# HIV Prevalence, Sociodemographic, and Behavioral Correlates and Recruitment Methods Among Injection Drug Users in St. Petersburg, Russia

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**Objective:** In St. Petersburg, Russia, we sought to describe the characteristics of active high-risk injection drug users (IDUs) to evaluate the associations between behavioral and demographic characteristics and HIV-1 infection and to describe 3 discrete recruitment methods.

**Methods:** Active high-risk IDUs were recruited in 3 ways: through street outreach, at facilities serving IDUs, and by network-based chain referral. Recruits were screened, counseled, and tested for HIV-1. Sociodemographic and behavioral data were collected. HIV-1 prevalence was analyzed as a function of sociodemographic and behavioral variables.

**Results:** During the 10-month recruitment period, data from 900 participants were collected: median age was 24 years, and in the previous month, 96% used heroin and 75% shared needles with others. The baseline HIV prevalence was 30% (95% confidence interval [CI]: 27 to 33). Recruitment through social networks was the most productive strategy. HIV-positive individuals were younger, but none of the other sociodemographic or behavioral characteristics differed significantly by HIV status.

**Conclusions:** The estimated HIV prevalence of 30% places St. Petersburg among the worst IDU-concentrated epidemics in Europe. Recruitment through network-based chain referral is a useful method for recruiting active IDUs. Sociodemographic and behavioral links to prevalent HIV infection remain to be elucidated.

**Key Words:** injection drug users, cohort accrual, HIV prevalence, Russia

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The combination of political, economic, and social changes that accompanied the fall of the Soviet Union has resulted in a dramatic epidemic of drug abuse in Russia, especially, among teenagers and adolescents.[1] This has led to an epidemic of HIV-1, driven by injection drug use. Before 1996, there were fewer than 1100 registered HIV infections in Russia and less than 200 new HIV infections per year were diagnosed.[2–5] Beginning in 1996, the size and nature of the epidemic changed: the number of new cases increased from 1500 in 1996 to 19,000 in 1999 and to 59,000 in 2001.[6]

Among 234,000 HIV cases officially registered in Russia by the end of 2002, more than 75% were concentrated among injection drug users (IDUs).[4] This finding is not the result of increased surveillance; throughout the 1990s, approximately 20 million HIV-1 antibody tests were performed annually.[7,8] A "detuned" assay analysis of HIV-positive sera collected in Moscow in 1998[9] showed that 58% of HIV-positive IDUs had been infected in the months before they were tested.[10] In St. Petersburg, there has been a 3-fold increase in IDUs and a 9-fold increase in teenaged IDUs during the past 5 years. It is estimated that there are currently 70,000 IDUs in St. Petersburg.[11] The prevalence of HIV infection among IDUs in St. Petersburg, estimated through cross-sectional convenience sampling, increased from 4% in 1999 to 12% to 19% in 2000.[11–13]

In St. Petersburg and all of Russia, there are scant services available to IDUs. Public-sponsored centers for rehabilitation are poorly attended, ineffectual, and mostly involuntary. Private drug treatment centers are available but are far too expensive for most drug users. Drug replacement therapy is illegal in Russia, even in research settings, leaving few choices for rehabilitation or risk reduction interventions. There are governmental and non-governmental organization (NGO)–sponsored needle exchange programs, but their effect on the epidemic has been limited, with only 100,000 exchanges reported annually in the years preceding this study.[14]

Recognizing the urgent need to develop, evaluate, and establish evidence-based behavioral HIV prevention programs targeting Russia's IDU population, a longitudinal cohort study to determine the HIV prevalence, incidence, and behavioral and sociodemographic correlates to HIV infection among high-risk IDUs was conducted as part of the HIV Prevention Trials Network (HPTN). In this article, we describe results from the recruitment of the first IDU cohort

in Russia, focusing on recruitment methods, HIV prevalence, baseline characteristics, and correlates to HIV infection.

## METHODS

Individuals were eligible for HIV screening and other services if they met either of the following 2 criteria: injected drugs at least 3 times per week in the previous month or used injection equipment after another person on at least 3 occasions in the previous 3 months. These criteria were chosen in an attempt to select and follow a cohort of HIV-seronegative IDUs who would be at the highest risk for HIV acquisition. Participants were also required to provide detailed locator information to aid the research staff in assisting with study visit adherence. Initially, male and female participants were required to be 18 years of age or older to be eligible, but this was amended near the end of the recruitment period to include 16-and 17-year-old IDUs in the cohort. To ensure the protection of human subjects, the Institutional Review Boards at The St. Petersburg Biomedical Center and the University of North Carolina approved the study. In addition, a Community Advisory Board was established to help develop guidelines to protect the safety of the IDU participants, and political agreements were established with the St. Petersburg municipal departments concerned with public safety, social issues, and public health. The study site was located close to a metro station and considered easily accessible by public transportation.

Resources provided at the study site specifically designed to benefit the IDUs included social, psychologic, and risk reduction counseling as well as medical care for HIV-negative and HIV-positive individuals, including sexually transmitted disease (STD) management, hepatitis B and C virus screening and care, CD4 cell testing, primary HIV care, and direct referrals to existing needle exchange programs and drug rehabilitation facilities when appropriate. The study site services were available at daily convenient hours for all participants.

### Participant Recruitment

Three main strategies were used to recruit potential participants:

1. Facility-based approach, which consisted of recruiting from governmental and NGO services for IDUs, including (governmental facilities) outpatient and inpatient clinics for drug addicts, rehabilitation centers, and infectious disease departments at the state hospitals for treating hepatitis B and C as well as (NGO facilities) needle-exchange buses, counseling centers, support groups, private physicians who provide services for drug addicts, and pharmacies.
2. Street-based outreach, which consisted of recruitment at places where IDUs congregate to obtain or sell drugs or to socialize. Street-based outreach began with key informant interviews and ethnography to identify these locations. The types of locations included market places, metro stations, parks, and other places where IDUs hung out.
3. Chain referral approach of social network contacts where enrolled IDUs were given small non-monetary incentives like tea, coffee, or public transportation tokens to encourage their IDU friends to visit the study site. This was accomplished by asking participants to refer other active injectors they knew to visit the study site.

The study, its inclusion criteria, and its consenting process were described to the referred participants when they arrived at the project site. There were 5 recruiters on our team who all had university degrees as social workers, and all had 2 to 4 years of prior NGO experience working with IDUs on a needle exchange bus or providing other IDU services.

### Screening and Enrollment

Screening and enrollment procedures followed the guidelines of the HPTN 033 protocol.[15] The prescreening interviews occurred during the recruitment of IDUs in the field or at the study site to establish if there was interest in participation, and an unstructured prescreening discussion about eligibility was conducted. No data were collected during this prescreening encounter.

Screening at the study site confirmed eligibility and obtained consent to perform HIV-1 testing by enzyme immunoassay (EIA; Vironostica HIV-Uni-Form II plus; BioMerieux, The Netherlands) with confirmatory Western blot analysis (NEW LAV BLOT 1; Bio-Rad Laboratories, France) and to administer a risk assessment questionnaire designed to collect sociodemographic and behavioral data concerning drug injection practices (eg, types of drugs, intensity of using, sharing experience) and characteristics of sexual behavior with primary and casual partners. Participants were instructed to return in 7 to 10 days for their test results. At the return visit, after HIV results were given, the HIV-negative individuals were invited to consent and enroll into a seronegative cohort. HIV-positive individuals were counseled and referred to physicians and psychologists working at the study site for HIV primary care and long-term counseling services. All participants were given gifts of foodstuffs or clothes and tokens for public transportation at each visit as compensation for their time and efforts. The value of these gifts was determined by St. Petersburg Institutional Review Board and Community Advisory Board to not create and undue inducement for participation.

### Statistical Analysis

Five hundred seronegative participants were enrolled into the longitudinal cohort study to achieve a half-width of approximately 2% for the 95% confidence interval (CI), based on a 12-month retention rate of 90% and a predicted 5% HIV seroincidence. Case report forms were faxed to the HPTN statistical and data management center (Statistical Center for HIV/AIDS Research and Prevention, Fred Hutchinson Cancer Research Center, Seattle, WA), where the data were entered into the study database. All analyses were performed using SAS software (version 8.2). Univariate analyses were performed to investigate relations between sociodemographic factors, baseline behavioral characteristics, and HIV status at screening. Significant factors identified in univariate

analysis ($P \leq 0.10$) were used in the multiple logistic regression model.

## RESULTS

### Screening

The recruitment, screening, and enrollment of IDUs began in March 2002 and ended in December 2002. Approximately 5000 contacts with suspected IDUs by street outreach and at facility-based recruitment places were made by the recruiters. A total of 900 eligible, high-risk, active IDUs presented to The Biomedical Center study site and consented to participate. Of the 898 with HIV test results, 270 (30.1%, 95% CI: 27.1 to 33.1) tested HIV-positive and 11 (1.0%) had an indeterminate Western blot test result.

Table 1 provides data on the sociodemographic characteristic of the screened individuals stratified by HIV status. The average age of the seronegative cohort (mean = 24.5, median = 24.3) was slightly higher than that of the seropositive cohort (mean = 23.7, median = 23.3). The difference is statistically significant ($P < 0.01$), primarily because the upper age limit was distinctly higher among the seronegative cohort (42 years) compared with the seropositive cohort (31 years). There was no difference in HIV serostatus by gender or any other sociodemographic characteristic. Overall, the sample was primarily single, with a high school or vocational school education, underemployed, and living with parents or relatives.

Table 2 describes the drug risks in the previous 1 month for all subjects screened by HIV status. The drug injected most by respondents was heroin (96%). A sizable minority (38%) reported using amphetamine. Fewer than 10% reported injection of any other illicit drug. The median frequency of use was 3 to 4 times per week, and 36% reported sharing needles at least once per week.

The multivariate analysis presented in Table 3 using logistic regression failed to identify any statistically significant risk factor for HIV infection in the 898 participants with HIV test results. There were no differences by serostatus in the types of drugs injected or injection frequency. Risk behaviors related to sharing used injection equipment were similar in frequency by serostatus.

### Recruitment Methods

During the first 4 months of recruitment, participants were identified mainly by facility-based referrals and street outreach. These methods proved inadequate at recruiting participants at a sufficient rate to meet the project target of 83 HIV-negative enrollees per month. The public facilities had few attendees because of poor service quality and because of the requirement to register as an IDU. The few

**TABLE 1.** Sociodemographic Characteristics of All Screened IDUs by HIV Status (N = 898)

| | HIV-Negative or Indeterminate (n = 628) (70%) | HIV-Positive (n = 270) (30%) | *P* | Odds Ratio (95%CI) |
|---|---|---|---|---|
| Age (y) | | | | |
| Mean | 24.5 | 23.7 | | 0.94 (0.89 to 0.98) |
| Median (minimum, maximum) | 24.3 (17.2, 42.0) | 23.3 (18.0, 30.9) | <0.01* | |
| Gender | | | | |
| Male | 447 (71%) | 192 (71%) | 0.98 | 1.0 (0.72 to 1.37) |
| Female | 181 (29%) | 78 (29%) | | Reference |
| Marital status | | | | |
| Living with partner/married | 155 (25%) | 57 (21%) | 0.25 | 0.82 (0.57 to 1.15) |
| No partner | 473 (75%) | 213 (79%) | | Reference |
| Education | | | | |
| Primary school | 0 (0%) | 1 (0%) | 0.26 | Undefined |
| Some secondary | 118 (19%) | 50 (19%) | | 1.02 (0.68 to 1.52) |
| Completed secondary | 194 (31%) | 95 (35%) | | 1.18 (0.84 to 1.65) |
| Vocational or trade | 245 (39%) | 102 (38%) | | Reference |
| Some university/college or degree | 71 (11%) | 22 (8%) | | 0.74 (0.43 to 1.27) |
| Employment | | | | |
| Full time (≥30 h) | 231 (37%) | 100 (37%) | 0.89 | 0.97 (0.70 to 1.33) |
| Part-time | 47 (7%) | 20 (7%) | | 0.95 (0.54 to 1.68) |
| Occasional | 81 (13%) | 30 (11%) | | 0.83 (0.51 to 1.33) |
| Unemployed | 269 (43%) | 120 (44%) | | Reference |
| Housing | | | | |
| Own house/apartment | 69 (11%) | 26 (9%) | 0.28 | 1.70 (0.69 to 4.13) |
| Rent house/apartment | 36 (6%) | 8 (3%) | | Reference |
| Stay with parents/other | 478 (76%) | 218 (81%) | | 2.05 (0.93 to 4.49) |
| Other | 45 (7%) | 18 (7%) | | 1.8 (0.70 to 4.61) |

*$P$ values obtained from $\chi^2$ test, except for age (medians: Wilcoxon and Kruskall-Wallace tests).

**TABLE 2.** Baseline Drug Risk for All Screened by HIV Status

| | | Negative/ Indeterminate | | Positive | | Total | |
|---|---|---|---|---|---|---|---|
| **Category** | **Levels** | **N** | **(%)** | **N** | **(%)** | **N** | **(%)** |
| Persons screened | | 628 | (70%) | 270 | (30%) | 898 | (100%) |
| Heroin use | Never | 25 | (4%) | 10 | (4%) | 35 | (4%) |
| | Less than once/wk | 49 | (8%) | 21 | (8%) | 70 | (8%) |
| | 1–2 times/wk | 157 | (25%) | 65 | (24%) | 222 | (25%) |
| | 3 times or more/wk | 397 | (63%) | 174 | (64%) | 571 | (63%) |
| Heroin mixed with other | Never | 577 | (92%) | 241 | (89%) | 818 | 91%) |
| | Less than once/wk | 42 | (7%) | 23 | (9%) | 65 | (7%) |
| | 1–2 times/wk | 6 | (1%) | 5 | (2%) | 11 | (1%) |
| | 3 times or more/wk | 3 | (0%) | 1 | (0%) | 4 | (0%) |
| Opium use | Never | 564 | (90%) | 249 | (92%) | 813 | (91%) |
| | Less than once/wk | 40 | (6%) | 17 | (6%) | 57 | (6%) |
| | 1–2 times/wk | 16 | (3%) | 3 | (1%) | 19 | (2%) |
| | 3 times or more/wk | 8 | (2%) | 1 | (0 %) | 9 | (1%) |
| Amphetamine use | Never | 402 | (64%) | 158 | (59%) | 560 | (62%) |
| | Less than once/wk | 142 | (23%) | 71 | (26%) | 213 | (24%) |
| | 1–2 times/wk | 48 | (8%) | 22 | (8%) | 70 | (8%) |
| | 3 times or more/wk | 36 | (6%) | 19 | (8%) | 55 | (6%) |
| Tranquilizer use | Never | 580 | (92%) | 251 | (93%) | 831 | (62%) |
| | Less than once/wk | 28 | (4%) | 10 | (4%) | 38 | (24%) |
| | 1–2 times/wk | 13 | (2%) | 6 | (2%) | 19 | (8%) |
| | 3 times or more/wk | 7 | (2%) | 3 | (1%) | 10 | (6%) |
| Other injecting drugs | Never | 566 | (90%) | 254 | (94%) | 820 | (91%) |
| | Less than once/wk | 39 | (6%) | 9 | (3%) | 48 | (5%) |
| | 1–2 times/wk | 18 | (3%) | 6 | (2%) | 24 | (3%) |
| | 3 times or more/wk | 5 | (1%) | 1 | (1%) | 6 | (1%) |
| Using after HIV-positive | Never | 477 | (76%) | 198 | (73%) | 675 | (75%) |
| | Less than once/wk | 32 | (5%) | 10 | (4%) | 42 | (5%) |
| | 1–2 times/wk | 1 | (0%) | 1 | (0%) | 2 | (0%) |
| | 3 times or more/wk | 2 | (0%) | 1 | (0%) | 3 | (0%) |
| | Don't know | 116 | (18%) | 60 | (22%) | 176 | (20%) |
| Using needle after others | Never | 136 | (21%) | 72 | (27%) | 207 | (23%) |
| | Less than once/wk | 273 | (43%) | 91 | (34%) | 364 | (41%) |
| | 1–2 times/wk | 140 | (22%) | 70 | (26%) | 210 | (23%) |
| | 3 times or more/wk | 69 | (11%) | 34 | (13%) | 103 | (12%) |
| | Don't know | 11 | (2%) | 3 | (1%) | 14 | (2%) |
| Sharing rinse water | Never | 54 | (9%) | 20 | (7%) | 74 | (8%) |
| | Less than once/wk | 106 | (17%) | 40 | (15%) | 146 | (16%) |
| | 1–2 times/wk | 189 | (30%) | 88 | (33%) | 277 | (31%) |
| | 3 times or more/wk | 277 | (44%) | 121 | (44%) | 398 | (45%) |
| | Don't know | 2 | (0%) | 1 | (0%) | 3 | (0%) |
| Sharing cooker | Never | 31 | (5%) | 15 | (6%) | 46 | (5%) |
| | Less than once/wk | 109 | (17%) | 37 | (14%) | 146 | (16%) |
| | 1–2 times/wk | 193 | (31%) | 89 | (33%) | 282 | (31%) |
| | 3 times or more/wk | 293 | (46%) | 126 | (46%) | 419 | (47%) |
| | Don't know | 2 | (0%) | 3 | (1%) | 5 | (1%) |
| Sharing cotton | Never | 73 | (12%) | 30 | (11%) | 103 | (11%) |
| | Less than once/wk | 91 | (14%) | 33 | (12%) | 124 | (14%) |
| | 1–2 times/wk | 184 | (29%) | 82 | (30%) | 266 | (30%) |
| | 3 times or more/wk | 277 | (44%) | 123 | (45%) | 300 | (45%) |
| | Don't know | 3 | (0%) | 2 | (1%) | 5 | (1%) |

**TABLE 2.** *(continued)* Baseline Drug Risk for All Screened by HIV Status

| Category | Levels | Negative/ Indeterminate N | Negative/ Indeterminate (%) | Positive N | Positive (%) | Total N | Total (%) |
|---|---|---|---|---|---|---|---|
| Share with front or backloading | Never | 126 | (20%) | 48 | (18%) | 174 | (19%) |
| | Less than once/wk | 132 | (21%) | 50 | (19%) | 182 | (20%) |
| | 1–2 times/wk | 178 | (28%) | 70 | (26%) | 248 | (28%) |
| | 3 times or more/wk | 189 | (30%) | 98 | (37%) | 287 | (32%) |
| | Don't know | 3 | (0%) | 4 | (1%) | 7 | (1%) |

private facilities were expensive, and these higher social status patients were, in general, not interested in participating. The outreach efforts were also nonproductive, because there were no geographically distinct districts of IDUs. Areas of drug buying, selling, and use were thinly distributed throughout the city, and the IDU culture in St. Petersburg does not, in general, let itself be publicly recognized. Thus, recruitment became increasingly dependent on social network chain referral. In total, 680 (76%) of 900 participants were recruited through social networking. Figure 1 illustrates the number of participants in each month by the 3 different methods of recruitment and clearly shows the increase in enrollment from the beginning of the recruitment period to the end. During the last 5 months of recruitment, there was almost exclusive dependence on recruitment through social networks.

Recruiters spent approximately 550 hours to recruit 54 participants (∽10 hours per recruit) through services and 800 hours to recruit 166 participants (∽5 hours per recruit) through street outreach. At the same time, 680 participants were recruited through social networks without intensive staff recruitment efforts beyond explaining to the participants at enrollment that their IDU referrals would be welcome and then providing them with a small incentive when they successfully referred their friends.

## Sexual Behavior and Risk

Data on sexual risk behavior in the previous 6 months are presented in Table 4. Although the HIV-uninfected IDUs seem to have more unprotected sex (71% vs. 61%; $P < 0.01$), there were no other differences in sexual risk behavior by HIV status. Of the entire 898-member cohort of IDUs screened, however, more than 95% were sexually active; 63% had a steady partner, with more than half of these partners being IDUs; the median number of sexual partners in the past 6 months was 3; and 25% reported exchanging sex for money, drugs, goods, or shelter in the previous 6 months.

# DISCUSSION

St. Petersburg is the second largest city in the Russian Federation, with 4.2 million inhabitants. It is estimated that 70,000 inhabitants are active IDUs, most of whom inject heroin.[11] HIV-1 was first detected among IDUs in St. Petersburg in 1996, and the prevalence rates in serial cross-sectional samples of IDUs increased from 4% in 1998 to 18% to 19% in 2000.[11–13] The present study documents conclusively that with the current prevalence rate of 30%, this trend of increasing prevalence has continued and levels now rival those seen in the worst IDU epidemics in Western Europe and North America.[16–20]

Heroin continues to be the predominant drug used among injectors and is available inexpensively from established Afghani sources.[21] The population of users is young, mostly male, single, sexually active, educated, underemployed, and living with their parents or relatives. This profile is, in fact, similar to the general profile of most St. Petersburg youth and illustrates the seemingly undefined sociodemographic nature of the problem.

Among the demographic data collected, HIV infection could be predicted only by younger age, and this significance was attributable to the fact that IDUs older than 31 years of age all tested HIV-negative. This pattern, in the absence of predictive behaviors, might be because older injectors initiated first and have developed protective patterns not discernible through the simple behavioral questionnaire used in this study, a function of the initiation of injection drug use universally starting at a younger age, HIV acquisition more likely to occur among recent initiates to injecting, and because this HIV epidemic has begun relatively recently. In any event, protection against HIV infection of injectors who began injecting before the epidemic took hold has also been detected in Belarus.[22]

In analyzing the behavioral characteristics of the IDUs we recruited and screened, we were unable to find any injection or sexual behaviors associated with prevalent HIV infections. We plan to follow the cohort of HIV-seronegative IDUs closely for 12 months to determine HIV incidence and correlates to infection; thus, the opportunity exists to identify risk behaviors unique to incident HIV infections. This may enable us to direct policy better and construct interventions to reduce transmission.

**TABLE 3.** Multiple Logistic Regression Analysis of the Sociodemographic and Risk Factors Associated With HIV Prevalence of Screened IDUs

| | Odds Ratio (95% CI) |
|---|---|
| Age | 0.94 (0.90 to 0.98) |
| Other injection drug use (yes vs. no) | 0.39 (0.17 to 0.89) |
| Unprotected sex in the last month (yes vs. no) | 0.67 (0.49 to 0.90) |

Significant factors at $P \leq 0.10$.

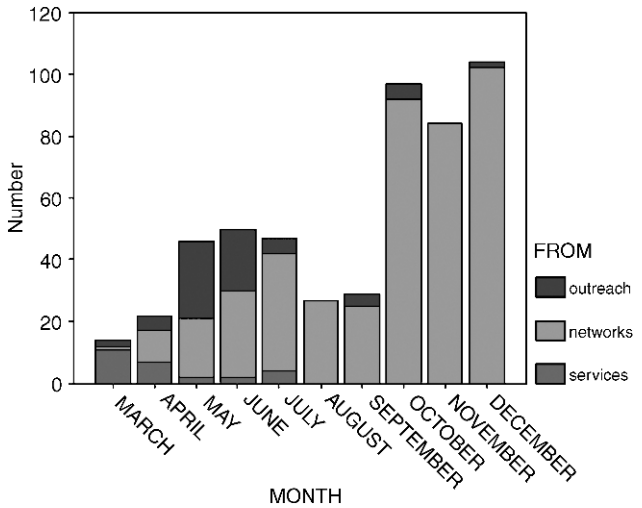


**FIGURE 1.** HPTN 033 enrollment per month (2002) by recruitment strategy (N = 520).

The public and NGO services provided to IDUs in St. Petersburg are poor. Replacement therapy is illegal, leaving short "cold turkey" detoxification centers as the only treatment option. Medical services to IDUs are state based and inadequate. NGO-based needle exchange and HIV counseling and testing programs are available in the community but fail to meet the demand of the IDU population. Because there are so few treatment and prevention services available to IDUs in St. Petersburg and because our clinical research site provided a safe haven, offering HIV and IDU specific medical care and expert counseling and referrals to all existing services, our epidemiologic research efforts had a strong ethical base.

Our data show the potentially important role of sexual HIV transmission in the development of the HIV epidemic in Russia. As would be expected, having sex was almost universally reported among these young IDUs. Increased sexual risk based on the number of sexual partners, sex with another IDU, selling sex, and unprotected sex was not found to be associated with HIV infection, however. Nevertheless, based on the facts that most men and women reported multiple sex partners in the past 6 months, one third reported sex with another IDU, and one fourth reported selling sex, sexual HIV transmission to drug-using and non–drug-using populations is probable. It is strongly advised that prevention interventions targeting IDUs in Russia include a sexual risk reduction component.

In recruiting IDUs into our study, we found that recruitment through social networks was more efficient than targeted street outreach or facility-based recruitment. Nevertheless, it must be recognized that social network recruitment was not possible until the study team gained the confidence of the participants, who would then be willing to refer other injectors to allow for a "snowball effect." Seventy-six percent of the IDUs who agreed to be screened for HIV were recruited from social networks. This seems to be a general characteristic of recruitment when applied to hidden populations.[23–25] In Russia, a network of dealers, each supplying a small number of clients, has emerged.[26] These dealers operate out of their flats and carefully control to whom they are willing to sell. Such a structure makes it difficult to recruit through outreach and easier to recruit by allowing IDUs to penetrate their own network of contacts. The closed drug scene in St. Petersburg seems to be the norm in the cities of the Russian Federation.[27–30] Thus, recruitment through social networks seems to be an ideal recruitment tool for researchers who wish to sample IDU populations elsewhere in Russia. Although facility-based and street outreach recruitment strategies did not provide a significant number of the participants, we believe that these methods play a supportive and important role for developing effective social network recruitment.

The primary purpose in accruing and HIV testing a sample of IDUs in St. Petersburg was to recruit a seronegative cohort into a longitudinal incidence study, establish baseline HIV prevalence, and determine if there were any behavioral or demographic correlates to prevalent infection. This cohort is now generating the first incidence estimate among IDUs in Russia. It may also permit a more direct assessment of the determinants of HIV-1 transmission. Through this exercise, the infrastructure has now been developed to conduct scientifically sound IDU prevention intervention research

**TABLE 4.** Sexual Risk Assessment of All Screened IDUs by HIV Status (N = 898)

| Category | HIV-Negative or Indeterminate (n = 628) 70% | HIV-Positive (n = 270) 30% | *P* | Odds Ratio (95% CI) |
|---|---|---|---|---|
| Had sex in last 6 months | 603 (96%) | 261 (97%) | 0.64 | 1.20 (0.55 to 2.60) |
| Has a primary sexual partner | 398 (66%) | 168 (64%) | 0.64 | 0.93 (0.68 to 1.26) |
| Primary partner injects drugs | Yes = 206 (52%) | Yes = 92 (55%) | 0.45 | Reference |
| | No = 189 (47%) | No = 76 (45%) | | 0.90 (0.62 to 1.29) |
| | Don't know = 3 (1%) | Don't know = 0 (0%) | | Undefined |
| Number of sexual partners in the past 6 months | N = 628 | N = 270 | 0.95* | 1.00 (0.99 to 1.00) |
| | Median = 3.0 | Median = 3.0 | | |
| Exchanges sex for money or goods in the last 6 months | 162 (26%) | 58 (21%) | 0.17 | 0.79 (0.56 to 1.11) |
| Unprotected sex in the last month | 444 (71%) | 164 (61%) | <0.01 | 0.64 (0.47 to 0.86) |

*$P$ values obtained from $\chi^2$ test, except for number of sexual partners in the past 6 months (medians: Wilcoxon and Kruskall-Wallace tests).

and, if successful, intervention implementation. The high prevalence among the IDUs tested speaks to the importance of these activities.

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