GENERAL TOPICS

Relationships and Diseases Among Drug Users and Nonusers

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ABSTRACT *Human immunodeficiency virus (HIV) and syphilis are relationship-based diseases that are typically transmitted by the cooperative activities (sex or drug injection) of two persons. A sample of 215 drug users and 52 sociodemographically matched nonusers was collected to examine the behaviors and relationships related to HIV and syphilis transmission. Results showed that, although drug users had more risk opportunities (more sex partners and, of course, more injection partners) than nonusers, actual sex risk behaviors (never using condoms) did not differ appreciably among drug users and nonusers or with opposite-sex partners and same-sex partners. The similarity of sexual risk was supported by the similar levels of syphilis between drug users and nonusers. The unique risk to drug users was drug injection, although drug users were found to engage in fewer risky injection behaviors (sharing of drug injection equipment) than the risky sexual behaviors in which all participants engaged. Although drug users interacted as frequently with partners as nonusers, nonuser relationships were longer lasting and emotionally closer.*

KEYWORDS *Drug Use, HIV/AIDS Risk, Injection Risk, Sex Risk, Social Relationship, Syphilis.*

INTRODUCTION

The nature of a person's relationships seriously affects his or her opportunity to transmit or receive infections like human immunodeficiency virus (HIV) and syphilis as these diseases rely on cooperative social relationships for transmission. The social context of transmission is an interpersonal, rather than individual, dimension that influences how people with a disease connect or are linked to the people they can infect.¹⁻⁹

Risk relationships may have consequences for individual members and for their partners over and above the effects of characteristics and behaviors of the individual involved.¹⁰ Sexual and injection cooperative behaviors form the pathways across which relationship-based diseases and infections are transmitted from one person to another. This fact may seem obvious, yet it represents a major distinction between relationship-transmitted infections and other infectious diseases. Unlike casual contact, sexual and injection partnering are highly nonrandom, a fact that has major

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consequences for both the rate with which and the extent to which a relationship-based disease can spread.^{1,10,11}

A major route of transmission for the HIV virus is through injection drug use, especially the sharing of needles, syringes, cookers, cottons, and other paraphernalia without adequate cleaning.^{12,13} In a study of injection drug users (IDUs) in New York City by Des Jarlais et al.,¹⁴ over 40% of those interviewed reported having engaged in unsafe injection practices (sharing needles, syringes, and other paraphernalia) in the previous 6 months. Similarly, Huebert and James's¹⁵ study of substance abuse treatment clients found a high rate of reported needle sharing despite clients' high levels of knowledge about acquired immunodeficiency syndrome (AIDS).

Sexual relationships have the potential of transmitting the HIV virus, syphilis, and other diseases. Syphilis is a serious bacterial infection transmitted by intimate contact, usually of a sexual nature, through moist mucous membranes, such as the genital area, mouth, or anus. This type of infection can ultimately provide a vector for transmission of more serious infections, such as HIV. One measure of the extent to which unprotected sex is practiced in a population is the prevalence of syphilis or other sexually transmitted diseases (STDs).^{16,17} The association between HIV and syphilis is strong enough that, when HIV infection reaches the epidemic stage in a population, the ecological or geographic distribution¹⁸ of incident cases of HIV will tend to mirror the pattern for incident cases of syphilis or other STDs. Thus, an epidemiological approach for estimating the likely trajectory of HIV infections in areas of low seroprevalence has been to use the prevalence of STDs as a precursory measure of the future distribution of HIV infection.¹⁹ Increased rates of HIV infection have been related, among other factors, to a prior syphilis infection.^{20,21} Having an open syphilis sore can make it easier for other diseases, especially HIV, to enter the body because the broken skin is a direct channel to the bloodstream.^{1,22} Individuals with an active case of syphilis have been found to be up to three times more likely to test HIV seropositive than those without an active case of syphilis.^{19,20} Thus, risk is exponentially increased when injection risks and sexual risks are combined.

Injection drug users can prevent the spread of HIV and AIDS by modifying their syringe-sharing and syringe-cleaning habits. Bleach cleaning methods have been found to be effective in reducing the risk of HIV infection from needle and syringe units.²³ Injection drug users who share needles are at a higher risk of contracting HIV, especially among those injectors who use common works.^{4,5,7,24-27} In many situations in which common works are used, however, partners are frequently unknown, with syringe-cleaning practices inadequate at best and nonexistent the majority of the time.^{4,5,7,28}

If used properly, a condom is very effective at reducing the risk of being infected during sexual intercourse with HIV or other sexually transmitted diseases. HIV cannot pass through latex condoms; however, condoms must be used consistently and correctly to provide maximum protection.²⁹ Some studies have documented the difficulty of using condoms correctly and have found breakage or slippage in up to 6%–10% of condom use occasions.³⁰⁻³² However, even when persons are competent to use condoms correctly, they often choose not to use them. Sex workers have been found to use condoms with clients, but not with regular partners,³³ and clients of prostitutes have been found to use condoms less with "steady" prostitutes.³⁴ Gay males who have multiple sex partners have been found to be more likely to use condoms with nonregular partners than with regular partners^{35,36} and to be receptive to the partner's preference for condom use.¹⁹ In addition, re-

search indicates crack users engage in high-risk sexual behaviors that are related to high rates of STDs and possibly HIV infection.²¹

Research shows a relatively high degree of sexual mixing between injectors and noninjectors; approximately half of the sexual partners of injectors are noninjectors.⁸ At least half of all new HIV cases now involve people who inject drugs or their heterosexual partners.^{8,37}

Because HIV and syphilis are relationship-based diseases, not all individuals are at equal risk for infection. Condom use, syringe sharing, and syringe-cleaning habits can have an enormous impact on an individual's risk of infection.^{12,38} Relationship characteristics such as duration, trust, communication, and power within the relationship have all been found to be associated with condom use.^{39,40} Receptive syringe sharing is also affected by the social relationships between injectors. Sharing is more likely to occur between individuals who have strong social ties, who engage in daily contact, who inject together for more than a year, who have very close relationships, who have sexual relationships, and who steal together.⁴¹ In addition, partner selection can be a critical indicator of one's risk probability. Whether partners are simultaneous or sequential, the nature of the social networks from which they are recruited, and the frequency of risk behaviors can all dramatically affect the likelihood of infection for drug users and nonusers alike.¹

One way to conceptualize relationships is in terms of *networks*, which can be defined as a set of nodes connected by links of one kind or another.¹⁰ Although the network model can describe a variety of both human and nonhuman groupings, the present focus is on networks in which the nodes are people and the links are the individual's personal relationships. A person's *risk network* is comprised of those relationships that can spread HIV or other relationship-based diseases; these relationships consist of an injection network (a person's injection partners, if any) and a sex network (a person's sex partners, if any). A more general concept is the *social network*, which can be made up of many types of relationships. Social networks can include both a person's risk network and a person's "intimate network," which is comprised of those persons to whom the individual feels emotionally close.

Research into the social networks of drug users and nonusers has provided us with estimates of the average size of networks, which vary tremendously among studies. Latkin and colleagues⁴² studied mostly African American male drug injectors in Baltimore, Maryland, who reported a mean social network size of 10.27. Friedman and colleagues⁴ studied a sample of New York drug injectors, who reported a mean injection network size of 4.11. Westermeyer and Neider⁴³ studied mostly white male and female substance abusers, who reported a mean intimate network size of 6.7. Erickson⁴⁴ reported that the average nonusing adult has a network composed of 3 to 6 intimates and a social network of 25 to 40 persons. A review conducted by Mueller⁴⁵ found a nonusers' mean network size of 6 to 10 intimates and a social network size of 25 to 40 other acquaintances. Walker and colleagues⁹ reported networks of 4 to 7 intimates and a social network of 20 individuals among persons who do not use drugs.

There is also some question about the differences between the relationships of drug users and those of nonusers. Preble and Casey,⁴⁶ for example, view drug users as having only acquaintances rather than friends and as having little contact with relatives. From this perspective, drug users' social lives are presented as characterized by distrust, one-dimensionality, and loneliness. Drug users have been seen as maintaining only one prototypical type of relationship, the "running partner," which offers many forms of support.^{46,47} Running partners form two-person groups;

the partners guard each other's back in the many high-risk situations that drug injectors face. Williams and Johnson⁴⁸ assert that most injectors are strongly linked to one another and are weakly linked to running partners. Other authors, however, have suggested that these relationships are not necessarily unemotional, distant relationships: Running partners often offer each other emotional support and friendship. Friedman and colleagues⁴ portray drug users as maintaining similar relationships to those of nonusers, with drug partners and friends as simply another set of actors within the network.

As we have seen, then, HIV and syphilis are relationship-based diseases transmitted in a social fashion. The structure of the network itself can have a significant impact on the spread of these infectious, relationship-based diseases since both sexual transmission and proliferation through contaminated needles are influenced by the structure of interactions within drug procurement and consumption networks, as well as the structure of other interactions within a person's social network. Conceptualizing a population of susceptible persons as a social network can provide insight into the transmission of HIV and syphilis among drug injectors and outward into the community.^{10,49} This research, therefore, investigated the differences and similarities between the relationships maintained and risk behaviors engaged in by drug users compared to nonusers.

METHOD

Data Collection

Data for this study were collected as part of a project that examined sexual and drug injection behaviors among a sample of individuals' risk networks. The goal of the research was to collect a representative sample of drug users and similar nonusers. Representativeness was achieved by using approximately random recruitment methods. These methods are "approximately" random because, although these methods in principle can achieve randomness, the hidden nature of populations, including drug users, and the resulting resistance to recruitment always involve some level of unmeasurable bias. All recruitment methods began with a series of neighborhood informants who were knowledgeable about the neighborhoods in which recruitment took place.

Index participants were selected through three recruitment methods, shown schematically in the Figure. The first method of recruitment for drug users was a two-step random walk.^{50,51} In this procedure, neighborhood informants gave a list of persons known or suspected to be *chronic drug users*, defined as those using drugs at least three times per week. One of these identified persons was randomly selected and recruited. This "random walk" informant was interviewed for a list of persons known or suspected to be chronic drug users. One person from this list was randomly selected and recruited. If the person met eligibility criteria (including a positive drug screen for cocaine or heroin or track marks), the person was interviewed as an "index participant." A total of 29 index participants was recruited by the random walk method.

The second method of recruitment was peer-driven recruitment.^{2,52} In the peer-driven recruitment procedure, neighborhood informants were trained in the recruitment goals of the study and were given three coupons with which to recruit eligible drug users. Eligible recruits were interviewed as index participants. Using the peer-driven recruitment procedure, 97 index participants were recruited.

FIGURE. Recruitment methods.

A third procedure was implemented for recruiting nonusing participants. When at least 60% of a drug-using index participant's risk partners were successfully recruited and interviewed (excluding commercial sex partners), a nonusing participant was sought. Matched nonusers were of the same gender, same race, and within 5 years of age and resided within approximately three blocks of the drug-using index participant. Additional eligibility requirements were that nonusing participants must have reported no use of cocaine, heroin, or methamphetamine in the previous 2 years and must have tested negative for cocaine and heroin by a urine drug screen. These participants were referred by neighborhood informants or by geographically targeted recruitment posters. By this method, 43 nonusing participants were recruited.

An interview was conducted with each participant, who named his or her injection, sex, drug use, and emotionally close partners from the previous 30 days. Each of the index participants was invited to recruit their sexual and injection partners from the previous 30 days. There were no restrictions on whether recruited partners were drug users. Of these eligible partners, 99 were successfully recruited.

Each study participant (index and risk partner) was given a 2-hour interview in a private room within a storefront location. Research assistants stressed that all information gained from study participants would be kept strictly confidential. Each participant signed an informed consent document in which they were told that they would be asked about their drug use and sexual activities and about their partners. They were told that they would be asked to give urine and blood specimens. Participants received cash compensation for their time and were given free syphilis testing and HIV counseling and testing.

The city of Houston has the highest prevalence of HIV and AIDS cases in Texas. Texas ranks seventh in the nation in the number of documented HIV and

AIDS cases.²⁹ In 1999, the reportable HIV incidence for Houston and Harris County was 36.1 per 100,000, and the total syphilis incidence was 32.1 per 100,000.

Measures

Relationships Relationships were assessed by asking participants to name the partners with whom they had used drugs in the last 30 days, those with whom they had sex in the last 30 days, and those to whom they felt “close.” For each partner named, participants reported the frequency of contact in the previous 30 days and rated the partner in terms of four items that measured emotional connection (extent of trust, respect, caring, and whether they would tell the partner important things they would not tell just anyone; α reliability = .90).

For drug use partners, participants indicated whether they had injected with the partner in the previous 30 days and whether they had shared injection equipment (needles and syringes) with the partner. Injection equipment sharing was coded as 0 (never shared equipment with any partner), 1 (sometimes shared equipment), or 2 (always shared equipment with every partner). For sex partners, participants indicated how often in the previous 30 days they had engaged in a particular kind of sex (vaginal, anal, and/or oral) and how often a condom was used for each type of sex. Vaginal and anal condom use was coded as 0 (no condom use with any partner), 1 (sometimes used condom), or 2 (always used condom with every partner). Drug users were defined by self-reported use of cocaine, heroin, or methamphetamine within the previous 30 days. For all participants, use was confirmed by urine drug screen or recent track marks.

Health Consequences For most participants, HIV and syphilis serostatus were assessed. All study participants who were requested to provide blood samples for HIV and syphilis testing agreed, but occasional technical difficulties with the laboratory resulted in loss of data. Participants received the National Institute on Drug Abuse (NIDA) standard HIV pretest information and counseling protocol⁵³ from a certified HIV pretest counselor. During the private counseling session, participants were informed that their HIV test results would remain confidential, but that state law required positive syphilis test results to be reported to the City of Houston Health Department. A licensed local hospital laboratory under contract to the investigators conducted testing. Blood samples were screened for HIV-1 using the enzyme-linked immunosorbent assay (ELISA) technique and were confirmed by Western blot. Blood samples were screened for syphilis using the rapid plasma reagin (RPR) assay.

Plan of Analysis Because each participant had multiple partners who might have been recruited into the study and thus were not statistically independent, there was the chance that variances within a participant’s partners would be more homogeneous than those between participants. This phenomenon can lead to biased significance tests.⁵⁴ To adjust for these variance differences, design-based statistical procedures were used to correct for nonindependence. Analyses were conducted using SUDAAN®, a statistics program that adjusts variance estimates for sample designs such as clustering.⁵⁵ Drug users and nonusers were analyzed for differences. For interval variables, *t* tests were performed, and chi-square tests were performed for categorical variables. Because of potential nonindependence among the responses of persons recruited together, design-based analyses that control for participant

clustering were performed, as well as standard analyses that assume statistical independence of observations. Although significance levels differed, both methods gave the same results for these data. Significance levels for the design-based analyses are reported.

RESULTS

Table 1 depicts demographic characteristics of the study sample. About 64% of the sample were male; about half were African American; and Anglo and Hispanic individuals made up about one fourth each. Most of the sample were between 30

TABLE 1. Sample characteristics

Variable	All participants	
	Drug user (N = 215), n (%)	Nonuser (N = 52), n (%)
Gender		
Male	140 (65)	30 (58)
Female	75 (35)	22 (42)
Race/ethnicity		
African American	98 (46)	24 (46)
Anglo/white	59 (27)	13 (25)
Hispanic	58 (27)	15 (29)
Age		
20 and under	10 (5)	2 (4)
21–30	33 (15)	5 (10)
31–40	83 (39)	20 (38)
41–50	64 (30)	10 (19)
51 and over	25 (12)	15 (29)
Education level		
Not high school graduate	126 (59)	31 (60)
High school graduate	89 (41)	21 (40)
Employment, previous 6 months		
None	98 (46)	22 (42)
Part time	58 (27)	15 (29)
Full time	58 (27)	15 (29)
Sexual identity*		
Straight	168 (78)	49 (94)
Gay/lesbian/bisexual	46 (22)	3 (6)
Injector*		
No	112 (52)	52 (100)
Yes	103 (48)	0
Drug use last 30 days (multiple responses)		
None*	0	42 (81)
Marijuana*	128 (60)	10 (19)
Crack cocaine*	176 (82)	0
Powder cocaine*	101 (47)	0
Heroin*	71 (33)	0
Methamphetamine*	34 (16)	0

* $P < .01$ by chi-square test.

and 50 years of age. The majority (59%) did not graduate from high school; about half had not been employed for the previous 6 months. There were 18% who identified themselves as gay, lesbian, or bisexual (prior to intended sex change operations). Among 215 drug users, 52% self-reported drug-injecting behavior. Of the 52 nonusers, 79% used alcohol or marijuana less than once a day, while 21% used these drugs more than once a day. Among drug users, in the previous 30 days, 60% had used marijuana, 82% had used crack cocaine, 47% had used powder cocaine, 33% had used heroin, and 16% had used methamphetamine.

Table 2 describes the relationships of study participants. Drug users reported

TABLE 2. Relationships

	Drug users (N = 215)	Nonusers (N = 52)	<i>P</i>
Sex			
Number of persons sexually active	172	34	
Mean number of sex partners (SD)	2.25 (2.14)	1.44 (1.05)	.001
Number reporting vaginal or anal sex	149	33	
Condom use, %			
Never use	56	55	.918
Occasionally	26	24	
Always use	18	21	
Number heterosexually active	148	33	
Mean number of partners (SD)	1.95 (1.70)	1.42 (1.06)	.024
Number reporting vaginal or anal sex	145	33	
Condom use, %			
Never use	57	54	.835
Occasionally	26	24	
Always use	17	21	
Number homosexually active	32	1	
Mean number of partner (SD)	2.97 (2.90)	—	—
Number reporting anal sex	18	—	
Condom use, %			
Never use	50	—	
Occasionally	39		
Always use	11		
Injection			
Number of injectors	101		
Mean number of injection partners (SD)	3.67 (2.88)		
Equipment sharing, %			
Never share	38		
Occasionally	44		
Always share	18		
Other relations			
Mean number of "close" partners (SD)	2.82 (2.27)	3.98 (2.97)	.008
Mean number of contacts in 30 days (SD)	17.14 (7.10)	16.31 (8.80)	.533
Mean level of emotional closeness (SD)	5.67 (1.84)	7.55 (1.43)	.001
Mean number of years known (SD)	8.89 (8.82)	16.56 (12.53)	.001
Known 5 years or more (%)	45.0 (33.3)	66.3 (33.5)	.001
Known 10 years or more (%)	29.9 (30.6)	54.9 (35.2)	.001

Tests on means were by independent samples *t* test; tests on frequencies were by chi-square test.

significantly more sex partners than nonusers (2.25 vs. 1.44), but they did not differ in condom use. Condoms were never used by about 50% of the sexually active participants, whether drug users or nonusers. Among drug-using participants, 11% with same-sex partners and 17% with opposite-sex partners reported using condoms all the time. Among nonusing participants, 21% reported using condoms all the time. Much of the reported difference was in same-sex relations, which were almost exclusively restricted to drug users in our sample. Condom use was about the same within homosexual relationships as within heterosexual relationships. Protective behaviors were more likely to occur within injection relationships (38% reported never sharing injection equipment with other injectors) than within sexual relationships (between 11% and 21% reported using a condom all the time). The 101 participants who were drug injectors reported a higher number of injection partners (3.67) than did the 172 sexually active participants (who reported 2.25 sexual partners). Drug users reported fewer close partners than nonusers (2.82 vs. 3.98). However, there was little difference in the number of days in the previous 30 days that drug users and nonusers spent with each partner (17.1 and 16.3, respectively). Drug users reported less emotional closeness in their relationships than did nonusers. Nonusers reported that their relationships had lasted considerably longer than the relationships reported by drug users.

Table 3 shows health consequences of social network structures. Drug users were more likely to test seropositive for HIV than nonusers (15% vs. 6%, marginally significant at $P = .051$, although significant in a more appropriate directional one-tailed test). Results for syphilis showed no significant difference between drug users and nonusers. Because the reactive RPR test for syphilis can detect past infection, even appropriately treated, we also compared nonusers who reported never injecting to nonusers who reported previous injection. We found that, of 33 nonusers who had never injected, 12.1% had positive RPR results, while of 14 who had ever injected, 14.3% had positive RPR results, not a significant difference. These rates can be compared to the countywide rates of 0.00036% for HIV and 0.00032% for syphilis.

DISCUSSION

The occurrence of HIV/AIDS is relationship based and is empirically related to drug use. In a sample of drug users and sociodemographically similar nonusers, we explored differences in relationships that may account for differences in HIV and syphilis prevalence. One important contribution of this research is that it includes data on both drug users and nonusers. To control for effects of the social and economic environment, the nonusers of our sample were matched with drug users by race/ethnicity, gender, age, and location of residence. In our sample, the drug users tended to be somewhat younger than nonusers and to be more likely to report

TABLE 3. Health consequences

	Drug users (N = 203)	Nonusers (N = 47)	P
Participants HIV+ (%)	30 (0.15)	3 (0.06)	.051
Participants with syphilis (%)	30 (0.15)	6 (0.13)	.645

Tests on proportions were by chi-square test.

their sexual identity as gay, lesbian, or bisexual. Approximately 80% of our drug-using sample were crack cocaine users; about 50% used powder cocaine; and about a third were heroin users. Our sample of participants was not matched on sexual orientation. In combination with the small proportion of homosexually active persons, this seems to have resulted in an underrepresentation of homosexual non-users.

Results indicate that drug users were more exposed to risk than nonusers in all categories of exposure. Compared to nonusers, drug users reported more heterosexual partners, more homosexual partners (although this finding may be influenced by sampling bias), and of course, more injection risk.

The heterosexual relationships of drug users differed significantly from the heterosexual relationships of nonusers, with drug users tending to name a somewhat larger number of sexual partners (about 2 vs. about 1.5 for nonusers). Drug-using gay or lesbian participants also named a higher number of 30-day sexual partners (about 3), but we were unable to compare this figure for nonusers since we did not have enough gay or lesbian nonusers in our sample. While drug users have more risk partners than nonusers, all three groups (drug users with same-sex partners, drug users with opposite-sex partners, and nonusers with opposite-sex partners) engage in unprotected sex at approximately the same rates.

When syphilis seroprevalence was examined, no significant differences were found between drug users and nonusers in this sample. Since syphilis is a sexually transmitted disease, usually transmitted heterosexually, these results validate our conclusion that heterosexual activities are essentially equal in this economically disadvantaged sample between drug users and nonusers.

Among all sexually active groups, approximately half of the participants reported never using condoms with any partner, and between 11% and 21% reported using condoms with all partners. A somewhat more protective pattern was revealed in the reports of needle-sharing activities among drug injectors: About a third reported never sharing equipment with any partner, while approximately one fifth reported always sharing equipment. These results support previous research that has found public health messages to be more effective at reducing HIV injection risk behaviors than in reducing sex risk behaviors.⁵⁶⁻⁵⁹

In general, drug users are about as socially active as nonusers. They have contact with their partners, on the average, about every other day, similar to the contact behavior of nonusers. However, drug users report that they are "close" to fewer persons than nonusers. Drug users report significantly less emotional closeness than nonusers and report that their relationships have endured about half as long as the average relationship reported by nonusers. Wellman and colleagues⁶⁰ found that about 25% of relationships in their general social sample lasted for as long as 10 years. Neaigus and colleagues⁶¹ found that 23% of relationships among drug users were maintained for 5 years or more. In our sample, 30% of the reported relationships of drug users were with partners who had been known for at least 10 years, and 45% were with partners who had been known between 5 and 10 years, compared to 55% and 66%, respectively, for nonusers. Our results show more intimacy for this sample than Wellman found in Toronto over 25 years earlier.⁶⁰ We found 55% of the nonuser relationships had lasted 10 years or more, along with 30% of the drug user relationships, both of which are greater than the 25% Wellman and colleagues found. However, Wellman's data were prospective (how many persons named at time 1 were named again at time 2), while our data were retrospective.

The size of a reported social network depends in large part on the list of “name generators” who elicit the names of partners.^{51,62} Wellman’s⁶⁰ working- and middle-class sample named an average of 5 close partners, while our economically disadvantaged nonusers named about 4 close partners, and the drug users named about 3 close partners. Previous research has shown that the stability of relationships generally depends on the strength of the emotional connection between the individuals.⁶³ Our sample of nonusers reported a significantly higher level of emotional closeness than that reported by drug users and a reported a significantly larger number of “close” partners, indicating relationships that were more stable among nonusers.

Our results on the emotional relationships of drug users fall between the results of those who claim that drug user relations do not differ from nonuser relations⁴ and those who claim that drug users have few, if any, strong relationships.^{46,47} Our results show instead that drug users experience a reasonable level of emotional connection in their relationships (a mean slightly above the midpoint of the scale), but that the level of emotional connection is significantly lower than for nonusers. At the same time, our results confirm that drug users tend to have a larger number of sex partners than nonusers.^{21,42}

Our results show, then, that drug users have higher exposure to disease transmission risk than nonusers. Many drug users engage in risky drug injection behaviors, and drug users have more sex partners than nonusers. We have confidence that these differences are due primarily to drug use because the sampling design ensured that drug users and nonusers were matched demographically and geographically. In addition to these findings, however, we find that drug users and nonusers tend to have about the same level of risk in their sexual relationships. For example, nonusers are just as likely to report that they never use condoms as are drug users. In addition, nonusers were found to have about the same syphilis rate as drug users, even when we compared current nonusers who had ever injected drugs to those who had never injected. The syphilis rates, like the HIV rates, were about 400 times higher than general rates in Houston. These results show us that we need to understand what it is that keeps the sex risk high (i.e., low condom use) in both nonusing and drug-using populations.

No longer is HIV confined to the drug-using and homosexual populations. Nonusers cannot assume immunity from HIV, syphilis, and other diseases given that approximately half of the sexual partners of drug injectors are noninjectors.⁸ Recent research has indicated that as many as 28% of men and 70% of women who become HIV seropositive do not report an identifiable transmission risk.⁶⁴ As HIV continues to move beyond drug users into the nonusing community, the disease can be expected to spread among nonusers. The challenge for researchers is to learn the dynamics of relationships and disease so that outreach workers, treatment providers, and public health workers will be better equipped to support and assist individuals and groups to lower their risk of disease transmission.

ACKNOWLEDGEMENT

Support for this research was provided by the National Institute on Drug Abuse (R01-DA08989), Isaac D. Montoya, Principal Investigator. Opinions expressed are solely those of the authors.

We would like to thank Charissa Higginbotham for help in the preparation of this manuscript.

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