Published in final edited form as:
Int J Drug Policy. 2014 September ; 25(5): 836–844. doi:10.1016/j.drugpo.2014.02.005.

Rethinking risk: Gender and injection drug-related HIV risk among female sex workers and their non-commercial partners along the Mexico-U.S. border

Jennifer L. Syvertsen, PhD, MPH[1,2], **Angela M. Robertson, PhD, MPH**[3,4], **Steffanie A Strathdee, PhD**[2], **Gustavo Martinez, MD**[5], **M. Gudelia Rangel, PhD**[6], and **Karla D Wagner, PhD**[2,*]

[1]Department of Anthropology, The Ohio State University, 4034 Smith Laboratory, 174 W. 18th Avenue, Columbus, OH 43210, USA

[2]Division of Global Public Health, Department of Medicine, University of California, San Diego; La Jolla, CA 92093-0507, USA

[3]Department of Epidemiology, Harvard School of Public Health, 677 Huntington Avenue, Boston, MA 02115, USA

[4]The Fenway Institute, Fenway Health, 1340 Boylston Street, 8th Floor, Boston, MA 02215, USA

[5]Federación Mexicana de Asociaciones Privadas, Ciudad Juárez, Chihuahua, México

[6]El Colegio de la Frontera Norte, Tijuana, Baja California, México

Abstract

Background—Studies of injection drug-using couples suggest a gendered performance of risk in which men exert greater control over drug use and render their female partners vulnerable to HIV infection and other negative health outcomes. This study assesses gender roles in injection drug use as practiced among female sex workers and their intimate male partners within a risk environment marked by rapid socioeconomic changes.

Methods—We draw on quantitative surveys, semi-structured interviews, and ethnographic fieldwork conducted as part of cohort study of HIV/STI risk among female sex workers and their intimate, non-commercial partners along the Mexico-U.S. border. This study employed descriptive statistics and inductive analyses of transcripts and field notes to examine practices related to drug procurement, syringe sharing, and injection assistance among couples in which both partners reported injecting drugs in the past six months.

Results—Among 156 couples in which both partners injected drugs (n=312), our analyses revealed that women's roles in drug use were active and multidimensional, and both partners'

[*]**Corresponding Author:** Dr. Karla D. Wagner, Division of Global Public Health, School of Medicine, University of California, San Diego, 9500 Gilman Drive, La Jolla, CA 92093-0507, USA, Tel: +1(619)543-0857, Fax: +1(858)534-7566, kdwagner@ucsd.edu.

injection risk practices represented embodied forms of cooperation and compassion. Women often earned money to purchase drugs and procured drugs to protect their partners from the police. Sharing drugs and syringes and seeking injection assistance were common among couples due to drug market characteristics (e.g., the use of “black tar” heroin that clogs syringes and damages veins). Both women and men provided and received injection assistance, which was typically framed as caring for the partner in need of help.

Conclusion—Our mixed methods study suggests that in certain risk environments, women are more active participants in injection-related practices than has often been revealed. This participation is shaped by dynamic relationship and structural factors. Our suggestion to consider gendered injection risk as a nuanced and relational process has direct implications for future research and interventions.

Keywords

injection drug use; gender; couples; HIV; Mexico

Studies of heterosexual drug-using couples suggest a gendered performance of risk (Barnard, 1993; Bryant et al., 2010; Evans et al., 2003). Women may have less ability than men to control the circumstances of their drug use, including procurement of drugs, using and sharing drugs and paraphernalia, and ability to inject. As such, women who inject drugs may face heightened risk for HIV and other injection-related health harms vis-à-vis their intimate relationships with men (Cleland et al., 2007; Go et al., 2006).

Gendered risk may begin with a division of labor in obtaining and using drugs. Studies have found that women frequently use drugs in the context of close relationships, including intimate sexual relationships (Barnard, 1993; Cruz et al., 2007). Often, women’s access to drugs and injection paraphernalia are controlled by their male partners (Bourgois, Prince, & Moss, 2004; Epele, 2002; Sherman, Latkin, & Gielen, 2001). Among drug-using couples, men are more likely to procure drugs, which may present additional opportunities to engage in HIV risk behaviors outside their intimate relationship (MacRae & Aalto, 2000; Simmons & Singer, 2006). Once drugs are obtained, male partners may control the preparation and injection processes for their female partners (MacRae & Aalto, 2000).

Women often experience heightened risk for infectious disease transmission through receptive syringe sharing and paraphernalia sharing (e.g., cookers, cotton) within their intimate relationships (Barnard, 1993; Go et al., 2006; Gyarmathy & Neaigus, 2009; Lazuardi et al., 2012; Unger et al., 2006). Historically, some scholars have suggested that sharing may represent an emotional bond or trust between committed partners (Loxley & Ovenden, 1995; Rhodes & Quirk, 1998). Others have speculated that such emotional meanings may be more important to women, whereas men may be motivated to share by “practical terms” such as experiencing drug withdrawal (MacRae & Aalto, 2000).

Research also suggests that many women need help injecting (Cleland et al., 2007; Cruz et al., 2007; Wood et al., 2003). When male partners control the drug supply within relationships, women may never learn how to inject and instead become dependent on their partner for help (Kral et al., 1999; Spittal et al., 2002). Requiring injection assistance has

been associated with multiple vulnerabilities, including having abscesses, engaging in receptive syringe sharing, and being arrested for carrying syringes (Robertson et al., 2010). HIV infection has been shown to be almost twice as high among drug users who require help injecting (O'Connell et al., 2005).

Furthermore, women's sexual relationships with intimate partners often amplify their drug-related risk (Gyarmathy & Neaigus, 2009; Hahn et al., 2002; Lakon, Ennett, & Norton, 2006; Sibthorpe, 1992). Drug-using intimate partners frequently report unprotected sex (Rhodes & Quirk, 1998) and female partners may also engage in sex work to maintain their own or their partners' drug habits (Lam, 2008; Simmons & Singer, 2006). In some contexts, women are manipulated into sex work to support male partners (Bourgois, Prince, & Moss, 2004; Spittal & Schechter, 2001). Researchers have suggested that gender inequality and emotional closeness are drivers of women's risky behaviors within intimate relationships (Tortu et al., 2003).

Taken together, these studies suggest that women who inject drugs, particularly those who engage in sex work, are vulnerable to HIV infection and other health harms. Moreover, these studies from diverse locations have shown how women's intimate relationships with men profoundly shape their HIV risk through practices related to drug procurement, syringe sharing, and injection assistance. We do not suggest that this literature is inaccurate. However, several studies from developing countries have identified inconsistent gender differences in injection practices (Choi, Cheung, & Chen, 2006; Cleland et al., 2007; Somlai et al., 2002). Cleland and colleagues' (2007) study of women's injection risk across ten developing countries documented few gender differences in risk behaviors (e.g., syringe sharing) when questions assessed risk on a general level. Yet women were more likely than men to engage in sexual and injection risk with primary sexual partners when questions specified particular relationship contexts in which behaviors occurred. These findings invite researchers to consider how the prevalence of high risk behaviors among women is often on par with men while thoroughly interrogating the gendered relations of heterosexual couples whose drug-related risk is shaped by diverse socioeconomic contexts.

This paper attempts to move beyond dichotomous analyses of gender to take a relational approach to injection drug-related practices among intimate couples who live in a precarious HIV risk environment marked by historical social and economic inequalities, poverty, high levels of mobility, and widespread drug availability and related cartel violence. Based on our mixed methods study with female sex workers and their non-commercial male partners who inject drugs in the Mexico-U.S. border region, we suggest that in certain rapidly changing socio-political contexts like this one, traditional gender roles in injection drug use may be shifting in ways that reflect complex reconfigurations of social relations writ large.

We draw on Connell's relational theory of gender that recognizes gender as a dynamic, multidimensional process that both creates and challenges social order (Connell, 1987; Connell, 2012). Building on ideas like that of Judith Butler's (1990) "gender performativity," or the notion that gender is not inherent but rather is acquired and enacted in socially patterned ways, relational theories of gender give primacy to how the relationships between men and women co-construct heteronormative gender order.

Relational gendered health theory is grounded in an historical analysis of structural (e.g., economic) and social (e.g., interpersonal relationships) characteristics of particular environments while recognizing how gendered micro-level patterns of social practice are developed and embodied as health consequences reflective of these broader conditions (Connell 2012). Our work in the Mexico-U.S. border draws on a gendered relational framework to focus on how economic factors, relationship power, and affect are symbolically embodied in couples' injection drug use practices and shaped by the HIV risk environment in which these partnerships are embedded.

Study setting

The HIV risk environment in Northern Mexico reflects dramatic socio-economic inequalities that have contributed to pervasive sex work and drug abuse, particularly in the largest border cities (Ramos et al., 2009). Tijuana, Baja California (across from San Diego, California, USA), has a population of 1.6 million residents, and Ciudad Juárez, Chihuahua (across from El Paso, Texas, USA), has a population of 1.3 million. While economic opportunities in U.S. markets have long drawn migrants from elsewhere in Mexico and Latin America to these border cities, not everyone is able to secure better opportunities after arriving, resulting in widespread underemployment and the largest wage gap between any two adjacent countries in the world (Clemens, Montenegro, & Pritchett, 2009). In the gendered border economy, low-skilled, low wage jobs (e.g. in *maquiladoras*) are targeted to women, while men who do not possess the education and skills for more technical positions are often left alienated from the formal labor market and unable to fulfill traditional gender roles as providers (Segura and Zavella, 2007). Deportations from the United States have also dramatically increased in recent decades, creating an influx of mostly male migrants who have few social, economic, or legal resources in the receiving border communities (Ojeda et al., 2011). As such, marginalized men and women may resort to informal activities for survival (González de la Rocha & Latapí, 2008), including sex work and drug-related activities.

Commercial sex is quasi-legal in Mexico (Carrier, 1989). Tijuana and Juárez have areas where sex work occurs, and women who use drugs often engage with regular and non-regular clients as a primary source of economic support (Robertson et al., 2013). HIV prevalence among female sex workers in these cities rose from <2% in 2004 to nearly 6% by 2006 (Patterson et al., 2008). HIV prevalence in this context is exacerbated by drug abuse and injection drug use, which are supported by U.S.-bound drug trafficking routes and the local "spillover" on the Mexican side of the border, which has created wide availability of black tar heroin and specialized stimulant markets (e.g., methamphetamine in Tijuana and cocaine in Juarez) (Brouwer et al., 2006; Bucardo et al., 2005). Female sex workers who inject drugs have higher HIV/STI prevalence than other sex workers (Strathdee et al., 2011), longer durations working in sex work, and more frequent drug use before sex (Strathdee et al., 2008). A behavioral intervention for sex workers did not increase injectors' condom use with clients to the same extent as it did with non-injecting women (Patterson et al., 2008), reinforcing findings that addiction compromises condom negotiation (Strathdee et al., 2009).

More recently, our binational team found that among our cohort of female sex workers and their non-commercial male partners (n=212 couples, both injectors and non-injectors), HIV prevalence was 2.6%, but nearly one in ten tested positive for any sexually transmitted infection, including gonorrhea, Chlamydia, active syphilis, and HIV. Injection drug use was not associated with infection, but HIV/STI prevalence was higher among women than men (12.7%vs. 7.1%, p=0.05) (Robertson, et al. *in press*). A separate analysis found that the social and behavioral profiles of male partners who injected drugs were riskier than men who did not inject. Injecting male partners were more likely to be younger, informally employed, have an arrest history, and report ever having sex (or exchanging sex) with other men, which may heighten their own and their female partners' vulnerability to HIV/STIs (Robertson et al., 2013). Unfortunately, limited access to drug treatment and sterile injection equipment coupled with abusive policing practices (e.g., syringe confiscation, arrest) challenge drug-involved individuals' recovery efforts and ability to adopt safer behaviors in the border region (Beletsky et al., 2012; Strathdee et al., 2011; Syvertsen et al., 2010).

Within this context, we explored the gendered dynamics of injection drug use among female sex workers and their intimate partners along the border. Using multiple sources of data, we evaluate the role of gender in shaping injection drug-related HIV vulnerability within a dynamic risk environment. Specifically, we focus on couples' practices related to drug procurement, syringe sharing, and seeking injection assistance.

Methods

Our study integrates quantitative, qualitative, and ethnographic data from *Proyecto Parejas* (Couples Project), a longitudinal study of HIV/STI risk among 214 female sex workers and their non-commercial male partners in Tijuana and Juárez, Mexico, as previously described (Syvertsen et al., 2012). Briefly, from 2010-2011, we recruited women ≥18 years old who reported ever using heroin, cocaine, crack, or methamphetamine; engaging in sex work (past month); having a non-commercial male partner for ≥6 months; and having sex with that partner (past month). Women experiencing severe partner violence were excluded due to concerns that participation in a couples study could exacerbate their risk of violence, and were offered referrals. Eligible women brought male partners to study offices to verify relationships (McMahon et al., 2003). Participants provided written informed consent. Review boards of the University of California, San Diego, the Hospital General and Colegio de la Frontera Norte in Tijuana, and the Universidad Autónoma de Ciudad Juárez approved all protocols.

Quantitative Methods

Interviewers administered baseline questionnaires lasting 1-2 hours that measured socio-demographics, relationship characteristics, sexual risk behaviors, and practices surrounding drug procurement and use, syringe sharing, and seeking injection assistance. Descriptive statistics summarize participant characteristics and behaviors.

Qualitative Methods

We conducted individual and joint baseline qualitative interviews lasting up to 90 minutes with a sub-sample of 41 couples who were purposively sampled for variation in relationships and drug use (Johnson, 1990). We interviewed 18 couples in Tijuana (18 joint and 36 individual interviews) and 23 couples in Ciudad Juárez (23 joint and 45 individual interviews) for a total of 122 unique interviews. Interviews explored relationship dynamics, including couples' drug use and injection practices. Across the 122 total interviews, we repeatedly heard similar information and determined that we had a sufficient sample size to explore the themes of interest (Guest, Bunce, & Johnson, 2006).

Bilingual staff followed a structured protocol to record, transcribe, and translate interviews for analysis (McLellan, MacQueen, & Neidig, 2003). We analyzed data using a collaborative process (MacQueen, McLellan, Kay, & Milstein, 1998) involving reading selected excerpts to independently generate codes (Ryan & Bernard, 2003), discussing codes to develop a codebook, independently applying codes, and finally, meeting regularly to discuss preliminary findings and refine the codebook as needed.

Ethnographic Methods

Two of the authors conducted five months of intensive fieldwork as part of their multi-year involvement in the larger cohort study. Seven couples in Tijuana participated in the ethnographic sub-study examining how emotions shaped sexual and drug-related risk behaviors. Couples were sampled based on the female partner's injection status and history of mobility, in order to reflect dynamic social characteristics of the border region that may heighten vulnerability to HIV infection. Several of the relationship-focused, in-depth interviews were conducted in the couples' homes, which also opened up a space to observe couple dynamics, the home environment, and injection drug-related practices. The first author analyzed interview texts and fieldnotes using a phenomenological approach (Creswell, 2007; Starks & Trinidad, 2007) focused on the emotional lived experience of drug injection.

Data Triangulation

This study was restricted to "injector couples" in which both partners reported injection in the past six months. Although a small number of couples reported discordant or non-injection drug use patterns, our restricted sample better illuminates relationship dynamics involved in injection practices. Descriptive statistics from 156 injector couples were integrated with qualitative findings from 21 injector couples and ethnographic observations from 4 injector couples. We present our results thematically, drawing on each source of data to uniquely contribute to a more comprehensive description of each injection-related risk practice of concern (i.e. procurement, sharing, and injection assistance). We use the survey data to describe patterns of behavior across the sample, the qualitative data to aid in our interpretation of the survey results and explore the social context of behaviors, and the ethnographic data to highlight the emotional lived experience of drug injection among intimate couples.

Names have been changed to protect identities. Representative quotes are from individual interviews unless otherwise indicated. Quotes were selected to give voice to participants and reinforce the major themes crosscutting our analysis.

Results

Among 156 injector couples (n=312 individuals), median age was 35 years (interquartile range [IQR]: 29-42 years) and men were older than women (median 37 vs. 33 years, $p<0.001$; Table 1). Median relationship duration was three years (IQR: 1.5-5.2 years); 97% of couples rarely or never used condoms with each other. Over half were not born in the study site (55%) and most had travelled to the United States at some time in their lives (60%). While men spent more time on the street trying to earn money through informal jobs than women (median 10 vs. 8 hours per day, $p<.01$), women were significantly more likely than men to earn >3500 pesos (~USD $270) per month (42% vs. 30%, $p<.01$). Heroin was most commonly injected (83%), followed by methamphetamine (26%) and cocaine (19%). Characteristics of our qualitative and ethnographic samples (n=42 and n=8 individuals) reflected those of the overall injecting cohort.

Drug procurement and use

We quantitatively examined couples' decision making about procuring and using any drugs within their relationships, but due to high prevalence of heroin use, we present data from 88 couples (n=176 individuals) who injected heroin together in the past 6 months (similar patterns were identified for other drugs). The majority reported that both partners shared equally in their decisions to buy and use heroin (82% and 90%). There were no significant gender differences across responses.

Qualitatively, couples described their drug use as a habitual practice and both partners contributed to its pursuit. This routine is particularly important to understand in the context of heroin addiction. Celia, 36, described heroin injection as "a full time job." She explained that "the heroin decides" when drugs are used and referred frequently to the symptoms of *malilla* (drug withdrawal) that compel users to inject. In other words, couples' physical addiction often rendered their decision to use drugs as a given part of their daily practice rather than a conscious decision making process.

Couples also described sharing responsibility to secure resources and purchase drugs to help each other "get well" (i.e., alleviate *malilla*). As active sex workers, women earned relatively steady income, while the men described more sporadic hustling (i.e., engaging in informal work). Women sometimes provided a greater portion of funds to purchase drugs, but the majority of couples reported that both partners contributed financially to drug use:

> We both [contribute money]. Sometimes he does, sometimes I do, sometimes we share the expense, I pitch in with half and he does the same… We both help each other. - Anna, age 42, Juárez

Furthermore, women played visible roles in purchasing drugs. They frequently maintained social connections to buy drugs and often preferred to make purchases in order to protect their male partners from police harassment, detention, and arrest. Our quantitative data

supported this perception of men being more vulnerable within police encounters, as men were more likely to report lifetime arrest than women (72% vs. 57%, $p<.01$). A few qualitative participants also described leveraging their relationship status to jointly evade police attention:

> We both go together to buy [drugs]. It so happens that when I have gone by myself, the police would stop me. Going as a couple, both of us, we usually try to pretend that we're going to buy some groceries or something we need—milk, bread—and from there we go buy the drugs, so that the police see us with grocery bags and they see us as a couple and they will ignore us…-Guillermo, age 44, JuárezM

Women also independently procured drugs. Cindy, 29, discussed dividing up drug-related responsibilities to reduce her partner's risk from police:

> As far as to who pays, it is whoever comes through, and if I see that the cops are really coming down hard, I don't want him to risk himself. I will go out there and handle the morning one [dose] and I will get the supplies and then I will go to sleep and he goes out to hustle while I am asleep and he has something put together by noon. But we always share every dose. – Cindy, age 29, Tijuana

During ethnographic fieldwork, we witnessed female partners independently procure drugs. On the way to her house for an interview, Perla, 36, instructed us to wait down the street while she stopped in her neighborhood *connecta* to purchase heroin for herself and her partner, Saul, 43, whose chronic illness largely prevents him from working. Perla had taken on the more public drug-related roles, while Saul prepared the drug using shared equipment for the two of them. This division of labor reflected their social and economic circumstances and enabled each partner to contribute their fair share.

Likewise, Celia earned money and procured drugs. Celia shared an apartment with several male family members and her partner, all of whom injected drugs. One day when they woke up around 4 am with *malilla*, Celia ventured into the Tijuana river canal, a potentially dangerous location of drug dealing, to procure drugs. She reasoned that because the fellow injectors in the canal knew her and she was better able to evade the police than the male household members, it was safer for her to make the purchase than her male counterparts.

Sharing behaviors

Quantitatively, injection equipment sharing was prevalent. In the overall sample of men and women, 45% (n=115) reported "indirect sharing" involving the use of a cooker, cotton filter, or rinse water that had been previously used. Forty percent (n=103) reported using a syringe to share or divide drugs (i.e., "backloading") and 42% (n=107) used a syringe that had previously been used by someone else (i.e., "receptive syringe sharing"). There were no statistically significant gender differences in these behaviors. Regarding receptive syringe sharing, the majority reported sharing with their steady partners (59%), followed by friends (36%) and acquaintances (22%). Women were more likely to report sharing with steady partners than were men (68% vs. 48%, $p<.05$), the context of which we explored further with qualitative and ethnographic data.

Qualitatively, couples' sharing practices were shaped by multiple factors including drug characteristics, resource availability, knowledge of HIV prevention strategies, the social context of injection, and partner care. Our analyses suggest that couples shared with each other as a risk reduction strategy, which was perceived as a "safe" and commonsense form of caring. While couples uniformly expressed that using new syringes for each injection was ideal, material circumstances often prevented them from doing so. In the following passage, Oscar, 30, and Leticia, 24, from Juárez discuss syringe sharing:

> Oscar: We used to [share with others]. A long time ago, we used to go to the picadero [shooting gallery], but then later, when we started using our syringes and everything, because we started seeing a lot of infections, we began doing it back at home, and only with our own insulinas [syringes].
>
> Leticia: We've never shared syringes with others, no. Only as I told you, when his gets clogged, he uses mine…
>
> Oscar: Yes.
>
> Leticia: Or if mine gets clogged, he uses [it], right?

During fieldwork, we observed multiple injection episodes among three couples. Cindy and her partner Beto, 33, often struggled due to scarred veins from their long careers of heroin injection. During one particularly long and painful event, Cindy eventually gave up on her clogged syringe. Beto, who had just successfully injected, backloaded her heroin into the syringe he just used and gave it to her. However, rather than unequal gendered power dynamics, this illustrated his care for her wellbeing within a context of limited material resources and the physical desperation of addiction. Similarly, Perla's partner Saul said that whenever they share, "she is always first, ladies first," as a form of respect. Although we did not directly witness receptive sharing among this couple, we saw Saul prepare "cotton shots" (i.e., leftover heroin from used cotton filters) and place pre-filled syringes in a drawer for later.

Injection assistance

Finally, we quantitatively examined seeking help injecting from others in the larger sample of men and women (i.e., "injection assistance"). In total, 27% (n=70) of participants reported receiving injection assistance in the past 6 months. Reasons for seeking assistance included collapsed veins (61%), never learning how to inject (20%), or difficulty accessing the injection site (16%). More women than men reported not knowing how to inject (26%, n=10 vs. 13%, n=4), and sought help from their partner (68%, n=26 vs. 53%, n=17), but none of these differences reached statistical significance.

Conversely, these data suggest that the majority of women *know* how to inject: only 10 out of the total 156 women never learned how to inject, representing just 6% of all women in our study. It is also noteworthy that over half of men (53%) who received injection assistance reported getting help from their female partners. Our qualitative data and observations confirmed that women often knew how to inject and helped their partners. We witnessed an injection episode between Cindy and Beto, introduced above, in which Beto

missed a vein and experienced a painful reaction that prompted Cindy to inject him as an act of compassion for his suffering.

Similarly, Luis, 52, said that his partner has “grace” and is able to help him inject. Juan Carlos, 53, and Patricia, 31, from Juarez, explained their injection practices:

> Patricia: I inject him.
>
> Juan Carlos: She is my heart doctor. When I am very malilla, well, she injects me because I can’t get my veins and she is there when I have malilla. Well, one is like that, your hand shakes, and I can’t reach [the vein] … and she can.

For other couples, the social context also shapes assistance practices. Adrianna, 28, struggles to inject her partner Martin, 34. At times, they rely on their network of Juárez injectors when she is unable to inject him:

> He doesn’t have [visible] veins, he can’t inject himself … he struggles a lot to shoot. And he has to look and sometimes we go to the picaderos [shooting galleries] so they can inject him, or my brother-in-law injects him, or I do when I can, it’s just that I struggle a lot because, well, he doesn’t have veins anymore. He sometimes has to pay for drops so they can cure [inject] him or money, ten, five pesos, sometimes he gives his hat away or something so they inject him.

Ethnographic insights further attest to the difficulty of injection and the multiple vulnerabilities it creates for both partners. Celia, described above as procuring drugs at risky locations and hours, was one of the few women in our sample who could not inject herself. Sometimes Celia’s partner, Lazarus, 43, injects her before injecting himself; otherwise he gets too high and cannot find her veins, leading to arguments. Sometimes Celia does not trust Lazarus to inject her because of his unsteady hands, and must seek help from family members. We witnessed Celia get injected by an acquaintance from the canal and by a family member who was not particularly gentle when tapping the needle into the front of her neck, where she is developing scarring from repeated injections.

Discussion

Our analysis suggests that researchers may benefit from applying relational theories of gender to studies of injection drug use among heterosexual couples in particular HIV risk environments. We structure our discussion around the idea that gender is a dynamic, relational process and focus on the multi-level nexus of factors related to economics, relationship power, and affect that underlie Connell’s approach to theorizing gendered health concerns (Connell, 2012). Based on our findings, we provide concrete suggestions for research and practice.

Our analysis of drug procurement, syringe sharing practices, and injection assistance is situated within the Mexico-U.S. border region’s unstable HIV risk environment (Rhodes 2009), where social and economic inequalities, a growing informal labor market, pervasive sex work and drug abuse, and heightened police surveillance structure the vulnerability of marginalized groups, including sex workers who inject drugs. We suggest that the dynamic injection-related gender roles we documented among high risk couples reflect broader social

and economic shifts in the border region, where women are increasingly participating in the burgeoning informal economy and men are becoming less likely to fulfill traditional roles as primary income earners (González de la Rocha & Latapí, 2008). Participants in our study earned well below the average monthly income of USD $645 in these cities (Censos Económicos, 2010), but women were more likely than men to report earnings in the highest category measured in our survey (>USD $270). Moreover, many of these men (and some women) have been forcefully relocated to Mexican border cities due to U.S. deportation. Criminal records, lack of documentation, and displacement from social support often challenge deportees' integration into the formal economy (Ojeda et al., 2011; Robertson et al., 2012).

Through sex work, the women in our study had greater access to financial resources than their male partners, typically through freelance arrangements in which they did not report to pimps and often formed autonomous relationships with long-term financial supporters (Robertson et al., 2013). This earning power places them in a unique position of economic and social privilege both within and outside the home (Connell, 2012). In this context, women contributed financially and often directly purchased drugs.

Other features of the risk environment shaped drug procurement practices. Previous work has documented links between repressive police practices and injection-related risk, such as fear of carrying clean syringes and engaging in rushed injections (Pollini et al., 2008; Volkmann et al., 2011). In contrast to typical male roles documented in the U.S. of procuring drugs to protect their partners from arrest (Simmons & Singer, 2006), our study indicates that policing practices along the Mexican border are forcing women to take on more visible and potentially dangerous roles in the drug market. Women frequently reported purchasing drugs to protect their male partners who were perceived as more vulnerable to harassment and arrest. Women embodied their relationship power in these public acts that protected their partners but also potentially placed themselves in harm's way (Beletsky et al., 2012).

Widespread syringe sharing and injection assistance is not surprising given local drug market characteristics. The predominant black tar heroin, which requires heating and dissolving for injection, can rapidly clog syringes (Koester, Glanz, & Baron, 2005). Its prolonged use contributes to vein scarring and collapsed veins (Ciccarone, 2009), similar to the vein damage caused by methamphetamine and cocaine injection (Pollini et al., 2010). These drug market characteristics in part prompted both partners to seek injection assistance.

Nevertheless, our analyses suggest that other social dynamics fundamentally shape drug use and sharing practices. Similar to other studies, we found no significant gender differences in drug use patterns or frequency of use (Breen et al., 2005), and in many couples, both partners reported sharing in decisions to procure and use drugs. Reflecting on our qualitative data, however, we wonder if framing these questions as "decision making" captured couples' habitual behaviors. Qualitatively, couples described drug use as part of their daily routines, with both partners typically contributing to its pursuit. Rather than an overtly recognized decision, couples' shared addiction and injection practices likely represent joint efforts to support each other in the mutual goal of "keeping each other well" that are more

unconscious, automatic, and rarely discussed (Rhodes & Quirk, 1998; Simmons & Singer, 2006).

While many couples have been exposed to HIV prevention messages, they appear to incorporate this information into their injection practices in ways that make sense to them. Sharing syringes with partners was a pragmatic form of risk reduction and many couples engaged in this "selective" sharing strategy (Valente & Vlahov, 2001). While our quantitative results match the literature that women are more likely to engage in receptive syringe sharing with their partners than men (cf. Barnard, 1993), our qualitative and ethnographic data urge us to consider the reasons for sharing (e.g., injection difficulty, partner care) that extend beyond gendered power imbalances. As most couples were engaging in unprotected sex, sharing syringes was another marker of the relationship that symbolized care and cooperation. Similar dynamics characterized assisted injection, as frequently *both* partners struggled to inject due to drug market characteristics and lengthy injection careers. Nevertheless, the majority of women knew how to inject and at times injected their partners as a form of care and support.

Importantly, an analysis of women's risk cannot be understood without attention to male partners' roles in co-constructing it. As described above, male partners in this context were not typically dominant in terms of economic earning potential or relationship power. Moreover, we argue that affect shaped men's risk behaviors and avoidance. Male perspectives on drug use are often presented as individual data divorced from their social relationships and Western views tend to be filtered through cultural notions that men are unemotional beings driven by sexual need. In this same light, men's engagement in syringe sharing has been explained by the biological imperative of addiction rather than owing to any emotional significance (MacRae & Aalto, 2000). However, particularly among emotionally close couples, partners helped each other get well by sharing syringes and offering injection assistance (Syvertsen, 2012). For couples whose relationships were less grounded in affect, friends and extended social networks also played a role in drug use, creating possibilities for outside sharing (Syvertsen et al., 2013).

Our study has implications for future research and interventions, which should incorporate a nuanced understanding of the gendered patterns of practice within sex workers' relationships in dynamic risk environments (Connell, 2012). Our findings suggest that couples' injection drug-related risk may not always be based on gender roles, but rather which partner is better equipped for the task. Instead of relying on gendered assumptions about responsibilities and exploited/exploitative roles, public health programs could build on the idea that injection practices occur in social contexts and may represent forms of support. For many couples, sexual and injection behaviors are entangled in complex webs of emotions, love, caretaking, and addiction.

We do not suggest that the women in our study experience less HIV risk than women elsewhere, but rather that their risk is configured according to political, economic, and sociocultural features of the environment in which their relationships and injection practices are embedded. As evidenced by our HIV/STI data in which women have higher prevalence compared to men (Robertson, et al., *in press*), women in this context are clearly vulnerable

to health harms despite higher levels of agency and autonomy as compared with women in more repressive sociocultural contexts. However, we argue that these risks are shaped by more complicated processes than what traditional gender norms would imply and that prevention programs must be sensitive to relationship characteristics as they are embedded within dynamic local realities.

Given that injector couples stayed together for a number of years and reported high levels of trust and relationship satisfaction, our study supports the development of couple-based interventions that encourage safe behaviors outside of intimate relationships (Cleland et al., 2007). Starting with such an extra-dyadic approach does not threaten to destabilize partner bonds but rather acknowledges how couples consider sharing syringes with each other as safer than the alternative of sharing with others and builds on these subjective meanings as a realistic step toward HIV prevention. For couples who share and seek injection assistance with outside partners, combined dyadic and social network approaches are needed to reduce risk (Gyarmathy et al., 2010). Finally, our study suggests that interventions should include structural components to address economic and legal vulnerabilities that shape men's and women's risk along the border (Burris et al., 2004; Des Jarlais, 2000).

Limitations and strengths

Our study has limitations. First, our sample was restricted to "injector couples" comprised of women who had relative autonomy as sex workers. Couples were also screened for partner violence to ensure that participation would not endanger their health or safety. In an initial screening process with the women, 4.2% were screened out due to concerns about partner violence, and at the couples stage of screening, two couples were screened out because of violence. While only couples at risk of immediate, life-threatening violence were excluded, women in relationships with partners who exert greater control over their earnings and freedom may greatly differ from our sample. Finally, we cannot discount that some women may have acquiesced to certain risk behaviors (e.g., pressured into earning money and procuring drugs for male partners, sharing syringes) under a guise of trust that may actually represent male partners' subtle forms of manipulation. However, qualitative and ethnographic data did not provide evidence of coercion and suggested instead that women exerted agency in their drug use. As such, our findings suggest that researchers should consider how conventional gender norms are being challenged in certain social contexts.

A key strength of our work is its methodology, which builds on recent trends in mixed methods research on drug use (Lopez et al., 2013; Wagner et al., 2011). Drawing on multiple sources of data from both partners reveals how women who inject drugs have multidimensional roles beyond that of passive victims. Further, couple-focused analyses highlight injection as a relational process rather than an individual event. We call for future mixed methods, couples-based studies of injection drug use to assess if similar dynamics are unfolding in other global contexts.

Conclusion

Our study suggests a need to consider the relationship context of injection drug use in order to provide a nuanced understanding of women's risk. In particular, researchers should acknowledge female sex workers' agency and the importance of their intimate relationships in shaping both strengths and vulnerabilities in their lives. By extension, this work can also inform strategies to address the concomitant health vulnerabilities of their intimate male partners. We call for interventions that reflect dynamic gender relations and urge researchers to approach their work with an open mind as to how socio-economic conditions, contextual factors, and affective ties are enacted through health risk behaviors and embodied as intimate partners' states of health and wellbeing. In considering how best to address HIV risk among couples who inject drugs, we may want to ask ourselves, do these injection drug practices represent exploitation, violence, and domination, or are they acts of care, compassion, and cooperation?

Acknowledgments

We would like to thank the project staff and participants without whom this study would not have been possible. Funding was provided by NIH grants R01DA027772, R36DA032376, T32DA023356, T32AI007384, and K01DA031031.

References

Barnard MA. Needle Sharing in Context: Patterns of Sharing Among Men and Women Injectors and HIV Risks. Addiction. 1993; 88:805–812. [PubMed: 8329971]

Barnard MA. Needle sharing in context: patterns of sharing among men and women injectors and HIV risks. Addiction. 1993; 88(6):805–812. [PubMed: 8329971]

Beletsky L, Martinez G, Gaines T, Nguyen L, Lozada R, Rangel GM, Strathdee SA. Mexico's northern border conflict: collateral damage to health and human rights of vulnerable groups. Rev Panam Salud Publica. 2012; 5:403–410. [PubMed: 22767041]

Bourgois P, Prince B, Moss A. The Everyday Violence of Hepatitis C Among Young Women Who Inject Drugs in San Francisco. Human Organization. 2004; 63(3):253–264. [PubMed: 16685288]

Bourgois P, Prince B, Moss A. The everyday violence of Hepatitis C among young women who inject drugs in San Francisco. Human Organization. 2004; 63(3):253–264. [PubMed: 16685288]

Breen C, Breen C, Roxburgh A, Degenhardt L. Gender differences among regular injecting drug users in Sydney, Australia, 1996-2003. Drug and alcohol review. 2005; 24(4):353–358. [PubMed: 16234131]

Brouwer KC, Case P, Ramos R, Magis-Rodriguez C, Bucardo J, Patterson TL, Strathdee SA. Trends in production, trafficking, and consumption of methamphetamine and cocaine in Mexico. Subst Use Misuse. 2006; 41(5):707–727. [PubMed: 16603456]

Bryant J, Brener L, Hull P, Treloar C. Needle sharing in regular sexual relationships: An examination of serodiscordance, drug using practices, and the gendered character of injecting. Drug and Alcohol Dependence. 2010; 107(2):182–187. [PubMed: 19942380]

Bucardo J, Brouwer KC, Magis-Rodriguez C, Ramos R, Fraga M, Perez SG, Strathdee SA. Historical trends in the production and consumption of illicit drugs in Mexico: implications for the prevention of blood borne infections. Drug Alcohol Depend. 2005; 79(3):281–293. [PubMed: 16102372]

Burris S, Blankenship KM, Donoghoe M, Sherman S, Vernick JS, Case P, Koester S. Addressing the "risk environment" for injection drug users: the mysterious case of the missing cop. Milbank Quarterly. 2004; 82(1):125–156. [PubMed: 15016246]

Butler, J. Gender Trouble: Feminism and the Subversion of Identity. Routledge; New York: 1990.

Carrier JM. Sexual behavior and spread of AIDS in Mexico. Med Anthropol. 1989; 10(2-3):129–142. [PubMed: 2725200]

Censos Económicos.. Resumen de los resultados de los Censos Económicos 2009. Mexico: 2010.

Choi SY, Cheung YW, Chen K. Gender and HIV risk behavior among intravenous drug users in Sichuan Province, China. Social Science & Medicine. 2006; 62(7):1672–1684. [PubMed: 16185801]

Ciccarone D. Heroin in brown, black and white: Structural factors and medical consequences in the US heroin market. International Journal of Drug Policy. 2009; 20(3):277–282. [PubMed: 18945606]

Cleland CM, Des Jarlais DC, Perlis TE, Stimson G, Poznyak V. HIV risk behaviors among female IDUs in developing and transitional countries. BMC Public Health. 2007; 7(1):271. [PubMed: 17908299]

Clemens, MA.; Montenegro, CE.; Pritchett, L. The place premium: wage differences for identical workers across the U.S. border (Working Paper No. RWP09-004). Havard Kennedy School; Boston, MA: 2009.

Connell, R. Gender and Power: Society, the Person, and Sexual Politics. Stanford University Press; Palo Alto, CA: 1987.

Connell R. Gender, health and theory: conceptualizing the issue, in local and world perspective. Soc Sci Med. 2012; 74(11):1675–1683. [PubMed: 21764489]

Creswell, JW. Qualitative inquiry and research design: Choosing among five approaches. Sage Publications; Thousand Oaks, CA: 2007.

Cruz MF, Mantsios A, Ramos R, Case P, Brouwer KC, Ramos ME, Strathdee SA. A Qualitative Exploration of Gender in the Context of Injection Drug Use in Two U.S.-Mexico Border Cities. AIDS and Behavior. 2007; 11(2):253–262. [PubMed: 16865542]

Cruz MF, Mantsios A, Ramos R, Case P, Brouwer KC, Ramos ME, Strathdee SA. A qualitative exploration of gender in the context of injection drug use in two US-Mexico border cities. AIDS Behav. 2007; 11(2):253–262. [PubMed: 16865542]

Des Jarlais DC. Structural interventions to reduce HIV transmission among injecting drug users. AIDS. 2000; 14:S41–S46. [PubMed: 10981473]

Epele ME. Gender, Violence and HIV: Women's Survival in the Streets. Culture Medicine and Psychiatry. 2002; 26:33–54.

Evans MJL, Hahn JA, Page-Shafer MK, Lum MPJ, Stein MES, Davidson MPJ, Moss AR. Gender differences in sexual and injection risk behavior among active young injection drug users in San Francisco (the UFO Study). Journal of Urban Health. 2003; 80(1):137–146. [PubMed: 12612103]

Go VF, Quan VM, Voytek C, Celentano D, Nam LV. Intra-couple communication dynamics of HIV risk behavior among injecting drug users and their sexual partners in Northern Vietnam. Drug Alcohol Depend. 2006; 84(1):69–76. [PubMed: 16413145]

González de la Rocha M, Latapí AE. Choices or constraints? Informality, labour market and poverty in Mexico. IDS Bulletin. 2008; 39(2):37–47.

Guest G, Bunce A, Johnson L. How many interviews are enough? Field Methods. 2006; 18(1):59–82.

Gyarmathy VA, Li N, Tobin KE, Hoffman IF, Sokolov N, Levchenko J, Latkin CA. Injecting equipment sharing in Russian drug injecting dyads. AIDS and Behavior. 2010; 14(1):141–151. [PubMed: 19214731]

Gyarmathy VA, Neaigus A. The relationship of sexual dyad and personal network characteristics and individual attributes to unprotected sex among young injecting drug users. AIDS Behav. 2009; 13(2):196–206. [PubMed: 17690975]

Hahn JA, Page-Shafer K, Lum PJ, Bourgois P, Stein E, Evans JL, Moss AR. Hepatitis C virus seroconversion among young injection drug users: relationships and risks. Journal of Infectious Diseases. 2002; 186(11):1558–1564. [PubMed: 12447730]

Johnson, JC. Selecting Ethnographic Informants. Sage Publications; Newbury Park, CA: 1990.

Koester S, Glanz J, Baron A. Drug sharing among heroin networks: implications for HIV and hepatitis B and C prevention. AIDS and Behavior. 2005; 9(1):27–39. [PubMed: 15812611]

Kral AH, Bluthenthal RN, Erringer EA, Lorvick J, Edlin BR. Risk factors among IDUs who give injections to or receive injections from other drug users. Addiction. 1999; 94(5):675–683. [PubMed: 10563032]

Lakon CM, Ennett ST, Norton EC. Mechanisms through which drug, sex partner, and friendship network characteristics relate to risky needle use among high risk youth and young adults. Social Science & Medicine. 2006; 63(9):2489–2499. [PubMed: 16875770]

Lam NT. Drugs, sex and AIDS: sexual relationships among injecting drug users and their sexual partners in Vietnam. Cult Health Sex. 2008; 10(Suppl):S123–137. [PubMed: 18446558]

Lazuardi E, Worth H, Saktiawati AMI, Spooner C, Padmawati R, Subronto Y. Boyfriends and injecting: the role of intimate male partners in the life of women who inject drugs in Central Java. Culture, Health & Sexuality. 2012; 14(5):491–503.

Lopez AM, Bourgois P, Wenger LD, Lorvick J, Martinez AN, Kral AH. Interdisciplinary mixed methods research with structurally vulnerable populations: Case studies of injection drug users in San Francisco. International Journal of Drug Policy. 2013

Loxley W, Ovenden C. Friends and lovers: needle sharing in young people in Western Australia. AIDS Care. 1995; 7(3):337–352. [PubMed: 7578309]

MacQueen KM, McLellan E, Kay K, Milstein B. Codebook development for team-based qualitative analysis. Cultural Anthropology Methods. 1998; 10(2):31–36.

MacRae R, Aalto E. Gendered power dynamics and HIV risk in drug-using sexual relationships. AIDS Care. 2000; 12(4):505–515. [PubMed: 11091783]

McLellan E, MacQueen KM, Neidig JL. Beyond the qualitative interview: data preparation and transcription. Field Methods. 2003; 15(1):63–84.

McMahon JM, Tortu S, Torres L, Pouget ER, Hamid R. Recruitment of heterosexual couples in public health research: a study protocol. BMC Med Res Methodol. 2003; 3:24. [PubMed: 14594457]

O'Connell JM, Kerr T, Li K, Tyndall MW, Hogg RS, Montaner JS, Wood E. Requiring Help Injecting Independently Predicts Incident HIV Infection Among Injection Drug Users. Journal of Acquired Immune Deficiency Syndromes. 2005; 40(1):83–88. [PubMed: 16123687]

Ojeda VD, Robertson AM, Hiller SP, Lozada R, Cornelius W, Palinkas LA, Strathdee SA. A qualitative view of drug use behaviors of Mexican male injection drug users deported from the United States. Journal of Urban Health. 2011; 88(1):104–117. [PubMed: 21246301]

Patterson TL, Mausbach B, Lozada R, Staines-Orozco H, Semple SJ, Fraga-Vallejo M, Strathdee SA. Efficacy of a brief behavioral intervention to promote condom use among female sex workers in Tijuana and Ciudad Juarez, Mexico. Am J Public Health. 2008; 98(11):2051–2057. [PubMed: 18799768]

Patterson TL, Semple SJ, Staines H, Lozada R, Orozovich P, Bucardo J, Strathdee SA. Prevalence and correlates of HIV infection among female sex workers in 2 Mexico-US border cities. J Infect Dis. 2008; 197(5):728–732. [PubMed: 18260766]

Pollini RA, Brouwer KC, Lozada RM, Ramos R, Cruz MF, Magis-Rodriguez C, Frost SD. Syringe possession arrests are associated with receptive syringe sharing in two Mexico-US border cities. Addiction. 2008; 103(1):101–108. [PubMed: 18028520]

Pollini RA, Gallardo M, Hasan S, Minuto J, Lozada R, Vera A, Strathdee SA. High prevalence of abscesses and self-treatment among injection drug users in Tijuana, Mexico. International Journal of Infectious Diseases. 2010; 14:e117–e122. [PubMed: 20381396]

Ramos R, Ferreira-Pinto JB, Brouwer KC, Ramos ME, Lozada RM, Firestone-Cruz M, Strathdee SA. A tale of two cities: Social and environmental influences shaping risk factors and protective behaviors in two Mexico-US border cities. Health and Place. 2009

Rhodes T. Risk environments and drug harms: A social science for harm reduction approach. International Journal of Drug Policy. 2009; 20(3):193–201. [PubMed: 19147339]

Rhodes T, Quirk A. Drug users' sexual relationships and the social organisation of risk: the sexual relationship as a site of risk management. Soc Sci Med. 1998; 46(2):157–169. doi: S0277953697001561 [pii]. [PubMed: 9447640]

Robertson AM, Lozada R, Vera A, Palinkas LA, Burgos JL, Magis-Rodriguez C, Ojeda VD. Deportation experiences of women who inject drugs in Tijuana, Mexico. Qualitative Health Research. 2012; 22(4):499–510. [PubMed: 21917563]

Robertson AM, Syvertsen JL, Ulibarri MD, Rangel MG, Martinez G, Strathdee SA. Prevalence and correlates of HIV and sexually transmitted infections among female sex workers and their non-commercial male partners in two Mexico-U.S. border cities. Journal of Urban Health. In press.

Robertson AM, Syvertsen JL, Amaro H, Martinez G, Rangel MG, Patterson TL, Strathdee SA. Can't buy my love: a typology of female sex workers' commercial relationships in the Mexico-U.S. border region. Journal of Sex Research. 2013 doi: 10.1080/00224499.2012.757283.

Robertson AM, Vera AY, Gallardo M, Pollini RA, Patterson TL, Case P, Strathdee SA. Correlates of seeking injection assistance among injection drug users in Tijuana, Mexico. Am J Addict. 2010; 19(4):357–363. [PubMed: 20653644]

Ryan GW, Bernard HR. Techniques to identify themes. Field Methods. 2003; 15(1):85–109.

Segura, DA.; Zavella, P. Women and Migration in the U.S.-Mexico Borderlands: A Reader. Duke University Press; Durham, NC: 2007.

Sherman SG, Latkin CA, Gielen AC. Social Factors Related to Syringe Sharing among Injecting Partners: A Focus on Gender. Substance Use & Misuse. 2001; 36(14):2113–2136. [PubMed: 11794586]

Sibthorpe B. The Social Construction of Sexual Relationships as a Determinant of HIV Risk Perception and Condom Use among Injection Drug Users. Medical Anthropology Quarterly. 1992; 6(3):255–270.

Simmons J, Singer M. I love you… and heroin: care and collusion among drug-using couples. Substance abuse treatment, prevention, and policy. 2006; 1:7.

Somlai AM, Kelly JA, Benotsch E, Gore-Felton C, Ostrovski D, McAuliffe T, Kozlov AP. Characteristics and predictors of HIV risk behaviors among injection-drug-using men and women in St. Petersburg, Russia. AIDS Education and Prevention. 2002; 14(4):295–305. [PubMed: 12212716]

Spittal PM, Craib KJ, Wood E, Laliberté N, Li K, Tyndall MW, O'Shaughnessy MV, Schechter MT. Risk factors for elevated HIV incidence rates among female injection drug users in Vancouver. Canadian Medical Association Journal. 2002; 166(7):894–899. [PubMed: 11949985]

Spittal PM, Schechter MT. Injection drug use and despair through the lens of gender. Canadian Medical Association Journal. 2001; 164(6):802–803. [PubMed: 11276548]

Starks H, Trinidad SB. Choose your method: a comparison of phenomenology, discourse analysis, and grounded theory. Qualitative Health Research. 2007; 17(10):1372–80. [PubMed: 18000076]

Strathdee SA, Lozada R, Martinez G, Vera A, Rusch M, Nguyen L, Patterson TL. Social and structural factors associated with HIV infection among female sex workers who inject drugs in the Mexico-US border region. PLoS One. 2011; 6(4):e19048. [PubMed: 21541349]

Strathdee SA, Mausbach B, Lozada R, Staines-Orozco H, Semple SJ, Abramovitz D, Patterson TL. Predictors of sexual risk reduction among Mexican female sex workers enrolled in a behavioral intervention study. J Acquir Immune Defic Syndr. 2009; 51(Suppl 1):S42–46. [PubMed: 19384101]

Strathdee SA, Philbin MM, Semple SJ, Pu M, Orozovich P, Martinez G, Patterson TL. Correlates of injection drug use among female sex workers in two Mexico-U.S. border cities. Drug Alcohol Depend. 2008; 92(1-3):132–140. [PubMed: 17714888]

Syvertsen, J. Sex Work, Heroin Injection, and Love in Tijuana: A Case Study; Paper presented at the Invited Panel, "Steps Toward an Anthropology of Affect," Annual Meetings of the American Anthropological Association; San Francisco, CA. 2012; Nov 14-18.

Syvertsen JL, Pollini RA, Lozada R, Vera A, Rangel G, Strathdee SA. Managing la malilla: exploring drug treatment experiences among injection drug users in Tijuana, Mexico, and their implications for drug law reform. Int J Drug Policy. 2010; 21(6):459–465. [PubMed: 20800464]

Syvertsen JL, Robertson AM, Abramovitz D, Rangel GM, Martinez G, Patterson TL, Strathdee SA. Study protocol for the recruitment of female sex workers and their non-commercial partners into couple-based HIV research. BMC Public Health. 2012; 12(136):1–16. [PubMed: 22214479]

Syvertsen JL, Robertson AM, Palinkas LA, Rangel MG, Martinez G, Strathdee SA. 'Where sex ends and emotions begin': love and HIV risk among female sex workers and their intimate, non-commercial partners along the Mexico-US border. Cult Health Sex. 2013; 15(5):540–554. [PubMed: 23473586]

Tortu S, McMahon JM, Hamid R, Neaigus A. Women's Drug Injection Practices in East Harlem: An Event Analysis in a High-Risk Community. AIDS and Behavior. 2003; 7(3):317–328. [PubMed: 14586193]

Unger JB, Kipke MD, De Rosa CJ, Hyde J, Ritt-Olson A, Montgomery S. Needle-sharing among young IV drug users and their social network members: The influence of the injection partner's characteristics on HIV risk behavior. Addict Behav. 2006; 31(9):1607–1618. [PubMed: 16459023]

Valente TW, Vlahov D. Selective risk taking among needle exchange participants: implications for supplemental interventions. American Journal of Public Health. 2001; 91(3):406. [PubMed: 11236405]

Volkmann T, Lozada R, Anderson CM, Patterson TL, Vera A, Strathdee SA. Factors associated with drug-related harms related to policing in Tijuana, Mexico. Harm reduction journal. 2011; 8(1):7. [PubMed: 21477299]

Wagner KD, Davidson PJ, Pollini RA, Strathdee SA, Washburn R, Palinkas LA. Reconciling incongruous qualitative and quantitative findings in mixed methods research: Exemplars from research with drug using populations. The International Journal of Drug Policy. 2011; 23(1):54–61.

Wood E, Tyndall MW, Spittal PM, O'Shaughnessy MV, Kerr T, Schechter MT, Small W. Requiring help injecting as a risk factor for HIV infection in the Vancouver epidemic. Revue canadienne de santé publique. 2003; 94(5):355–359. [PubMed: 14577743]

Table 1

Characteristics of female sex workers and their non-commercial male partners who inject drugs in Tijuana and Cd. Juárez, Mexico (n=312; 156 couples)[a]

	Women (n=156)	Men (n=156)	Overall (n=312)
Sociodemographics			
Study site is Tijuana (vs. Cd. Ciudad Juárez)	70 (45%)	70 (45%)	140 (45%)
Median age in years (interquartile range; IQR)	33 (28-40)	37 (31-43)	35 (29-42) ***
Median educational attainment in years (IQR)	6 (5-8)	7 (6-9)	6 (6-9) **
Born in study site (vs. someplace else)	70 (45%)	71 (46%)	141 (45%)
Ever had children	143 (92%)	118 (76%)	261 (84%) ***
Income >3500 pesos per month (>$270 USD)	65 (42%)	45 (30%)	110 (36%) **
Median time spent on street each day in hours (IQR)	8 (5-10)	10 (8-12)	8 (6-12) **
Ever been arrested (lifetime)	89 (57%)	112 (72%)	201 (64%) **
Ever migrated to the United States	75 (48%)	113 (72%)	188 (60%) ***
Ever been deported from the United States	11 (7%)	26 (17%)	37 (12%) **
Relationship Characteristics			
Median relationship duration in years (IQR)[b]	--	--	3.0 (1.5-5.2)
Median trust of partner on 10-point scale (IQR)	9 (7-10)	9 (7-10)	9 (7-10)
Median relationship satisfaction on 20-point scale (IQR)	15 (13-15)	15 (14-15)	15 (14-15) *
Male financial dependence on FSW's income[b]	--	--	86 (28%)
Couple rarely/never uses condoms (vs. often/always)	--	--	302 (97%)
Drug Abuse (past 6 months, alone or in combination with other drugs)			
Used heroin	133 (85%)	125 (80%)	258 (83%)
Injected heroin	132 (85%)	123 (79%)	255 (82%)
Used methamphetamine	42 (27%)	39 (25%)	81 (26%)
Injected methamphetamine	21 (13%)	25 (16%)	46 (15%)
Used cocaine use	32 (21%)	27 (17%)	59 (19%)
Injected cocaine	15 (10%)	15 (10%)	30 (10%)
Used crack	24 (15%)	18 (12%)	42 (13%)
Injected crack	2 (1%)	4 (3%)	6 (2%)
Drug Procurement within Relationships (past 6 months)			
Uses heroin with partner at least once per day	91 (58%)	90 (58%)	181 (58%)
Injects heroin with partner at least once per day	90 (58%)	86 (55%)	176 (56%)
Before using heroin together with partner, who			

	Women (n=156)	Men (n=156)	Overall (n=312)
usually makes the decision to use the drug: [c]			
1. Participant mostly/completely decides (vs. partner)	9 (10%)	4 (5%)	13 (7%)
2. Participant and partner decide together (equally)	79 (88%)	80 (93%)	159 (90%)
3. Partner mostly/completely decides (vs. participant)	2 (2%)	2 (2%)	4 (2%)
Before using *heroin* together with partner, who was usually responsible for buying it: [c]			
1. Participant mostly/completely responsible	6 (7%)	13 (15%)	19 (11%)
2. Participant and partner equally responsible	76 (84%)	69 (80%)	145 (82%)
3. Partner mostly/completely responsible	8 (9%)	4 (5%)	12 (7%)
Injection Equipment Sharing within Relationships (past 6 months)			
Gave or loaned a syringe to someone else after using it (including to partner)	63 (47%)	44 (36%)	107 (42%) *
To whom a used syringe was given/loaned: [d]			
Steady partner	42 (67%)	24 (55%)	66 (62%)
Friends	25 (40%)	15 (34%)	40 (37%)
Acquaintances	7 (11%)	13 (30%)	20 (19%) *
Gave or loaned a spoon, bottle cap, cotton filter or rinse water to someone else after using it (including to partner)	65 (49%)	51 (42%)	116 (45%)
Shared or divided drugs by using a syringe to load drugs into another syringe	53 (40%)	50 (41%)	103 (40%)
Often/always used a new syringe to divide the drugs (vs. rarely/never): [e]	10 (19%)	22 (44%)	32 (31%) **
Used a syringe after someone else had used it (including partner; i.e., receptive syringe sharing)	59 (44%)	48 (39%)	107 (42%)
From whom the used syringe was obtained: [f]			
Steady partner	40 (68%)	23 (48%)	63 (59%) *
Friends	20 (34%)	19 (40%)	39 (36%)
Acquaintances	8 (14%)	15 (31%)	23 (22%) *
Used a spoon, bottle cap, cotton filter or rinse water after someone else had used it (including to partner)	63 (48%)	52 (42%)	115 (45%)
Injection Assistance Behaviors (past 6 months)			
Received help injecting from someone else	38 (29%)	32 (26%)	70 (27%)
Reason for seeking help injecting from someone else: [g]			
Veins are collapsed/too small	24 (63%)	19 (59%)	43 (61%)

	Women (n=156)	Men (n=156)	Overall (n=312)
Never learned how to inject	10 (26%)	4 (13%)	14 (20%)
Wanted to inject in neck or other difficult places	4 (6%)	7 (10%)	11 (16%)
From whom the help injecting was obtained: [g]			
Steady partner	26 (68%)	17 (53%)	43 (61%)
Friends	11 (29%)	14 (44%)	25 (36%)
Acquaintances	5 (13%)	4 (13%)	9 (13%)

Notes:

P-values were obtained from bivariable logistic regression analyses with clustered standard errors to account for correlation within couples.

[a] Analysis restricted to 312 participants involved in relationships in which both partners reported injecting drugs within six months prior to their baseline visit (i.e., 156 “injector couples”).

[b] Average of both partners’ responses within couples.

[c] Among 176 who inject heroin together at least once per day.

[d] Among 107 who gave or loaned a syringe to someone else after using it.

[e] Among 103 who shared/divided drugs using another syringe.

[f] Among 107 who used a syringe after someone else (receptive syringe sharing).

[g] Among 70 who received help injecting from someone else (injection assistance).

* p<.05

** p<.01

*** p<.001.