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HIV testing and access to HIV medical care among people who inject drugs and their intimate partners in Kazakhstan

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Abstract

Background—Growing rates of HIV and high rates of injection drug use in Kazakhstan call for examining access to testing and treatment among people who inject drugs and their intimate partners.

Objectives—We examine how access to health and drug treatment services as well as risk environment factors are associated with ever being tested for HIV and ever receiving any general HIV medical care among 728 male and female intimate partners where at least one partner injects drugs.

Methods—Multivariate random effects logistic regression with random effects for couple were conducted to examine associations between access to health and drug treatment services, risk environment factors, and HIV testing and HIV medical care outcomes.

Results—Analyses indicate that accessing needle exchange services and having a regular physician were associated both with access to HIV testing and HIV medical care. Receiving drug treatment was associated with accessing HIV testing but not HIV medical care. Being arrested and charged with a criminal offense was also associated with accessing HIV testing but not HIV medical care.

Conclusions/Importance—Study findings highlight the need for increased scale-up of HIV testing efforts, as well as integrated HIV treatment and care in Kazakhstan.

Keywords

HIV testing and treatment; Kazakhstan; Injection drug use

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INTRODUCTION

Extensive research demonstrates that providing HIV testing and HIV medical care to key populations including people who inject drugs (PWID) comprise effective HIV prevention strategies (Dieffenbach & Fauci, 2009; Granich, Gilks, Dye, De Cock, & Williams; Mathers et al., 2010; Weinhardt, Carey, Johnson, & Bickham, 1999). Despite this evidence, coverage of HIV testing among PWID in Central Asia remains limited (Vickerman et al., 2014). Research indicates testing coverage in Kazakhstan to be 11.2% (Republican AIDS Center, 2015), while approximately 65% of PWID in Kazakhstan received an HIV test in the prior year and were aware of their status (Terlikbayeva et al., 2013). Among people who were HIV positive, an estimated 65% were linked to care and 22-23% accessed antiretroviral therapy, although this number may be lower among PWID who are HIV positive (UNAIDS, 2012; Walsh & Maher, 2013).

Health care is provided free of charge for all citizens of Kazakhstan, under the universally guaranteed package of services. HIV testing and syringe exchange services are included in the guaranteed package and readily available at local policlinics and non-governmental organizations (Republic of Kazakhstan, 2009). HIV diagnostics and treatment are also provided through government-run AIDS Centers free of charge, HIV testing in correctional settings is mandatory, and substance use treatment in narcological facilities is available free of charge for registered substance users. Free services available include detoxification, psychotherapy, rehabilitation, and therapeutic community living in government-run narcological centers (Ministry of Healthcare and Social Development, 2014). Opioid substitution therapy (OST) has been introduced as a pilot initiative in 10 sites across the country, but is not available in Almaty city.

This paper examines 728 men and women who inject drugs and their intimate partners who participated in Project Renaissance, conducted between 2009 and 2012 in Almaty, Kazakhstan. We describe the prevalence of ever receiving an HIV test and ever accessing HIV medical care. We examine how HIV testing and HIV medical care are associated with socio-demographic characteristics, access to general health care and drug related services (needle exchange services, drug treatment, and having a regular physician), and structural risk environment factors (homelessness, food insecurity, and ever being arrested and charged with a criminal offense).

Due to the role of social and structural factors in shaping contexts of HIV prevention and treatment access (Rhodes, Singer, Bourgois, Friedman, & Strathdee, 2005; Wolfe, Carrieri, & Shepard, 2010), we hypothesize that participants who have access to health and drug related services (needle exchange, drug treatment, and a regular physician) and who have ever been arrested are more likely to have received an HIV test and HIV medical care, while those who experience food insecurity and homelessness are less likely to have received HIV testing and HIV medical care.

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METHOD

Study participants

We used baseline data from NIDA-funded Project Renaissance, conducted between 2009 and 2012 in Almaty, Kazakhstan. Study participants were recruited by trained research assistants through centers serving PWID, and word-of-mouth via other participants (Anonymous, 2013). Participants were eligible to participate if they met the following criteria: (1) both were aged 18 or older, (2) both identified each other as their main partner of the opposite sex and someone whom the participant considered a boy/girlfriend, spouse, lover and/or parent of his/her child, (3) both reported the relationship had existed for at least three months, (4) both reported intending to remain together for at least 12 months, (5) at least one partner reported having had unprotected vaginal or anal intercourse with the other partner within the previous 90 days, and (6) at least one partner reported injecting drugs within the previous 90 days. Participants were excluded if they met any of the following criteria: (1) either partner showed evidence of psychiatric, physical, or neurological impairment that would limit effective participation in the study, (2) either partner reported severe physical or sexual violence perpetrated by the other partner in the past year, as determined on a Revised Conflict Tactics Scale (Straus, 1979), (3) either partner reported that the couple was planning a pregnancy within the next 18 months, or (4) either partner was not fluent in Russian as determined during the informed consent process.

Inclusion and exclusion criteria were based on needs for Project Renaissance, a randomized clinical trial of a HIV/hepatitis C/sexually transmitted infection prevention intervention, conducted with couples where one or both partners inject drugs (Anonymous, 2013). A total of 971 individuals completed the screening interview. Of these, 728 met study eligibility criteria and completed the baseline interview. An additional 33 people were eligible but did not return to participate in the baseline. The Columbia University Institutional Review Board and the Kazakhstan School of Public Health Institutional Review Board approved all study procedures (Anonymous, 2013).

Data collection

Data collection included both self-reported data and objective biological assays. During the baseline visit, participants completed a 1.5-hour Audio Computer Assisted Self-Interview (ACASI) conducted in Russian in a private room. The ACASI included all measures described below. After the interview, a Clinical Research Coordinator (CRC) conducted individual pre-test counseling related to HIV privately with each participant. Within two weeks of the baseline interview, the CRC notified each participant privately of his or her HIV test results, conducted post-test counseling, and provided referrals and navigation to treatment when applicable. Participants received the equivalent of $10 USD for completing the baseline ACASI interview and biological testing.

Measures

Socio-demographic variables—Self-reported information was collected about participant's socio-demographic characteristics including age, gender, years of education, ethnicity, marital status (legally married and common-law marriage as 'married,' and

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divorced, separated, widowed, or never married as 'unmarried'), whether or not they had ever lived with their study partner, and whether participants had children.

Service utilization—Participants were asked if they had ever utilized syringe exchange services, and whether they had ever attended drug treatment for heroin addiction. Additionally, participants were asked if they had a regular physician.

HIV testing and HIV medical care—In the ACASI, participants reported whether they had ever received an HIV test. Participants who reported being HIV positive in the ACASI were asked whether they ever received any medical care for HIV. The variable 'medical care for HIV' thus refers to receiving any general medical care in relation to being HIV positive. We also asked those who reported being HIV positive in the ACASI whether they were taking antiretroviral therapy (ART).

HIV status—HIV status was measured through the use of biological assays. A dried blood spot (DBS) technique was applied where a whole blood spot was obtained by a finger prick, applied to five printed circles on DBS filter paper cards, and sent to the reference laboratory at the Republican AIDS Center (RAC). For the serologic surveillance, a standard enzyme-linked immunosorbent assay (ELISA test manufactured by Abbott Murex) was used (Young, Moyes, Seagar, & McMillan, 1998). Tests were conducted using a serial two-test strategy, as recommended by the World Health Organization and routinely used at the RAC. U.S. manufactured Abbott Murex Biotech tests were used for the second test. According to the RAC Guidelines for Serological Surveillance, the Murex anti HIV ABBOTT, has a reported sensitivity of >99.9% and specificity of 99%.

Risk environment—We asked participants if they had been without a place to sleep in the past 90 days to measure homelessness, and whether they had insufficient money for food in the past 90 days as an indicator of food insecurity. Additionally, we asked participants whether they had ever been arrested and charged with a criminal offense.

Statistical Analysis

Statistical analyses were performed in SPSS version 20. Bivariate relationships between receiving HIV testing, receiving HIV medical care, and each of the socio-demographic characteristics, service use, and risk environment factors were evaluated by t-tests for continuous variables and chi-square tests for categorical variables. Random effects logistic regression models were utilized to examine the relationship between HIV testing and HIV medical care outcomes with service utilization and risk environment factors, with couple identification number as a random effect to account for nesting of data within couples. HIV medical care outcomes were examined only among the sub-sample of participants who knew they were HIV positive prior to study participation. Random effects models were conducted with a binomial probability distribution and logit link function. Each adjusted regression model included socio-demographic covariates (age, gender, ethnicity, marital status, and years of education). Unadjusted odds ratios (OR), adjusted odds ratios (aOR), and their associated 95% confidence intervals are reported.

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RESULTS

Socio-demographic characteristics

Participant's average age was 35 and most completed over 11 years of education (See Table 1). Nearly two thirds of participants (65.7%) were ethnically Russian, although 11.7% were Kazakh and 22.7% comprised another ethnic group (Ukrainian, German, Tatar, Uighur, Uzbek, Roma, Dunghan, Korean, and others). Most respondents were married or in a common-law marriage (86.4%) and lived with their study partner (79.3%), while slightly more than half had children (52.9%). Of the sample, 96.4% of men (n=351) and 62.9% of women (n=229) reported ever injecting drugs (El-Bassel et al., 2013). Among the sub-sample of those who knew they were HIV positive, 100% of men and 80.3% of women had injected drugs.

Health and drug treatment service access and structural risk factors

Approximately one tenth of participants (11.1%) had ever utilized syringe exchange services, including 13.4% (n=78) of those who had ever injected drugs. A higher number (30.1%) reported ever attending drug treatment for heroin addiction, including 37.4% (n=217) of those who had ever injected drugs. A small number of participants who did not report ever injecting drugs reported utilizing syringe exchange services (n=3) and attending drug treatment for heroin addiction (n=2), suggesting perhaps that these few participants accessed drug treatment for non-injection heroin use, utilized needle exchange services for their partners or for other available services, or alternatively, that these participants did not accurately report their own history of injection drug use. Over one fourth (27.5%) of the sample had a regular physician.

Examining the structural risk environment, 13.5% of participants had experienced homelessness in the prior 90 days and nearly half of participants (48.8%) experienced food insecurity during the same period. Two thirds (67.0%) of study participants had ever been arrested and charged with a criminal offense.

HIV testing and socio-demographic characteristics, access to services, and structural risk environment

Of 728 study participants, 544 (74.7%) had received an HIV test. Table 1 examines bivariate relationships between HIV testing and socio-demographic characteristics, service usage, and structural risk factors. No significant differences in age, years of education, ethnicity, marital status, or ever living with one's study partner were found in respect to HIV testing. Participants with children were more likely to have been tested for HIV than those without children ($p<.05$). Those who utilized syringe exchange services, attended drug treatment for heroin addiction, or had a regular physician were more likely to have been tested when compared to those who had lower levels of service access (see Table 1). Additionally, those who were arrested and charged with a criminal offense were more likely to have been tested than those who were not been arrested. Food insecurity and homelessness were not associated with HIV testing.

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HIV medical treatment and socio-demographic characteristics, access to services, and structural risk environment

Although 183 participants (25.1%) tested HIV positive, 141 (77.0%) of those who tested positive were previously aware of their HIV positive status. Of these individuals, 73 (49.6%) ever accessed HIV medical care. Few (n=22) were taking antiretroviral therapy (ART), representing 15.6% of those who were aware of their HIV positive status (Anonymous, 2013).

When analyzing access to HIV medical care, this paper focuses only on the sub-sample who knew they were HIV positive (n=141). Similar to findings regarding HIV testing, socio-demographic characteristics did not vary significantly by whether participants accessed HIV medical care, although participants with children were again more likely to have accessed HIV medical care ($p<.05$, See Table 2). Participants who utilized syringe exchange services were more likely to have received HIV medical care ($p<.05$), as were those had a regular physician ($p<.001$). People who experienced food insecurity were less likely to have accessed medical care than those without food insecurity ($p<.05$).

Multivariate analysis of HIV testing and HIV medical care

We examined study hypotheses that participants who utilized needle exchange services, attended heroin treatment, accessed a regular doctor, or were ever arrested were: 1) more likely to be tested for HIV and 2) more likely to receive HIV medical care; and the hypothesis that participants who experienced food insecurity or homelessness were: 1) less likely to receive HIV testing and 2) less likely to receive HIV medical care, when controlling for socio-demographic characteristics.

Overall, unadjusted and adjusted models produced similar measures of association; adjusted models are reported here. Accessing HIV testing was associated with utilizing needle exchange services (aOR=2.219, 95% CI=1.122, 4.384), attending drug treatment for heroin addiction (aOR=2.804, 95% CI=1.793, 4.384), and having a regular physician (aOR=1.685, 95% CI=1.105, 2.570), in support of our hypotheses. HIV testing was not associated with homelessness and food insecurity. The odds of having an HIV test among those who were ever arrested and charged with a criminal offense was 2.721 times the odds of those who were not arrested in the adjusted model (95% CI 1.820-4.067).

Receiving HIV medical care was associated with utilizing needle exchange services (aOR=3.456, 95% CI=1.092, 10.892) and having a regular physician (aOR=4.884, 95% CI=2.032, 11.752), but not with attending drug treatment (aOR=1.177, 95% CI=.462, 3.001). In the multivariate models, receiving HIV medical care was not associated with risk environment characteristics, including criminal justice involvement.

DISCUSSION

Study findings suggest that access to HIV testing and HIV medical care among PWID and their intimate partners in Kazakhstan remains limited, where three quarters of our sample ever had an HIV test and only half of those who knew they were HIV positive ever accessed general HIV related medical care. Coverage of testing reflects scale-up efforts and may be

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higher than that found in other Central Asian countries (Thorne, Ferencic, Malyuta, Mimica, & Niemiec, 2010). Similarly, while access to HIV medical care was low, our finding that 15.6% of HIV positive participants accessed ART demonstrates higher levels of access than that observed in Uzbekistan, Russia, Pakistan, Chile, and Kenya, where less than 1% of PWID received ART (Mathers et al., 2010).

Study hypotheses that testing and treatment were higher among participants accessing needle exchange, drug treatment, and general health care services were partially supported. Accessing needle exchange services and having a regular physician were associated with receiving HIV testing and receiving HIV medical care, perhaps due to the frequent co-location of needle exchange services within HIV general polyclinics or AIDS Centers, where general medical care is also available. Syringe exchange programs may be an important venue for the promotion of HIV prevention and access to treatment (Vlahov, 2010), although additional research is needed to determine pathways of service access.

Drug treatment for heroin was associated with HIV testing but not with HIV medical care, suggesting drug treatment services may be a missed opportunity for linking HIV positive individuals to necessary medical care and treatment. Research suggests that opiate substitution therapies, particularly methadone but also buprenorphine and naltrexone, lead to improvements in adherence to ART and subsequent reductions in the likelihood of HIV transmission (Malta, Magnanini, Strathdee, & Bastos, 2010; Metzger, Woody, & O'Brien, 2010). Provision of evidence-based drug treatment services alongside clinical treatment for HIV is feasible (Altice et al., 2011) and could be a useful approach to improving both drug treatment and HIV related services for people who use drugs in Kazakhstan.

The association observed between HIV testing and criminal justice involvement likely coincides with mandatory testing policies within the prison system (Thorne et al., 2010). However, we did not find an association between accessing HIV medical care and being arrested and charged with a criminal offense. While the criminal justice system is an avenue within which testing and treatment can be delivered, access to care within prison systems is often negligible and links to care upon release are necessary (Azbel, Wickersham, Grishaev, Dvoryak, & Altice, 2013).

Contrary to study hypotheses, homelessness and food insecurity were not associated with decreased likelihood of accessing HIV testing or HIV medical care in the multivariate models, suggesting services reached those from various socio-economic backgrounds. The bivariate finding that participants with children were more likely to be tested and access HIV medical care may suggest that parents are more connected to health systems and medical care, perhaps due to mandatory HIV testing and subsequent treatment when needed during pregnancy.

Although scaling up HIV prevention services including testing, drug treatment, and ART can avert deaths and significantly reduce health care costs (Schwartländer et al., 2011), access to these services has been found to be low worldwide, especially among PWID (Degenhardt et al., 2010; Niccolai et al., 2010). People who are HIV positive and unaware of their status tend to change their risk behaviors upon being informed of their status (Marks, Crepaz,

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Senterfitt, & Janssen, 2005), highlighting the need for access to regular HIV testing among those with high risk behavior. To reduce HIV incidence, coverage of cost-effective measures including HIV testing and counseling, needle exchange programs, medication-assisted therapy, and ART needs to reach at least 60% (Dutta, Wirtz, Baral, Beyrer, & Cleghorn, 2012). UNAIDS ambitious treatment target is that by 2020, 90% of all people living with HIV will know their HIV status, 90% of people with diagnosed HIV infection will receive sustained ART, and 90% of those receiving ART will have viral suppression (UNAIDS, 2014).

Working towards these treatment targets in Kazakhstan, additional efforts to engage communities of people who inject drugs are needed. As HIV testing is provided only within government-run facilities in Kazakhstan, further scale up of HIV testing may be possible through community driven HIV testing and counseling efforts, which have demonstrated promise globally (Suthar et al., 2013). The City AIDS Center in Almaty, where study participants with positive HIV tests were referred, provided HIV clinical services, including laboratory monitoring and case management of HIV-positive patients by a multidisciplinary team of specialists (Ministry of Health, 2011). However, linkages across service sectors such as drug treatment and co-occurring infections, i.e., TB and HCV, were limited. Removing structural barriers to the integration of harm reduction and HIV treatment services is critical for the promotion of combination intervention approaches across Central Asia (Jolley et al, 2012).

Availability of preventative HIV health services may be insufficient to ensure access to testing and treatment when additional barriers including stigma, criminalization, discriminatory practices, and limited knowledge persist (Spicer et al., 2011). These barriers may lead to reluctance among PWID to receive HIV testing from government-run services, even when services are anonymous (Thorne, 2010). Research globally has identified the importance of coverage of a combination of services including syringe exchange, OST, and ART, alongside attention to social and structural barriers (Degenhardt et al., 2010) in order to prevent HIV infection. Continued attention to social and structural barriers to the provision of accessible combined approaches in Kazakhstan is needed (Krüsi, Wood, Montaner, & Kerr, 2010).

A primary limitation of the study is that the sample is not random, thus findings do not apply to all PWID in Kazakhstan. Furthermore, data was cross sectional and we cannot determine how access to services and structural risk environment factors may have influenced access to HIV testing and treatment. For example, while we examined having a regular physician and accessing drug treatment as independent correlates of HIV testing and HIV medical care, persons who test positive for HIV may be more likely to seek out such services. We were also limited in our ability to examine HIV treatment outcomes. We measured HIV medical care as a general variable rather than specifically looking at ART. However, a regular physician may have provided HIV medical care and participants may not have distinguished clearly between HIV medical care and medical care received for other conditions. Although our sample includes a portion of participants who did not report injecting drugs, we chose to include these non-injecting intimate partners in the analysis as they also experience risks for HIV and are in need of access to HIV testing and HIV medical care (Jenness, Neaigus,

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Hagan, Murrill, & Wendel, 2010). Partner and familial supports may be a relevant social component of treatment access for many PWID (Krüsi et al., 2010). We encourage further research into the role of relationship characteristics and social support in treatment promotion, as well as to the service needs of intimate partners of PWID (Hammett, Van, Kling, Binh, & Oanh, 2010; Solomon, Mehta, Latimore, Srikrishnan, & Celentano, 2010).

CONCLUSIONS

Study findings suggest that access to HIV testing is higher among PWID and their intimate partners who access syringe exchange services, drug treatment, a regular physician, and the criminal justice system. While testing has reached a large proportion of PWID and their intimate partners, additional attention is needed to increase access to regular testing and counseling for couples where one or both partners inject in Kazakhstan. Among people who knew they were HIV positive, those who received syringe exchange services and had a regular physician had higher rates of access to general HIV medical treatment. While links or co-location between services appears to be helpful, increased integration across HIV, drug treatment, and criminal justice systems is needed.

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Table 1

Socio-demographic characteristics, service use, and exposure to risk environment by HIV testing (N=728)

	Total Sample (N=728)	Ever had an HIV test (n=544)	Never had an HIV test (n=184)
Socio-demographics			
Age (mean, SD)	35.75, 7.8	36.0, 7.6	35.0, 8.4
Years of education completed (mean, SD)	11.4, 3.3	11.4, 3.2	11.5, 3.5
Gender (n, %)			
Male	364 (50)	275 (50.6)	89 (48.4)
Female	364 (50)	269 (49.4)	95 (51.6)
Ethnicity			
Kazakh	85 (11.7)	63 (11.6)	22 (11.9)
Russian	478 (65.7)	357 (65.6)	121 (65.8)
Other	165 (22.7)	124 (22.8)	41 (22.3)
Marital Status			
Married	629 (86.4)	471 (86.6)	158 (85.9)
Unmarried	99 (13.6)	73 (13.4)	26 (14.1)
Ever lived with study partner	577 (79.3)	432 (79.4)	145 (78.8)
Has children	385 (52.9)	301 (55.3) *	84 (45.7) *
Access to Services			
Ever utilized syringe exchange services	81 (11.1)	70 (12.9) *	11 (6.0) *
Ever attended drug treatment for heroin addiction	219 (30.1)	189 (34.7) **	30 (16.3) **
Has a regular physician	200 (27.5)	162 (29.8) *	38 (20.7) *
Structural Risk Environment			
Homeless in past 90 days	98 (13.5)	66 (12.1)	32 (17.4)
Food insecurity in past 90 days	355 (48.8)	270 (49.6)	85 (46.2)
Ever arrested and charged with a criminal offense	488 (67.0)	393 (72.2) **	95 (51.6) **

* $p<0.05$,

** $p<0.01$

Note: The significance test for differences was performed by t-test and chi-square test.

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Table 2

Socio-demographic characteristics, service use, and exposure to risk environment by access to HIV medical care among people aware of HIV positive status (N=141)

	Total Sample (N=141)	Ever had access to HIV medical care (n=70)	No access (n=71)
Socio-demographics			
Age	36.5 (7.4)	36.9 (8.1)	36.1 (6.6)
Years of education completed (mean, SD)	11.1 (3.7)	10.7 (2.4)	11.4 (4.7)
Gender (n, %)			
Male	80 (56.7)	38 (54.3)	42 (59.2)
Female	61 (43.3)	32 (45.7)	29 (40.8)
Ethnicity			
Kazakh	12 (8.5)	3 (4.3)	9 (12.7)
Russian	98 (69.5)	47 (67.1)	51 (71.8)
Other	31 (22.0)	20 (28.6)	11 (15.5)
Marital Status			
Married	119 (84.4)	62 (88.6)	57 (80.3)
Unmarried	22 (15.6)	8 (11.4)	14 (19.7)
Ever lived with study partner	116 (82.3)	59 (84.3)	57 (80.3)
Has children	73 (51.8)	40 (57.1)*	33 (46.5)*
Access to Services			
Ever utilized syringe exchange services	27 (19.1)	19 (27.1)*	8 (11.3)*
Ever attended drug treatment for heroin addiction	48 (34.0)	24 (34.3)	24 (33.8)
Has a regular physician	68 (48.2)	46 (65.7)**	22 (31.0)**
Structural Risk Environment			
Homeless in past 90 days	22 (15.6)	11 (15.7)	11 (15.5)
Food insecurity in past 90 days	67 (47.5)	26 (37.1)*	41 (57.7)*
Ever arrested and charged with a criminal offense	121 (85.8)	58 (82.9)	63 (88.7)

*p<0.05,

**p<.01

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Table 3

Mixed effect logistic regression of predictors of HIV testing with random effects for couple (N=728)[a]

	Unadjusted	Adjusted
Access to Services		
Ever utilized needle exchange services	2.307 [1.176, 4.527]*	2.219 [1.122, 4.384]*
Ever attended drug treatment for heroin addiction	2.694 [1.742, 4.170]**	2.804 [1.793, 4.384]**
Has a regular physician	1.616 [1.070, 2.440]*	1.685 [1.105, 2.570]*
Structural Risk Environment		
Homeless in the past 90 days	0.644 [0.399, 1.040]	0.643 [0.395, 1.048]
Insufficient money for food in past 90 days	1.150 [0.813, 1.627]	1.133 [0.798, 1.611]
Ever arrested and charged with a criminal offense	2.406 [1.692, 3.421]**	2.721 [1.820, 4.067]**

[a]each model controlled for age, gender, ethnicity, marital status, and years of education

*p<0.05,

**p<0.01

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Table 4

Mixed effect logistic regression of predictors of receiving HIV medical care with random effects for couple among people aware of HIV positive status (n=141)[a]

	Unadjusted	Adjusted
Access to Services		
Ever utilized needle exchange services	3.025 [1.047, 8.732] *	3.456 [1.092, 10.892] *
Ever attended drug treatment for heroin addiction	0.959 [0.424, 2.166]	1.177 [0.462, 3.001]
Has a regular physician	4.071 [1.833, 9.043] **	4.884 [2.032, 11.752] **
Structural Risk Environment		
Homeless in the past 90 days	1.094 [0.374, 3.203]	1.066 [0.346, 3.281]
Insufficient money for food in past 90 days	.463 [0.213, 1.008]	.493 [0.215, 1.134]
Ever arrested & charged with criminal offense	.588 [0.193, 1.791]	.533 [0.145, 1.964]

[a] each model controlled for age, gender, ethnicity, marital status, and years of education

* $p<0.05$,

** $p<0.01$