University of BRISTOL

Bristol Medical School

Incidence of hepatitis C virus (HCV) and HIV infection among people who inject drugs: A systematic review and meta-analysis

Adelina Artenie, Jack Stone, Hannah Fraser, Chiedozie Arum, Aaron G Lim, Anna McNaughton, Adam Trickey, Zoe Ward, Matthew Hickman, Peter Vickerman

Declaration of interests

I have no conflicts of interest to declare.

No global data on hepatitis C virus (HCV) and HIV incidence among people who inject drugs

- People who inject drugs are one of the populations most affected by HCV and HIV infection
- Given that effective prevention and treatment interventions are available, international public health agencies have called for the elimination/end of these epidemics as public health threats by 2030[1,2]
- While several studies have synthesized existing global data on HCV and HIV prevalence among people who inject drugs[3,4], no similar study has summarized levels of HCV and HIV incidence
- Incident HCV/HIV infection can be a difficult metric to measure[5-7], yet **it is key to monitoring the course of these epidemics, to informing the need for interventions and to tracking progress towards the elimination goals**
- **Aim:** to systematically review and synthesize global data on HCV and HIV incidence among people who inject drugs

[1]WHO. Global health sector strategy on viral hepatitis 2016-2021. 2016
[2]Joint UNAIDS. An ambitious treatment target to help end the AIDS epidemic. 2014
[3]Degenhardt L et al. Lancet global Health 2017
[4]Grebely J et al. Addiction 2018
[5]Artenie A et al. Lancet Gastroenterol Hepatol 2021 [In press]
[6]Hallet TB. Current opinion in HIV and AIDS 2011
[7]Mastro TD et al. J HIV AIDS Surveill Epidemiol 2010

Methods

- **Search strategy and selection criteria:** a systematic literature search[1,2] of MEDLINE, Embase, and PsycINFO for studies published between Jan 1, 2000 and Sept 14, 2020, including conference abstracts, without language restrictions
- **Population:** people with a history of injection drug use
- **Measures:** HCV or HIV incident infection assessed either through repeat follow-up of people susceptible to infection, or through tests of recent infection
- **Data extraction**
  - HCV/HIV incidence overall and stratified by gender (female vs male) and age (≤25 vs >25, where possible or similar cut-off)
  - Method of incidence estimation, testing schedule, follow-up duration and attrition
  - Study characteristics (e.g., inclusion/exclusion criteria, recruitment scheme)
  - Participant characteristics (e.g., mean age/duration of injection, % female, % on OAT, background HCV/HIV prevalence)
- **Data analysis**
  - Risk of bias assessed using an adapted version of the Newcastle-Ottawa Scale
  - Estimates synthesized using random-effects meta-analysis
  - Potential sources of heterogeneity investigated using subgroup and random-effects meta-regression analyses
- Analysis plan was pre-specified (PROSPERO 2020 CRD42020220884)

[1]Stone J et al. Lancet Infect Dis 2018
[2]Arum C et al. Lancet Public Health 2021

Global and regional estimates of HCV and HIV incidence among people who inject drugs

Total number of incidence estimates

- HCV: n=54
  - High-income countries: 45
  - Low or middle-income countries: 9
- HIV: n=46
  - High-income countries: 24
  - Low or middle-income countries: 22

Countries with available incidence estimates for either HCV or HIV

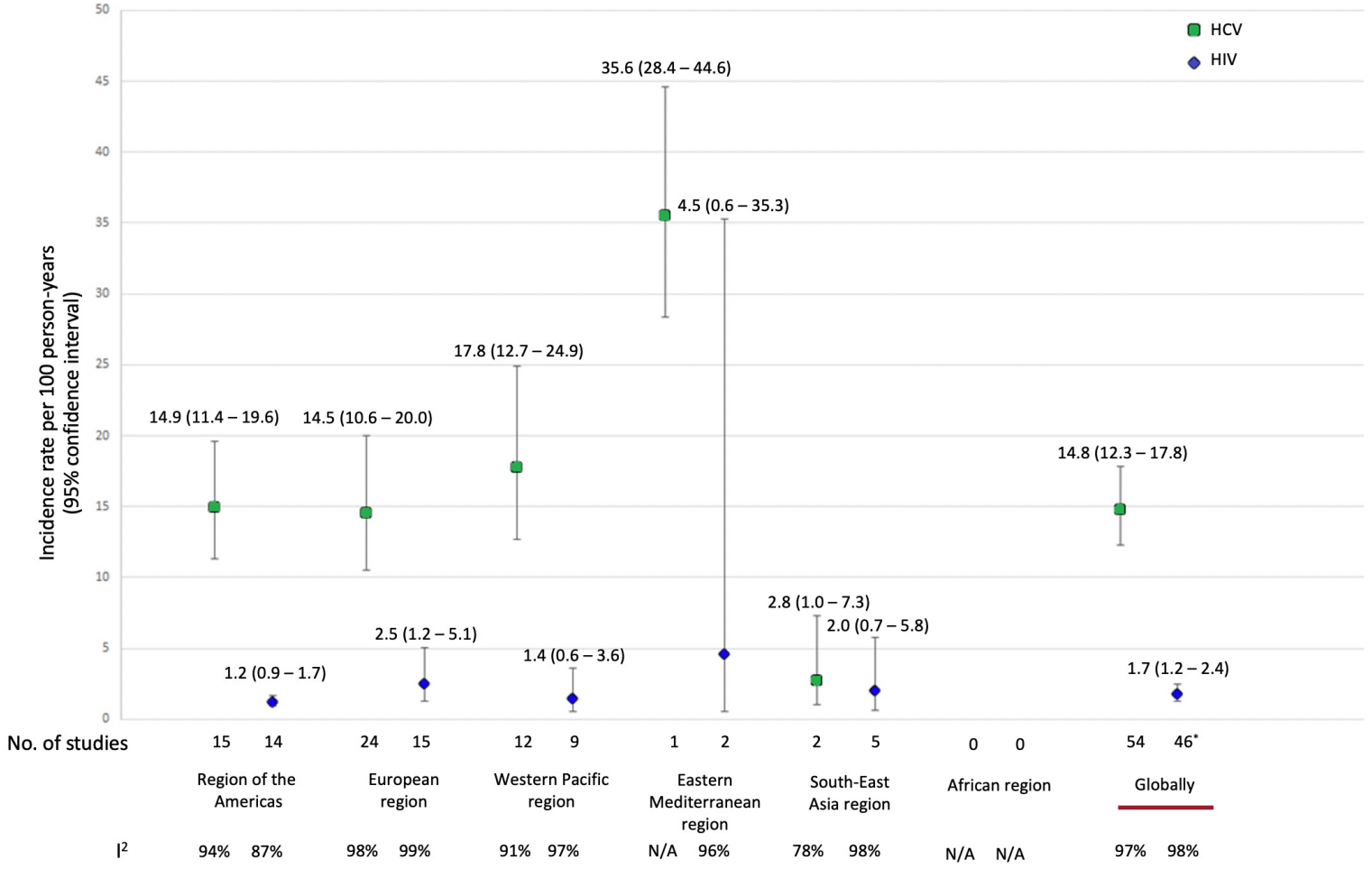
- n=25

Countries with available incidence estimates for both HCV and HIV

- n=17

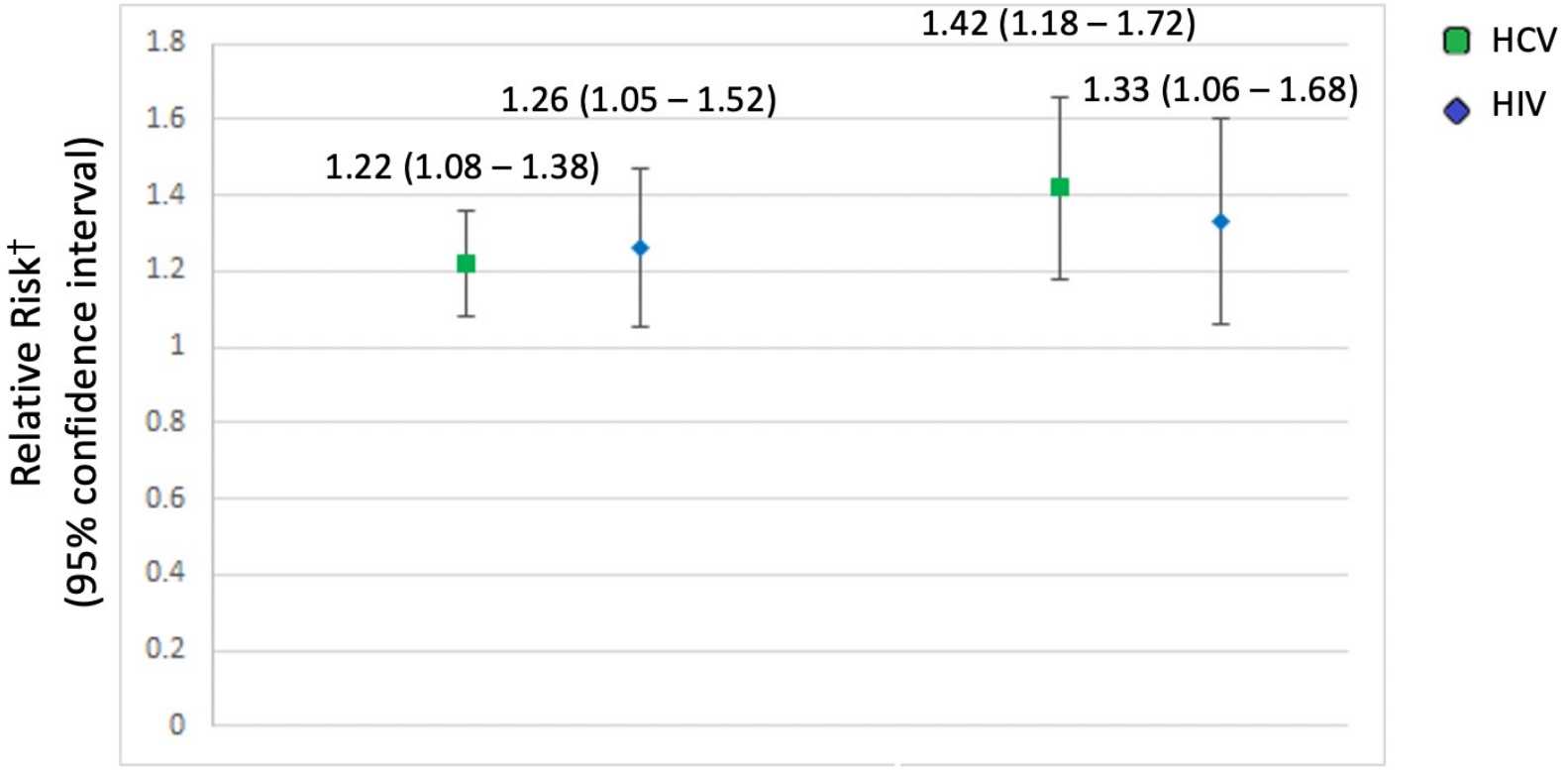
Proportion of incidence estimates derived from a single city rather than multi-city/nationwide

- HCV: 61%
- HIV: 70%



*1 study spanned multiple regions and was excluded from stratified analyses

HCV and HIV infection risks are higher among people who inject drugs who are women or young relative to those who are men or not young, respectively



No. of studies	26	22	16	14
	Gender:	Women vs. Men	Age*:	≤25 vs. >25
I^2	31%	59%	47%	64%
$p_{heterogeneity}$	0.07	<0.01	0.02	<0.01

**25 was prioritised as the cut-off where possible, but could vary between 20-30*

†reflecting the crude rate ratio, hazard ratio or risk ratio, as reported

Conclusion and implications

- Estimates of HCV or HIV incidence among people who inject drugs are unavailable in most countries and if available, estimates are rarely nationwide

- Available estimates:
  - offer some initial insight into the global level of HCV and HIV transmission among people who inject drugs
  - suggest that considerable efforts are needed to develop systems for monitoring HCV and HIV incidence and/or that indirect methods or other metrics are needed to keep track of these epidemics and validate elimination goals in some countries

15MIN ON DEMAND PRESENTATION

- Next steps: update HCV/HIV incidence estimates using unpublished data

Acknowledgements

- Peter Vickerman
- Matthew Hickman
- Jack Stone
- Hannah Fraser
- Chiedozie Arum
- Aaron G Lim
- Anna McNaughton
- Adam Trickey
- Zoe Ward

Postdoctoral fellowships

CIHR IRSC
Canadian Institutes of Health Research
Instituts de recherche en santé du Canada

CanHepC
Canadian Network on Hepatitis C
Réseau Canadien sur l'Hépatite C

Fonds de recherche Santé Québec

Contact: adelina.artenie@bristol.ac.uk

University of BRISTOL