MODELLING THE IMPACT OF HEPATITIS C (HCV) TESTING AND TREATMENT ON HCV INCIDENCE AMONG PEOPLE WHO INJECT DRUGS IN ENGLAND

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ABSTRACT

Background:
England has expanded HCV screening and treatment interventions among people who inject drugs (PWID) with the aim of reaching the World Health Organization's (WHO) elimination target of decreasing HCV incidence among PWID to <2 per 100 person years (/100pyrs) by 2030. Surveillance data suggests large declines in chronic HCV prevalence, but empirical incidence estimates are very uncertain. We used mathematical modelling to evaluate England's progress towards WHO's incidence target.

Methods:
A deterministic compartmental model of HCV transmission was developed among PWID in England. The model was calibrated and parameterised in a Bayesian framework using England-specific data from annual bio-behavioural surveys (2011-2023) and national HCV testing and treatment databases. Over 53,000 ever-PWID have been treated since 2016. The model incorporates testing and treatment pathways through prison, setting providing opioid agonist therapy (OAT) and other non-community settings. We estimated the impact of existing HCV testing and treatment among PWID on HCV incidence in 2024 and in 2030 if treatment continues at same rate.

Results:
The calibrated model agreed well with data although it slightly underestimated the decline in chronic (RNA-positive) prevalence, projecting it decreased by 60.2% (95%CrI: 46.3-69.3) over 2015-2024 (Figure). Our model projects that HCV incidence declined by 58.1% (95%CrI: 43.3-68.3) over 2015-2024 from 10.9/100pyrs (8.3-13.8) in 2015 to 4.6/100pyrs (2.9-6.9) in 2024. If HCV testing and treatment continues at current rates over 2024-2030, HCV incidence will decrease to 1.9 (0.9-3.9) by 2030, with 53% of model runs projecting a HCV incidence <2/100pyrs by 2030. This increases to 88.5% of model runs if we only consider the model runs that are in the 95% confidence intervals of the chronic prevalence estimates in 2023.

Conclusions:
Our findings suggest that England is on the pathway towards achieving HCV elimination among PWID by 2030 if current testing and treatment pathways are maintained.

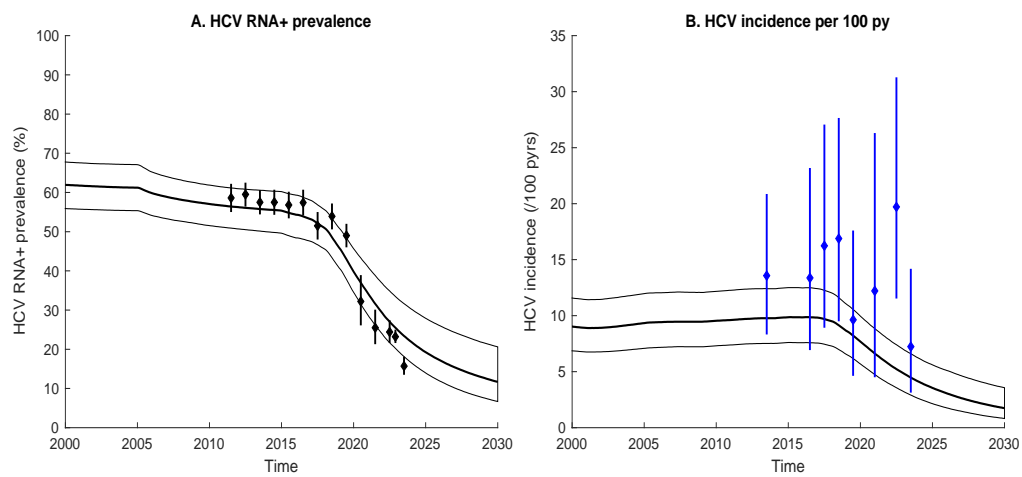**Disclosure of Interest Statement:** none

Figures

Figure 1: A comparison of model projections with empirical HCV chronic (RNA-positive) prevalence and HCV incidence estimates among PWID.

The black line represents the median estimate with 95% credible interval shaded red. The incidence estimates (blue colour) were not fitted to.