ever consuming heroin (n=61; 98%), cocaine powder (n=42; 68%), methamphetamine (n=36; 58%), crack cocaine (n=33; 53%), injected “speedballs” (i.e., cocaine with heroin) (n=23; 56%), tranquilizers (n=26; 42%), barbiturates (n=4; 7%), marijuana (n=46; 74%), and inhalants (n=18; 29%). We also examined self-reported drug use practices at the time of the interview, finding that receiving and sharing injection equipment with others in the prior month was extensively reported by all FSW-IDUs.

Illicit Drug Use in Birth City

We examined the drug use behaviors of circular migrant FSW-IDUs in their birth city (Table 2). Nearly one-half of circular migrant FSW-IDUs (43.6%; n=27) ever consumed drugs in their birth city, including heroin (70.4%, n=19), methamphetamine and cocaine (18.5%, n=5, for each) and crack cocaine (7.4%, n=2). Three-quarters (n=20) of circular migrants who consumed drugs in their birth city also ever injected drugs there, including heroin which was injected by 85% (n=17) of drug-using circular migrant FSW-IDUs. The context for injection drug use varied; while nearly one-half reported injecting alone, others injected with friends (40%, n=8), family or strangers (10%, n=2, for each). Sharing (50%, n=10) and receiving (55%, n=11) used injection equipment in the birth city was reported by one-half of circular migrant FSW-IDU injectors.

Factors Associated with FSW-IDUs' Circular Migration

We built a multivariate logistic regression model to identify sociodemographic, drug, and social relationship factors associated with FSW-IDUs' return to their birth community (Table 3). Factors positively and significantly associated with returning to the birth community included maintaining contact with anyone in the birth community (Odds Ratio (OR): 3.03, 95% Confidence Interval (CI): 1.35, 6.83) and having family members in the birth community (OR: 7.95, 95% CI: 2.69, 23.55), and financially supporting at least 1 person (OR: 1.92, 95% CI: 1.00, 3.71); we also controlled for age, interview site, and availability of drugs in community, all of which were nonsignificant.

DISCUSSION

The health implications of Mexican female migration are understudied. To our knowledge, this study is the first to examine the circular migration and drug use behaviors of female sex workers who inject drugs in two U.S.-Mexico border cities. Circular migration was reported by one-quarter of migrant FSW-IDUs in our study and three-quarters of these returned recently, within 5 years of being interviewed. We documented risky drug use behaviors (e.g., sharing and receiving used injection equipment) in both receiving communities and birth cities. FSW-IDUs exhibit migration trajectories that include traditional and non-traditional receiving states, (29) and their migration routes included all except five Mexican states, reflecting the extensive levels of mobility engaged in by this high-risk population. Additionally, our findings suggest that circular migration is an important phenomenon characteristic of migrant FSWs who are IDUs, and related HIV risk behaviors merit further examination in a larger cohort given the pervasiveness of risky drug use practices in this sample and women's lack of awareness of their HIV serostatus.

Mexico's national drug survey has demonstrated that women's consumption of illicit drugs is generally lower than males' drug use, however, drug consumption is rising among women (i.e., 1.9% in 2008, up from 1% in 2002) (30). Injected heroin was prevalent in all community contexts. Additionally, more than 50% of circular migrant FSW-IDUs have ever consumed methamphetamine, a stimulant, and nearly one in five circular migrant FSW-IDUs consumed methamphetamine in their birth community. Heroin is associated with unsafe injection drug use behaviors;(31) similarly, methamphetamine is associated with high-risk drug use and unsafe sexual behaviors (32, 33) that are associated with HIV infection. In Baja California and Chihuahua, men's and women's rates of illicit drug use, including cocaine, exceed the national means; methamphetamine consumption for men in Chihuahua and for both genders in Baja California also exceed the national means,(34, 35), thus reflecting states' vulnerability to drug use resulting from drug trafficking and local drug production.(26, 27)

Overall, 5% of migrant FSW-IDUs were HIV+, suggesting that the infection is concentrated in this population and concerning given FSW-IDUs' high rates of mobility. Of the thirty-one states and federal district, all but five states were implicated in migrant FSW-IDUs' migration routes, suggesting that FSW-IDUs' migration patterns and their health is of national concern. More than half of infected circular and non-circular migrant FSW-IDUs were unaware of their HIV status, suggesting that the transmission of HIV/blood borne infections by FSW-IDUs and their sexual and drug-using contacts is a real threat to the health of both population subgroups and their communities, especially given both groups' movements across diverse geographic spaces and unsafe substance use behaviors in communities throughout Mexico.(36) Persons who are unaware of their serostatus are at high risk of continuing to transmit the infection,(37) making HIV serostatus awareness, particularly among high-risk populations, of critical importance to Mexican public health agencies. Prior studies have found that HIV risk behaviors may decline following testing/counseling or seroconversion (38), and it is important to determine whether and which FSW-IDUs' risk behaviors are amenable to change following HIV testing/counseling or HIV-related interventions, (18) particularly among those who are HIV-positive. Structural factors are also important in HIV detection.(39) A prior study of governmental sex worker regulation in Tijuana found that condom use was greater among FSWs who were registered with the city's Municipal Health Services Program (MHSP) for FSWs.(40) Community-based services such as Tijuana's MHSP may be useful in helping to contain the transmission of HIV and other sexually transmitted infections (STI) by providing increased opportunities for the regular promotion of safer sex and injection practices and increasing FSWs' access to HIV/STI testing and treatment services. However, reducing financial and other structural

access to health care barriers for FSWs, especially FSW-IDUs, will be critical to ensuring broader up-take of targeted services, especially among those who are most marginalized (e.g., working on the street).(39, 40) Additionally, ensuring the availability of local and low/no-cost HIV testing and treatment services for the contacts of FSW-IDUs may also be important within Mexico's larger HIV/AIDS strategy; further investigation about promoting the uptake of HIV services in the social networks of FSW-IDUs is needed.

Mexico's migration statistics document heavy internal migration flows from southern states to northern Mexican states since 1995. Additionally, current internal migration flows are characterized by urban-to-urban migration (rather than rural to urban flows). (29) We observed migration from throughout Mexico, although northern Mexican states predominated among FSW-IDUs' sending states, suggesting that further regional investigation of the intersection between female migration, sex work, and drug use trajectories is warranted. Migration studies have documented the importance of social networks (i.e., relationships between persons who share certain traits, experiences, or behaviors) in perpetuating migratory flows.(41, 42) Curran and Fuentes previously found that female networks were important in supporting migrations *within* Mexico (vs. international migrations).(43) Findings from our multivariate analyses demonstrated that having active social relationships in the birth community were significantly associated with returning home, whereas our hypothesis that financial status would be associated with circular migration was unsupported. Notably, our data support Curran's and Fuentes' findings that female migrants stimulate migration within Mexico (43): nearly one-third of non-circular migrant and three-quarters of circular migrant FSW-IDUs are visited in Tijuana or Ciudad Juarez by persons from their birth community, suggesting that FSW-IDUs' presence in other communities further motivates the (temporary or permanent) migration of their contacts. The presence of other drug users in an individual's social network has implications for their drug use behaviors, including successful completion of drug abuse treatment interventions and long-term sobriety.(44) Thus, the drug and HIV risk behaviors of FSW-IDUs' social networks when in transit to and in the U.S.-Mexico border cities also merit further examination, given the potential for further diffusion of HIV via the *circular migration of FSW-IDUs' contacts*.

Mexico is considered a resource-poor country and as such, was recently designated a Global Fund To Fight AIDS, Tuberculosis, and Malaria grantee, reflecting the nation's growing epidemic of HIV/AIDS, especially among injection drug users and men who have sex with men.(45) As Northern Mexican states predominated among FSW-IDUs migration patterns, they may consider developing a coordinated multilevel (e.g., individual, community-based, structural) HIV and drug treatment policy and intervention strategy (e.g., coordinated safer sex and drug use programs; HIV testing; access to syringe exchange and substance use treatment programs; protection from police harassment) for FSWs, IDUs, and their social contacts.(28, 46, 47) Such an approach may leverage each state's social, economic and other resources.(48) Since women reported engaging in drug use and unsafe injected drug use with persons within and external to their social networks, an inclusive intervention strategy may be warranted.(36)

Our study findings should be considered in light of several limitations. Results may not be representative of all FSW-IDUs in Mexico and may be affected by participants' ability to adequately recall historical events, especially in light of their extensive drug use. Our study is based on self-reported substance use behaviors; given participants' poly-drug use, we cannot be certain that use of particular substances was not omitted or under-reported. Further, we lacked data on participants' sexual behaviors in birth communities, limiting us from examining HIV risks associated with unsafe sexual practices (e.g., drug use during sex, sex work, or sex with multiple partners) in birth communities. Nevertheless, data from the

parent study, *Mujer Más Segura*, demonstrated that sexually transmitted infections are prevalent in this population (i.e., HIV: 5.3%; gonorrhea: 4%; Chlamydia: 13%; trichomonas: 35%; syphilis titers 1:8 10%) and those who are HIV-positive are more likely to often/always inject with their clients, (28) suggesting that the pervasiveness of comorbid STIs and risk behaviors during sexual encounters may further facilitate the transmission of HIV among FSW-IDUs and their sexual and drug-using partners. We lacked data on sexual and substance use behaviors by participants' social networks who have visited FSW-IDUs in Tijuana or Ciudad Juarez, thus limiting our understanding of FSW-IDUs' social networks role as epidemiological bridges of HIV transmission. Additional data on sexual practices in sending communities is warranted given these findings. We agree with Deane and colleagues that studies need to collect detailed data describing participants' sexual and drug networks to better understand the role and context of migration in HIV diffusion. (49) Despite these limitations, we believe that this is the first study to examine FSW-IDUs' mobility and substance use in Mexican sending communities; we have identified numerous issues that merit further scrutiny.

Our results suggest that FSW-IDUs in U.S.-Mexico border cities can benefit from access to regular, no-cost, community-based (i.e., outside of traditional testing sites) HIV testing and treatment services, both in their main residence and while traveling, given their multiple HIV risk exposures (i.e., sex work, drug use) and ongoing ties to people and communities throughout Mexico. Mexico has historically lacked mental health and substance use treatment services, resulting in significant delays in use of appropriate care.(50) Mexico has recently decriminalized small amounts of illicit drugs,(51) and expansion of drug treatment services is expected. Mexico's investment in a system of safe and affordable substance abuse treatment options is considered to be an important component in a multilevel HIV reduction strategy that may help stem the HIV epidemic, especially in states and communities that lie on the U.S.-Mexico border.(52, 53) Larger studies of female migration by high-risk populations, such as FSW-IDUs and their sexual and drug-abusing partners, are critically needed to more fully elucidate the relationship between migration and HIV risks in sending *and* receiving communities. Such data may be useful in shaping HIV and substance use interventions targeting highly vulnerable FSW-IDUs and their contacts.

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Table 1

Sociodemographic Characteristics, Social Relationships with Birth Community, and Substance Use Behaviors of Mexican Female Sex Workers who are Injection Drug Users, by Circular Migrant Status, Tijuana and Ciudad Juarez, Mexico, 2008-2010

	NOT CIRCULAR MIGRANTS n=196 (%)	CIRCULAR MIGRANTS n=62 (%)
SOCIODEMOGRAPHICS		
Mean Age	34.7	35.2
(Standard deviation: SD)	(8.7)	(8.4)
Marital status: Married/common law	86 (43.9)	23 (37.1)
Highest Educational Attainment		
Up to and Complete Primary	103 (52.6)	33 (53.2)
More than Primary education	93 (47.5)	29 (46.8)
Self-rated Perception of Financial Situation		
Neither good nor bad/ Good or extremely good	73 (37.2)	28 (45.2)
Extremely bad/ bad	123 (62.8)	34 (54.8)
Currently Financially Supports 1 Person	91 (46.4)	37 ^{**} (59.7)
Currently Resides in Unstable Housing	177 (90.3)	54 (87.1)
Has Any Children	185 (94.4)	58 (93.6)
Ever Traveled to United States	92 (46.9)	25 (40.3)
Interview Site		
Tijuana	112 (57.1)	33 (53.2)
Ciudad Juarez	84 (42.9)	29 (46.8)
SOCIAL RELATIONSHIPS WITH BIRTH COMMUNITY		
Has Children in Birth City	43 (25.8)	25 (40.3) ^{**}
Children Have Ever Visited Participant in Tijuana or Ciudad Juarez [†]	12 (27.9)	15 (60.0) ^{***}
Other Family Members Reside in Birth City	115 (69.3)	58 (95.1) ^{***}
Other Family Members Have Ever Visited Participant in Tijuana or Ciudad Juarez ^{††}	33 (28.7)	42 (72.4) ^{***}
Participant From Birth City With Whom Maintains Most Contact		

	NOT CIRCULAR MIGRANTS n=196 (%)	CIRCULAR MIGRANTS n=62 (%)
Parents	23 (13.7)	20 ^{***} (32.3)
Others	60 (35.7)	32 (51.6)
No one	85 (50.6)	10 (16.1)
LIFETIME DRUG USE [¥]		
Inhalants (e.g., glue, gasoline)	54 (27.6)	18 (29.0)
Marijuana/hash	150 (76.5)	46 (74.2)
Heroin	190 (96.9)	61 (98.4)
Crack Cocaine	86 (43.9)	33 (53.2)
Cocaine (powder)	122 (62.2)	42 (67.7)
Injected Cocaine with Heroin ^{¥¥}	75 (61.5)	23 (56.1)
Methamphetamine/ crystal	107 (54.9)	36 (58.1)
Tranquilizers (e.g., Valium, Ativan)	81 (41.5)	26 (41.9)
Barbiturates	2 (1.0)	4 ^{**} (6.5)
Agua Celeste	46 (23.5)	14 (22.6)
CURRENT DRUG USE		
Drugs Are Very/Somewhat Easily Obtained in Tijuana/Ciudad Juarez	142 (72.8)	38 (61.3) [*]
Injects 1 Time/Day	176 (89.8)	52 (83.9)
PAST MONTH DISTRIBUTIVE DRUG SHARING BEHAVIORS		
Ever Distributed Own Syringe To Another Person After Having Used It	176 (89.8)	56 (90.2)
Ever Distributed Own Cooker/Bottlecap/Spoon To Another Person After Having Used It	180 (91.8)	56 (90.2)
Ever Distributed Own Cotton Filter For A Needle To Another Person After Having Used It	170 (86.7)	51 ^{**} (85.0)
Ever Distributed Own Rinse Water To Another Person After Having Used It	177 (90.3)	56 (91.8)
Ever Shared Or Divided Drugs By Using A Syringe To Load Drugs Into Another Syringe	169 (86.7)	46 [*] (74.2)
PAST MONTH RECEPTIVE DRUG SHARING BEHAVIORS		

	NOT CIRCULAR MIGRANTS n=196 (%)	CIRCULAR MIGRANTS n=62 (%)
Ever Used Cooker/Bottlecap/Spoon After Someone Else Used It	186 (94.9)	60 (98.4)
Ever Used Rinse Water After Someone Else Used It	181 (92.3)	56 (90.2)
Ever Used Cotton Filter For A Needle After Someone Else Used It	168 (85.7)	52 ^{***} (85.2)
Ever Used A Syringe After Someone Else Used It	189 (96.4)	57 (93.4)
HIV SEROSTATUS		
HIV Positive (Based on Testing at Baseline)	12 (6.1)	2 (3.3)
Not Aware Is HIV Positive at Baseline ^Ω	9 (81.8)	1 (50.0)

*
p<0.1

**
p<0.05

p<0.01 level of statistical significance between proportions comparing circular migrants and female sex workers who are not circular migrants

SD: refers to standard deviation

[†] Among those with children in birth city

^{††} Among those with family in birth city

[‡] Participants could select multiple responses

^{‡‡} Among those who have ever used cocaine

^Ω Among those who tested positive for HIV at baseline

Table 2

Migration and Drug Use Experiences in the Birth Community of Circular Migrant Female Sex Workers who are Injection Drug Users, Tijuana and Ciudad Juarez, Mexico, 2008-2010 (n=62)

	N (%)
Visited Birth City in Past 5 Years	45 (72.6)
Birth State *	
Baja California	7
Chiapas	1
Chihuahua	6
Coahuila	14
Federal District	1
Durango	8
Jalisco	4
Michoacan	1
State of Mexico	1
Puebla	1
Sinaloa	7
Sonora	7
Veracruz	1
Zacatecas	1
Ever Consumed Illicit Drugs in Birth City	27 (43.6)
Illicit Drugs Consumed in Birth City ^{†,‡}	
Heroin only	19 (70.4)
Cocaine only	5 (18.5)
Methamphetamine (Crystal)	5 (18.5)
Crack Cocaine	2 (7.4)
Marijuana	4 (14.8)
Another drug combination	1 (3.7)
Ever Injected Drugs in Birth City [†]	20 (74.1)
Drugs Injected in Birth City ^{††}	
Heroin	17 (85.0)
Cocaine only	1 (5.0)
Methamphetamine (crystal) with Heroin	1 (5.0)

	N (%)
Injection Partner(s) in Birth City ^{††} , [‡]	
Parents/Siblings	2 (10.0)
Friends	8 (40.0)
Strangers	2 (10.0)
No one else	9 (45.0)
Ever Used Injection Equipment After Someone Else Has Used It, in Birth City ^{††}	11 (55.0)
Ever Shared Injection Equipment with Another Person After Participant Used It, in Birth City ^{††}	10 (50.0)

Circular migrants are women who have ever returned to their birth city

* Birth state data have missing data for 2 participants

[†] Among those who ever used drugs in birth city

^{††} Among those who ever injected drugs in birth city

[‡] Participants could select multiple responses

Table 3

Factors Associated with Circular Migration to the Birth Community, Mexican Female Sex Workers who are Injection Drug Users, Tijuana and Ciudad Juarez, Mexico, 2008-2010 (n=257)

	Odds Ratio (95% Confidence Interval)
Sociodemographics	
Currently Financially Supports 1 Person	1.92 * (1.00, 3.71)
Social Relationships with Birth Community	
Maintains Contact with Anyone in Birth City	3.04 ** (1.35, 6.83)
Has Any Family in the Birth Community	7.95 ** (2.59, 23.55)

*
p<0.05

**
p<0.01

Model also controlled for age, study site, drugs are very/somewhat easily obtained in Tijuana/Ciudad Juarez (vs. not easily obtained).