# SEX WORK OR MALE-WITH-MALE SEXUAL ACTIVITY AND THE RISKS OF HCV AND HIV ACQUISITION AMONG PEOPLE WHO INJECT DRUGS: A SYSTEMATIC REVIEW AND META-ANALYSIS

# Authors:

<u>Joshua Dawe</u><sup>1</sup>, Adelina Artenie<sup>1</sup>, Jack Stone<sup>1</sup>, Hannah Fraser<sup>1</sup>, Daniel Stewart<sup>1</sup>, Chiedozie Arum<sup>1,2</sup>, Matthew Hickman<sup>1,3</sup>, Peter Vickerman<sup>1,3</sup>

<sup>1</sup> Bristol Population Health Science Institute, Bristol Medical School, <sup>2</sup> Department of Epidemiology of Microbial Diseases, Yale School of Medicine, <sup>3</sup> Health Protection Research Unit, Bristol Medical School

## **Background:**

Some people who inject drugs (PWID) have overlapping risk behaviours for HIV and hepatitis C virus (HCV) acquisition, including sex work and male-with-male sexual activity. We assessed whether PWID who have engaged in recent (previous year) sex work (PWID-SW) or who were male and ever engaged in male-with-male sexual activity (PWID-MSM) have increased risks of HCV and HIV acquisition.

# Methods:

We searched MEDLINE, Embase and PsycINFO databases for HCV and HIV incidence studies among community-recruited PWID published between 01/01/2000 and 12/12/2022. We extracted unadjusted estimates comparing risks of HIV and HCV acquisition between PWID-SW and PWID who had not recently engaged in sex work (PWID non-SW) and between PWID-MSM and male PWID who did not engage in male-with-male sex (PWID non-MSM). We included PWID-MSM studies that included both women and men combined if >2/3 of participants were male. We pooled data using random-effects meta-analysis.

## **Results:**

We included 26 studies, of which 21 reported on recent sex work and 14 reported on male-withmale sexual activity. In included studies, between 8%–46% of male and female PWID were PWID-SW and between 1%–34% were PWID-MSM. Compared to PWID non-SW, PWID-SW were approximately twice as likely to acquire HIV (relative risk [RR]:1.86;95%CI:1.34–2.47;I2:69.1%; n=12 studies ) and HCV (RR:2.09;95%CI:1.45–3.01;I2:54.3%; n=7 studies). Compared to PWID non-MSM, PWID-MSM had an 156% (RR:2.56;95%CI:1.27–5.17;I2:66.6%; n=8 studies) and 62% (RR:1.62;95%CI:1.08– 2.42;I2:9.9%; n=5 studies) greater risk of HIV and HCV acquisition, respectively. In PWID-MSM analyses, no HIV studies and three HCV studies included both men and women. Pooled estimates carried low or moderate between-study heterogeneity (Figure).

## **Conclusion:**

PWID who engage in sex work or male-with-male sex have higher risks of HIV and HCV acquisition compared to PWID who do not engage in these practices. Interventions for PWID should include services to address these overlapping risks.

## **Disclosure of Interest Statement:**

None to declare.

**Figure.** Associations between sex work in previous 12 months and (a) HIV acquisition and (b) HCV acquisition, and male-with-male sexual activity and (c) HIV acquisition and (d) HCV acquisition among people who inject drugs

**Figure.** Associations between sex work in previous 12 months and (a) HIV acquisition and (b) HCV acquisition, and male-with-male sexual activity and (c) HIV acquisition and (d) HCV acquisition among people who inject drugs

a. Sex work in previous 12 months and HIV acquisition

Study	Country	WHO region	Sex work (%)
Female only			
Sypsa, 2017	Greece	European Region	NR
Bruneau, 2011	Canada	Region of the Americas	46
Doherty, 2000	USA	Region of the Americas	32
Male and Female			
Walker, 2021	Kenya	African Region	9
Kozlov, 2006	Russia	European Region	13
Ickowicz, 2015	Canada	Region of the Americas	23
Jain, 2020	Mexico	Region of the Americas	31
Kral, 2001	USA	Region of the Americas	12
Roy, 2011	Canada	Region of the Americas	17
Strathdee, 2001	USA	Region of the Americas	24
Iversen, 2014	Australia	Western Pacific Region	16
Zhang, 2006	China	Western Pacific Region	8

#### Overall

Heterogeneity:  $J^2 = 69.1\%$ ,  $\tau^2 = 0.1$ , p < 0.001Test for subgroup differences:  $\chi_1^2 = 1.72$ , df = 1 (p = 0.190)

b. Sex work in previous 12 months and HCV acquisition

#### Male and Female

Vallejo, 2014 van den Berg, 2007 Bach, 2016 Hahn, 2002 Roy, 2007 Soittel, 2012	Spain Netherlands Canada USA Canada	European Region European Region Region of the Americas Region of the Americas Region of the Americas	
Spittal, 2012 Female Moles, 2020	Canada Vietnam	Region of the Americas South-East Asia Region	

#### Overall

Heterogeneity: I<sup>2</sup> = 54.3%, τ<sup>2</sup> = 0.1, p = 0.041

Test for subgroup differences:  $\chi_1^2 = 1.03$ , df = 1 (p = 0.309)

#### c. Male-with-male sexual activity and HIV acquisition

Study	Country	WHO region	MSM (	
Sypsa, 2017	Greece	European Region	NR	
Bruneau, 2011	Canada	Region of the Americas	15	
Kral, 2001	USA	Region of the Americas	11	
Mirzazadeh, 2018	USA	Region of the Americas	20	
Strathdee, 2001	USA	Region of the Americas	NR	
Lucas, 2015	India	South-East Asia Region	NR	
Martin, 2014	Thailand	South-East Asia Region	5	
Suntharasamai, 2009	Thailand	South-East Asia Region	1	
		-		

#### Overall

Heterogeneity: I<sup>2</sup> = 66.6%, τ<sup>2</sup> = 0.6, p = 0.004

d. Male-with-male sexual activity and HCV acquisition

Study	Country	WHO region	MSM (%)		Risk Ratio	RR	95%-CI	Weight
Spada, 2017	Italy	European Region	3			→ 2.3	(0.3-17.6)	3.9%
Jacka, 2019	Canada	Region of the Americas	11			• 2.2	(1.2-3.9)	38.0%
Roy, 2007	Canada	Region of the Americas	NR			- 1.1	(0.7 - 2.0)	42.7%
Hill, 2021	USA	Region of the Americas	34		_	→ 6.8	(0.8-99.0)	2.7%
Hagan, 2010	USA	Region of the Americas	6	_	*	1.3	(0.4-3.8)	12.8%
Overall					-	> 1.6	(1.1-2.4)	100.0%
Heterogeneity: /2 = 9.9	%, τ <sup>2</sup> < 0.1, p	= 0.349						
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