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HIV Sexual Risk Behaviors and Multi-Level Determinants Among Male Labor Migrants from Tajikistan

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Abstract

The purpose of this study was to investigate HIV risk behaviors and their multilevel determinants in male labor migrants from Tajikistan to Moscow. In Russia and Central Asia, where AIDS rates are amongst the world's highest, conditions in both sending and receiving countries pose serious challenges to HIV prevention. A survey of Tajik married male seasonal labor migrants in Moscow was completed by 200 workers from 4 bazaars and 200 workers from 18 construction sites as part of a mixed method study. The quantitative results indicated that male labor migrants were at risk for HIV due to higher sexual behaviors including sexual relations with sex workers (92%), multiple partnering in the past month (86%), unprotected sex with sex workers (33%), and reduced frequency of condom use while drinking alcohol (57%). Multivariate tests indicated the multilevel factors that increased HIV sexual risks including: pre-migration factors (e.g. used sex workers in Tajikistan); migrant work and lifestyle factors (e.g. greater number of times visited Moscow); migrant sexual and relational factors (e.g. regular partner in Moscow); and migrant health and mental health factors (e.g. increased frequency of alcohol use). Qualitative findings from longitudinal ethnographic interviews and observations of a subset of 40 purposively sampled Tajik male migrants demonstrated how these multilevel pre-migration and migration factors account for HIV risk and protective behaviors in context. These findings underscore the seriousness of HIV risk for labor migrants and call both for multilevel approaches to prevention and for further study.

Keywords

HIV risk; labor migrants; Central Asia

INTRODUCTION

Central Asia and Eastern Europe report the fastest rates of HIV/AIDS growth in the world, doubling since 2001 (1). More than 1.4 million people in Russia, Eastern Europe and Central Asia were living with HIV in 2009. Massive political, social, cultural and behavioral changes, along with economic upheaval and the collapse of the public health infrastructure, have created circumstances conducive to the rapid spread of HIV/AIDS (2).

Tajikistan, a former Soviet republic, became one of the largest regional labor exporters in the aftermath of its civil war (1992–1997) (3). Over one million Tajik citizens work outside of their country. Russia is their primary destination. This is due to rapid economic growth in Russia, requiring laborers for the least desirable work. Most Tajik migrants in Russia live and work in Moscow, carrying goods in the bazaars and working in construction sites. Most migrants are male (80%), married (70%), and between 30 and 40 years of age (4). Far from their families, many Tajik male migrants have reported having sex with multiple partners including sex workers (5), who are known to have rates of HIV-1 that are 30 to 120 times higher than that of Moscow's general population (6).

As of May 2011 there were 3051 registered HIV positive cases in Tajikistan (7). Though Tajikistan is classified as a low-risk country, public health officials are concerned about the increased risk of HIV/AIDS. This includes the risk to labor migrants and the possibility that they may serve as a bridge for HIV transmission to the general population (8). Globally, labor migration is also recognized as an important contributor to the global HIV/AIDS epidemic. Evidence from several different geographic regions suggests that migrant workers are at higher risk of contracting HIV/AIDS (9, 10, 11, 12).

Approaches to HIV prevention are evolving from a single-minded focus on the development of interventions with individuals to include preventive strategies at the levels of couples, families, peer groups/networks, institutions, communities, and combinations thereof (15). The development of multilevel interventions calls for an evidence base explaining multilevel determinants.

The present study of labor migration and HIV/AIDS prevention amongst Tajik male migrants was guided by migration theory (13) and gender schema theory (14). It posited that labor migration transforms male migrants' experience of masculinity, which heightens HIV risk scenarios, and creates needs for innovative HIV prevention strategies. This theory provided a framework for investigating how pre-migration and migration factors act as determinants regarding migrants' HIV risk and protective behaviors.

The central research questions addressed in this study were: 1) What were migrants' pre-migration and migrant characteristics and behaviors regarding HIV/AIDS risk and protection? 2) How do these characteristics impact HIV risk and preventive behaviors? 3) What are the implications for HIV prevention and research regarding labor migrants?

METHODS

Approach to Sampling

Tajik male migrant workers from Moscow were sampled from bazaars and construction sites, which serve as the largest base of employment for the migrants in Moscow. For the first stage of each, sample size measures of the number of workers in each bazaar and the number of workers at each construction site were obtained from the Union of Tajik Migrants. The estimated population sizes for the two samples were as follows. There were 40 bazaars, with a total of 17,324 workers across all of them. There were 102 construction sites, with 7,336 workers across them all. Each bazaar and construction site was further divided into multiple brigades of workers.

Sampling from bazaars was conducted in three stages: sampling bazaars, sampling brigades within the bazaars, and sampling workers within the brigades. In the first stage, bazaars were sampled with probabilities proportionate to size (PPS), where the measure of size was the number of workers. In the second stage, because brigade size within bazaar varied little, brigades were sampled with simple random sampling (SRS). In the last stage, 10 workers

were sampled from each brigade with SRS. The sampling interval for the bazaars was 3464 (n/number of clusters). For the brigades the probability of selection was 4/# of brigades in the bazaar. The denominator of this fraction ranged from 3 to 140. In the bazaar with only 3 brigades, all three were sampled. In the bazaar that was sampled twice, the probability of selection of brigades was 8/140. For sampling workers in the brigades, the probability of selection was 10 divided by the brigade size. Simple random sampling (SRS) was implemented at the second and third stages by assigning random numbers to bazaars with sampled brigades and assigning random numbers to workers within sampled brigades. Random numbers were assigned using a random number generator.

The sampling of construction sites was a two-step process. In the first step, 20 construction sites were sampled from a total of 102, with PPS, where the measure of size was again the number of workers. In the second stage, a simple random sample of 10 workers was drawn from each of the 20 sites, for a total of 200 workers. The PPS procedure for the construction sites was the same as that for sampling bazaars. The process for sampling workers from each site was the same as the process for sampling workers from brigades. For the construction sites, the sampling interval for the sites was 367 (n/number of clusters). The probability of selection of workers was 10 divided by the number of workers at each site. The denominator ranged from 25 to 1000, but the site with 1000 workers was sampled 3 times, so that sampling fraction was 30/1000. The SRS process for construction workers was the same as described above for bazaars.

Measures

A survey instrument was developed that combined items and scales from existing instruments that have been used with migrants with new items and scales focused on key issues concerning masculinity and migration. The survey consisted of items with either forced choice (yes/no or Likert scale) responses or numerical response (e.g. estimate the percentage). It was designed to be self-administered in one hour or less in order to be easily completed by the migrants. Questionnaires were translated into Russian, as all Tajik migrants are literate in Russian. The survey consisted of questions in the following realms:

Pre-Migration—Items addressing age, educational level, region, family, and religion, were adapted from the Coffee and Families Education and Support (CAFES) and Collaborative HIV Prevention and Adolescent Mental Health Project (CHAMP) surveys (16, 17).

Migrant Work and Lifestyle—Items addressing number of visits to Russia, workplace, living place, and income were from the CAFES and Forced Migrations surveys (18).

Migrant Sexual and Relational—Items addressing age of prior sexual activity, current sexual activity, communication regarding sexual activity and HIV/AIDS, prior STD, HIV testing, and condom use, were adapted from the AIDS survey and CHAMP survey (17, 18, 19). HIV/AIDS knowledge was assessed with 18 items, worry about AIDS with 4 items, and talking with persons about AIDS with 7 items. These questionnaires were the HIV knowledge survey and CHAMP survey with alpha coefficients ranging from .74 to .87 in this study (17, 18).

Migrant Health and Mental Health—Health was assessed with the SF-12 (20). Cronbach's alpha was .70 for the sample. Health care access was assessed with a 5-item scale that was adapted from the CAFES surveys (16). Other items asked about alcohol and drug use. A Traumatic Events Inventory consisting of 18 items was designed by the researchers specifically for Tajik labor migrants based upon existing instruments for assessing traumatic events associated with torture and refugees as its foundation (21, 22).

The respondent indicates whether or not he experienced the event (direct trauma), or heard about others experiencing it (indirect trauma). A cumulative score over these 18 items was calculated. Cronbach's alpha scores were .81 (direct trauma) and .91 (indirect trauma) for the sample. Post-Traumatic Stress Disorder (PTSD) was assessed via the PC-PTSD Screen, a 4-item self-administered screen for PTSD that has been found to have good test-retest reliability ($r = .80$) and yielded a sensitivity of .91 and specificity of .80 using a cut score of 3 (23, 24). It consisted of 4 items, that correspond to the different PTSD symptom clusters: 1) Reexperiencing: nightmares or having thought about it (traumatic event(s)) when you didn't want to; 2) Avoidance: having tried hard not to think about it; 3) Hyperarousal: being alert, careful, frightened; 4) Numbness: felt numb or detached from others, activities, surroundings. Among Tajik labor migrants, the Cronbach's alpha was .90. Participation in community, family, village, party, and religious activities was assessed via 23 items that were adapted from the Forced Migration Survey (17). Cronbach's alpha coefficients were .64 to .94.

Careful attention was paid to cross-cultural preparation of the measures. The research team includes several professionals from both Tajikistan and Russia who assisted with the translation of the instruments and assessed the extent to which the translations succeeded. Each research team member carefully reviewed the instrument. Issues or disagreements were resolved by consensus. Think-a-loud interviews (both concurrent and retrospective) with migrants were used to ascertain what respondents thought questions meant and how they formulated their answers. The survey was piloted with 40 migrants. Item frequencies and scale reliabilities from the pilot data were compared to data collected from existing data sets. Items that did not fit the expected response patterns or that were difficult to answer were reassessed for cultural adaptability and then revised.

Procedures

Trilingual (Tajik, Russian, and English), trained interviewers described the study to prospective participants in either Tajik or Russian depending upon respondent preference, answered their questions, and then invited them to participate. Oral informed consent to participate was obtained as approved by the Institutional Review Boards of the University of Illinois at Chicago, Case Western Reserve University, the Ministry of Health of Tajikistan, and the Russian Academy of Arts and Sciences. Those persons who gave oral consent were asked to complete the survey. Surveys were self-administered survey in a private place (e.g. an office in the bazaar or the construction site), in the presence of a study fieldworker who offered to clarify any questions. Participants were each paid \$20 for their participation. Surveys were administered beginning in June 2009 and completed within two months.

Analytic Approach

To determine the migrants' characteristics and behaviors, we computed descriptive statistics (Tables 1 and 2) including comparing participants from bazaar and construction site subgroups using regression analysis with generalized least squares method for continuous measures and Rao-Scott adjusted chi-square tests for discrete measures. Tests of significance were conducted with adjusted F statistics. SAS software was used for all analyses (25). To assess the impact of these characteristics on HIV risk and prevention behaviors, a total of seven multiple regression and logistic regression models were constructed with different independent variables (Tables 3 and 4). The overall strategy was to regress each of the HIV risk and protection dependent variables onto sets of theory driven multilevel independent variables.

The theory driven multilevel independent variables belonged to five categories: 1) **Pre-Migration Characteristics** (age, level of education, amount paid for rent in Tajikistan,

number of people the individual lived with in Tajikistan, religion, age of sexual initiation, lifetime sexual partners, used sex workers in Tajikistan); 2) ***Migrant Work and Lifestyle Characteristics*** (number of times visited Moscow, bazaar or construction worker, amount paid for rent in Moscow, number of people the migrant lived with in Moscow, monthly salary in Moscow, amount of money sent home monthly, frequency of community activities, frequency of party activities, frequency of religious activities, frequency of visit villagers, and frequency of visiting relatives); 3) ***Migrant Sexual and Relational Characteristics*** (have a regular partner (RP) in Moscow, talk with wife regarding HIV, talk with wife regarding sex activity, talk with wife regarding condom use in Moscow, talk with RP regarding HIV, talk with RP regarding sex activity, talk with RP regarding condom use in Moscow; talk with friend in Moscow regarding HIV); 4) ***Migrant Health and Mental Health Characteristics*** (direct trauma exposure, indirect trauma exposure, PTSD symptoms, accessing health care, health status, alcohol use (>3 / wk), frequency of marijuana use, frequency of any drug use, previously HIV tested, know where to get HIV tested in Tajikistan, worry about HIV/AIDS, HIV knowledge, prior STD).

The HIV risk and protective behaviors related to dependent continuous variables assessed through multiple regression were: Model #1: Number of times had vaginal sex in the past month; Model #2: Number of times had vaginal sex in the past month with women other than your regular partner in Russia; Model #3: Number of sex workers whose sexual services were used in the past month; Model #4: Frequency of condom use with sex workers. The HIV risk and protection related dependent ordinal variables assessed through logistic regression were: Model #5: Have you ever used a Moscow sex worker? Model #6: Higher frequency of sex worker use? Model #7: Unprotected sex with sex workers in Moscow?

Though this paper focuses primarily on the quantitative data analysis, it utilizes a mixed methods research explanatory design (24) by incorporating qualitative data from the longitudinal ethnographic study of 40 Tajik labor migrants purposively selected from the survey sample. These qualitative findings mentioned were derived using a grounded theory approach to data collection and qualitative analysis (25, 26) that utilized Atlas/ti computer software (27).

RESULTS

Pre-Migration and Migrant Characteristics

The recruited and enrolled sample consisted of 400 Tajik married male migrants (Table 1) whose composition roughly reflected the regional diversity of Tajik migrants in Moscow (4): Dushanbe (63; 16%), Khatlon (114; 29%), Sughd (89; 22%), GBAO (41; 10%), and Subordinate Districts (92; 23%). The sample consisted of Sunni (353; 88%) and Ismaili (47; 12%) Muslims, whose average age was 31.5 years (SD = 6.1). Education level ranged from primary school through completion of university, with almost three-quarters of the men having completed secondary school. All of the men were married to a woman in Tajikistan. Twenty-three men (6%) were also married to a woman in Russia and (352; 88%) had a regular partner in Russia. The men had an average of 1.9 (S.D.=1.3) children in Tajikistan. The respondents financially supported an average of 6.6 persons in Tajikistan (SD=3.1).

Bivariate analyses comparing bazaar and construction workers (Tables 1 and 2) indicated that the migrants working in bazaars were younger, $F(1,20) = 5.00, p < .0369$, and less educated, $F(1,20) = 4.53, p < .0024$, came from different regions in Tajikistan (Khatlon, Dushanbe, and Subordinate Districts), $F(4, 80) = 7.97, p < .0001$, were more likely to be Sunni, $F(1,20) = 22.68, p < .0001$, and to live with more people in Tajikistan, $F(1,20) = 3.24, p < .0869$. In Moscow, they were more likely to have a regular sexual partner, $F(1,20)$

= 3.03, $p < .0971$, to earn less money, $F(1,20) = 10.01$, $p < .0049$, to live with more people due to the economic crisis, $F(1,20) = 13.10$, $p < .0017$, and to have fewer religious activities, $F(1,20) = 3.66$, $p < .070$. Bazaar workers also had an earlier age of sexual initiation, $F(1,20) = 12.39$, $p < .0022$, and were less likely to discuss HIV with their wives in Tajikistan, $F(1,20) = 12.89$, $p < .0008$. Bazaar workers had more direct trauma exposure, $F(1,20) = 13.73$, $p < .0014$, more indirect trauma exposure, $F(1,20) = 21.08$, $p < .0001$, higher frequency of PTSD diagnosis, $F(1,20) = 18.73$, $p < .003$, more PTSD symptoms, $F(1,20) = 8.09$, $p < .010$, and worse health status, $F(1,20) = 5.35$, $p < .0315$. Thirteen percent of the total sample reported having engaged in any drug use and 12% reported having used marijuana; there was no statistically significant difference between bazaar and construction workers with respect to drug use.

HIV Risk and Protective Behaviors

In the overall sample, male labor migrants were at risk for HIV due to sexual behaviors including use of sex workers (367; 92%), multiple partnering (having vaginal sex with a woman other than one's wife or regular partner in Moscow) in the past month (346; 87%), unprotected sex with sex workers (153; 33%), and less condom use while drinking alcohol (227; 57%). They also showed little condom use with regular partners in Moscow (34; 9%) and with their wives in Tajikistan (6; 1%), which poses HIV risks to these sexual partners. Bazaar workers were more likely to use Moscow sex workers, $F(1,20) = 25.66$, $p < .0001$.

Multilevel Determinants of HIV Sexual Risk and Protection

This section summarizes the results of the mixed methods analysis. For the quantitative analysis both multiple and logistic regression models were tested to examine the multilevel factors that determined indicators of HIV risk and protection (Tables 3 and 4). Combined models included pre-migration and migrant (work and lifestyle, sexual and relational, health and mental health) variables. For the qualitative analysis, ethnographic data was utilized to help explain the associations between pre-migration and migrant characteristics and HIV sexual risk and protection especially concerning those issues that would be pertinent for multilevel prevention. Below, the italicized bolded sentences represent key quantitative findings from the combined model regressions (Note: $p < .10$ was used for selection of items to explicate using the qualitative data). Each is followed by one or more sentences that explain the findings in context on the basis of the ethnographic evidence.

Pre-Migration Characteristics

Having less education was associated with more HIV sexual risk—Regression model #5 ($X^2 = 66.75$, $df = 5$, $p < .0001$, 83% concordant) showed that a lower level of education (OR = 0.4, 95% CI = 0.3, 0.5) was associated with having ever used a Moscow sex worker. Most men reported lacking education or practical knowledge regarding the risks of acquiring HIV/AIDS from sex workers. For example one said, “Those newcomers who come from the regions, I don't use condoms with them, but those who work here as prostitutes, I have used condoms in the first contacts, but after the third contact I ask them to refuse using condoms. I don't use condoms with student prostitutes.”

Having more lifetime sexual partners and using sex workers in Tajikistan was associated with more HIV risk—Regression model #6 ($X^2 = 66.75$, $df = 5$, $p < .0001$, 71% concordant) showed that a higher frequency of sex worker use was directly associated with sex workers in Tajikistan (OR = 2.6, 95% CI = 1.0, 6.7) and number of lifetime partners (OR = 1.0, 95% CI = 1.0, 1.1). Ethnographic analysis showed that some of those men who were taking more HIV sexual risks in Moscow also reported that they had

previously been more sexually active in other contexts, such as in Tajikistan, including unprotected sex with sex workers.

Sunni Muslims used condoms more frequently than Ismaili Muslims—

Regression model #4 ($R^2 = .18$, $F(5, 351) = 15.41$, $p < .0001$) showed that higher frequency of condom use with sex workers was directly associated with Sunni religion ($\beta = -0.50$, $p < .004$). Ethnographic analysis showed that Ismaili migrants reported two factors that could in part explain this association: using alcohol more than Sunnis and being more rural which meant less familiarity with HIV prevention strategies.

Older age of sexual initiation is associated with less HIV protection—

Regression model #7 ($X^2 = 84.85$, $df = 7$, $p < .0001$, 76% concordant) showed that an older age of sexual initiation is directly associated with more unprotected sex with sex workers (OR = 1.1, 95% CI = 1.0, 1.2). Ethnographic analysis showed that those who started sexual activity at an older age reflected less caution regarding HIV risk and protection. Most had not learned from practice the importance of condom use.

Migrant Characteristics

Work and Lifestyle

The more times migrants came to work in Moscow, the greater their HIV risk:

Regression model #3 ($R^2 = .11$, $F(5, 358) = 8.83$, $p < .0001$) showed that using the services of a greater number of sex workers in the past month was directly associated with more migration to Moscow [$\beta = 0.05$, $p < .001$]. Ethnographic analysis showed that first-time migrants expressed greater wariness about going out in Moscow and finding women to have sexual relations with than did migrants with greater familiarity and more social contacts in Moscow. New migrants to Moscow reported less language ability, not knowing how to move about the city, smaller networks of friends in Moscow, and not knowing the procedures for approaching sex workers and other women for sex. Additionally, with repeated visits came greater acculturation to Moscow sexual norms, where visiting sex workers without condoms is common practice amongst male migrants.

Alcohol and drug use, party activities and visiting villagers were associated with more

HIV risk: Regression model #1 ($R^2 = .24$, $F(8, 293) = 11.61$, $p < .0001$) showed that having more vaginal sex in the past month was directly associated with more party activities ($\beta = 0.07$, $p < .057$), heavy alcohol use ($\beta = 0.24$, $p < .004$), any drug use ($\beta = 0.45$, $p < .099$). Ethnographic analysis showed that migrants reported that a “real man” sought to have as much alcohol and as many sexual partners as possible, often together, and along with others from their villages with whom they live and work. “If you don’t drink vodka with me you don’t respect me.”

Visiting relatives in Moscow was associated with less HIV risk: Regression model #3 showed that using the services of a greater number of sex workers in the past month was directly associated with fewer visits to relatives ($\beta = -0.08$, $p < .068$). Ethnographic analysis showed that when a Tajik migrant had relatives in Moscow and met with them, then they were more likely to be under the influence of the family elder, whose job it was to protect and control his “avlod” or extended family members.

Living with more people in Moscow was associated with more HIV protection:

Regression model #2 ($R^2 = .23$, $F(7, 303) = 13.09$, $p < .0001$) showed that having more vaginal sex in the past month with women other than one’s regular partner was directly associated with fewer cohabitants in Moscow ($\beta = -0.01$, $p < .003$). Ethnographic analysis showed that migrants in more crowded living situations were more likely to be in the

presence of an older male migrant who acted as a leader and who would talk to the men about HIV risk and protection.

Sexual and Relational

Migrants with a regular partner in Moscow had higher HIV risk: Regression model #2 showed that having more vaginal sex in the past month with women other than one's regular partner was directly associated with regular partner in Moscow ($\beta = 0.37, p < .008$). Ethnographic analysis showed that male migrants took regular partners in order to have a living place or legal status, often switching partners and seeing other women concurrently with their regular sex partners. Some migrant men described themselves as "shustri" which means, "smart, clever, overcomes barriers, so as to do what you want to do."

Migrants who talked with their friends in Moscow regarding HIV had both more HIV risk and more HIV protection: More talking with friends in Moscow regarding HIV/AIDS was associated with using Moscow a sex worker (OR = 3.6, 95% CI = 1.6, 8.3); Regression Model #5) but also with less unprotected sex with sex worker (OR = 0.5, 95% CI = 0.3, 0.7); Regression Model #7). Ethnographic analysis showed that men often talk with each other about their sexual adventures with sex workers, and that sometimes this includes talking about whether or not they are going to get HIV/AIDS, often reflecting their partial knowledge: "We talk about HIV issue with our friends. Using condoms is very important. And also one should wash himself after sex, because washing could clean also the microbes from your body."

Health and Mental Health

Poorer health status and more indirect trauma were associated with higher HIV sexual risks: Regression model #6 showed that higher frequency of sex worker use was directly associated with worse health status (OR = 1.2, 95% CI = 1.0, 1.3). Ethnographic analysis showed that migrants reported that when feeling physical discomfort they often turned to sexual activity as a way to feel better. In general, migrants find it very difficult to manage their health in Moscow, living in adverse conditions with little to no access to health care.

More HIV/AIDS knowledge is associated with HIV protection: Regression model #4 showed that higher frequency of condom use with sex workers was directly associated with more HIV knowledge ($\beta = 0.03, p < .012$). Ethnographic analysis showed that some migrant men reported being more conscious of HIV/AIDS risk and more worried about getting infected.

Less HIV testing was associated with less HIV protection: Regression model #7 showed that getting less HIV testing was associated with more unprotected sex with sex workers (OR = 0.3, 95% CI = 0.2, 0.5). Many men were not aware of the importance of HIV testing or HIV treatment. However they reported believing that learning you have HIV is pointless because it is highly stigmatizing and a death sentence.

Higher PTSD symptom score was associated with less HIV protection: Regression model #7 showed that having unprotected sex with sex workers in Moscow was directly associated with higher PTSD symptoms score (OR = 1.2, 95% CI = 1.1, 1.4). Ethnographic analysis showed that migrants reported that fear and anxiety associated with trauma exposure in Moscow can make it harder for them to evaluate situations and know when they are at risk. "I can be killed tomorrow, so why should I be thinking about ten years from now?"

Discussion

This study found evidence to support concerns that have been raised about the HIV/AIDS risks of labor migrants from Central Asia to Russia, including Tajikistan (4, 5). The male labor migrants showed high rates of use of sex workers, unprotected sex with sex workers, multiple concurrent sexual partners, and less condom use while drinking alcohol. Moreover, they showed little condom use with wives in Tajikistan, which supports concerns regarding the possibility that male migrants may act as a bridge for HIV/AIDS infection to their home country (8). Though this study did not gather biological data to determine rates of infection amongst migrants, one important implication of these findings is that such studies would be warranted.

The study findings provided evidence of several key mechanisms and processes that are associated with HIV risk protection that could be helpful starting points for thinking about developing multilevel HIV prevention.

First, they point to individual level risk factors that are commonly a focus in HIV prevention activities, such as HIV knowledge and HIV testing, and which should be a focus of HIV prevention with male labor migrants. On the other hand, they also point to possible family level protective factors, such as visiting relatives, which suggests the potential value of both invoking the migrants' obligation to protect family members and involving these other family members in family-focused HIV prevention.

Second, the study findings provide evidence that challenges some important commonly held beliefs about preventing HIV among migrants' wives in Tajikistan (33). Previous research found that wives frequently believe that: 1) their husbands are not visiting sex workers in Russia; 2) if their husbands have a regular partner in Moscow, then they will not visit sex workers, and; 3) their migrant husbands can be trusted to protect them from HIV/AIDS. Our study found, however, that having a regular partner in Moscow is associated with having more vaginal sex with women other than the regular partner and with relatively little condom use. Our study findings may be critical to health advocates who seek to change existing health behaviors and beliefs and practices of sexual inequality. They call for public health campaigns to openly challenge these dangerous assumptions.

Third, the evidence points towards how the working and living conditions for labor migrants in Moscow tend to amplify some masculine norms that are associated with higher HIV sexual risk, such as drinking alcohol and multiple sexual partnering. Changing those conditions, or strengthening the migrants' capacities for alternatives ways of coping with such difficulties, could also be a focus of multilevel prevention. For example, male migrants need other avenues for socializing in their leisure hours that do not involve alcohol and sexual infidelity.

In contrast with one prior study of Eastern European and Central Asian labor migrants (30), the present study found that although intravenous drug use was low, there was some evidence that other drug use (e.g. marijuana, hash, snorting heroin) among Tajik labor migrants was associated with increased HIV/AIDS sexual risk. Drug use amongst migrants and their HIV risk merits further investigation and the development of specialized intervention programs.

In contrast with one prior report on risky spaces amongst Mexican labor migrants (31) the present study did not find any major differences in HIV risk between bazaars and construction sites that would indicate that one or the other was a more risky space, apart from the finding that a greater proportion of bazaar workers, compared to construction site workers, utilized the services of Moscow sex workers. However, the findings suggest that

the local geographies are highly complex and require more detailed analysis, perhaps using mixed-methods.

This study has several limitations. One, given the language and cross-cultural issues, there is always the possibility of misunderstandings. Two, this study relied on survey data at one time point only, so it cannot address longitudinal changes or make causal inferences. Three, Tajiks' experience may not be generalizable to other Central Asian labor migrants or to labor migrants generally. Further research is needed with rigorous, mixed-methods studies, and intervention studies focused on the interaction between HIV risk and protection and multilevel variables in labor migrants.

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Table 1

Pre-Migration Characteristics

	Full Sample (n=400)	Bazaar (n=200)	Construction (n=200)
Age	31.5(6.1)	30.1(1.0)	32.8(.6) **
Education			
Primary	25(6%)	17(8%)	8(4%) ***
Secondary	288(72%)	158(81%)	130(66%) ***
College	38 (9%)	12(5%)	26(13%) ***
University (come)	10(2%)	1(0.3%)	9(4%) ***
University (graduated)	39(10%)	12(6%)	27(13%) ***
Region			
Dushanbe	63(16%)	50(23%)	13(7%) ***
Khatlon	114(29%)	89(47%)	25(13%) ***
Sughd	89(22%)	3(1%)	86(38%) ***
GBAO	41(10%)	5(3%)	36(20%) ***
Subordinate	92(23%)	53(26%)	39(21%) ***
Religion			
Sunni	353(88%)	198(99%)	155(77%) ***
Ismaili	47(12%)	2(2%)	45(22%) ***
Marriage/Family			
Married to Tajik wife	400(100%)	200(100%)	200(100%)
# children (Tajik wife)	1.9 (1.4)	1.7 (1.3)	2.1 (1.3)
# people live w/ in Tajik.	6.6 (2.8)	6.9 (0.2)	6.3 (0.3) *
Married to Russian wife	23(6%)	14(7%)	9(5%)
Regular partner, Moscow	352(88%)	182(91%)	170(85%) *
Age of sexual initiation	18.7 (2.9)	18.0 (0.2)	19.5 (0.4) **
Lifetime sexual partners	8.9 (19.6)	8.9 (4.4)	8.9 (1.4)
Sex worker in Tajikistan	119 (30%)	71 (36%)	48 (24%)

* .1 < p

** p < .05

*** p < .005

Table 2

Migrant Characteristics

	Full Sample (n=400)	Bazaar (n=200)	Construction (n=200)
Work and Lifestyle			
# of times in Russia	4.3 (2.7)	4.3(0.4)	4.0(0.2)
Monthly income	17691(5448)	16205(341)	19143(864)***
Living with more people in Moscow	13.3(27.2)	22.5(10.7)	6.40(0.49)
Living with more people due to economic crisis	180(45%)	186(93%)	168(84%)**
Community activities	9.5(0.4)	9.8(0.2)	9.2 (0.4)
Party activities	4.6(0.4)	4.4(0.2)	4.8(0.2)
Religious activities	10.7(0.8)	9.9(0.4)	11.5(0.7)*
Visiting villagers	2.9(0.8)	2.8(0.7)	3.1(0.3)
Visiting relatives	2.5(1.2)	2.7(1.0)	2.3(0.3)
Sexual and Relational			
Vaginal sex in Moscow past month	2.1(0.99)	2.2(0.1)	2.1(0.12)
Vaginal sex with other than regular partner in Moscow past month	1.3 (0.9)	1.3 (0.8)	1.2 (1.0)
Sex worker in Moscow ever	367 (92%)	194(97%)	172(86%)***
Higher frequency of sex worker use	73 (18%)	40 (19%)	33 (18%)
Unprotected sex with sex worker	153 (33%)	79 (32%)	74 (34%)
Number of sex workers in Moscow past month	1.5 (.99)	1.7(.47)	1.3(.08)
Condom use w/ sex worker (always)	247(62%)	121(60%)	126(63%)
Condom use w/ regular partner (always)	34(9%)	16(6%)	126(9%)
Condom use w/ Tajik wife (always)	6 (1%)	1 (0%)	5 (2%)
Sexual activity with alcohol use	261(65%)	131(66%)	130(65%)
Less condom use with alcohol use	227(57%)	111(55%)	116(58%)
Talk w/wife regarding HIV	50(12%)	13(6%)	37(18%)***
Talk w/wife regarding sex activity	20(5%)	11(5%)	9(5%)
Talk w/wife regarding condom use, Moscow	15(4%)	7(3%)	8(4%)
Talk w/regular partner regarding HIV	128(32%)	64(32%)	64(32%)
Talk w/RP regarding sex activity	34(9%)	20(10%)	14(8%)
Talk w/RP regarding condom use in Moscow	54(13%)	33(16%)	21(10%)
Talk with friend in Moscow regarding HIV	283(73%)	142(75%)	141(71%)
Health and Mental Health			
Regular sexual partner in Moscow	352 (88%)	182 (91%)	170 (85%)*
HIV tested	263(66%)	117(59%)	145(73%)
Worry about HIV/AIDS	4.9(1.6)	4.8(0.2)	5.1(0.2)
HIV knowledge	8.5(4.4)	8.3(0.8)	8.7(0.4)
Prior STD	52(13%)	26(13%)	26(13%)
Direct trauma	1.8 (2.3)	2.5(0.3)	1.0(0.2)***

	Full Sample (n=400)	Bazaar (n=200)	Construction (n=200)
Indirect trauma	7.3 (4.4)	9.2(0.5)	5.6(0.6)***
PTSD by PC-PTSD screen	107(27%)	83(42%)	24(12%)***
PTSD symptoms	1.2(1.6)	1.7(0.35)	0.70(0.13)**
Accessing health care (higher is more)	14.1 (1.2)	14.0(0.1)	14.1(.1)
Health status (higher is worse)	33.5(6.2)	34.9(1.1)	32.2(0.5)**
Heavy Alcohol use (>3 / wk)	125(31%)	68(34%)	57(28%)
Marijuana use	47 (12%)	23 (11%)	24 (12%)
Any drug use	54 (13%)	29 (14%)	25 (12%)

* .1 < p

** $p < .05$

*** $p < .005$

Table 3

Multivariate Relationships

Risk and Protection Characteristics	Beta	P value
<i>Model #1: Number of women had vaginal sex with in Moscow past month</i>		
Number of people you live with in Tajikistan	0.04	.01
Number of people you live with in Moscow	-0.01	.005
Regular sexual partner in Moscow	0.61	.003
Lifetime sexual partners	0.01	.006
Prior STD	0.46	.026
Alcohol use	0.24	.004
Any drug use	0.45	.099
Party activities	0.07	.057
$R^2 = .24, F(8, 293) = 11.61, p < .0001$		
<i>Model #2: Number of women had vaginal sex with other than RP/wife past month</i>		
Number of people you live with in Moscow	-0.01	.003
Regular sexual partner in Moscow	0.37	.008
Lifetime sexual partners	0.01	.016
Prior STD	0.38	.018
Alcohol use	0.19	.010
Party activities	0.09	.001
Indirect trauma	0.03	.015
$R^2 = .23, F(7, 303) = 13.09, p < .0001$		
<i>Model #3: Number of sex workers in Moscow past month</i>		
Number of times in Moscow	0.05	.001
Sex worker in Tajikistan	0.45	.010
Party activities	0.11	.071
Frequency of visiting villagers	0.27	.009
Frequency of visiting relatives	-0.08	.068
$R^2 = .11, F(5, 358) = 8.83, p < .0001$		
<i>Model #4: Frequency of condom use with sex workers in Moscow</i>		
Religion (1=Sunni 2=Ismaili)	-0.50	.004
Alcohol use	0.01	.007
HIV tested	0.48	.001
HIV knowledge	0.03	.012
Talk with wife re condoms in Moscow	-0.58	.091
$R^2 = .18, F(5, 351) = 15.41, p < .0001$		

Table 4

Multivariate relationships: Logistic Regressions

Risk Characteristics Significant Multivariate Associations	OR	95% C.I.
<i>Model #5: Ever used a sex worker in Moscow?</i>		
Level of education	0.4	0.3, 0.5
Used sex worker in Tajikistan	22.0	1.9, 248.7
Prior STD	4.8	2.0, 11.3
Talk with regular partner regarding HIV/AIDS	0.3	0.2, 0.6
Talk with friends in Moscow regarding HIV/AIDS	3.6	1.6, 8.3
$X^2 = 66.75, df = 5, p < .0001, 83\%$ concordant		
<i>Model #6: Higher frequency of sex worker use?</i>		
Age	1.0	1.0, 1.1
Used sex worker in Tajikistan	2.6	1.0, 6.7
Number of lifetime sexual partners	1.0	1.0, 1.0
Party activities	1.2	1.0, 1.3
Health status	1.2	1.0, 1.3
$X^2 = 66.75, df = 5, p < .0001, 71\%$ concordant		
<i>Model #7: Unprotected sex with sex worker?</i>		
Number of people you live with in Tajikistan	0.9	0.9, 1.0
Religion (1=Sunni 2=Ismaili)	4.3	1.7, 11.0
Number of people you live with in Moscow	1.0	1.0, 1.0
Age of sexual initiation	1.1	1.0, 1.2
HIV tested	0.3	0.2, 0.5
PTSD symptoms by PC-PTSD screen	1.2	1.1, 1.4
Talk with friends in Moscow regarding HIV/AIDS	0.5	0.3, 0.7
$X^2 = 84.85, df = 7, p < .0001, 76\%$ concordant		