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An Assessment of the Feasibility and Acceptability of a Friendship-Based Social Network Recruitment Strategy to Screen At-Risk African American and Hispanic/Latina Young Women for HIV Infection

Dr. Cherrie B. Boyer, PhD, **Dr. Lisa Hightow-Weidman, MD, MPH**, **Dr. James Bethel, PhD**, **Dr. Su X. Li, MD**, **Dr. Lisa Henry-Reid, MD**, **Dr. Donna Futterman, MD, MSN, ARNP, PNP-BC**, **Mss. Donna Maturo, MSN**, **Dr. Diane M. Straub, MD**, **Ms. Kourtney Howell, BA**, **Mss. Shirleta Reid**, **Ms. Jaime Lowe, BS**, **Dr. Bill G. Kapogiannis, MD**, and **Dr. Jonathan M. Ellen, MD**
Division of Adolescent and Young Adult Medicine, Department of Pediatrics, University of California, San Francisco (Dr Boyer); Division of Infectious Diseases, Department of Medicine, University of North Carolina at Chapel Hill (Dr Hightow-Weidman); Westat, Rockville, Maryland (Drs Bethel and Li); Division of Adolescent and Young Adult Medicine, Department of Pediatrics, Stroger Hospital of Cook County, Chicago, Illinois (Dr Henry-Reid and Ms Lowe); Division of Adolescent Medicine, Department of Pediatrics, Montefiore Medical Center, Bronx, New York (Dr Futterman and Ms Howell); Division of Adolescent Medicine, University of Miami School of Medicine, Miami (Mss Maturo and Reid), and Division of General Pediatrics and Adolescent Medicine, University of South Florida, Tampa (Dr Straub), Florida; and Pediatric and Adolescent Medicine Branch, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health, Bethesda (Dr Kapogiannis), and Department of Pediatrics, Johns Hopkins University School of Medicine, Baltimore (Dr Ellen), Maryland

Abstract

Objectives—To examine the feasibility and acceptability of a friendship-based network recruitment strategy for identifying undiagnosed human immunodeficiency virus (HIV) infection

Correspondence: Cherrie B. Boyer, PhD, Division of Adolescent and Young Adult Medicine, Department of Pediatrics, University of California, San Francisco, 3333 California St, Ste 245, San Francisco, CA 94118 (boyerc@peds.ucsf.edu).

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within young women's same-sex friendship networks and to determine factors that facilitated and hindered index recruiters (IRs) in recruiting female friendship network members (FNMs) as well as factors that facilitated and hindered FNMs in undergoing HIV screening.

Design—A cross-sectional study design that incorporated dual incentives for IRs and their female FNMs.

Setting—The IRs were recruited through 3 Adolescent Trials Network for HIV/AIDS Interventions sites within their Adolescent Medicine Trials Units. Data were collected from January 1, 2009, through June 30, 2010.

Participants—The IRs self-identifying as HIV positive, negative, or status unknown were enrolled to recruit FNMs to undergo HIV screening.

Main Outcome Measures—Self-reports of HIV risk and facilitators and barriers to network recruitment and HIV screening were assessed using an audio-computer-assisted self-interview. Participants were identified as HIV negative or positive on the basis of an OraQuick HIV test with confirmatory enzyme-linked immunosorbent assay and/or Western blot tests.

Results—Nearly all (156 [98.1%]) eligible IRs agreed to participate and most (78.4%) recruited 1 or more FNMs. Of the 381 FNMs, most (342 [89.8%]) agreed to HIV screening. Although a high acceptance of HIV screening was achieved, the HIV prevalence was low (0.26%).

Conclusion—Our findings provide compelling evidence to suggest that use of a female friendship network approach is a feasible and acceptable means for engaging at-risk young women in HIV screening, as shown by their high rates of agreement to undergo HIV screening.

Despite 2 decades of prevention efforts, adolescent (aged 13–19 years) and young adult (aged 20–24 years) women are at increased risk for human immunodeficiency virus (HIV) infection.[1,2] African American and Hispanic/Latina young women have disproportionately high rates of HIV infection. In 2009, African American young women comprised 14% of the US female population but had 66% of the HIV infections diagnosed among females, and Hispanic/Latina young women represented 11% of the female population but had 14% of the HIV infections diagnosed among females.[2] These data underscore the critical need for reaching African American and Hispanic/Latina young women who are in need of primary HIV prevention interventions, including HIV counseling and testing.

The Centers for Disease Control and Prevention recommends that every person in the United States from 13 to 64 years old get tested for HIV.[3] Despite this, nationally, among high school students, 12% of Hispanic/Latinos and 21% of African Americans have been tested for HIV infection.[4] It is estimated that 50% of all HIV-infected adolescents are unaware of their HIV status.[5,6] Identifying undiagnosed HIV infection provides opportunities for referrals to risk-reduction counseling, medical care, and psychosocial services as early as possible. Consequently, it is important to establish effective strategies for identifying undiagnosed HIV infection in African American and Hispanic/Latina young women because they are at increased risk for HIV. To increase HIV testing and timely linkage to care, it is necessary to understand factors that prohibit young women from seeking HIV testing[7] and factors that will make HIV testing a desirable and attainable aspect of HIV prevention.[8]

A social network approach has been effective in identifying HIV infections; however, this approach has focused largely on adults, including heterosexual men and women, men with male-to-male sexual contact, and intravenous drug users.[9,10] The extent to which a social network approach will be an effective means to screen for HIV infection in heterosexual young women is unknown. Moreover, because there are few definitive risk factors for HIV infection among nonintravenous drug using heterosexual young women beside neighborhood of residence and race/ethnicity,[2,11] it is likely that the social networks of HIV-

uninfected young women residing in communities with high HIV prevalence include HIV-infected young women,[12] suggesting the need for a broader approach to social network recruitment that would include individuals who may be HIV negative or whose HIV status is unknown. This broad social network recruitment approach was used in this research. Previous research also suggests that same-sex close-friendship networks may be a feasible and acceptable approach for recruiting African American and Hispanic/Latina adolescents in sexually transmitted infection or HIV prevention interventions.[13–16] Thus, this study examined the feasibility and acceptability of a friendship-based network recruitment strategy for identifying undiagnosed HIV infection within the young women's same-sex friendship networks. We also examined factors that facilitated and hindered index recruiters (IRs) in recruiting female friendship network members (FNMs) as well as factors that facilitated and hindered FNMs in undergoing HIV screening.

METHODS

STUDY PARTICIPANTS

Study eligibility for all study participants included self-identifying as biologically female and sexual intercourse with a male partner. Eligibility for IRs included self-identifying as African American, Hispanic/Latina ethnicity, mixed African American and/or Hispanic/Latina ethnicity, age 13 to 24 years, and self-disclosure as (1) HIV positive, (2) HIV negative (a negative HIV test result <12 months before study consent), or (3) HIV status unknown (no history of HIV testing or receipt of negative HIV test results >12 months before study consent). Eligibility for FNMs was age at least 13 years. Although it was anticipated that most of the FNMs would be African American or Hispanic/Latina, those who self-identified as another race were not excluded from participation. Because a goal of this research was to assess the feasibility of recruiting FNMs who may be at risk for HIV, it was important that IRs did not restrict recruitment of FNMs on the basis of age, race/ethnicity, or perceived risk. The FNMs were defined as "female friends you may hang out with more than others, or trust more than others."[13,14,16]

STUDY DESIGN AND SETTING

A cross-sectional design using dual incentives for IRs and FNMs was used. The IRs received $40 to $50 for completing the assessments and for travel expenses and $10 to $20 for recruiting each FNM; FNMs received $40 to $50 for completing the assessments and for travel expenses.

The IRs were recruited from the Adolescent Medicine Trials Units of 3 Adolescent Trials Network for HIV/AIDS Interventions (ATN) sites (Stroger Hospital of Cook County, Montefiore Medical Center, and the University of Miami School of Medicine). Young women provided verbal consent to undergo a brief screening interview. If eligible, they provided written, informed consent or assent. Parental permission was required by the institutional review board at the University of Miami School of Medicine. All study procedures were approved by each site's institutional review board.

The IRs completed a brief audio-computer-assisted self-interview and received 6 referral cards to distribute to their FNMs, which included the IRs' subject identification number to link IRs and FNMs. The IRs who self-identified as HIV negative or unknown were invited to undergo HIV screening. The IRs were allowed up to 4 months to recruit their FNMs, after which they completed an audio-computer-assisted self-interview on factors that facilitated or hindered recruitment of FNMs. The FNMs also completed an audio-computer-assisted self-interview to assess their HIV risk and factors that facilitated or hindered HIV screening. Data were collected from January 1, 2009, through June 30, 2010.

MAIN OUTCOME MEASURES

The audio-computer-assisted self-interview took approximately 40 minutes to complete and included the following measures:

Sociodemographic Characteristics and HIV-Related Risk measures were derived from a prior ATN-sponsored study.[17,18] The behavioral HIV risk measures were created using criteria established by Seage et al[19] and expanded to include measures from Boyer et al.[20] The alcohol and substance use assessment included questions about alcohol, marijuana, and other substances.

Facilitators for HIV Screening for IRs and FNMs comprised a 12-item, 4-point Likert scale measure ("strongly disagree" to "strongly agree") focusing on (1) concern about personal health; (2) past behaviors; (3) high prevalence of HIV in own community; (4) sexual partner's HIV risk; (5) protecting future health; (6) girlfriend screening for HIV; (7) free HIV testing; (8) confidential HIV testing; (9) HIV testing before study consent; (10) benefits of HIV treatment, if positive; (11) painless test; and (12) friends' support.

Barriers to HIV Screening for FNMs and IRs included a 13-item, 4-point Likert scale measure ("strongly disagree" to "strongly agree") focusing on concern about (1) confidentiality, (2) parents receiving test results, and (3) friends' judgment, no concern about (4) past behaviors (5) current behaviors, (6) health, or (7) HIV in own community; (8) indifference to painless testing; (9) embarrassment for HIV screening; (10) fear of knowing HIV status; (11) indifference to benefits of HIV treatments; (12) lack of time for screening; and (13) lack of trust in health care professionals. The facilitators and barriers to HIV screening measures were developed from existing literature[7–10] and the authors' clinical experience.

HIV tests identified participants as HIV negative or positive on the basis of oral rapid testing using the OraQuick HIV test with confirmatory tests using enzyme-linked immunosorbent assay and/or Western blot tests. Each site followed its specific Adolescent Medicine Trials Unit standard-of-care protocol for providing counseling before and after HIV screening. Participants who were given a diagnosis of HIV were linked to medical care at each participating Adolescent Medicine Trials Unit.

STATISTICAL ANALYSIS

Conventional descriptive statistics were used to examine the characteristics of participants. Frequencies and proportions for categorical variables and means (SDs), along with median and range of data values for continuous variables, were calculated. Comparisons by IRs' HIV status were performed separately for IRs and FNMs, in which χ^2 or Fisher exact tests were used for the categorical variables and analysis of variance for continuous variables. Facilitator and barrier measures were dichotomized; "strongly agree" and "agree" were combined as were the "disagree" and "strongly disagree" responses. Logistic regression analyses identified facilitators and barriers that were associated with the probability of recruiting at least 2 FNMs into the study relative to those who recruited none or 1. Data analyses were performed using SAS, version 9.2 (SAS Institute, Inc).[21]

RESULTS

CHARACTERISTICS OF IRs

Sociodemographic Characteristics—Of the 156 young women who were screened to serve as an IR, 153 (98.1%) were enrolled in the study. They were primarily African American (70.6%) and Hispanic/Latina (27.5%), and the mean age was 20 years (Table 1).

HIV-Related Sexual Risk—All IRs reported a history of sexual intercourse with a male and 31.4% also reported sexual intercourse with a female. HIV risk was reported by a sizable number of the IRs, including sexual initiation at 16 years or younger (32.7%) and a history of pregnancy (56.2%) and sexually transmitted infections (50.3%) (Table 2).

Alcohol and Other Substance Use—Use of alcohol and other substances was also prevalent among IRs; 80.4% reported drinking alcohol and 59.5% reported engaging in sexual intercourse while under the influence of alcohol. Marijuana was the most prevalent non-prescription substance used (57.5%). Sex in exchange for drugs or money was reported by 11.8% (Table 3).

Comparisons Among IRs—Compared with IRs who were HIV negative or whose status was unknown, IRs who were HIV positive were significantly more likely to report a higher number of life-time ($F_{2,142} = 5.65$, $P < .004$) and casual sex partners ($F_{2,109} = 4.43$, $P < .01$); a current sexual relationship lasting more than 1 year ($\chi^2 = 7.82$, $P = .02$); sex with someone who they knew had HIV ($\chi^2 = 36.64$, $P < .001$); sex with a male who had been incarcerated ($\chi^2 = 10.21$, $P < .007$); sex with a male who has dealt drugs ($\chi^2 = 13.82$, $P < .002$); a history of sexually transmitted infections ($\chi^2 = 19.55$, $P < .001$); exchange of sex for drugs or money ($\chi^2 = 17.77$, $P < .001$); undergoing a prior HIV test ($\chi^2 = 47.15$, $P < .001$); and a longer time since their most recent HIV test ($\chi^2 = 52.77$, $P < .001$).

Recruitment of FNMs—On average, IRs discussed the study with 6 FNMs and recruited a mean (SD) of 2 (2) FNMs (range, 0–7 FNMs). Overall, 33 IRs (21.6%) recruited no FNMs, whereas 16 (10.5%) recruited 1. Forty-one IRs (26.8%) recruited 2 FNMs and 63 (41.2%) recruited 3 or more. No statistical differences were observed between IRs who recruited less than 2 FNMs compared with those who recruited 2 or more (data not shown).

CHARACTERISTICS OF FNMs

Sociodemographic Characteristics—Three hundred eighty-one FNMs were recruited; 115 (30.2%) were recruited by IRs who were HIV positive, 146 (38.3%) were recruited by IRs who were HIV negative, and 120 (31.5%) were recruited by IRs whose HIV status was unknown. The FNMs were largely African American (68.5%) and 26.5% identified as Hispanic/Latina. The mean age of FNMs was 21 years (Table 1).

HIV-Related Risk—Almost all FNMs (99.5%) reported sexual intercourse with a male and 20.5% reported sexual intercourse with a female. HIV risk factors were identified among many of the FNMs, including sex with a male who was incarcerated (44.1%) or who has dealt drugs (42.3%). The mean number of lifetime sexual partners was 15 and of casual sexual partners was 7 (Table 2).

Alcohol and Other Substance Use—Alcohol use was reported by most of the FNMs (74.8%), and nearly half (48.3%) reported engaging in sexual intercourse while using alcohol. Marijuana use was also prevalent (51.2%) (Table 3).

Comparisons Among FNMs—The FNMs who were recruited by HIV-positive IRs were significantly more likely to identify as African American ($\chi^2 = 20.31$, $P = .02$) and to report a history of homelessness ($\chi^2 = 8.47$, $P < .02$); sex with a female ($\chi^2 = 18.29$, $P < .001$); and sex with a male who has been incarcerated ($\chi^2 = 7.22$, $P < .02$). In contrast, FNMs who were recruited by HIV-negative IRs were significantly more likely to identify as Hispanic/Latina ($\chi^2 = 12.81$, $P = .002$) and to have a history of HIV testing ($\chi^2 = 14.78$, $P < .004$), whereas FNMs who were recruited by IRs whose HIV status was unknown were

significantly less likely to report drinking more than 1 drink of alcohol on a typical day (χ^2 = 23.47, P = .01).

CURRENT HIV SCREENING

Index Recruiters—Of the 153 IRs, 92 (60.1%) underwent HIV screening; none was diagnosed as HIV positive.

Friendship Network Members—Of the 381 FNMs enrolled in the study, 342 (89.8%) were screened for HIV. Among those who were tested, 112 (32.7%) were recruited by IRs who self-identified as HIV positive, 128 (37.4%) were recruited by IRs who self-identified as HIV negative, and 102 (29.8%) were recruited by IRs who self-identified as HIV status unknown. The FNMs who were screened for HIV were significantly more likely to be older (χ^2 = 54.85, P < .001), African American (χ^2 = 20.48, P < .001), or currently out of school (χ^2 = 5.75, P < .05) and were more likely to report a higher level of education (χ^2 = 20.85, P < .002), a history of homelessness (χ^2 = 8.47, P < .02), and a lower number of steady and lifetime sexual partners ($F_{1,374}$ = 5.52, P < .02). Of the FNMs who were screened for HIV, only 1 was given a diagnosis of HIV positive. This participant was recruited by an HIV-positive IR, reflecting 0.87% of the FNMs recruited by HIV-positive IRs, with an overall HIV prevalence of 0.26%.

FACILITATORS AND BARRIERS TO RECRUITMENT OF FNMs

Facilitators for Recruiting FNMs by IRs—Most IRs (85%–90%) endorsed facilitator statements to describe their experiences in discussing HIV screening with their FNMs. The IRs who recruited 2 or more FNMs more frequently agreed with the following statements than IRs who recruited none or 1 FNM: ease of speaking about HIV screening with girlfriends (χ^2 = 9.38, P < .03), telling girlfriends about the importance of knowing their HIV status (χ^2 = 11.98, P > .006), telling girlfriends about the high rate of HIV in their community (χ^2 = 10.96, P < .02), and telling girlfriends about their concern for them having sex with an HIV-infected person (χ^2 = 11.14, P < .007). Logistic regression analysis indicated that of the facilitator statements, telling girlfriends about the importance of knowing their HIV status (odds ratio [OR], 3.88; 95% CI, 1.18–12.76) and telling girlfriends about the high rate of HIV in their community (3.80; 1.45–10.01) were the most salient factors associated with recruitment of at least 2 FNMs.

Barriers to Recruiting FNMs by IRs—A number of statistical differences were identified among barriers to recruitment of FNMs across the IRs' HIV status, including embarrassment in speaking about HIV screening (higher among young women who were HIV positive; χ^2 = 16.53, P < .009); friends' concern that their parents may receive HIV test results (lower for young women who were HIV positive; χ^2 = 11.78, P < .03); and concern that friends would assume the IRs to be HIV positive if they talked them into HIV screening (higher among young women who were HIV positive; χ^2 = 17.16, P < .01). Logistic regression analysis assessing barriers associated with IRs recruiting less than 2 FNMs included difficulty in speaking to girlfriends about HIV screening (OR, 4.17; 95% CI, 1.56–11.10); lack of time to contact girlfriends (5.57; 1.38–22.44); girlfriends who were afraid to know their HIV status (2.57; 1.06–6.22); and concern that girlfriends would assume the IR was HIV positive (3.75; 1.51–9.33).

FACILITATORS AND BARRIERS TO HIV SCREENING AMONG FNMs

Facilitators for HIV Screening Among FNMs—Among facilitator measures endorsed by FNMs, concern about health (χ^2 = 19.17, P < .004) and free HIV tests (14.33, P < .03) were significantly associated with HIV screening. The facilitator measures for HIV

screening among FNMs were completed only by those who agreed to undertake HIV screening (89.8%); thus, logistic regression modeling to compare responses between screened and nonscreened FNMs was not feasible.

Barriers to HIV Screening Among FNMs—Among the FNMs, 39 (10.2%) did not undergo HIV screening; of these, 3 (7.7%) were recruited by IRs who were HIV positive, 18 (46.2%) were recruited by IRs who were HIV negative, and 18 (46.2%) were recruited by IRs whose HIV status was unknown. Most FNMs "strongly disagreed/disagreed" with most barrier statements, including past behaviors putting them at risk for HIV infection (87.2%), embarrassment about HIV screening (92.3%), not being concerned about their health (94.5%), and not trusting health care professionals (84.61%). The only measure that was marginally significant was fear of knowing the HIV status ($\chi^2 = 11.99$, $P < .057$). Given that the HIV screening measure was completed by a small number of FNMs who did not agree to undertake HIV screening, logistical regression modeling was not feasible.

COMMENT

Despite the Centers for Disease Control and Prevention's recommendation that every person in the United States from 13 to 64 years old be screened for HIV, it is estimated that 50% of all HIV-infected adolescents are unaware of their infection status.[6] In an attempt to address this public health mandate and to build on recent research suggesting that female friendship-based networks may be a practical strategy for engaging young women in sexually transmitted infection and HIV prevention interventions,[14–16] this study examined whether social networks are a feasible and acceptable approach for engaging at-risk African American and Hispanic/Latina young women in HIV screening. A number of social network studies have been conducted to screen for HIV among at-risk adults,[9,22–24] but little is known about whether such a strategy would be a feasible and acceptable approach to engage at-risk young women in HIV screening. The intent of our research was to fill this gap in current literature. Our findings provide compelling evidence to suggest that use of a female friendship network approach is a feasible and acceptable means for engaging at-risk young women in HIV screening, as shown by their high rates of agreement to undergo HIV screening.

As expected, many of the IRs and their FNMs reported risk factors that are associated with HIV.[4,25,26] This supports the need for early and sustained primary prevention interventions for young women. The role of alcohol and other substance use as well as the potential effect that the HIV risk of the sexual partner(s) may have on the HIV risk of young women are important topics that should be addressed in HIV prevention interventions. Although participants reported sexual intercourse with men who had a history of incarceration and drug dealing, few reported sexual relationships with men who have male-to-male sexual contact. An unexpected finding was the high rate of sexual relationships with other women, suggesting a fluidity of sexual behavior among young women during adolescence and emerging adulthood. As such, interventions that target at-risk young women should emphasize the potential HIV risk during unprotected sexual intercourse with male and female partners. Moreover, a sizeable number of young women engaged in sexual intercourse with HIV-positive men. This suggests the need to educate young women about the importance of avoiding unprotected sexual intercourse with someone who is known to be HIV infected. In addition, educational strategies should include information regarding the benefits of using preexposure and postexposure prophylaxis, as appropriate.

A unique aspect of this research was our examination of facilitators and barriers to HIV screening. Our findings, particularly those related to barriers to recruiting FNMs, suggest that future research should consider engaging IRs in educational and skills-building

exercises that provide opportunities to rehearse what they might say to their FNMs, identify appropriate times and places for raising issues around the importance of HIV screening, and enhance their skills to avoid unintentional disclosure of their HIV status.

Our findings also indicated that many of the FNMS who agreed to undergo HIV screening strongly endorsed statements related to concern about their health, receipt of free HIV testing and confidential test results, the availability of treatment for those with positive test results, and concern about the high rates of HIV in their community. Future efforts to increase HIV screening in at-risk young women may increase receptivity if these factors are addressed as part of the pre-HIV test counseling discussions. Having such discussions may reinforce the young women's decision to be screened and conversely may allay their fears and address misconceptions among those who are undecided or who may otherwise forgo HIV screening as a preventative health strategy.

Our lack of clear results on barriers to HIV screening among FNMs suggests the need for in-depth qualitative studies to examine factors that prevent at-risk young women from seeking HIV screening. Such studies should explore social, emotional, cultural, and developmental factors that may contribute to young women's refusal to be screened even in light of knowledge about free and confidential screening.

Several limitations to this study should be noted. Because the study design was cross-sectional, causal association among HIV screening, facilitators, and barriers should not be inferred. Also, despite successfully engaging young women from 3 types of social networks (HIV positive, negative, and status unknown) to undergo HIV screening, we yielded a very low HIV prevalence in at-risk young women who reside in large inner-city areas with high rates of HIV. This low prevalence may be due, in part, to the high rate of prior HIV testing among our study participants, suggesting the need for future studies to better understand appropriate time intervals for screening young women who engage in HIV-related behaviors. The low HIV prevalence also provides support for the perception that there are no clear-cut definitive HIV risk factors for young women even when they report sexual relationships with known risky sexual partners. Future HIV screening studies involving social networks would do well to first examine the sexual risk characteristics of the network members and include members of the young women's sexual network. Moreover, our sample of young women did not report sexual bridging where their male partners also engaged in sex with other male partners, nor did they report sex with intravenous drug users. Although these factors may have contributed to the low HIV prevalence, providing posttest counseling results to HIV-negative individuals is an excellent teaching opportunity to actively engage them in risk prevention activities.[27] For adolescents and emerging adults, this may include engaging them in anticipatory guidance exercises and skills-based risk-reduction counseling to prevent future exposure to HIV.

Despite the limitations of this research, it contributes to the growing body of literature on the use of social networks to engage at-risk individuals in HIV screening. We demonstrated that targeting small, close, female friendship networks is a feasible and acceptable means of offering HIV screening to large groups of young women. However, research should explore the conditions and circumstances under which young women refuse HIV screening, even in light of free and confidential testing and when they express concerns about not wanting to know their HIV status.

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Table 1

Sociodemographic Characteristics of IRs and Female FNMs by IRs' Self-Reported HIV Status[a]

	IRs					FNMs				
Variable	**Total (N=153)**	**HIV (−) (n = 52)**	**HIV (+) (n = 52)**	**HIV (?)(n = 49)**	***P* Value**	**Total (N=381)**	**HIV (−)(n = 146)**	**HIV (+) (n = 115)**	**HIV (?) (n = 120)**	***P* Value**
Race										
Asian/Pacific Islander	0	0	0	0		4 (1.0)	1 (.7)	2 (1.7)	1 (.8)	
African American	108 (70.6)	38 (73.0)	38 (73.0)	32 (65.3)		261 (68.5)	87 (59.6)	86 (74.8)	88 (73.3)	
Native American/Alaskan Native	0	0	0	0	.36	2 (.5)	0	2 (1.7)	0	.02
White	1 (0.7)	1 (1.9)	0	0		10 (2.6)	4 (2.7)	3 (2.6)	3 (2.5)	
Mixed race/other	45 (29.4)	13 (25.0)	14 (26.9)	17 (34.7)		101 (26.5)	54 (37.0)	19 (16.5)	28 (23.3)	
Hispanic/Latino origin	42 (27.1)	16 (30.8)	12 (23.1)	14 (28.57)	.68	101 (26.5)	54 (37.0)	23 (20.0)	24 (20.0)	.002
Current age, mean (SD), y	20 (2)	20 (2)	21 (2)	19 (3)	.02	21 (5)	21 (5)	21 (5)	20 (6)	.37
Currently in school	88 (57.5)	32 (61.5)	28 (53.8)	28 (57.1)	.56	228 (59.8)	90 (61.6)	59 (51.3)	79 (65.8)	.08
Highest educational level										
Did not complete high school	61 (39.9)	18 (34.6)	22 (42.3)	34 (69.4)		142 (37.3)	57 (39.0)	41 (35.7)	44 (36.7)	
High school graduate/GED	54 (35.3)	21 (40.4)	17 (32.7)	16 (32.7)	.36	140 (36.7)	54 (37.0)	44 (38.3)	42 (35.0)	.40
Some college/tech school	28 (18.3)	13 (25.0)	10 (19.2)	5 (10.2)		68 (17.8)	26 (17.8)	19 (16.5)	23 (19.2)	
Place living most of the time										
Own house/apartment	35 (22.9)	9 (17.3)	20 (38.5)	6 (12.2)		77 (2.2)	24 (16.4)	29 (25.2)	24 (20.0)	
Parent(s)/another relative(s)/house/apartment	105 (68.6)	39 (75.0)	28 (53.8)	38 (77.6)		274 (71.9)	109 (74.7)	79 (68.7)	86 (71.7)	
Rooming/halfway house, shelter, welfare hotel/other	12 (7.8)	3 (5.8)	4 (7.7)	5 (10.2)	.02	23 (6.0)	11 (7.5)	4 (3.5)	8 (6.7)	.12
Having ever been homeless	46 (30.1)	17 (32.7)	20 (38.5)	9 (18.4)	.07	94 (24.7)	35 (24.0)	38 (33.0)	21 (17.5)	.02

Abbreviations: FNM, friendship network member; GED, general equivalency diploma; HIV, human immunodeficiency virus; IR, index recruiter.

[a]Data are given as number (percentage) unless otherwise indicated. Not all cells are depicted for each measure.

Table 2

HIV-Related Factors for IRs and Female FNMs by IRs' Self-Reported HIV Infection Status[a]

	IRs					FNMs				
Variable	**Total (N=153)**	**HIV (−) (n = 52)**	**HIV (+) (n = 52)**	**HIV (?) (n = 49)**	***P* Value**	**Total (N=381)**	**HIV (−) (n = 146)**	**HIV (+) (n = 115)**	**HIV (?) (n = 120)**	***P* Value**
Sex with a male	153 (100.0)	52 (100.0)	52 (100.0)	49 (100.0)	.07	379 (99.5)	146 (100.0)	113 (98.3)	120 (100.0)	<.001
Sex with a female	48 (31.4)	16 (30.8)	22 (42.3)	10 (20.4)		78 (20.5)	26 (17.8)	38 (33.0)	14 (11.7)	
Age at sexual debut ≤16 y	50 (32.7)	15 (28.8)	18 (34.6)	17 (34.7)	.64	134 (35.2)	61 (41.8)	31 (27.0)	42 (35.0)	.07
Lifetime sex partners, mean (range)	10 (1–88)	10 (1–60)	15 (1–88)	6 (1–20)	.004	15 (1–89)	8 (1–50)	9 (1–60)	7 (1–89)	.14
Steady sex partners, mean (range)	4 (1–25)	4 (1–25)	3 (1–10)	3 (1–10)	.17	11 (1–40)	4 (1–40)	4 (1–20)	3 (1–20)	.48
Casual sex partners, mean (range)	7 (1–90)	5 (1–48)	13 (1–90)	3 (1–15)	.01	7 (1–50)	4 (1–45)	5 (1–50)	5 (1–35)	.36
Current relationship >1 y	71 (46.4)	16 (30.8)	29 (55.8)	26 (53.1)	.02	185 (48.6)	69 (47.3)	62 (53.9)	54 (45.0)	.29
Sex with IDU	5 (3.3)	1 (1.9)	4 (7.7)	0 (0)	.13	10 (2.6)	5 (3.4)	4 (3.5)	1 (0.8)	.31
Sex with men who have male-to-male sexual contact	8 (5.2)	4 (7.7)	3 (5.8)	1 (2.0)	.29	10 (2.6)	5 (3.4)	2 (1.7)	3 (2.5)	.73
Sex with known HIV-positive person	16 (10.5)	0	16 (30.8)	0	<.001	4 (1.0)	1 (0.7)	3 (2.6)	0	.18
Sex with incarcerated male	98 (64.1)	35 (67.3)	40 (76.9)	23 (46.9)	.007	168 (44.1)	67 (45.9)	59 (51.3)	42 (35.0)	.02
Sex with male with STI <1 y	31 (20.3)	12 (23.1)	12 (23.1)	7 (14.3)	.75	54 (14.2)	23 (15.8)	20 (17.4)	11 (9.2)	.13
Sex with male who deals drugs	80 (52.3)	33 (63.5)	31 (59.6)	16 (32.7)	.002	161 (42.3)	65 (44.5)	51 (44.3)	45 (37.5)	.34
Sex in exchange for drugs/ money										
Never	135 (88.2)	49 (94.2)	38 (73.1)	48 (98.0)	<.001	361 (94.8)	143 (97.9)	104 (90.4)	114 (95.0)	.08
≤1 mo	18 (11.8)	3 (5.8)	14 (26.9)	1 (2.0)		18 (4.7)	3 (2.1)	9 (7.8)	6 (5.0)	
Latex condom use										
<90%	101 (66.0)	32 (61.5)	35 (67.3)	34 (69.4)	.74	230 (60.4)	92 (63.0)	82 (71.3)	67 (55.8)	.65
90%–100%	51 (33.3)	20 (38.5)	17 (32.7)	14 (28.6)		148 (38.8)	53 (36.3)	42 (36.5)	53 (44.2)	
History of pregnancy	86 (56.2)	32 (61.5)	32 (61.5)	22 (44.9)	.22	196 (51.4)	78 (53.4)	59 (51.3)	59 (49.2)	.45
No. of pregnancies, mean (SD)	2 (2)	2 (1)	2 (2)	2 (1)	.15	2 (1)	2 (1)	2 (2)	2 (1)	.29

Variable	IRs					FNMs				
	Total (N=153)	HIV (−) (n = 52)	HIV (+) (n = 52)	HIV (?) (n = 49)	*P* Value	Total (N=381)	HIV (−) (n = 146)	HIV (+) (n = 115)	HIV (?) (n = 120)	*P* Value
History of STIs	77 (50.3)	27 (51.9)	36 (69.2)	14 (28.6)	<.001	113 (29.7)	46 (31.5)	39 (33.9)	28 (23.3)	.15
HIV testing	125 (81.7)	48 (92.3)	52 (100)	25 (51.0)	<.001	275 (72.2)	117 (80.1)	86 (74.8)	72 (60.0)	.004
Time since last HIV test, mo										
<6	44 (28.8)	26 (50.0)	15 (28.8)	3 (6.1)	<.001	130 (34.1)	59 (40.4)	34 (29.6)	37 (30.8)	.60
6–12	33 (21.6)	21 (40.4)	11 (21.2)	1 (2.0)		72 (18.9)	27 (18.5)	26 (22.6)	19 (15.8)	
>12	42 (27.5)	1 (1.9)	22 (42.3)	19 (38.8)		66 (17.3)	28 (19.2)	22 (19.1)	16 (13.3)	

Abbreviations: FNM, friendship network member; HIV, human immunodeficiency virus; IDU, intravenous drug user; IR, index recruiter; STI, sexually transmitted infection.

[a]Data are given as number (percentage) unless otherwise indicated. Not all cells are depicted for each measure.

Table 3

Alcohol and Substance Use for IRs and Female FNMs by IRs' Self-Reported HIV Infection Status[a]

	IRs					FNMs				
Variable	**Total (N=153)**	**HIV (−)(n = 52)**	**HIV (+)(n = 52)**	**HIV (?)(n = 49)**	***P* Value**	**Total (N=381)**	**HIV (−)(n = 146)**	**HIV (+)(n = 115)**	**HIV (?)(n = 120)**	***P* Value**
Alcohol use	123 (80.4)	41 (78.8)	41 (78.8)	41 (83.7)	.79	285 (74.8)	115 (78.8)	85 (73.9)	85 (70.8)	.34
Typical alcohol use										
≥1 mo	30 (19.6)	13 (25.0)	8 (15.4)	9 (18.4)	.50	72 (18.9)	26 (17.8)	23 (20.0)	23 (19.2)	
≥1 wk	17 (11.1)	3 (5.8)	10 (19.2)	4 (8.2)		38 (10.0)	13 (8.9)	16 (13.9)	9 (7.5)	.31
Everyday	3 (2.0)	1 (1.9)	1 (1.9)	1 (2.0)		4 (1.0)	2 (1.4)	2 (1.7)	0	
Drinks typical day when drinking										
3 or 4 drinks	37 (24.2)	11 (21.2)	14 (26.9)	12 (24.5)	.38	83 (21.8)	28 (19.2)	31 (27.0)	24 (20.0)	.01
≥5 drinks	20 (13.1)	8 (15.4)	6 (11.5)	6 (12.2)		45 (11.8)	23 (15.8)	16 (13.9)	6 (5.0)	
Sex while using alcohol	91 (59.5)	28 (53.8)	35 (67.3)	28 (57.1)	.34	184 (48.3)	69 (47.3)	65 (56.5)	50 (41.7)	.06
Marijuana use	88 (57.5)	31 (59.6)	34 (65.4)	23 (46.9)	.16	195 (51.2)	80 (54.8)	62 (53.9)	53 (44.2)	.16
Typical marijuana use										
≥1 wk	20 (13.1)	5 (9.6)	8 (15.4)	7 (14.3)	.53	23 (6.0)	11 (7.5)	8 (7.0)	4 (3.3)	.06
Everyday	22 (14.4)	7 (13.5)	11 (21.2)	4 (8.2)		50 (13.1)	20 (13.7)	21 (18.3)	9 (7.5)	
Injection drug use	0	0	0	0	>.99	1 (0.3)	1 (0.7)	0	0	>.99

Abbreviations: FNM, friendship network member; HIV, human immunodeficiency virus; IR, index recruiter.

[a]Not all cells are depicted for each measure. Street names were used to describe substances in the audio-computer-assisted self-interview.