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# **HIV Prevalence and Risk Behaviors among People Who Inject Drugs in Iran: The 2010 National Surveillance Survey**

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## **Abstract**

**Objectives:** To assess the prevalence of HIV and related risk behaviors among People Who Inject Drugs (PWID) in Iran.

**Methods:** We conducted a national cross-sectional bio-behavioral surveillance survey between March and July 2010, interviewing male PWID from a geographically dispersed sample through a facility-based sampling method.

**Results:** We recruited 2480, and tested 2290 PWID. The overall prevalence of HIV was 15.2% (95% CI 9.7-23.1). Among those who had injected drugs over the last month, 36.9% had used a non-sterile needle, and 12.6% had practiced shared injection. Over the past 12 months preceding the interview, 30.4% had sold sex for money, drugs, goods or a favor. In the multivariate analysis, the prevalence of HIV had a positive association with age, while having above high school education, and permanent job were protective.

**Conclusion:** Unsafe injection, and sexual risk behaviors were still frequent and the prevalence of HIV among PWID remains high. Intensified efforts are needed to prevent the further spread of HIV among Iranian PWID and their sexual partners.

## **Background**

It is estimated that around 300,000 People Who Inject Drugs (PWID) are living in Iran.[1] National statistics show injection drug use is still the principal mode of HIV transmission in Iran.[2] From 1986 to 2006, around 64% of new HIV cases were reported as acquiring the infection through injecting drug use. Recent evidence show that the prevalence of HIV infection might be on a downward trend among in this group.[3] However, the first Iranian national Bio-Behavioral Surveillance Survey (BBSS1) of HIV among PWID conducted in 2008, found an alarmingly high HIV prevalence of 15.3% with high levels of risky injection and sexual behaviors.[4]

More effective prevention and care response requires tracking the key features of the HIV epidemic. This paper, therefore presents the results of the second round of BBSS (BBSS2) among male PWID in Iran thereby establishing the current status of HIV infection and gauging the potential for further spread due to injection and sexual risk behaviors.

## **Methods**

### *Setting and Participants*

This cross-sectional survey was conducted in the same ten provinces (out of 31) as in BBSS1. Based on the trend of identified HIV cases among PWID during 2000- 2003, provinces were categorized in two strata: one stratum included the provinces with an upward trend and the other with a downward or stable trend. From each stratum, five provinces were purposefully selected to provide the most disperse geographic representativeness.

In the current survey, between March and July 2010, using a facility-based sampling approach, PWID were recruited from drop-in centers, shelters, drug treatment centers, voluntary counseling and testing centers, and outreach spots in each selected province. Having the inputs from the officers in charge of the HIV surveillance system in each province, we selected minimum five different facilities in the capital city and neighborhood cities (if feasible). Participants were recruited by convenience sampling at the center regardless of their known or unknown HIV status and their verbal informed consent was requested to participate in the study. Eligible participants were men  $\geq 18$  years of age, who had injected drug at least once during the past 12 months.

### *Data Collection*

A structured questionnaire was used to collect data on the demographic characteristics, and the key indicators of injection and sexual risk behaviors. Provincial supervisors trained and monitored the facility's staff to recruit, interview, and collect Dried Blood Samples (DBS) based on a standard protocol. Upon completion of the behavioral survey, each subject was given an incentive of 1.5 USD (Tehran 2.5 USD) in cash, and if agreed to be tested for HIV, they would

get an additional 0.5 USD. DBS samples were tested for HIV antibodies by ELISA (using bioMérieux Vironostika Uni-Form II Ag/Ab). All positives and 10% of the negative samples were rechecked in the Pasteur reference laboratory (using Bio-Rad Genscreen Plus HIV Ag-Ab); the Kappa coefficient was 95.8% . .

### *Statistical Analysis*

Multivariate logistic regression models were applied to determine the factors associated with HIV infection. Variables with a p-value less than 0.2 in the bivariate analysis were entered into the multivariate model. In order to adjust for the clustering effects within facilities and provinces, and also to weight for the size of facilities, the survey function in stata (version 10) was used.

## Results

A total of 2518 PWID were asked to participate in this study. Of whom 27 individuals did not meet the eligibility criteria, and 11 refused to provide informed consent (Overall response rate 97.5%). Out of 2480 PWID, 2417 provided informed consent for HIV testing (response rate 97.5%). We were unable to complete the HIV test on 127 DBS as the specimen was not sufficient for HIV testing.

The overall prevalence of HIV was 15.2% (95% CI: 9.7-23.1); the highest and the lowest prevalence in different provinces were 31.9% and 2.2%, respectively. Among subgroups, unemployed PWID had the highest prevalence (20.1%), and those with above high school education had the lowest (4.6%). The mean (standard deviation) age at the time of study, age at first drug use and age at first drug injection were 34.6 (8.9), 18.7 (5.2), and 25.9 (7.2) years, respectively. Over the past month, among those who had injected drugs, 36.9% had used a non-sterile needle and, 12.6% had practiced shared injection. Over the past 12 months, 30.4% had sold sex for money, drugs, goods or a favor. In the multivariate model, HIV was significantly associated with current age, the level of education, and job status. Compared to 18-25 age group, the adjusted odds ratio [AOR] of infection were 3.1 and 4.1 in 26-35 and >35 years age groups, respectively. Regarding the education level,  $AOR_{(\text{secondary and high school/ above high school})}$ ,  $AOR_{(\text{primary/ above high school})}$ , and  $AOR_{(\text{illiterate/ above high school})}$  were 3.2, 3.1, and 2.7, respectively. Having temporary job, and unemployment increased the AORs as well (3.1 and 4.6, respectively)(Table 1).

## **Discussion**

This survey showed that the prevalence of HIV among PWID in Iran is still alarmingly high, and behaviors for acquisition and transmission of HIV are common. The prevalence of HIV in BBSS1(2008) and what we observed in this survey was remarkably similar (15.3% versus 15.2%).[4] However, the apparently stable prevalence of HIV must be considered as a dynamic balance of several competing or offsetting factors, including new infections against mortality of HIV-infected PWID, in against out migration, initiation against discontinuation of injection and other factors such as incarceration and improved survival with anti-retroviral therapy. Nonetheless, our data make a strong case that HIV transmission will remain a major health problem throughout Iran for the years to come.

In other high risk groups in Iran such as female sex workers, still rather low levels of HIV prevalence (below 5%) are found compared to PWID.[5] Our findings confirm that PWID are still the most affected high risk group by HIV in Iran with a prevalence of about 15%. Though this level of prevalence among PWID is rather high compared to other countries in the Middle East and North Africa, it is still lower than those found in other countries including Libya and Pakistan.[6-7] This might be partly explained by our method of sampling recruiting PWID from the facilities; however, other studies which recruited individuals through respondent driven sampling have also reported high prevalence of HIV (25%) among PWID.[8]

Although there has been a history of prevention efforts among PWID in Iran, our findings potentially point to a sustained level of risky injection among PWID. While a large proportion of participants reported the use of sterile needles and syringes in their last injection, a considerable



fraction still practice shared injections. Indeed, almost 40% of participants reported a history of using previously used needles during the month before the interview. Possible explanations may be peer pressure among PWID[9-10] or having poor access to harm reduction services where and when they are needed the most.

In addition to risky injecting behaviors, sexual risk behaviors were relatively common among PWID. We observed selling sex in exchange with money, drugs, goods or a favor during the previous year were common; an issue that is difficult to address in the Iranian context. Iranian law outlaws male-male sex which makes any explicit intervention regarding this behavior even harder. Compounding the situation is that more than 60% of the participants reported not having used a condom in their last sexual encounter with a client. We think practical approaches are needed to slow down this potential mode of transmission among this population.

We acknowledge the limitations of our study. Our main sampling method (convenience sampling of those who seek services at the facilities) may limit the generalization of the findings to all PWID in Iran, particularly those who are hidden and not linked to services. However, we tried to address such bias by recruiting from venues and hotspots of PWID through out-reach activities. This method of sampling and recruitment is feasible given the geography and time constraints (more than 10 provinces over 4 months). It is also similar to that used in BBSS1 in 2008, thereby facilitating comparison with the results of that round.[4]. As is common in behavioral surveys, social desirability may have affected the reporting of sensitive behaviors. Some sort of calibration may be needed to address this issue.[11]

In conclusion, injection and sexual risks are common among PWID and they still have the highest prevalence of HIV infection among the key populations in Iran. This high prevalence of

HIV and its associated risky behaviors among PWID raise an alarm for the health authorities in Iran to design and implement effective and timely interventions to prevent further transmission among this population and to their partners.

## Key messages

- ▶ PWID continue to have the highest HIV prevalence in Iran.
- ▶ Unsafe injection and sex are still common among Iranian PWID.
- ▶ Targeted HIV interventions tailored for the specific needs of PWID are critical to prevent further transmission of HIV among this high risk group and to other sub-populations.

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## **Conflict of interest**

None.

## **Contributors list**

AH supervised the project and led the analysis and manuscript development. MO participated in writing the proposal, project management, and drafted the first version of the manuscript. RK and MK carried out the statistical analysis and contributed to the development of the manuscript. All authors had contribution in the data collection process. In addition, all authors read and approved the final version of this manuscript.

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## **Ethics approval**

The ethics committee of Kerman University of Medical Sciences reviewed and approved the study's protocol.

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**Table 1.** Socio-demographic characteristics, risk behaviors, and HIV infection among people who inject drugs in Iran, 2010

	Percent	HIV prevalence N (%)	Bivariate Model		Multivariate Model	
			OR (95%CI)	p-value	OR (95%CI)	p-value
<b>Current age (years)</b>						
18-25	13.9 (11.6- 16.6)	7.8 (3.3- 17.4)	Ref	----	Ref	----
26-35	46.6 (43.9- 49.3)	15.8 (10.1- 23.8)	2.3 (1.2- 4.4)	0.017	3.1 (1.6- 6.1)	0.001
>=36	39.5 (35.8- 43.3)	17.0 (10.5- 26.4)	2.4 (1.2- 5.1)	0.018	4.1 (1.7- 9.5)	0.002
<b>Age at first drug use (years)</b>						
<= 18	56.7 (51.5- 61.8)	14.2 (9.9- 19.9)	Ref	----	b	b
>18	43.3 (38.2- 48.5)	16.1 (8.5- 28.4)	1.2 (0.6- 2.1)	0.617	b	b
<b>Age at first drug injection (years)</b>						
<= 25	57.0 (52.9- 60.9)	16.4 (10.1- 25.6)	Ref	----	Ref	----
>25	43.0 (39.0- 47.1)	13.2 (8.6- 19.6)	0.8 (0.6- 1.1)	0.164	0.7 (0.5- 1.1)	0.106
<b>Marital Status</b>						
Currently married	31.2 (27.4- 35.3)	13.2 (7.1- 23.2)	Ref	----	Ref	----
Ever been married (divorced and widowed)	21.5 (18.7- 24.6)	16.7 (10.4- 25.9)	1.3 (0.1-1.9)	0.164	1.1 (0.7- 1.9)	0.605
Single	47.3 (43.6- 51.0)	15.9 (10.2- 23.8)	1.3 (0.8-2.1)	0.339	1.4(0.7- 2.6)	0.259
<b>Education</b>						
Above high school	4.5 (3.1- 6.6)	4.6 (1.4- 13.7)	Ref	----	Ref	----
Secondary and High school	65.2 (60.6- 69.6)	15.6 (9.6- 24.4)	3.8 (1.2-12.1)	0.024	3.2 (1.1- 9.4)	0.039
Primary school	24.6 (21.3- 28.2)	16.2 (9.6- 26.0)	3.9 (1.2-12.6)	0.024	3.1 (1.1- 8.7)	0.036
Illiterate	5.7 (3.5- 9.2)	14.7 (7.9- 25.6)	3.4 (0.9-12.6)	0.063	2.7 (0.7-9.8)	0.125
<b>Job status</b>						
Permanent job	12.3 (7.5- 19.7)	5.1 (1.9- 12.5)	Ref	----	Ref	----
Temporary job	48.9 (43.7- 54.1)	13.8 (9.6- 19.6)	3.3 (1.2-8.7)	0.020	3.1 (1.2- 8.1)	0.025
Unemployed	38.8 (31.9- 46.2)	20.1 (10.9- 33.9)	5.2 (1.6-16.4)	0.006	4.6 (1.6- 13.6)	0.007
<b>Having at least one injection in the last month</b>						
No	38.2 (29.2- 48.1)	11.0 (6.8- 17.2)	Ref	----	Ref	----
Yes	61.8 (51.8- 70.8)	17.8 (10.1- 29.4)	1.7 (0.8- 3.8)	0.178	1.7 (0.8- 3.6)	0.184
<b>Using a used needle or syringe for injection in the last month *</b>						
No	63.1 (55.0- 70.6)	17.9 (9.6- 30.9)	Ref	----	b	b
Yes	36.9 (29.4- 44.9)	17.6 (10.1- 28.9)	0.9 (0.6- 1.5)	0.903	b	b
<b>Using a sterile needle or syringe at last injection</b>						
No	11.1 (8.3- 14.6)	19.0 (10.6- 31.5)	Ref	----	b	b
Yes	88.9 (85.4- 91.7)	14.7 (9.1- 22.9)	0.8 (0.5- 1.3)	0.368	b	b
<b>Sharing injection tools with others over the last month*</b>						
No	87.4 (83.2- 90.7)	18.5 (10.2- 31.4)	Ref	----	b	b
Yes	12.6 (9.3- 16.8)	13.5 (7.9- 22.2)	0.7 (0.3-1.5)	0.353	b	b
<b>Sold sex during last 12 months</b>						
No	69.6	195 (15.1)	Ref	----	b	b
Yes	30.4	78 (13.6)	0.9 (0.6- 1.2)	0.392	b	b
<b>Condom use at last sexual intercourse**</b>						
No	61.7	47 (13.4)	Ref	----	b	b
Yes	38.3	29 (13.2)	0.9 (0.5- 2.1)	0.976	b	b

\* Among those who had at least one injection in the last month.

\*\* Among those who sold sex in exchange with money, drug, goods, or any favor during the last 12 months.

**b:** Not entered into the multivariate model (p-value in bivariate model was >0.2).