

# Prevalence of HIV and Hepatitis C Virus Infections and Related Behavioral Determinants among Injecting Drug Users of Drop-in Centers in Iran

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## Abstract

**Background:** Drop-in centers (DICs) are set up to reduce the harms of high-risk behaviors in high-risk groups especially in injecting drug users (IDUs). This study aimed to determine the prevalence of high-risk behaviors in hepatitis C virus (HCV), and human immunodeficiency virus (HIV) in IDUs seeking harm reduction services in DICs in Iran.

**Methods:** Fifteen out of 48 centers covered by universities of medical sciences were enrolled through a systematic random sampling method. Information on demography, high-risk behaviors, and HIV and HCV infections of all IDUs (N=1531) were obtained through interview over a one month period.

**Results:** Among 1531 subjects analyzed, 96.1% were male, 47.8% were single, and 35.1% married. The mean age of the participants was 33±9.0 years and the most prevalent age group was 26-35 years (45%). The median durations of drug abuse and injection were 12 (ranging 1 to 43) and 5 (ranging to 37) years, respectively. 20.5% (95% CI: 17.94, 23.22) of the participants were HIV positive test cases, while the prevalence of HCV was 43.4% (95% CI: 40.17, 46.62). The median number of injections was 21 times per week for all injections and zero for injection with shared needles and syringes. 47.4% of the IDUs had sexual contact with someone other than their spouse. The proportions of unprotected homo- and heterosexual contacts among IDUs were 19.4% and 37.4%, respectively.

**Conclusion:** IDUs had a high rate of unsafe sexual contact and injection related behaviors. The high prevalence of HIV and HCV infection among this group implies a high rate of transmission and exposure to the risk of serious diseases. The study showed the necessity of establishing and developing harm reduction support to the majority of IDUs, to reduce transmission and burden of HIV and hepatitis C in Iran.

**Keywords:** DICs; IDUs; Prevalence; HIV; HCV; High-risk behaviors; Iran

## Introduction

It is estimated that there are about 200 to 300 thousands injecting drug users (IDUs) in Iran.<sup>1</sup> Many IDUs are at high risk of serious infections and contribute to the transmission of such diseases as hepatitis B virus (HBV), HCV, and HIV within the community due to the needle sharing<sup>2</sup> and high risk sexual

behaviors. Based on the Iran's Ministry of Health and Medical Education (MOHME) reports, more than 65% of HIV infections in Iran are due to drug injection among IDUs.<sup>3,4</sup>

In response to the need of such a large high-risk population, DICs were designed and implemented to reduce the harms of HIV, HCV and HBV infections among IDUs.<sup>5</sup> Drop-in centers (DICs) run needle syringe exchange program (NSEP), providing condoms and methadone maintenance treatment (MMT),<sup>6,7</sup> for referring people

Several studies in Iran have reported the prevalence of high-risk behaviors particularly needle shar-

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ing among IDUs. Razzaghi and his colleagues showed that 48.8% of the IDUs had a history of using shared needles and syringes. It was 24.8% for the last injection.<sup>8</sup> In another study in 2007, Iran's MOHME reported that approximately three fourths of IDUs used sterile needles and syringes in their last injection.<sup>9</sup> Day and his colleagues reported that 67% of IDUs have shared a needle or syringe,<sup>10</sup> but another study estimated 14.3% during the month before.<sup>11</sup>

There were not many studies on condom use in sexual contacts among IDUs. Only two studies reported that the proportion of condom use in the last sexual contact was 33% and 38.1%.<sup>9,11</sup>

The prevalence of HIV infection among IDUs was between 12% and 63% in different studies,<sup>12-15</sup> and that of HCV infection was 20 to 90% in Iran.<sup>16-18</sup>

In this study, we tried to estimate the distribution of high-risk behaviors and prevalence of HIV and HCV in IDUs, seeking harm reduction from drop-in centers.

## Materials and Methods

All the clients (n=1531) attending for a one month period in 15 DICs were enrolled by systematic random sampling. The total number of the countrywide

DICs under supervision by the MOHME is 48. For each participant, trained interviewers completed an interviewer-administered questionnaire including questions on demographic information, HIV and HCV condition, and high-risk behaviors before their arrival. Information of HIV and HCV infections were provided from documented laboratory records. Because of ethical issues, participation in this study was entirely arbitrary and the data were collected anonymously. The reliability of the questionnaire was evaluated, using Kappa and intra-class correlation coefficient (ICC). ICC was between 0.85-1, and kappa was between 0.9-1 for all variables.

## Results

From 1531 participants, 96.1% were male with a mean age of 33±8.9 years (age range=48 from 15 to 63) and median of 32 years. Regarding marital status, 47.8% of the subjects were single and 35.1% married. The most drugs at the first consumption were opium (56.4%), cannabis (25.3%), and heroin (11.7%) (Table 1).

The mean (SD) of the drug use was 13.36 (7.9). At time of their arrival to DIC, about 90.3% of the subjects were IDUs with a mean (SD) duration of injection

**Table 1:** Distribution of the characteristics of the participant's referred to DICs in Iran

Characteristics	No. (%)
<b>Age (year)</b> (n = 1525)	
≤ 20	66 (4.4)
Mean ± SD: 33.09 ± 8.97	258 (16.9)
Median: 32	366 (24.0)
Range: 48 (15-63)	320 (21.0)
	36-40
	201 (13.2)
	41-50
	244 (16.0)
	> 50
	69 (4.5)
<b>Gender</b> (n = 1525)	
Male	1465 (96.1)
Female	60 (3.9)
<b>Marital status</b> (n = 1531)	
Single	731 (47.7)
Married	537 (35.1)
Divorce	235 (15.4)
Widow	22 (1.4)
Others	6 (0.4)
<b>Type of drug use at first consumption</b> (n = 1474)	
Opium	832 (56.4)
Cannabis	373 (25.3)
Heroin	172 (11.7)
Crack	32 (2.2)
Others and mix	65 (4.4)

of 6.67 (6.63) years. The mean (SD) frequency of injection was 21.1 (14.0) times per week while 4.8 (8.2) of them used shared needles and syringes. The number of individuals with whom IDUs shared syringes and needles was  $1.18 \pm 2.08$  in each injection party. 47.4% of the IDUs had sexual contact with someone other than their spouse before their arrival to the drop-in centers. The median and mean of the number of sexual contacts were zero and 3.61 (12.9) contacts per month, respectively. 19.4% of the subjects had, at least, one homosexual contact in the previous month. About 41.4% of the IDUs had, at least, one heterosexual contact per month (Table 2).

In general, in 38.3% of the participants, HIV and HCV test results were not obvious. Among those who had clear and documented test results, the prevalence of HIV and HCV were 20.5% (95% CI: 17.94, 23.22) and 43.4% (95% CI: 40.17, 46.62), respectively (Table 3).

## Discussion

In this study, the most prevalent age group was 26-35

years old. The mean age was  $33 \pm 8.9$  years. The other studies in Iran have shown that the young age group is more prone to using drugs.<sup>18</sup> In other countries, this age group is more susceptible to drug consumption and injection. About 95% of the IDUs were male, demonstrating the tendency of males to addiction and drug injection in Iran. However, some studies suggested the rising number of female drug users during the recent two decades.<sup>19</sup>

This study showed that the duration of drug use and injection was long. These findings are not pleasant due to two reasons. First, 13 years of drug use makes treatment very difficult. Second, 6.5 years of injecting drugs is a sufficient time to be afflicted with different infections transmitted by injection.<sup>20</sup> Although the activities of DICs are not very extensive in Iran, such measures should be implemented vastly for all of the IDUs around the country.

In those who had documented test results, the prevalence of HIV and HCV infections was 20.5% and 43.6%, respectively. Most studies showed that the prevalence of HIV was around 20% while another research stated a higher prevalence of about 52% to

**Table 2:** Distribution of high-risk behaviors of participants referred to DICs in Iran

High-risk behavior	No (%)	Mean	SD <sup>b</sup>	Percentile		
				25	50	75
Number of injections during last week (n = 1501) <sup>a</sup>	1355 (90.3%) <sup>c</sup>	21.13	13.96	14	21	28
Number of injection with shared needle/syringe during last week (n = 1480) <sup>a</sup>	696 (47%) <sup>d</sup>	4.31	7.95	0	0	7
Number of person in each injection party (n = 1467) <sup>a</sup>	689 (47%) <sup>e</sup>	1.18	2.08	0	0	2
Unprotected intercourses/last month						
Heterosexual (n = 1496) <sup>a</sup>	559 (37.4) <sup>f</sup>	2.6	10.59	0	0	2
Homosexual (n = 1516) <sup>a</sup>	294 (19.4) <sup>g</sup>	0.61	2.67	0	0	0
Unprotected intercourses in subjects who have at least 1 intercourses/last month						
Heterosexual (n = 559) <sup>a</sup>	-	6.97	16.42	2	3	5
Homosexual (n = 294) <sup>a</sup>	-	3.16	5.37	1	2	3

<sup>a</sup> Number of participants who have answered to question (denominator), <sup>b</sup> SD = Standard deviation, <sup>c</sup> proportion of participants who have at least one injection during last week, <sup>d</sup> proportion of participants who have at least one shared injection during last week, <sup>e</sup> proportion of participants who shared his or her injection at least with one person, <sup>f</sup> proportion of participants who have at least one heterosexual contacts during last month, <sup>g</sup> proportion of participants who have at least one homosexual contacts during last month

**Table 3:** Prevalence of HIV and HCV infections among participants referred to DICs in Iran.

Characteristics	N (%)	
<b>Ever tested for HIV</b>	Yes	997 (65.6%)
(n = 1519)	No	522 (34.4%)
<b>Prevalence of infections</b>	HIV +	192 (20.5%, 95%CI: 17.94 - 23.22)
(n = 936)	HCV +	406 (43.4%, 95%CI: 40.17 - 46.62)

63%.<sup>12-15</sup> Generally, the prevalence of HCV was more than that of HIV in drug injection addicts. In many studies, its prevalence was up to 90% and more.<sup>16,18</sup> In other countries, the HIV prevalence was between 5 and 99%<sup>21,22</sup> and HCV prevalence was between 10 and 100% among IDUs.<sup>23</sup>

In those who injected drugs, the mean number of injections per week was 23.4±12.7 and about 4.8 of the injections (20%) were with used needles and syringes. Each subject had shared injection with an average of 2.4±3.4 IDUs. Such high-risk behaviors among IDUs can increase the transmission of HIV and HCV.<sup>2</sup> At present, about 65% of HIV infection in Iran is due to injection of drugs with used needles and syringes.<sup>3,4</sup>

Despite lower risk of HIV and HCV transmission in all types of unprotected sexual contacts, such behaviors can be the most route of transmission of infections from IDUs to their families and communities due to high-frequent sexual contacts among IDUs.<sup>24</sup> These days, the most common cause of HIV transmission worldwide is sexual contacts.<sup>24</sup>

The present study was conducted on participants who referred to harm reduction centers. It would have been better to conduct the study on a random sample from all IDUs, but difficulties of collecting data from the outreach IDUs, uncooperative IDUs, and some problems of the questionnaires made us perform the study on IDUs who referred to the DICs. Because of the large sample size (n=1531), variant distribution of

the selected centers all over the country, and systematic random sampling, these findings can be generalized to all IDUs.

Our data were directly gathered from the participants by an interviewer-administered questionnaire. A previous study has demonstrated that IDUs may under-report stigmatized behaviors, such as needle sharing and especially sexual behaviors.<sup>25</sup> Nevertheless, self-report of sexual and drug use behaviors in IDUs have been demonstrated to be of acceptable reliability and validity.<sup>26-28</sup>

The prevalence of infections transmitted by shared injection is high among IDUs. The unprotected sexual contacts and unsafe injection were high, causing more problems for families and communities. Establishment and development of DICs in Iran is necessary, but effectiveness and cost-effectiveness of DICs in Iran should be evaluated.

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**Conflict of interest:** None declared.

## References

- Razzaghi EM, Movaghar AR, Green TC, Khoshnood K. Profiles of risk: a qualitative study of injecting drug users in Tehran, Iran. *Harm Reduct J* 2006;3:12. [16545137] [doi:10.1186/1477-7517-3-12]
- Haverkos HW. Infectious diseases and drug abuse. Prevention and treatment in the drug abuse treatment system. *J Subst Abuse Treat* 1991;8:269-75. [1787552] [doi:10.1016/0740-5472(91)90050-K]
- Iranian Ministry of Health and Medical Education: Statistics on HIV/AIDS in Iran. 2003. (In Persian)
- Salazar C, Hamidreza S. Uniting the World against AIDS. Iran (Islamic Republic of) UNAIDS: Joint United Nations Programme on HIV/AIDS, 2006.
- Vazirian M. Review of drug demand reduction programs in Iran. Advances for development and strategic planning, *Social Welfare Quarterly* 2003;9:145-201 (in Persian).
- Single E. Defining harm reduction. *Drug Alcohol Rev* 1995;14:287-90. [16203323] [doi:10.1080/09595239500185371]
- Thomas G. Harm Reduction Policies and Programs for Persons Involved in the Criminal Justice System Ottawa: Canadian Centre on Substance Abuse, 2005.
- Razzaghi EM, Rahimi Movaghar A, Hosseini M, Madani S, Chatterjee A. Rapid Situation Assessment of Drug Abuse in Iran. Iranian Welfare Organization and UNDCP, 1999.
- Iran UNGASS HIV report of 2008. National secretariat for monitoring of HIV/AIDS. [data.unaids.org/pub/Report/2008/iran\\_2008\\_country\\_progress\\_report\\_persian\\_xx.pdf](http://data.unaids.org/pub/Report/2008/iran_2008_country_progress_report_persian_xx.pdf). (20 Jan 2009)
- Day C, Nassirimanesh B, Shakeshaft A, Dolan K. Patterns of drug use among a sample of drug users and injecting drug users attending a General Practice in Iran. *Harm Reduct J* 2006;3:2. [16433914] [doi:10.1186/1477-7517-3-2]
- Vazirian M, Nassirimanesh B, Zamani S, Ono-Kihara M, Kihara M, Ravari SM, Gouya MM. Needle and syringe sharing practices of injecting drug users participating in an outreach HIV prevention program in Tehran, Iran: a cross-sectional study. *Harm Reduct J* 2005;2:19. [16212655] [doi:10.1186/1477-7517-2-19]
- Joint UNAIDS program on HIV/AIDS and WHO AIDS Epidemic Update December 2002. UNAIDS: Geneva, Switzerland, 2002.
- UNAIDS Factsheet 2002. The Middle East and North Africa, UNAIDS, Geneva, Switzerland, 2002.
- Afshar P. Personal Communication, September 2003. (Director General

- of Health, Iran Prisons Organization), 2003.
- 15 Rowhani Rahbar A, Rooholamini S, Khoshnood K. Prevalence of HIV infection and other blood-borne infections in incarcerated and non-incarcerated injection drug users (IDUs) in Mashhad, Iran. *Drug Policy Int J* 2004;**15**:151-55. [doi: 10.1016/j.drugpo.2003.07.001]
  - 16 Mohtasham Amiri Z, Rezvani M, Jafari Shakib R, Jafari Shakib A. Prevalence of hepatitis C virus infection and risk factors of drug using prisoners in Guilan province. *East Mediterr Health J* 2007;**13**:250-6. [17684845]
  - 17 Alizadeh AH, Alavian SM, Jafari K, Yazdi N. Prevalence of hepatitis C virus infection and its related risk factors in drug abuser prisoners in Hamedan--Iran. *World J Gastroenterol* 2005;**11**:4085-9. [15996035]
  - 18 Alavi SM, Etemadi A. HIV/HBV, HIV/HCV and HIV/HTLV-1 co infection among injecting drug user patients hospitalized at the infectious disease ward of a training hospital in Iran. *Pak J Med Sci* 2007;**23**:510-13.
  - 19 United Nations Office on Drugs and Crime. Substance abuse treatment and care for women: Case studies and lessons learned, 2004.
  - 20 Aceijas C, Friedman SR, Cooper HL, Wiessing L, Stimson GV, Hickman M. Estimates of injecting drug users at the national and local level in developing and transitional countries and gender and age distribution. *Sex Transm Infect* 2006; **82**:iii10-17. [16735287] [doi:10.1136/sti.2005.019471]
  - 21 Zhang LL, et al. An investigation into HIV infection and related behavioral factors among drug users in correctional centers. *J Prev Med Information* 1999; **15**:138-139.
  - 22 Sarkar S, Panda S, Sarkar K, Hangzo CZ, Bijaya L, Singh NY, Das N, Agarwal A, Chatterjee A, Deb BC, et al. A cross-sectional study on factors including HIV testing and counseling determining unsafe injecting practices among injecting drug users of Manipur. *Indian J Public Health* 1995;**39**:86-92. [8690497]
  - 23 Aceijas C, Rhodes T. Global estimates of prevalence of HCV infection among injecting drug users. *Int J Drug Policy* 2007;**18**:352-8. [17854722] [doi:10.1016/j.drugpo.2007.04.004]
  - 24 Report on the global AIDS epidemic 2008. ([www.unaids.org](http://www.unaids.org))
  - 25 Macalino GE, Celentano DD, Latkin C, Strathdee SA, Vlahov D. Risk behaviors by audio computer-assisted self-interviews among HIV-seropositive and HIV-seronegative injection drug users. *AIDS Educ Prev* 2002;**14**:367-78. [12413183] [doi:10.1521/aeap.14.6.367.24075]
  - 26 Adelekan M, Green A, Dasgupta N, Tallack F, Stimson GV, Wells B. Reliability and validity of the Opiate Treatment Index among opioid users in the United Kingdom. *Drug Alcohol Rev* 1996;**15**:261-70. [16203381] [doi:10.1080/09595239600186001]
  - 27 Dowling-Guyer S, Johnson ME, Fisher DG, et al. Reliability of drug users' self-reported HIV risk behaviors and validity of self-reported recent drug use. *Assessment* 1994; **1**:383-92.
  - 28 Weatherby N, Needle R, Cesari H, et al. Validity of self-reported drug use among injection drug users recruited through street outreach. *Evaluation and Program Planning* 1994;**17**:347-355.