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Male Labor Migrants in Russia: HIV Risk Behavior Levels, Contextual Factors, and Prevention Needs

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Abstract

Background—Although the dire life circumstances of labor migrants working in Russia are well-known, their HIV risk vulnerability and prevention needs are understudied. Low socioeconomic status, lack of access to services, separation from family, and limited risk awareness all contribute to migrants' HIV vulnerability.

Methods—Male labor migrants in St. Petersburg (n=499) were administered assessments of their sexual behavior practices, substance use, and psychosocial characteristics related to risk and well-being.

Results—Thirty percent of migrants reported multiple female partners in the past 3 months. Condom use was low, ranging from 35% with permanent to 52% with casual partners. Central Asian migrants had very low AIDS knowledge, low levels of substance use, moderate sexual risk, high depression, and poor social supports. Eastern European migrants had higher AIDS knowledge, alcohol and drug use, and sexual risk.

Discussion—Improved HIV prevention efforts are needed to reduce the risk vulnerability of migrants who relocate to high disease prevalence areas.

Keywords

Labor migrants; Russia; HIV/AIDS; HIV risk behavior; Psychosocial risk factors

BACKGROUND

Labor migrants are among the world's most HIV-vulnerable populations (1). Russia, which in the past decade has had HIV incidence among the highest in the world, also has the world's second greatest number of labor migrants, ranking as a country for work destination only behind the United States. Reports have documented the difficult social circumstances and exploitation facing labor migrants in Russia (2). However, little is known about their HIV prevention needs.

Persons in impoverished regions often migrate to more prosperous locations in an effort to gain employment. It is estimated that more than 12 million persons in Russia were migrants in 2005 (3), and 7 to 9 million are migrant workers, commonly referred to in Russia as "Gastarbeiter" (2). Prior research in multiple world regions has shown that migrants often have limited HIV knowledge (4,5) and low perceptions of risk (6). Labor migrants may have multiple sexual partners (4,7,8), inconsistently use condoms, and have sex with commercial sex workers (6,9,10). Sexual harassment, abuse, or rape are commonly reported by female labor migrants (5,11). Apart from their own health risk, labor migrants who contract HIV and then return home can expose their home-country sexual partners—often wives or permanent partners—to the disease (12,13). Social factors that contribute to vulnerability include stresses associated with being away from spouses and other emotionally important persons in one's home country for extended periods, as well as with lack of acculturation and assimilation in a destination country. Alcohol and drug use, unofficial status that prevents access to services, and absence of legal rights are common among labor migrants (7,9,10,14–16).

A number of factors stimulated a great expansion in labor migration to Russia in the past decade (2). Fueled by oil revenues, Russia's economic development rate was much greater than that of most other former Soviet states. At the same time, employment opportunities deteriorated in many other post-Soviet countries, especially in Central Asian republics and poorer countries within Eastern Europe. Between 30% to 50% of the gross domestic product in countries such as Tajikistan, Kyrgyzstan, or Moldova come from the remittances sent by labor migrants working abroad (3).

Most labor migrants in Russia are employed in the construction industry (17), and either have few skills or work in menial jobs below their skill levels. One pattern of labor migration is seasonal, occurring in 3- to 6-month "shifts" in which migrants maintain close ties with home. Another pattern is long-term labor migration which primarily characterizes younger, unmarried individuals who often intend to reside in Russia indefinitely or permanently. These migrants sometimes relocate their family members to Russia or establish concurrent relationships in Russia. Both types of labor migrants include those who work legally and those who work without documentation.

The HIV vulnerability of labor migrants working in Russia is a public health concern because of the country's high HIV prevalence rate. However, few studies have documented the HIV vulnerability of labor migrants in Russia. A recent qualitative study found that male Tajik migrants working in Moscow had frequent contact with commercial sex workers and

low knowledge about AIDS, and were often officially undocumented workers, unprotected by Russian labor laws and living under harsh conditions (18). Low knowledge about HIV risk was also been found among Tajik migrants returning home (19). Elevated HIV incidence has been observed among wives of male Tajik migrants following their return home (20). During a 10-month period in 2007 when approximately 30,000 new infections were diagnosed in Russia, 1,480 of them were among migrants (17).

Social circumstances, distance from home-country supports, and behavioral factors contribute to HIV vulnerability of labor migrants in Russia. However, differences in migrants' cultural backgrounds may also need to be taken into account in the development of effective HIV prevention programs. In former Soviet countries, two distinctive regional cultures are suggested in the literature (21), predominantly Christian Eastern Europe and predominantly Muslim Central Asia. These regions greatly differ in their cultures, sociodemographic characteristics, and socioeconomic development, including in ways that may influence risk vulnerability of migrants who come from these regions.

This article reports findings of a study carried out with a systematically-recruited sample of male labor migrants in St. Petersburg, Russia's second largest city and a destination for labor migration from both post-Soviet Eastern European and Central Asian republics. The first objective of the study was to establish levels of migrants' HIV risk behavioral vulnerability as well as to describe contextual characteristics including substance use, mental health, perceived discrimination, and socio-demographic indicators. The study's second objective was to identify which of these domains were associated with elevated levels of HIV risk vulnerability. Because labor migrants coming to Russia from Eastern European countries and those coming from Central Asia differ in their cultural backgrounds, the study also sought to examine whether there were differences in HIV risk among groups. The study's overall aim was to shed light on the HIV prevention needs of labor migrants in the post-Soviet region.

METHODS

Procedures and Setting

Male labor migrants were recruited using invitation flyers when they presented for obligatory work permission medical screening at Botkin Hospital for Infectious Diseases between April and June, 2008. Written informed consent followed a protocol approved by IRBs of the Medical College of Wisconsin and Botkin Municipal Clinical Infectious Diseases Hospital in St. Petersburg. A total of 499 persons were successfully recruited, reflecting a response rate of 52.5%. It required most participants about 60 minutes to complete the anonymous written questionnaire, self-administered in Russian, Tajik, Uzbek, and Moldovan languages. Participants received a \$10 incentive payment.

Participants

The study sample included 347 (71%) migrants of Central Asian backgrounds, predominantly from Uzbekistan and Tajikistan, and 143 (29%) migrants of Eastern European origin, primarily from Ukraine, Moldova, and Belarus, with 9 participants not

identifying their country of origin. Table I describes participants' socio-demographic characteristics overall and broken down based upon their home region.

As Table I shows, migrants in the sample were almost evenly distributed with respect to coming from large cities, small towns, and rural areas in their home countries. Most were in their early-30s and did not have any university education, and slightly over half were married. Most sought work either in construction or in other types of work. A higher percentage of migrants from Central Asia than those from other Eastern European countries reported that this was their first time seeking work in Russia.

Measures

HIV sexual risk behavior—Participants reported their total number of female sexual partners in the past year and in the past 3 months, both in their home country and in St. Petersburg. Participants were asked whether they had a permanent female sexual partner, whether she was in St. Petersburg, and how many times they had either vaginal or anal intercourse with a permanent female partner in the past 3 months. Other sets of questions assessed sexual practices in the past 3 months with casual female partners in St. Petersburg and with any male partners. Respondents indicated how often they used condoms with permanent and casual partners and whether they received or had given money or valuables in exchange for sex in the past 3 months. Participants were asked about their reasons for condom use, whether they could afford to purchase condoms, and whether they regularly bought condoms and had them available. Finally, respondents were asked whether they ever had an STD.

Alcohol and drug use—Participants specified the number of beer, wine, or liquor drinks they consumed per week. In addition, respondents indicated whether and how often in the past 3 months they injected any drug or used marijuana, hallucinogens, ecstasy, cocaine, or other substances.

Scales measuring HIV risk knowledge and safer sex behavior intentions, perceived norms, and self-efficacy—Social-cognitive theory (22) and the theory of reasoned action (23) propose that taking steps to reduce health risk is influenced by an individual's practical knowledge of risk reduction as well as by strength of risk reduction behavioral intentions, perceived peer normative support for behavior change, perceived self-efficacy for successfully enacting risk reduction steps, and attitudes toward behavior change. Multiple-item scales to measure these constructs applied to HIV risk reduction behavior change were first tested in research conducted in the United States, where scale scores were found to significantly correlate with self-reported sexual risk practices and to show change in predicted directions following HIV prevention intervention (24, 25). The scales were more recently adapted, translated, and employed in HIV prevention research carried out in Russia and other post-socialist Eastern European countries. In studies with ethnic minority Roma and also men who have sex with men in Russia and Bulgaria, the scales were again found to have strong psychometric properties and high internal consistency, and were validated both through statistically significant correlations with participant sexual risk behavior and also significant change following participation in HIV risk reduction

interventions (26–28). Table II describes the scales used in the present research to measure migrants' *HIV risk knowledge* and *safer sex behavioral intentions*, *perceived norms*, and *self-efficacy*, including a description of each scale's conceptual construct, sample items, score range, and Cronbach alpha in the migrant sample. We attempted to measure condom attitudes, but the scale assessing this construct had inadequate internal consistency.

Scales measuring social support, depression, and perceived discrimination

scales—Three additional scales assessed psychosocial contexts for risk. *The Social Provisions Scale (SPS)* (29) assesses quality and adequacy of perceived social support. *The Center for Epidemiological Studies-Depression (CES-D)* is a well-established and widely-used measure of depression in community populations (30). A scale developed specifically for this study measured *perceived discrimination* related to migrant status. It listed 8 discrimination experiences and asked respondents to indicate whether and how often each had been encountered. The constructs and content of each of these scales are also described in Table II, together with their internal consistency in the present study sample.

Statistical Methods

Univariate analyses were conducted on demographic, psychosocial, substance use, and sexual risk behavior characteristics. Differences between Central Asian and Eastern European migrants were evaluated by Pearson's Chi Square for categorical data and Mann-Whitney U-test for numerical variables. Next, multiple linear and logistic regression analyses explored variables associated with migrants' sexual risk behaviors. A backward stepwise algorithm was used to select variables in the regression models from a large set of potential factors including demographics and home region; use of alcohol and drugs; condom affordability; HIV risk-related psychosocial scales; perceived discrimination, social support, and depression scales; and length of time in Russia and number of visits home. Variables achieving a *p*-value of at least <0.10 were selected into the models. To reduce skewness, counts for the distribution of sexual partners and number of intercourse occasions were transformed using the formula $\log_{10}+1$. Analyses were conducted using SPSS for Windows, version 13 (December, 2004).

RESULTS

HIV/AIDS Risk Knowledge and Psychosocial Characteristics

As Table III shows, participants' overall knowledge about HIV transmission was low, and it was significantly lower among Central Asian migrants than migrants from Eastern Europe. On 6 of the 8 questions, fewer than half of participants provided correct answers. For example, only 29% (n=143) of participants knew that oil-based lubricants should not be used with condoms and 45% (n=221) believed that birth control pills or IUDs prevent HIV transmission.

As shown in Table III, migrants from Central Asia had significantly weaker safer sex behavior intentions than those from Eastern Europe, but the region groups did not differ in safer sex perceived norms nor self-efficacy. The mean values of the intentions and self-

efficacy scales were near the midpoint of their ranges, but safer sex normative perceptions were weak.

Mental Health Well-Being and Perceived Discrimination

With respect to social support, the mean score of Eastern European men was near the SPS normative sample mean (29) but Central Asian men's perceived social support was much lower. In addition, migrants from Central Asia reported significantly greater levels of depression, with means exceeding the CES-D cutoff indicator of 16 used to signify possible clinical depression (30). On the perceived discrimination measure, Central Asian labor migrants reported significantly more frequent experiences of discrimination than did Eastern European migrants.

HIV Sexual Risk Behavior Characteristics

Table III depicts HIV risk sexual behavior in the sample overall and also with participants broken down by Central Asian and Eastern Europe origins. Sixty-nine percent of participants reported being sexually active in the past 3 months, much higher among migrants from Eastern Europe (91%) than those from Central Asia (60%). Almost all sexual activity was with female partners; only 1 man in the sample reported having any same-sex partners in the past 3 months. Nearly one-third of men in the overall sample had sex with multiple partners in this period. Almost half of migrants had a permanent partner, and 30% had a permanent partner in St. Petersburg. Eleven percent of migrants reported one permanent partner but a nearly equal proportion of men had multiple permanent partners in the past 3 months, indicating that a permanent partner was not necessarily exclusive. Condoms were used on an average of only 35% of intercourse occasions with permanent partners. Fourteen percent of migrants had sex with casual partners. Among them, 62% had unprotected sex (mean=8.8 acts) with casual partners, and about half of these acts were unprotected. Nine percent of migrants reported paying for sex in the past 3 months, and 3% reported receiving money for sex.

Table III shows that there were numerous differences in risk between migrants from Eastern European countries compared to Central Asian republics. Eastern European migrants had more partners, were more likely to report one and more than one permanent partner, and had more frequent intercourse and lower condom use with these partners. Eastern European migrants were twice as likely as migrants from Central Asia to have casual partners.

Reasons for condom use were to protect against HIV (81%, n=293), sexually transmitted diseases (STDs) (76%, n=278), and pregnancy (67%, n=245). Fifty-three percent (n=251) of participants reported regularly buying condoms and having them available, although 14% of participants (n=66) said they did not have enough money to buy condoms. Finally, 18% of Eastern European and 6% of Central Asian migrants reported having had an STD at some point.

Use of Alcohol and Other Substances

Participants reported consuming a mean of 4.2 (median=1) alcohol drinks per week, higher among Eastern European than Central Asian migrants (means=9.7 versus 1.9, $p<0.001$). Any

drug use in the past 3 months was reported by 4.1% (n=20) of migrants, more by Eastern European participants (10%, n=14) than those from Central Asia (2%, n=6, $p<0.001$). Marijuana—the most commonly used drug—was used by 15 participants an average of 15.3 (median=3) days in the past 3 months. Only 3 men reported injecting in the past 3 months.

Multivariate Associations with Sexual Risk Practices

Tables IV and V present results of multivariate associations with levels of sexual risk behavior of labor migrants in the sample during the past year and the past 3 months. Separate analyses were performed to identify variables associated with men's total number of female sexual partners in both time frames as well as number of casual female partners, number of unprotected intercourse acts with casual female partners, and percentage of intercourse acts protected by condoms (Table IV). Multivariate associations of whether participants had multiple partners, had casual partners, had unprotected sex with casual partners, or paid for sex in the past 3 months are shown in Table V.

Number of female partners in the past year was associated with the migrant's home region, with migrants from Eastern European countries reporting more partners than those from Central Asia. Number of partners was also associated with drug use and a trend for weekly alcohol use, not having enough money to buy condoms, and—counterintuitively—higher knowledge about HIV. Similar factors were associated with migrants' number of female partners in the past 3 months, as were perceived safer sex norms and level of education.

As shown in Table IV, greater number of casual female partners and greater frequency of unprotected intercourse acts with casual female partners were independently associated with alcohol and other drug use, younger age, and poorer social support. The percentage of intercourse occasions with casual partners protected by condoms in the past 3 months was associated with being a migrant from Central Asia rather than Eastern Europe and having stronger safer sex intentions. In addition, and as shown in Table V, having sex with casual partners, unprotected intercourse with them, or having sex with commercial partners were all independently associated with number of alcohol drinks consumed, other substance use, being from Eastern Europe, reporting poorer social supports, and being younger in age.

DISCUSSION

Labor migrants coming to Russia are arriving in a country with high HIV prevalence and, consequently, high risk for contracting the disease. Very little prior research has assessed levels of risk behavior in labor migrants in Russia.

In this sample, nearly one-third of migrants reported multiple sexual partners during the past 3 months, and condoms were used only about half the time with casual partners and only 35% of time with partners described as permanent. Given that study participants worked in Russia for a median of 6 months during their present stays, the majority of these sexual activities took place in Russia. Interestingly, the percentage of migrants reporting multiple partners was much greater than the percentage who reported having casual partners in the past 3 months. We believe that this was because many men had concurrent partnerships with multiple female partners who were considered as regular (albeit nonexclusive) partners as

opposed to partners defined as “casual.” Some men probably formed concurrent relationships with regular partners in their country of extended work residence.

The study findings established high HIV vulnerability overall among labor migrants working in Russia and identified factors independently associated with this vulnerability. However, the study’s results also showed that migrants from different regions also differ from one another with respect to risk behavior levels, lifestyles, or mental health well-being. Migrants’ home region was significantly associated with many HIV risk domains.

Migrants—particularly men from Central Asia—had elevated depression and poor social supports. These negative social and mental health indicators would be expected in men who have left their friends, families, and social connections in their home countries in search of work in an unfamiliar place, especially given patterns of exploitation that have been documented among labor migrants in Russia (2). Central Asian migrants reported greater and more frequent discrimination than those from Eastern Europe.

Greater proportions of Eastern European migrants engaged in sexual behavior with partners described as permanent, overall and while in St. Petersburg. They reported more casual partners, multiple permanent partners, and more frequent intercourse. Eastern European migrants used condoms less frequently with their St. Petersburg permanent partners than Central Asian migrants, although no differences were found in levels of condom use with casual partners. On the other hand, Eastern Europeans had higher HIV risk knowledge and stronger safer sex behavior intentions. These findings may be explained by differences in migrants’ backgrounds. For example, 90% of all Eastern European participants previously worked in Russia compared to only a half of Central Asian participants. Eastern European men’s greater assimilation and social connectedness in Russia may result in more opportunities for sex, establishing permanent relationships, and greater sexual risk. In contrast, Central Asian migrants may encounter greater cultural and communication barriers while in St. Petersburg. Several counterintuitive relationships may have been due to Eastern European migrants’ higher education and HIV knowledge, but also a greater levels of assimilation and opportunities for establishing stable sexual relationships.

This research identified specific HIV prevention needs of labor migrants who visit Russia to work. Comprehensive HIV prevention programs are needed in these communities. Several challenging issues should be addressed if service programs are to be effective and feasible:

- a. Regional, national, and international public health bodies should recognize the HIV prevention needs of labor migrants, allocate appropriate resources, and technically support prevention program implementation;
- b. HIV prevention service systems are needed—including both the integration of services into existing infrastructures and the development of new systems—so that migrants receive appropriate intervention in both their home and host countries. This involves supporting existing in-country service provider programs to reach migrant communities as well as mobilizing migrant and ethnic communities and labor brigades to implement culturally-sensitive programs.

- c. Programs need to address specific contexts of risk rather than simply provide risk reduction information. Programs that target migrant communities using network or other peer-based approaches are particularly promising because migrants know one another's specific risk issues and behaviors practiced, and speak the same language as their peer friends and colleagues. Social network-level approaches can reduce risk behavior and strengthen safer sex peer norms, condom attitudes, intentions, and self-efficacy (26, 27).
- d. Programs intended to prevent HIV among migrants should universally provide prevention skills training in important areas including condom use and should seek to strengthen positive condom intentions and attitudes, safer sex norms, and risk reduction self-efficacy. However, successful programs must also be tailored to particular needs based on the migrants' backgrounds. Differences among migrant subgroups based on their home country or region carry important HIV prevention programmatic implications. For example, programs for Central Asian migrants may need to emphasize comprehensive basic HIV education and also to address coping with discrimination, improving social supports, reducing depression, and acculturation and assimilation opportunities. Programs for Eastern European migrants need to focus especially on HIV risk issues surrounding concurrent sexual partnerships, the importance of protection with different types of partners, and alcohol and drug use.

Study limitations include reliance on participants' recall accuracy in reports of behavioral practices. Although survey anonymity was emphasized, some participants may still have underreported stigmatized or illegal behavior. Some labor migrants declined to participate, and the study did not sample migrants who never sought to obtain a legal job permit. This study employed a cross-sectional assessment carried out at a single time point, and associations are not necessarily causal.

This research constitutes a first step toward the development of improved HIV prevention efforts for labor migrants by characterizing patterns of risk and identifying factors that influence it. An important next step is the conceptualization of prevention intervention models and service delivery approaches to reduce migrants' HIV risk both in Russia and elsewhere in the world.

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Table ILabor Migrant Demographic Characteristics (n=499)^a

Variable	Overall Sample (n=499) ^b	Eastern European Migrants (n=143)	Central Asian Migrants (n=347)	p ^c
% (n) who in their home country lived in:				
A large city	29.5% (140)	26.8% (38)	30.6% (102)	n.s.
A small town	36.8% (175)	43.7% (62)	33.9% (113)	0.04
A rural area	33.7% (160)	29.6% (42)	35.4% (118)	n.s.
Mean (median) age, years	31.9 (30.5)	32.5 (30)	31.8 (31)	n.s.
% (n) who had any university education	25.7% (125)	28.0% (40)	24.7% (85)	n.s.
% (n) married	59.0% (279)	52.9% (74)	61.6% (205)	0.08
Type of labor sought while in Russia, % (n)				
Construction worker	46.5% (224)	51.4% (73)	44.4% (151)	n.s.
Repair worker	3.7% (18)	2.1% (3)	4.4% (15)	n.s.
Vendor	3.1% (15)	0.7% (1)	4.1% (14)	0.05
Driver	10.0% (48)	12.0% (17)	9.1% (31)	n.s.
Food industry worker	9.3% (45)	1.4% (2)	12.6% (43)	<0.01
Other	27.4% (132)	25.3% (86)	32.4% (46)	n.s.
Lived in worksites/ dormitories / rental places with compatriots, % (n)	22.9% (112)	14.7% (21)	26.2% (91)	0.01
First time ever working in Russia, % (n)	38.5% (185)	11.2% (16)	50.1% (169)	<0.01
# of months since first working in Russia, mean (median)	37.4 (24)	48.1 (36)	32.9 (15)	<0.01
# of months of current stay in Russia, mean (median)	13.7 (6)	11.9 (4)	14.5 (8)	<0.01
Ever worked in Russia without legal permission, % (n)	29.9% (144)	44.8% (64)	23.6% (80)	<0.01

^a Total sample size was 499; however, there were missing data (usually, 3% or less) on all of the variables.

^b Nine participants did not identify their country of origin.

^c Significance was evaluated by Pearson's Chi Square for categorical data and by Mann Whitney U test for numerical variables.

Table II**Description of Psychosocial Scales Completed by Study Participants**

Scale	Description of Scale Construct	Sample Items	Score Range	Cronbach Alpha, Current Sample
HIV/AIDS Risk Knowledge	Respondent understanding of HIV risk reduction steps and misconceptions that could contribute to risk for contracting HIV (8 items)	"Most people who have the AIDS virus look sick;" "Washing carefully after sex helps to prevent getting AIDS and venereal diseases."	0–8	*
Safer Sex Behavioral Intentions	Strength of respondent plans to take personal actions in order to reduce HIV risk (7 items)	"I will refuse a sexual partner's pressure to have intercourse without a condom;" "I will use a condom regardless of whether or not I drink alcohol."	0–21	0.76
Safer Sex Perceived Norms	Strength of perceptions that close peers are taking HIV risk reduction steps and that risk reduction is an accepted peer norm (7 items)	"Condom use is accepted by my friends;" "Very few of my friends use condoms."	0–21	0.74
Safer Sex Self-Efficacy	Respondent's strength of personal confidence in ability to successfully enact HIV risk reduction steps (7 items)	"I am confident in using a condom;" "I can suggest condom use even to a partner with whom I had unprotected sex before."	0–21	0.82
Social Provisions Scale (SPS)	Quality and adequacy of perceived social support from others (24 items)	"There are some people I can depend on who help me if I really need it;" "If I need help, there is no one I can rely on."	24–96	0.84
Center for Epidemiological Studies-Depression (CES-D)	Level of recent depression in community population samples (20 items)	"I felt depressed;" "I had crying spells."	0–60	0.82
Perceived Discrimination	Reported experiences perceived by the respondent as discrimination by authorities, police, or members of the majority population based on ethnic origin (8 items)	"The militia police harass me for no reason;" "I have been refused a place to live because of my ethnic origin."	8–32	0.82

* Because the HIV/AIDS Risk Knowledge scale is intentionally composed of items reflecting knowledge in diverse areas, the measure's internal consistency is not a meaningful indicator of psychometric soundness.

Table IIIHIV Sexual Behavior Characteristics of Labor Migrants in St. Petersburg, Russia (n=499)^a

Variable	Overall Sample	Eastern European Migrants	Central Asian Migrants	p ^b
AIDS THEORY-BASED PREDICTOR SCALES AND SOCIAL AND MENTAL HEALTH WELL-BEING SCALES				
HIV risk knowledge	3.6	5.1	3.0	<0.001
Safer sex behavioral intentions	11.5	12.6	11.1	<0.001
Safer sex perceived norms	7.7	7.5	7.8	n.s.
Safer sex self-efficacy	10.0	10.3	9.8	n.s.
Social Provisions Scale (SPS)	75.7	82.0	73.0	<0.001
Center for Epidemiological Studies-Depression (CES-D)	16.8	15.3	17.5	0.006
Perceived discrimination	15.7	13.5	16.7	<0.001
PROPORTIONS OF PARTICIPANTS ENGAGING IN SEX AND HAVING MULTIPLE OR COMMERCIAL PARTNERS, PAST 3 MONTHS				
% (n) reporting sex in the past 3 months	69% (326)	91% (128)	60% (198)	<0.001
% (n) reporting sex with multiple partners in the past 3 months	30% (140)	39% (55)	26% (85)	0.003
% (n) reporting paying for sex in the past 3 months	9% (42)	9% (13)	9% (29)	n.s.
% (n) reporting selling sex in the past 3 months	3% (14)	1% (1)	4% (13)	0.061
NUMBER OF FEMALE PARTNERS, PAST 3 MONTHS AND PAST YEAR				
Mean (median) # of female sexual partners, past year	3.5 (1)	4.9 (2)	2.9 (1)	<0.001
Mean (median) # of female sexual partners, past 3 months	1.9 (1)	3.0 (1)	1.5 (1)	<0.001
Mean (median) # of female partners in home country, past 3 months	0.9 (0)	1.2 (1)	0.8 (0)	0.011
Mean (median) # of female partners in St Petersburg, past 3 months	0.9 (0)	1.6 (1)	0.6 (1)	<0.001
SEXUAL BEHAVIOR WITH PERMANENT PARTNERS				
% (n) reporting a permanent partner	46% (223)	74% (106)	34% (117)	<0.001
% (n) reporting one permanent partner only ^c	11% (52)	18% (26)	8% (26)	<0.001
% (n) reporting sex with multiple permanent partners, past 3 months. ^d	11% (64)	15% (21)	9% (31)	0.064
% (n) having a permanent partner in St. Petersburg, past 3 months	30% (142)	48% (67)	22% (75)	<0.001
Among them, mean (median) # of intercourse acts	37.7 (25)	43.7 (27)	32.3 (22)	n.s.
Among them, mean (median) percentage of condom use	35.0 (10)	26.8 (0)	42.2 (25)	0.064
SEXUAL BEHAVIOR WITH CASUAL PARTNERS				
% (n) reporting sex with a casual partner in the past 3 months	14% (69)	22% (31)	11% (38)	0.002
Among them, mean (median) # of casual partners	2.1 (1)	2.6 (1)	1.8 (1)	n.s.
Among them, mean (median) # of commercial partners ^e	2.0 (0)	0.2 (0)	3.5 (0)	0.036

Variable	Overall Sample	Eastern European Migrants	Central Asian Migrants	p ^b
Among them, mean (median) # of intercourse acts	8.8 (2)	9.3 (2)	8.4 (1.5)	0.041
Among them, mean (median) percentage of condom use	52.2 (50)	53.6 (50)	51.1 (50)	n.s.
Among them, % (n) reporting unprotected sex	62% (43)	58% (18)	66% (25)	n.s.
REPORTING HISTORY OF HAVING HAD AN STD, % (n)	9% (46)	18% (26)	6% (20)	<0.001

^a Total sample size was 499; however, there were missing data (usually, 3% or less) on all of the variables.

^b Significance was evaluated by Pearson's Chi Square for categorical data and by Mann Whitney U test for numerical variables.

^c Estimated from data: men who reported having a permanent partner, who reported only 1 total partner, and no casual partners in the past 3 months.

^d Estimated from data: men who reported having a permanent partner, who reported 2 or more total partners, and no casual partners in the past 3 months.

^e One outlier who reported 500 commercial partners was removed from the analysis.

Table IV**Multivariate Regression-Revealed Associations of Sexual Risk Behaviors**

Risk Characteristic	Significant Multivariate Associations	Results	
		Beta	p-value
Number of female sexual partners, past year			
	Region (0=C. Asia, 1=E. Europe)	0.11	0.039
	HIV knowledge	0.14	0.007
	Alcohol drinks per week	0.93	0.067
	Any drug used	0.20	<0.001
	Not enough money to buy condoms	−0.11	0.020
Number of female sexual partners, past 3 months			
	Education	0.13	0.008
	Region (0=C. Asia, 1=E. Europe)	0.11	0.043
	HIV knowledge	0.11	0.039
	Safer sex peer norms	0.13	0.008
	Alcohol drinks per week	0.13	0.013
	Any drug used	0.18	<0.001
Number of casual female partners, past 3 months			
	Alcohol drinks per week	0.36	0.004
	Any drug used	0.26	0.028
	Social support (SPS)	−0.34	0.005
Number of unprotected intercourse acts with casual partners, past 3 months			
	Age	−0.11	0.019
	Alcohol drinks per week	0.12	0.009
	Any drug used	0.24	<0.001
Percentage of condom use with casual partners, past 3 months			
	Region (0=C. Asia, 1=E. Europe)	−0.10	0.020
	Safer sex intentions	0.10	0.025

Table V

Multivariate Logistic Regression-Revealed Associations of Having Sex with a Casual Partner, Having Unprotected Sex with a Casual Partner, and Paying for Sex in the Past 3 Months.

Risk Characteristic	Significant Multivariate Associations	Results	
		OR	95%CI
Sex with a casual female partner			
	Age	0.95	0.92, 0.99***
	Region (0=C. Asia, 1=E. Europe)	2.01	1.16, 3.48**
	Any drug used	3.73	1.43, 9.71***
Unprotected sex with a casual female partner			
	Region (0=C. Asia, 1=E. Europe)	2.24	0.99, 5.04*
	Any drug used	3.06	1.08, 11.08**
	Social support (SPS)	0.96	0.94, 0.99**
Paid for sex			
	Age	0.95	0.91, 0.99**
	Alcohol drinks per week	1.05	1.02, 1.09****
	Social support (SPS)	0.96	0.93, 0.99***

*
p<0.1

**
p<0.05

p<0.01

p<0.001