

# Injection Drug Use in Rural Iran: Integrating HIV Prevention into Iran's Rural Primary Health Care System

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**Abstract** Major opium trafficking routes traverse rural Iran, but patterns of drug use and HIV infection in these areas are unknown. In 2004, Iran's Ministry of Health integrated substance use treatment and HIV prevention into the rural primary health care system. Active opium or heroin users ( $N = 478$ ) were enrolled in a rural clinic. Participants received counseling for abstinence from substances, or daily needle exchange and condoms. On enrollment, 108 (23%) reported injecting; of these, 79 (73%) reported sharing needles. Of 65 participants tested for HIV, 46 (72%) tested positive. Participants who received daily needle exchange/condoms stayed in the program longer than those who did not (AOR 2.08, 95% CI 1.1–3.88). This project demonstrates that HIV risks exist in rural Iran and suggests the innovative use of Iran's rural health care system to extend prevention and treatment services to these populations.

**Keywords** Iran · HIV · Injection drug use · Rural · Harm reduction

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## Introduction

With the highest per capita opiate use in the world, Iran currently faces a public health crisis (UNODC 2006). Although the exact number is unknown, recent estimates suggest that there are between 2 and 3 million substance users and approximately 200,000 drug injectors (Razzaghi et al. 2006b) in Iran's total population of 65 million (CIA World Factbook 2007). Injection drug users (IDUs) comprise more than 82% of the reported HIV cases for which the route of transmission is known (Gouya 2006). Recent studies have shown HIV prevalence rates ranging from 15 to 25% in IDUs living in Tehran, Iran's major urban center (Zamani et al. 2005, 2006; Malekinejad et al. 2008).

Since the early 1990s, Iran has expanded care and social support programs for IDUs (Razzaghi et al. 2006a; Kumar 2005) to include a host of abstinence-based counseling services, including Narcotics Anonymous, and new harm reduction programs. Harm reduction such as publicly and privately funded needle exchange, methadone maintenance and buprenorphine maintenance programs have received international recognition for their innovative strategies (Nassirimanesh et al. 2005; Razani et al. 2007). These services, however, have focused primarily only on Tehran and other urban centers, such as Shiraz, Esfahan, and Kermanshah.

The published literature, likewise, has focused mainly on Iran's urban IDUs, such as cross-sectional data of IDUs sampled at or near a drop-in center in southern Tehran (Day et al. 2006; Zamani et al. 2005, 2006; Vazirian et al. 2005), qualitative research with IDUs across Tehran (Razani et al. 2007), and recently presented data from a respondent-driven sample of IDUs living in Tehran (Malekinejad et al. 2008).

Despite the research focus on urban areas, there is reason to believe that Iran's rural areas also face the problems of injection drug use and increased rates of HIV infection. Forty percent of Iran's population lives outside of cities, and many of the world's largest drug trafficking routes traverse rural Iran (UNODC World Drug Report 2007). This information is important because drug trafficking routes have predicted and mirrored the spread of HIV in other rural areas, including those of China (Xiao et al. 2007; Liu et al. 2006), India (Sarkar et al. 1997), and Myanmar (Beyrer et al. 2000). High rates of opium smoking already have been documented in Iran's rural areas, such as the Fars province in southwest Iran (Ahmadi et al. 2007) and the city of Bam, in the southern province of Kerman, during post-earthquake relief (Movaghar et al. 2005). The WHO and the Ministry of Welfare conducted a rapid situation analysis of 28 provinces in Iran and showed that, at a minimum, injection drug use is present in rural areas (Razzaghi et al. 1999). To our knowledge, HIV risk behaviors and injection practices among rural substance users have not been studied previously.

In 2004, a demonstration program was initiated by the Substance Abuse Prevention and Treatment Office in the Ministry of Health in an attempt to fill this gap in services for and information about rural areas. The project's goal was to assess the feasibility of integrating substance use treatment and HIV prevention into Iran's primary health care system (PHC). We will refer to this project as the PHC integration project.

The PHC is a government system initially designed to provide basic health care to Iran's rural populations and to people living in small cities, with services including vaccination, maternal and child care, and management of prevalent infectious disease. Since its inception in the late 1970s, the PHC has been used with success to address family planning, diabetes, hypertension (Asadi-Lari et al. 2004), and more recently, mental health (Yasamy et al. 2001), which has not yet included treatment for substance use. The system relies on community health workers (*behvarz*), who are recruited from the populations they serve and given 2 years of training in preventive health care, care of certain basic ailments, and health outreach. *Behvarz* conduct door-to-door outreach in the most remote rural areas in Iran and are able to monitor a variety of health conditions among individuals in their jurisdiction. They are trained to triage health concerns and to determine who needs referral to an urban center for specialized care.

In this study, we use programmatic information gathered during the PHC integration project to explore existing injection practices and potential HIV risks in one of Iran's rural districts. We also look at predictors of retention in the program as a way to explore how best to use the PHC for future prevention and treatment programs.

## Methods

### Setting

The PHC integration project was piloted in a district located in northwestern Iran, near the country's border with Iraq. The majority of people in this district work in agriculture; there is neither a facility for higher education nor many industrial and administrative occupations.

The site was chosen for the PHC integration project because it had already established the care of psychiatric illnesses, such as major depression, in *behvarz* outreach protocols. The PHC did not, prior to this effort, have formalized outreach or treatment for substance use. The site also was chosen because of its perceived history of success in working with the local *behvarz* on prior projects. In this district, the *behvarz* is an integral part of the community and is familiar with the health issues of many families and individuals. Finally, this site was chosen because the *behvarz* and members of the local community expressed enthusiasm and support for the program.

### Study Design

This descriptive study summarizes information from an intake sheet gathered when individuals were enrolled in the PHC integration program. Additionally, we analyzed follow-up data from a subset of patients that was seen for addiction services to determine which factors were associated with retention in the program. This project was initiated and managed by the Substance Abuse Prevention and Treatment Office of the Ministry of Health of Iran.

### Study Subjects

We included a consecutive sample of all people seeking addiction management services at the local PHC health center during the months of February 2004–2005.

Participant recruitment was coordinated by the *behvarz*, who actively communicated with family members of individuals known to them as substance users and with other community sites, such as schools. The *behvarz* referred and, if desired, accompanied new enrollees to the PHC health center.

### Study Procedures

Once a client presented to the PHC health center, he or she was interviewed by a general practitioner who may or may not have been from the client's geographic area. Clients had the program described to them and were offered the choice to participate. Clients who agreed and self-identified as substance users were included in the study. No one who

was referred was excluded, and no one refused to participate.

The general practitioner registered participants' information on an intake form during the first patient–provider interview. Elicited information covered demographics, substance use characteristics and interventions received. Upon enrollment, participants also were given the option of a 2-week outpatient medical detoxification with clonidine and clonazepam. Although this detoxification was not mandatory, most participants opted for the treatment.

The Ministry of Health trained the general practitioners to use a clinical decision-making protocol prior to onset of the study. They were instructed to recommend HIV testing and/or harm reduction for patients who admitted history of heroin use or injection drug use or who had signs of injection on physical examination. General practitioners steered individuals who had no history or current signs of heroin use or injection towards an abstinence-based counseling intervention. The clinical decision tree was intended to serve more as a guideline than a restriction, and physicians were allowed to use their clinical judgment in enrolling patients to either intervention based on perceived need. In addition, a client could switch interventions upon follow-up after consultation with the general practitioner.

Participants entering the abstinence-based program were seen by a health provider for one-on-one counseling every week for 1 month, followed by bimonthly counseling for 2 months, followed by monthly counseling, for a total potential follow-up time of 6 months. Along with needle exchange services and condoms, the individuals in the harm reduction group received one-on-one counseling scheduled at the same intervals as the abstinence-only group. Neither methadone nor buprenorphine were used in either group (Fig. 1).

The counseling services were provided at a small cost that was constant across both groups. Needles were

provided free of cost. All services (counseling and needle exchange) occurred in the same PHC health facility. These programs were not mutually exclusive; a client first could be assigned to the abstinence-based program then to harm reduction if he or she relapsed.

### Laboratory Methods

The general practitioner recommended HIV testing for selected participants based on their risk profile. The individuals for whom the general practitioner recommended testing were referred to the District Transfusion Center for phlebotomy, HIV enzyme-linked immunosorbent assays (EIA), and confirmation of positive EIA test results (Bio-Rad Laboratories, Marnes-la-Coquette, France) by Western blot assay (Genelab, Singapore).

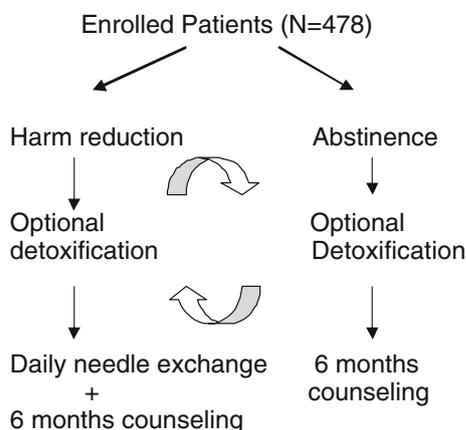
### Analysis

Completed participant information sheets were sent to the district health center where they were reviewed and entered into a database. No identifying information was included. Final analysis was done in STATA version 10 (StataCorp, College Station, Texas).

Our outcome of interest for bivariate and multivariate analysis was retention in the program for more than 1 month. Based on the intake data, we assessed the association of this outcome and series of demographic and substance use predictors, including heroin use versus no heroin use, history of injection, sharing needles, unprotected sex in the last month, duration of substance use, education level, employment, duration of follow-up, marital status, and age. There were too few women participants to assess gender. These associations were assessed using Fisher's exact test. An association with an outcome of  $P < 0.2$  on bivariate analysis were included in a multivariate analysis. We fit a logistic regression model for each outcome using stepwise covariate selection based on the Akaike information criterion (Akaike 1974).

### Ethical Considerations

Data were gathered as part of a programmatic evaluation of a project that sought to integrate HIV prevention into the PHC in Iran. The activities of this effort were reviewed by joint task committee members of the Bureau of Propagation of the PHC and the Bureau of Psychosocial and School of Health (both part of Iran's Ministry of Health). The confidentiality of interviews was protected by the patient–provider relationship, as is standard in Iran. Prior to any analysis, both in Iran and at the University of California, San Francisco, all identifying information was removed from the data.



**Fig. 1** Integration of treatment for substance use and HIV prevention into Iran's rural primary health care system: patient flow chart

## Results

A total of 478 individuals were enrolled in the program; their demographic characteristics are summarized in Table 1. Approximately 80% were older than 30 years, with a median age of 37.5 years. The sample was overwhelmingly male (98%), 70% were married, 59% were employed, 16% were illiterate, and only 13% had a high school education or higher. The *behvarz* had referred 74% of the sample. Opium was the predominant drug used, although 23% of participants used heroin. Eighty percent reported greater than a 3-year history of substance use; more than one-third of participants had greater than a 10-year history of use, and 4% reported using for less than 1 year.

Among all 478 participants, only four non-injectors were tested; two were HIV positive. One hundred eight (23%) reported having ever injected drugs, 61 (56%) of whom were tested, and 44 (72%) of whom were HIV positive. Combined—the four non-injectors and the 61 injectors—65 people were tested for HIV and 46 (71% of those tested) were HIV positive. Of the 108 injectors, 79 (73%) reported a history of sharing needles, and 17 (16%) reported having unprotected sex in the last month.

The majority of those interviewed (99%) elected to undergo medical detoxification. Seventy-four (15%) received harm reduction in the form of daily needle exchange. Sixty percent participated in the program for more than 1 month. Only 4% completed the abstinence-based intervention (6 months of prevention counseling, as described above).

Factors associated with greater than 1-month retention in the program (Table 2) included having received needle exchange and/or condoms, currently being married, being unemployed, being a heroin user, ever having injected drugs, syringe sharing, and having a history of unprotected sex. We did not examine receiving condoms as a predictor separate from receiving needles as both were part of the harm reduction intervention.

The following variables were sufficiently associated with retention greater than 1 month to be entered into a step-wise model selection algorithm: marital status, employment status, history of heroin use, currently injecting, history of unprotected sex, and having received needles/condoms. The final model consisted of having received needles/condoms and history of unprotected sex. Having received needles and condoms was the only factor that was statistically significantly associated with retention in the program (odds ratio 2.08; 95% CI 1.11–3.88).

## Discussion

To our knowledge, this is the first study to demonstrate that HIV risks, primarily injection drug use and associated

**Table 1** Characteristics of individuals referred for substance use-related services to a rural primary health care (PHC) system

Characteristics	Number	(%)
All participants	478	100
Age, years (median 37)		
<29	116	24
30–35	118	25
36–40	101	21
>40	143	30
Gender		
Male	467	98
Female	11	2
Current marital status		
Married	331	69
Unmarried	130	27
Widowed/separated/divorced	17	4
Completed level of education		
None	74	16
Primary school	177	37
Secondary school	163	34
High school or greater	64	13
Working status in last month		
Working	283	59
Not working	192	40
Other	3	1
Type of referral to the program		
Health care worker	355	74
Family	86	18
Friends	14	3
Advertisement	23	5
Type of substance used in the last month <sup>a</sup>		
Opium <sup>b</sup>	370	77
Heroin <sup>c</sup>	108	23
Duration of substance use		
≤12 months	17	4
1–4 years	127	27
5–10 years	169	35
11+ years	165	35
History of injecting		
Injected	108	23
Never injected	360	77
Missing	10	2
Reported syringe sharing in the past month	108	23
Yes	79	73
No	29	27
Missing	1	<1
Unprotected sex in the past month		
Yes	27	17
No	438	83
Not specified	13	3

<sup>a</sup> Only three people reported amphetamines, two in combination with opium and one with heroin

<sup>b</sup> Two users of shireh, an opium derivative, are included in this category

<sup>c</sup> 16 users who reported heroin and another substance, such as opium or marijuana, are included in this category

Percentages may not sum to 100% due to rounding

**Table 2** Characteristics of participants compared with retention time in the primary health care (PHC) substance use treatment program

Characteristics	Retention time of 4 weeks or less		Retention time of 5 weeks or more		P- value
	n	(%)	n	(%)	
All participants	191		276		
Age					0.37
≤35 years	91	48	137	50	
≥36 years	100	52	139	50	
Current marital status					0.03
Married	142	74	179	65	
Unmarried/widowed/separated/divorced	49	26	97	35	
Working status in last month					0.035
Working	125	65	153	55	
Not working	66	35	123	45	
Education					0.78
None or less than high school	168	88	240	87	
High school or more	23	12	36	13	
Type of substance used					0.003
Opium	162	84	198	72	
Heroin	29	16	78	28	
Duration of substance abuse					0.39
<10 years	104	54	167	58	
≥10 years	88	46	119	42	
Received harm reduction (needles with or without condoms)					<0.00
Yes	16	8	58	20	
No	175	91	218	76	
History of unprotected sex? <sup>a</sup>					0.004
Yes	4	2	22	8	
No or missing data	183	98	245	92	

<sup>a</sup> These values are of 454 total participants (187 who received 4 weeks or less of intervention and 267 who received 5 weeks or more of intervention)

factors such as needle sharing, exist in a rural area in Iran and the first to suggest that HIV prevention should be considered in these regions. Of the participants tested, all were heroin or opium users and 71% were HIV infected. The true prevalence of HIV in rural populations is likely to be lower than in this select and at-risk population, but these data point to a possible concentrated epidemic among rural IDUs in Iran.

It is of note that participants who received harm reduction in the form of daily needle exchange, condoms, and counseling were retained in the program longer than those who received abstinence-only measures in the form of counseling. In fact, only 4% of enrollees who received the abstinence-only intervention completed the 6-month

relapse-prevention program. These data suggest that needle and condom distribution, possibly along with counseling, may be a useful part of HIV prevention interventions designed for rural Iran.

The use of the PHC in this project is an innovative way to extend substance use treatment and HIV prevention services to people in these previously neglected rural areas. One application of the PHC may be to enact a clinical decision tree to screen for at-risk substance users who could receive HIV testing and/or HIV prevention services. The public health implications are promising given the success of the PHC in tackling such stigmatized issues as family planning and mental health.

Involvement of the community health workers (*behvarz*) also may prove to be a promising component of future prevention efforts. In this demonstration project, the *behvarz* were active in recruiting community members into treatment services. The success of any effort to integrate an intervention into the PHC will rely on the involvement of the *behvarz* and their relationship to the community. Historically, vaccinations and family planning have been more successful in rural than in urban Iran, reflecting the strength of the primary health care system in community outreach in these areas (Nasseri et al. 1991).

Limitations of this demonstration project include lack of generalizability. The study site, for example, was selected for ease of integrating the studied services into the PHC program. In addition, recruitment and retention of IDUs may be different in other rural areas in Iran. Few women and few youth were enrolled in this project; they have been difficult to reach in other efforts to understand injection drug use in the Middle East, including a recent respondent-driven sample of IDUs in Tehran, Iran where no women were recruited (Malekinejad et al. 2008).

Despite these limitations, these data are valuable in their ability to provide descriptive information on this difficult to reach population. These data are also of use in verifying the existence of injection drug use, unsafe sex, needle sharing, and other activities risky for HIV infection in Iran's rural areas, which have been overlooked in studies of the HIV epidemic in Iran.

## Conclusions

HIV among rural IDUs in Iran has been a neglected area of research and provision of services. With increasing recognition of Afghanistan as the world's major opium producer, the fact that Iran's bordering rural areas sit on drug trafficking routes, and that drug trafficking mirrors injection drug use and risky HIV-related behaviors in the rural areas of other countries, there has been concern that HIV may be spreading in the rural regions of Iran. Our data

show the existence of HIV risk behavior in one rural site in Iran, and they suggest a possible concentrated epidemic among rural IDUs. Based on these data, which also show that IDUs are retained in HIV prevention programs longer if needles and condoms are provided, distribution of these materials may be a useful part of the PHC-integrated HIV prevention programs designed for rural Iran.

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