

The Importance of Prison-Based Interventions to Eliminate Hepatitis C Virus Transmission Amongst People Who Inject Drugs

Jack Stone, Natasha K. Martin, Matthew Hickman, Peter Vickerman

BACKGROUND

- Globally, 58% of people who inject drugs (PWID) have ever been incarcerated [1]
- PWID are overrepresented in prisons; consequently, hepatitis C virus (HCV) prevalence amongst prisoners is high. [2]
- There is evidence that injecting risk is elevated following prison release. [3]
- So the lack of harm reduction interventions in prisons could undermine community efforts to reduce HCV transmission amongst PWID.
- Mathematical modelling suggests scaling-up HCV treatment could substantially reduce HCV transmission amongst PWID [4], and will be important for HCV elimination [5].
- Prisons may be an important setting for prevention delivery.

To highlight the importance of incarceration as a driver of HCV transmission, and prison as an important setting for prevention delivery, we:

- Perform a systematic review of the effect of incarceration history on HCV transmission risk amongst PWID
- Model the contribution of incarceration to HCV transmission amongst PWID
- Model the impact and cost-effectiveness of prison-based prevention interventions.

METHODS

MEDLINE, EMBASE and PsycINFO databases were searched for epidemiological studies assessing HCV incidence amongst community PWID. Studies published since January 2000 were retrieved for review without language restriction. Studies were included if they reported the association between recent incarceration and HCV incidence. Authors of incidence studies which did not report on this outcome were contacted to obtain additional data. Data were extracted and pooled in meta-analyses using a random effects model.

Dynamic models of HCV transmission and incarceration were developed and calibrated to:

- Scotland - low HCV incidence (4.3/100pyrs) in prisons, 2.3-fold elevated risk amongst recently released PWID (<6 months) compared to other community PWID [6]
- Perry County, Kentucky, USA - 1.9 fold elevated risk amongst currently incarcerated PWID and recently released PWID (<6 months)
- Australia, Ukraine and Thailand like settings - Scotland/Kentucky model recalibrated to have different incarceration dynamics and higher HCV incidence in prisons [7]
- England - Same HCV transmission rate amongst PWID in prison and the community and no increase in HCV transmission risk following release. [8]

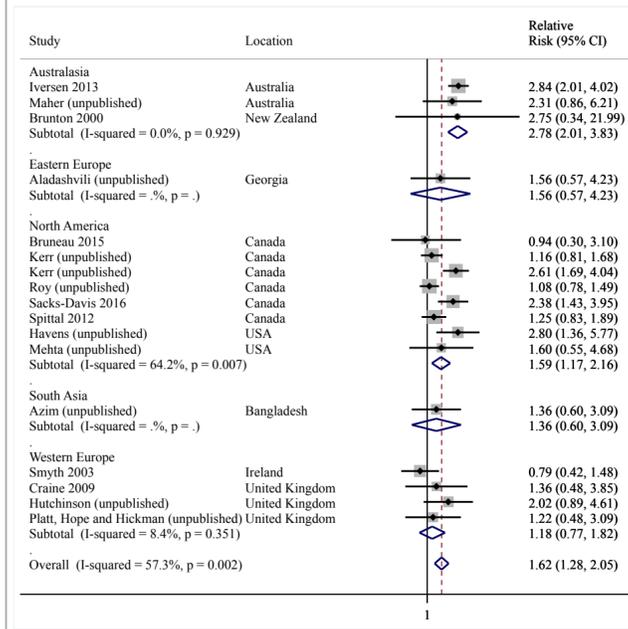
CONCLUSIONS

- Incarceration is an important contributor to HCV transmission amongst PWID globally.
- Interventions that focus on reducing the elevated risks both during and post incarceration may be important for HCV elimination.
- Prison-based HCV case-finding and treatment could be cost-effective and have large preventative impact.
- Further studies need to investigate the feasibility of this in different settings.

RESULTS

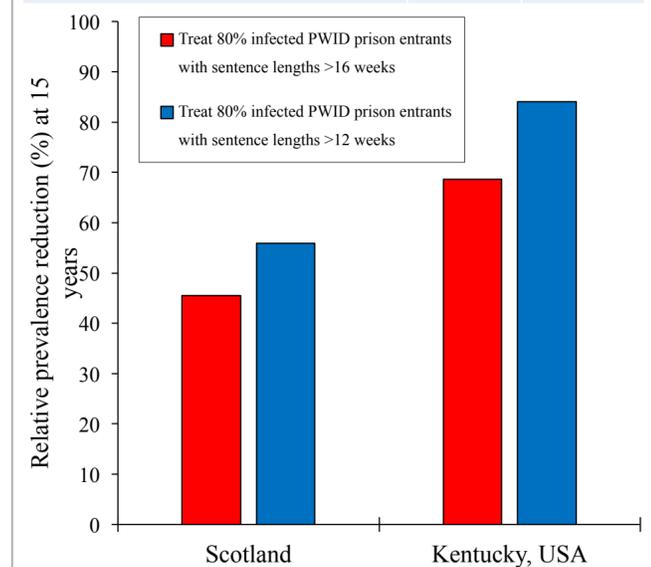
A systematic review and meta-analysis of the impact of recent incarceration on HCV acquisition risk, including 10 published studies and 7 unpublished studies, found that recent incarceration was associated with a 62% increase in the risk of incident HCV infection.

In multi-variable meta-regression analyses, we found a greater effect of recent incarceration in studies with higher levels of homelessness at baseline and countries with higher incarceration rates.



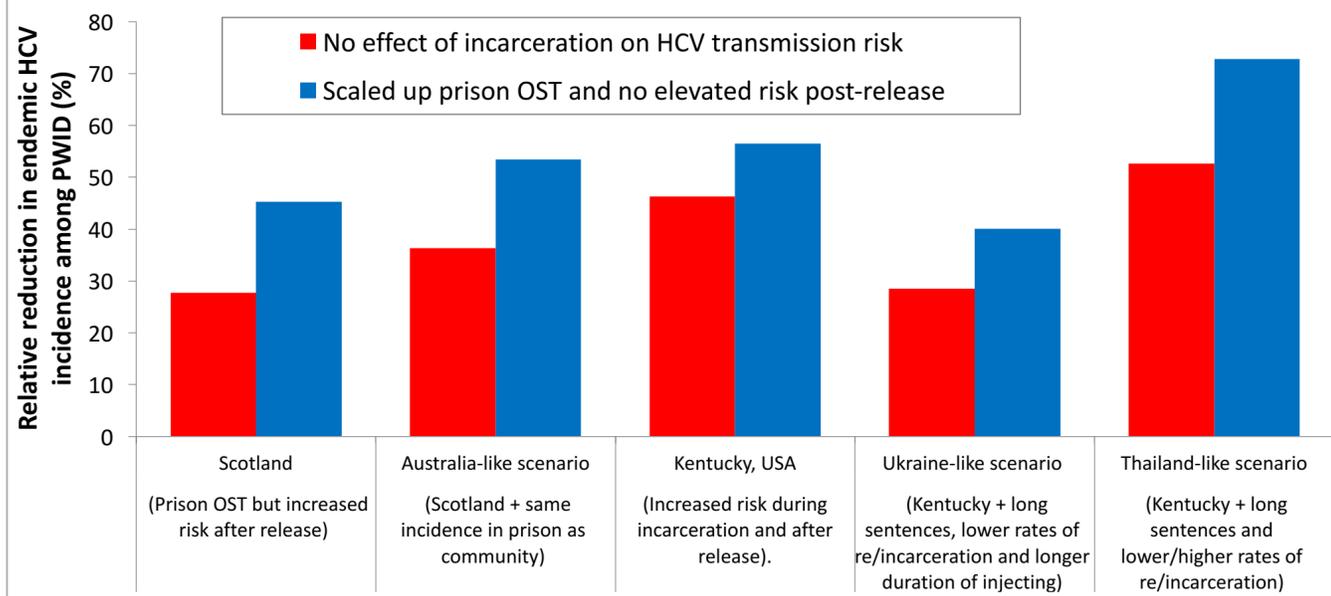
Scaling-up HCV treatment amongst incarcerated PWID (Scotland & Kentucky) could have substantial impact on HCV transmission amongst PWID.

	Scotland	Kentucky
Proportion of PWID with sentence lengths > 16 weeks	43.0%	25.6%
Proportion of PWID with sentence lengths > 12 weeks	60.3%	34.3%

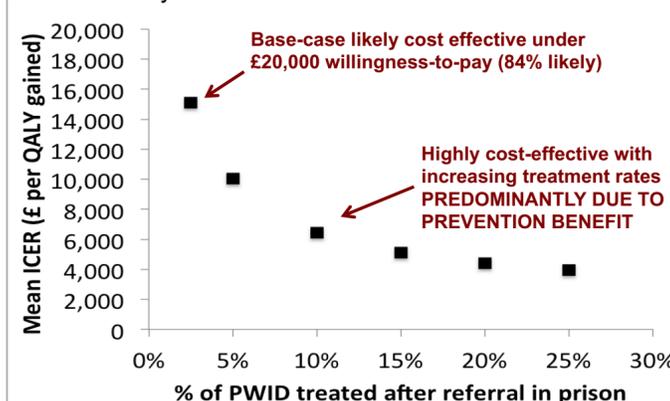


*Assumes screening at entry, 4 weeks to treatment initiation and 8 or 12 weeks treatment durations.

- In Scotland, despite high coverage levels of opiate substitution therapy (OST; 57%) and low HCV incidence in prisons, incarceration contributes 28% of HCV transmission among PWID.
- In settings which have no prison-based harm reduction interventions, and where HCV transmission is elevated both during incarceration and following release, incarceration could contribute more to HCV transmission (up to 53%).
- Reducing the risk associated with recent incarceration and scaling-up OST in prisons could have important prevention impact for HCV transmission amongst PWID.



Opt-out HCV case-finding in English prisons is likely to be cost-effective, particularly if there is adequate linkage to treatment and continuity of treatment/care between prison and the community.



REFERENCES

- [1] Degenhardt Lancet Global Health 2017; [2] Dolan Lancet 2016; [3] Kamarulzaman Lancet 2016; [4] Martin Hepatology 2013; [5] Martin Clinical Infectious Diseases 2013; [6] Stone Addiction 2016; [7] Csete Lancet 2016; [8] Martin Hepatology 2016.

CONFLICTS OF INTEREST

JS has received a conference attendance sponsorship from Gilead. NKM has received research grants from Gilead, and honoraria from Merck, AbbVie and Gilead. MH reports personal fees from Gilead, AbbVie, and MSD. PV has received research grants from Gilead.

Contact Information

Jack Stone
Jack.stone@bristol.ac.uk