

# Cross-Sectional Comparison of Behavioral Risk Factors for HIV/HCV in People Who Inject Drugs (PWID) in Egypt

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## Background

- Egypt has the greatest HCV prevalence worldwide at 15%.
- The concentrated HIV epidemic in male people who inject drugs (PWID) is at 6.8%.
- Injection drug use is criminalized in Egypt, and there are limited harm reduction programs.
- Previous studies in Egypt found 53% of male PWID used needles that had been used by others and 89% had a regular female sex partner.<sup>1</sup>
- This is the first study examining the sexual links between PWID and the general population in Egypt.



<sup>1</sup>Soliman, et al. (2010). HIV prevalence and risk behaviors of male injection drug users in Cairo, Egypt. AIDS, 24, S33-S38

## Methods

### Study Design:

- Cross-sectional study of 632 consenting injection drug users in Cairo and Alexandria seeking harm reduction services.

### Hypothesis:

- PWID who share needles are at an increased odds of HIV and HCV seropositivity compared to those who do not share needles.
- PWID who share needles have both high and low-risk sexual partners.

### Analysis:

- Examined the links between needle-sharing PWID's sexual practices and the general population.
- Multiple logistic regression evaluated the associations between high-risk injection drug use and sexual practices and HIV/HCV status using SAS 9.4.

### Partners:

- Conducted in partnership with Freedom Drugs and HIV Programme, Egypt.
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**Table 1:** Summary of demographic indicators by HIV/HCV status and unadjusted odds ratios (UOR).

	HIV (n=604)			HCV (n=624)			Study vs. General Pop.	
	Positive	(row %)	UOR	Positive	(row %)	UOR	Study	Egypt
Male	61	(10.97)	ref	359	(62.54)	ref	92.09%	<sup>a</sup> 51.22%
Female	3	(6.25)	0.541	25	(50.00)	*0.599	7.91%	<sup>a</sup> 48.78%
18-25 years of age	8	(5.48)	ref	60	(39.47)	ref	24.29%	<sup>b</sup> 16.00%
26-35	34	(10.93)	*2.117	203	(63.44)	**2.660	51.43%	<sup>b</sup> 16.30%
36+	22	(15.17)	**3.085	120	(79.47)	**5.935	24.29%	<sup>b</sup> 25.90%
No Education	6	(28.57)	ref	17	(73.91)	ref	3.64%	<sup>c</sup> 19.50%
Less than University	43	(10.94)	**0.307	253	(62.16)	0.580	64.87%	<sup>c</sup> 67.90%
University or Higher	15	(7.89)	**0.214	114	(58.76)	0.503	31.49%	<sup>c</sup> 12.70%
Relationship status: Single	30	(12.77)	ref	125	(51.23)	ref	39.08%	<sup>c</sup> 25.90%
In a Relationship	3	(5.66)	0.410	30	(54.55)	1.142	8.70%	<sup>c</sup> 0.00%
Married	21	(10.10)	0.767	149	(70.62)	**2.288	33.86%	<sup>c</sup> 69.70%
Divorced/Separated/Widowed	10	(9.26)	0.697	80	(70.18)	**2.240	18.35%	<sup>c</sup> 4.50%
Unemployed	9	(8.57)	ref	65	(57.02)	ref	18.60%	<sup>a</sup> 9.90%
Employed	54	(10.89)	1.303	317	(62.52)	1.258	81.40%	<sup>a</sup> 90.10%

p-val <0.1\*, p-val <0.05\*\*, <sup>a</sup>Egypt Development Indicators, 2013; <sup>b</sup>US Census International Data Base, 2015; <sup>c</sup>Demographic and Health Survey, 2014

## Results

**Table 2:** Multiple logistic regression models of HIV and HCV.

	HIV Model OR (95% CI)	HCV Model OR (95% CI)
Male	ref	ref
Female	1.593 (0.179-14.164)	1.337 (0.559-3.200)
18-25 years of age	ref	ref
26-35	2.925 (0.593-14.431)	**2.412 (1.365-4.261)
36+	2.288 (0.355-14.762)	**3.011 (1.335-6.788)
No Education	ref	ref
Less than University	*0.206 (0.033-1.298)	*0.22 (0.044-1.095)
University or Higher	*0.158 (0.023-1.111)	**0.174 (0.034-0.896)
0-1 years of inj. drug use	ref	ref
2-9	0.880 (0.101-7.673)	**2.666 (1.087-6.540)
10-19	0.707 (0.071-7.007)	**3.815 (1.372-10.607)
20+	0.337 (0.014-8.166)	**7.912 (1.557-40.197)
Shared Needles with 1-10 People	ref	ref
>10	**5.112 (1.925-13.577)	1.223 (0.622-2.403)
No Sex Partners Last 6 mo.	ref	
1	0.882 (0.349-2.231)	
>1	>999.999 (<0.001->999.9)	

p-val <0.1\*, p-val <0.05\*\*

**Table 3:** Marginal difference in probability of testing HIV+ for change in the number of people PWID shared needle with\*, keeping all other model indicators at their most frequent value in the study population.

Age	Sex	Education	Years of Injection Drug Use	Number Shared Needle With*	No. Sex Partners Last 6 mo.	Marginal Difference
26-35	M	<University	2-9	1-10 >10	1	0.15958

Compared to PWID who share needles with 1-10 people:

- PWID who share needles with >10 people have 16% higher probability of testing HIV positive.

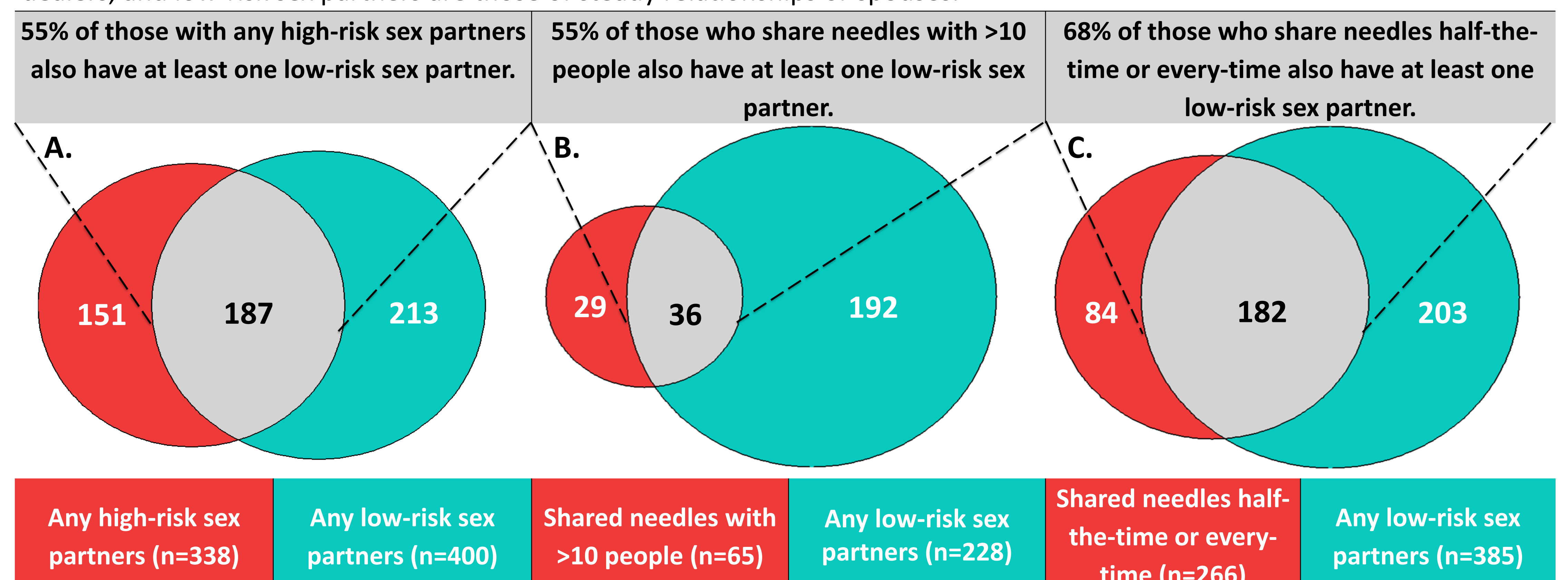
**Table 4:** Marginal difference in probability of testing HCV+ for change in duration of injection drug use\*, keeping all other model indicators at their most frequent value in the study population.

Age	Sex	Education	Years of Injection Drug Use*	Number Shared Needle With	Marginal Difference
26-35	M	<University	0-1 2-9	1-10	0.23873
26-35	M	<University	0-1 10-19	1-10	0.32275
26-35	M	<University	0-1 20+	1-10	0.4627

Compared to PWID who have been using injection drugs for 0-1 year:

- PWID who have been using for 2-9 years have 24% higher probability of testing HCV positive.
- PWID who have been using for 10-19 years have 32% higher probability of testing HCV positive.
- PWID who have been using for 20+ years have 46% higher probability of testing HCV positive.

**Figure 1:** Venn-diagrams A-C summarize the overlap between behavioral indicators known to contribute to the spread of HIV in the general population, where high-risk sex partners include men who have sex with men (MSM), sex-workers, and drug dealers, and low-risk sex partners are those of steady relationships or spouses.



## Conclusions

### Among PWID in Egypt:

- More than half of PWID who have a high-risk sex partner, share needles with >10 people, and frequently share needles also have a low-risk sex partner.
- The general population is at risk of HIV/HCV primarily through sexual contact.
- Those who shared needles with >10 people had higher odds of testing positive for HIV.
- Those more years of injection drug use had higher odds of testing positive for HCV.
- In agreement with the literature, higher education is associated with lower odds of HIV/HCV, and older age is associated with higher odds of HIV/HCV.

### Significance:

- In Egypt repressive policies that include low education and lack of harm reduction programs may place the general population at risk for HIV/HCV.
- In Russia, repressive policies toward PWID allowed HIV to spread to the general population and the country has seen a 49% increase in HIV prevalence 2005-2015. Egypt could see a similar trajectory in HIV prevalence.
- Common-sense harm reduction programs like clean needle exchanges and decriminalization of injection drug use are needed to control the spread of HIV and HCV in Egypt.