Published in final edited form as:
Subst Abus. 2009 ; 30(3): 213–222. doi:10.1080/08897070903040923.

Binge Drinking and Unsafe Sex: A Study of Narcology Hospital Patients from St. Petersburg, Russia

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Abstract

The purpose of this study was to assess the association between binge alcohol use and unprotected sex in Russian substance users. Participants (N=181) were narcology hospital patients assessed on demographics, alcohol use, risky sex, and STD/HIV diagnoses. Adjusted GEE logistic regression analysis examined the association between binge drinking and same day unprotected sex across each of the past 30 days, per participant (N=5430 observations). Participants were age 18–55 years, 75% male, and 64% binge drinking. Sex trade was reported by 27%; history of STDs by 43%; and HIV by 15%. One-fourth of daily observations included sex; 88% of these involved unprotected sex. Binge drinking was not associated with same day unprotected sex (OR_{adj}=1.0, 95% CI=0.7–1.4, χ^2 (1, N=5219)=0.01, ns). Findings document substantial HIV/STD risk and prevalence among Russian narcology patients, but no link between binge drinking and unprotected sex in this population, possibly due to very low rates of condom use generally.

Keywords

unprotected sex; condom use; alcohol

INTRODUCTION

HIV infection was rare in Eastern Europe in the mid-1990's, but its prevalence has been increasing in the past decade. AIDS deaths in this region doubled between 2003 and 2005 (1). The Russian Federation (heretofore referred to as Russia) currently has the largest number of HIV cases in all of Europe (1). At the heart of the Russian epidemic is the large number of young injection drug users (IDUs), primarily in urban centers (1). Data from early 2004 indicated that 80% of all officially reported cases in the country were transmitted by injection drug use (1). However, sexual transmission of HIV in Russia is rapidly

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increasing; 25% of HIV infections were attributable to sexual contact in 2004, compared to 6% in 2001 (1). Further, clinical and epidemiologic data indicate that sexual transmission of HIV infection in this region may be the most rapidly increasing of all HIV infection transmission risk behaviors (2).

Sexual transmission of HIV infection within Russia is assumed to result from HIV-infected IDUs engaging in unprotected sex, bridging the epidemic to non-IDU populations. Studies with IDUs recruited from urban centers within Russia have found that the majority reports recent sexual activity, multiple partners and non-condom use (3,4). The epidemic has been propelled even further via the link between injection drug use and sex work, particularly for female IDUs. A substantial proportion of female IDUs (37%) report having engaged in sex work (5) and those engaging in sex work are more likely to report both risky injection drug use and a history of sexually transmitted diseases, as compared with male IDUs or IDUs reporting no history of sex work (6,7).

Some evidence from Russia raises the possibility that HIV may be spreading beyond IDUs and sex workers and reaching those with alcohol dependence (8). Increased risk for HIV among Russians with alcohol problems such as binge alcohol use would affect a substantial proportion of the Russian population, as Russia has one of the highest per capita use of alcohol in the world (5,9,10). The issue of a possible association between unsafe sex and alcohol use is important as the Russian Longitudinal Monitoring Survey, which assesses behavior and health with a representative sample of Russians aged 14–49 years, found that one-third of sexually active participants engaged in alcohol use at last sexual episode (11). To better address how alcohol may be linked to sexual risk within this population, research is needed to assess the association between binge drinking and unprotected sex within the Russian context. Recent research has examined sexual risk among IDUs in Russia (3,7) but not between binge alcohol use and risky sexual behaviors. Nonetheless, studies from other countries suggest such a link likely exists and is a concern for an expansion of the HIV epidemic to Russians engaging in binge alcohol use. Studies in the United States and Western Europe indicate that binge drinkers are more likely to engage in riskier sexual activities (e.g., multiple sex partners) and less likely to use condoms generally (12,13). Further, there is some, albeit inconsistent, evidence that excessive use of alcohol when engaging in sex reduces the likelihood of protected sex in that episode (12,13).

In summary, research demonstrates that HIV is at epidemic proportions in Russia and that those with substance abuse problems, specifically IDUs and perhaps binge drinkers, are at disproportionate risk for acquiring the virus and spreading it to others. The Joint United Nations Programme on AIDS recommends the use of sexual risk reduction interventions targeting substance abusing populations as an important means to inhibit the ongoing epidemic in this region (1). Development of such interventions will require more understanding of how substance use behaviors are linked to unprotected sex within a Russian treatment population than that provided by the current literature. This study seeks to build upon the growing body of work in the area of substance use and sexual risk in Russia by assessing the association between binge alcohol use and unprotected sex among Russian narcology hospital patients diagnosed with alcohol and/or drug dependence.

METHODS

Study Design & Subject Recruitment

Data for this research came from the Russian PREVENT (**P**artnership to **R**educe the **E**pidemic **V**ia **E**ngagement in **N**arcology **T**reatment) study, a randomized controlled trial (RCT) of an HIV behavioral intervention in narcology hospital in-patients in Russia. The PREVENT study included alcohol and/or drug-dependent men and women recruited from 2

narcology hospitals in the vicinity of St. Petersburg Russia: a) the Leningrad Regional Center for Addictions (LRCA) and b) the Medical Narcology Rehabilitation Center (MNRC). Narcology hospitals are a standard setting for drug and alcohol dependent persons in Russia and Eastern Europe to receive treatment. Typically, the hospitalization is 3 to 4 weeks in length and involves patients undergoing detoxification and then receiving addiction treatment.

Participants for this study were recruited from October 2004 to April 2005. Trained physician research associates approached all patients after initial detoxification and assessed them for study eligibility. Eligible participants were 18 years or older, reported unprotected vaginal or anal sex in the past 6 months, and had a primary diagnosis of alcohol or drug dependence. Additional study entry criteria were the following: abstinence from alcohol and other abusive substances for 48 hours; willingness to undergo HIV testing as per standard narcology hospital protocol if not known to be HIV-infected; willingness and able to provide contact information for themselves as well as a relative or close friend through whom they could be contacted; residing within 150 kilometers of St. Petersburg; and possessing a home telephone. Individuals who were not fluent in Russian or demonstrated severe cognitive impairment as assessed by the research associate's clinical judgment at recruitment were excluded from the study. All eligible subjects provided written informed consent prior to study enrollment.

Procedure

Immediately subsequent to recruitment and eligibility assessment, all participants provided written informed consent and received their baseline survey, which assessed demographics, HIV risk behaviors, substance use behaviors and other key health indicators. At baseline, while subjects were in the narcology hospitals, HIV risk behavior questions were administered by both a face to face research associate interview as well as through an Audio Computer-Assisted Self Interviewing (ACASI) system. ACASI removes the interviewer and, therefore, allows additional privacy, minimizes literacy issues, encourages truth telling, and provides an identical recording of each question; using this system has been shown to enhance the quality of self-report behavioral assessments, to maintain confidentiality, and to provide an acceptable method for collecting self-reports of HIV risk behavior (14). All interviews were conducted in Russian, and participants were compensated US$5 for the baseline assessment. The current analyses include data collected at the baseline assessment.

Measures

Demographics including age, gender, marital status, education and employment were assessed via single survey items.

Main Independent Variable—Our main independent variable, daily binge alcohol use, was collected using a Timeline Followback (TLFB) approach (15,18). Participants noted the number of drinks they had in each of the past 30 days prior to hospitalization; daily binge alcohol use was defined as having 5 or more drinks per day for men, 4 or more for women. Additional data collected included substance use condition, based on the diagnosis received at the narcology hospital, and injection drug use and risky injection drug user ("sharing needles or works") in the past 6 months, assessed via single items from the Risk Assessment Battery (RAB) (19).

Outcomes—Our primary outcome variable, unprotected sex, was based on a TLFB assessment in which participants were asked the number of times they had vaginal or anal sex and if a condom was used in each of the past 30 days prior to hospitalization. Unprotected sex was modeled as a dichotomous outcome where subjects were categorized

as either having an unprotected sex episode (any anal or vaginal sex without a condom on a given day) or having no unprotected sex (using a condom during all anal or vaginal sex on a given day or having no anal or vaginal sex) for each of the past 30 days. For descriptive purposes, we also assessed number of times unprotected vaginal or anal sex occurred with all primary and all casual partners in the past 3 months via separate survey items. A primary sex partner was defined as "the person you have sex with most often and regularly and/or the person with whom you feel most attached," and casual partners were defined as "people you have sex with less frequently and with whom you do not consider yourself in a steady relationship."

Covariates—HIV behavioral risk factors (i.e., multiple sex partners, sex trade involvement, and recent risky injection drug use) were covariates in analyses and assessed via survey items from the Risk Assessment Battery (RAB). A single item asked participants the number of sex partners in the past 6 months; multiple sex partners was defined as 4 or more partners due to the large proportion of the sample reporting this behavior. Two additional RAB items with dichotomous responses were used to assess buying sex with money or drugs (buying sex) and selling sex for money or drugs (selling sex) in the past 6 months. Two dichotomous RAB items also assessed recent injection drug use and recent risky injection drug use. The first item asked whether the participant engaged in injection drug use in the past 6 months; the second asked, for those reporting yes on item one, whether they had shared needles or works when injecting drugs in the past 6 months.

STD/HIV diagnoses were included as covariates in analyses. Self-reported STD was assessed by asking whether participants had ever been diagnosed with syphilis, gonorrhea, chlamydia, genital warts, genital herpes, other STDs (defined to exclude HIV) or pelvic inflammatory disease (women only); no positive response yielded a "no STD diagnosis" dichotomous response. HIV serostatus was determined by HIV test results.

Data Analyses

Descriptive statistics were used to assess participants' characteristics for the sample (N=181). We also assessed bivariate associations between any binge drinking in the past 30 days with demographics and HIV risk factors using Chi-square and t-tests as appropriate.

For the primary hypothesis, we assessed the association between binge drinking and unprotected sex across each of the past 30 days per participant. Thus each of the 181 subjects could contribute a maximum of 30 observations to the analyses, resulting in N=5430 observations for the repeated measures analyses. We used generalized estimating equations (GEE) logistic regression models to examine the association between binge drinking and unprotected sex on the same day for each observation, adjusting for potential confounding factors: demographics (age, marital status, gender), HIV serostatus, and HIV risk factors (multiple partners, same sex partners, sex trade involvement, no primary partner, injection drug use and STD history). The GEE approach was used to adjust for the correlation due to analyzing repeated measures from the same subject (20).The empirical standard errors from the GEE approach were used for all analyses. The primary analyses utilized all available observations (N=5430). Secondary analyses were also conducted that excluded observations in which sex was not reported (N=1535). All analyses were conducted using two-sided tests and a significance level of 0.05. Note: Data presented in the results include and indicate whether they come from unique subjects (N=181) or if they include repeated observations from the same subject (N=5430).

RESULTS

Subject Characteristics

Study participants (N=181) were age 18–55 years (mean age 33.2 years), predominantly male (75%) and unmarried (67%). Although almost all had graduated from high school (94%), only half were employed. Nearly everyone (99%) identified as heterosexual; however 9% reported having been with at least 1 same sex partner in the past 6 months, with women being more likely to report a same sex partner than men.

Substance Abuse Behaviors and Diagnosis, Unprotected Sex, and HIV Risk Factors

Almost three-quarters of our sample (72%) reported alcohol use in the past 30 days; 64% reported binge drinking in this same period. The 181 study subjects contributed a total of 5430 observations from the TLFB. Among the 5400 observations, 37% reported alcohol use (n=2020); 83% of these involved binge drinking (n=1669/2020). Recent injection drug use was reported by 40% of the sample. These findings are consistent with subjects' clinical diagnoses, which indicate that 60% of this sample is alcohol-dependent, 32% heroin dependent, and 8% both alcohol and heroin dependent. (Table I)

Three-fourths of participants reported having a primary sex partner, and 67% reported having a casual sex partner. Among those reporting recent involvement with a primary partner (n=136), 88% engaged in unprotected vaginal sex and 17% in unprotected anal sex with this type of partner. Among those reporting recent involvement with a casual partner (n=121), 76% engaged in unprotected vaginal sex and 8% in unprotected anal sex with this partner. (Table I) TLFB data demonstrated that, among the 5430 observations, 28% included at least one episode of either vaginal or anal sex (n=1535); 88% of these involved unprotected sex (n=1345/1535). Sex with 2 or more partners in the past 6 months was reported by 70% of the sample; 26% had been with 4 or more sex partners in the past 6 months. More than 1 in 4 participants (27%) reported sex trade involvement--19% had bought sex and 12% had sold sex. One third of participants (31%) had engaged in recent risky IDU; notably, this is the majority of those engaging in recent IDU (78%, 55/72). Consistent with these risks, high rates of HIV and STD were observed in this sample; almost half (43%) had a history of other STDs, and a substantial minority (15%) was HIV-infected. (Table I)

Bivariate Associations with Binge Drinking

Participants reporting binge alcohol use in the past 30 days were significantly more likely to be older, male, and employed, compared with non-binge drinkers, and they were also significantly less likely to be engaging in injection drug use, have a history of STDs, and be HIV-infected. (Table II)

Associations Between Binge Drinking and Same Day Unprotected Sex Across Each of the Past 30 Days, Per Participant

Repeated measures analyses of daily observations indicated no association between binge drinking and same day unprotected sex in either unadjusted (OR=1.0, 95% CI=0.8–1.3, χ^2 (1, N=5219)=0.01, ns) or adjusted analyses controlling for demographics and HIV risk factors (OR_{adj} =1.0, 95% CI=0.7–1.4, χ^2 (1, N=5219)=0.01, ns). (Table III) In analyses restricted to observations where sex was reported, the association between binge drinking and unprotected sex remained non-significant (OR_{adj} =1.0, 95% CI=0.5–1.7, χ^2 (1, N=1451)=0.02, ns). (Table IV)

Notably, the multivariable model of daily observation did indicate associations between other factors and unprotected sex. (Table III) The odds of an unprotected sex observation

were significantly higher among those having a primary partner (OR_{adj}=2.9, 95% CI=1.7–4.7, χ^2 (1, N=5219)=15.65, <0.001) and those having 4 or more sex partners in the past 6 months (OR_{adj}=2.2, 95% CI=1.4–3.2, χ^2 (1, 5219)=9.89, <0.01); the odds of an unprotected sex observation were significantly lower among those who had purchased sex in the past 6 months (OR_{adj}=0.5, 95% CI=0.4–0.8, χ^2 (1, 5219)=7.84, <0.01). (Table III) In the model restricted to observations where sex was reported, the effects of having a primary partner, having 4 or more sex partners, and purchasing sex were attenuated and no longer statistically significant. (Table IV) Neither of the multivariable observation models detected associations between HIV/STD infection, selling sex, or recent risky IDU and unprotected sex.

DISCUSSION

Despite reported associations between alcohol use and unsafe sex in the medical literature (21,23) in this Russian cohort of narcology hospital patients with unsafe sex in the past 6-months, binge drinking was not associated with an increased odds of same day unprotected sex. These findings are similar to other event specific studies of substance use and unprotected sex in US adolescents (24,26). The absence of an association in this study may reflect a reality that binge alcohol use does not impact unsafe sex in this population, however, another possibility must be considered: the impact of alcohol may be difficult to detect when 88% of daily observations in which sex occurs do not include condoms.

Currently, condoms in Russia are primarily used for pregnancy prevention and not, as yet, for prevention of sexually transmitted infections (11). However, as condom use becomes more normative in the Russian population, an impact of binge alcohol use may become evident. These data suggest that binge alcohol use, in a setting in which condom use is the exception, rather than the rule, is not a major issue for the promotion of the use of condoms. Nonetheless, as the HIV epidemic in Russia gains greater recognition in general, condom use will increase and the uptake of condoms may occur differentially between those with risky alcohol use and without such alcohol use behavior. Of note is the fact that for this sample, alcohol use predominantly meant binge alcohol use, with 83% of alcohol use incidents involving binge drinking levels.

In addition to binge drinking, no significant association was observed between the following variables and an observation of unprotected sex: HIV seropositive status, recent risky IDU, and history of STD diagnosis. However, we did observe higher odds of an unprotected sex observation among those reporting 4 or more sex partners and those who did not purchase sex in the past 6 months, as well as those with a primary partner. Notably, these significant associations with unprotected sex were lost when the model was limited to observations in which sex occurred, suggesting that these variables may be associated with having sex, rather than with an unprotected sex episode. Overall these findings demonstrate substantial HIV risk and pervasive unprotected sex among Russian narcology patients, with unprotected sex being no less likely among those with greater HIV risk.

These risk-specific findings are substantially different from those seen in the United States. Substance using and clinical samples from the United States demonstrate greater condom use among those with multiple sex partners, recent risky injection drug use and sex trade involvement (27,29). However, unprotected sex being more common among those with primary partners is consistent with US research (27,29) as well as with that seen in the general Russian population (11). Lack of significant findings in the model only including observations in which sex occurred may again be indicative of condom use simply not being normative in any Russia populations and more typically being used as a means of pregnancy prevention (11). These findings clearly speak to the need for better condom promotion in Russia generally and particularly among those in drug and alcohol treatment.

Risky sexual behaviors were remarkable for the cohort overall, especially compared with the general Russian population. Whereas 13% of sexually active Russians from a nationally representative sample reported 2 or more partners in the past year, 26% in this cohort reported 4 or more partners in the past year. Another dimension of risky sexual behavior is the high proportion involved in sex trade, an activity reported by 27% of this sample. While sex trade involvement has been discussed among Russian IDUs (5,7), it has not received as much focus among binge drinkers in treatment; our study demonstrates that sex trade involvement is as likely for binge drinkers as IDUs. Future research to understand and address HIV risk among Russians in substance abuse treatment should consider multiple sex partners and sex trade involvement by alcohol dependent patients as well as IDUs in order to better address the epidemic in this clinical population.

While the current findings contribute to our growing understanding of the HIV epidemic in Russia, there are several limitations of the study. The study was observational at a single point in time which limits our ability to establish causality; however, the associations found do inform us regarding levels of HIV risk in sexually active Russian narcology hospital patients. Assessments were limited as they did not provide information on relative timing of same day binge alcohol use and unprotected sex; information on which occurred first and whether they occurred within the same relative period of the day was not collected. Additionally, reliance on self-report for behavioral risk variables potentially results in social desirability and recall biases on these, although, recall biases are likely minimal as timeframes for behavior assessment were short (i.e., past 1 to 6 months prior to hospitalization). We attempted to mitigate social desirability bias by use of the ACASI technology to assess risk behavior; such a bias typically results in an underestimate rather than overestimate of risk behavior and STD prevalence (14). Use of a single city in Russia and 2 narcology treatment sites for recruitment may also limit generalizablity of findings to other narcology hospital settings.

CONCLUSION and IMPLICATIONS

Sexual risk among alcohol and drug dependent patients is an important public health issue meriting research and clinical attention. While the hypothesized association between binge drinking and same day unprotected sex was not observed, findings did demonstrate substantial HIV risk for binge drinkers in treatment, as well as non-binge drinkers, a group that was predominantly IDUs. The exceedingly low condom use among a population at substantial risk for acquiring and transmitting HIV is alarming. The finding that episodes of unprotected sex are more common among some of those at greater risk for HIV infection, specifically those with a greater number of sex partners is of concern. These findings demonstrate that narcology treatment settings are an important venue in which HIV intervention could occur, and such intervention should not only promote condom use but guide patients to understand how their sexual behaviors increase risk for both acquiring and transmitting HIV. Efforts to address the HIV epidemic in Russia should address sex risk behaviors in the alcohol abusing population as well as among IDUs.

Acknowledgments

This work was supported by the National Institute on Alcohol Abuse and Alcoholism (NIAAA), NIH: R21-AA014821 and K24-AA015674 (Dr. Samet).

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Table I

Substance use behaviors and diagnosis, unprotected sex behaviors and HIV risk factors at baseline for narcology hospital patients enrolled in a sex risk reduction RCT in St. Petersburg, Russia (N=181)

	Total Sample % (n)
SUBSTANCE USE BEHAVIORS AND DIAGNOSIS	
Any Alcohol Use, Past 30 Days	72% (130)
Binge Drinking, Past 30 Days	64% (116)
IDU, Past 6 Months	40% (72)
Substance Abuse Diagnosis	
Alcohol-Dependent	60% (108)
Heroin-Dependent	32% (58)
BothAlcohol and Heroin-Dependent	8% (15)
UNPROTECTED SEX	
Any Unprotected Sex - Primary Sex Partner, past 3 months[a]	
Unprotected Vaginal Sex	88% (119)
Unprotected Anal Sex	17% (23)
Any Unprotected Sex - Casual Sex Partner, past 3 months[b]	
Unprotected Vaginal Sex	76% (92)
Unprotected Anal Sex	8% (10)
HIV RISK PROFILE	
Two or More Sex Partners	70% (126)
Four or More Sex Partners	26% (47)
Any Sex Trade	27% (49)
Buy Sex	19% (34)
Sell Sex	12% (21)
Recent IDU	40% (72)
Recent Risky IDU	31% (55)
STD History	43% (77)
HIV-infected	15% (27)

[a] Of our 181 participants, 136 (75.6%) reported a primary partner and were then asked questions about sex with a primary partner in the past 3 months.

[b] Of our 181 participants, 121(66.9%) reported a casual partner and were then asked questions about sex with a secondary partner in the past 3 months.

Table II

Baseline demographics and HIV risk factors for binge drinkers (n=116) and non-binge drinkers (n=65) enrolled in a sex risk reduction RCT in St. Petersburg, Russia(N=181) (stratified by binge drinking)

	Binge Drinkers[a] (n=116) %(n)	Non-Binge Drinkers (n=65) % (n)	Test statistic, degrees of freedom, p-value
DEMOGRAPHICS			
Age Range and Mean[b]	22–55; 36.0 (9.0)	18–55; 28.1 (7.2)	$t(181)= -6.02, 1, <.001^{**}$
Gender			
Male	83% (96)	60% (39)	$11.38, 1, <.001^{**}$
Female	17% (20)	40% (26)	
Full-time Employed	65% (75)	22% (14)	$30.99, 1, <.001^{**}$
High School Graduate	94%(108)	94% (61)	0.00, 1, .97
Married	36% (42)	28% (18)	1.36, 1, .24
Primary Partner	71% (82)	83% (54)	3.12, 1, .08
Same Sex Partners	9% (10)	11% (7)	0.23, 1, .63
HIV RISK PROFILE			
Two or More Sex Partners	72% (83)	66% (43)	0.57, 1, .45
Four or More Sex Partners	28% (33)	22% (14)	1.03, 1, .31
Any Sex Trade	24% (28)	32% (21)	1.41, 1, .24
Buy Sex	17% (20)	22% (14)	0.50, 1, .48
Sell Sex	9% (10)	17% (11)	2.80, 1, .09
Injection Drug Use (IDU)	13% (15)	89% (57)	$99.61, 1, <.001^{**}$
Risky IDU[c]	10% (11)	69% (44)	$67.67, 1, <.001^{**}$
STD History	31% (36)	63% (41)	$17.50, 1, <.001^{**}$
HIV-infected	8% (9)	28% (18)	$13.04, 1, <.001^{**}$

[a] Any binge drinking in the past 30 days.

[b] Range and Mean (Standard Deviation) are provided for this continuous variable.

[c] Sample size used for this variable is N=72 injection drug users.

* $p < .05$.

** $p < .01$.

Table III

Adjusted odds ratios for unprotected sex from multivariable logistic regression analyses (N=5430).

Independent Variable	Adjusted Odds Ratio (95% Confidence Interval)	Score χ^2, degrees of freedom, p-value
Binge Drinking	1.01 (0.74–1.38)	0.01, 1, 0.94
Married	1.19 (0.72–1.97)	0.46, 1, 0.50
Female	1.18 (0.70–1.99)	0.37, 1, 0.54
Age[a]	0.83 (0.67–1.03)	2.84, 1, 0.09
Employed	0.76 (0.48–1.89)	1.40, 1, 0.24
Same Sex Partners	1.89 (0.90–3.99)	1.99, 1, 0.16
Primary Partner	2.85 (1.73–4.72)**	15.65, 1, <0.0001
Buy Sex	0.54 (0.36–.80)**	7.84, 1, 0.005
Sell Sex	0.70 (0.35–1.41)	1.01, 1, 0.31
Multiple Sex Partners (4+)	2.15 (1.42–3.24)**	9.89, 1, 0.002
Recent Risky IDU	1.46 (0.85–2.50)	1.92, 1, 0.16
STD Ever	0.73 (0.49–1.09)	2.34, 1, 0.13
HIV-infected	0.64 (0.31–1.35)	1.43, 1, 0.23

Note. N represents the total number of observations. Generalized estimating equations (GEE) were used to fit the logistic regression models

[a] Odds ratio corresponds to a 1 standard deviation (9.2 year) increase in age.

* p<.05.

** p<.01.

Table IV

Adjusted odds ratios for unprotected sex from multivariable logistic regression analyses including only observations in which sex occurred (N=1535).

Independent Variable	Adjusted Odds Ratio (95% Confidence Interval)	Score χ^2, degrees of freedom, p-value
Binge Drinking	0.96 (0.54–1.71)	0.02, 1, 0.90
Married	0.95 (0.36–2.52)	0.01, 1, 0.92
Female	1.02 (0.34–3.07)	0.00, 1, 0.97
Age[a]	1.38 (0.86–2.22)	1.78, 1, 0.18
Employed	1.68 (0.72–3.93)	1.46, 1, 0.23
Same Sex Partners	1.16 (0.33–4.11)	0.05, 1, 0.82
Primary Partner	2.01 (0.89–4.53)	2.63, 1, 0.01
Buy Sex	0.76 (0.32–1.80)	0.36, 1, 0.55
Sell Sex	0.74 (0.24–2.24)	0.29, 1, 0.59
Multiple Sex Partners (4+)	0.96 (0.49–1.88)	0.01, 1, 0.91
Recent Risky IDU	0.72 (0.24–2.12)	0.33, 1, 0.56
STD Ever	0.95 (0.43–2.11)	0.01, 1, 0.91
HIV-infected	0.83 (0.83–3.84)	0.06, 1, 0.81

Note. N represents the total number of observations. Generalized estimating equations (GEE) were used to fit the logistic regression models

[a] Odds ratio corresponds to a 1 standard deviation (9.2 year) increase in age.

* p<.05.

** p<.0.