Contribution of prison-based hepatitis C treatment initiations to overall treatment uptake in Victoria, Australia

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Australia has committed to WHO goals to eliminate hepatitis C virus (HCV) as a public health threat by 2030.[1] People in prison remain a priority for hepatitis C elimination due to high hepatitis C prevalence.[2] Prison hepatitis programs operate across all Australian jurisdictions, accounting for 35% of direct-acting antiviral treatment (DAA) initiations in 2022.[3] However, treatment uptake overall in Australia has declined. If hepatitis C testing and treatment does not increase, Australia is unlikely to meet WHO hepatitis C elimination targets by 2030.[3]

In the state of Victoria, the estimated hepatitis C infection prevalence is 0.65%,[4] but estimated at 20% in prison among approximately 7000 incarcerated individuals.[2,5,6] In Victoria, following a positive HCV RNA test, DAAs can be prescribed to people by general practitioners, specialists and by nurse practitioners. In 14 Victorian prisons, opt-in viral hepatitis screening is offered at reception. Between 2016 and 2022, following a positive HCV RNA test, or self-reported previous diagnosis, people in prison were referred to the Statewide Hepatitis Program, which prescribed all DAA prescriptions in Victorian prisons.

To reach people missed with previous testing and treatment strategies, tailored and settings-based approaches are required, including high hepatitis C prevalence settings, such as prisons.[7,8] To help guide the next phase of hepatitis C elimination, we describe treatment and retreatment in a statewide, decentralised prison hepatitis C treatment program and the community between 2016 and 2022, and identify trends in treatment uptake by setting.

Two datasets were used for analyses: (1) Pharmaceutical Benefits Scheme (PBS) records of all DAA prescriptions dispensed to people in Victoria (2) Victorian Statewide Hepatitis Program records of DAA treatments prescribed in prisons.

The PBS is a government program subsidising prescription medicines in Australia. PBS records include all individual-level prescriptions dispensed. For this analysis, individuals' date of DAA dispensation was used to determine the first and subsequent DAA treatment uptake, alongside individuals' age and sex. More details of this methodology are reported elsewhere.[9]

The Victorian Statewide Hepatitis Program, implemented by St Vincent's Hospital Melbourne, is described elsewhere.[10] For this analysis, Statewide Hepatitis Program records of DAA dispensation dates, alongside date of birth and sex were used to determine DAAs dispensed in prison. The number of people dispensed DAAs in the community was determined by subtracting the number of people dispensed DAAs in prisons from the total people dispensed DAAs.

People included in analyses were 18 and over and had DAAs dispensed via the PBS between 01 March 2016 (date DAAs were first listed on PBS) and 31 December 2022, with a postcode of residence in the state of Victoria.

For this analysis, data includes first DAA treatment and any subsequent treatment (retreatment). In PBS data, assignment of a treatment episode as retreatment occurred when there was prior DAA treatment recorded in the PBS system. Assignment of a treatment episode as prison retreatment occurred when there was record of prior DAA treatment in the Statewide Hepatitis Program records.

We conducted an ecological study with a primary outcome of aggregated counts of people dispensed DAAs. Total first and subsequent community and prison treatments are reported.

To estimate the association between the count of first DAA dispensations and time, we fitted a generalised linear model (Poisson distribution) to the combined

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Year	Total number of people	Prison	Community
2016	8732	454 (5%)	8278 (95%)
2017	5265	624 (12%)	4641 (88%)
2018	3613	614 (17%)	2999 (83%)
2019	2606	477 (18%)	2129 (81%)
2020	1631	370 (23%)	1261 (77%)
2021	1284	215 (17%)	1069 (83%)
2022	994	143 (14%)	851 (85%)
Total	24,125	2897	21,228

Table 1: **People prescribed primary course of DAAs by year in the community and in prisons.**

dataset (PBS and Statewide Hepatitis Program data). Model coefficients, interpreted as incidence rate ratios (IRRs), represent the average change in the number of first DAA initiations between months. Time was a pseudo-continuous variable from 1 (March 2016) to 82 in monthly increments. To assess if the effect of time was different by setting, we fitted an interaction term. Profile plots demonstrate model fit, time trends in treatment, and difference in trend by setting.

Between 1st March 2016 and 31st December 2022, there were 26,353 recorded episodes of DAA treatment in Victoria; 24,125 were first treatments and 2228 retreatments. Of first treatments, 21,228 (88%) were in the community and 2897 (12%) in prisons (Table 1). The proportion of first DAA treatments occurring in prisons compared to the community increased from 5.2% (454/8732) in 2016 to 22.7% in 2020 (370/1631), before declining to 14.4% (143/994) in 2022.

The number of monthly first DAA treatments in the community declined to 2020, before plateauing. In prison, the number of monthly first DAA treatments declined steadily from 2016 (Fig. 1a and b). The average monthly decline in first treatments in the community was 3.82% (IRR 0.962, 95% CI 0.961–0.962) and 1.62% (IRR 0.984, 95% CI 0.982–0.985) in prisons. There was a statistically significant difference between the decline in first treatments between the settings (IRR 0.978, 95% CI 0.976–0.979).

The number of people treated for hepatitis C infection in Australia has declined progressively in both the community and prison. A faster decline observed in the community is likely driven by more efficient case finding in a high prevalence setting and greater retention in hepatitis C care in prison.[11] Socio-structural barriers, including experiences of stigma and discrimination in healthcare settings and a lack of streamlined care models, limit access and retention in care for people who inject drugs. Understanding and addressing these barriers is crucial for Australia to reach WHO hepatitis C elimination targets.

Barriers to engaging in community-based hepatitis C care can be minimised by integrating care into other services frequented by people who inject drugs.[12] Hepatitis programs can learn from successful co-located healthcare, such as those linked to needle and syringe programs, supervised injecting facilities, and alcohol and other drug services.[13] Further, financial incentives can increase engagement and retention in hepatitis care.[14] Experiences of stigma and discrimination in community healthcare can be reduced by incorporating peers in the design and delivery of non-judgemental and person-centred hepatitis services.[12,13]

While the scale-up of DAAs has reduced hepatitis C incidence in Australian prisons, treatment alone will be insufficient to eliminate hepatitis C in prisons without harm reduction and prevention measures.[15,16] But in the absence of prison needle and syringe programs and high coverage of opioid agonist therapy, incident infection and reinfection in prisons can be minimised through more convenient and streamlined point-of-care testing at reception.[6]

Limitations of these analyses include not being able to account for changes to HCV RNA prevalence in prison and community because of increased treatment availability, and its impact on case finding. However, the aim of this paper was to describe treatment uptake as an

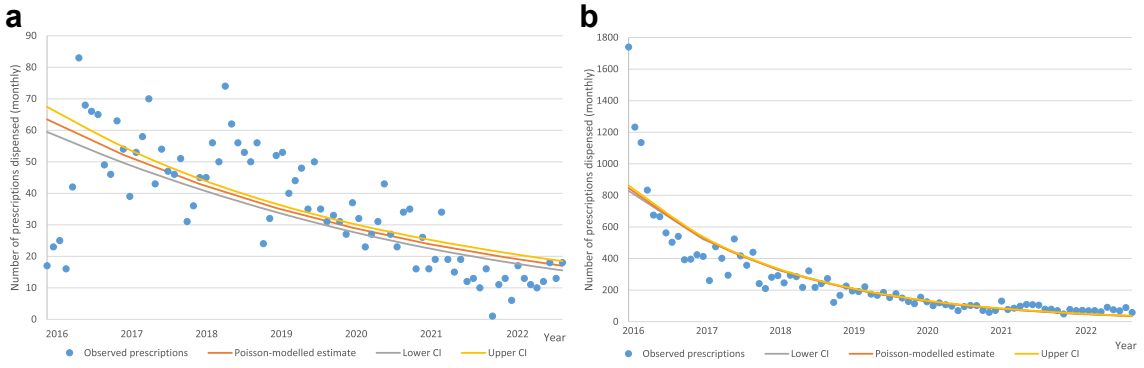

Fig. 1: a) and b) Observed and fitted monthly number of people initially prescribed DAAs in Victorian prisons and the community setting, 2016–2022.

indicator of progress to hepatitis C elimination; an outcome affected by both case finding and retention in care. We have previously described a need to scale up hepatitis C testing to achieve elimination[17] and, as noted earlier, efficient case finding and retention in care that underpins prison hepatitis C program success.[11] This paper further supports those collective conclusions that enhanced community models of care are needed, alongside continued support for prison models of care, if Australia is to achieve hepatitis C elimination targets. We were also not able to determine the differential impact of Covid-19 movement restrictions between settings. However, observed monthly DAA prescriptions (Fig. 1a and b) suggest a continuation of declines occurring prior to Covid-19 restrictions (most substantive in 2020 and 2021). Finally, prison retreatment classification is based on self-reported prior treatment, or evidence of past treatment by the program, which may not be definitive.

Community and prison treatment initiations are declining, a red flag for Australia's progress towards hepatitis C elimination. While still making up a considerable proportion of all treatment, enhanced efforts are needed to sustain hepatitis C treatment rates in Australian prisons. More substantive declines in community treatment highlight the importance of more accessible and tailored community models of care to meet the needs of people at high-risk.

Ethical approval was granted by the Department of Justice and Community Safety Human Research Ethics Committee (JHREC) (CF/19/24677) for Statewide Hepatitis Program data and by UNSW Medicine Human Research Advisory Panel (HC200728) for PBS data.

Contributors

SG: Conceptualisation, methodology, formal analysis, writing- original draft.

ALW: Conceptualisation, methodology, software, formal analysis, writing-review and editing.

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Data sharing statement

Data relevant to this study will not be made available to others due to governance agreements.

Declaration of interests

RW has received investigator-initiated funding from Gilead Sciences unrelated to this work. MS has received investigator-initiated research grants from Abbvie and Gilead and consultancy from Gilead. ARL has received investigator-initiated research grant support from Gilead Sciences and AbbVie. AT has received consulting fees from Gilead, Abbvie, Roche Diagnostics, Assembly Biosciences, speaker fees from Gilead Sciences, Roche Diagnostics and investigator-initiated grants from Gilead Sciences. MH has received investigator-initiated research grant support from Gilead Sciences and AbbVie. JH has received investigator-initiated grant funding from Gilead. MM has received investigator-initiated grant funding from Gilead. All other authors have no conflicts to declare.

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