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Homelessness, unstable housing, and risk of HIV and hepatitis C virus acquisition among people who inject drugs: a systematic review and meta-analysis

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Homelessness, unstable housing, and risk of HIV and hepatitis C virus acquisition among people who inject drugs: a systematic review and meta-analysis

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Summary

Background People who inject drugs (PWID) are at increased risk for HIV and hepatitis C virus (HCV) infection and also have high levels of homelessness and unstable housing. We assessed whether homelessness or unstable housing is associated with an increased risk of HIV or HCV acquisition among PWID compared with PWID who are not homeless or are stably housed.

Methods In this systematic review and meta-analysis, we updated an existing database of HIV and HCV incidence studies published between Jan 1, 2000, and June 13, 2017. Using the same strategy as for this existing database, we searched MEDLINE, Embase, and PsycINFO for studies, including conference abstracts, published between June 13, 2017, and Sept 14, 2020, that estimated HIV or HCV incidence, or both, among community-recruited PWID. We only included studies reporting original results without restrictions to study design or language. We contacted authors of studies that reported HIV or HCV incidence, or both, but did not report on an association with homelessness or unstable housing, to request crude data and, where possible, adjusted effect estimates. We extracted effect estimates and pooled data using random-effects meta-analyses to quantify the associations between recent (current or within the

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Background

- People who inject drugs (PWID) are at increased risk for HIV and hepatitis C virus (HCV) infection[1]
- Globally, an estimated 22% of PWID report experiencing homelessness or unstable housing in the past year, with substantial variations regionally[1]
  - >40% in England, Wales, Canada, US, India, Czech Republic[1]
- PWID who are homeless or unstably housed are more likely to engage in high-risk behaviours associated with HIV and HCV transmission (such as sex work, public injecting, and sharing of injection equipment)[2,3,4] and to experience barriers to accessing addiction treatment[5,6] and HIV and HCV prevention and care[4,7,8]
- Homelessness has been linked to recent outbreaks of HIV infection in several European cities, Israel and Canada, despite the availability of comprehensive harm reduction in some of these settings [9]
- Although multiple studies have reported associations between homelessness or unstable housing and incident HIV and HCV infection among PWID, no systematic review has synthesised these data.

[1]Degenhardt et al *Lancet Global Health* 2017; [2]Aidala et al *AIDS Behav* 2005; [3]Linton *Drug Alcohol Depend* 2013; [4]Topp et al *J Urban Health* 2013; [5]Appel et al *Am J Drug Alcohol Abuse* 2004; [6]Havens *J Subst Abuse Treat* 2009; [7]Harris et al *Harm Reduct J* 2013; [8]Makarenko et al *Int J Drug Policy* 2019; [9] Des Jarlais *Lancet HIV* 2020.

Aims

- Systematic review and meta-analysis to quantify the associations between homelessness or unstable housing and the risk of HIV and HCV acquisition among PWID.

Methods

- Updated an existing database of HIV and HCV incidence studies published between Jan 1, 2000, and June 13, 2017.[1]
- **Search strategy:** a systematic literature search of MEDLINE, Embase, and PsycINFO for studies published between June 14, 2017 and Sept 14, 2020, including conference abstracts, without language restrictions
  - We used terms related to HIV infection, HCV infection, injecting drug use, and study designs that could be used to measure incidence of HIV or HCV
- **Selection criteria:**
  - **Population:** people with a history (current/recent/ever) of injection drug use recruited in the community (i.e. not prisons)
  - **Exposure:** recent homelessness or unstable housing ("currently" to "past 1–12 months")
  - **Outcome:** HIV or HCV incident infection - assessed either through repeat follow-up of people susceptible to infection, or through biological markers of recent infection

[1] Stone et al. Lancet Infectious Diseases 2018.

Methods

- Double screening of title/abstracts & full text.

- As in our previous review[1], we requested additional data from:
  - (i) authors of studies that reported estimates of HIV/HCV incidence but did not report on the association with homelessness or unstable housing
  - (ii) lead investigators of other ongoing HIV and HCV incidence cohorts.

- Estimates obtained in this way were described as “unpublished estimates”.
  - It should be noted that the vast majority of these estimates were calculated using raw data from studies with published estimates of HIV or HCV incidence.

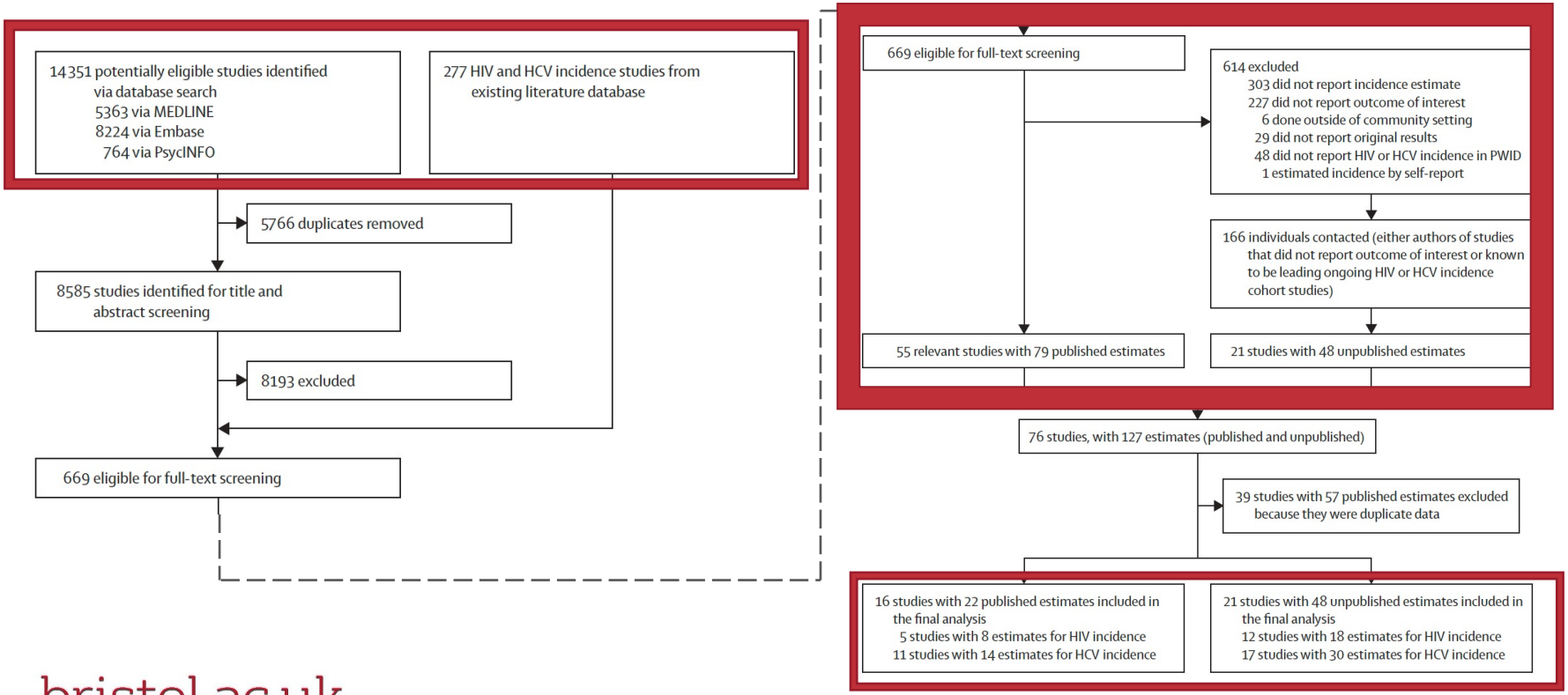
[1] Stone et al. Lancet Infectious Diseases 2018.

Methods

- Unadjusted and adjusted relative risks based on HRs, IRRs and ORs were extracted or derived from data.
- ORs were transformed to RRs when HCV or HIV incidence were high (>10 per 100py) [1]
- Effect measures and standard errors were log-transformed and pooled using random effects meta-analysis.
- Between-study heterogeneity was evaluated using the I^2 statistic and the P value for heterogeneity [2]
- We performed subgroup analyses and random-effects meta-regression analyses to explore potential sources of heterogeneity.
- We assessed the risk of bias of each study for each included outcome using the Newcastle-Ottawa Scale

1. Zhang JAMA 1998
2. Huedo-Medina Psychological methods 2006

Results - Study Selection



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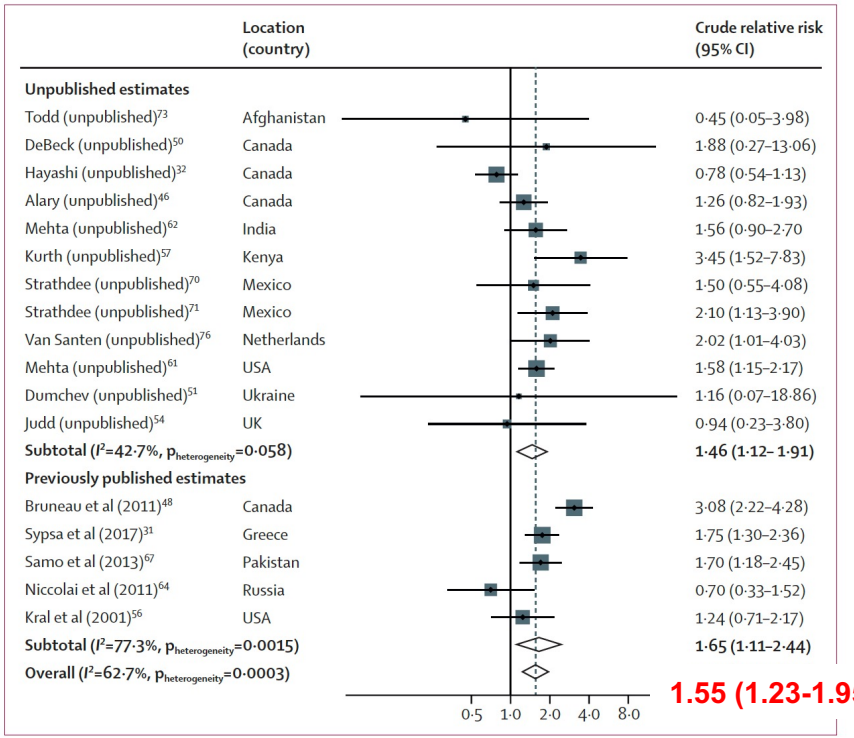
Overall: 37 studies including 70 estimates

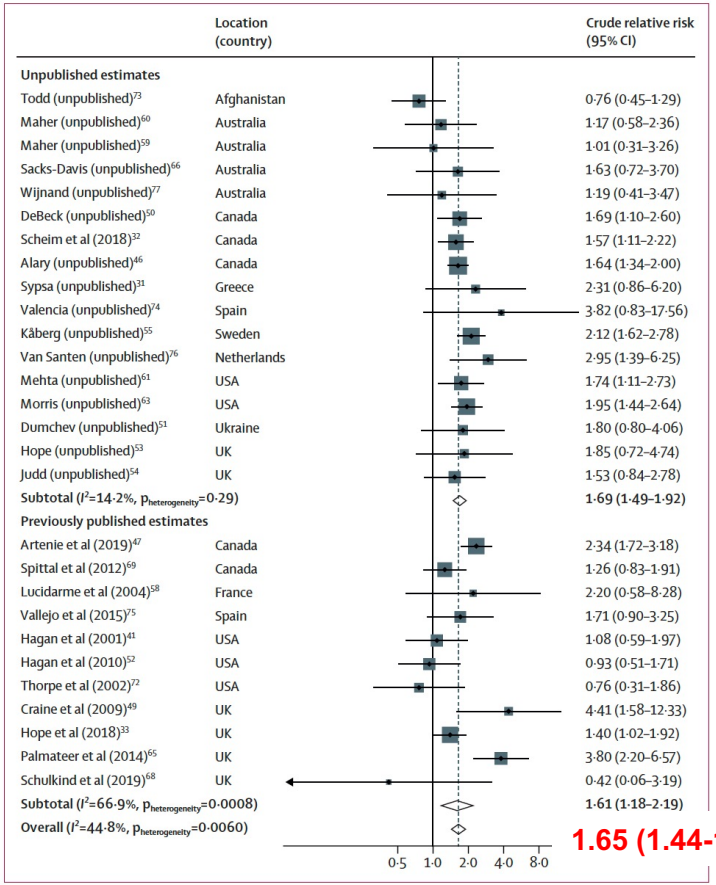
Results – Risk of HIV Acquisition



1.55 (1.23-1.95)

- 17 crude estimates; 12 of which unpublished
- Unstable housing/homelessness associated with 55% increase in risk of HIV acquisition
- Effect persisted when pooling adjusted estimates but was lower than crude estimates: 1.39 vs 1.55
- Estimates not sensitive to pooling only longitudinal studies or studies at low risk of bias.
- Unpublished estimates were lower than published estimates:1.46 vs 1.65
- Estimates for homelessness were lower than unstable housing: 1.44 vs 1.82

Results – Risk of HCV Acquisition



- 28 crude estimates; 17 of which unpublished
- Unstable housing/homelessness associated with 65% increase in risk of HCV acquisition
- Effect persisted when pooling adjusted estimates and pooled effect was similar: 1.64 vs 1.65
- Estimates not sensitive to pooling only longitudinal studies or studies at low risk of bias.
- Unpublished estimates similar to published estimates:1.61 vs 1.69
- Estimates for homelessness were similar to estimates for unstable housing: 1.66 vs 1.72

Meta-Regression Results

- No evidence that the effect of recent homelessness or unstable housing on HIV acquisition risk differed by region, baseline characteristics of study participants, or study characteristics

- Association between recent homelessness or unstable housing and HCV acquisition risk was higher in:
  - Europe
  - Studies with higher baseline OST coverage
  - Studies spanning longer time periods

Discussion

- Unstable housing and homelessness associated with a 55% and 65% increase in the risk of HIV and HCV acquisition amongst PWID, respectively.
- Findings strengthened by the inclusion of unpublished estimates (>2/3rds of all estimates)
  - Likely reduced possible effects of publication bias for HIV analyses
- However, few studies conducted in low- and middle-income countries
- Our findings frame housing instability as an important driver of HIV and HCV transmission among PWID
  - e.g. In US & England, unstable housing is projected to contribute over a quarter of new HCV infections among PWID [1]
- Support calls for **intensified efforts to assess and implement housing initiatives** and targeted prevention services that are tailored to the needs of this marginalised population

1. Stone et al. INHSU 2021 Day 2.

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