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The Profile of Injection Drug Users in Chennai, India: Identification of Risk Behaviours and Implications for Interventions

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Abstract

We characterize the demographics, injection practices and risk behaviours of 1158 injection drug users (IDUs) in Chennai, the capital of Tamil Nadu in southern India who were recruited in 2005–2006 by community outreach. The median age was 35 years; the majority of IDUs were male, of Tamil ethnicity and married, earning less than USD 75 per month. Most (76%) had injected in the prior month. The median age at first injection was 25 years; the most common drug injected was heroin (80%) followed by buprenorphine. High risk behaviours were common and included needle sharing, unsafe disposal and inappropriate cleaning of needles as well as limited condom use. IDUs in India need to be educated on harm reduction and safe-injection practices; Pharmacies could serve as potential venues for HIV prevention interventions among IDUs in India as most IDUs obtain their needles from pharmacies without prescription.

Keywords

Injection drug use; India; risk behaviour; HIV

Background

Injection drug use in India was initially recognized in the Northeastern (NE) states of Manipur and Nagaland, likely due to their proximity to the ‘Golden Triangle’ – Burma, Thailand and Cambodia (Gammelgaard, 1992). However, injection drug use has increasingly extended outside the NE regions to southern states of Tamil Nadu (Kumar, 2000) and Maharashtra (Saraswathi, 2007), and recent reports suggest emerging epidemics in Northern states of Punjab and Haryana (Zaheer K, 2007), which border Pakistan. Estimates of the absolute number of injection drug users (IDUs) in India have been highly variable, ranging from 164,820 to 1,294,000 IDUs with some estimates suggesting that the metropolitan cities of Delhi and Mumbai have among the largest populations of IDUs in the

world (Aceijas, 2006; Mathers, 2008). The 2008 World Drug Report reported that Afghanistan produced 8,200 metric tons of opium in 2007 – the largest in the world, and a large proportion of this trafficked via Pakistan to India. This report also suggested that Asia was the largest market for consumption of heroin, with India being the largest consumer in the region (~3 million opiate users) (United Nations Office on Drugs and Crime, 2008).

IDUs are at high risk for HIV, hepatitis C virus (HCV) and hepatitis B virus (HBV) among other bloodborne infections. Estimates of the prevalence of HIV among Indian IDUs encompass a broad range from 1 to 68% (Aceijas, 2006), with recent national estimates suggesting a prevalence of 15% among IDUs greater than 25 years of age (NACO, 2006). National sentinel surveillance data further suggest that the highest HIV prevalence is in Tamil Nadu, a state in Southern India (24%), followed by Mumbai (20%) in the west and Manipur (20%) in the northeast (NACO, 2006). Observational studies have reported HIV prevalence among IDUs as high as 80% in some groups in Manipur (Devi, 2005; Panda, 2005; Dorabjee, 2000). Chennai (formerly known as Madras), the capital of Tamil Nadu, has approximately 10,000 to 15,000 IDUs (Dorabjee, 2000; Panda, 2005); HIV prevalence amongst IDUs in Chennai is estimated to range from 20 to 40 % (NACO, 2006; Solomon, 2008; Panda, 2005; Kumar, 2000). Prevalence estimates of HCV and HBV in India range from 50–90% and 70–90%, respectively.

Until recently, the National AIDS Control Programs (NACP) have been focused on heterosexual at-risk populations in India (National AIDS Control Organization, 2005). However, the NACP Phase III has revised its focus to include IDUs in planned targeted interventions (National AIDS Control Organization, 2006). Relatively few recent studies have characterized in detail the risk behaviours and/or socio-demographic profile of IDUs in India, which are critical to the implementation of such prevention/treatment interventions. Those that have been reported were limited by small sample size or were restricted to subsets of IDUs (Panda, 2005; Kumar, 2000). In 2000, Kumar and colleagues carried out a rapid assessment of injection drug use in Chennai through a combination of focus groups and 100 semi-structured interviews among IDUs (Kumar, 2000). Panda and colleagues conducted a larger study in 2003 (n=226) but this study was restricted to married IDUs (Panda, 2005). We extend these studies by characterizing in depth the drug use practices, living conditions and risk behaviors of a large sample of IDUs (n=1158) previously demonstrated to have high HIV prevalence (Solomon, 2008). Further, we compare whether risk behaviors are different among older IDUs compared to those who have more recently initiated injection drug use.

Methods

Study setting

A longitudinal cohort study of IDUs, the Madras Injection Drug Users and AIDS Cohort Study (MIDACS) was initiated in March 2005 through the YR Gaitonde Centre for Substance Abuse-Related Research (YRGCSAR) located in north Chennai (Solomon, 2008). The goals of the MIDACS were to measure the incidence of HIV and examine the natural history of drug abuse among IDUs in Chennai. YRGCSAR is a satellite of the YR Gaitonde Medical Educational and Research Foundation (YRGMERF), a not for profit non-governmental organization that has been involved in treatment and prevention studies related to HIV since the early 1990s. YRGCSAR is a drop-in center that provides VCT services to the population of North Chennai, where the majority of IDUs in Chennai reside. Additionally, there is also an on-site HIV clinic and private rooms for the administration of the informed consent and study forms for research studies. This study was approved by the YRGCARE and Johns Hopkins Bloomberg School of Public Health Institutional Review Boards.

Study Population

Between March 2005 and April 2006, a convenience sample of IDUs from different regions of Chennai was actively recruited by outreach field staff, primarily former IDUs, to participate in this longitudinal cohort study. Field staff visited shooting galleries and other locations where IDUs tend to congregate to recruit participants. Participants were also permitted to refer other IDUs to the study site for participation in the cohort study. Participants were eligible for the study if they were 18 years of age and older and had injected drugs at least once in the prior six months by self-report. 1184 IDUs were screened between March 31, 2005 and March 10, 2006. Of these, 1172 (99%) provided written informed consent to participate in the study and 1158 (98%) provided a blood sample and responded to a behavioral survey. HIV negative participants were enrolled in a longitudinal study to characterize HIV incidence and those tested positive for HIV were followed up at an on-site clinic at YRGCSAR for HIV and general medical care.

At baseline and subsequent follow-up visits, all study participants 1) underwent a blood draw; 2) received pre-and post-test HIV and risk-reduction counseling; and 3) received a structured interview where information was collected on general demographics, lifetime history of drug and alcohol use, recent drug use and drug use practices including sharing, cleaning and disposal of needles, and interactions with drug treatment and the criminal justice system. The majority of questions reflect behaviors in the prior one month to minimize recall bias.

Statistical analysis

Descriptive statistics of characteristics of interest are presented. The median and interquartile range (IQR) are presented for continuous variables. The number and percent of study participants practicing a particular behaviour are presented for binary and categorical variables. We compared behaviors among persons who recently initiated injection drug use (≤ 2 years) to those who had a more long-term history of use (> 2 years) using the Mann-Whitney U-Test (for continuous variables) or the Chi-squared test (for categorical variables).

Results

Demographics and Socioeconomic profile

Of the 1158 study participants, only three were female. The median age was 35 (IQR: 29 – 40). The majority were of Tamil ethnicity (99%); 64% either married or living with their partner at the time of the interview and 62% primary school education or less. The majority (79%) earned daily wages and 53% earned less than 1500 Indian Rupees per month (approximately USD 31). While almost all IDUs (99%) reported spending at least one night sleeping at home in the prior 6 months, 35% had spent at least one night sleeping on the street and 13% spent at least one night in jail/prison in the last 6 months (Table 1). Forty-seven participants (4%) reported some form of drug treatment in the prior six months, the majority of whom reported an outpatient/drug-free program ($n = 24$; 51%). Only three reported undergoing detoxification. HIV, anti-HCV and HBsAg prevalence were 25%, 55% and 10%, respectively (Table 1).

Injection drug use

The median age at the time of 1st injection use was 25 years (Table 2). All participants reported injecting drugs in the prior six months and 76% reported injection in the prior month. The drug most commonly injected was heroin (brown sugar) (80%), followed by buprenorphine (Tidigesic[®]) (30%) and benzodiazepines (10%). Overall, 429 participants (49%) reported injecting at least two of these drugs in combination.

On average in the prior one month, 327 participants (37%) reported using a previously used syringe at least once. Among those who reported using someone else's syringe at least once, the median number of times was three and the median number of sharing partners was also three. Thirty-nine percent reported passing on a used syringe at least once and 252 (29%) reported passing on a used cotton filter.

The majority of IDUs acquired needles from pharmacies (89%). Common places to store needles were "syringe lockers" (30%), which are behind bricks in walls or buried in the ground (25%). Needles were disposed of most commonly in the garbage (78%) or by handing it over to someone else for disposal (10%). Needle exchange programs were used for disposal/acquisition by only three percent. In terms of safe syringe disposal, only 13% reported always disabling and disposing of a used needle in a manner to minimize the risk of needle stick injuries.

In the month prior to their interview, IDUs were mostly likely to report injecting at public toilets (30%), at home (28%) or in public parks (18%). The majority of IDUs reported injecting alone (63%). Sixty-one percent reported always cleaning their needle before use and 59% after use. However, none reported ever using bleach. The most commonly used cleansing agents were tap water (55%) or soap and tap water (28%).

Non-injection drug use

The most common non-injection drug reported was marijuana, which was used by 73% of participants (Table 3). 26% reported chasing brown sugar and 18% reported chewing intoxicating tobacco. 79% reported drinking some alcohol in the prior six months, with 37% reporting drinking more than twice a week. Nearly 60% reported having been drunk while high on drugs (the majority due to insufficient drug intoxication), but only 15% always combined alcohol and drugs. The most commonly consumed alcoholic beverages reported were brandy (78%), rum (46%) and whiskey (37%). Marijuana was taken in combination with alcohol frequently (76%).

Sexual risk behaviours

Less than half of the IDUs (45%) reported having vaginal or anal intercourse in the prior month (Table 4). The median number of different female partners was one. The rates of condom use per sexual encounter were lower with primary than non-primary sex partners. In the last one month, 23% of participants exchanged money or drugs for sex, but only 2% were given money or drugs in exchange for sex.

Comparison of recent vs. older initiates into injection drug use

Compared to those who had initiated injection drug use >2 years ago, recent initiates were on average younger (29 vs 35 years) and had lower prevalence of HIV (9% vs. 28%) and anti-HCV (17% vs 62%; $p<0.001$ for all). HBsAg prevalence was similar in both groups (9% vs 10%, $p=0.70$). Recent initiates were also significantly less likely to be injecting heroin (69% vs. 82%, $p<0.001$), less likely to be using marijuana (66% vs. 75%, $p=0.01$) and more likely to be injecting buprenorphine (43% vs. 28%, $p<0.001$). Recent initiates were also more likely to pass a needle to someone after having used it (46% vs. 38%, $p=0.06$), use a needle after someone else had used it (49% vs. 35%, $p<0.01$) and use cotton/filter after someone else had used it (37% vs. 27%, $p=0.03$). Recent initiates were also less likely to report injecting by themselves (46% vs. 66%, $p<0.001$) and were more likely to report disposing of used needles in the trash (87% vs. 77%, $p<0.01$).

Discussion

In this large cohort of IDUs, we observed: 1) that the risk behaviors practiced were very similar to a rapid assessment among 100 IDUs in the same region more than five years earlier (Kumar, 2000); 2) though there are similarities between this population of IDUs in Chennai and other IDUs throughout the world, there are notable differences that should provide direction for prevention initiatives in Chennai and possibly in other parts of India; and 3) new initiates into injection drug use are particularly risky and should be a key focus of any prevention initiatives.

The fact that our results are similar to those of the rapid assessment done by Kumar et al in 2000 are reflective of the fact that few interventions in Tamil Nadu and India in general have targeted IDUs. Despite the hope that these previous data would translate into large-scale interventions directed at IDUs (Kumar, 2000), it is clear that this has not happened at least in this community of injectors in Chennai. High risk behaviours prevail and the prevalence of HIV, if anything, has increased over time. It is encouraging that IDUs are a focus of the current National AIDS Control Programme (NACP-III) (National AIDS Control Organization, 2006); however efforts need to be made to ensure that the plan becomes a reality. Our data may provide at least some insights into possible targets for such interventions.

Not surprisingly, most IDUs in this cohort were male as has been reported previously in Chennai (Kumar, 2000; Panda, 2005). The majority were economically disadvantaged and even those who were married were often separated from their families. Qualitative data from our cohort suggest that IDUs are often estranged from their families during periods of use, but that they return to their families during periods when they are not using drugs (data not shown). That these IDUs vacillated from living at home to the street makes them particularly vulnerable to infections (e.g., hepatitis A, diarrhoea) with limited access to care and drug treatment (Rhodes, 2005; Devi, 2005). Further, the dynamic nature of the relationships between these IDUs and their spouses/sexual partners has implications for transmission of HIV. Overall, 50% of this cohort was married, 50% were sexually active and condom use with regular partners was rarely reported, suggesting that there is a large group of women who may not be injecting themselves but are vulnerable to HIV, HBV and possibly HCV through their husbands' risk behaviours. Low levels of risk perception among the wives of IDUs have been previously reported by Panda and colleagues (Panda, 2005; Panda, 1998) and there is also evidence for transmission of HIV from IDUs to their spouses in Chennai as well as the Northeast. It is therefore imperative that interventions should target not only the IDUs, but more importantly their spouses/families, who are clearly at risk and play a key role in the stability of the IDU. This could be particularly important in the management of infections that require long-term treatment such as tuberculosis and HIV.

Our data also suggest that these individuals initiate injection at young ages and practice multiple high-risk behaviours related to injection. The most common drug injected was heroin although there was also a high prevalence of pharmaceutical drug injection, including buprenorphine, as has been reported previously (Panda, 2005; Panda, 1997; Kumar, 2000). Buprenorphine injection was more common among recent initiates into injection drug use which is consistent with previous data suggesting that buprenorphine was introduced in India later than heroin (Kumar, 2000). Heroin users were more likely to share needles than buprenorphine injectors (data not shown), which is also consistent with previous reports (Kumar, 2000) and may reflect that buprenorphine is purchased in pharmacies where users also acquire syringes. What is concerning; however, is that despite the predominance of buprenorphine injection among younger injectors, a higher frequency of sharing needles and other paraphernalia was reported among these newer initiates. Optimal HIV prevention

would involve targeting this group of injectors who still have a low prevalence of HIV and HCV. There is a small window of opportunity to reach this group given the high levels of needle sharing and elevated prevalence of HIV among IDUs. Even better would be to target non-injectors as many IDUs, including those in India, transition from non-injection drug use before initiating injection drug use.

Interventions need to include education not only about needle sharing but also about needle hygiene and safe acquisition and disposal. In this cohort, most IDUs reported cleaning their needles before and after use suggesting some risk perception related to repeated use of needles. Unfortunately, the majority used tap water or soap and water, which is insufficient to effectively disinfect injection equipment. Equally concerning were the methods of syringe storage and disposal. Needles were often buried in the ground or stored in 'syringe lockers'. This storage mechanism lends itself to users inadvertently using other's injection paraphernalia. In terms of disposal, most syringes were simply disposed of in the garbage and only rarely were attempts made to disable the needle so it could not be used again. Disposing of syringes in the garbage in India is potentially problematic particularly as there are large numbers of garbage scavengers, who are paid for the recyclable refuse they collect. These garbage scavengers do not use gloves or protective gear, which places them at risk for needle stick injuries and potential acquisition of bloodborne infections.

In terms of needle acquisition, most IDUs reported acquiring their needles from a pharmacy (67%); thus, needles and syringes are available cheaply over the counter at pharmacies without a prescription in India. We observed that few IDUs acquired needles from syringe needle exchange programs (SNEPs). This is consistent with other reports from India, including one by Eicher et al. (Eicher, 2000) that found low levels of SNEP utilization among IDUs in Manipur. Suggested reasons for low utilization have included distance to and scarcity of SNEPs as well as the potential for police harassment. Though we did not ask specifically about the reasons for not going to an SNEP, it is plausible that similar reasons are applicable to these IDUs in Chennai. In other countries, SNEPs have served as avenues for linking IDUs with other services beyond clean needles including VCT, referrals for medical care and drug treatment (Porter, 2002; Riley, 2002). The patterns of needle acquisition in India suggest that pharmacies should be targeted as venues for such interventions. It may also be feasible to coordinate the efforts of pharmacies in regions with high IDU burden with SNEPs which could either be run through these pharmacies or staff from pharmacies could be trained to work in SNEPs.

All behaviours in this study were self-reported in face-to-face interviews. It has been well documented that use of the audio computer-assisted self interview (ACASI) format elicits higher reports of risk behaviours (Des Jarlais, 1999). Therefore, it is likely that our prevalence estimates of risk behaviours underestimate the true frequency of these behaviours in the population. Further, we characterized recent risk behaviours within the prior 30 days to minimize recall bias. Thus, we have not taken into account changes in injection practices from initiation of injection to the present time. Finally, we did not perform multivariate analysis because the objective was not to identify etiological associations but rather characterize current behaviours for targeting interventions.

In conclusion, these data suggest a high prevalence of risk behaviours among predominantly male IDUs in Chennai, India. Although these data are consistent with what has been previously reported in Chennai, they are particularly concerning because nothing appears to have changed in the half-decade since the rapid assessment by Kumar et al (Kumar, 2000). Further, we observed that some risk behaviors were being more commonly practiced by younger injectors, which is of concern for the future trajectory of the HIV and hepatitis epidemics among IDUs in India. Of critical importance is that these behaviours continue to

not only place IDUs at risk for acquisition of HIV and other blood-borne infections but for transmission to other IDUs as well as the general population, including their sexual partners. These data also suggest that beyond health education, interventions targeted at the families of IDUs could play a crucial role in this setting. Additionally, pharmacies should be considered as a venue for interventions targeted at IDUs given that the majority of users acquire their needles from a pharmacy.

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Table 1

Demographic and Socioeconomic Profile of Injection Drug Users (IDUs) in Chennai (n=1158)

Variable	n (%)
Age	
Median (IQR)	35 (29 – 40)
Ethnicity	
Tamil	1142 (98.6)
Telugu	9 (0.78)
Anglo-Indian	4 (0.35)
Malayalee	3 (0.26)
Marital status	
Single	356 (30.7)
Married or living with partner	745 (64.3)
Separated/ Divorced	54 (4.66)
Widowed	3 (0.26)
Highest level of education	
None	323 (27.9)
Primary	393 (33.9)
Secondary	295 (25.5)
High school/ University/ Professional	147 (12.7)
Type of employment	
Monthly wages	75 (6.48)
Weekly wages	61 (5.27)
Daily wages	910 (78.6)
Unemployed	112 (9.7)
Monthly income[†]	
< USD 10	119 (10.3)
USD 10 – 31	499 (43.1)
USD 32 – 63	437 (37.7)
> USD 63	103 (8.89)
Living situation in the prior 6 months	
At least 1 night at home	1143 (98.8)
At least 1 night on the street	407 (35.2)
At least 1 night at friends or relative's house	437 (37.7)
At least one night in a medical center	84 (7.3)
History of prison/jail stay in the prior 6 months	
At least one night in prison/jail	148 (12.8)
Duration of stay [median (IQR)]	30 (15 – 90)
Injected drugs while in prison/jail	22 (14.9)
History of drug treatment in prior 6 months	
Type of drug treatment program	
Inpatient	20 (42.6)

Variable	n (%)
Outpatient program	24 (51.1)
Detoxification	3 (6.4)
<i>Prevalence of blood borne infections</i>	
HIV	293 (25.3)
Anti-HCV antibodies	631 (54.5)
Chronic HBV infection (HbsAg)	119 (10.3)

HIV – Human Immunodeficiency Virus; HCV – Hepatitis C Virus; HBV – Hepatitis B Virus

[†] 1 US dollar (USD) = 48 Indian Rupees

Table 2

Injection practices among 1158 Injection Drug Users (IDUs) in Chennai, India

Variable	n (%)
Age at initiation of drug use	
Median (IQR)	25 (20 – 30)
Injected in the prior 1 month	
Yes	876 (75.7)
Drug injected in the prior 1 month[†]	
Heroin/ Brown Sugar	702 (80.1)
Buprenorphine (Tidigesic)	265 (30.3)
Pheniramine Maleate (Avil)	320 (36.5)
Benzodiazepines	84 (9.6)
Promethazine	40 (4.6)
Combinations of two or more of the above listed drugs	429 (49)
Injection/paraphernalia sharing in the prior 1 month[†]	
Used another persons syringe/needle	327 (37.3)
➤ Number of times [median (IQR)]	3 (2 – 8)
➤ Number of persons [median (IQR)]	3 (2 – 3)
Passed his/her needle/syringe to another	341 (38.9)
Passed his/her cotton filter to another	252 (28.8)
Shared paraphernalia with a known-HIV positive person	19 (2.17)
Needle acquisition in the prior one month[†]	
Pharmacy	777 (88.7)
Hospital Dispensary	5 (0.57)
Needle-exchange	6 (0.68)
Friend	42 (4.79)
Non-governmental organization	70 (7.99)
Storage of injection paraphernalia in the prior month	
Buried in the ground	222 (25.3)
Syringe Locker (behind bricks in walls, etc)	264 (30.1)
Public Toilets	57 (6.51)
Dealer's Place	7 (0.79)
Needle disposal in the prior one month[†]	
Garbage	686 (78.3)
Needle-exchange	29 (3.31)
Public Toilet	26 (2.97)
Public Space (street, park, etc)	40 (4.56)
Someone else disposed of the needles	84 (9.59)
Always disabled and disposed needle in a manner to minimize needle-stick injuries	112 (12.8)
Needle injection venues in the prior 1 month[†]	
Home	242 (27.6)

Variable	n (%)
Dealers Place	130 (14.8)
Public Toilets	264 (30.1)
Public Parks	158 (18)
Friend's residence	55 (6.3)
<i>Injection networks in the prior 1 month[†]</i>	
Injected alone	548 (62.6)
Injected with well-known people	361 (41.2)
Injected with not well-known or unknown people	4 (0.46)
<i>Needle cleaning in the prior one month[†]</i>	
Always cleaned before use	534 (61)
Always cleaned after use	512 (58.5)
Ever used bleach to clean	0
Ever cleaned with alcohol	5 (0.58)
Ever cleaned with tap water	479 (54.7)
Ever cleaned with soap and water	247 (28.2)
Ever cleaned with distilled water	23 (2.62)

[†] Questions were asked only of the 876 who reported injecting in the prior one month

Table 3

Non-injection drug use among 1158 injection drug users (IDUs) in Chennai

Variable	n (%)
<i>Drugs used in the prior 1 month</i>	
Marijuana	850 (73.4)
Smoked brown sugar	131 (11.3)
Chased brown sugar	295 (25.5)
Prescription medications	201 (17.4)
Chewing tobacco	212 (18.3)
<i>Ever consumed alcohol</i>	
Yes	914 (78.9)
<i>Frequency of alcohol use</i>	
<1 per week	372 (40.7)
1 to 2 days per week	207 (22.7)
3 to 6 days per week	135 (25.7)
Everyday	100 (10.9)
<i>Quantity of alcohol consumption</i>	
Number of drinks used per drinking episode [median (IQR)]	4 (4 – 4)
<i>Ever combined alcohol and drugs</i>	
Yes	548 (59.5)
<i>Type of alcohol consumed when combining with drugs[†]</i>	
Brandy	427 (77.9)
Whiskey	204 (37.2)
Rum	250 (45.6)
Vodka	13 (2.4)
Beer	55 (10)
<i>Drugs most likely to combine with alcohol[†]</i>	
Marijuana	418 (76.3)
Brown Sugar (heroin)	85 (15.5)
Mawa/ Zarda	36 (6.6)
Pharmaceutical Drugs	6 (1.1)
<i>Reason for combining alcohol with drugs[†]</i>	
Insufficient intoxication	516 (94.2)
Experimentation	6 (1.1)
Peer Influence	22 (4)

[†] Questions were asked only of the 548 who reported drinking while high

Table 4

Sexual Practices among Injection Drug Users (IDUs) in Chennai (n=1158)

Variable	n (%)
<i>History of sexual intercourse in the prior 1 month</i>	
Yes	522 (45.1)
<i>History of primary sexual partner[†]</i>	
Yes	395 (75.7)
Number of different female partners [median (range)]	1 (1 – 10)
<i>MSM behaviour in the prior 1 month[†]</i>	
Yes	27 (5.2)
Number of different male partners [median (range)]	1 (1–10)
<i>Frequency (%) condom use with sexual partners</i>	
With primary partner [median (IQR)]	0 (0 – 0)
With – non primary partner	0 (0 – 50)
<i>History of exchanging money/drugs for sex[†]</i>	
Yes	117 (22.5)

MSM – men who have sex with men

[†] Questions were asked only for 375 participants who reported being sexually active in the prior one month