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J. A. Kelly $^{\rm a}$, Y. A. Amirkhanian $^{\rm a\ b}$, T. L. McAuliffe $^{\rm a}$

- , J. V. Granskaya ^c , O. I. Borodkina ^b , R. V. Dyatlov ^d
- , A. Kukharsky ^e & A. P. Kozlov ^d

^a Center for AIDS Intervention Research (CAIR), Department of Psychiatry and Behavioral Medicine, Medical College of Wisconsin, USA

^b Faculty of Sociology, St. Petersburg State University

 $^{\rm c}$ Faculty of Psychology , St. Petersburg State University

^d Biomedical Center , St. Petersburg

 $^{\rm e}$ The St. Petersburg Gay and Lesbian Rights Center , 'KRILIJA', Russia

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HIV risk characteristics and prevention needs in a community sample of bisexual men in St. Petersburg, Russia

J. A. Kelly,¹ Y. A. Amirkhanian,^{1,2} T. L. McAuliffe,¹ J. V. Granskaya,³ O. I. Borodkina,² R. V. Dyatlov,⁴ A. Kukharsky⁵ & A. P. Kozlov⁴

¹Center for AIDS Intervention Research (CAIR), Department of Psychiatry and Behavioral Medicine, Medical College of Wisconsin, USA, ²Faculty of Sociology, St. Petersburg State University, ³Faculty of Psychology, St. Petersburg State University, ⁴Biomedical Center, St. Petersburg & ⁵The St. Petersburg Gay and Lesbian Rights Center, 'KRILIJA', Russia

Abstract A new and understudied HIV epidemic is quickly unfolding in the Central and Eastern European countries of the former Soviet Union. Men who have sex with men (MSM) in Russia constitute a population highly vulnerable to sexually-transmitted HIV infection. In a community sample of 434 Russian MSM accessed in gay venues in St. Petersburg, 126 had had both male and female partners in the past three months. In this paper, we report on their risk characteristics. Forty-five per cent of men reported recently engaging in unprotected anal intercourse with their male partners. Respondents had a mean of 3.3 male and 3.4 female partners in the past three months, and most had multiple male and female partners in this time period. There were serious and significant gaps in the AIDS risk knowledge levels of these men, and most believed they had no personal contact with HIV-positive people. Bisexual men were more likely than exclusively gay men to have engaged in commercial sex and tended to have lower AIDS risk knowledge. Although they did not differ in average age, bisexual compared to gay men more recently had their first sex with a man. Multivariate logistic and linear regression analyses showed that condom and safer sex attitudes, perceived norms, AIDS risk knowledge and age at first sex with a man were independent predictors of high-risk behaviour among bisexual men. HIV prevention interventions for bisexual men should address their sexual practices with both male and female partners, correct misconceptions about risk, address behaviour practices rather than gay identity, and recognize risk issues faced by the female partners of bisexual men.

Introduction

Research and theory in the field of human sexuality has long emphasized that sexual orientation should be construed as falling along a continuum that ranges from exclusive heterosexuality to exclusive homosexuality, but including many gradations in between (Kinsey *et al.*, 1948; 1953). Nonetheless, most empirical research on AIDS has treated sexual

Address for correspondence: Jeffrey A. Kelly, PhD, Center for AIDS Intervention Research, Medical College of Wisconsin, 2071 North Summit Avenue, Milwaukee, WI 53225, USA. Tel: 414 456 7700; Fax: 414 287 4209; E-mail: kdemming@mcw.edu

orientation more as a dichotomy, defining and categorizing individuals as either gay or heterosexual, and then usually consolidating together bisexual men into a single group with gay men. In the USA and in most countries of Western Europe, different HIV prevention sexual risk reduction messages have evolved and been tailored for what are often seen as distinct and largely separate gay and heterosexual communities. While tailored HIV prevention campaigns for gay and nongay communities are logical in cultures where individuals also categorically define their own sexual self-identity as homosexual or heterosexual, HIV risk issues and prevention needs may be quite different in cultures where there is greater diversity in persons' sexual orientations and in their behaviour. It may also be true in cultures that are experiencing value changes determined by modernization and social transformation.

Community surveys of men who have sex with men (MSM) undertaken in many developed western countries have shown that a large majority of non-ethnic minority, sexually-active adult MSM report only having male sexual partners in the recent past and define their sexual orientation as exclusively or predominantly gay (Kelly *et al.*, 1992; McManus *et al.*, 1993). In contrast, studies conducted in other countries and cultures often show that many MSM have not only male but also female partners and do not self-identify as gay, even when their sexual contacts are primarily with persons of the same gender. These patterns have been especially observed in Latin cultures (Diaz, 1998; Garcia *et al.*, 1989; Mourao, 1992; Tielman *et al.*, 1992) and among MSM from ethnic minority backgrounds who are living in western cultures (Chu *et al.*, 1992; Diaz *et al.*, 1993; Doll & Beeker, 1996). They have also been observed, although less systematically studied, in other cultures with strong norms against public disclosure of homosexuality, strong emphasis on values related to family heritage preservation through marriage, and religious conservatism related to sexuality (cf. Tielman *et al.*, 1992).

Beyond the prevalence of bisexual behaviour under different cultural circumstances are the questions of whether bisexual men are at greater risk for HIV than their exclusively gay (or heterosexual) counterparts, and whether HIV prevention messages directed toward gay or heterosexual communities 'miss' MSM who also have sex with women and may not perceive themselves as gay. Some research has shown that behaviourally bisexual MSM are at greater HIV risk than exclusively gay men especially in areas related to their numbers of sexual partners, numbers of casual partners, incidence of syphilis and other sexually transmitted diseases (STDs), substance use patterns and histories of commercial sex (Bevier et al., 1993; Diaz et al., 1997; Weatherburn et al., 1996). However, other research has found that bisexual men less frequently engage in high-risk sexual behaviour practices with their male partners than exclusively gay men but have high rates of unprotected sex with females (Boulton et al., 1992; Izazola-Licca et al., 1996). This may be because ethnic traditions and gender roles are less likely to define insertive penetrative acts as homosexual activities, but strongly discourage passive or receptive activities with same-gender partners. Understanding the sexual risk practices of bisexual men has public health relevance because it can shed light on the risk of bisexual men for contracting or transmitting HIV infection during sex with their male partners and also for their risk of transmitting HIV to their female partners. In some areas of the USA, up to half of women with HIV/AIDS contracted their disease due to unprotected sex with a bisexual man (Chu et al., 1992).

While patterns of male bisexual HIV risk behaviour have been studied in some areas of the world, almost no research has systematically examined these patterns among MSM in the countries of Central and Eastern Europe. The HIV epidemic has emerged on a large scale in Russia only over the past five years. Until about 1996, fewer than 200 HIV infections were recorded annually in Russia (UNAIDS, 1998). Since that year, the number of new Russian HIV infections officially recorded has doubled annually, and 148,000 cases were recorded by September 2001 (Russian Health Ministry, 2001). However, the officially-recorded number of HIV infections in Russia is believed to represent only 10% to 15% of the true total, and up to two million HIV infections could occur in the country by the end of 2001 (United States Intelligence Council, 2000). Although injection drug users constitute the majority of officially-recorded HIV/AIDS cases in Russia, approximately half of sexually-transmitted HIV infections are among MSM (Kozlov, 2000). Given that Russia's syphilis and other STD rates are among the highest of any developed country (Borisenko *et al.*, 1999; Tichonova *et al.*, 1997), sharp future increases in HIV sexual transmission are also likely. With what is also one of the highest HIV new case incidence rates in the world (UNAIDS, 1999), behavioural research to identify the determinants of Russia's HIV epidemic and to guide prevention efforts is urgently needed (Amirkhanian, Kelly & Issayer, 2001).

In the former Soviet era, official polices discouraged open discussion about sexuality, and homosexuality was statutorily illegal. Following the breakup of the Soviet Union in 1991, Russia experienced greater openness; increased western contact, democratic values, and personal freedoms; and a liberalization of cultural and social norms. With homosexuality decriminalized, visible, legal and organized gay communities emerged for the first time in Russia's larger cities, including gay-identified discotheques, bars, cafes and advocacy organizations (Amirkhanian, Kelly, Kukharsky *et al.*, 2001). However, conservative religious and cultural anti-gay stigma remain strong (Kon, 1997; 1999), and the country's economic problems, banking system collapse, widespread joblessness and limited resource capacity for public health services have made Russia's social and economic development difficult. A limited body of literature suggests that common patterns in Russia are same-sex activity among men who do not self-identify as gay, commercial sex as a means of economic livelihood, compelled homosexual acts, having large numbers of casual partners and heavy substance use (Issayev, 1993).

Because of the lack of contemporary, systematic behavioural research on sexual HIV risk characteristics in community samples of Russian gay or bisexual men, we recently undertook a large-scale survey of men entering all gay-identified bars and nightclubs in St. Petersburg, Russia's second largest city. Almost 80% of men in the sample reported both male and female sexual partners in their lives and 37% had female partners in the past three months (Amirkhanian, Kelly, Kukharsky, *et al.*, 2001). No published research has examined the sexual risk practices of the AIDS-related attitudes, beliefs and knowledge of bisexual men in Russia, even though bisexual behaviour is common among Russian MSM. In this paper, we report on these findings and their implications for HIV prevention efforts in Russia.

Methods

Setting and participants

St. Petersburg, with a population of approximately five million residents, is located in Russia's northwest region. Study data were collected in June 2000. Legal gay venues appeared in St. Petersburg only during the past decade. The largest of these are bars. Working with the leadership of a gay community nongovernmental organization (NGO), we identified all five of the city's gay clubs where MSM could be accessed in large numbers. The study was conducted in these venues. A survey sampling frame was created by determining each club's nights of peak attendance, conducting surveys on two nights in each club, and thereby creating a ten-event sampling schedule. Most survey events occurred on weekends

when club attendance was highest. Each survey night started at approximately 11:00pm and continued for about three hours. Participants in the study were men 18 years of age or older who visited these gay clubs. Scales included in the survey measure were adapted from those previously validated in studies undertaken with MSM in the USA (Kelly *et al.*, 1992). The survey was written in Russian and had been translated and back-translated to ensure correspondence between English and Russian word meanings.

Data collection procedures

Four-member field data collection teams consisted of two NGO members and two university students or faculty. All fieldwork team members participated in a training session in how to approach men entering the clubs, how to explain study purposes and how to emphasize anonymity of participants' responses. Thus, the session established standardized data collection methods and field activities that were followed across all settings and sampling periods.

Men entering clubs were asked to participate in the study by field team members. Participants received a coffee mug, a t-shirt with study logo, or a condom and lubricant kit as incentives. Survey completion requests were reinforced by posters placed in the clubs and announcements made by club emcees. Each man was also asked whether he had completed the survey before. To avoid repeated survey completions by the same person, men who completed a survey earlier were allowed to complete it again for an incentive gift but their questionnaires were marked and later discarded by data entry personnel.

Before completing the survey, participants read a cover sheet that described the study's purpose, identified the institutions conducting the study, emphasized the anonymity of responses and requested informed consent. Consent forms were kept apart from surveys to protect anonymity. To reinforce the confidentiality of their responses, participants put their completed questionnaires in an envelope, sealed the envelope and placed it inside large boxes. Field team members observed the survey completion and provided assistance in answering questions when needed. The survey required less than 20 minutes for most persons to complete. Across all survey events, over 80% of all men approached completed the written questionnaire.

Demographic characteristics. Participants were asked their age, whether they were now in school and whether they now worked. Participants selected from five options to indicate the type and number of years of education they had completed. Types of employment were coded from open-ended responses completed on the questionnaire.

Sexual risk behaviour. Thirteen questions measured respondents' personal sexual behaviour. Participants reported their total number of lifetime male partners, age at first sex with a man, and total number of lifetime female partners.

Additional questions asked the respondent to describe details about his sexual activity during the past three months. For this time period, he reported his number of male and female partners. Respondents then indicated the number of times and the number of men with whom they had had anal intercourse during the same time period. Participants who reported having anal intercourse with men during the past three months marked an 11-point scale (from 0-100%) to indicate the percentage of time condoms were used. Participants were also asked whether a condom was used during their most recent anal intercourse occasion with a male partner.

AIDS risk behaviour knowledge. Using options of 'yes', 'no' or 'I don't know', participants responded to the accuracy of seven statements that assessed practical knowledge about HIV transmission risk behaviour and risk reduction steps. For example, questions asked whether anal intercourse without a condom creates great risk for getting HIV, whether oil-based substances should be used as lubricants, whether one can tell a person's HIV-positive status from his appearance and whether washing carefully protects against HIV. Some items on the knowledge scale and all other scales were reverse-keyed to control for acquiescent response set bias. Responses were scored to show the number of items correctly answered. Because AIDS risk knowledge is a multidimensional construct, the scale's internal consistency was not examined.

STD treatment history. Participants were asked whether or not they had been treated for any kind of STD.

Condom and safer sex attitudes. Participants completed a seven-item scale measuring their attitudes toward the use of condoms and toward safer sex. Respondents used three choices ('yes', 'somewhat' or 'no') to indicate their agreement with attitudes expressed in seven statements (sample items: 'Using condoms can be very pleasurable', 'Safer sex makes a stimulating sexual game', 'Using condoms interrupts the pleasure of sex' and 'Condoms show a lack of trust between partners'). Scale scores could range from seven to 21, and higher scores reflected more positive attitudes (Cronbach's alpha = 0.70).

Condom and safer sex perceived norms. Using options of 'yes', 'somewhat' or 'no', participants responded to a series of five statements assessing the extent to which safer sex practices are a well-accepted norm among peers and sexual partners (sample items: 'Safer sex is accepted by my friends and sexual partners' and 'My friends talk more about safer sex than they practice it'). The scale included five items, and scores ranged from five to 15. Higher scores reflected stronger perceived safer sex norms (Cronbach's alpha = 0.69).

Risk reduction behaviour change intentions. Using the response scale options of 'yes', 'I don't know' or 'no', participants indicated their level of agreement with five statements describing strength of safer sex behaviour intentions (sample items: 'I will tell my next sexual partner to use a condom', 'I will refuse to have sex if I am drunk or affected by drugs' and 'I will refuse a sexual partner's pressure to have unsafe sex'). The scale's internal consistency (Cronbach's alpha) was modest (0.42), indicating that multiple intentions were being measured. Scale scores could range from five (weakest behaviour change intentions) to 15 (strongest intentions.

Personal contact with people with HIV/AIDS. Each respondent was asked whether he personally knew anyone who was HIV-positive or had AIDS.

Commercial sex bought or sold. Respondents indicated whether they had given someone money or valuables to gain sex, or, in a separate question, whether they ever were paid by someone for sex.

Condom access. Participants indicated whether or not they have enough money to buy condoms, whether they regularly buy condoms and whether they always have them when needed.

Statistical analysis

Survey responses were double-key entered into a computerized database for analyses. Descriptive analyses were performed to calculate frequencies, means, and standard deviations (SDs) for the variables in order to describe risk characteristics of the sample. A total of 434 men in the sample reported that they had ever had sex with a man. The sample for this study's analysis consists of a sub-set of 192 MSM, those categorized as bisexual and those categorized as exclusively gay. For this study's purposes, bisexual men were defined as those men who reported having both male and female sexual partners during the past three months (n = 126). Exclusively gay men were those who had only male partners in the past three months and also reported no female partners in their lives (n = 66). The remainder of the surveyed men are those who had had female partners at some point in their lives but not in the past three months, and those who had had no male partners during the past three months. They were not included in this study's analyses. Bisexual and exclusively gay groups were compared in their HIV risk behaviours and psychological characteristics using t-tests for continuous variables which met criteria for normal distributions, Mann-Whitney U-tests (equalize) for variables with skewed distributions and χ^2 -tests for categorical variables. Respondents were considered to have engaged in unprotected anal intercourse in the past three months if they reported anal sex and also less than consistent condom use during anal intercourse.

Multiple logistic regression analysis was then used to statistically model independent predictors of risk behaviour among the 126 bisexual men with respect to two criteria: (1) having engaged in any anal intercourse in the past three months without use of a condom, and (2) not using a condom during the most recent occasion of anal intercourse. Finally, multiple linear regression analysis was used to determine predictors of the percentage of the time that a condom was used during anal intercourse in the past three months among the 126 bisexual men. All analyses were performed using SPSS version 9.0.

Results

The mean age of bisexual men in the sample was 23.5 years old. Approximately 20% had completed high school, 18% had completed a technical education, 25% had completed some university education and 37% had completed their university education. Eighty-two per cent of bisexual men worked. The most common types of employment reported by participants were work in business and administration, culture and science, public service and construction and industry.

Sexual risk behaviour characteristics

As Table 1 shows, participants reported large numbers of both male and female partners in their lifetimes¹. Bisexual men had a mean of 28.6 male partners in their lives, and reported a mean of 18 lifetime female partners. During the past three months, respondents had an average of 3.3 male and 3.4 female partners. In the past three-month time period, 64% of bisexual men had more than one male partner and 57% had more than one female partners. Forty-five per cent of men said they had unprotected anal intercourse with male partners in

Risk behaviour characteristic	Reporting % (n)	Mean (SD)
Bisexual men's mean number of :		
Male lifetime partners		28.62 (100.7)
Female lifetime partners		17.96 (22.95)
Male partners, past three months		3.29 (4.00)
Female partners, past three months		3.41 (3.90)
Bisexual men's mean percentage of condom use during anal sex		
intercourse, past 3 months		65.54 (38.81)
Percentage of bisexual men:		
Reporting any unprotected anal intercourse, past three months	45.1 (55)	
Who used a condom during their most recent anal intercourse	68.0 (68)	
With >1 male partner, past three months	63.5 (80)	
With >1 female partner, past three months	57.1 (72)	
Reporting any sale of sex to get money or valuables	32.0 (39)	
Reporting any purchase of sex for money or valuables	19.5 (24)	
Reporting past treatment for an STD	26.6 (33)	
Who report that they regularly buy condoms and always have them		
when needed	75.0 (93)	

Table 1. Sexual risk behaviour characteristics of bisexual men in St. Petersburg, Russia

N = 126. Slight variations are due to missing data.

the past three months. When asked to report on patterns of condom use during anal intercourse in the past three months, bisexual men indicated that approximately 34% of their intercourse occasions were unprotected. Thirty-two per-cent of men said they did not use a condom the last time they had anal intercourse with a male partner.

Participants reported about their past treatment for STDs. Over 26% of men said that they had been treated. With respect to patterns of commercial sex, 32% of bisexual men said that they sold sex for money or valuables, and almost 20% said that they gave someone money or valuables to gain sex.

HIV risk behaviour knowledge

Table 2 presents the percentage of bisexual men who incorrectly answered or did not know the answer to each HIV risk behaviour knowledge question. Only 4% of bisexual men were able to correctly answer all seven knowledge items. Fewer than one-third of men knew that condoms should not be lubricated with oils or Vaseline. Approximately 54% of participants

Table 2. HIV risk behaviour knowledge among bisexual men in St.	Petersburg, Russia
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Knowledge item	Incorrectly answered % (n)
It is a bad idea to lubricate condoms with oils or Vaseline (T)	67.7 (84)
Washing carefully after sex helps to protect you from HIV (F)	45.6 (57)
If a person tells you he is HIV negative, you don't have to follow safer sex (F)	45.5 (56)
Anal sex without a condom carries greater risk than oral sex without a condom (T)	39.7 (50)
Mutual masturbation is very safe (T)	35.2 (44)
One can usually tell from a person's appearance if he is HIV positive (F)	35.2 (44)
Anal intercourse without a condom creates great risk for getting HIV (T)	22.4 (28)

N = 126. Slight variations are due to missing data; T = true, F = false statement.

believed that washing carefully after sex helps to protect against HIV, and the same percentage believed that safer sex is not needed if a partner says that he is HIV-negative. Forty per cent of men did not know that unprotected anal sex carries greater risk than oral sex. Thirty-five per cent of respondents did not know that mutual masturbation is a very safe activity. The same percentage of men said that one can usually tell from a person's appearance if he is HIV-positive. Finally, only 78% felt that anal intercourse without a condom creates great risk for contracting HIV.

Univariate comparisons of bisexual and exclusively gay men on HIV risk characteristics

Table 3 presents univariate comparisons of bisexual and exclusively-gay men in their HIV risk behaviours and on the risk-related psychosocial characteristic scales. Although bisexual and gay men did not differ significantly in their mean age, bisexual men reported their first sex with a male partner as more recent (mean = 6.9 years ago) than gay men (mean = 9.2 years ago); Mann-Whitney U = 3041, p = 0.006. A significantly greater proportion of bisexual men (32%) than exclusively gay men (18%) said that they had sold sex to gain money or valuables ($c^2 = 3.98$, df = 1, p = 0.05). Gay men (40%) were also more likely than bisexual men (22%) to indicate that they knew someone who was HIV-positive ($c^2 = 6.50$, df = 1, p = 0.01).

Exclusively-gay men tended to have higher scores on the measure of AIDS risk behaviour knowledge than bisexual men (t = 1.80, df = 181, p = 0.07), and tended to report a greater number of lifetime male partners than bisexual men (Mann-Whitney U = 2262, p < 0.07). There were no significant differences in the sexual risk behavioural practices of bisexual men relative to their exclusively-gay counterparts, nor were there differences on behaviour change intentions, safer sex attitudes or safer sex perceived norms.

Multivariate predictors of risk behaviour among bisexual men

For the regression analyses, it was necessary to restrict the number of potential predictor variables. We did this by examining which variables had strong univariate correlations with risk behaviour, and also which variables differentiated gay and bisexual men in the univariate comparisons. The predictor variables were age at first sex with a man, AIDS risk knowledge scores, condom and safer sex attitude scores, and norm scores as predictors.

Table 4 presents the results of the multivariate logistic regression predicting whether bisexual men engaged in any unprotected anal intercourse in the past three months. Increased condom use perceived social norms (OR = 0.80, with 95% CI, 0.66 to 0.97) and younger age at first sex with a man (OR = 0.92, with 95% CI, 0.83 to 1.00) were the strongest independent predictors of not engaging in unprotected anal intercourse in the past three months. The logistic regression model correctly predicted 63% of the bisexual men with respect to having engaged in any unprotected anal intercourse in the past three months ($c^2 = 11.5$, df = 4, p = 0.02).

To further examine predictors of risk behaviour, we then performed a logistic regression to predict not using a condom during the last occasion of anal intercourse. The results of this multivariate logistic regression are also presented in Table 4. Lower condom and safer sex attitudes (OR = 0.65, with 95% CI, 0.51 to 0.82), lower condom use perceived social norms (OR = 0.78, with 95% CI, 0.61 to 0.99) and higher AIDS risk knowledge (OR = 0.61, with 95% CI, 0.45 to 0.90) were independent predictors of not using a condom during the most recent anal intercourse. The logistic regression model correctly predicted 80% of bisexual

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Table 3. Comparisons of bisexual and exclusively gay men on HIV risk characteristics¹

	Bisexual	men	Gay m	ıen	Statistic type		
Variable	(<i>u</i>) %	Mean	(u) %	Mean	and value	df	Ф
Age at first sex with a man		16.9		17.0	U = 3880		NS
Years since first sex with a man		6.9		9.2	U = 3041		0.006
Number of male partners, lifetime		28.6		97.6	U = 2262		0.07
Number of male partners, past three months		3.29		4.55	U = 3778		NS
Percentage of anal intercourse when condoms were used, past							
three months		65.5		63.5	t =28	138	NS
Percentage using condom at last anal intercourse	68.0 (68)		62.3(33)		$\chi^2 = 0.51$	1	NS
Percentage reporting past STD treatment	26.6 (32)		18.8 (12)		χ ² = 1.43	1	NS
Percentage selling sex for money	32.0 (39)		18.0(11)		$\chi^2 = 3.98$	1	0.05
Percentage reporting any unprotected anal sex, past three months	45.1 (55)		39.4(26)		$\chi^2 = 0.56$	1	NS
Percentage knowing anyone HIV-postive	21.8 (26)		39.7 (25)		$\chi^{2} = 6.50$	1	0.01
AIDS risk knowledge scale items correct		4.26		4.67	t = 1.80	181	0.07
Risk reduction behaviour change intentions scale		12.04		12.44	t = 1.28	184	NS
Condom and safer sex attitudes scale		16.71		16.02	t = -1.63	183	NS
Condom and safer sex perceived norms scale		11.66		11.63	t = -0.09	183	NS
¹ Bisexual men group $n = 126$, gay men $n = 66$.							

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Sample size vary slightly across variables due to missing data.

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Table 4. Regression analyses predicting risk behaviour in the past three months among bisexual men in Russia

	Logistic reg any unpro	gression mod stected anal i	el predict ntercours	e ¹ e	Logistic regre use of a conde	ession model om at last an	predicting al intercou	g no urse ²	Multiple linear r of time a condom	egression pre was used dui	edicting per ing anal in	centage tercourse ³
Variable	Coefficient (SE)	Exp (B)	χ^{2}	đ	Coefficient (SE)	Exp (B)	χ^2	đ	Coefficient (SE)	Standard coeff.	τ	đ
Age at first sex with	0.09 (0.05)	1.09	3.46	0.06	0.03 (0.06)	1.03	0.19	NS	-2.04 (0.88)	-0.21	- 2.33	0.02
a man (years) AIDS risk knowledge	0.05 (0.14)	1.05	0.11	NS	0.49 (0.19)	1.63	6.36	0.01	-1.59 (2.37)	- 0.06	-0.67	NS
Scale score Condom and safer sex	-0.22 (0.10)	0.80	5.11	0.03	-0.25 (0.13)	0.78	3.91	0.05	4.36 (1.72)	0.27	2.53	0.01
percerved notifies scale Condom and safer sex attitudes scale score	-0.04 (0.08)	0.96	0.24	NS	- 0.43 (0.12)	0.65	12.97	.0003	4.33 (1.35)	0.35	3.20	0.002
¹ Model significance (χ	$^{2} = 11.5$, df = 41, p) = 0.02); goc	dness of	fit (Hosn	ner-Lemeshow $\chi^2 = 9$	0.0, df = 8, p	= 0.34); c	ases used	= 118;			

² Model significance ($\chi^2 = 35.1$, df = 4, p = 0.001); goodness of fit (Hosmer-Lemeshow $\chi^2 = 5.4$, df = 8, p = 0.71); cases used = 98;

³ Model significance (F = 10.2, df = 4 and 85, p = 0.001); model $\mathbb{R}^2 = 0.33$; residual standard error = 32.9; cases used = 90.

men with respect to having used a condom during their last anal intercourse ($c^2 = 35.1$, df = 4, p = 0.0001).

Finally, we examined the percentage of times that condoms were used during anal sex over the past three months. A multiple linear regression analysis was conducted using the same variables to predict percentage of condom use. Table 4 shows the results of this analysis. Increased condom use, higher perceived social norms (standardized beta = 0.35, p = 0.002), increased condom and safer sex attitudes (standardized beta = 0.27, p = 0.01) and younger age at the time of first sex with a man (standardized beta = (0.21, p = 0.02) were found to each have an independent association with greater condom use. The resulting model, multiple correlation coefficient (\mathbb{R}^2) = 0.33, explained 30% of the variability in the percentage of time when condoms were used (F = 10.2, df = 4 and 85, p = 0.001).

Discussion

Although Russian men surveyed in this study were patrons of gay-identified clubs, a very high proportion were also behaviourally bisexual. Almost 80% had both male and female partners in their lives, and over one-third of MSM had female partners in the past three months alone. Our findings indicate that these men are at high risk for HIV due to their serious misunder-standings about HIV transmission and risk reduction steps, and their risky behaviour practices with same-sex partners. For the most part, bisexual men in the sample did not differ greatly from exclusively gay men in their HIV risk characteristics, and both groups reported very frequent risky activities. Most of the bisexual men had multiple male partners as well as female partners even in the short time frame of the past three months. Nearly half reported engaging recently in unprotected anal intercourse. Bisexual men were more likely than exclusively gay men to sell sex for money.

Bisexual men in this sample reported large numbers of both male and female sexual partners in even the recent past and, given the high prevalence of risky sexual practices that occurred with their male partners, these men are at risk for contracting or transmitting HIV during their sexual contacts. Although the survey did not assess patterns of condom use between bisexual men and their female partners, prior research indicates that bisexual men are less likely to use condoms during intercourse with their female than male partners (Doll & Beeker, 1996). We do not know the specific relationship circumstances of bisexual men in this sample with their female sexual partners. However, the fact that most bisexual respondents in the sample reported multiple male and also female partners in the past three months suggests that many of these sexual relationships were casual or of short duration. This further underscores the high HIV risk of bisexual men's sexual relationships with both men and women.

While the survey measure assessed behavioural bisexuality, it did not assess respondents' self-identified sexual orientation. However, prior research has shown that MSM who have female partners often do not self-identify as gay (Chu *et al.*, 1992; Doll & Beeker, 1996; Evans *et al.*, 1998; Garcia *et al.*, 1989; Tielman *et al.*, 1992). In a different large-scale survey of young people in St. Petersburg, very few older adolescents self-identified as primarily homosexual even though almost 30% also said they were not exclusively heterosexual (Amirkhanian, Tiunov & Kelly, 2001). Such patterns indicate that a significant proportion of MSM in Russia do not define themselves as gay even when they have male sexual partners. These patterns are likely to arise from transformations in the cultural context and in social change occurring in Eastern Europe. On one hand, the patterns may represent less stereo-typed sexual orientation roles. On the other, they may also reflect the presence of strong, longstanding social, cultural, religious and familial stigma against homosexuality that makes

it difficult for persons to accept and identify their sexual orientation as gay regardless of their sexual behaviour and preferences.

Our findings carry practical implications for the development of HIV prevention programmes in Central and Eastern Europe. Because such a high proportion of MSM have both male and female partners, it will be very important for HIV prevention messages to focus on risks associated with both homosexual and heterosexual practices and behaviour occurring with both male and female partners. To the extent that MSM may not self-identify as gay, risk reduction messages tailored to their specific sexual practices (such as anal or vaginal intercourse) may be more relevant than those which appeal to persons' self-identity as gay men. Under circumstances where a large percentage of MSM also have female partners, much more attention should be given to women's HIV prevention issues, especially as they relate to protection during sex with bisexual men. Finally, given the prevalence and characteristics of risk behaviour found here among bisexual men, more research is needed to better understand the nature of their relationships with both male and female partners. A better understanding of these relationships can enhance the development of HIV prevention interventions for bisexual men and both their male and female partners.

As expected, both positive safer sex norms and attitudes predicted use of a condom during last anal intercourse as well as the percentage of condom use over the last three months. Condom use perceived norms predicted not having unprotected sex during the past three months. Less expectedly, length of time since participants began having sex with men influenced risk behaviour. Bisexual men had their first same-sex experience, on average, more recently than exclusively-gay men. Among bisexual men, younger age at first sex with a man was related to safer behaviour. Bisexual men who have had longer histories of male same-sex behaviour may hold stronger norms supporting safer behaviour than men who have been homosexually-active for a shorter time. The association between higher risk knowledge scores and lower use of condoms at last anal intercourse was unexpected. It suggests that the relationship between safer sex knowledge and recent risk behaviour may be mediated by other factors, perhaps by variables not assessed in our measures.

Several limitations of the study should be noted. First, our sample was obtained in gay-identified venues. We are not able to generalize the findings to bisexual men who might not visit these venues. Second, the internal consistency of some survey scales was modest. This was due, in part, to the need to utilize brief measures in this field survey research. Finally, we did not assess the HIV status of sexual partners with whom respondents had unprotected sex.

In contrast to the well-known and longstanding HIV epidemics in western countries and in developing world areas, the HIV epidemic now unfolding in Eastern European and former Soviet countries is new, rapidly moving and still understudied. Its dynamics are likely to be both similar to—and also different from—HIV epidemics in other regions due to unique cultural, social, political and economic changes in these Eastern European nations. Behavioural and social science research undertaken now with vulnerable populations in these areas can lead to the development of prevention interventions capable of averting the HIV/AIDS crisis now confronting this world region.

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Note

[1] Sample sizes vary slightly across analyses because of missing data. In response to the question inquiring about number of lifetime partners, a number of participants wrote text responses indicative of very large numbers (e.g. 'a lot', 'too many to remember' or 'I can't count the number'). Such text responses could not be quantified, so they were treated as missing data in the calculation of mean frequencies. For that reason, data on lifetime partners are likely to represent an underestimate of the true number of lifetime partners.

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