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Concurrent sexual partnerships among female sex workers and their non-commercial male partners in Tijuana and Ciudad Juárez, Mexico

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Abstract

Objectives—To investigate the prevalence and correlates of concurrent (overlapping) sexual partnerships among female sex workers (FSWs) and their non-commercial male partners in two Mexico-U.S. border cities.

Methods—A cross-sectional survey of FSWs and their non-commercial male partners was conducted in Tijuana and Ciudad Juárez, Mexico (2010–2011). Eligible FSWs and verified non-commercial partners were aged ≥18 years; FSWs had ever used hard drugs (lifetime) and recently exchanged sex for money, drugs, or other goods (past month). Participants underwent baseline questionnaires obtaining dates of sex and condom use with ≤5 other recurring partners, including FSWs' regular clients. These dates were compared to dates of sex with enrolled study partners to determine overlap (i.e., "recurring" concurrency). Bivariate probit regression identified recurring concurrency correlates.

Results—Among 428 individuals (214 couples), past-year recurring concurrency prevalence was 16% and was higher among women than their non-commercial male partners (26% vs. 6%). In 10

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couples (5%), both partners reported recurring concurrency. The majority of couples (64%) always had unprotected sex, and most of the individuals (70%) with recurring concurrency "sometimes" or "never" used condoms with their concurrent partners. Recurring concurrency was positively associated with FSWs' income, men's *caballerismo* (a form of traditional masculinity), and men's belief that their FSW-partners had STIs.

Conclusions—Recurring concurrency, representing sustained periods of overlapping partnerships in which unprotected sex was common, should be addressed by couple-based STI prevention interventions.

Keywords

Sexual behavior; concurrent sexual partners; sexually transmitted diseases/*transmission; epidemiology; cross-sectional study

INTRODUCTION

Concurrent (overlapping) sexual partnerships potentiate transmission of sexually transmitted infections (STIs) by shortening the time between sexual contacts and increasing the risk of infected individuals transmitting disease to uninfected individuals.[1] Globally, concurrency prevalence varies widely and is motivated by a range of social and interpersonal factors (e.g., relationship dissatisfaction, perceived infidelity). STI prevention efforts require an improved understanding of concurrency patterns within a variety of relationship contexts,[2] including female sex workers' (FSWs) non-commercial relationships in resource-poor settings, where the majority of FSWs reside.[3]

Dynamic STI epidemics have emerged among FSWs in Tijuana, Baja California and Ciudad Juárez, Chihuahua (adjacent to San Diego, California and El Paso, Texas), where sex tourism from the United States and Mexico is common.[4] In 2006, prevalence of HIV, gonorrhea, Chlamydia, and active syphilis (titers ≥1:8) among FSWs in these cities was estimated at 6%, 6%, 13% and 14%, respectively.[5] Nearly one in three FSWs reported having non-commercial male partners with whom they were unlikely to use condoms.[6] While research has found that concurrency among FSWs' commercial partners (male clients) may promote STI transmission to the general population,[7] little is known about concurrency among FSWs themselves or their non-commercial male partners. Thus, we assessed the prevalence and correlates of concurrency among FSWs and their non-commercial male partners.

METHODS

We drew from an epidemiological study of STIs among FSWs and their non-commercial male partners in Tijuana and Ciudad Juárez, *Proyecto Parejas*, which is described in detail elsewhere.[8] Eligible FSWs, who were recruited first, were aged ≥18 years; had ever used hard drugs; had a non-commercial male partner for ≥6 months; recently had sex with that non-commercial partner and exchanged sex with male clients for money, drugs, or other goods (past month); and did not fear severe intimate partner violence from participating. Eligible non-commercial male partners were ≥18 years of age. Additional screening verified relationship legitimacy.[8] Participants provided written informed consent; all study protocols were approved by institutional review boards of the University of California, San Diego, Tijuana's Hospital General, El Colegio de la Frontera Norte, and the Universidad Autónoma de Ciudad Juárez.

From 2010–2011, participants completed separate, confidential interviewer-administered baseline questionnaires eliciting socio-demographics, relationship factors, drug abuse and

sexual behaviors, and adherence to traditional gender norms including *machismo* (aggression/antisocial attitudes) and *caballerismo* (more positive characteristics of masculinity including social/emotional affiliation).[9]

By design, all eligible FSWs had concurrent commercial and non-commercial relationships within a month prior to enrollment. Thus, we sought to assess "recurring" concurrency, which could have a greater potential impact on STI transmission. We obtained dates of sex with up to five other recurring sexual partners from the past year (i.e., partners with whom participants repeatedly had sex), including FSWs' regular clients, with whom unprotected sex is more likely than with non-regular clients.[10] We compared dates of sex with various partners, including enrolled study partners, to identify periods of overlap and determine the past-year cumulative prevalence of recurring concurrency.[2] Bivariate probit regression, a maximum-likelihood approach allowing correlation within couples, identified correlates of recurring concurrency. Marginal effects facilitated interpretation of coefficients.

RESULTS

Among 214 couples (n=428 individuals; 212 in Tijuana, 216 in Juárez), median relationship duration was 3 years (interquartile rage [IQR]: 2–6 years) and the majority of couples (64%) always had unprotected sex (median 100% of past-month vaginal sex acts were unprotected; Table 1). Past-year cumulative prevalence of recurring concurrency was 16%. Prevalence was higher among women than men (26% vs. 6%) but fell to a similar proportion when excluding FSWs' clients (8% vs. 6%). Recurring concurrency was positively correlated within couples ($p<.001$). In 10 couples (5%), both partners reported recurring concurrency. Unprotected sex was common within recurring concurrent partners: 66% of FSWs and 83% of men reported using condoms "sometimes" or "never" with their most frequent recurring concurrent partner.

Our adjusted model controlling for city identified three independent correlates of recurring concurrency: women with income ≥$250 USD per month were 26% more likely to report recurring concurrency than women earning less, men with higher *caballerismo* were more likely to report recurring concurrency (4% per point increase), and men who believed that their FSW-partners had STIs were 9% more likely to report recurring concurrency than men without this concern (Table 1).

DISCUSSION

Recurring concurrency, representing sustained periods of overlapping sexual partnerships, was relatively common among FSWs and their non-commercial male partners in Tijuana and Ciudad Juárez. Given the normative nature of unprotected sex within FSWs' non-commercial relationships,[6, 10] the infrequency of condom use with either partner in recurring concurrent partnerships could provide pathways for STI transmission into FSWs' commercial and non-commercial relationships and their partners' broader sexual networks.

Recurring concurrency was associated with different factors for women and men. FSWs with higher income were more likely to engage in recurring concurrency, possibly reflecting greater agency in retaining more lucrative regular clients. The association between men's *caballerismo* and recurring concurrency may relate to sociability or promiscuity extending beyond primary relationships;[9] however, additional research is needed to assess the validity of this construct in this population. Finally, men who believed that their FSW-partners had STIs were more likely to engage in recurring concurrency, possibly reflecting retaliation against perceived partner infidelity or frustration with partners' sex work. These findings warrant additional qualitative and quantitative investigation.

Our study was limited by several factors, including small sample size and reduced generalizability (e.g., excluding women experiencing severe violence and shorter-term couples may have resulted in a cohort of more autonomous FSWs and relatively stable couples). However, we believe that our selection approach was justified by ethical considerations and previous couple-based research.[8] Additionally, by excluding short-term concurrent relationships, our concurrency prevalence estimates are conservative. Nevertheless, we identified recurring overlapping partnerships with low levels of condom use that carry important implications for STI transmission and couple-based sexual risk reduction interventions. While additional research is needed to clarify the conceptualization and measurement of concurrency among FSWs and their non-commercial partners, our study provides an important first examination of overlapping partnerships in an understudied population of high risk couples.

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REFERENCES

1. Morris M, Kretzschmar M. Concurrent partnerships and the spread of HIV. AIDS. 1997; 11(5):641–648. [PubMed: 9108946]
2. UNAIDS. Consensus indicators are needed for concurrency. Lancet. 2010; 375(9715):621–622. [PubMed: 19954832]
3. Baral S, Beyrer C, Muessig K, et al. Burden of HIV among female sex workers in low-income and middle-income countries: a systematic review and meta-analysis. Lancet Infect Dis. 2012
4. Strathdee SA, Magis-Rodriguez C. Mexico's evolving HIV epidemic. JAMA. 2008; 300(5):571–573. [PubMed: 18677029]
5. Patterson TL, Semple SJ, Staines H, et al. 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]
6. Ulibarri MD, Strathdee SA, Lozada R, et al. Condom use among female sex workers and their noncommercial partners: effects of a sexual risk intervention in two Mexican cities. Int J STD AIDS. 2012; 23(4):229–234. [PubMed: 22581944]
7. Patterson TL, Volkmann T, Goldenberg S, et al. Identifying the HIV transmission bridge: which men are having unprotected sex with female sex workers and their own wives or steady partners? J Acquir Immune Defic Syndr. 2012
8. Syvertsen JL, Robertson AM, Abramovitz D, et al. Study protocol for the recruitment of female sex workers and their non-commercial partners into couple-based HIV research. BMC Public Health. 2012
9. Arciniega GM, Anderson TC, Tovar-Blank ZG, et al. Toward a fuller conception of machismo: development of a Traditional Machismo and Caballerismo Scale. J Couns Psychol. 2008; 55(1):19–33.
10. Jackson LA, Augusta-Scott T, Burwash-Brennan M, et al. Intimate relationships and women involved in the sex trade: perceptions and experiences of inclusion and exclusion. Health (London). 2009; 13(1):25–46. [PubMed: 19103714]

Key messages

- Concurrent (overlapping) sexual partnerships, which may potentiate STI transmission, were relatively common among FSWs and their non-commercial male partners.
- Condom use was rare within couples' primary (study) relationships and with recurring concurrent partnerships, representing sustained periods of overlapping, unprotected sex.
- Recurring concurrency was associated with different factors for women and men, possibly reflecting relationship and contextual factors that increase STI vulnerability.
- Additional research is needed to clarify concurrency measurement within FSWs' non-commercial relationships, as these couples comprise an understudied population vulnerable to STIs.

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Table 1

Recurring sexual partner concurrency among female sex workers and their non-commercial male partners in Tijuana and Cd. Juárez, Mexico (n=428)

	With past-year recurring concurrency (n=68, 16%)	Without past-year recurring concurrency (n=360, 84%)	Overall (n=428, 100%)	FSWs' Concurrency: Marginal Effect (robust SE) [a] (n=214)	Men's Concurrency: Marginal Effect (robust SE) [a] (n=214)
Socio-Demographics & Relationship Factors					
Female (vs. male)	55 (81%)	159 (44%)	214 (50%)	--	--
Age in years (median, IQR [b])	33 (28–41)	35 (29–42)	35 (29–42)	--	--
Educational attainment in years (median, IQR)	7 (6–9)	6 (6–9)	7 (6–9)	--	--
Income ≥$250 USD per month	52 (76%)	190 (53%)	242 (57%)	0.26*** (0.06)	−0.01 (0.03)
Non-commercial relationship duration in years (median, IQR) [c]	3 (2–7)	3 (2–5)	3 (2–6)	--	--
Unprotected vaginal sex acts w/ study partner, past month (median %, IQR) [c]	100% (65–100)	100% (83–100)	100% (80–100)	--	--
Believes study partner has had STIs	11 (16%)	22 (6%)	33 (8%)	0.09 (0.09)	0.09** (0.04)
Machismo score (range 10–40; median, IQR) [d]	20 (18–22)	20 (17–23)	20 (17–23)	--	--
Caballerismo score (range 10–40; median, IQR) [d]	30 (20–30)	30 (28–37)	30 (28–36)	−0.01 (0.04)	0.04** (0.02)
Heroin use (past 6 months)	34 (50%)	233 (65%)	267 (62%)	--	--
Cocaine use (past 6 months)	13 (19%)	72 (20%)	85 (20%)	--	--
Crack use (past 6 months)	4 (6%)	55 (15%)	59 (14%)	--	--
Methamphetamine use (past 6 months)	39 (57%)	95 (26%)	134 (31%)	--	--

	With past-year recurring concurrency (n=68, 16%)	Without past-year recurring concurrency (n=360, 84%)	Overall (n=428, 100%)	FSWs' Concurrency: Marginal Effect (robust SE) [a] (n=214)	Men's Concurrency: Marginal Effect (robust SE) [a] (n=214)
Injected any drugs (past 6 months)	31 (46%)	225 (63%)	256 (60%)	--	--

[a] Marginal effects were calculated from the final, adjusted bivariate probit regression model with robust standard errors (SE) controlling for city and couple-specific effects (Rho statistic indicated significant correlation of error terms within couples, p<.001).

[b] Interquartile range.

[c] Dyad average (uses information from both partners' responses within a given couple).

[d] Subscale of the Traditional *Machismo* and *Caballerismo* Scale.[9]

* p<.10,

** p<.05,

*** p<.01.