

# The Emerging Epidemics of HIV-1 and HCV among Injecting Drug Users in Tajikistan

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## ABSTRACT V-105

**Objective:** To determine HIV-1 and HCV prevalence and correlates and HIV-1 subtypes among injecting drug users (IDUs) in Tajikistan, a frontline heroin trafficking state of Central Asia bordering Afghanistan and the poorest former Soviet republic.

**Methods:** In 2004, 491 active adult IDUs were recruited through street outreach in Dushanbe, Tajikistan capital. Risk factors for HIV and HCV were assessed through an interview administered survey. HIV-1 status was determined with rapid testing and confirmed with ELISA. HCV testing was conducted using HEOELISA HCV kit, syphilis with VDRL, and TPHA. HIV-1 subtyping was done on a subset with full-length sequencing. Logistic regression was used to identify correlates of HIV and HCV infection.

**Results:** Overall prevalence of HIV, HCV and syphilis was 12.1%, 61.3% and 15.7% respectively. Independent correlates of HIV infection in multivariate analyses included Tajik nationality (OR 7.06), and daily injection of narcotics (OR 3.22). Independent correlates of HCV infection were Tajik nationality (OR 1.91), history of arrest (OR 2.37), living working outside Tajikistan in the last ten years (OR 2.43), and daily injection of narcotics (OR 3.26); protective effects for HIV were being female (OR 0.53), and always using sterile needles (OR 0.47). Among 20 HIV positive IDUs with specimens available for typing, 10 had subtype A of HIV-1, 9 had CRF02\_AG, and one an A\_CRF02\_AG recombinant.

**Conclusions:** Epidemics of HIV, HCV, syphilis and drug use are underway in Dushanbe and have distinctive molecular features, including predominance of HIV-1 West African variants. Targeted prevention programs offering both needle exchange programs and drug treatment (with methadone, buprenorphine or other currently unavailable therapies) are urgently called for to prevent further spread of HIV and HCV in Tajikistan. Afghanistan was the world's largest exporter of opiate including heroin in 2004 and is having regional health impacts.

## INTRODUCTION

**Introduction**  
 Tajikistan is the poorest state to have emerged from the Former Soviet Union, with a GDP per capita of 180USD/year and roughly 35% adult unemployment. It is a landlocked Central Asia State (Fig. 1)

Tajikistan is a frontline state in the Golden Crescent opium and heroin trafficking zone, with a long porous border with Afghanistan (Fig. 2).

Figure 2 (right) is from the United Nations Office of Drugs and Crime 2002 survey Opium Production in Afghanistan.

Tajikistan has been flooded with opiates, including heroin, and is undergoing an epidemic of injection drug use of heroin among its young people. Parfitt (2003 362/939) reported that 20-50% of all economic activity in Tajikistan in 2002 was linked to the drug trade. The estimated number of IDUs in Tajikistan in 2004 was 40,000 to 135,000 (Acetate, et al AIDS, 2004).

In 2001 IDU prevalence in Dushanbe, was 3.8%. Almost 95% of IDU report sharing needles and syringes.

There is no substitution therapy currently available, and no public sector ARVs. There is a needle and syringe exchange program (NSEP) in Dushanbe, supported the Open Society Institute, Tajikistan.

To determine HIV-1 and HCV prevalence, correlates and HIV-1, and to assess HIV-1 subtypes among injecting drug users (IDUs) in Tajikistan, we began an epidemiologic investigation of this emerging epidemic in 2004.



Figure 1. Map of Tajikistan

## METHODS

In 2004, 491 IDUs were recruited through street outreach, shooting galleries, and through a NSEP in Dushanbe, Tajikistan. Participants were male and female, aged 17 years and older, active IDU (defined as self-reported history of injection in the previous month), Russian or Tajik speaking, and able to provide informed consent.

Training for study staff was provided in outreach, pre- and post-test HIV counseling, research ethics, interviewing skills, and informed consent procedures. Interviews were conducted at an urban polytechnic with a large and diverse patient population to minimize the risk of participant identification.

Risk factors for HIV and HCV were assessed through an interview administered survey.

HIV-1 status was determined with rapid testing and confirmed with ELISA. HCV testing was conducted using HEOELISA HCV kit, syphilis with VDRL and TPHA.

HIV-1 subtyping was done on a subset with full-length sequencing at the Henry M. Jackson Foundation Lab in Rockville, MD.

Univariate analysis was done with Pearson's chi-square and logistic regression models to generate odds ratios with 95% confidence intervals. Separate logistic regression models were used to identify independent correlates of HIV and HCV infection respectively.

## RESULTS

**Overall prevalence of HIV, HCV and syphilis was 12.1%, 61.3% and 15.7% respectively.**

Table 1 shows the sample characteristics. The majority of IDUs were male (84.7%) and the median age was 31 years. About half were ethnic Tajiks, 29.7% Russian, 11.9% Uzbek, and 9.4% other. Nearly a third reported living or working outside Tajikistan in the last 10 years.

Heroin was the primary drug injected, reported by 98.8% of all IDUs; 65.4% reported having also smoked heroin. Opium smoking was much less commonly reported: 17.6% of participants reported a lifetime history of opium smoking.

Table 1. Baseline characteristics & HIV, HCV prevalence among Tajik IDUs in Dushanbe, Tajikistan, 2004

Variable	Total (%)	HIV Positive (%)	OR (95% CI)	HCV Positive (%)	OR (95% CI)
<b>Gender (n=490)</b>					
Female	410 (84.7)	51 (12.4)	1.0	270 (65.1)	1.0
Male	91 (18.3)	8 (9.8)	0.88 (0.36-2.46)	58 (64.8)	0.88 (0.23-3.43)
<b>Age (n=492)</b>					
<16	109 (22.5)	0 (7.3)	1.0	54 (48.5)	1.0
16-19	188 (38.4)	10 (5.3)	0.71 (0.31-1.61)	103 (54.8)	0.71 (0.24-2.20)
20-29	122 (25.2)	39 (7.8)	2.75 (1.54-5.33)	113 (93.8)	2.75 (1.45-5.25)
30-39	114 (23.6)	6 (5.2)	0.69 (0.23-2.06)	65 (57.0)	0.69 (0.23-2.06)
40-49	38 (7.7)	1 (2.6)	0.34 (0.01-10.2)	20 (52.6)	0.34 (0.01-10.2)
≥50	19 (3.9)	1 (5.3)	0.71 (0.01-23.7)	10 (52.6)	0.71 (0.01-23.7)
<b>Employment (n=491)</b>					
Unemployed	38 (7.7)	0 (0.0)	1.0	19 (50.0)	1.0
Employed	380 (77.3)	51 (13.4)	1.66 (0.81-3.23)	251 (66.1)	1.66 (0.81-3.23)
<b>Education (n=490)</b>					
Illiterate	15 (3.1)	0 (0.0)	1.0	8 (53.3)	1.0
1-3 years	45 (9.2)	1 (2.2)	0.21 (0.01-5.41)	24 (53.3)	0.21 (0.01-5.41)
4-6 years	172 (35.1)	14 (8.1)	0.52 (0.28-1.00)	104 (60.5)	0.52 (0.28-1.00)
7-9 years	215 (43.7)	22 (10.2)	0.82 (0.41-1.65)	127 (58.6)	0.82 (0.41-1.65)
≥10 years	145 (29.7)	22 (15.1)	1.23 (0.65-2.34)	89 (61.3)	1.23 (0.65-2.34)
<b>Nationality (n=492)</b>					
Russian	145 (29.7)	5 (3.4)	0.28 (0.01-7.11)	77 (53.1)	0.28 (0.01-7.11)
Tajik	240 (48.8)	46 (19.2)	6.71 (3.53-12.7)	161 (67.1)	6.71 (3.53-12.7)
Uzbek	91 (18.3)	2 (2.2)	0.19 (0.01-4.40)	49 (53.8)	0.19 (0.01-4.40)
Other	46 (9.3)	5 (10.9)	1.02 (0.24-4.51)	24 (52.2)	1.02 (0.24-4.51)
<b>History (n=492)</b>					
Arrested	145 (29.7)	5 (3.4)	0.16 (0.00-3.50)	77 (53.1)	0.16 (0.00-3.50)
Living/working outside Tajikistan in last 10 years	240 (48.8)	46 (19.2)	1.61 (0.81-3.23)	161 (67.1)	1.61 (0.81-3.23)
Always using sterile needles	380 (77.3)	51 (13.4)	0.47 (0.24-0.91)	251 (66.1)	0.47 (0.24-0.91)
<b>Injection (n=492)</b>					
Heroin	380 (77.3)	51 (13.4)	1.0	251 (66.1)	1.0
Other	112 (22.7)	1 (0.9)	0.07 (0.00-1.40)	60 (53.6)	0.07 (0.00-1.40)
<b>Smoking (n=492)</b>					
Smoked heroin	320 (65.0)	31 (9.7)	0.15 (0.00-3.50)	166 (51.9)	0.15 (0.00-3.50)
Smoked opium	145 (29.7)	5 (3.4)	0.16 (0.00-3.50)	77 (53.1)	0.16 (0.00-3.50)
Never smoked	240 (48.8)	46 (19.2)	1.0	161 (67.1)	1.0
<b>Sexual (n=492)</b>					
Sexual intercourse	380 (77.3)	51 (13.4)	1.0	251 (66.1)	1.0
Never	112 (22.7)	1 (0.9)	0.07 (0.00-1.40)	60 (53.6)	0.07 (0.00-1.40)
<b>Sexual risk (n=492)</b>					
Sexual intercourse	380 (77.3)	51 (13.4)	1.0	251 (66.1)	1.0
Never	112 (22.7)	1 (0.9)	0.07 (0.00-1.40)	60 (53.6)	0.07 (0.00-1.40)
<b>Sexual risk in Prison (n=12)</b>					
Sexual intercourse	11 (92%)	1 (9.1)	1.0	6 (54.5)	1.0
Never	1 (8.3)	0 (0.0)	0.07 (0.00-1.40)	0 (0.0)	0.07 (0.00-1.40)
<b>Sexual risk in Dushanbe Center (n=14)</b>					
Sexual intercourse	13 (93%)	3 (23.1)	1.0	8 (61.5)	1.0
Never	1 (7.1)	0 (0.0)	0.07 (0.00-1.40)	0 (0.0)	0.07 (0.00-1.40)
<b>Lowerwerth limb tattooed last 10 years (n=477)</b>					
Yes	133 (28.0)	35 (26.3)	1.0	188 (68.5)	1.0
No	344 (72.0)	96 (27.7)	1.0	173 (50.3)	1.0

## RESULTS (contd.)

Table 2 shows the relationship of drug using behaviors and HIV and HCV prevalence.

The median age of initiation of IDU behavior was 24 years. 39.1% reported daily use in the previous 6 months.

Lifetime prevalence of use of a used needle was 47.2%.

Univariate risks for HIV included initiation at age 20-39 years and daily injection use. Having used a needle and syringe exchange was protective for HIV infection: OR 0.52 (95% CI 0.28-0.96).

Univariate risks for HCV included increasing time injecting; history of used needle use; and daily injection. Again, use of an NSEP was protective for HCV.

Table 2. Injection behaviors & HIV, HCV prevalence among Tajik IDUs in Dushanbe, Tajikistan, 2004

Variable	Total (%)	HIV Positive (%)	OR (95% CI)	HCV Positive (%)	OR (95% CI)
<b>Age at initiation of injecting (n=492)</b>					
<16 years old	117 (24.2)	7 (6.0)	1.0	100 (85.0)	1.0
16-19 years old	240 (48.8)	40 (16.7)	2.62 (1.41-4.87)	182 (75.8)	2.62 (1.41-4.87)
20-29 years old	115 (24.2)	12 (10.4)	1.75 (0.87-3.43)	127 (62.2)	1.75 (0.87-3.43)
30-39 years old	78 (16.0)	6 (7.7)	1.0	38 (48.7)	1.0
≥40 years old	20 (4.1)	1 (5.0)	0.71 (0.01-23.7)	10 (50.0)	0.71 (0.01-23.7)
<b>Years since initiating injecting (n=477)</b>					
<1 year	258 (54.3)	28 (10.8)	1.0	127 (49.2)	1.0
1-4 years	229 (47.8)	31 (13.5)	1.27 (0.71-2.34)	162 (70.7)	1.27 (0.71-2.34)
5-9 years	101 (20.9)	24 (23.8)	2.22 (1.14-4.33)	57 (56.4)	2.22 (1.14-4.33)
≥10 years	31 (6.4)	2 (6.5)	0.94 (0.13-7.07)	17 (54.8)	0.94 (0.13-7.07)
<b>Injection with used needle/syringe (n=492)</b>					
Yes	238 (48.2)	28 (11.8)	1.0	127 (53.1)	1.0
No	254 (51.8)	31 (12.2)	1.02 (0.51-2.06)	154 (60.3)	1.02 (0.51-2.06)
<b>Use of substitute needle in the last 10 yrs (n=492)</b>					
Yes	171 (35.0)	24 (14.0)	1.0	107 (62.5)	1.0
No	321 (65.0)	34 (10.6)	0.74 (0.42-1.30)	177 (55.3)	0.74 (0.42-1.30)
<b>Ever received a needle/syringe NSP (n=492)</b>					
Yes	282 (57.3)	41 (14.7)	1.0	151 (54.0)	1.0
No	210 (42.7)	10 (4.8)	0.32 (0.16-0.66)	107 (50.5)	0.32 (0.16-0.66)
<b>Frequency of injection in the last 10 years (n=492)</b>					
1-2 times a week or less	98 (20.2)	7 (7.1)	1.0	58 (58.6)	1.0
3-4 times a week	148 (30.3)	10 (6.8)	0.97 (0.47-2.03)	84 (56.8)	0.97 (0.47-2.03)
5-6 times a week	191 (39.1)	36 (18.9)	3.04 (1.76-5.29)	146 (75.9)	3.04 (1.76-5.29)
Daily	103 (21.2)	17 (16.6)	2.38 (1.21-4.71)	67 (64.1)	2.38 (1.21-4.71)

## RESULTS (contd.)

Table 3. Sexual behavior & HIV, HCV prevalence among Tajik IDUs in Dushanbe, Tajikistan, 2004

Variable	Total (%)	HIV Positive (%)	OR (95% CI)	HCV Positive (%)	OR (95% CI)
<b>Trading sex (n=492)</b>					
Yes	251 (51.0)	45 (18.0)	1.0	148 (59.0)	1.0
No	241 (49.0)	6 (2.5)	0.14 (0.01-2.91-4.4)	134 (55.6)	0.14 (0.01-2.91-4.4)
<b>Consistent use regular sterile needles/syringes last 4 months (n=492)</b>					
Yes	380 (77.3)	34 (9.0)	1.0	238 (62.6)	1.0
No	112 (22.7)	17 (15.2)	1.71 (0.91-3.23)	60 (53.6)	1.71 (0.91-3.23)
<b>Consistent use correct sexual practices last 4 months (n=492)</b>					
Yes	122 (24.8)	14 (11.5)	1.0	69 (56.5)	1.0
No	370 (75.2)	37 (10.0)	0.87 (0.47-1.61)	212 (57.3)	0.87 (0.47-1.61)
<b>Consistent sex sexual correct condom (n=492)</b>					
Yes	201 (41.0)	26 (13.0)	1.0	109 (54.2)	1.0
No	291 (59.0)	25 (8.6)	0.63 (0.32-1.24)	143 (49.3)	0.63 (0.32-1.24)
<b>MSM (men) (n=367)</b>					
Yes	376 (94.7)	48 (12.8)	1.0	226 (60.1)	1.0
No	21 (5.3)	0 (0.0)	0.07 (0.00-1.40)	11 (52.4)	0.07 (0.00-1.40)
<b>Praying for sex with drug/money (n=492)</b>					
Yes	252 (51.2)	45 (18.0)	1.0	153 (60.7)	1.0
No	240 (48.8)	6 (2.5)	0.13 (0.01-2.91-4.4)	134 (55.6)	0.13 (0.01-2.91-4.4)
<b>Ever STI (n=492)</b>					
Yes	387 (78.7)	52 (13.4)	1.0	214 (55.3)	1.0
No	105 (21.3)	9 (8.6)	0.66 (0.31-1.40)	56 (52.4)	0.66 (0.31-1.40)
<b>Age of first sexual contact (n=492)</b>					
<16 years	242 (49.2)	28 (11.6)	1.0	144 (59.5)	1.0
16-19 years	229 (46.5)	28 (12.2)	1.0	114 (49.8)	1.0
20-29 years	101 (20.6)	10 (10.0)	1.0	57 (56.4)	1.0
≥30 years	20 (4.1)	2 (10.0)	1.0	11 (55.0)	1.0
<b>Number of sexual partners last 4 months (n=492)</b>					
1	225 (45.7)	28 (12.4)	1.0	122 (54.2)	1.0
2	125 (25.6)	20 (16.0)	1.33 (0.71-2.51)	66 (52.8)	1.33 (0.71-2.51)
3	125 (25.6)	20 (16.0)	1.33 (0.71-2.51)	66 (52.8)	1.33 (0.71-2.51)
≥4	21 (4.3)	2 (9.5)	0.71 (0.01-23.7)	10 (47.6)	0.71 (0.01-23.7)

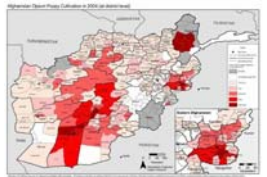


Figure 2.

## DISCUSSION

This is the first in-depth epidemiologic study assessing HIV and HCV prevalence and correlates among IDUs in Tajikistan. We found an HIV prevalence of 12.1% among IDUs in Dushanbe, which substantially exceeds a previous estimate and suggests that the HIV epidemic in this population is in a concentrated rather than nascent stage. The prevalence of HCV infection was 61.3%, indicating that multi-person use of syringes and injection paraphernalia are common. Along with rapid HIV spread among IDUs, Central Asia faces concurrent epidemics of sexually transmitted infections (STIs). The prevalence of syphilis among our IDU sample was 15.7%, and female IDUs were more than twice as likely to have evidence of syphilis infection as males. The high prevalence of syphilis among female IDUs is may reflect their involvement in commercial sex work, since three quarters of the women in our study reported a history of trading sex for drugs or money. The high prevalence of syphilis we observed is concerning as untreated STIs are known to enhance HIV transmission, and HIV epidemics in IDUs