

Hepatitis C virus treatment uptake among people with recent incarceration in New South Wales, Australia: a population-based linkage study

Shane Tillakeratne¹, Heather Valerio¹, Maryam Alavi¹, Marianne Martinello¹, Jason Grebely¹, Andrew R. Lloyd¹, Sallie-Anne Pearson², Gregory J. Dore¹

¹Kirby Institute, UNSW Australia, Sydney, Australia ²School of Population Health, UNSW Sydney, Sydney, Australia

Introduction

Global HCV Elimination Progress:

- Progress towards WHO's 2030 goal to eliminate HCV globally is uncertain [1]
- Targets include an 80% treatment rate and a 90% reduction in HCV incidence, requiring high uptake among at-risk populations [2].

Prison Population Prioritisation:

- Individuals in prison are a priority for HCV elimination due to high prevalence and incidence [3].
- Marginalisation of this population intensifies the need for strategic interventions.

Australian DAA Access Model:

- Since March 2016, Australia has subsidized DAA therapy for all adults with chronic HCV.
- Prisoners, often excluded from healthcare access, receive special provisions for federally-subsidized pharmaceuticals.

Australia's Leading Role:

- Australia stands out globally by providing unrestricted DAA access, setting a precedent for HCV elimination efforts.
- Both specialists and primary care physicians are authorized to prescribe DAAs, enhancing accessibility.

Research Gap in HCV Treatment Uptake:

- Despite high prevalence and incidence, limited evaluation exists on HCV treatment uptake among those with a history of incarceration in the DAA era.
- Existing studies often suffer from selection bias or rely on uncertain mathematical models [4].

Prison-Based Surveillance Challenges:

- Few prison-based surveillance cohorts exist, with a focus mainly on incarcerated people who inject drugs (PWID) [5].
- In Australia, the prevalence of chronic HCV amongst people in prison is estimated at 10-20%, at least tenfold more prevalent than in the general community [6]. Despite this, evaluation of treatment uptake remains limited.

Aims

- Utilising data linkage, identify people notified with HCV who were associated with evidence of recent or historical incarceration
- Evaluate the proportion who have initiated DAA treatment, and the factors associated with treatment initiation.

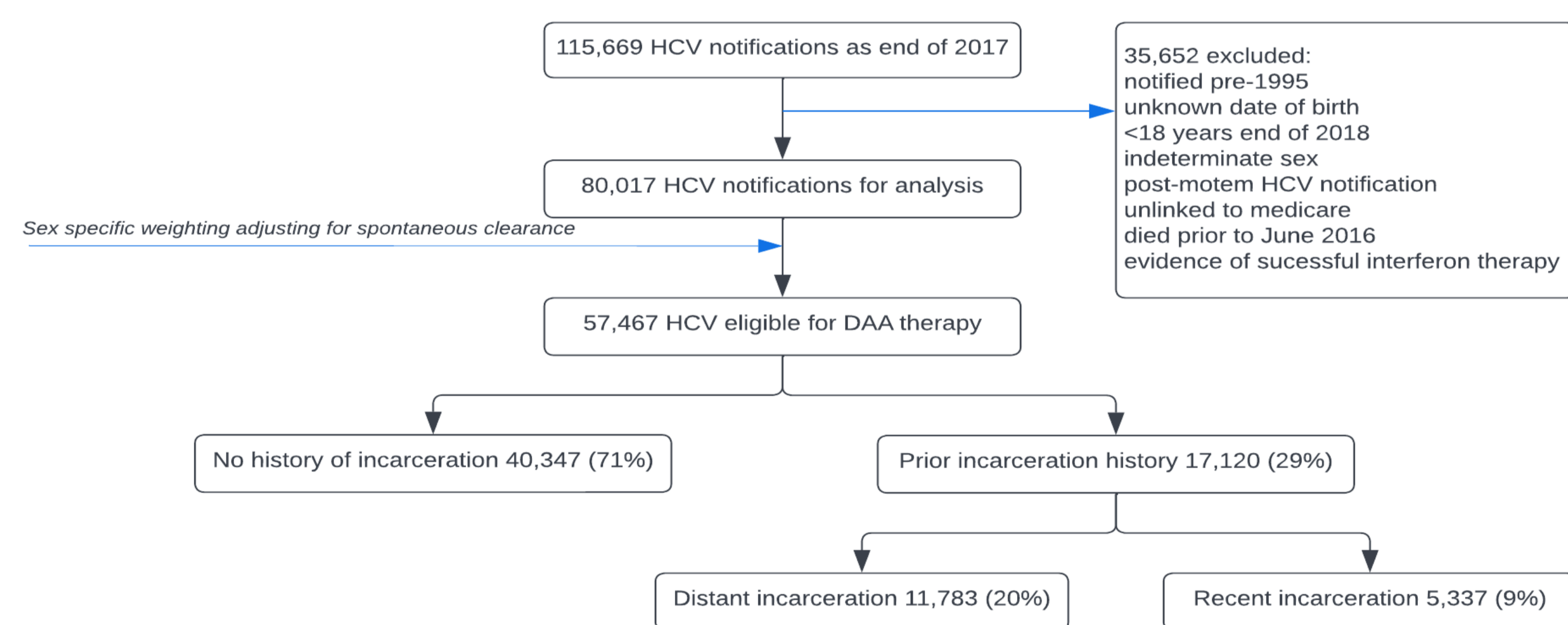


Figure 1. Derivation of cohort and incarceration groups

Results

- Among 115,669 HCV notifications available at the end of 2017, 80,017 individuals met the study inclusion criteria (Figure 1). After accounting for spontaneous clearance, 57,467 were estimated to have chronic HCV and were eligible for DAA therapy between March 2016 - December 2018, of which 71% (40,347/57,467) had no record of incarceration, 20% (11,783/57,467) had a distant record of incarceration, and 9% (5,337/57,467) had a recent record of incarceration
- Treatment uptake was higher among people with evidence of recent incarceration (2,464/5,337, 46%) compared to distant history (4,798/11,783, 40%) and no history (14,308/40,347, 35%).
- Among people with evidence of recent incarceration, DAA treatment uptake was less likely among:
 - Aboriginal and/or Torres Strait Islander peoples (adjusted odds ratio [aOR]:0.68; 95% CI 0.60, 0.77)
 - Women (aOR 0.81; 95% CI 0.69, 0.94)
 - people with shorter periods of incarceration (vs ≥12 months): one day (aOR 0.51; 95% CI 0.42, 0.62), 2-30 days (aOR 0.50; 95% CI 0.41, 0.62), and 1-3 months (aOR 0.57; 95% CI 0.46, 0.70).
- DAA uptake was more likely among people with evidence of recent drug dependence (aOR 1.34 95% CI 1.19, 1.51) history of alcohol use disorder (aOR 1.13; 95% CI 1.01, 1.27).

Method

- All diagnoses of HCV infection in Australia are the subject of mandatory laboratory notification.
- In NSW, the Notifiable Conditions Information Management System (NCIMS) hold records for all HCV notifications since 1993. These notifications are largely based on serological testing (anti-HCV antibody).
- From each database, data were collected as follows for the study period: HCV notifications (1 January 1993-31 December 2017); incarcerations (1 January 1994-31 December 2017); hospitalisations (1 January 2001-30 June 2018); deaths (1 January 1993-30 June 2018); Opioid Agonist treatment authority (1 January 1985-19 September 2018); HIV notifications (1 January 1985-31 December 2017); HCV treatment (1 January 2010-31 December 2018).
- For all people with an HCV notification, time periods of incarceration were determined using prison reception and discharge dates (entry and release). For individuals found to have evidence of both distant and recent incarceration, classification was recent.
- Three mutually exclusive groups, according to incarceration history, were derived as follows:
 - no record of incarceration
 - distant (last recorded incarceration pre-2016),
 - recent (last recorded incarceration between 2016-2017).
For individuals found to have evidence of both distant and recent incarceration, classification was recent.
- Excluded records: Pre-1995 HCV notifications (n = 12,319) due to assay concerns, missing birth date (n = 55), age <18 by Dec 31, 2018 (n = 244), unknown sex (n = 409), deaths before June 1, 2016 (n = 11,174), post-mortem notifications (n = 20), and those without linked treatment card numbers (PBS) (HCV treatment) linkage (n = 9,931).
- First, estimates of the eligible treatment population and treatment uptake among the eligible population were analysed; and second, factors associated with treatment uptake were evaluated. The first analyses were conducted among all people with an HCV notification, and the second analysis focused on people who had a record of recent incarceration
- All analyses were performed in STATA v.16.0 [College Station, TX, USA].

Table 2: Factors associated with DAA uptake among people with recent incarceration history with HCV notification in NSW, Australia^a

Characteristic	OR (95%CI)	p value	aOR (95%CI)	p value
Age				
18-29	-reference-		-reference-	
30-45	0.94 (0.80,1.11)	0.493	0.91 (0.77,1.08)	0.293
45-59	0.87 (0.72,1.03)	0.114	0.87 (0.72,1.05)	0.155
60+	0.73 (0.47,1.34)	0.165	0.78 (0.49,1.24)	0.294
Sex				
Male	-reference-		-reference-	
Female	0.71 (0.62,0.82)	<0.001	0.81 (0.69,0.94)	0.005
Indigenous Australian ethnicity				
No	-reference-		-reference-	
Yes	0.73 (0.65,0.82)	<0.001	0.68 (0.60,0.77)	<0.001
Region of HCV notification				
Metro	-reference-		-reference-	
Outer Metro	0.95 (0.80,1.12)	0.510	0.95 (0.80,1.13)	0.575
Regional/Rural	1.03 (0.87,1.21)	0.765	1.11 (0.94,1.31)	0.227
Country of birth				
Australia	-reference-		-reference-	
Overseas	1.02 (0.84,1.25)	0.418	0.93 (0.75,1.14)	0.478
Recent drug dependence				
No	-reference-		-reference-	
Yes	1.32 (1.18,1.48)	<0.001	1.34 (1.19,1.51)	<0.001
Coinfection				
HCV only	-reference-		-reference-	
HCV/HBV	0.48 (0.37,0.63)	<0.001	0.48 (0.36,0.63)	<0.001
HCV/HIV	1.97 (0.95,4.07)	0.068	2.05 (0.98,4.30)	0.056
Alcohol use disorder				
No	-reference-		-reference-	
Yes	1.07 (0.96,1.19)	0.203	1.13 (1.01,1.27)	0.032
Total duration of incarceration in DAA era^a				
1 day	0.54 (0.45,0.65)	<0.001	0.51 (0.42,0.62)	<0.001
2-30 days	0.55 (0.46,0.67)	<0.001	0.50 (0.41,0.62)	<0.001
1-3 months	0.59 (0.48,0.73)	<0.001	0.57 (0.46,0.70)	<0.001
3-6 months	0.75 (0.63,0.89)	0.001	0.70 (0.59,0.83)	<0.001
6-12 months	0.88 (0.75,1.01)	0.086	0.85 (0.73,0.98)	0.037
>12 months ^d	-reference-		-reference-	

AUD, alcohol use disorder; DAA, direct-acting antiviral; NSW, New South Wales. ^a Results from adjusted and unadjusted logistic regression. ^b Missing data for Indigenous Australian ethnicity, region of HCV notification, and country of birth not shown. ^c DAA era (1st March 2016- 31st December 2017) ^d 12-22 months

Discussion

- Despite substantive organizational and other barriers, these encouraging outcomes indicate progress in HCV elimination efforts among people in the prison and community settings.
- Further initiatives will be required to not only to maximise continual health engagement of people in prison, but also to address system-level barriers to care in prison which will require support from both health and correctional services.
- A focus on facilitating a persistent link to care among those with recent incarceration history, whose both risk of HCV acquisition and level of access to DAA and health-services constantly shift between settings, will be essential for HCV elimination strategies.
- Further studies are warranted and are in progress to investigate DAA uptake in later years may shed light on the current HCV elimination trajectory in the post-COVID-19 era.

References: 1. World Health Organization. Global Health Sector Strategy on Viral Hepatitis 2016-2021. Towards Ending Viral Hepatitis. World Health Organization; 2016. 2. Kwon JA et al., Australia could miss the WHO hepatitis C virus elimination targets due to declining treatment uptake and ongoing burden of advanced liver disease complications. Plos one. 2021 Sep 16;16(9):e0257369. 3. Scott N et al., Australia needs to increase testing to achieve hepatitis C elimination. Medical Journal of Australia. 2020 May;212(8):365-70. 4. Lloyd A. Hepatitis C in Australian prisons: a national needs assessment. Int J Prison Health. 2016;12(1):3-16. doi: 10.1108/IJPH-08-2015-0025. PMID: 26933988. 5. Valerio H et al., High hepatitis C treatment uptake among people with recent drug dependence in New South Wales, Australia. Journal of hepatology. 2021 Feb 1;74(2):293-302. 6. NSW Government. North Sydney; NSW Health; 2014.

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