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The relationship between drug use stigma and HIV injection risk behaviors among injection drug users in Chennai, India

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Abstract

Background—The purpose of this study was to examine the relationship between perceived drug use stigma, acquiescence response bias, and HIV injection risk behaviors among current injection drug users in Chennai, India.

Methods—The sample consists of 851 males in Chennai, India who reported having injected drugs in the last month and were recruited through street outreach.

Results—Results indicate a strong and consistent positive association between drug use stigma and HIV injection drug use risk behaviors. This association held across the injection behaviors of frequency of sharing needles, cookers, cotton filters, rinse water, prefilled syringes and common drug solutions, even after controlling for acquiescence response bias, frequency of injection, and HIV/HCV serostatus.

Conclusions—These findings suggest that future HIV prevention and harm reduction programs for injection drug users and service providers should address drug use stigma.

Keywords

stigma; HIV; HCV; acquiescence response bias; risk behavior; India; injection drug use

1. Introduction

1.1. Background

In the last decade, there has been a wealth of empirical research on HIV stigma. In several counties, HIV stigma has been found to be associated with diminished access to HIV care, lower rates of HIV medication adherence, and poorer mental health (Dlamini et al., 2009; Kinsler et al., 2007; Whetten et al., 2008). HIV stigma has been conceptualized as multidimensional, manifested as a form of prejudice or discrimination, and based, in part, on power dynamics (Link & Phelan, 2007; Parker & Aggleton, 2003). Stemming from the work

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of Goffman (1963) which refers to stigma as a social role within interaction, HIV stigma has been defined as a socially constructed meaning about the devalued status of people who were perceived to have HIV or be associated with HIV (Herek et al., 2002; Tewksbury & Mcgaughey, 1997). For the recipient of stigma, internalized stigma may occur when individuals begin to expect the application of a stereotype and fear rejection and negative evaluations (Mahajan et al., 2008; Valdiserri, 2002). In addition, HIV stigma is not only the assigned attribute of individuals who are seropositive that is the target of stigmatization. It is often compounded with other socially stigmatized conditions, such as same sex partners, multiple partners, exchange partners, and injection drug users (IDUs) (Herek et al., 2005; Nyblade, 2006).

Although HIV stigma is considered a major obstacle to effective responses to the HIV/AIDS epidemic, very few studies have examined the stigma of drug use, and the link between stigma and high risk injection behaviors (Mahajan et al., 2008; Nyblade, 2006). In this paper, we assessed stigma associated with drug use among a sample of male injection drug users in Chennai, India and examined the relationship between levels of perceived drug use stigma and HIV injection risk behaviors.

1.2. HIV Stigma in India

While there is little information about drug use stigma in India, HIV stigma has been examined in detail in India. It is commonly reported as a tremendous burden among people living with HIV/AIDS (PLHAs) in India (Priya & Sathyamala, 2007). A study by Zelaya and colleagues (2008) found high levels of HIV stigma in a community sample in Chennai, India. Another Chennai study reported high levels of internalized stigma, which was negatively correlated with PLHAs' quality of life (Thomas et al., 2005). The most common expressions of internalized stigma included loss of hope and feelings of inferiority (Thomas et al., 2005). Research in India also indicates that HIV stigma may lead to social isolation and poor mental health (Bharat, 1995; Chandra et al., 2003a). In addition, many Indian families are concerned about affiliative stigma of an infected family member stigmatizing the whole family (Chandra et al., 2003b; Mawar et al., 2005). Sri Krishnan and colleagues (2007) discovered that many HIV affected families in Bangalore were highly concerned about stigma and many experienced discrimination in the health care system.

1.3. HCV stigma

Investigators have examined Hepatitis C (HCV) stigma. As HCV is frequently transmitted by injection drug use, HCV status may be viewed as a proxy measure of lifetime history of injection drug use and hence how medical professional treat HCV seropositives may indicate how they view injection drug users (Schafer et al., 2000). There have been several studies documenting HCV stigma. One study found that higher level of HCV stigma was associated with more perceived problems in health care, lower quality of life, and higher levels of anxiety and depressive (Zickmund et al., 2003), yet another study in Ireland found that HCV stigma was associated with injection drug use as the mode of infection (Golden et al., 2006).

1.4. IDU and drug use stigma

In many communities, illicit drug use and users are highly stigmatized. In the media, drug users are often negatively portrayed (Boyd, 2002; Manning, 2006). Labeling drug user with a deviant social status may serve to discourage illicit drug use. However, drug use discrimination and stigma has been found to negatively affect drug users' mental and physical health (Ahern et al., 2007; Link et al., 1997). Flom and colleagues (2001) reported that among drug users, crack and injection drug users had a greater social stigma than non-injected cocaine or heroin users, and a study of Thai nursing students using vignettes of a

hypothetical patient found that injection drug use was more stigmatized than HIV (Chan et al., 2008). Stigma of injection drug users by health care workers is well documented (McLaughlin & Long, 1996). In a study of comorbidities among HIV-infected injection drug users in Chennai, Indian, Solomon and colleagues suggested stigma as one of the reasons patients were reluctant to seek health care (Solomon et al., 2008a). Yet few studies have assessed how drug use stigma may influence HIV risk behaviors. One study in South West England by Simmonds and Coomber (2009) conducted qualitative interviews of pharmacies and injection drug users. They found a pervasive stigma surrounding being an injecting drug user and concluded that some IDUs may avoid needle exchanges located in community pharmacy settings due to fear of being recognized coupled with the stigma of injection drug use. In the current study, it was anticipated that drug use stigma would also have an impact on HIV injection risk behaviors, with individuals who report high levels of drug use stigma engaging in greater injection risk behaviors.

1.5. Acquiescence Response Biases

The current study also examined acquiescence response biases and their influence on participants' responses (Bentler et al., 1971; McClendon, 1991). Acquiescence response biases refer to the tendency of some respondents to agree with questions, regardless of question's content or meaning (Billiet & McClendon, 2000). Consequently, if the majority of questions are positively loaded, acquiescence bias may inflate the associations between the dependent and independent variables. Differences in acquiescent reporting have been found in several cross-cultural comparisons (Johnson et al., 2005; van Herk et al., 2004). Accordingly, acquiescence response biases are more prevalent among certain cultural settings, including India (Johnson et al., 2005). It was expected that although acquiescence biases might be present in the sample, controlling for it would not alter the association between stigma and injection risk behaviors.

2. Methods

2.1. Study participants

Data for this paper came from the baseline assessment from a longitudinal study of IDUs in Chennai, India. Recruitment for this study was conducted between March 2005 and April 2006 at the research facilities of the YR Gaitonde Centre for Substance Abuse Related Research (YRGCSAR), a non-governmental and non-profit organization.

IDUs were recruited by field staff throughout the city of Chennai. The staff targeted areas of the city known to be frequented by IDUs. Between March 2005 and April 2006, IDUs were recruited by outreach workers, who were primarily former IDUs, from areas in Chennai known to have large concentrations of IDUs. Outreach workers visited shooting galleries and other locations where IDUs frequent. Participants were also encouraged to refer other IDUs to the study. To be eligible for the study, IDUs had to (1) provide written informed consent for screening, (2) be at least 18 years of age, and (3) have injected at least once in the prior 6 months.

At the baseline, trained interviewers administered a face-to-face survey on HIV and HCV risk behaviors, patterns of drug use and drug overdoses, demographic factors, and drug use stigma. Participants also provided a blood specimen. All participants received pre- and post-test counseling. As few participants had ever received an HIV antibody test, we felt that questions about the HIV stigma experiences among seropositives would not be relevant. Participants also received information/counseling on safer injecting practices and tailored sexual risk-reduction counseling. This study was approved by Institutional Review Boards at

YRG CARE and the Johns Hopkins Bloomberg School of Public Health. Participants were compensated Indian rupees (INR) 150 (~USD 3.5) for the baseline interview.

2.2. Measures

2.2.1. Injection risk behaviors—were assessed by self-reported frequency of injecting drugs and sharing injection equipments (needles, cookers, cotton filters, and rinse water) and frequency of drawing up a drug solution from a common container in the past six months. The response categories were 9-point scales from “never/none” to “four or more times day/ almost every day”. Frequency of injecting drugs was dichotomized as “more than once a day” or “once a day or less”. Responses of the frequency of sharing equipments were dichotomized as “at least once a week” or “less than once a week.”

2.2.2. Stigma of drug use—was assessed through a scale that was developed based extensive formative research with participants and health care providers who worked with drug users in Chennai, India. During the formative phase, participants were asked to discuss their perceptions of how people in the community treated drug users and their reaction to this treatment. Based on piloting and psychometric analyses, 8 items were chosen for the study. The scale assessed participants’ beliefs of drug use, and their experience with family, friends and people in the community as a drug user on 4-point response options from “not at all”, “just a little”, “somewhat” to “very much”. Eight items included questions “how much do you feel that you need to hide your drug use,” “how much do you feel ashamed of using drugs,” “how much do you feel people avoid you because you use drug,” “how much do you fear you will lose your friends because you use drugs,” “how much do you feel fear family will reject you because you use drugs,” “how much do you think drug use is a punishment for something,” “how much do you feel that people don’t want you around their children because you use drugs,” and “how much do you think other people are uncomfortable being around you because you use drugs.” The scale had strong internal consistency, with Cronbach’s alpha of 0.93. A composite score for the stigma of drug use was calculated by adding dichotomized responses from these 8 items, with a range from 0 to 32. A binary variable for the level of drug use stigma was dichotomized at the median for the final analysis.

2.2.3. Acquiescence assessment—The approach for controlling acquiescence bias was based on the procedures developed by Welkenhuysen-Gybels and colleagues (Welkenhuysen-Gybels et al., 2003). This approach allows us to identify acquiescence as a common factor behind a set of agree-disagree items that are semantically balanced (Mirowsky & Ross, 1991; Waston, 1992; Welkenhuysen-Gybels et al., 2003). The scale of acquiescence bias was developed by choosing pairs of corresponding items that had response categories that were affirmative for one of the items and negative for the other items. In the present study, the acquiescence factor was created by using a six-item scale of the attitude toward police and each response was numerically coded on a 3-point response option from “agree”, “neither agree nor disagree” and “disagree”. These six items are systematically balanced; three items are worded in the opposite direction of the other three items with respect to the general construct being measured. For example, the question “The police assume everyone is a criminal” was paired with “The police treat community members with respect.” A composite score for the acquiescence factor was calculated by adding responses to the six items (range 0–18). The composite score indicated how many times respondents agreed to a set of oppositely worded statement, and respondents with a high value for this index indicated a tendency to acquiesce.

2.2.4. Confounders—Variables that may be associated with drug use stigma due to drug use experience and may be independently associated with injection risky behaviors were

controlled as confounders. These data included sociodemographic factors, such as age, marriage status, monthly income, current employment, education, and arrest in the past year, age starting injections and drug treatment.

2.2.5. HIV and HCV status—HIV serostatus was determined using double ELISA testing (Murex HIV-1.2.O, Abbott Murex, UK and Vironostika[®] HIV Uni-form II Ag/Ab, Biomérieux, The Netherlands). HCV was assessed using Murex Anti-HCV kit (Abbott Murex, Republic of South Africa).

2.3. Data analysis

Data analysis was limited to those participants who reported having injected drugs in the month prior to the baseline interview. Frequency distributions were calculated to examine the distribution of the variables and to generate a profile of this sample of active injection drug users. The outcomes of interest were the frequency of a list of high-risk injection behaviors, which were dichotomized as high or low. Thus, bivariate and multivariate logistic regression was done to assess the relationship between independent variables and the outcome variables. Acquiescence bias was treated as a control variable in examining the association between stigma of drug use and HIV injection drug use risk behaviors. Variance inflation factor (VIF) was checked to determine the potential multicollinearity among the independent variables. All analyses were performed using Stata Version 9.0 (StataCorp, 2005)

3. Results

3.1. Individual characteristics, drug use stigma and high risk injection behaviors

A total of 1,135 male injection drug users participated in the baseline survey and 851 of them reported injecting in the last month (76%). Table 1 presents the characteristics of these 851 active injection drug users. The average age of this sample was 34.9 years. More than two-thirds (68%) of the participants were married and thirty percent were single. About two-thirds (65%) had monthly income more than 1,500 INR (~USD 35). Most (89%) of the sample was currently employed and less than half (40%) had at least secondary school education. Twenty-four percent of the injection drug users had been arrested in the past year and 21% had ever received drug treatment. The average age of starting injecting drugs was 25.7 years. The prevalence of HIV and HCV in this sample was 27% and 59% respectively.

One hundred and thirty-two participants (16%) agreed all six items from two sets of questions on the attitude toward police, which were worded in the opposite direction. Almost two-thirds of the sample (62%) endorsed at least two out of three items from each set of questions. The reported score of acquiescence factor ranged from 0 to 18, and the average score for acquiescence factor was 9.4.

Among these 851 active injection drug users, types of drug injected in the past one month included heroin (80%), promethazine (42%), buprenorphine (30%), diazepam (10%) and About 14% of the sample reported injecting drugs more than once a day. The prevalence of sharing needles at least weekly in the past 6 months was 10%. Almost one-third shared cookers (32%) or cotton filters (32%) at least once a week in the past 6 months. Other high risk injection behaviors in the past 6 months included sharing rinse water (26%), using pre-filled syringe (10%) and drawing from common drug solution (21%) at least once a week. More than one-third of the sample (34%) had at least two high-risk injection behaviors per week in the past 6 months.

The average composite score for drug use stigma was 21.95 (SD=9.22) with a range from 0 to 32. Over two-thirds of the sample felt “very much” they needed to hide their drug use (67%), felt “very much” ashamed of using drugs (70%), and felt “very much” that drug use is a punishment for something (52%). About half of the sample feared “very much” they would lose friends (54%) and family would reject them (47%) because they used drugs. Many participants also reported experience of stigma from the community because they use drugs. About half of the participants felt “very much” that people avoid them (57%), people don’t want them around their children (47%) and other people are uncomfortable being around them (47%).

3.2. Bivariate analysis of high risk injection behaviors

Table 1 presents bivariate associations between high risk injection behaviors and individual sociodemographic background, arrest in the past year and drug treatment, the frequency of injection, health status, perceived drug use stigma and acquiescence factors. Results of bivariate analyses demonstrate a significant association between drug use stigma and all high risk injection behaviors, including high frequency of injection per day (Odds Ratio [OR]:3.85, 95%CI: 2.44,6.09), sharing needles (OR: 4.19, 95%CI: 2.38,7.37), sharing cookers (OR: 2.56, 95%CI: 1.89, 3.47), sharing cotton filters (OR: 2.78, 95%CI: 2.04,3.77), sharing rinse water (OR: 2.64, 95%CI: 1.90, 3.66), using pre-filled syringes (OR:5.36, 95%CI: 2.91, 9.86), sharing common drug solution (OR: 1.80, 95%CI: 1.27,2.55), and having at least two high risk injection behaviors per week (OR: 3.06, 95%CI: 2.27, 4.13).

3.3. Multivariate logistic regression models of high risk injection behaviors

The VIF among the independent variables ranged from 1.06 to 1.55 and the average VIF was 1.20, indicating there was no multicollinearity among the independent variables. As shown in Table 2, after adjusting for individual sociodemographic factors, history of arrest in the past year and drug treatment, ages of starting injection, health status and acquiescence bias, perceived higher level of drug use stigma remained consistently associated with higher frequency of injecting drugs (Adjusted Odds Ratio [AOR]: 3.75, 95%CI: 2.18,6.43), and sharing injection equipments, including sharing needles (AOR: 2.13, 95%CI: 1.11,4.08), cookers (AOR: 1.95, 95%CI:1.37,2.80), cotton filters (AOR: 2.48, 95%CI:1.73,3.56), rinse water(AOR: 2.32, 95%CI:1.58,3.41), using pre-filled syringe (AOR: 3.78, 95%CI: 1.90,7.51), sharing common drug solution (AOR: 1.70, 95%CI: 1.10,2.63) and having at least two high risk injection behaviors per week in the past 6 months (AOR: 2.48, 95%CI: 1.74, 2.53).

Results of the multivariate logistic regression also reveal the acquiescence bias was independently associated with several high risk injection behaviors, including sharing needles (AOR: 1.22, 95%CI: 1.15, 1.30), sharing cookers (AOR: 1.07, 95%CI: 1.03,1.12), sharing cotton filers (AOR: 1.05, 05%CI: 1.00, 1.09), using pre-filled syringe (AOR: 1.15, 95%CI 1.08,1.22), sharing common drug solution (AOR: 1.13, 95%CI: 1.08,1.18), and having at least two high risk injection behaviors (AOR: 1.06, 95%CI: 1.02,1.11).

4. Discussion

The results of this study indicate that among male IDUs in Chennai, India, there is a strong and consistent association between drug use stigma and high levels of HIV injection drug use risk behaviors. This association held across the injection behaviors of sharing needles, cookers, cotton filters, rinse water, and common drug solutions, even after adjusting for acquiescence bias and frequency of injection. Results from the current study demonstrate high levels of perceived drug use stigma. A large proportion of the participants expressed the shame of being a drug user and the fear of rejection by family and friends. In addition,

participants exhibited acquiescence bias, as a large proportion of the participants agreed all or at least two out of three items from each set of questions that were worded in the opposite direction. Moreover, we found positive associations between acquiescence bias and reported HIV injection risk behaviors. Often there is concern about social desirability bias in studies of risk behavior, which may lead to an under-reporting of behaviors that are perceived as socially undesirable. However, when risk behaviors questions are asked in the affirmative, acquiescence bias may lead to an over reporting of risk behaviors. Hence, it is important to balance questions by including negatively as well as positively worded questions. This finding suggests the importance of assessing and controlling acquiescence bias, especially in populations that may not be accustomed to survey research or who perceive that it would be rude or disrespectful to disagree with the opinion statements in an interview (Johnson et al., 2005).

Study limitations included restrictions on generalizability due to sampling strategy and the face-to-face assessment of illegal behaviors with the potential for heightened social desirability response bias. Generalizability is also limited by the unique characteristics of Chennai IDUs and the community's attitudes toward drug users. Additional studies are needed to examine how drug use stigma may be linked to drug use, relapse, treatment seeking, and risk behaviors within and across countries. In addition, the study was restricted to a sample of injection drug users but the questions asked about drug use in general. Hence, we do not know how much of the reported stigma was based on non-injection drug use as well as injection drug use. However, as the study targeted injection drug users and many of the questions focused on injection drug users, it is highly likely that participants considered their injection drug use in responding to the questions. Future research should examine the relationship between stigma and mode of drug use and how national and local drug laws and policies influence the stigmatization of drug users. As with HIV stigma, injection drug use stigma is likely to be multidimensional, especially among those experiencing HIV and Hepatitis. The relationship between specific dimensions and injection risk behaviors is also an important topic for future research.

Although this study found a strong link between drug use stigma and risk behaviors, we do not know the mechanisms of this association or the directionality. Future research should also examine the mediators in the link between stigma and risk behaviors. There are several potential explanations for the association between drug use stigma and injection risk behaviors. Drug users may be excluded from their broader social network, and hence turn to their drug network for support, which may increase the likelihood of high risk injection behaviors (Fitzgerald et al., 2004). Fear of being labeled as a drug user may lead injectors to refrain from accessing syringes at needle exchange programs and pharmacies or from carrying their own injection equipment (Simmonds & Coomber, 2009). Alternatively, drug use severity may lead to stigmatizing behaviors, such as public injecting and intoxication, and to increased injection risk behaviors. Moreover, those with lower social status may have high levels of stigma and less social power to prevent sharing of injection equipment. Depression caused by drug use stigma may also lead to injection risk behaviors.

A recent report of high burden of HIV, HCV and Hepatitis B(HBV) among IDUs in Chennai, India called for a timely action to increase the access of prevention and treatment programs among IDUs (Solomon et al., 2008b). Results from the current study suggest future prevention programs that aim to reduce HIV risk behaviors among drug users need to address drug use stigma. While it may be difficult to change the stigma of drug users in the community due to the negative portrayal of drug users in the media and the association between certain types of drug use and crime, it may be feasible to reduce drug use stigma by enhancing the training in addiction sciences for health professionals, especially emergency medical services personal and among individuals in criminal justice professions. These

professionals often interact with drug user based on limited training in science of substance abuse and treatment. In addition, it is also important to address the topic of drug use stigma in harm reduction and health promotion programs and to develop empirically based interventions to reduce drug use stigma. Similar to the anti-tobacco movement coupled with a social transformation that has stigmatized smokers (Bayer & Stuber, 2006), stigma may serve as a deterrent to illicit drug use and drug prevention programs may have had profound impacts on the social standing of drug users. The present study finding of the association of stigma and injection risky behaviors is a cause for concern. The issue of how to implement drug prevention program without stigmatizing drug users warrants further discussion and research.

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Table 1

Bivariate associations with injection behaviors in the past 6 months among active IDUs (n=851)

	Total (n=851)	>=2 injection a day N(%)	Sharing needles# N(%)	Sharing cookers# N(%)	Sharing cotton filters# N(%)	Sharing rinse water# N(%)	Using pre-filled syringes# N(%)	Sharing common drug solution# N(%)	>=2 HIV high risk injection behaviors N(%)
	N(%)	OR(95%CI)	OR(95%CI)	OR(95%CI)	OR(95%CI)	OR(95%CI)	OR(95%CI)	OR(95%CI)	OR(95%CI)
Age (Mean (SD))	34.92(7.37)	0.99(0.96,1.01)	1.01(0.99,1.05)	0.99(0.98,1.02)	0.99(0.97,1.01)	0.99(0.96,1.03)	1.01(0.99,1.04)	0.99(0.98-1.01)	
Marriage status									
Married	573(68)	0.44(0.30,0.65)***	0.95(0.59,1.54)	0.82(0.60,1.11)	0.81(0.60,1.11)	0.77(0.56,1.07)	1.14(0.79,1.64)	0.86(0.63,1.16)	
Single & Other	269 (32)								
Monthly income:									
<=500	261(35)								
>500	486 (65)	1.10(0.72,1.70)	0.33(0.20,0.53)***	1.01(0.73,1.39)	0.99(0.72,1.37)	0.83(0.59,1.16)	0.67(0.46,0.96)*	0.78(0.57-1.07)	
Current employment									
Unemployed	92(11)								
Employed	747(89)	1.38(0.70,2.75)	1.62(0.69,3.84)	1.22(0.75,1.96)	0.93(0.59,1.48)	0.95(0.58,1.54)	0.87(0.52,1.46)	1.00(0.64-1.58)	
Highest level of education									
< secondary school	514(60)								
>=secondary school	337 (40)	0.55(0.36,0.85)**	0.52(0.31,0.87)*	0.60(0.44,0.81)**	0.75(0.59,1.02)+	0.66(0.48,0.91)*	0.43(0.25,0.73)**	0.74(0.53,1.05)+	0.67(0.50-0.90)**
Arrived in the past year	197 (24)	1.59(1.04,2.45)*	2.51(1.56,4.02)***	1.45(1.04,2.02)*	1.34(0.96,1.88)+	1.10(0.77,1.57)	1.68(1.02,2.74)*	1.91(1.31,2.76)**	1.41(1.01-1.96)*
Ever attended drug treatment									
Yes	169(21)	1.08(0.67,1.74)	0.87(0.48,1.57)	0.91(0.63,1.31)	0.89(0.62,1.29)	0.80(0.54,1.19)	0.75(0.40,1.40)	1.48(0.99,2.21)+	0.84(0.58-1.20)
Age starting injection:									
Mean (SD)	25.65 (7.05)	0.92(0.89,0.95)***	1.01(0.98,1.04)	0.98(0.96,1.00)+	0.98(0.96,0.99)+	0.98(0.96,1.01)	0.98(0.95,1.02)	1.00(0.98,1.03)	0.98(0.96-0.99)*
Injected drugs more than once/day									
Yes	120(14)	---	1.03(0.54,1.97)	3.12(2.10,4.63)***	2.76(1.86,4.09)***	2.60(1.74,3.88)***	0.29(0.10,0.80)*	1.32(0.84,2.08)	2.66(1.80-3.94)***

	>=2 injection a day N(%)	Sharing needles# N(%)	Sharing cookers# N(%)	Sharing cotton filters# N(%)	Sharing rinse water# N(%)	Using pre-filled syringes# N(%)	Sharing common drug solution# N(%)	>=2 HIV high risk injection behaviors N(%)
Total (n=851)	120(14)	82 (10)	269(32)	272(32)	221(26)	81(10)	175(21)	293(34)
	OR(95%CI)	OR(95%CI)	OR(95%CI)	OR(95%CI)	OR(95%CI)	OR(95%CI)	OR(95%CI)	OR(95%CI)
HIV serostatus								
Negative	618 (73)							
Positive	2.89 (1.94,4.29)***	0.97(0.59, 1.64)	0.92(0.66,1.27)	0.94(0.68, 1.31)	0.82(0.58,1.17)	0.86(0.51, 1.47)	1.30 (0.90, 1.87)	0.87(0.63,1.20)
HC serostatus								
Negative	345(41)							
Positive	2.93(1.84,4.66)***	0.65(0.41, 1.02) ⁺	1.03(0.77, 1.38)	1.03(0.77, 1.39)	0.86(0.63, 1.17)	0.62(0.39, 0.99) *	1.22(0.86,1.71)	0.99(0.74, 1.33)
Stigma of drug use								
Mean (SD)	21.95(9.22)							
Low	408(48)							
High	443(52)	3.85(2.44,6.09)***	2.56(1.89,3.47)***	2.78(2.04,3.77)***	2.64(1.90,3.66)***	5.36(2.91,9.86)****	1.80(1.27,2.55)***	3.06(2.27,4.13)****
Acquiescence factor: Mean (SD)	9.41 (4.34)	1.02(0.98,1.07)	1.24(1.18,1.30)***	1.05(1.01,1.08)**	1.02(0.99,1.06)	1.18(1.12,1.23)***	1.17(1.13,1.21)***	1.07(1.03,1.10)****

at least once a week

+ p<.05

* p<.01

** p<.001

*** p<.0001

Table 2
Multivariate logistic analyses of high risk injection behaviors in the past 6 months among active IDUs

	Injecting drugs at least twice a day (n=730)	Sharing needles at least once a week (n=712)	Sharing cotton filters at least once a week (n=711)	Sharing rinse water at least once a week (n=712)	Using pre-filled syringes at least once a week (n=711)	Sharing common drug solution at least once a week (n=712)	>=2 HIV high risk injection behaviors a week (n=712)
	AOR (95%CI)	AOR (95%CI)	AOR (95%CI)	AOR (95%CI)	AOR (95%CI)	AOR (95%CI)	AOR (95%CI)
Marriage status							
Married	0.66(0.41,1.06) ⁺	0.93(0.64,1.35)	0.93(0.64,1.35)	0.85(0.58,1.25)	1.29(0.68,2.45)	1.40(0.88,2.23)	1.01(0.70,1.47)
Monthly income							
>1500	1.33(0.81,2.18)	0.50(0.29,0.87) [*]	1.12(0.78,1.59)	0.94(0.65,1.36)	0.39(0.23,0.69) ^{**}	0.86(0.57,1.30)	0.89(0.63,1.26)
Education							
>=Secondary school	0.77(0.46,1.27)	0.58(0.31,1.08) ⁺	0.79(0.55,1.12)	0.71(0.48,1.03)	0.37(0.19,0.74) ^{**}	0.67(0.44,1.03)	0.68(0.47,0.97) [*]
Arrested in the past year							
Yes	1.41(0.85,2.34)	2.03(1.09,3.78) [*]	1.15(0.77,1.72)	0.97(0.63,1.49)	0.94(0.48,1.86)	1.17(0.73,1.86)	1.14(0.76,1.71)
Age of starting injection	0.95(0.91,0.99) [*]	1.04(0.99,1.08) ⁺	0.99(0.97,1.02)	0.99(0.97,1.03)	0.99(0.95,1.03)	1.05(0.61,1.79)	0.99(0.97,1.02)
Ever attended drug treatment							
Yes	1.10(0.60,2.03)	0.62(0.28,1.37)	0.84(0.52,1.36)	0.91(0.55,1.52)	0.69(0.29,1.62)	1.05(0.61,1.79)	0.75(0.46,1.21)
Injected > once/day							
Yes	---	0.84(0.36,1.95)	2.38(1.49,3.81) ^{***}	2.50(1.55,4.01) ^{***}	0.13(0.03,0.55) ^{**}	1.32(0.76,2.31)	2.45(1.53,3.94) ^{***}
HIV serostatus							
Positive	1.89(1.12,3.20) [*]	0.82(0.38,1.76)	0.77(0.50,1.20)	0.70(0.44,1.12)	0.69(0.32,1.53)	1.07(0.64,1.78)	0.68(0.44,1.06) ⁺
HCV serostatus							
Positive	1.95(1.07,3.56) [*]	0.46(0.22,0.93)	0.95(0.63,1.44)	0.89(0.58,1.37)	0.62(0.31,2.25)	0.78(0.47,1.29)	0.93(0.62,1.40)
Stigma of drug use	3.75(2.18,6.43) ^{***}	2.13(1.11,4.08) [*]	2.48(1.73,3.56) ^{***}	2.32(1.58,3.41) ^{***}	3.78(1.90,7.51) ^{***}	1.70(1.10,2.63) [*]	2.48(1.74,3.53) ^{***}
Acquiescence factor	0.95(0.89,1.01) ⁺	1.22(1.15,1.30) ^{***}	1.05(1.00,1.09) [*]	1.03(0.99,1.08) [*]	1.15(1.08,1.22) ^{***}	1.13(1.08,1.18) ^{***}	1.06(1.02,1.11) ^{**}

⁺ p<.10,

^{*} p<.05,

^{**} p<.01,

100<.000

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