

A COMBINED TREATMENT AND PREVENTION APPROACH IS VITAL IN ELIMINATING HEPATITIS C VIRUS IN AUSTRALIAN PRISONS: A MODELLING STUDY

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Introduction: Australia is on track to meet the WHO global hepatitis C (HCV) elimination goals by 2030, reflecting universal subsidised access to testing and direct acting antiviral (DAA) treatment, including for prisoners. However, Australian prisoners have a high HCV prevalence and incidence of transmissions, which could undermine national elimination efforts. An individual-based mathematical model of a typical prison setting was developed to test the preventative effects of DAA treatment scale-up, opiate substitution treatment (OST), and needle-syringe program (NSP) strategies.

Methods: Prisoners were described by demographic characteristics, HCV infection history, risk behaviors, and accessing treatment and prevention measures in varied security settings. The model was calibrated against Australian epidemiological datasets and executed in-prison events for each individual daily, including movements between prisons, changes in risk behavior, and uptake of prevention measures such as OST, NSP, as well as DAA treatment. Scenarios from 2018 to 2030 were projected.

Results: Doubling the current DAA treatment rate reduced the HCV incidence of 10.19% (8.22, 11.48) to 8.69% (8.17, 9.20) per 100 person-years (100 p.y). Combined treatment and prevention strategies revealed greater reductions, down to 5.22% (5.13, 5.52) per 100 p.y. Considering the projected reductions in the prevalence of chronic HCV in the Australian community, by 2030 the in-prison incidence was predicted to drop to 0.93 (0.92, 0.98) per 100 p.y.

Conclusion: This model simulates key prison scenarios to inform national HCV elimination efforts in Australia. Combined treatment and prevention strategies in the prison setting are crucial in achieving HCV elimination.

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