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## The Role of Incarceration in HCV Transmission Amongst People Who Inject Drugs: A Modelling Analysis

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### Disclosures of interest

- No conflicts to declare.

# Motivation & Background

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## The Lancet Commissions

### Public health and international drug policy



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#### Executive summary

In September, 2015, the member states of the UN endorsed Sustainable Development Goals (SDGs) for 2030, which aspire to human-rights-centred approaches to ensuring the health and wellbeing of all people. The SDGs embody both the UN Charter values of rights and justice for all and the responsibility of states to rely on the best scientific evidence as they seek to better humankind. In April, 2016, these same states will consider control of illicit drugs, an area of social policy that has been fraught with controversy and thought of as inconsistent with human rights norms, and in which scientific evidence and public health approaches have arguably had too limited a role.

the same light as potentially dangerous foods, tobacco, and alcohol, for which the goal of social policy is to reduce potential harms.

#### Health impact of drug policy based on prohibition

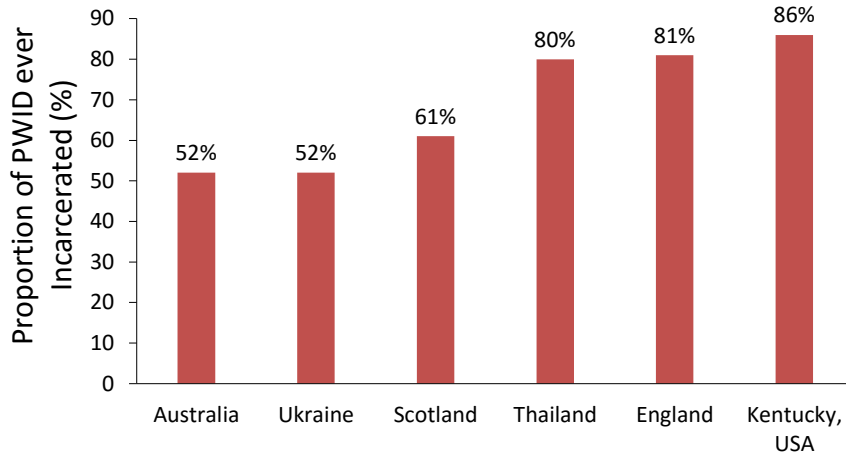
The pursuit of drug prohibition has generated a parallel economy run by criminal networks. Both these networks, which resort to violence to protect their markets, and the police and sometimes military or paramilitary forces that pursue them contribute to violence and insecurity in communities affected by drug transit and sales. In Mexico, the striking increase in homicides since the government decided to use military forces against drug traffickers in 2006 has been so great that it reduced life

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## PWID Experience High Incarceration Rates



Australia: Topp J. Urban Health 2013; Scotland: Palmateer Plos One 2014;  
Thailand: Hayashi BMC P.H.2013; England: Hope J.V.H. 2011;  
Kentucky: Unpublished analyses

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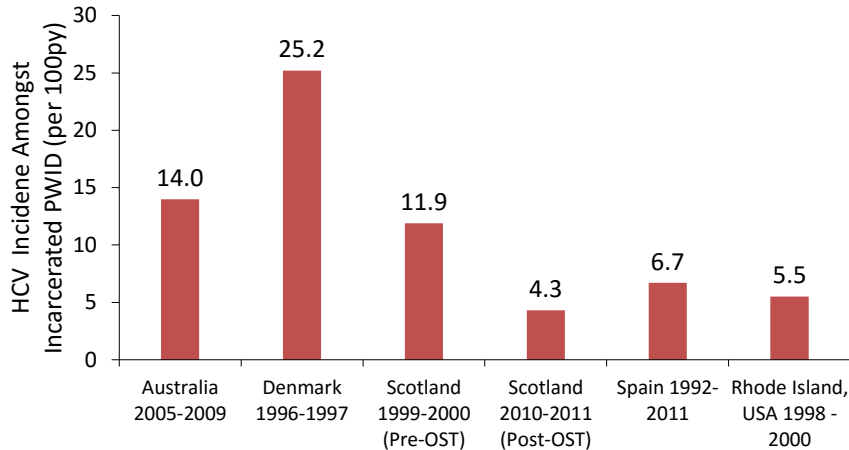
## Limited Interventions in Prison

- Only 8 countries report having Needle and syringe programmes (NSP) in prison<sup>1</sup> compared to 82 in the community<sup>2</sup>
- Opiate substitution therapy (OST) is available in prisons in nearly 40 countries compared to 72 in the community<sup>3</sup>
- Prison OST coverage is often low and frequently not available in all prisons within a country

[1] Stover UNODC report 2015; [2] Mathers Lancet 2010; [3] Jurgens J. Int. AIDS Soc.

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## Incarceration and HCV Transmission



Luciani Addiction 2014; Christensen E.J.E. 2010; Champion A.J.E. 2004; Taylor Addiction 2013; Marco PloS 1 2014; Macalino Am. J. PH 2004;

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## Incarceration and HCV Transmission

- History of incarceration frequently found to be associated with HCV prevalent or incident infection in the community<sup>1-5</sup>
- Recently released PWID frequently report increased risk behavior<sup>6-9</sup>
- High exposure to incarceration and the associated risks of increased transmission during and following incarceration suggest that incarceration could contribute significantly to HCV transmission

[1] Hope J. Vir Hepat 2011; [2] Hickman J. Vir Hepat 2007; [3] Khierandish J. Urban Health 2009; [4] Oliveira J. Clin Virol 2009; [5] Allen IJDP 2012; [6] Capeda DAD 2015; [7] Milloy Drug and Alc Rev 2008; [8] Wood Pub Health Reports 2005; [9] Milloy BMC PH 2009

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## Aims

- Evaluate the role of incarceration on HCV transmission amongst PWID.
- Consider 4 scenarios which mimic different global settings:
  - Scotland: High OST coverage in prison and short prison sentence
  - Australia: Lower prison OST coverage and similar incarceration dynamics
  - Ukraine: No prison OST and longer sentences
  - Thailand: No prison OST, longer sentences and higher proportion ever in prison

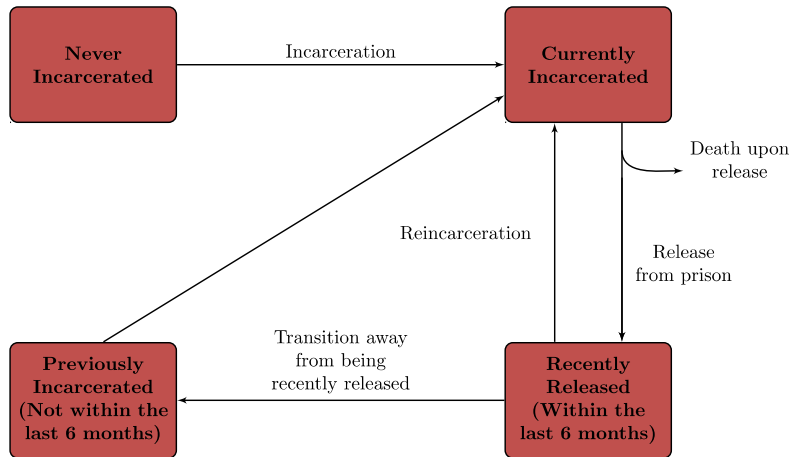
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## Methods

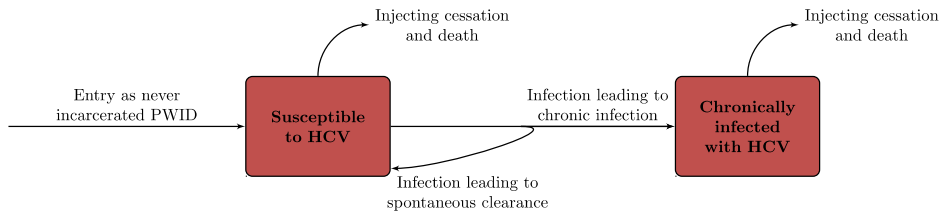
## Model Structure I



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## Model Structure II



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## Model Calibration

- Model first calibrated to Scotland scenario, with key parameters changed accordingly for other scenarios.
- For Scotland, incarceration assumptions:
  - % community PWID ever incarcerated: 61% <sup>1</sup>
  - % community PWID incarcerated in last 6 months: 13% <sup>2</sup>
  - Average PWID sentence length - 7 months <sup>3</sup>
- Main model assumptions:
  - 3-fold lower HCV incidence in prison than in community <sup>1,3</sup>
  - 3-fold increased HCV transmissions risk in the 6 months following release (compared to other community PWID) <sup>2</sup>

[1] Palmateer Plos One 2014; [2] Allen IJDP 2012;  
[3] Taylor Addiction 2013

## Modeled scenarios

Parameters	Scotland-like scenario	Australia-like scenario	Ukraine-like scenario	Thailand-like scenario
Proportion ever incarcerated	61%	61%	52%	80%
Proportion recently incarcerated	13% in last 6 months	13% in last 6 months	9.7% in last 6 months	17% in last 3 months
Average time spent in prison	7 months	7 months	14 months	12 months
HCV incidence amongst incarcerated PWID vs community PWID	3x <b>lower</b> in prison than community	2x <b>higher</b> in prison than community	2x <b>higher</b> in prison than community	2x <b>higher</b> in prison than community

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## Model Analyses

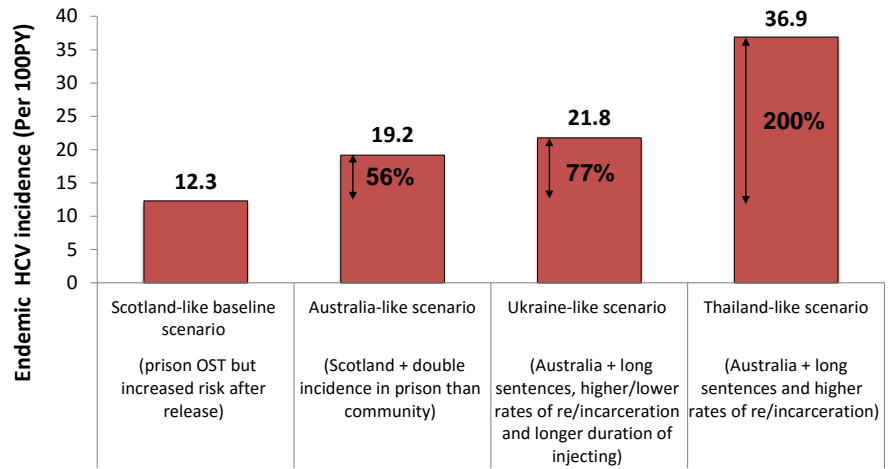
- How changes in the model assumptions can effect the overall HCV incidence from the Scotland-like scenario
  - Estimate the degree to which incarceration increases the overall level of HCV transmission amongst PWID in each scenario.
    - Assume HCV transmission risk during and after prison is same as amongst never incarcerated community PWID.
  - Estimate potential impact of scaling-up prison OST to Scottish levels (57% coverage) and preventing the increased transmission risk in the 6 month post-release period.
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# Results



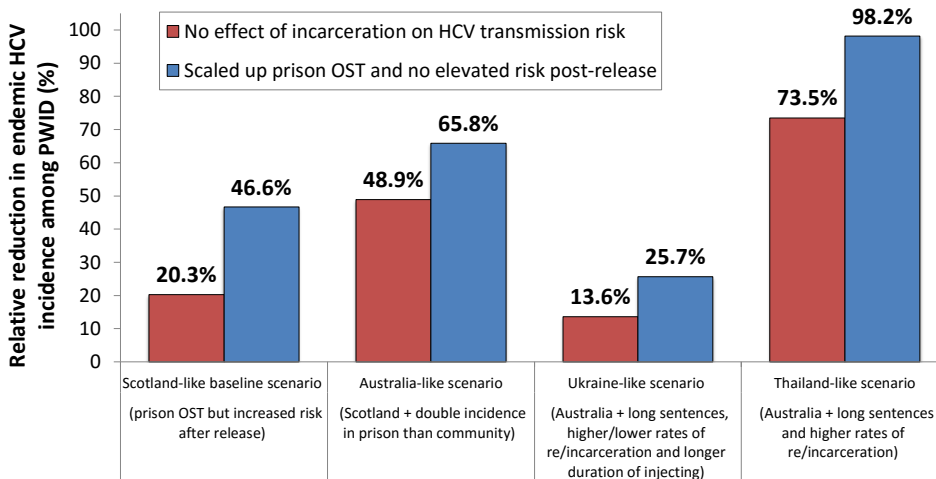
## HCV Incidence



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## The Role of Incarceration on HCV Transmission



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# Conclusions

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## Conclusions

- Incarceration can have a significant impact on HCV transmission
  - Even in countries with low HCV incidence during incarceration – Scotland.
- Reducing the risk of HCV transmission amongst incarcerated PWID, and preventing the increased risk post release could have great prevention benefits for all PWID.

## How can the role of incarceration be reduced?

1. Scaling-up harm reduction measures in prison that are available in the community.
2. Facilitate retention on OST following prison release.
3. Facilitate re-entry into the community following release.
  - Many recently released PWID become homeless which can elevate HCV acquisition risk<sup>1,2</sup>
  - High levels of unemployment can result in high levels of risk following release<sup>3</sup>
4. Reduce incarceration rates through the decriminalisation of minor drug offences.

[1] Turner Addiction 2011; [2] Allen I.J.D.P. 2012;  
[3] Cepeda D.A.D. 2015

## Limitations & Next Steps

- Although, parameterisation of the baseline Scotland scenario utilizes a simplistic approach, results agree well with a recent, more detailed, modelling analysis.
- Other scenarios are only variations of Scotland scenario and should be considered illustrative.
- Future Work:
  - Model in detail, the role of incarceration and the impact of prison OST and reducing incarceration rates on HCV transmission in a variety of global settings.

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- Open Society