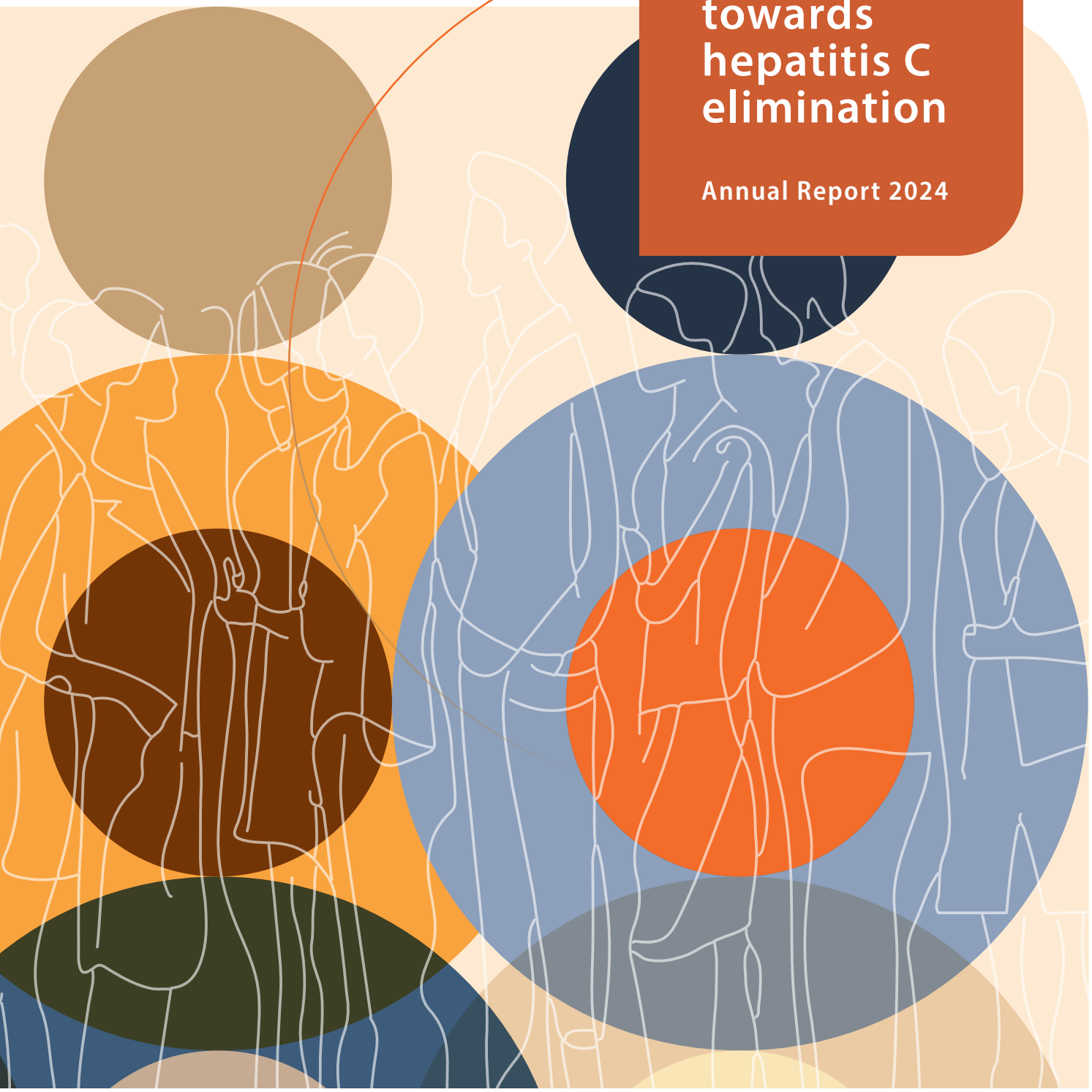
Australia's progress towards hepatitis C elimination

Annual Report 2024



Burnet
reach for the many

UNSW
Kirby Institute

Suggested citation: Burnet Institute and Kirby Institute. Australia's progress towards hepatitis C elimination: annual report 2024. Melbourne: Burnet Institute; 2024.

ISBN: 978-0-646-70456-2
DOI: https://doi.org/10.26190/unsworks/30597

Burnet Institute
Head Office
85 Commercial Road
Melbourne, VIC, 3004
T: + 61 (3) 9282 2111
E: info@burnet.edu.au
W: burnet.edu.au

/burnetinstitute

@burnetinstitute

Burnet Institute

Kirby Institute
Wallace Wurth Building
UNSW Sydney, NSW, 2052
T: +61 (2) 9385 0900
F: +61 (2) 9385 0920
E: info@kirby.unsw.edu.au
W: kirby.unsw.edu.au

/KirbyInstitute

@kirbyinstitute

Kirby Institute

Designer: il Razzo
admin@ilrazzo.com.au

Acknowledgement of Country

The authors acknowledge the Traditional Owners of the Lands on which this report was produced, including the Boon Wurrung people of the Kulin nations (where the Burnet Institute is located) and the Gadigal people of the Eora nation (where the Kirby Institute is located). We pay respect to all Aboriginal and Torres Strait Islander people and recognise their cultural, spiritual, and educational practices, their ongoing connection to Lands, Waters, and Communities, and that sovereignty was never ceded.

Acknowledgement of people with living and lived experience

The authors acknowledge all the people who have lost their lives to hepatitis C and liver disease. We acknowledge, thank, and recognise all people with living and lived experience of injecting drug use and hepatitis C, that have contributed to this report and their crucial work to reduce harm to their community. Real people and real lives give meaning to the work that progresses us towards hepatitis C elimination, and in fighting the negative effects of stigma and criminalisation.

The Burnet and Kirby Institutes

Prepared by:

Anna Wilkinson
Samara Griffin

Edited by:

Margaret Hellard
Mark Stoové
Gregory Dore
Jason Grebely
Alisa Pedrana
Joseph Doyle
Alexander Thompson
Behzad Hajarizadeh
Timothy Broady
Troy Combo

Data Contributors (in order of data presented):

- Australian Collaboration for Coordinated Enhanced Sentinel Surveillance of Sexually Transmissible Infections and Blood Borne Viruses: Margaret Hellard, Mark Stoové, Jason Asselin, Michael Traeger, Victoria Polkinghorne, Nyssa Watson, Thi Nguyen, Long Nguyen, Carol El-Hayek, and Samara Griffin (Burnet Institute); Rebecca Guy, Basil Donovan, Allison Carter, and Htein Linn Aung (Kirby Institute); Wayne Dimech (NRL Quality).
- MIXMAX Melbourne Cohort hepatitis C sub-study: Phoebe Hadley, Tarnia Fisher, Peter Higgs, Phyo Aung, Mark Stoové, Paul Dietze, and Rachel Sacks-Davis (Burnet Institute); MIXMAX Melbourne Cohort Investigators.
- ATLAS Indigenous Primary Care Surveillance and Research Network: James Ward, Parham Kebria, Alan Ho, Shellee Williams, and Rani West (University of Queensland Poche Centre for Indigenous Health); ATLAS network governance and investigator groups and participating Aboriginal Community Controlled Health Services.
- Australian Needle Syringe Program Survey: Sue Heard, Farzaneh Zolala, Bradley Mathers, Jenny Iversen, and Lisa Maher (Kirby Institute).
- National Prisons Hepatitis Network: Yumi Sheehan, Andrew Lloyd, and Behzad Hajarizadeh (Kirby Institute); Alexander Thompson (St Vincent's Hospital Melbourne); Rebecca Winter and Mark Stoové (Burnet Institute).
- Australian Hepatitis and Risk Survey in Prisons: Rugiatu Bah, Yumi Sheehan, Xiaoying Li, Gregory Dore, Jason Grebely, Andrew Lloyd, and Behzad Hajarizadeh (Kirby Institute).

- Monitoring hepatitis C treatment uptake in Australia: Joanne Carson, Behzad Hajarizadeh, and Gregory Dore (Kirby Institute).
- National Retreatment Project: Joanne Carson, Gail Matthews, Gregory Dore, and Behzad Hajarizadeh (Kirby Institute); Sebastiano Barbieri (Centre for Big Data Research in Health, University of New South Wales).
- National hepatitis C diagnosis and care cascade: Jisoo Amy Kwon, Gregory Dore, Behzad Hajarizadeh, Maryam Alavi, Heather Valerio, Jason Grebely, Rebecca Guy, Richard Gray, Jenny Iversen, Lisa Maher, Jonathan King, and Skye McGregor (Kirby Institute); members of the Australian HCV Diagnosis and Care Cascade Reference Group.
- Australia and New Zealand Liver and Intestinal Transplant Registry: Michael Fink and Wing-Yee Lo (Victorian Liver Transplant Unit, Austin Health); Simone Strasser (Australian National Liver Transplant Unit, Royal Prince Alfred Hospital); Peter Hodgkinson (Queensland Liver Transplant Service, Princess Alexandra Hospital); John Chen (South Australian Liver Transplant Unit, Flinders Medical Centre); Robert Jones (Victorian Liver Transplant Unit, Austin Health); Bryon Jaques (Western Australian Liver Transplantation Service, Sir Charles Gairdner Hospital).
- Stigma Indicators Monitoring Project: Timothy Broady, Loren Brener, Elena Cama, and Carla Treloar (Centre for Social Research in Health, University of New South Wales).
- Needle Syringe Program National Minimum Data Collection: Sue Heard, Bradley Mathers, Jenny Iversen, and Lisa Maher (Kirby Institute).
- Gay Community Periodic Survey: Timothy Broady, James MacGibbon, Anthony Smith, Limin Mao, and Martin Holt (Centre for Social Research in Health, University of New South Wales); Benjamin Bavinton and Curtis Chan (Kirby Institute).
- Viral Hepatitis Mapping Project: Jennifer MacLachlan and Benjamin Cowie (Peter Doherty Institute for Infection and Immunity).
- Mathematical modelling: Jisoo Amy Kwon, Gregory Dore, Jason Grebely, Behzad Hajarizadeh, Rebecca Guy, and Richard Gray (Kirby Institute); Chris Estes and Homie Razavi (Centre for Disease Analysis).
- Mathematical modelling: Chris Bailie, Joseph Doyle, Margaret Hellard, and Nick Scott (Burnet Institute).

Contents

Preface

Hepatitis C is a significant public health issue in Australia. Until direct-acting antivirals (DAAs) became available to all Medicare-eligible Australians with hepatitis C on 1 March 2016, there was a growing number of people living with hepatitis C, a rising burden of liver disease, and increasing rates of liver cancer and premature deaths attributed to long-term hepatitis C.[1] At the end of 2015 an estimated 162 590* people had chronic hepatitis C in Australia.[2,3,4] Aboriginal and Torres Strait Islander people are disproportionally affected by hepatitis C, representing 16% of all people living with hepatitis C at the end of 2015.[5] Unrestricted access to DAAs, a highly tolerable and effective medication,[6,7] through public subsidy since March 2016 means there is an opportunity to eliminate hepatitis C as a public health threat in Australia by 2030.

Australia is working towards eliminating hepatitis C as a public health threat by 2030. This elimination goal is in line with global targets set by the World Health Organization and targets included in Australia's National Hepatitis C Strategy 2018–2022.[8] To achieve hepatitis C elimination, efforts to increase testing, diagnosis, and engagement in care need to be combined with effective primary prevention measures to ensure we minimise new infections and maximise treatment uptake. Social, structural, and legal frameworks that criminalise drug use and stigmatise people who use drugs will hinder progress towards hepatitis C elimination. Disproportionate rates of incarceration among people who inject drugs, coupled with high rates of risk behaviour and the absence of primary prevention, means prison settings represent the highest concentration of hepatitis C infection and therefore are a priority setting for the response to hepatitis C.

To understand progress towards hepatitis C elimination, measurement and monitoring of trends in new infections, counts of people tested and treated, people receiving hepatitis C-related liver transplants, and people experiencing stigma and discrimination is required. These data also guide projections based on mathematical modelling. However, there is limited data available disaggregated by all priority settings and populations†, which hinders our ability to identify targeted strategies which may be effective and cost-effective. This is the sixth national report on progress towards hepatitis C elimination in Australia. It brings together national data from across the sector, to give an overview on progress towards eliminating hepatitis C in Australia. This report also highlights gaps in our knowledge and informs future directions in Australia's hepatitis C elimination response.

* Estimate of people living with hepatitis C at the end of 2015 was derived as part of the National hepatitis C diagnosis and care cascade (Chapter Three).[2,3,4]

† The Fifth National Hepatitis C Strategy 2018–2022 identifies six priority populations: people living with hepatitis C, people who inject drugs and/or accessing drug treatment programs, people who previously injected drugs, people in custodial settings, Aboriginal and Torres Strait Islander people, and people from culturally and linguistically diverse backgrounds.[8]

Acronyms

ACCHS	Aboriginal Community Controlled Health Services
BBV	blood borne virus
CI	confidence interval
DAA	direct-acting antiviral
GBM	gay, bisexual, and other men who have sex with men
HCV	hepatitis C virus
NSP	needle and syringe program
PHN	Primary Health Network
PBS	Pharmaceutical Benefits Scheme
RNA	ribonucleic acid
STI	sexually transmissible infection
SVR	sustained virological response

Figures

Executive Summary

Rates of new hepatitis C infections have steadily declined since 2016, seen through reductions in incidence among people attending primary care clinics and a sample of people who inject drugs. New estimates of HCV ribonucleic acid (RNA) prevalence among a sample of people who inject drugs show a considerable decline in prevalence since 2016. Data from this year's report show other promising signs, with increased testing seen in some settings including primary care, sexual health clinics, and Aboriginal Community Controlled Health Services. There remain areas for improvement though; data from the Australian Hepatitis and Risk Survey in Prisons indicates gaps in recent testing coverage. Further, cascades of care from community settings including primary care clinics and Aboriginal Community Controlled Health Services suggest some people were not engaged in care and treatment following diagnosis.

Between 2016 and the end of 2023, 105 940 individuals had been treated for hepatitis C (first treatment), including 5 499 people initiating treatment in 2023. Also, since 2016 there has been 13 465 prescriptions for retreatment. In 2023, there was, for the first time since 2016, an increase in the number of people receiving treatment compared to the previous year. Further, hepatitis C treatment initiations in prisons continue to represent a large and increasing proportion of all treatment initiations nationally (42% in 2023). Declines in hepatitis C-related transplants demonstrate how direct-acting antiviral treatment reduces the risk of developing liver disease and liver cancer.

There are however challenges in progress towards elimination. Modelling estimated that there remained 68 890 people living with hepatitis C at the end of 2023. As we move forward, and the population of people cured of hepatitis C continues to grow (already over 100 000 people), we need to ensure people's liver health is monitored, particularly by checking for liver cirrhosis, a key risk factor for liver cancer. Importantly, this report highlights that stigma and discrimination towards people at risk of and living with hepatitis C is prevalent. Further, this report highlights that primary prevention must remain a critical component of the response to hepatitis C and be strengthened. Up to 20% of people who inject drugs surveyed in 2023 reported borrowing needles or syringes, the primary method of hepatitis C transmission. Geographical data shows variation in treatment coverage, highlighting that equity must be at the forefront of the response to hepatitis C.

If Australia is to reach elimination by 2030, a range of interventions are urgently needed. Health promotion campaigns are needed to ensure priority populations are aware that hepatitis C treatment and retreatment is available to them and to encourage them to engage in care. Models of care need to be tailored to reach priority populations and provide wrap-around or flexible services that support effective linkage to care. A focus needs to be on engaging people within priority settings including drug treatment services, needle and syringe programs, services for people experiencing unstable housing, community corrections, and prisons. Given the success of scaling up testing and treatment models in prison, resources should be allocated to broaden the reach of these programs across the justice systems including in remand centres and across community corrections services to ensure these priority populations have equitable access to hepatitis C care. Ongoing investment is also needed to stop new infections, including in prisons, using the full suite of harm reduction programs.

Continued efforts to address stigma and discrimination related to hepatitis C and injecting drug use are needed. By providing person-centred care that recognises people's experiences of stigma, trauma and racism, and focusses on social, cultural, and emotional needs, in addition to medical needs, services can better support individuals throughout their hepatitis C journey. Alongside expanding models of care to reach priority populations, ensuring the workforce is adequately trained and equipped through education and skill development is critical to deliver appropriate care for people living with hepatitis C.

Australia's progress towards hepatitis C elimination 2024

Since 2016

- Over ~105,900 individuals have been treated for the first time
- New infections have declined
- Fewer people need liver transplants for hepatitis C-related cirrhosis

In 2023

- **Increases** in the number of people tested and treated were seen
- But over **70%** of people who use drugs surveyed experienced stigma or discrimination
- And up to **20%** of people in the community said they borrowed needles or syringes
- There remain **~68,900** people living with hepatitis C

To eliminate hepatitis C by 2030 We need to…

… end stigma and discrimination

… maintain at least 4,000 people treated each year

We need to test more people so we can treat more people—and help them stay in care

… strengthen prevention to stop new infections

Burnet
reach for the many

UNSW
Kirby Institute

One

Newly acquired hepatitis C infections

Measuring the rate of new hepatitis C infections helps monitor strategies that aim to prevent ongoing transmission, including primary and secondary prevention (testing and treatment strategies). New acquisition of hepatitis C is best measured using an incidence rate, which describes the rate at which people test positive for hepatitis C virus (HCV) after previously testing negative. The direct measurement of incidence requires monitoring of repeat testing of individuals (i.e., HCV antibody and ribonucleic acid (RNA) tests) over time to detect new infections. It is therefore important to note that incidence rates are sensitive to changes in testing patterns, as occurred when testing initially increased after direct-acting antivirals (DAAs) were introduced in 2016. Also, regular and repeat testing among specific cohorts improves the reliability of incidence rates. Given these considerations, reliable data on rates of hepatitis C incidence remains limited.

Measuring changes in the rate of new infections of hepatitis C can be monitored through the number of notifications of hepatitis C among people aged 15–24 years.[4,9] These notifications may reflect broader incident infections because younger people are likely to have initiated injecting drug use relatively recently.[10]

Hepatitis C incidence measurement in Australia is also possible using data collated by the Australian Collaboration for Coordinated Enhanced Sentinel Surveillance of Sexually Transmissible Infections (STI) and Blood Borne Viruses (BBV; ACCESS),[11] which links individuals' diagnostic testing data over time.[12,13]

One ongoing study provides an estimate of hepatitis C incidence over time among people who inject drugs. The MIXMAX Melbourne Cohort is a prospective longitudinal cohort of people who inject drugs in Melbourne (2008 to the present).[14] Participants recruited from street drug markets by a combination of respondent driven sampling, street outreach, and snowball sampling participate in face-to-face interviews, scheduled annually. Since late 2009, blood has been collected at annual interviews using venepuncture, with samples tested for HCV antibody and HCV RNA. The hepatitis C sub-study of the MIXMAX Melbourne Cohort provides estimates of the change in hepatitis C incidence associated with subsidisation of DAAs for hepatitis C treatment in March 2016 among people who inject drugs.[15]

PROGRESS ON REDUCING NEW INFECTIONS

Among men and women aged 20–24 years, the number of hepatitis C notifications has declined since 2016; there was however a notable increase in notifications in 2023 among men aged 20–24 years (Figure 1). The monitoring of hepatitis C notifications among people aged 15–24 years as a surrogate measure for hepatitis C incidence needs to consider unknown levels of testing and their influence on trends. The increase in notifications among men only is likely due to targeted testing programs in specific settings during 2023, particularly prisons.

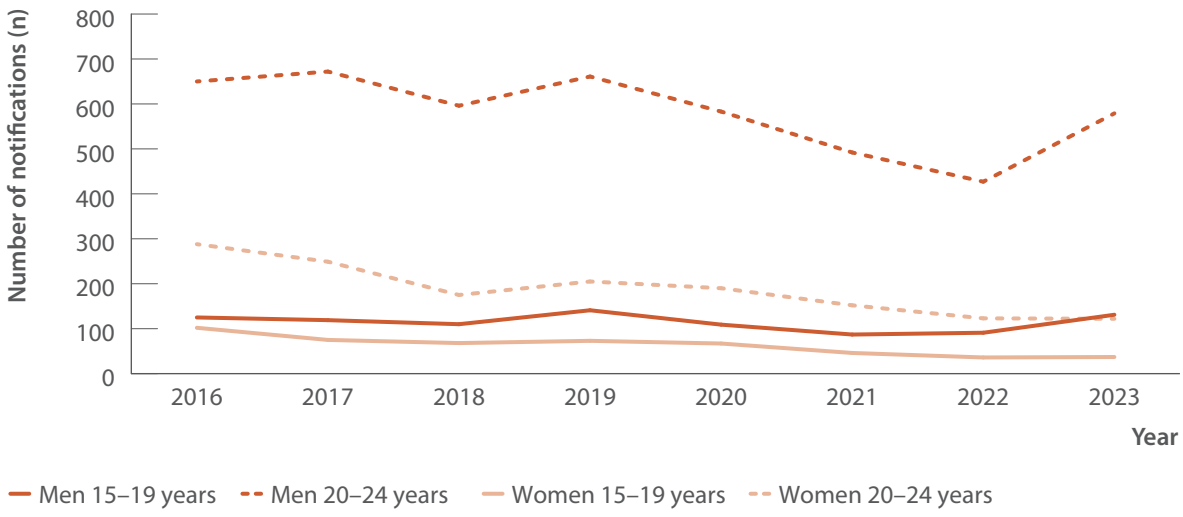
Declines in hepatitis C incidence were observed among individuals tested at ACCESS primary care clinics and among HIV-positive gay and bisexual, and other men who have sex with men (GBM) tested at ACCESS GBM and sexual health clinics between 2016 and 2023 (Figures 2 and 3).

A substantial decline in hepatitis C incidence was observed among people who inject drugs participating in the MIXMAX Melbourne Cohort after subsidisation of DAAs for hepatitis C treatment in March 2016.

Improving the reliability of monitoring hepatitis C incidence trends will require improvements in surveillance coverage, as well as the refinement of methods to account for changes in testing patterns and their impact on hepatitis C notification and incidence rates. In addition, more data are needed to understand progress in reducing hepatitis C incidence in priority populations, as well as within specific geographic areas to help inform targeted strategies.

Monitoring new hepatitis C infections

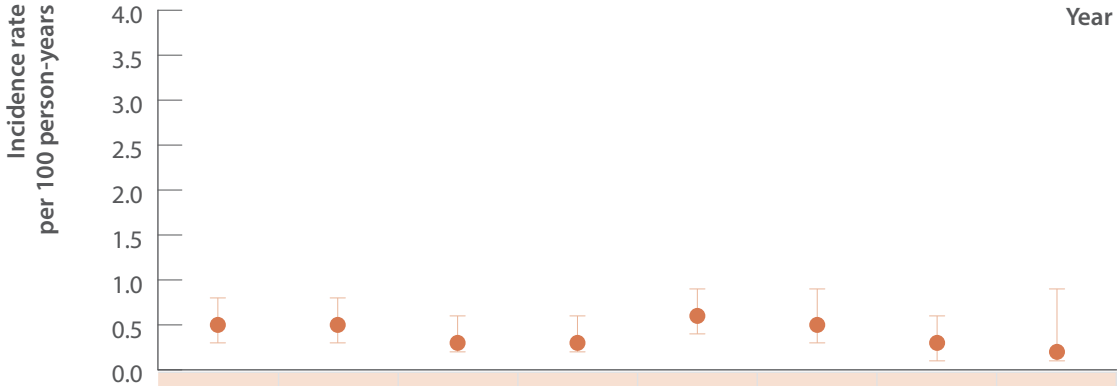
Figure 1. Number of hepatitis C (unspecified and newly acquired) notifications by age group and gender, 2016–2023



Source: Australian National Notifiable Diseases Surveillance System.[4,9]

Notes: Cases other than newly acquired were assigned as unspecified.

Figure 2. Incidence of primary hepatitis C infection among individuals tested at ACCESS primary care clinics, ACCESS, 2016–2023



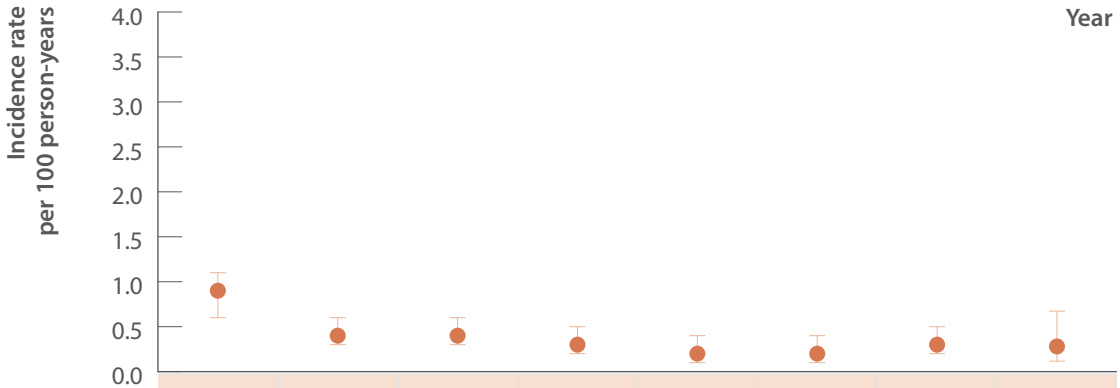
	2016	2017	2018	2019	2020	2021	2022	2023
Incident infections	18	19	13	12	21	16	6	2
Person-years	3 632	3 777	3 783	3 783	3 492	3 006	2 242	897

Observed incidence rate — 95% CI

Source: ACCESS.[11]

Notes: Analysis includes N=11 427 individuals and 30 181 tests (2009–2023) with data from 2016 shown for brevity. Analysis includes 16 sites: 14 in Victoria (VIC), one in Western Australia (WA), and one in Queensland (QLD). Primary care clinics see high caseloads of people at risk of hepatitis C and provide both specialist services to current or former people who inject drugs as well as general health services. First incident infection only included in analysis. Incident infection date was assigned as the midpoint between the positive HCV antibody or HCV RNA test date and previous HCV antibody negative test date. ACCESS collates data from January 2009. Individuals included tested HCV antibody negative on their first test observed and had at least one follow-up test (HCV antibody or HCV RNA or both) on or before 31 December 2023. Individuals were 15 years or older. CI: confidence interval.

Figure 3. Incidence of primary hepatitis C infection among HIV-positive GBM tested at ACCESS GBM or sexual health clinics, ACCESS, 2016–2023



	2016	2017	2018	2019	2020	2021	2022	2023
Incident infections	47	25	24	19	13	12	11	5
Person-years	5 480	5 737	5 879	5 767	5 502	4 946	3 958	1 784

● Observed incidence rate — 95% CI

Source: ACCESS.[11]

Notes: Analysis includes N=9 157 individuals, 73 989 tests (2009–2023) with data from 2016 shown for brevity. Analysis includes 23 sites: 12 in New South Wales (NSW), four in VIC, two in South Australia (SA), two in WA, two in QLD, and one in Tasmania (TAS). GBM were classed as being HIV-positive for the entire calendar year of their diagnosis and were 15 years or older. First incident infection only included in analysis. Incident infection date was assigned as the midpoint between the positive HCV antibody or HCV RNA test date and previous HCV antibody negative test date. ACCESS collates data from January 2009. Individuals included tested HCV antibody negative on their first test observed and had at least one follow-up test (HCV antibody or HCV RNA or both) on or before 31 December 2023. CI: confidence interval.

Monitoring new hepatitis C infections among people who inject drugs

Analysis of longitudinal data from people who inject drugs participating in the MIXMAX Melbourne Cohort estimated hepatitis C incidence before and after universal access to DAAs in 2016. Pre-DAA (March 2010–February 2016) hepatitis C incidence was 6.4 per 100 person-years (PY; 24 cases, 374.5 PY, 95% confidence interval (CI):4.3, 9.6), declining to 1.2 per 100 PY (two cases, 164.5 PY, 95% CI: 0.3, 4.9) post-DAA (March 2016–December 2022). The estimated decline in hepatitis C incidence was 81% (incidence rate ratio: 0.19, 95% CI: 0.04, 0.80).[15]

Two

Testing and diagnosis

Eliminating hepatitis C in Australia relies on finding people living with chronic hepatitis C through diagnostic testing and facilitating appropriate care and treatment. Testing for the presence of HCV antibodies is used as an initial screening for hepatitis C infection. The presence of antibodies indicates exposure to HCV but does not indicate current infection. To diagnose current infection, HCV antibody positive individuals need an HCV RNA test.[16] Guidelines published in 2022 recommend clinicians request reflex testing for hepatitis C, meaning a laboratory proceeds to an HCV RNA test if HCV antibodies are detected.[17]

ACCESS collates data on consultations, HCV antibody and HCV RNA tests conducted, and test outcomes from sites that offer specialist services for people at risk of hepatitis C, including people currently or with a history of injecting drug use, and HIV-positive GBM.

The ATLAS network is an established national STI and BBV surveillance and research network specific to Aboriginal and Torres Strait Islander people.[18] Data from the ATLAS network for this report were provided by Aboriginal Community Controlled Health Services (ACCHS) located in urban, regional, and remote areas (65 ACCHS/sites). ATLAS provides trends in annual hepatitis C testing uptake, annual HCV antibody test uptake and positivity, the proportion of individuals receiving an HCV antibody test, and among those testing positive, the proportion then tested for HCV RNA or viral load.

The Australian Needle Syringe Program Survey is a sentinel surveillance system conducted annually at participating Needle and Syringe Program (NSP) sites across Australia (N=1 991 participants across 55 NSP sites in 2023). The number of respondents in 2020, 2021, and 2022 was lower than in previous years due to the ongoing impacts of the COVID-19 pandemic and public health measures designed to reduce community transmission in some jurisdictions and sites. The Australian Needle Syringe Program Survey asks about a range of risk and health-seeking behaviours, including hepatitis C testing. Respondents are invited to provide a dried blood spot sample for HCV antibody and HCV RNA testing. The proportion of respondents undergoing dried blood spot for HCV RNA testing has increased over time, with ~90% of respondents tested for HCV RNA in all years since 2020.[19]

Population-level monitoring of testing related to diagnosis of current hepatitis C infection can occur through the publicly available Medicare Benefits Schedule claims dataset, when item numbers are restricted to 69499 and 69500. These item numbers are specifically used for testing to detect HCV RNA and not used for tests associated with treatment monitoring.[20]

Specific studies can provide estimates of testing and diagnosis among priority populations or within specific settings. The Australian Hepatitis C Point-of-Care Testing Program has implemented point-of-care HCV antibody and HCV RNA testing within specific settings during 2022 and 2023. Whilst finalised data were unavailable for this report, data presented here should be interpreted in the context that additional testing conducted by this program is occurring, including in community (including community corrections) and prison settings.[21]

The National Prisons Hepatitis Network collates data from jurisdictional Justice Health services and provides the number of individuals who received testing for hepatitis C in 2023.[22] There were 96 prisons in the network in 2023 and data were collated from 93 prisons across eight states and territories. Of the 93 prisons providing data, 78 prisons across six jurisdictions reported the number of individuals HCV antibody tested via venepuncture testing and test positivity, and 79 prisons across seven jurisdictions reported the number of individuals HCV RNA tested and test positivity.

The Australian Hepatitis and Risk Survey in Prisons has been planned as a repeated cross-sectional bio-behavioural survey of representative populations of people in prison in each jurisdiction in Australia. The first round of the study was conducted from April 2022 to June 2023.[23,24] The study provides estimates of HCV antibody and HCV RNA prevalence, from study-based point-care-testing of participants, as well as self-reported history of testing and treatment.

The MIXMAX Melbourne Cohort is a prospective longitudinal cohort study of people who inject drugs in Melbourne (2008 to current).[14] The hepatitis C sub-study of the cohort provides estimates of the change in hepatitis C prevalence associated with universal access to DAA therapies. The prevalence of hepatitis C infection was defined as the number of people HCV RNA positive divided by the number of people with a complete hepatitis C test in each period. A complete hepatitis C test was defined as an HCV RNA test or a negative HCV antibody test.[15]

PROGRESS ON DIAGNOSIS OF HEPATITIS C INFECTION

Across the most recent eight years of data (2016–2023) within ACCESS primary care clinics, annual hepatitis C test uptake (HCV antibody or HCV RNA) was stable with 7% (6 731/101 301) of people who attended a consultation in 2023 tested for hepatitis C (Figure 4). Among HIV-positive GBM, annual hepatitis C test uptake stabilised in 2023 to 47% (4 221/9 026) of men tested (Figure 5). Among individuals ever prescribed opioid agonist therapy at ACCESS clinics, annual hepatitis C test uptake increased to 11% (919/8 632) of people who attended in 2023 tested for hepatitis C (Figure 6). Among Aboriginal and Torres Strait Islander people, the number of people tested increased in 2023 compared to 2022, with annual hepatitis C test uptake remaining stable with 30% (777/2 597) of people who attended in 2023 tested for hepatitis C (Figure 7).

PROGRESS ON DIAGNOSIS OF HEPATITIS C INFECTION (CONTINUED)

Within ACCESS primary care clinics, HCV antibody testing and HCV antibody positivity data highlight that the number of people tested in primary care clinics for HCV antibody increased year-on-year between 2020 and 2023. HCV antibody positivity among men was 10% (259/2 605) in 2023, almost half the antibody positivity among men in 2017 (18%, 460/2 523) (Figure 8). Among HIV-positive GBM, HCV antibody positivity in 2023 was 0.9% (34/3 914) (Figure 9). Among individuals ever prescribed opioid agonist therapy, HCV antibody positivity remained high, with 41% (132/320) positivity among men and 40% (57/141) among women in 2023 (Figure 10). Among Aboriginal and Torres Strait Islander people, there was an increase in the number of both men and women tested in 2023 to the highest number observed since 2016. HCV antibody positivity among men was 6% (28/440) among women was 10% in 2023 (24/233) in 2023 (Figure 11).

In the ATLAS network, annual hepatitis C test uptake (HCV antibody or HCV RNA) increased in 2023 to 8% (5 130/63 109) (Figure 12). An increase in the number of individuals HCV antibody tested was observed year-on-year between 2016 and 2023. While more HCV antibody tests were among women compared to men, higher positivity was observed for men, and this remained consistent between 2016 and 2023 (Figure 13). Between 2016 and 2023, 8% (1 316/16 899) of ACCHS clients tested for HCV antibodies were positive and 73% (961/1 316) were subsequently tested for HCV RNA or viral load (Figure 14). It is important to note that universal screening for hepatitis C is not recommended and within ACCHS—as elsewhere—testing should be based on individual risk assessment between clients and practitioners.

Approximately half of Australian Needle Syringe Program Survey respondents reported testing for hepatitis C in the previous year. Across most jurisdictions the proportion of respondents tested in 2023 remains lower than pre–2020 levels (Figure 15). There was slightly higher uptake of hepatitis C testing among men (Figure 16), and among Indigenous respondents (Figure 17). In 2023, overall HCV antibody positivity among respondents was 45% (745/1 663), the seventh consecutive year that positivity was <50%, following two decades of HCV antibody positivity ≥50% (all years between 1999 and 2016). In 2023, 51% (244/476) of Indigenous respondents were HCV antibody positive, an increase from 36% (154/431) observed in 2022, but consistent with pre-2021 levels.[19]

PROGRESS ON DIAGNOSIS OF HEPATITIS C INFECTION (CONTINUED)

Among Australian Needle Syringe Program Survey respondents tested for HCV RNA, the proportion with current infection (weighted by HCV antibody status and gender from 2015–2019) declined from 51% (496/978) to 12% (197/1 646) between 2015 and 2023. Among men, the proportion with current infection declined from 53% (350/658) to 13% (140/1 038) between 2015 and 2023. Among women, the proportion with current infection declined from 45% (141/311) to 10% (56/578) between 2015 and 2023 (Figure 18).[25]

From the beginning of 2017, Medicare claims for HCV RNA tests related to hepatitis C diagnosis have declined steadily year-on-year to 2022; there was however an increase between 2022 (n=11 674 tests) and 2023 (n=13 222 tests) (Figure 19).

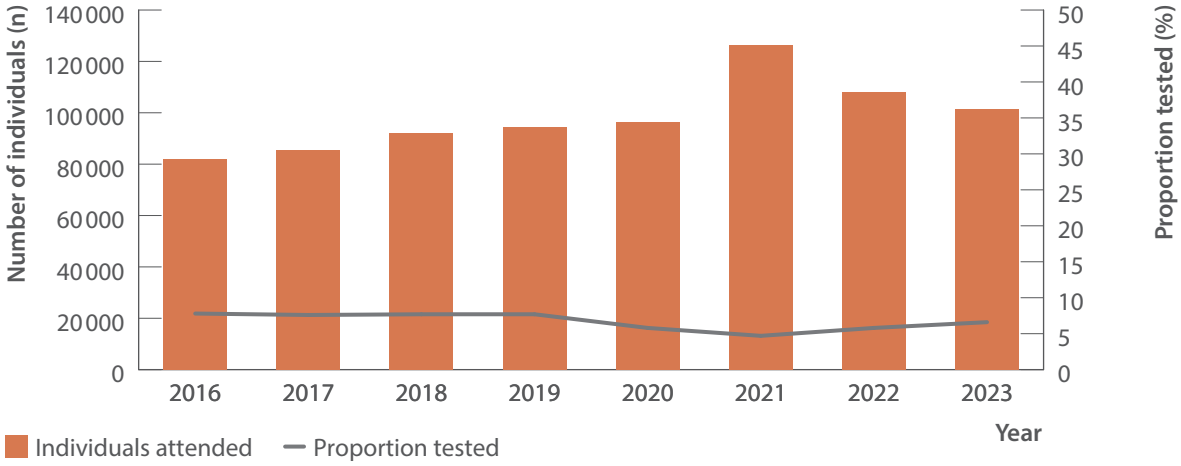
In 2023, HCV antibody testing pathology data were collated across 78 prisons, by the National Prisons Hepatitis Network. A total of 20 804 individuals were HCV antibody tested and 24% (5 012/20 804) of individuals were positive. HCV antibody test positivity ranged from 3 to 35% between jurisdictions. Across 79 prisons from which HCV RNA testing pathology data were collected, a total of 10 746 individuals were HCV RNA tested in prisons of which 26% (2 773/10 746) were positive; HCV RNA test positivity ranged from 7 to 34% between jurisdictions.

A total of 1 599 people in prison were enrolled in the Australian Hepatitis and Risk Survey in Prisons study April 2022–June 2023. The national prevalence estimate among people in prison for HCV antibody was 32% (95% CI: 29–35) and for HCV RNA was 8% (95% CI: 6–10). Among people who reported having ever injected drugs, HCV RNA prevalence was 15% (95% CI: 12–19). There were wide variations in HCV prevalence across jurisdictions (Figure 20). Self-reported data on uptake of hepatitis C testing shows that 36% (weighted proportion) of participants reported any hepatitis C test in the past 12 months (Figure 21).

Among 1 497 people who inject drugs recruited into the MIXMAX Melbourne Cohort, 1 083 had at least one hepatitis C test and were included in analysis of prevalence 2010–2022. Hepatitis C viraemic prevalence was stable at 52% (95% CI: 48–56) March 2010–February 2016. An estimated a decline of 17% (prevalence ratio: 0.83, 95% CI: 0.73–0.94) was observed in 2016, followed by a sustained decline of 14% per annum thereafter (prevalence ratio: 0.86, 95% CI: 0.82–0.90) (Figure 22).

Monitoring hepatitis C testing

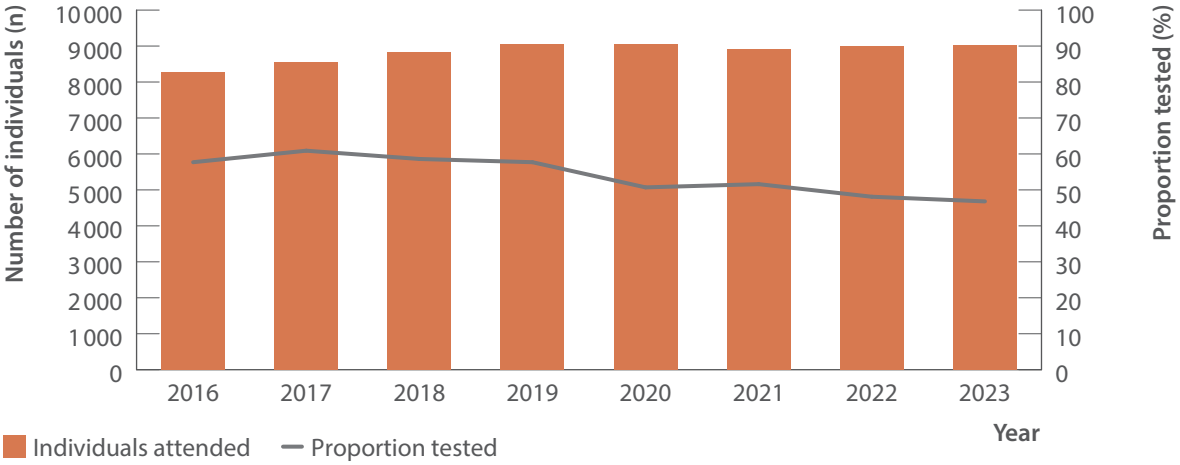
Figure 4. Number of individuals attending ACCESS primary care clinics and proportion tested for HCV (HCV antibody only or HCV antibody and RNA or HCV RNA only), ACCESS, 2016–2023



Source: ACCESS.[11]

Notes: Analysis includes 16 sites: 14 in VIC, one in WA, and one in QLD. Primary care clinics see high caseloads of people at risk of hepatitis C and provide both specialist services to current or former people who inject drugs as well as general health services. Clinic attendances included in-person and telehealth consultations. Individuals were 15 years or older and contributed one consultation and one test per year.

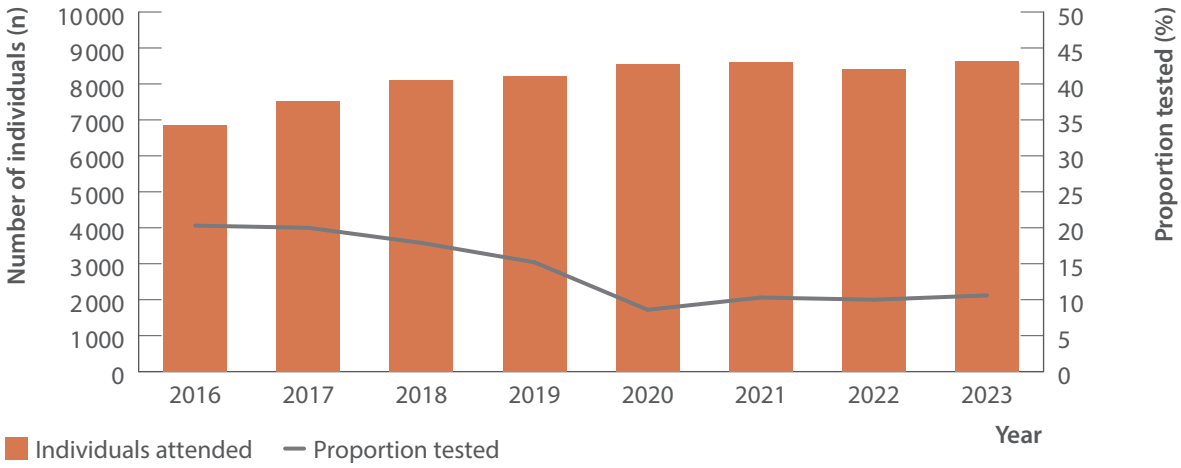
Figure 5. Number of HIV-positive GBM attending ACCESS GBM or sexual health clinics and proportion tested for HCV (HCV antibody only or HCV antibody and RNA or HCV RNA only), ACCESS, 2016–2023



Source: ACCESS.[11]

Notes: Analysis includes 23 sites: 12 in NSW, four in VIC, two in SA, two in WA, two in QLD, and one in TAS. Clinic attendances included in-person and telehealth consultations. GBM were classed as being HIV-positive for the entire calendar year of their diagnosis, were 15 years or older, and contributed one consultation and one test per year.

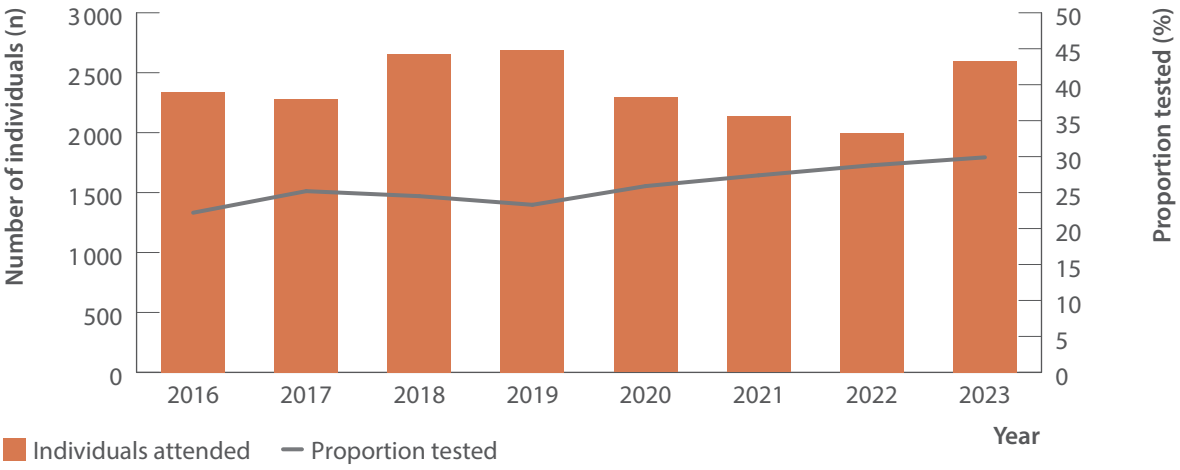
Figure 6. Number of individuals ever prescribed opioid agonist therapy attending ACCESS primary care clinics and proportion tested for HCV (HCV antibody only or HCV antibody and RNA or HCV RNA only), ACCESS, 2016–2023



Source: ACCESS.[11]

Notes: Analysis includes 16 sites: 14 in VIC, one in WA, and one in QLD. Primary care clinics have high caseloads of people at risk of hepatitis C and provide both specialist services to current and former people who inject drugs as well as general health services. Clinic attendances included in-person and telehealth consultations. Individuals were 15 years or older, had at least one electronic medical record of a prescription for opioid agonist therapy between January 2009 and December 2023, and contributed one consultation and one test per year.

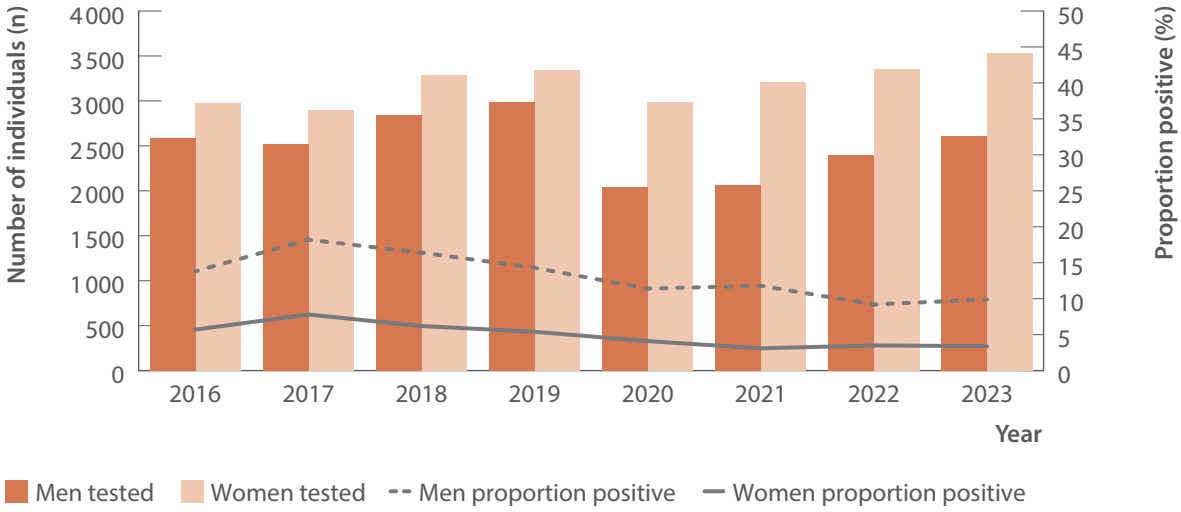
Figure 7. Number of Aboriginal and/or Torres Strait Islander people attending ACCESS sexual health clinics and proportion tested for HCV (HCV antibody only or HCV antibody and RNA or HCV RNA only), ACCESS, 2016–2023



Source: ACCESS.[11]

Notes: Analysis includes 11 sites: seven in NSW, two in QLD, one in VIC, and one in SA. Clinic attendances included in-person and telehealth consultations. Individuals were 15 years or older and contributed one consultation and one test per year. Overall, of unique individuals who attended included clinics 2013–2023 for a consultation (N=398 095), 8% of people had no Aboriginal or Torres Strait Islander status recorded (missing), 6% were recorded as `not stated', 82% were neither Aboriginal nor Torres Strait Islander people, and 4% were Aboriginal and Torres Strait Islander people).

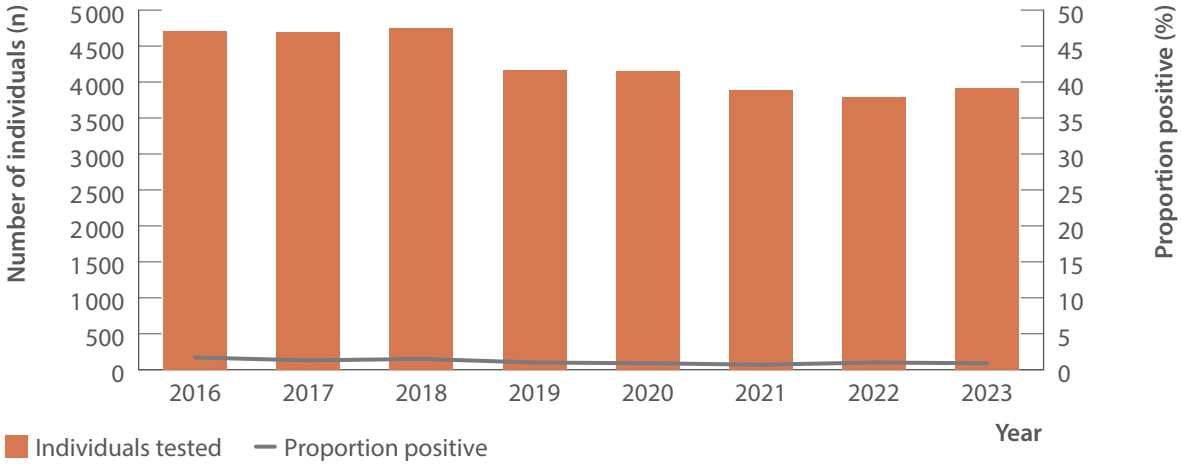
Figure 8. Number of individuals tested for HCV antibody at ACCESS primary care clinics and proportion of HCV antibody tests positive by gender, ACCESS, 2016–2023



Source: ACCESS.[11]

Notes: Analysis includes 16 sites: 14 in VIC, one in WA, and one in QLD. Primary care clinics have high caseloads of people at risk of hepatitis C and provide both specialist services to current and former people who inject drugs as well as general health services. Individuals were 15 years or older and contributed one test per year. Individuals recorded as a gender other than man or woman were not reported due to small sample size. Individuals included either had no previous HCV antibody test recorded in ACCESS since 2009 or had previously tested HCV antibody negative. Individual's HCV antibody tests after an HCV antibody positive test being observed were excluded from analysis.

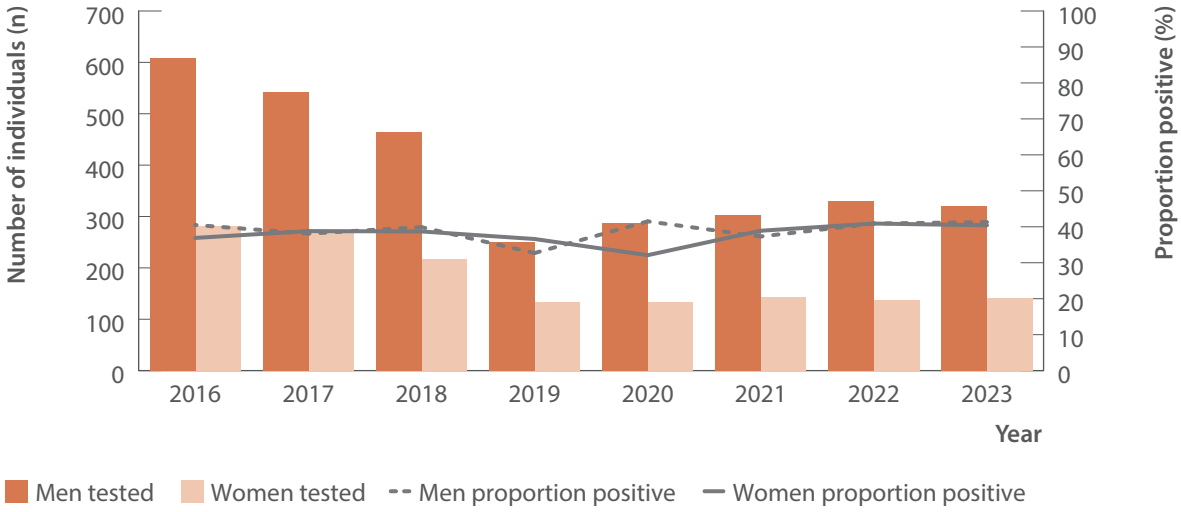
Figure 9. Number of HIV-positive GBM tested for HCV antibody at ACCESS GBM or sexual health clinics and proportion of HCV antibody tests positive, ACCESS, 2016–2023



Source: ACCESS.[11]

Notes: Analysis includes 23 sites: 12 in NSW, four in VIC, two in SA, two in WA, two in QLD, and one in TAS. GBM were classed as being HIV-positive for the entire calendar year of their diagnosis, were 15 years or older, and contributed one test per year. Individuals included either had no previous HCV antibody test recorded in ACCESS since 2009 or had previously tested HCV antibody negative. Individual's HCV antibody tests after an HCV antibody positive test being observed were excluded from analysis.

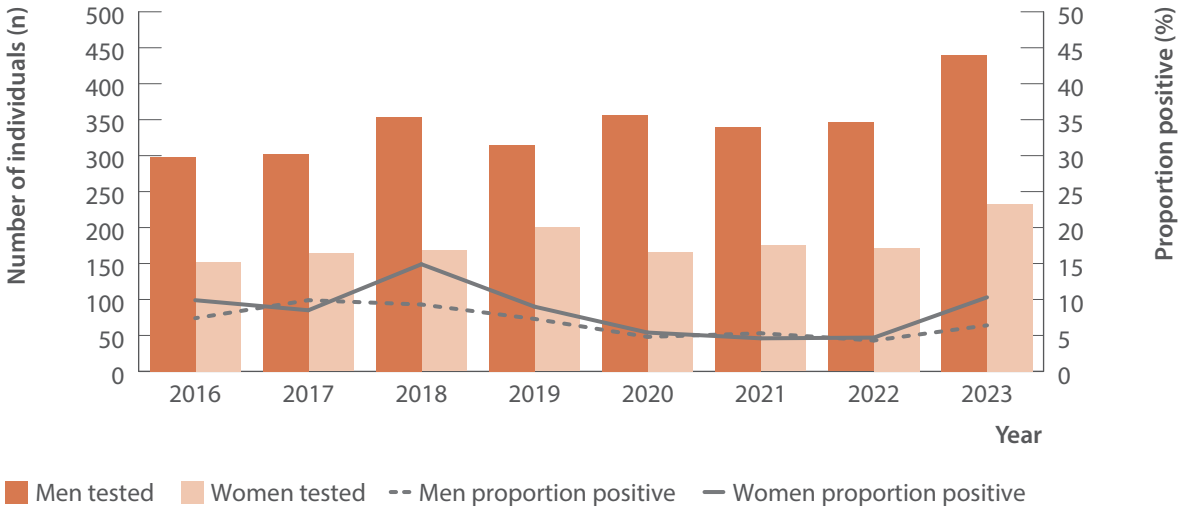
Figure 10. Number of individuals ever prescribed opioid agonist therapy tested for HCV antibody at ACCESS primary care clinics and proportion of HCV antibody tests positive by gender, ACCESS, 2016–2023



Source: ACCESS.[11]

Notes: Analysis includes 16 sites: 14 in VIC, one in WA, and one in QLD. Primary care clinics have high caseloads of people at risk of hepatitis C and provide both specialist services to current and former people who inject drugs as well as general health services. Individuals were 15 years or older, had at least one electronic medical record of a prescription for opioid agonist therapy between January 2009 and December 2023, and contributed one test per year. Individuals recorded as a gender other than man or woman were not reported due to small sample size. Individuals included either had no previous HCV antibody test recorded in ACCESS since 2009 or had previously tested HCV antibody negative. Individual's HCV antibody tests after an HCV antibody positive test being observed were excluded from analysis.

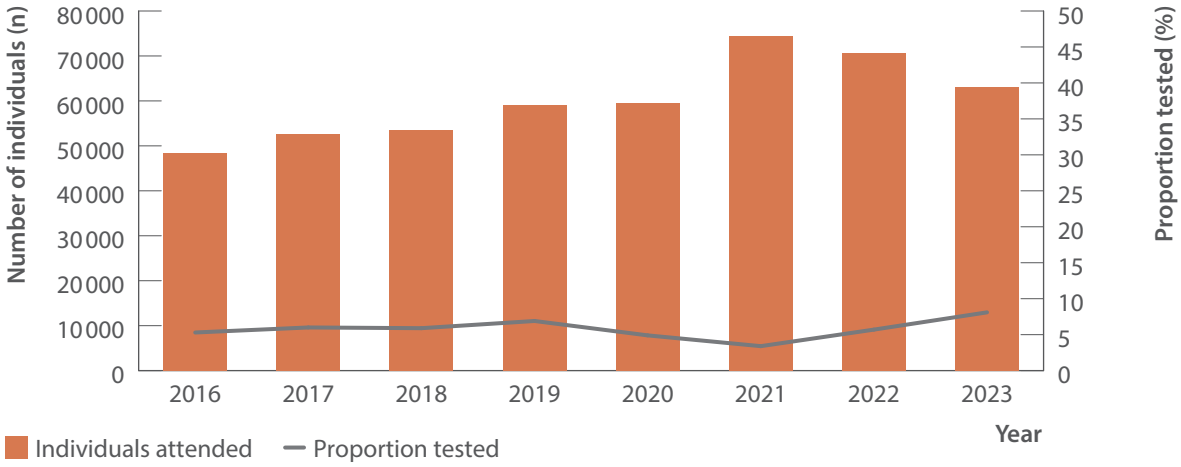
Figure 11. Number of Aboriginal and/or Torres Strait Islander people tested for HCV antibody at ACCESS sexual health clinics and proportion of HCV antibody tests positive, ACCESS, 2016–2023



Source: ACCESS.[11]

Notes: Analysis includes 11 sites: seven in NSW, two in QLD, one in VIC, and one in SA. Individuals were 15 years or older and contributed one test per year. Individuals recorded as a gender other than man or woman were not reported due to small sample size. Individuals included either had no previous HCV antibody test recorded in ACCESS since 2009 or had previously tested HCV antibody negative. Individual's HCV antibody tests after an HCV antibody positive test being observed were excluded from analysis.

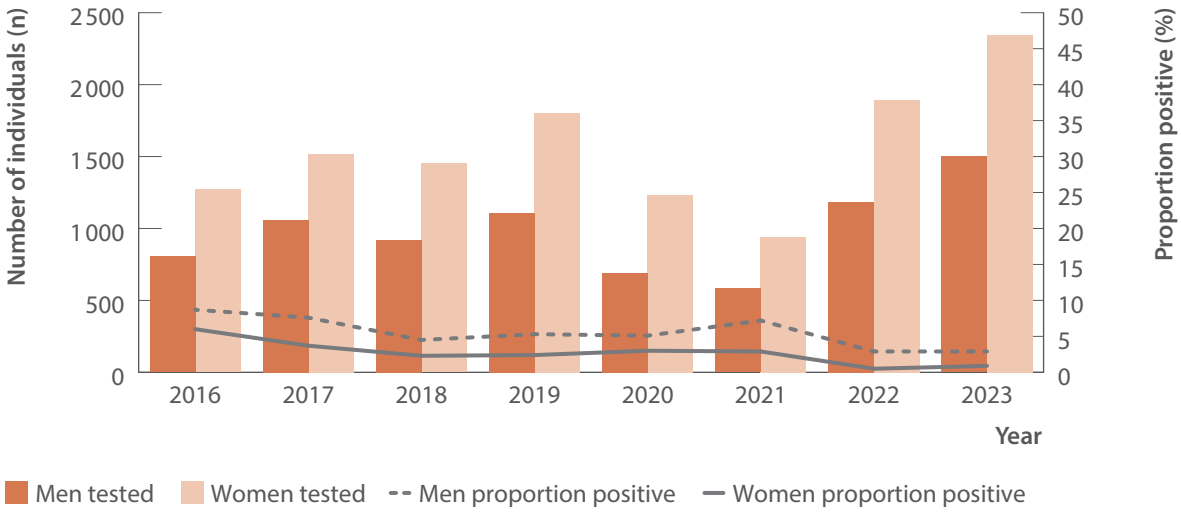
Figure 12. Number of individuals attending ACCHS and proportion tested for HCV (HCV antibody only or HCV antibody and RNA or HCV RNA only), ATLAS network, 2016–2023



Source: ATLAS Indigenous Primary Care Surveillance and Research Network, 2016–2023.[18]

Notes: Individuals defined as people aged 15 years or older, who visited a doctor, nurse, or Aboriginal health practitioner ('medical consultations') between 2016 and 2023.

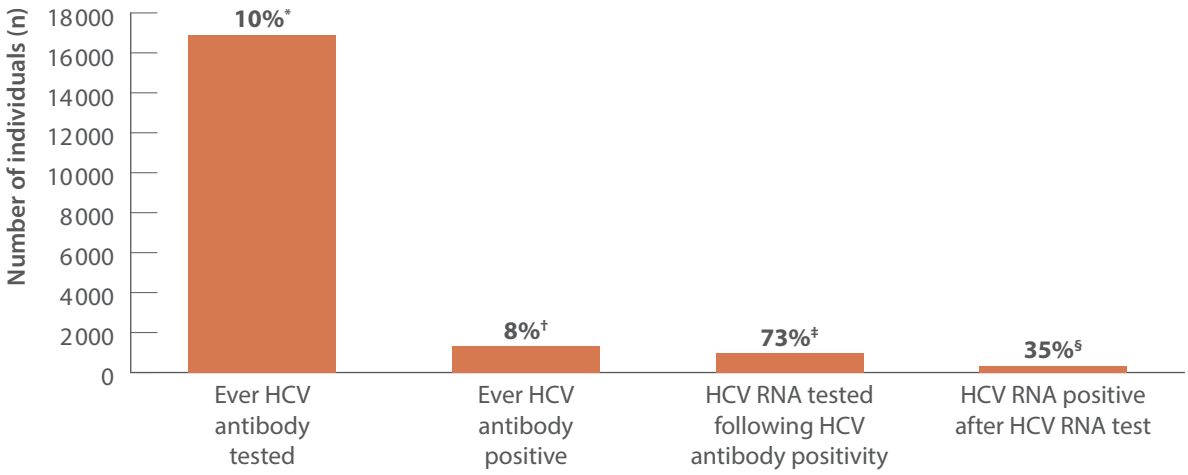
Figure 13. Number of individuals attending ACCHS tested for HCV antibody and proportion positive by gender, ATLAS network, 2016–2023



Source: ATLAS Indigenous Primary Care Surveillance and Research Network, 2016–2023.[18]

Notes: Individuals defined as people aged 15 years or older, who visited a doctor, nurse, or Aboriginal health practitioner ('medical consultations') between 2016 and 2023. Number of people tested per year as follows: 2016: 805 men, 1 272 women; 2017: 1 059 men, 1 516 women; 2018: 921 men, 1 451 women; 2019: 1 109 men, 1 804 women; 2020: 690 men, 1 232 women; 2021: 582 men, 939 women; 2022: 1 182 men, 1 892 women; 2023: 1 501 men, 2 344 women.

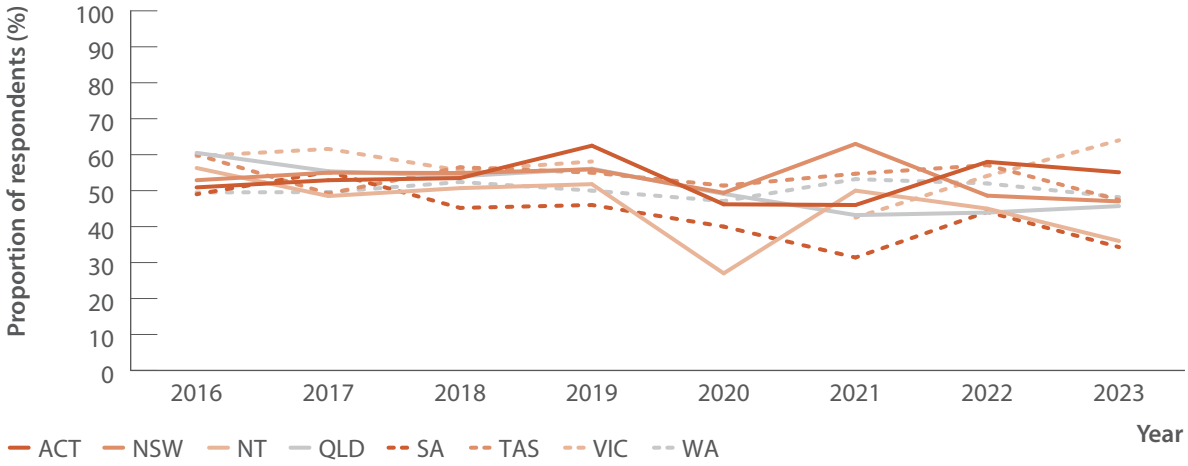
Figure 14. Hepatitis C testing cascade: number and proportion of individuals attending ACCHS tested for HCV antibody or RNA and among those tested, the number and proportion testing positive, ATLAS network, aggregated for years 2016–2023



Source: ATLAS Indigenous Primary Care Surveillance and Research Network, 2016–2023.[18]

Notes: Individuals defined as people aged 15 years or older, who visited a doctor, nurse, or Aboriginal health practitioner ('medical consultations') between 2016 and 2023. 'Ever HCV antibody positive' was defined as having had a positive test result at any time since data collection began (1st January 2016) until end of the sample period (December 2023). *A total of 178 816 individuals aged 15 years or older attended medical appointments between 2016 and 2023, of whom 9.5% (16 899/178 816) had an HCV antibody test. †Of those tested for HCV antibody, 7.8% (1 316/16 899) tested HCV antibody positive. ‡Of those HCV antibody positive, 73.0% (961/1 316) had an HCV RNA test following HCV antibody positivity of which §35.5% (341/961) were HCV RNA positive.

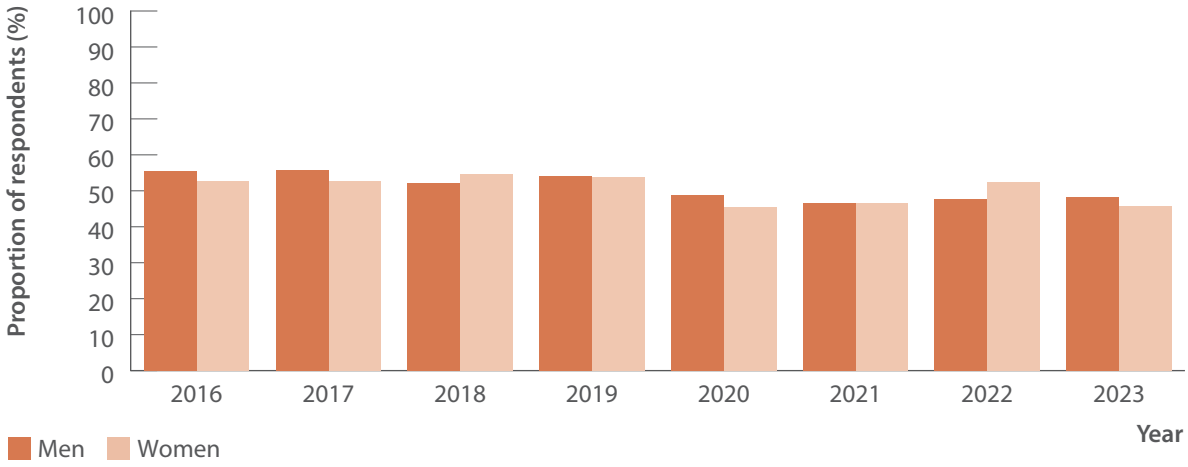
Figure 15. Proportion of Australian Needle Syringe Program Survey respondents self-reporting recent (past 12 months) hepatitis C testing by jurisdiction, 2016–2023



Source: Australian Needle Syringe Program Survey. 25-year National Data Report 1995–2019.[26] Australian Needle Syringe Program Survey. National Data Report 2019–2023.[19]

Notes: No participant recruitment occurred in VIC in 2020.

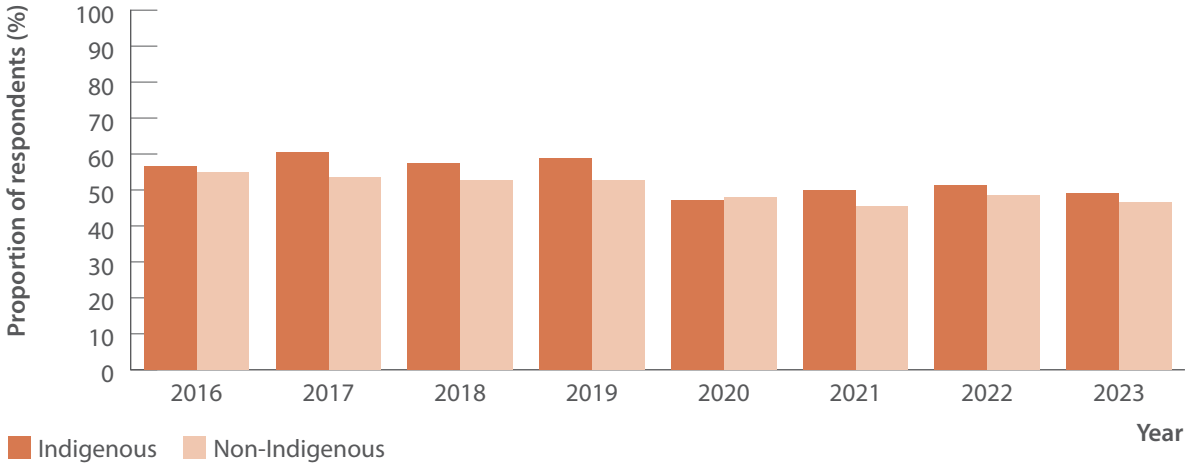
Figure 16. Proportion of Australian Needle Syringe Program Survey respondents reporting recent (past 12 months) hepatitis C testing by gender, 2016–2023



Source: Australian Needle Syringe Program Survey. 25-year National Data Report 1995–2019.[26] Australian Needle Syringe Program Survey. National Data Report 2019–2023.[19]

Notes: No participant recruitment occurred in VIC in 2020.

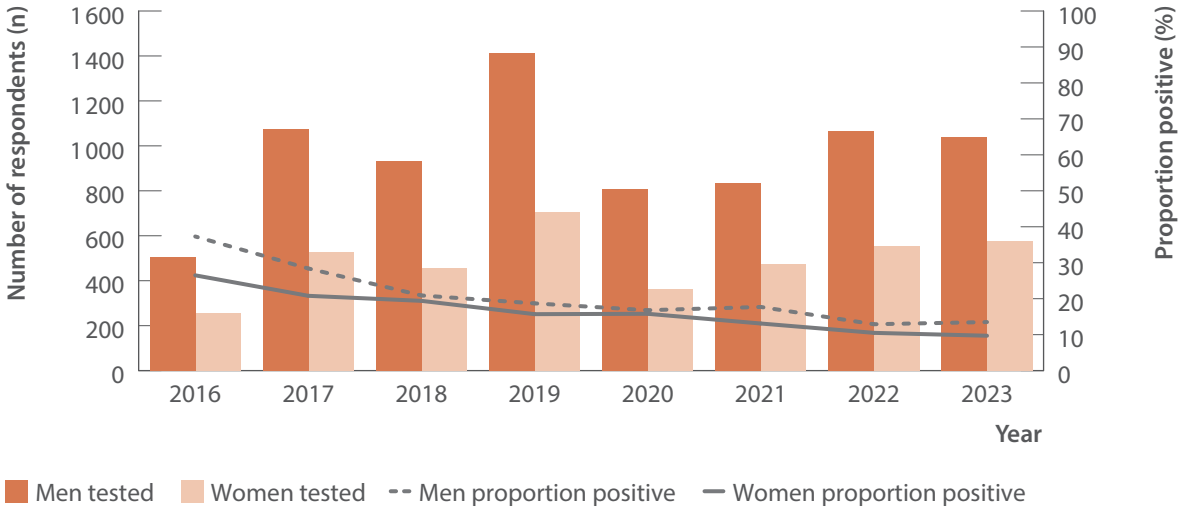
Figure 17. Proportion of Australian Needle Syringe Program Survey respondents reporting recent (past 12 months) hepatitis C testing by Indigenous status, 2016–2023



Source: Australian Needle Syringe Program Survey. 25-year National Data Report 1995–2019.[26] Australian Needle Syringe Program Survey. National Data Report 2019–2023.[19]

Notes: No participant recruitment occurred in VIC in 2020.

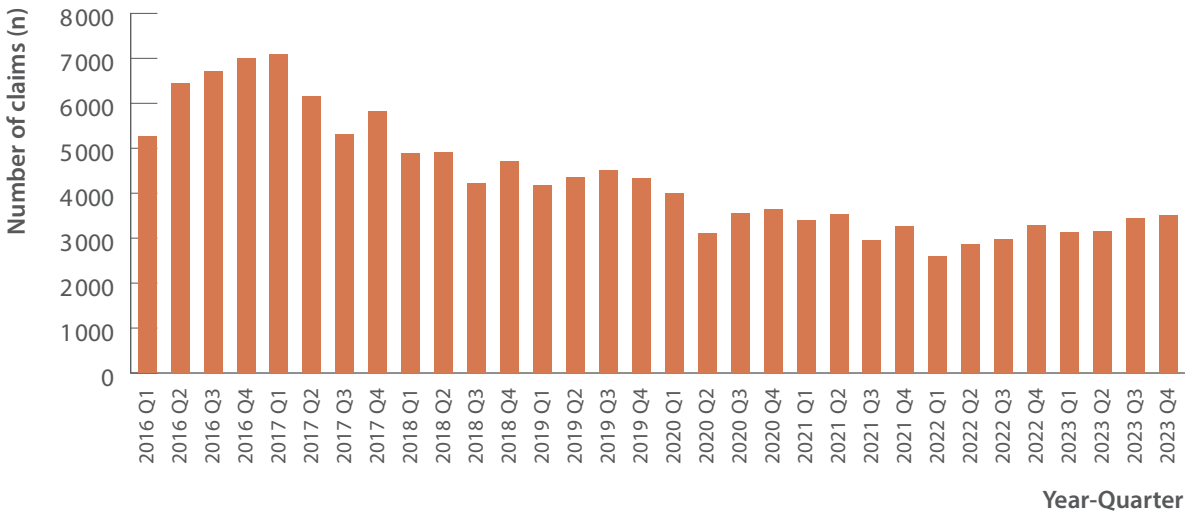
Figure 18. Number of Australian Needle Syringe Program Survey respondents tested for HCV RNA and proportion positive by gender, 2016–2023



Source: Australian Needle Syringe Program Survey. 25-year National Data Report 1995–2019.[26] Australian Needle Syringe Program Survey. National Data Report 2019–2023.[19]

Notes: No participant recruitment occurred in VIC in 2020. Weighted for gender and HCV antibody status 2015–2019.

Figure 19. Number of claims to Medicare for items 69499 and 69500 (detection of HCV RNA, new infections only), 2016–2023

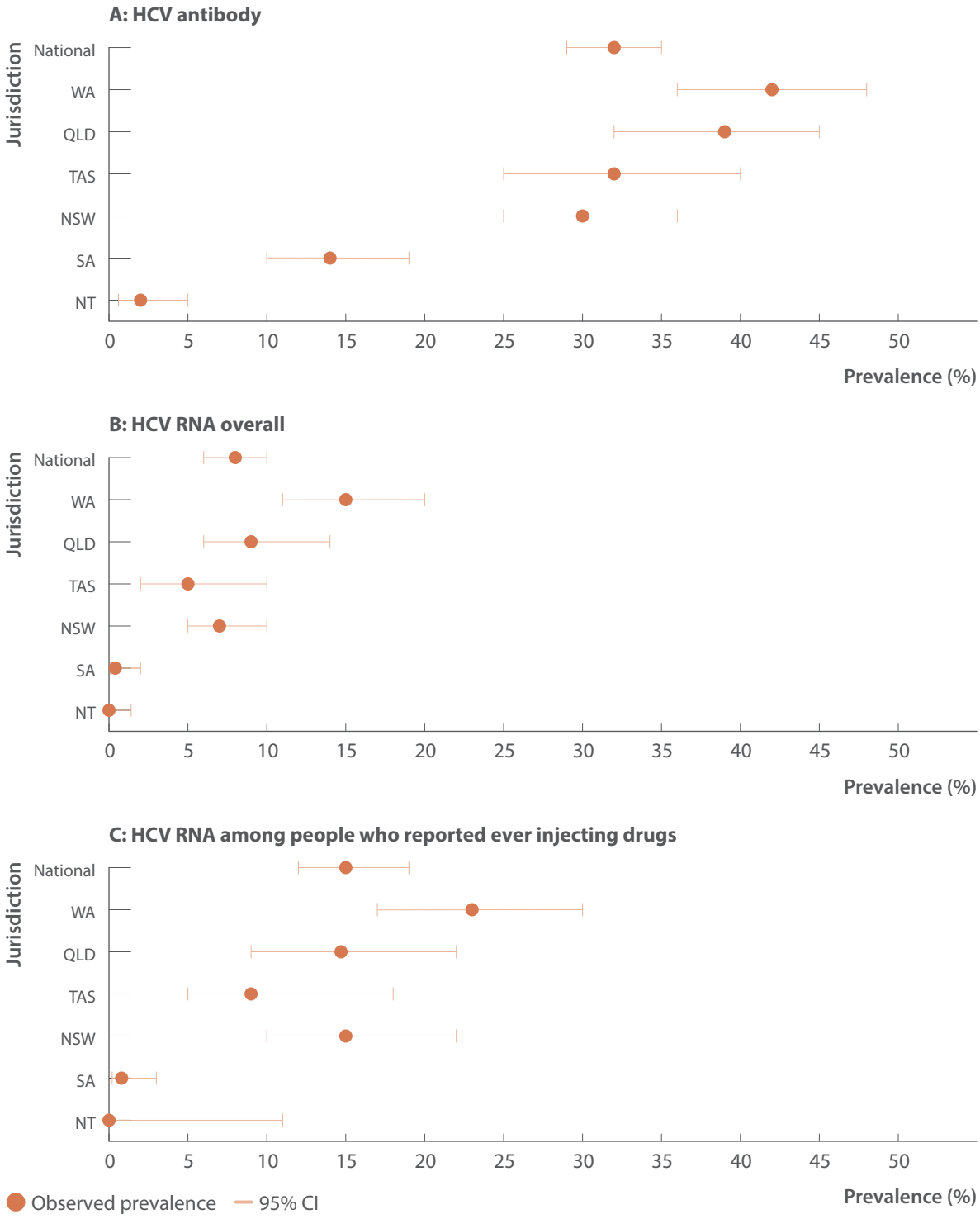


Source: Medicare Australia Statistics.[20]

Notes: Medicare Benefits Schedule item numbers (69499 and 69500) are used for testing to detect current hepatitis C infection which are not used for tests associated with treatment monitoring. Prison-based testing not included in Medicare Benefits Schedule data.

Monitoring testing and diagnosis among people in prison and people who inject drugs

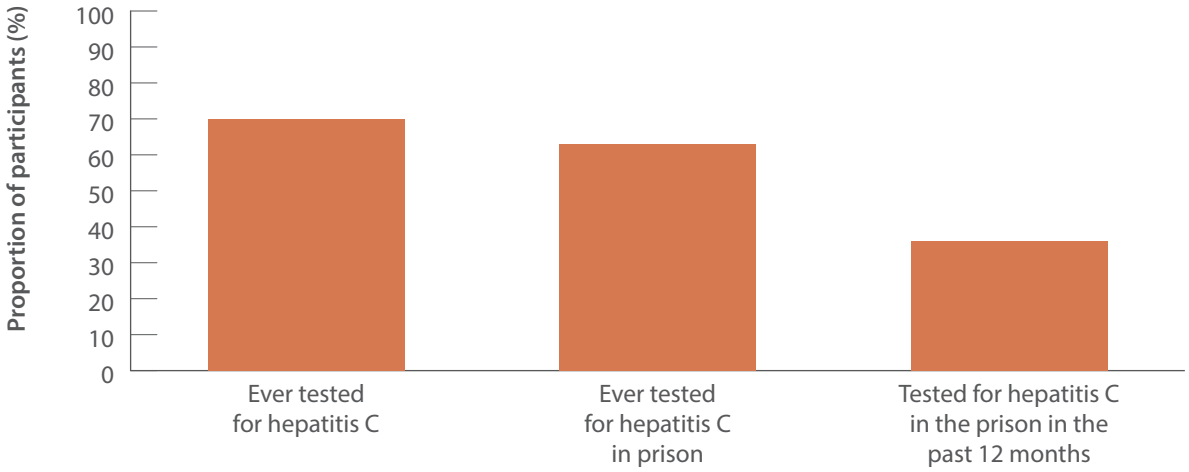
Figure 20. Prevalence of hepatitis C among people in prison by (A) HCV antibody, (B) HCV RNA overall, and (C) HCV RNA among people who reported ever injecting drugs, Australian Hepatitis and Risk Survey in Prisons, April 2022–June 2023



Source: Adapted from Bah et al., *Int J Drug Policy* 2024,[23] and Bah et al., *The Lancet Reg Health Western Pac* 2024.[24]

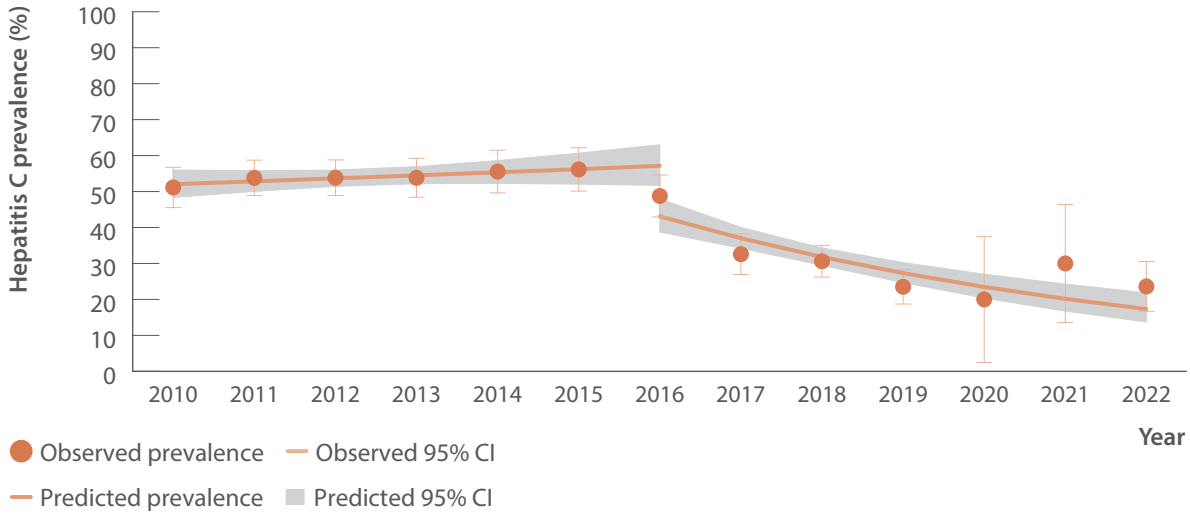
Notes: A total of 1 599 people in prison were enrolled and all participants were tested for HCV antibody. Participants who were HCV antibody positive were then tested for HCV RNA. The study sample sizes for each jurisdiction were: NT n=254; SA n=300; NSW n=327; TAS n=171; QLD n=248; WA n=299. For all of the national prevalence estimates, the sample size in each jurisdiction was weighted by the prisoner population size of that jurisdiction and the distribution of gender, and First Nations identity among people in prison, based on data from the Australian Bureau of Statistics in 2022.[27] CI: confidence interval.

Figure 21. Proportion of people in prison self-reporting any hepatitis C testing, Australian Hepatitis and Risk Survey in Prisons, April 2022–June 2023



Source: Adapted from Bah et al., *Int J Drug Policy* 2024,[23] and Bah et al., *The Lancet Reg Health Western Pac* 2024.[24]

Figure 22. Proportion of people who inject drugs participating in the MIXMAX Melbourne Cohort HCV RNA positive before and after subsidisation of DAAs in March 2016, March 2010–December 2022



Source: Adapted from Fisher et al.[15]

Notes: CI: confidence interval.

Three

Uptake of direct-acting antiviral treatment

Achieving hepatitis C elimination in Australia relies on strengthening primary prevention strategies and ensuring people who are diagnosed with chronic hepatitis C access care, treatment and cure, especially those at risk of transmitting their infection to others.[28,29,30] DAAs for the treatment of hepatitis C have a high cure rate, are highly tolerable,[6,7] and following listing on the Pharmaceutical Benefits Scheme (PBS) in March 2016, are available at minimal cost to Medicare-eligible Australians.

Treatment uptake

The monitoring treatment uptake in Australia and the National Retreatment projects provide estimates of the number of individuals initiating DAA treatment, and retreatment, between March 2016 and December 2023, recorded in the PBS database. DAA treatment initiations (first treatment) by jurisdiction and provider type are described.[31] As the PBS data does not capture reason for retreatment, retreatment data from the REACH-C cohort[32,33] and a statistical technique (Random Forest machine learning model) were used to classify records in the PBS data as being retreatment for reinfection or treatment failure.[34]

The Australian Needle Syringe Program Survey provides annual self-reported hepatitis C treatment uptake among people who inject drugs attending NSPs.[19]

The National Prisons Hepatitis Network collated data from 93 prisons across eight jurisdictions on the number of individuals who received DAA treatment for hepatitis C in 2023.[22] The PBS database provides an estimate of the total number of individuals who commenced treatment in 2023 (first treatment or a retreatment episode).[31]

The Australian Hepatitis and Risk Survey in Prisons provides data on self-reported history of treatment uptake among people in prison enrolled in the study April 2022–June 2023.[23,24]

Cascades of care

ACCESS data from primary care clinics provides a hepatitis C care cascade for patients; the cascade reflects the status of individuals at 31 December 2023 and includes individuals with evidence of ever being diagnosed HCV RNA positive who had a clinical consultation between 2016 and 2023.[11,35]

The ATLAS network provides a cascade of care using patient data of treatment uptake (proportion of HCV RNA positive individuals prescribed DAA treatment) and HCV RNA testing after treatment.[18] Undetectable HCV viral load was defined as individuals testing negative for HCV RNA or HCV viral load following their DAA treatment, during the study period (2016–2023).

The 2023 national hepatitis C diagnosis and care cascade is a population-level cross-sectional cascade estimated annually as part of the *HIV, viral hepatitis and sexually transmissible infections in Australia: annual surveillance report*.[2,3,4] Using available data, mathematical modelling, and accounting for uncertainties, the number of people in each stage of the diagnosis and care cascade in Australia at the end of 2023 were

estimated including the number of people living with chronic hepatitis C in Australia, the number and proportion of people who have been diagnosed, the number who received antiviral treatment (for primary infection and reinfection), the number cured and the number of new infections.

PROGRESS ON INCREASING TREATMENT UPTAKE

Treatment uptake

Between March 2016 and December 2023, an estimated 105 947 people living with chronic hepatitis C initiated DAA therapy (first treatment), including 32 458 people in 2016, 21 249 in 2017, 15 355 in 2018, 11 433 in 2019, 8 215 in 2020, and 6 563 in 2021, 5 175 in 2022, and 5 499 in 2023. There were 13 465 retreatments between 2016 and 2023 (Figure 23). There were variations in uptake by jurisdiction (Figure 24). Hepatitis C treatment initiations declined through 2019–2022 with 2022 having the lowest number of people treated in the DAA era; however there was an increase in the number of people treated between 2022 and 2023. Declining numbers of treatment initiations by specialists were not offset by increased numbers of initiations by non-specialists (Figure 25). Analyses of retreatment by reason and gender highlights men have been retreated more than women and mostly for reinfection (Figure 26).

Lifetime treatment uptake among Australian Needle Syringe Program Survey respondents rose considerably among both men and women, from 30% (137/459) in 2016 to 76% (205/270) in 2023 among men and 26% (47/182) to 72% (93/129) among women (Figure 27).

In 2023, 3 414 individuals were initiated on hepatitis C DAA treatment in prisons across all Australian jurisdictions. This represents 42% (3 414/8 077) of all individuals receiving at least one hepatitis C treatment episode in Australia in 2023. The number of individuals initiated on treatment nationally and by jurisdiction is presented in Figure 28 and Table 1. In 2023, across the various jurisdictions, the proportion of individuals initiated on treatment in the prisons ranged from 4 to 75% of the jurisdictional total. The commencement of treatment for hepatitis C within prisons varies across jurisdictions in relation to the prevalence of infection, the size of the population of people in prison, the number of people previously treated in prison or the community, hepatitis C testing activities, and the number of new diagnoses (see Chapter Two for numbers of individuals HCV RNA tested and test positivity in prisons in 2023). The proportion of people treated in prisons has increased each year: 25% (2019), 31% (2020), 31% (2021), and 35% (2022). It is important to note that previous reports used the total number of treatment initiations[36] whereas the 2023 data are the number of individuals treated.

The majority (85%, weighted proportion) of participants in the Australian Hepatitis and Risk Survey in Prisons study who were ever hepatitis C treatment eligible self-reported being treated (Figure 29).

PROGRESS ON INCREASING TREATMENT UPTAKE (CONTINUED)

Cascades of care

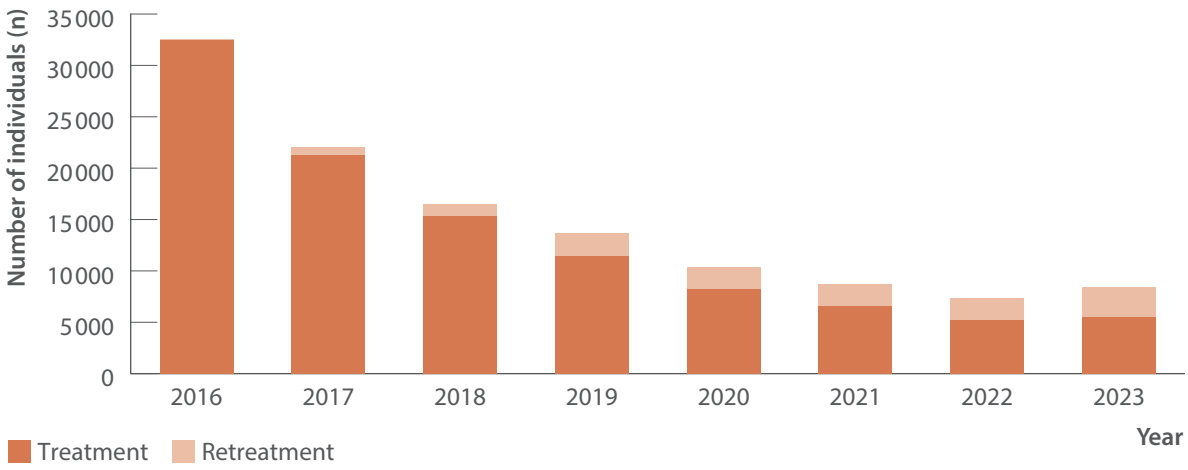
At the end of 2023, among those with a clinical consultation at ACCESS primary care clinics between 2016 and 2023 and an HCV RNA positive test recorded in ACCESS (N=5 295), 54% (2 873/5 295) had initiated treatment and of those treated, 48% (1 376/2 873) had an HCV RNA test >eight weeks post-treatment, of which 93% (1 276/1 376) were HCV RNA negative (Figure 30).

Over the eight years of the ATLAS network data (2016–2023), of those ACCHS clients with a detected HCV viral load, 40% (138/341) were recorded to then receive DAA treatment and 59% (82/138) of the clients prescribed DAA treatment received further HCV RNA testing after eight weeks within the same health service. Of those retested after treatment initiation, 59% (48/82) had an undetectable HCV viral load (Figure 31). The ATLAS network is currently investigating the steps in the testing and treatment cascade where major decreases are observed, to determine the reasons driving this apparent loss from care. This may include initiation of treatment in health services not participating in ATLAS.

The hepatitis C diagnosis and care cascade modelling estimated that at the end of 2023, 68 890 people were living with hepatitis C. During 2023, 5 500 people received DAA treatment for primary infection, and there were 1 910 treatment initiations for reinfection (Figure 32).

Monitoring treatment uptake

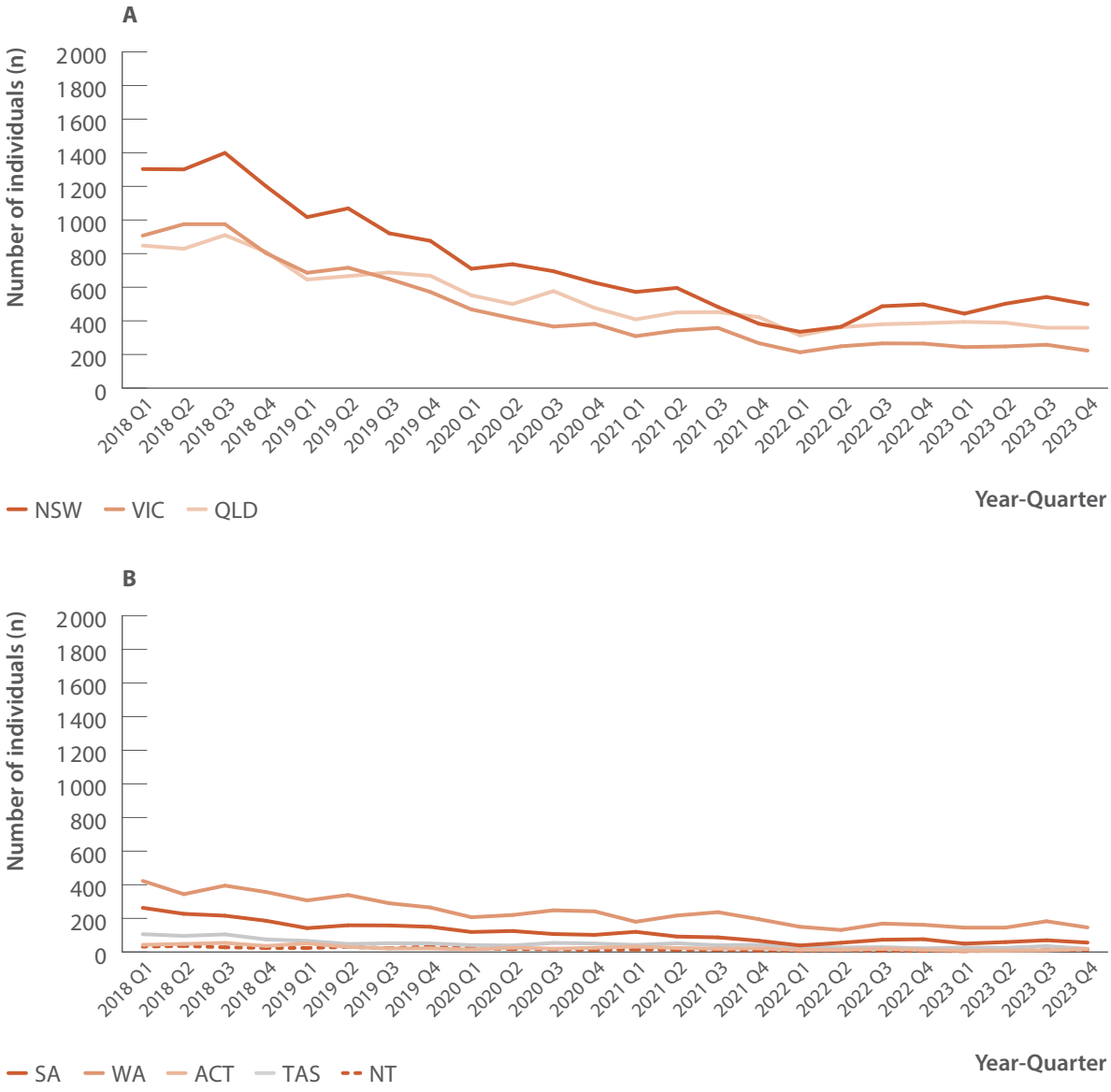
Figure 23. Total estimated number of individuals initiating DAA treatment (including retreatment), PBS database, March 2016–December 2023



Source: Monitoring hepatitis C treatment uptake in Australia.[31]

Notes: Treatment numbers may vary from previous or future reports due to refinements made to the PBS data between releases.

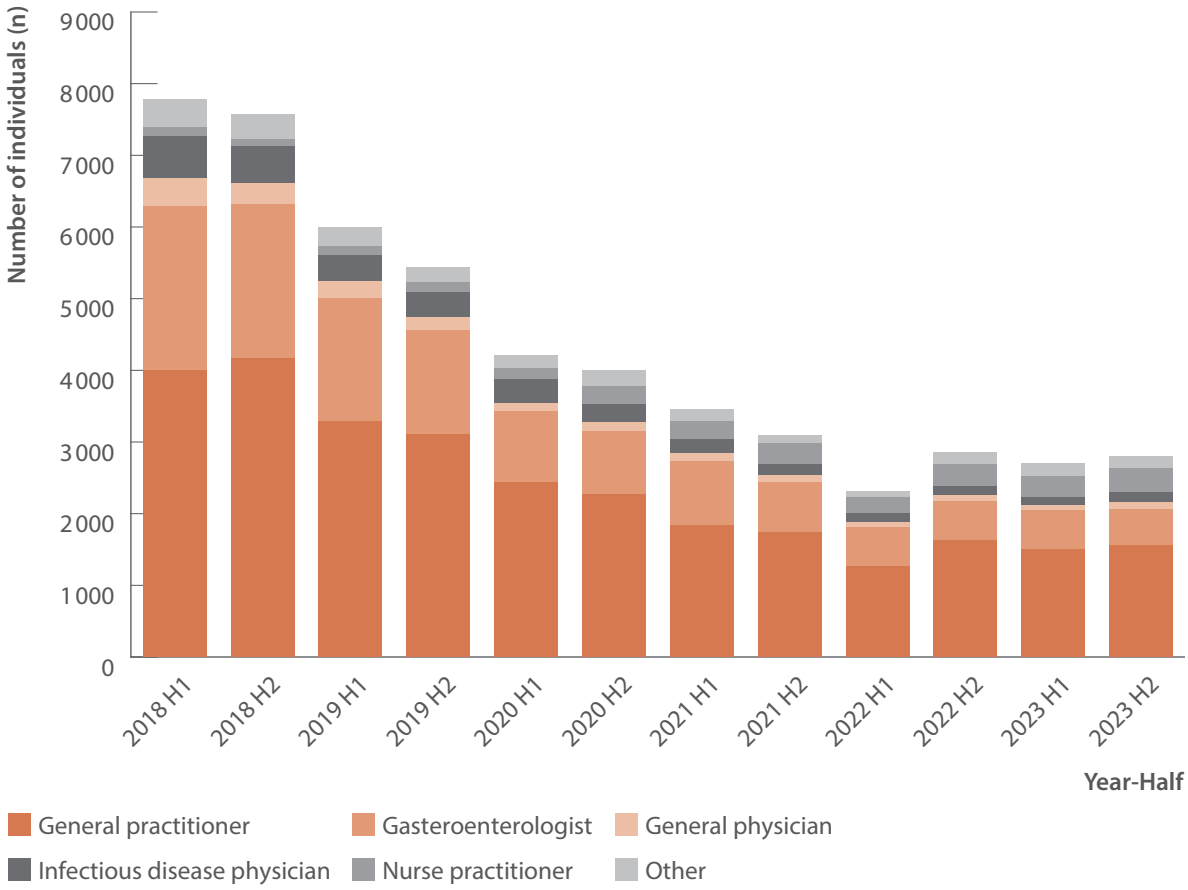
Figure 24. Estimated number of individuals initiating DAA treatment by jurisdiction, PBS database, 2018–2023



Source: Monitoring hepatitis C treatment uptake in Australia.[31]

Notes: Treatment numbers may vary from previous or future reports due to refinements made to the PBS data between releases.

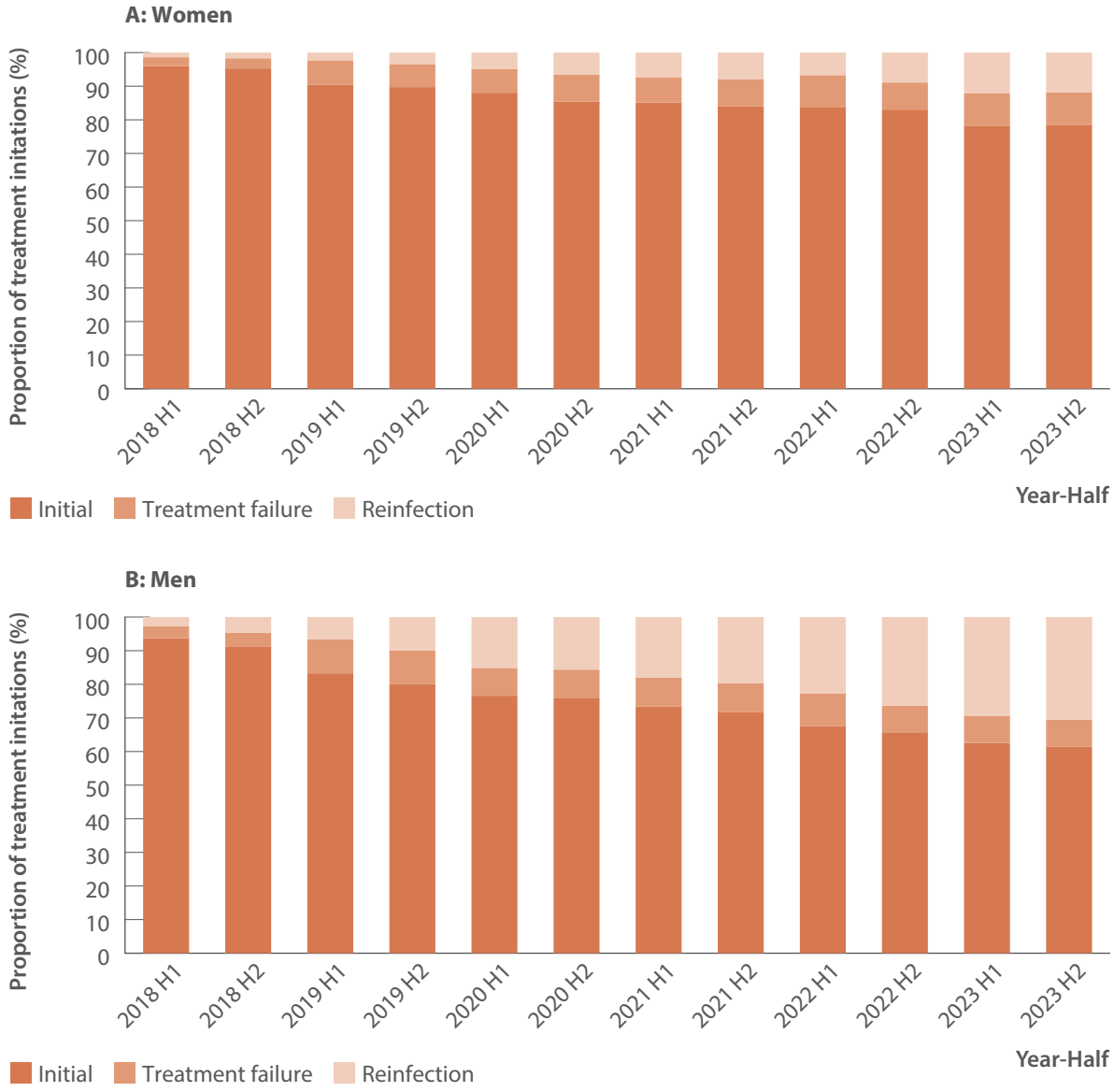
Figure 25. Estimated number of individuals initiating DAA treatment by prescriber type, PBS database, 2018–2023



Source: Monitoring hepatitis C treatment uptake in Australia.[31]

Notes: Treatment numbers may vary from previous or future reports due to refinements made to the PBS data between releases. Nurse practitioners have been authorised to prescribe DAA therapy for hepatitis C treatment since June 2017.

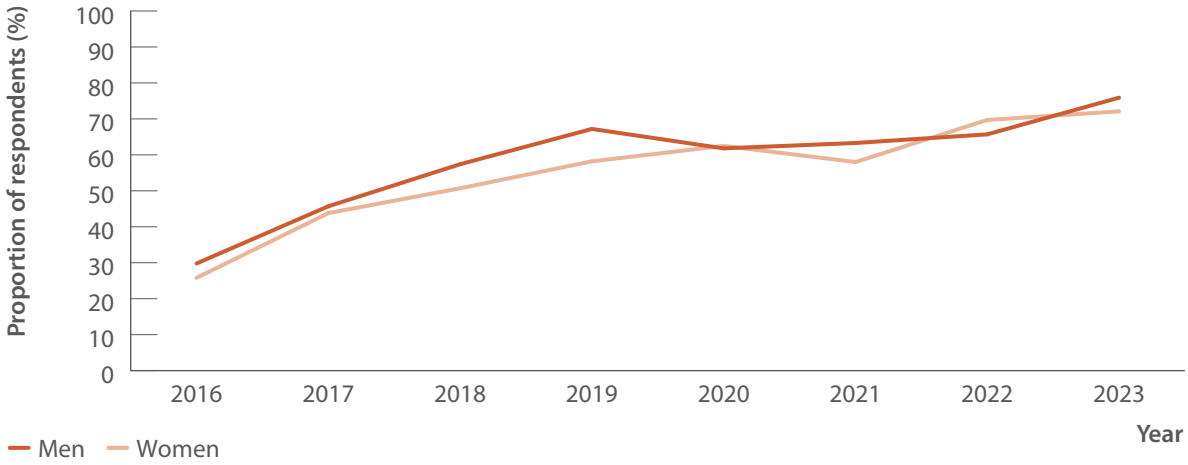
Figure 26. Estimated proportion of individuals initiating DAA treatment and retreatment by gender, PBS database, 2018–2023



Source: Monitoring hepatitis C treatment uptake in Australia and National Retreatment Project.[31]

Notes: Treatment numbers may vary from previous or future reports due to refinements made to the PBS data between releases.

Figure 27. Proportion of Australian Needle Syringe Program Survey respondents who tested HCV antibody positive, self-reporting lifetime history of hepatitis C treatment by gender, 2016–2023



Source: Australian Needle Syringe Program Survey. 25-year National Data Report 1995–2019.[26] Australian Needle Syringe Program Survey. National Data Report 2019–2023.[19]

Notes: Includes respondents who tested HCV antibody positive and excludes those self-reporting spontaneous hepatitis C clearance. No participant recruitment occurred in VIC in 2020.

Figure 28. Number of individuals receiving DAA treatment in prison versus in the community nationally and by jurisdiction, National Prisons Hepatitis Network and PBS database, 2023

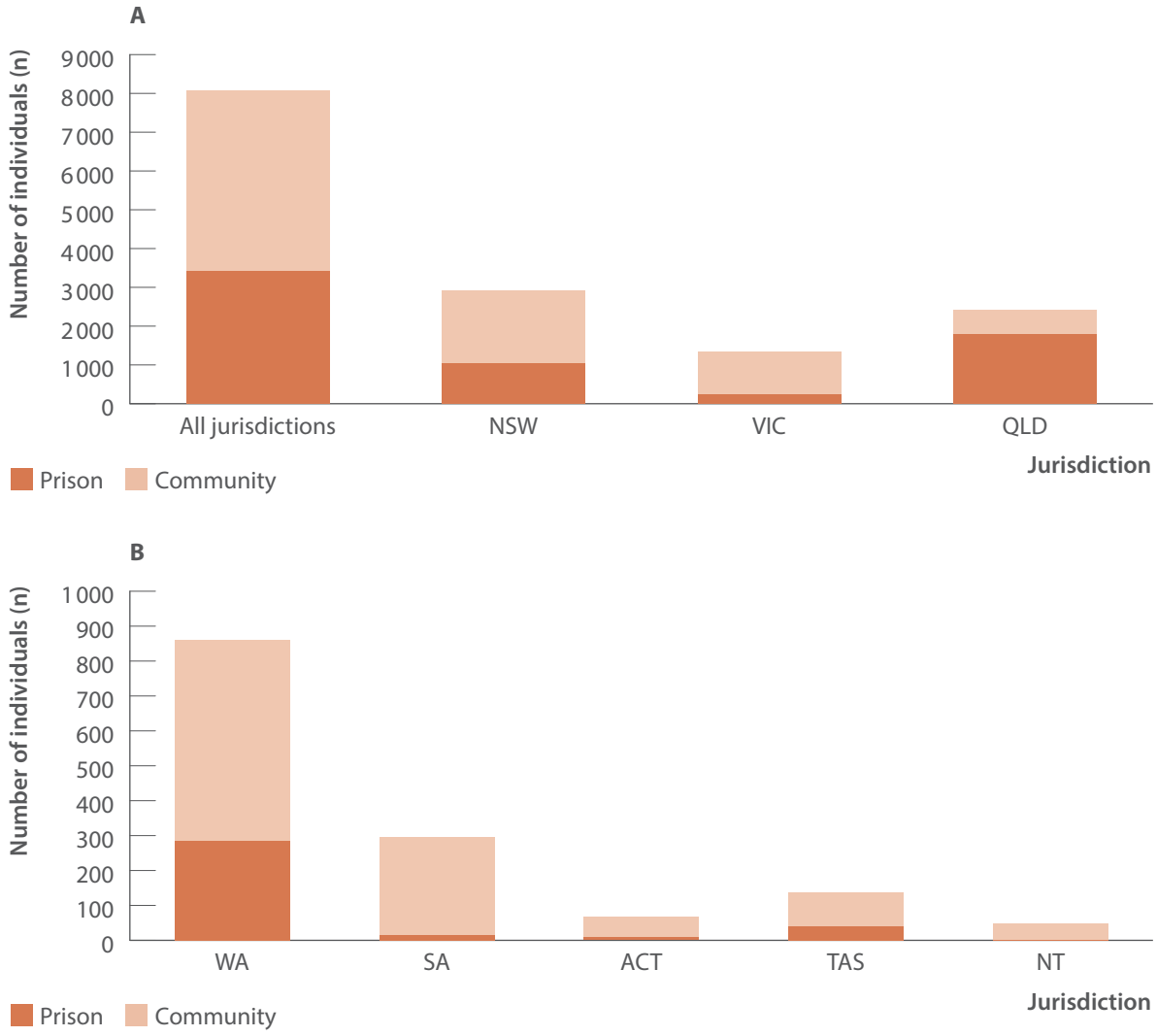


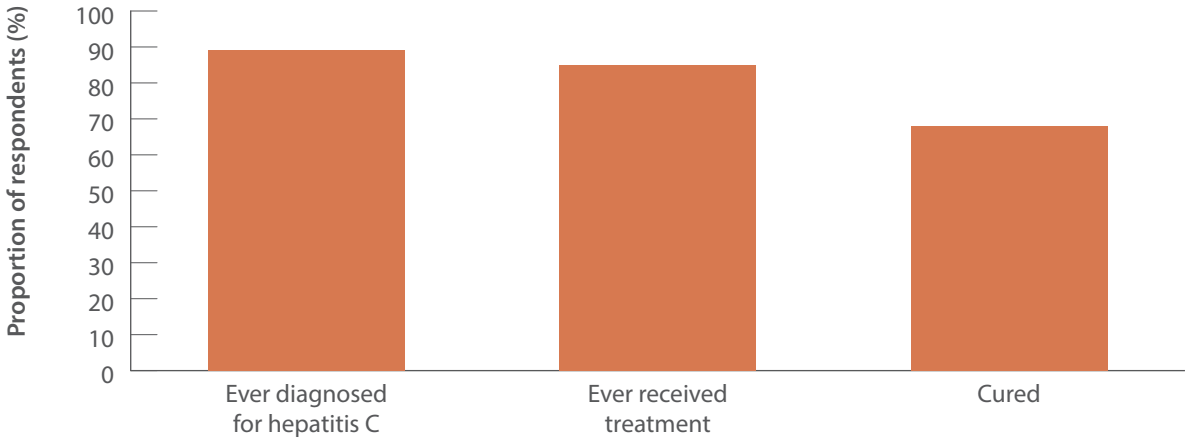
Table 1. Number of individuals who received DAA treatment in prison versus in the community, nationally and by jurisdiction, National Prisons Hepatitis Network and PBS database, 2023

	National	NSW	VIC	QLD	WA	SA	ACT	TAS	NT
2023									
Number of prisons*	96	33†	14	14	17	9	1	6	2
Number of individuals who received DAA treatment in prisons	3 414	1 027	236	1 796	287	15	11	40	2
Total number individuals who received treatment (PBS database)	8 077	2 927	1 340	2 402	860	295	69	136	48

Source: State and Territory Justice Health authorities via the National Prisons Hepatitis Network.[22] Monitoring treatment uptake in Australia.[31]

Notes: *Number of adult prisons in the network. †Data were collected from 30 prisons. The proportion of all people treated in prisons nationally was calculated using the number of people who initiated treatment reported by jurisdictional prison hepatitis services as a proportion of all people treated derived from the PBS database. 'Community' treatment initiations are therefore defined as all people treated in the PBS database minus all people treated reported by jurisdictional prison hepatitis services. Individuals are counted once per year and treatment may be first treatment or retreatment.

Figure 29. Proportion of people in prison ever hepatitis C treatment eligible self-reporting treatment, Australian Hepatitis and Risk Survey in Prisons, April 2022–June 2023

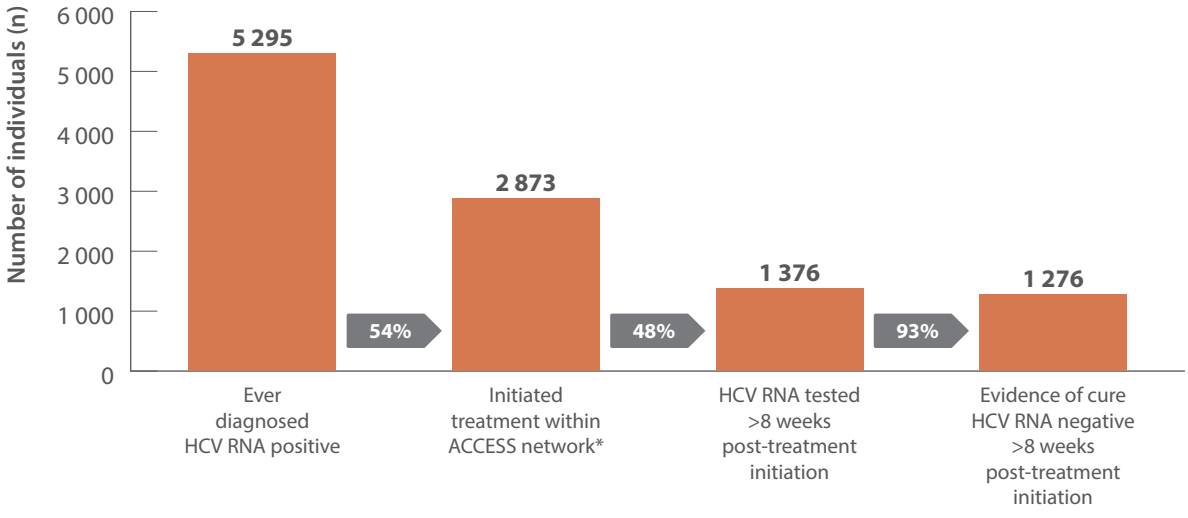


Source: Adapted from Bah et al., *Int J Drug Policy* 2024,[23] and Bah et al. *The Lancet Reg Health Western Pac* 2024.[24]

Notes: Denominator population is people ever eligible for treatment, defined as those with detectable HCV RNA (study-conducted test), regardless of the history of treatment or those HCV antibody positive (study-conducted test) who had a self-reported history of treatment. Participants diagnosed for hepatitis C were defined as those ever treatment eligible who had ever been told by a health professional that they had chronic hepatitis C. Hepatitis C cure was defined by a positive HCV antibody and undetected HCV RNA among those who had received treatment (study-conducted test). Those without 'cure' (i.e., study-conducted HCV RNA positive) includes people who have not responded to treatment or those who may have achieved a sustained virological response (SVR) but were reinfected.

Cascades of care

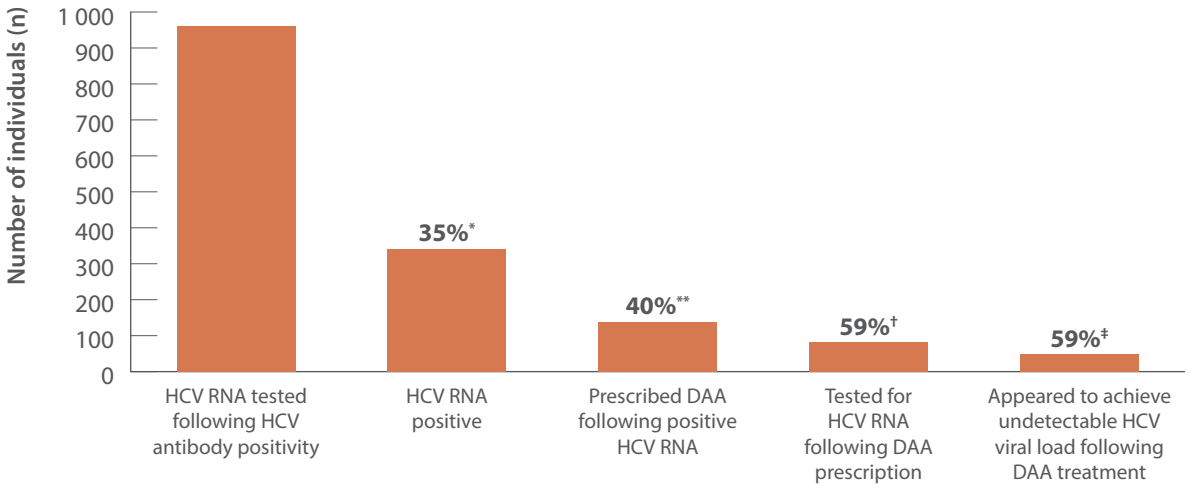
Figure 30. Hepatitis C treatment cascade at ACCESS primary care clinics: number of individuals hepatitis C diagnosed, number and proportion of individuals who initiated treatment, and tested for HCV RNA post-treatment initiation, 2016–2023



Source: ACCESS.[11] Updated from Traeger et al., *PLOS One* 2020.[35]

Notes: Cascade includes individuals with evidence of ever being diagnosed HCV RNA positive, i.e., a positive HCV RNA test result recorded in ACCESS since 2009. The cascade reflects the status of individuals on 31 December 2023 and is restricted to individuals who had a clinical consultation between 2016 and 2023. Includes individuals attending ACCESS primary care clinics (same primary care clinics as other ACCESS sections in report). *Treatment initiation was indicated by the presence of an electronic medical record of a prescription of DAA therapy recorded at an ACCESS clinic. Individuals were assumed to have progressed through preceding cascade stages if evidence of reaching a subsequent stage was present.

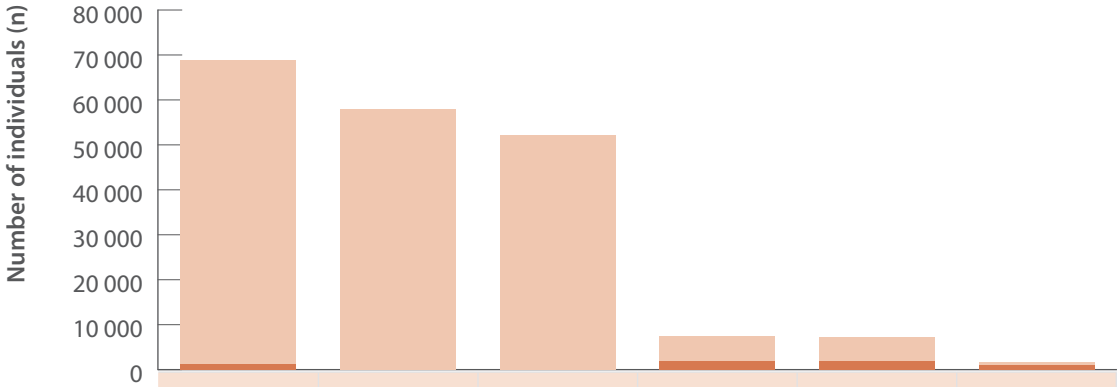
Figure 31. Hepatitis C treatment cascade: number and proportion of individuals attending ACCHS tested for HCV RNA and prescribed DAAs, and among those treated, the number and proportion who appeared to achieve an undetectable HCV viral load, ATLAS network, aggregated for years 2016–2023



Source: ATLAS Indigenous Primary Care Surveillance and Research Network, 2016–2023.[18]

Notes: Individuals defined as people aged 15 years or older, who visited a doctor, nurse, or Aboriginal health practitioner ('medical consultations') 2016–2023. 'Undetectable viral load' defined as testing negative for HCV RNA or HCV viral load following DAA treatment. A total of 178 816 individuals aged 15 years or older attended medical appointments between 2016 and 2023. *Of individuals who were HCV RNA tested following an HCV antibody positive test, 35% (341/961) tested positive. **Of those who tested HCV RNA positive, 40% (138/341) were then prescribed DAA treatment. †Of those prescribed DAAs, 59% (82/138) had an HCV RNA test following treatment, of whom ‡59% (48/82) had an undetectable viral load and 41% (34/82) were either positive or not tested (data unavailable to define these 34 further). Clinician notes/reason for HCV RNA testing was not obtained by ATLAS to further classify individuals who were HCV RNA tested but were not positive (65%; 620/961, not HCV RNA positive). If those with evidence of DAA treatment are inferred as HCV RNA positive, the proportion of positive HCV RNA testing is higher, approaching 50%.

Figure 32. The 2023 hepatitis C diagnosis and care cascade, HIV, viral hepatitis and sexually transmissible infections in Australia, Annual Surveillance Report



	Living with heptitis C at the end of 2023	Diagnosed with hepatitis C	HCV RNA confirmed hepatitis C	Received treatment (DAA) during 2023	Cured	New infections
Primary infection	67 610			5 500	5 170	830
Reinfection	1 280			1 910	1 790	910
Total (primary and reinfection)	68 890	57 900	52 110	7 140	6 960	1 740

Source: Updated by Kirby Institute, from the *HIV, viral hepatitis and sexually transmissible infections in Australia: annual surveillance report 2023*.[2,3,4]

Notes: Numbers in the figure rounded for clarity. The care cascade was estimated using mathematical modelling; mathematical modelling uses available data from observational research studies and administrative datasets to derive estimates like the population prevalence of hepatitis C, accounting for uncertainties. Living with hepatitis C is the estimated number of individuals in the overall population who had detectable HCV RNA in 2023; diagnosed with hepatitis infection is the estimated number of individuals living with chronic HCV in 2023 who have been previously diagnosed (HCV antibody positive or HCV RNA); HCV RNA confirmed hepatitis C is the estimated number of individuals who are confirmed with HCV from RNA testing; received DAA treatment is the observed number of individuals who received treatment in 2023 for primary infection and reinfection; and cured is the estimated number of treated individuals who achieved undetectable HCV RNA post-treatment in 2023.

Four

Hepatitis C-attributable morbidity: transplantations

Reducing hepatitis C-related mortality is a key goal of global and national hepatitis C elimination targets. Given the elevated risk of hepatocellular carcinoma among people with cirrhosis, even after hepatitis C cure, morbidity and mortality remain important outcomes to monitor.

People with cirrhosis who are cured through DAA therapy have a very low risk of progression to liver failure but remain at risk (albeit reduced compared to those not cured) of hepatocellular carcinoma. Due to this, observed declines in cases of hepatocellular carcinoma are likely to be delayed. Further, for people with hepatitis C-related hepatocellular carcinoma who achieve cure, improved liver function post cure may allow for curative treatments for hepatocellular carcinoma other than liver transplantation. However, reductions in the incidence of liver failure and subsequent liver transplants due to liver failure are useful indicators in monitoring long-term outcomes achievable though hepatitis C elimination efforts.

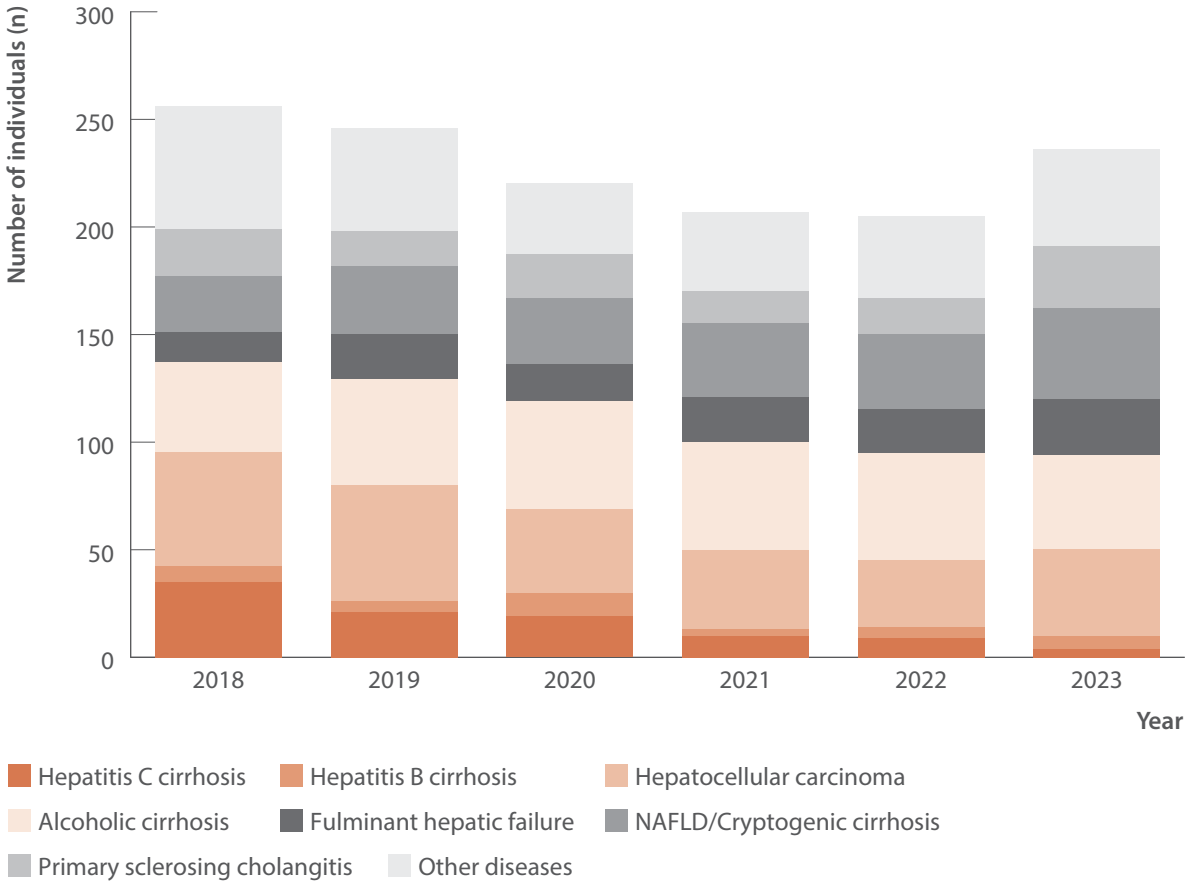
No national registry collates data on morbidity and mortality outcomes among people diagnosed with hepatitis C. However, the Australia and New Zealand Liver and Intestinal Transplant Registry collates data on the primary diagnosis of liver transplant recipients.

PROGRESS ON REDUCING HEPATITIS-C ATTRIBUTABLE MORBIDITY: TRANSPLANTATIONS

The number of individuals who were recipients of a liver transplant and had a primary diagnosis of hepatitis C cirrhosis declined in the past eight years (Figure 33).

Data on mortality, morbidity, and other outcomes related to hepatitis C in Australia are scarce, a gap that requires urgent action. Monitoring the long-term outcomes of those living with hepatitis C and the effect of primary and secondary prevention on mortality and morbidity is crucial for evaluating strategies to eliminate hepatitis C.

Figure 33. Number of Australian adult liver transplant recipients by primary diagnosis and year of first transplant, Australia and New Zealand Liver and Intestinal Transplant Registry, 2018–2023



Source: Australia and New Zealand Liver and Intestinal Transplant Registry.[37]

Notes: Australian transplant recipients only. Adults defined as 16 years or older. NAFLD: non-alcoholic fatty liver disease.

Five

Stigma and discrimination experienced by people living with hepatitis C

Stigma is a significant barrier to testing, diagnosis, and treatment for hepatitis C, and is therefore important to address if progress in these areas is to be achieved. Understanding how and where hepatitis C-related stigma is both expressed and experienced can provide context to other indicators, such as any lack of progress in testing, treatment uptake, and maintained engagement with healthcare services across populations of people living with or at risk of hepatitis C, among specific groups, or within particular settings. Shame, fear, experiences of discrimination, and concerns about privacy can all contribute to individuals not disclosing their engagement in risk practices (e.g., injecting drug use) and therefore not being offered hepatitis C testing. This then flows on to individuals not receiving timely diagnosis and treatment.

Standardised population-level monitoring of stigma related to hepatitis C and injecting drug use has been undertaken in Australia since 2016, with measures developed and implemented as part of the Stigma Indicators Monitoring Project.[38] Indicators of experienced stigma were included in surveys of people who inject drugs and people diagnosed with hepatitis C, between 2016 and 2023.

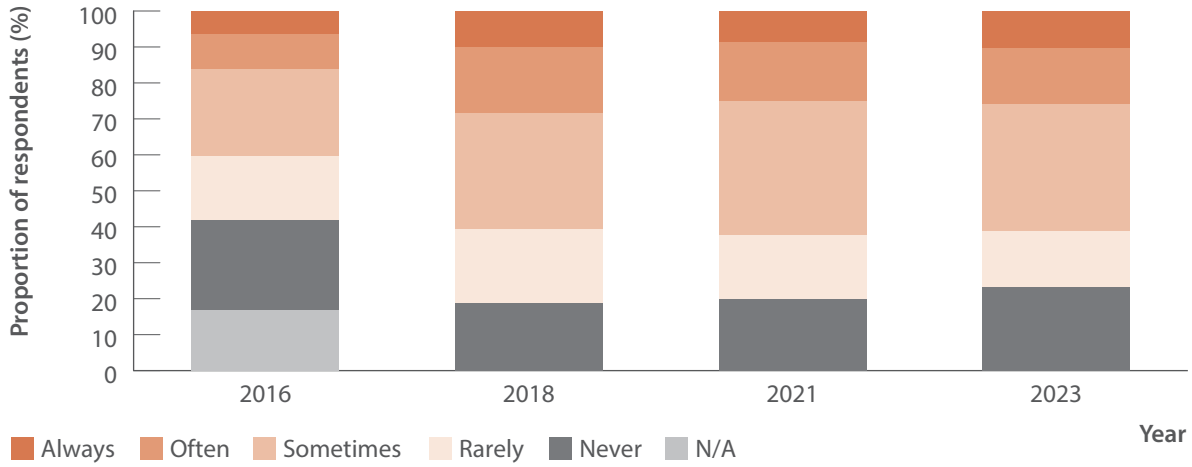
PROGRESS ON REDUCING STIGMA

In 2023, the Stigma Indicators Monitoring Project surveyed a national sample of people who inject drugs. Over three-quarters of the participants surveyed (77%, 470/612) reported experiencing any stigma or discrimination in relation to their injecting drug use within the past 12 months. This proportion has not significantly changed over time (Figure 34). Among those participants who had ever been diagnosed with hepatitis C, 52% (140/267) reported experiencing any stigma or discrimination in relation to their hepatitis C within the past 12 months. Reports of hepatitis C-related stigma have also not significantly changed over time (Figure 35). Survey participants were also asked if healthcare workers had treated them negatively or differently to other people in the past 12 months. In 2023, 69% (419/608) of people who inject drugs reported any negative or different treatment from healthcare workers due to their injecting drug use, including 21% (128/608) who indicated that this had often or always occurred (Figure 36).

There is some evidence in the literature regarding positive short-term effects of stigma intervention initiatives,[39,40,41] however, these effects tend to attenuate over time. Further research is needed to identify effective means of positively influencing attitudes towards people living with hepatitis C and people who inject drugs and how to more widely increase public support for reducing stigma. There is also a need to investigate underlying beliefs that act as root causes of stigma towards people who inject drugs and people living with hepatitis C to inform targeted intervention efforts. Beyond individual attitudes, institutional policies and structures can create environments that reinforce stigma. It is therefore essential to address structural stigma in order to minimise barriers to health care access and enhance the effectiveness of individual-level stigma interventions.

Regular monitoring of stigmatising experiences among people who inject drugs and people living with hepatitis C (including those who do not inject drugs) is required, within healthcare settings and more widely, as is continued monitoring of expressed stigma towards these groups by the general public and healthcare workers. Measuring stigma from these varied perspectives is necessary to understand any changes in experiences and effects of stigma over time, as well as the impact of any interventions to reduce stigma. There is therefore a need for ongoing investment into a range of complementary approaches to reducing stigma at interpersonal, institutional, and structural levels in health care and more broadly.

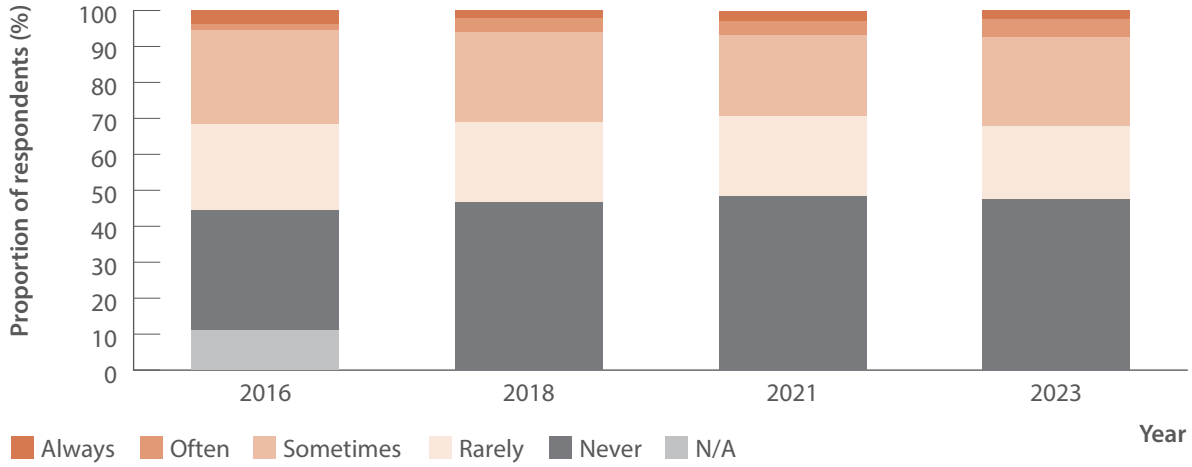
Figure 34. Reports of injecting drug use-related stigma or discrimination in the past 12 months by people who inject drugs, 2016–2023



Source: Stigma Indicators Monitoring Project.[42]

Notes: "N/A" was not provided as a response option after 2016.

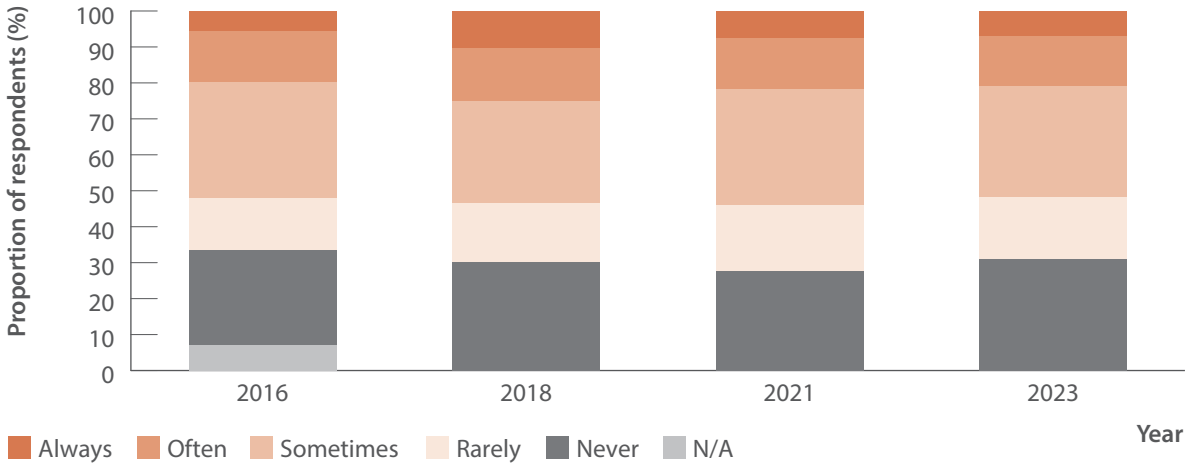
Figure 35. Reports of hepatitis C-related stigma or discrimination in the past 12 months by people diagnosed with hepatitis C, 2016–2023



Source: Stigma Indicators Monitoring Project.[43]

Notes: "N/A" was not provided as a response option after 2016.

Figure 36. Reports of negative treatment from healthcare workers by people who inject drugs, 2016–2023



Source: Stigma Indicators Monitoring Project.[42]

Notes: "N/A" was not provided as a response option after 2016.

Six

Primary prevention

Key actions for preventing the transmission of hepatitis C include a focus on reducing receptive sharing of needles, syringes, and injecting equipment. Measuring the availability and distribution of sterile injecting equipment and monitoring the injecting behaviours of people who inject drugs provides important indicators for assessment of hepatitis C prevention efforts.

The Needle Syringe Program National Minimum Data Collection reports annually on needles and syringes distributed in community settings nationally, providing an overview of activity to prevent re-use of needles and syringes, as well as estimates of coverage and people who inject drugs population size.[44] Despite new hepatitis C infections occurring in Australia's prisons,[45,46,47] no regulated needle and syringe distribution programs currently operate in Australian custodial settings.

The annual Australian Needle Syringe Program Survey[19] and the Illicit Drug Reporting System ask participants about episodes of recent receptive sharing.[48]

The Gay Community Periodic Survey provides national estimates on injecting drug use among GBM and gives specific insights into injecting drug use among GBM by HIV status.[49,50]

PROGRESS ON PREVENTION OF HEPATITIS C ACQUISITION

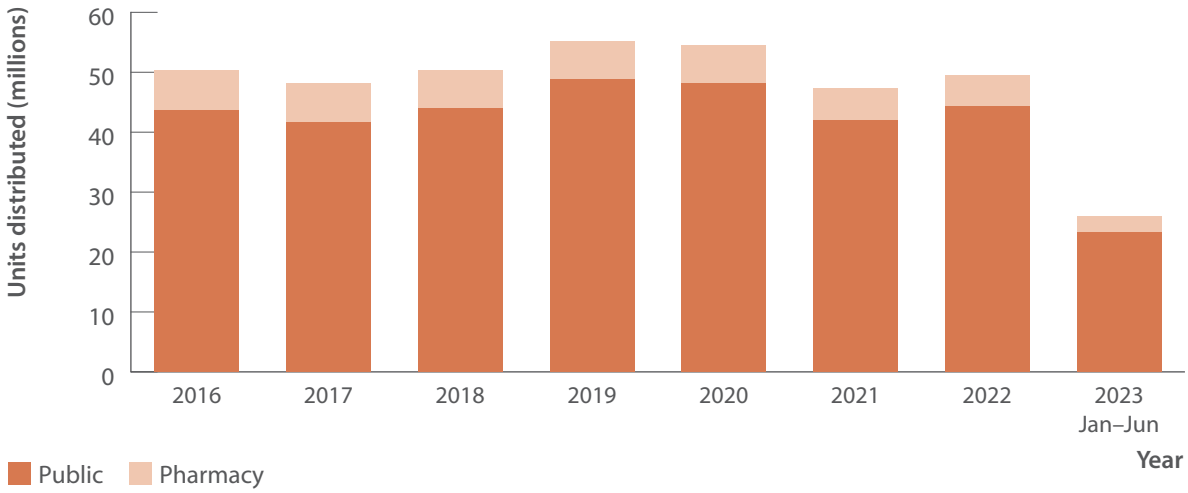
The number of needles and syringes distributed in Australia is generally stable; in 2022 (the latest complete year of data) an increase in the number of needles and syringes distributed compared to 2021 was recorded (Figure 37).

Among respondents in the Australian Needle Syringe Program Survey who injected in the past month, approximately one in five reported past month receptive sharing of needles and syringes and this proportion has remained stable over the past ten years (2016–2023) (Figure 38).

The Illicit Drug Reporting System has shown a stable trend between 2016 and 2023 in the receptive and distributive sharing of needles and syringes with borrowing of needles reported by 5% of respondents and lending needles reported by 7% of participants in 2023 (Figure 39).

Data from the Gay Community Periodic Survey shows that injecting drug use is more prevalent among HIV-positive than HIV-negative GBM, with little change in the prevalence of self-reported injecting between 2016 and 2023 (Figure 40).

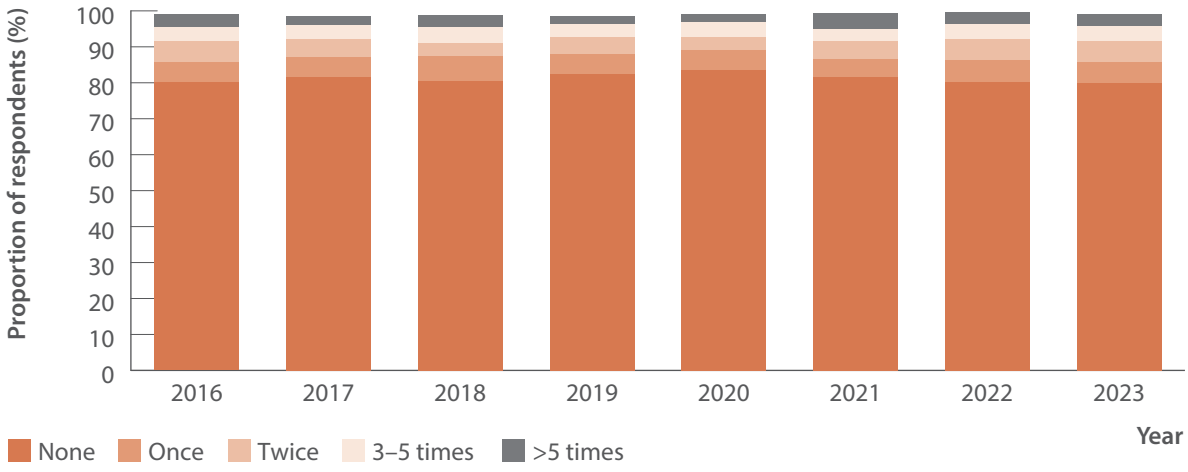
Figure 37. Number of needle and syringe units distributed by public and pharmacy sector, Needle Syringe Program National Minimum Data Collection, 2016–June 2023



Source: Needle Syringe Program National Minimum Data Collection. National Data Report 2023.[44]

Notes: July–December 2023 data not available at the time of reporting.

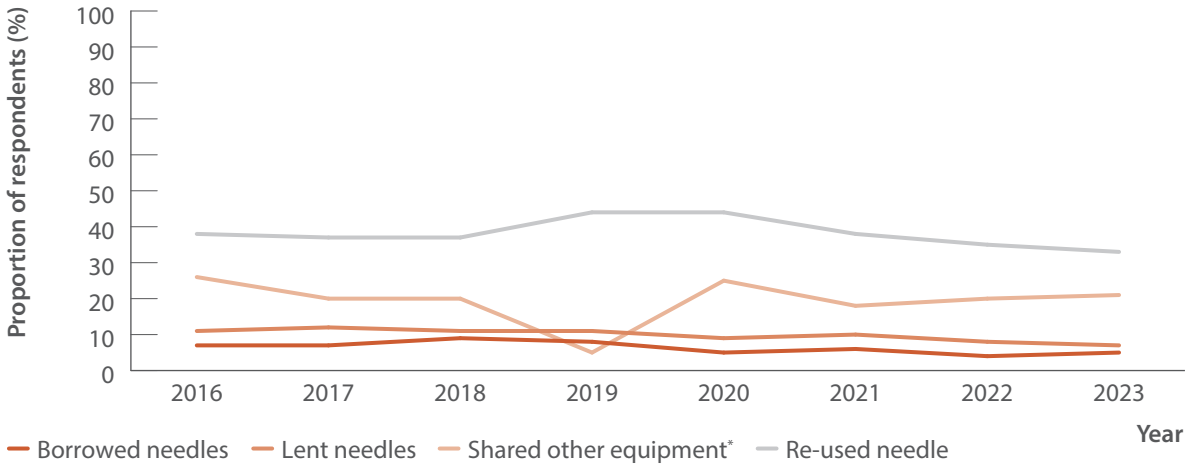
Figure 38. Proportion of Australian Needle Syringe Program Survey respondents reporting re-use of someone else's needles and syringes in the past month, 2016–2023



Source: Australian Needle Syringe Program Survey. 25-year National Data Report 1995–2019.[26] Australian Needle Syringe Program Survey. National Data Report 2019–2023.[19]

Notes: Not reported not included. Injection risk behaviour variables are presented among those who injected in the previous month, not the entire sample. For 2016 to 2023, sample size was (in order): 1 993, 2 314, 2 452, 2 333, 1 173, 1 259, 1 581, and 1 748.

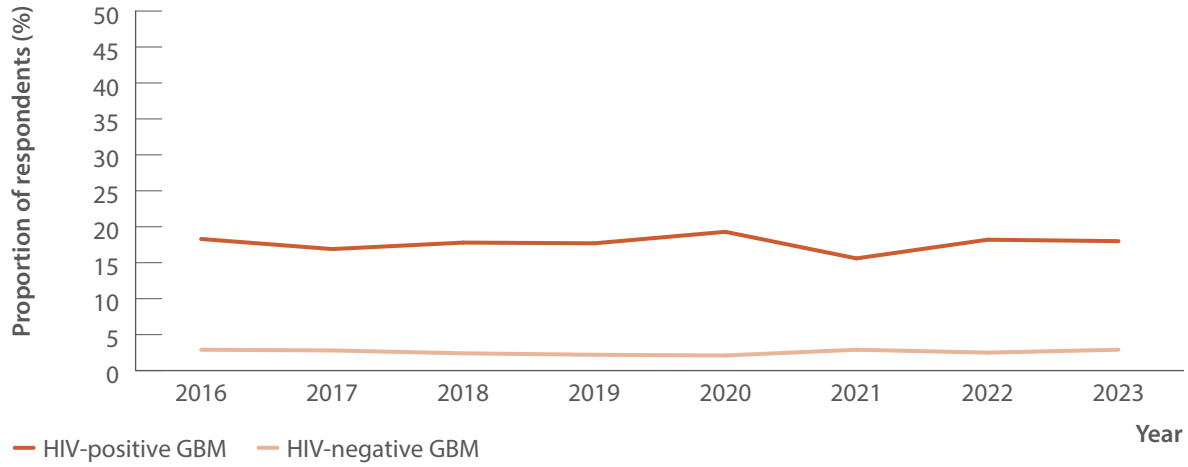
Figure 39. Proportion of respondents reporting borrowing and lending of needles, sharing of injecting equipment, and re-use of needles in the past month, national, Illicit Drug Reporting System, 2016–2023



Source: Australian Drug Trends 2023: key findings from the National Illicit Drug Reporting System (IDRS) Interviews.[48]

Notes: *Includes spoons, water, tourniquets, and filters.

Figure 40. Proportion of GBM who reported any drug injection in the six months prior to the survey by HIV status, national, Gay Community Periodic Survey, 2016–2023



Source: Annual Report of Trends in Behaviour 2024: HIV and STIs in Australia.[49,50]

Notes: Unadjusted data.

Seven

Health equity mapping

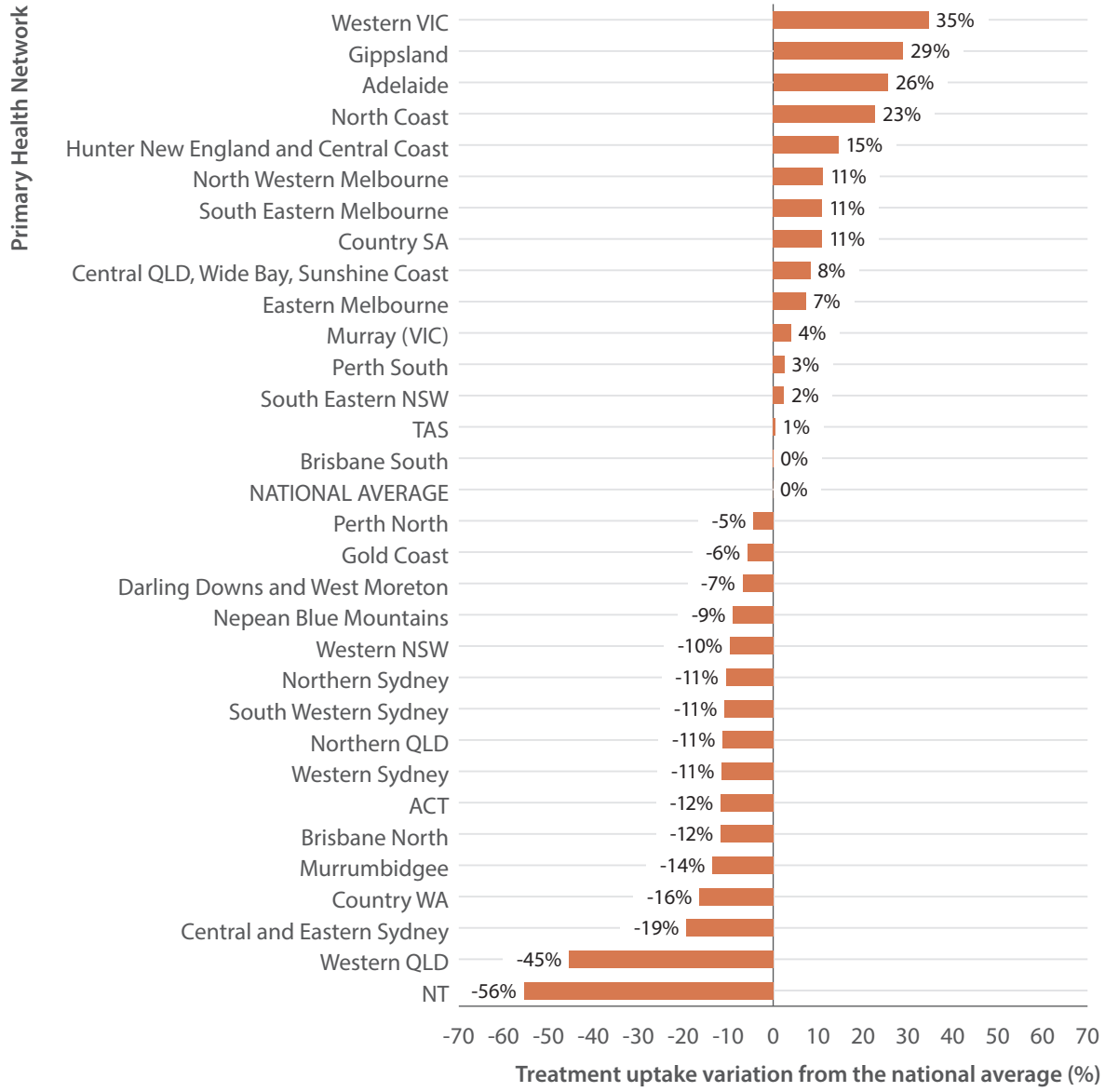
To help achieve Australia's hepatitis C elimination targets, it is important to ensure that treatment uptake is high in all jurisdictions and there is equity in access to treatment between regions, including metropolitan, rural, and regional Australia.

The following data were collected and reported by the Viral Hepatitis Mapping Project, WHO Collaborating Centre for Viral Hepatitis at the Doherty Institute, funded by the Australian Government Department of Health. These data provide detail on hepatitis C prevalence, management, and treatment uptake by Primary Health Networks (PHNs) compared to the national average, giving insight into geographic diversity in these outcomes.[51]

PROGRESS TOWARDS EQUITY

Treatment uptake at October 2023 was highest in the Western VIC, Gippsland, Adelaide, North Coast, and Hunter New England and Central Coast PHNs. The lowest treatment uptake was seen in NT, Western QLD, Central and Eastern Sydney, and Country WA (Figures 41 and 42).

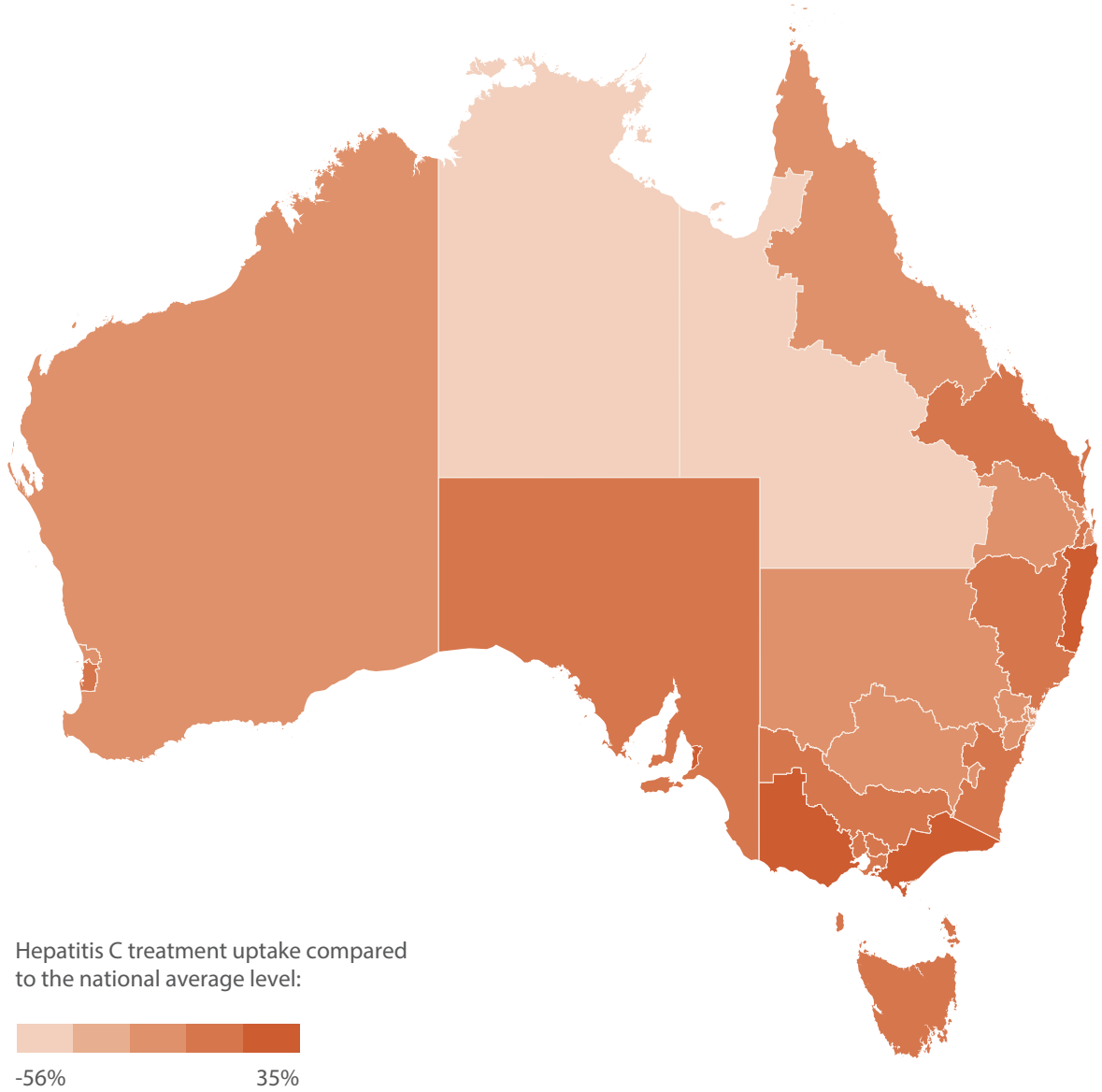
Figure 41. Hepatitis C treatment uptake variation in Australia by PHN, March 2016–October 2023



Source: The National Viral Hepatitis Mapping Project (WHO Collaborating Centre for Viral Hepatitis, The Doherty Institute).[51]

Notes: Hepatitis C treatment uptake variation estimates based on treatment (PBS) data sourced from Medicare statistics and hepatitis C notifications according to geographic region.

Figure 42. Geographic variation in hepatitis C treatment uptake, March 2016–October 2023



Source: The National Viral Hepatitis Mapping Project (WHO Collaborating Centre for Viral Hepatitis, The Doherty Institute).[51]

Notes: Hepatitis C treatment uptake variation estimates based on treatment data (PBS database) sourced from Medicare statistics and hepatitis C notifications according to geographic region.

Eight

Modelling

Mathematical models are useful tools for identifying factors influencing the likelihood of Australia eliminating hepatitis C as a public health threat. Over the past decade, several models have highlighted the cost-effectiveness and feasibility of hepatitis C treatment and elimination. There is ongoing work in this area, in particular focussing on the coverage of interventions required to ensure Australia meets its elimination targets (e.g., increased testing), the cost-effectiveness of these interventions, how funds can be spent optimally to achieve elimination, and modelling and mapping to identify where key regions or sub-populations are being left behind in the elimination response.

PROGRESS TOWARDS ELIMINATION

With annual treatment uptake in 2023 increasing to 5 499 people treated, modelling from the Kirby Institute showed that hepatitis C incidence and treatment coverage goals would be met under all three treatment scenarios (optimistic, intermediate, and pessimistic). In an optimistic scenario, annual treatment numbers increase and are maintained at 6 874 (25% increase from the 2023 level) each year from 2024 onwards, meeting the goal by 2027. In an intermediate scenario (considered a realistic treatment uptake) annual treatment numbers are maintained at 2023 levels; 5 499 each year from 2024 onwards, with the goal met by 2029. In a pessimistic scenario, annual treatment numbers decline and are maintained at 4 124 (25% decrease from the 2023 level) each year from 2024 onwards, meeting the goal by 2030 (Figure 43 and Table 2).

This model produces estimates of the number of people living with hepatitis C and the resulting time trends by first producing a specific estimate for 2015. The number of people living with hepatitis C at the end of 2015 was first estimated using observed cumulative notifications, estimated spontaneous clearance, mortality, and migration rates, and an estimate for the percentage of people undiagnosed. In addition, the model mortality rates are calibrated to match empirical data from the NSW linkage study to best reflect the number of cases of decompensated cirrhosis, hepatocellular carcinoma, and liver-related death. The resulting model estimates are compared to available measured data to ensure they are valid and as accurate as possible. This process is repeated annually and can result in changes to the model estimates from year to year due to the availability of new data and information.

Modelling by the Burnet Institute compared the cost-effectiveness of laboratory reflex testing to other hepatitis C testing approaches. In 2022, the *Australian recommendations for the management of hepatitis C virus infection* consensus statement recommended clinicians request reflex HCV RNA testing if HCV antibody testing is positive, and the Royal College of Pathologists of Australasia endorsed laboratory-initiated reflex HCV RNA testing of HCV antibody positive or indeterminate samples without the need for clinician request.[17,52] These recommendations for reflex HCV RNA testing aimed to prevent unnecessary healthcare visits for additional venepuncture, making it simpler for people to find out their hepatitis C status and access treatment. The effect of these initiatives on historically poor rates of follow-up HCV RNA testing[53,36] are yet to be described. The modelling aimed to estimate the effects of universal uptake of laboratory reflex testing on hepatitis C treatment completion and associated healthcare costs. It focussed on people who inject drugs attending community-based health services who had never been treated for hepatitis C.

PROGRESS TOWARDS ELIMINATION (CONTINUED)

The model described a cohort of 1 000 simulated people undergoing testing, of whom 120 had chronic hepatitis C. It estimated the number of people living with hepatitis C treated with DAAs and the costs to the healthcare system after the cohort had either tested negative, been lost to follow-up, or completed treatment. Three scenarios were modelled in which different testing approaches were applied: (1) no reflex testing (pre-2022 standard of care); (2) reflex laboratory testing, and (3) a sequential point-of-care HCV antibody and HCV RNA test strategy. Model inputs of HCV antibody and HCV RNA prevalence were from the 2022 Australian Needle Syringe Program Survey,[19] loss to follow-up proportions were from clinical studies and surveillance data,[53,54,55] and test performance estimates were from validation studies.[56,57] Diagnosis and pre-treatment assessment costs came from published estimates[58,59] and the Medicare Benefits Schedule.[60] Hepatitis C treatment costs were based on the estimated average price paid per course by the Australian Government between March 2016 and February 2021 ($13 495).[61]

For all scenarios, most of the overall cost was the cost of treatment for people with hepatitis C infection ($17 663 per completion in each scenario). Additional costs of diagnosis, pre-treatment assessment, and of treating people with false-positive point-of-care test results were on average $2 399 per completion in the no reflex testing scenario, $1 973 per completion in the reflex laboratory testing scenario, and $2 808 per completion in the point-of-care scenario (Figure 44).

Figure 45 focusses on these additional costs attributable to the testing approach (leaving aside the costs of antiviral treatment of those infected). Effectiveness (number of treatment completions) and costs per 1 000 people screened are shown for each scenario. The modelling suggested that uptake of reflex laboratory testing improved the efficiency of laboratory-based hepatitis C diagnosis, while point-of-care approaches provide additional benefit but at higher short-term costs. The model estimated that reflex testing cost modestly more than the no reflex testing approach to screening, but increased treatment completions from 23 to 33. The point-of-care strategy was substantially more costly but resulted in the highest number of treatment completions—40. These findings emphasise the potential benefits of policies that improve the efficiency of existing hepatitis C laboratory testing approaches by enabling and encouraging routine reflex testing in addition to roll out of new testing technologies that expand reach.

Figure 43. Annual change in people living with chronic hepatitis C, hepatitis C incidence (all), treatment coverage, and liver-related deaths (viraemic and cured) in Australia 2030 (2010–2030) with WHO HCV elimination targets (dotted lines: Panel B: - - 80% and - - 90% reductions in incidence, Panel C: - - 80% eligible treated, and Panel D: - - 65% reduction in deaths)

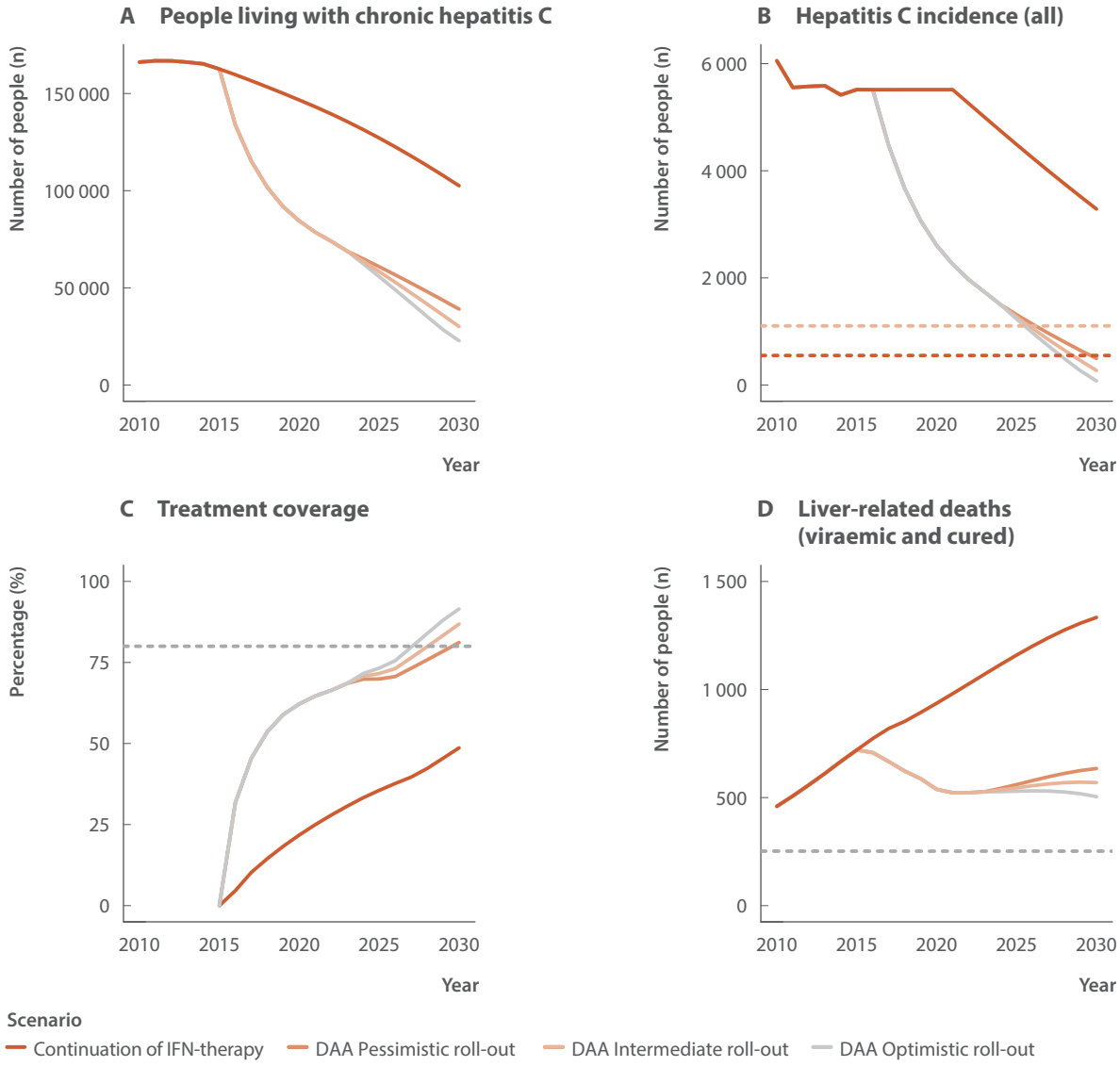


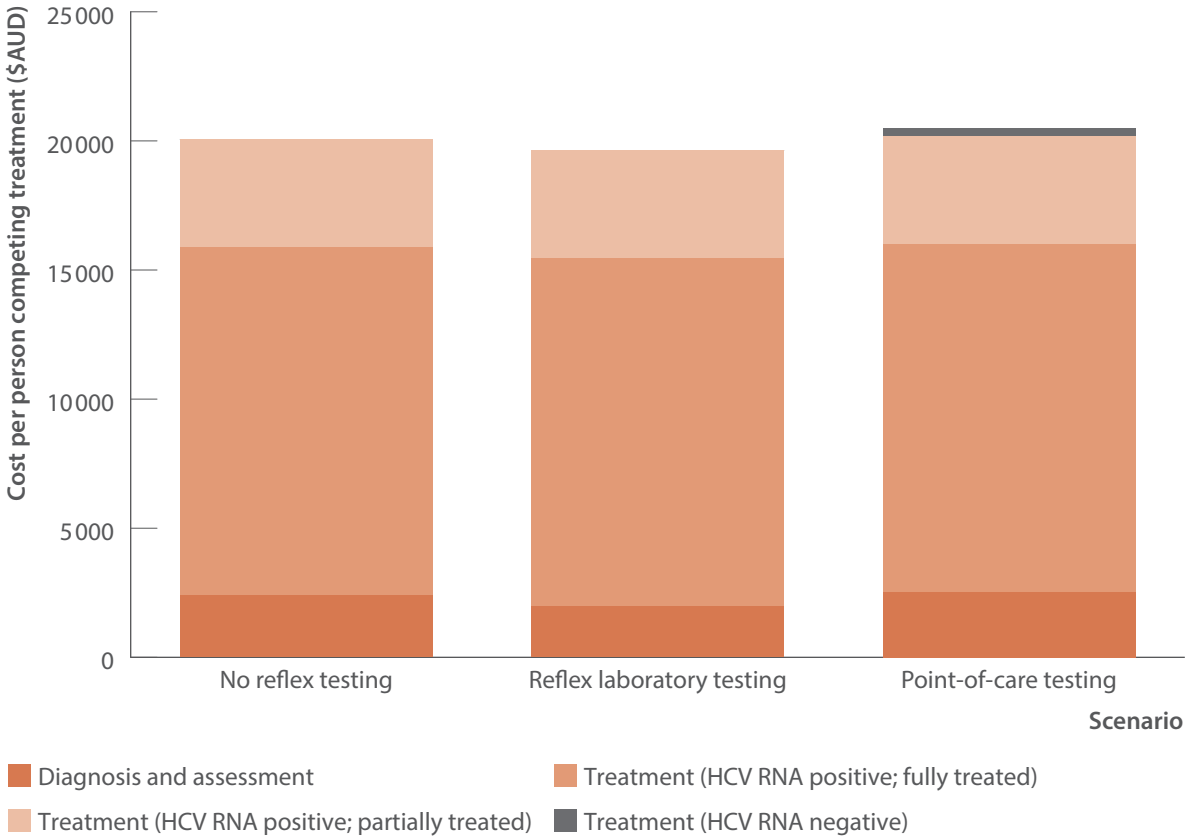
Table 2. Scenarios for the annual number of people in Australia receiving DAA

Treatment roll-out scenarios	2020	2021	2022	2023	Post-2024
Pessimistic roll-out	8 215	6 563	5 175	5 499	4 124
Intermediate roll-out	8 215	6 563	5 175	5 499	5 499
Optimistic roll-out	8 215	6 563	5 175	5 499	6 874

Source: Updated from Kwon et al., *J Viral Hepat* 2019[2] and Kwon et al., *PLoS One* 2021.[3]

Notes: Treatment coverage is calculated among people who have ever been diagnosed (numerator: the cumulative number of people treated since the end of 2015; denominator: the cumulative number of people cured since the end of 2015 plus the number of people who have ever been diagnosed and are still living in 2022). We assumed a pessimistic roll-out scenario corresponding to 25% less people being treated with DAA therapy than 2023, an intermediate roll-out scenario corresponding to the annual number treated equalling the number in 2023, and an optimistic scenario where the annual number treated increased 25% more than the 2023 level. The annual number of people treated for all three scenarios in the earlier years is as follows: 2015 (interferon plus DAA): 4 720; 2016: 32 458; 2017:21 249; 2018:15 355; and 2019: 11 433.

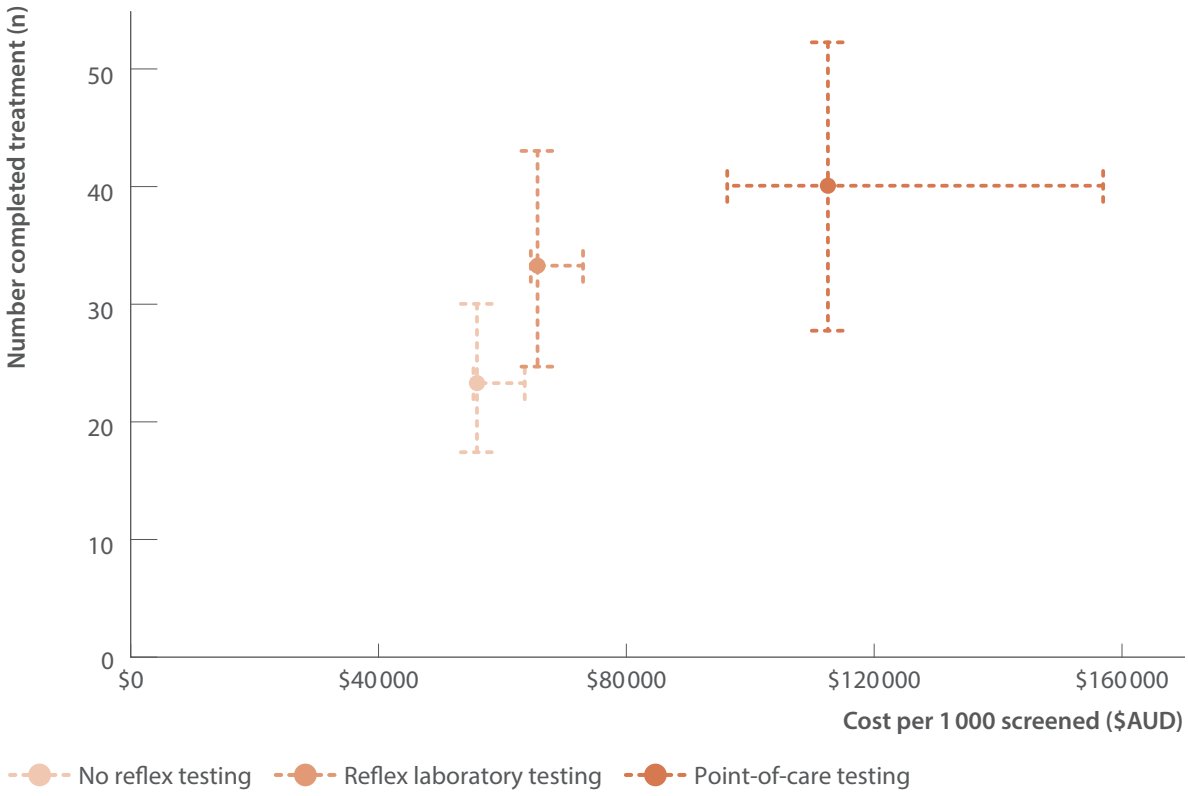
Figure 44. Estimated costs (2023 $AUD) of hepatitis C treatment initiation strategies for treatment-naive people who inject drugs



Source: Adapted from Baille et al. 2024.(*personal communication*, Joseph Doyle, Burnet Institute).

Notes: The no reflex testing scenario is laboratory HCV antibody and laboratory HCV RNA (re-collection of venepuncture sample). The reflex laboratory scenario is laboratory HCV antibody and laboratory HCV RNA in one venepuncture collection. The point-of-care scenario is point-of-care HCV antibody test and point-of-care HCV RNA test. AUD: Australian Dollar.

Figure 45. Estimated costs (2023 $AUD) and effectiveness of hepatitis C treatment initiation approaches for treatment-naive people who inject drugs



Source: Adapted from Baille et al. 2024.(*personal communication*, Joseph Doyle, Burnet Institute).

Notes: Costs of diagnosis, assessment, and for point-of-care, treatment initiation of those HCV RNA negative. Dashed lines show 95% uncertainty intervals from 1 000 probabilistic draws. AUD: Australian Dollar.

Methods

This report brings together national data sources to assess Australia's progress towards eliminating hepatitis C. Some data were not included due to unavailability at the time of reporting; future reports will aim to provide the most comprehensive picture possible.

Notifications of hepatitis C

Notifications of newly acquired hepatitis C were from the National Notifiable Diseases Surveillance System[9] with details and notifications requirements, procedures, and case definitions available from the Australian Government Department of Health and Ageing.[62] Notifications are also reported annually in the *HIV, viral hepatitis and sexually transmissible infections in Australia: annual surveillance report*.[4,9]

Australian Collaboration for Coordinated Enhanced Sentinel Surveillance of Sexually Transmissible Infections and Blood Borne Viruses

ACCESS was established to monitor STI and BBV testing and test outcomes among priority populations.[11,12,13] ACCESS focusses on recruiting sites that serve priority populations, including people who inject drugs and HIV-positive ACCESS collates data on consultations, hepatitis C testing and test outcomes from participating sites. Please note that the data included in this report may differ to those presented in previous or subsequent reports due to the availability of expanded data and associated enhancement of analytical, linkage, and processing methods.

Record linkage

Individuals' electronic medical records were linked between sites using a linkage code and probabilistic matching so that consultation, testing and test outcome data account for individuals attending more than one ACCESS site.

Sites

ACCESS includes primary care clinics that provide specialist health services to people who inject drugs, such as NSP, opioid agonist therapy, and hepatitis C testing and treatment. ACCESS sites include both specialist and general health services, where attendees may be people currently injecting, people who previously injected drugs, or people who have never injected drugs. Also, a subset of sexual health clinics participating in ACCESS that had data available for this report, had high completion of the Aboriginal and Torres Strait Islander status of individuals in their patient management systems. Of unique individuals who attended included clinics 2013–2023 for a consultation (N=398 095), 8% of people had no Aboriginal or Torres Strait Islander status recorded (missing), 6% were recorded as 'not stated', 82% were neither Aboriginal nor Torres Strait Islander people, and 4% were Aboriginal and Torres Strait Islander people. When restricted to individuals contributing one test per year, data from the ACCESS sites can be used to describe trends in test uptake (tests conducted divided by consultations) and positivity (positive tests divided by tests conducted).

Data from 41 sites in total were used and stratified into primary care clinics that specialise in the health of people who inject drugs as well as providing general primary care (16 sites, one site has three health services counted as one site and one site has eight health services counted as one site), and primary care clinics specialising in the health of GBM (12 sites) and sexual health clinics (11 sites). Eleven sexual health clinics were used for analysis of hepatitis C testing among Aboriginal and Torres Strait islander people; all 11 clinics were included in the analysis of hepatitis C testing among HIV-positive GBM.

Primary care clinics included 14 in VIC, one in WA, and one in QLD; of these clinics seven had onsite NSPs and all 14 clinics had opioid agonist therapy providers at the time of reporting. Primary care clinics specialising in the health of GBM included five in NSW, three in VIC, two in WA, one in SA, and one in TAS. Sexual health clinics included seven in NSW, two in QLD, one in VIC, and one in SA. Sexual health clinics included for analysis of Aboriginal and Torres Strait Islander people were seven in NSW, two in QLD, one in VIC, and one in SA. ACCESS continues to expand and refine its system; therefore, future reports will include data from additional sites.

Gay, bisexual, and other men who have sex with men

Individuals classified as GBM were males who:

- were recorded as gay or bisexual in an ACCESS clinic's patient management system, or
- had ever had a rectal swab for chlamydia or gonorrhoea at an ACCESS clinic,[63] or
- were HIV-positive and had ever had a syphilis test at an ACCESS clinic (algorithm developed by Burnet Institute based on syphilis epidemiology and prevalence among HIV-positive GBM populations in VIC).

Note that at the GBM clinics, only a small proportion of individuals could be classified on recorded sexuality alone, meaning that classification of individuals as GBM at these clinics is based largely on STI testing history criteria within the algorithm.

HIV-positive gay and bisexual men

Individuals defined in ACCESS as HIV-positive GBM:

- had a positive HIV diagnostic test result recorded at an ACCESS clinic, or
- had an HIV viral load test result in an ACCESS clinic's patient management system, and
- were defined as GBM using the algorithm outlined above.

HIV status could only be determined if a history of HIV diagnostic or viral load testing was recorded at a site within the ACCESS network.

Incidence definition

Individuals were included in the incidence estimate if they were HCV antibody negative and HCV RNA negative or HCV antibody negative and HCV RNA testing was not performed during their first testing episode recorded by ACCESS from 2009 (at risk for primary infection). Time-at-risk was defined as the cumulative time between everyone's first negative test (HCV antibody) and last test (HCV antibody and/or HCV RNA). Time-at-risk was assigned to the calendar year in which it occurred for annual incidence estimates.

Incident hepatitis C cases were defined as:

- acute infection (HCV antibody negative and HCV RNA positive after an HCV antibody negative),
- antibody seroconversion (HCV antibody positive after an HCV antibody negative), or
- HCV RNA positive after an HCV antibody negative in the absence of an HCV antibody test.

Date for incident infection was assigned as the midpoint between the positive test (HCV antibody or HCV RNA) and prior HCV antibody negative test. Only individuals' first incident infection recorded in ACCESS were included in analyses.

Consults

To account for the effects of the COVID-19 pandemic on consultation data, consultations that were associated with a SARS-CoV-2 pathology test request were excluded.

Test uptake

Annual test uptake was defined as number of individuals tested divided by number of individuals who attended a consultation, with individuals only counted once a year. Clinic attendances included in-person and telehealth consultations.

Proportion positive

Annual positivity was defined as number of individuals tested positive divided by number of individuals tested, with individuals only counted once a year. Individual's HCV antibody tests after an HCV antibody positive test being observed were excluded from analysis.

Treatment

Treatment initiation was inferred by presence of an electronic medical record prescription for hepatitis C treatment stored in patient management systems of participating clinics.

MIXMAX Melbourne Cohort hepatitis C sub-study

Hepatitis C incidence

The study measured the incidence of primary (first) hepatitis C infection, defined as HCV antibody negative with a subsequent positive hepatitis C test (HCV antibody or HCV RNA). Participants were eligible for inclusion in this analysis if they had an HCV antibody negative test with at least one subsequent hepatitis C test to access infection outcome. Time zero was defined as the date of the first HCV antibody negative test. Participants were censored at the estimated date of infection calculated using the midpoint method, or the last negative HCV antibody test, whichever came first.

Changes in incidence of primary hepatitis C infection following DAA introduction were estimated using a before-after approach, implemented using Poisson regression. The pre-DAA period was defined as March 2010 to February 2016, the DAA access period was defined as March 2016 to February 2022.

Hepatitis C prevalence

The study measured the prevalence of current hepatitis C infection, defined as HCV RNA positive. The prevalence of hepatitis C infection was defined as the number of people HCV RNA positive divided by the number of people with a complete hepatitis C test. A complete hepatitis C test was defined as an HCV RNA test with a valid result or an HCV antibody negative test without a valid HCV RNA test. Those with an HCV antibody negative test without a valid HCV RNA test were assumed not to have current hepatitis C infection. Those with an HCV antibody positive result without a valid HCV RNA test were excluded from the prevalence analysis.

Hepatitis C prevalence was estimated annually in intervals spanning March to February to coincide with the introduction of universal DAA access in March 2016. Estimates were calculated from March 2010 to February 2022.

Changes in prevalence of hepatitis C infection following DAA introduction were estimated using an interrupted time series approach, implemented using log-binomial generalised estimating equations.[15]

ATLAS network

The ATLAS network is a STI and BBV sentinel surveillance and research network representative of ACCHS led by Professor James Ward from the University of Queensland Poche Centre for Indigenous Health. ATLAS is funded through the National Health and Medical Research Council, Medical Research Future Fund, and Commonwealth Department of Health, and includes many of Australia's leading public health researchers among its investigator group. ATLAS augments the National Notifiable Disease Surveillance System[18] and helps us understand the burden of disease due to STIs and BBVs among Aboriginal and Torres Strait Islander people. The ATLAS network currently includes 65 ACCHS largely associated with six 'clinical hubs' across QLD (two hubs), NSW, SA, and the Kimberley, WA, and VIC. Regular reports addressing 12 performance measures are provided to ACCHS to assess clinical practice and drive continuous quality improvement initiatives internally. Data were also aggregated at the hub, jurisdictional, and national level and used to inform clinical guidelines and to guide future research questions.

Currently, three performance measures focus on hepatitis C testing and management: hepatitis C testing rate (proportion of individuals receiving an HCV antibody test and among those testing positive, the proportion then tested for HCV RNA or HCV viral load), hepatitis C treatment uptake (proportion of HCV RNA positive individuals prescribed DAA treatment), and SVR (proportion of individuals who, after having been prescribed DAA treatment, achieve an undetectable HCV viral load).

The goal of hepatitis C testing is not to test the entire patient population, but rather the population at risk of hepatitis C. The ATLAS network recognises that its current surveillance approach is limited by an inability to capture data on chronic/historical hepatitis C infection diagnosed prior to 2016 and not being actively managed by the ACCHS. Surveillance data is dynamic and subject to change. The more conservative count for HCV antibody testing reported in 2023 is due to data refinement. Previous years' data are likely an overestimate. It must also be noted that a change in methodology now limits case inclusion to clients HCV RNA tested following a positive HCV antibody test, not clients recorded as ever being tested for HCV RNA. Similarly, only clients prescribed DAA treatment following a recorded HCV RNA positive result were included in this year's analysis. This change reduces case counts but improves our knowledge of the cascade of care in ACCHS.

The Australian Needle Syringe Program Survey

The Australian Needle Syringe Program Survey National, led by Professor Lisa Maher, provides serial point prevalence estimates of HIV and HCV antibody prevalence, HCV RNA prevalence and monitors sexual and injecting behaviour among people who inject drugs in Australia. The Australian Needle Syringe Program Survey is conducted annually at more than 50 NSP services over a one-to-two-week period in October each year. Participants complete a brief self-administered questionnaire and provide a capillary blood sample which is subsequently tested for HIV and HCV antibodies and HCV RNA. The Australian Needle Syringe Program Survey National Data Report is published annually, including full details of the methodology.[19]

Medicare claims for HCV RNA testing

Data tables of Medicare claims are available through Medicare Australia Statistics.[20]

National Prisons Hepatitis Network

Data on HCV antibody and HCV RNA testing, test positivity, and individuals initiated on DAA treatment in 2023 in Australia's prisons were collated by the National Prisons Hepatitis Network from prison-based hepatitis services.

For some jurisdictions, there were differences in the number and type of prisons included in data collection. For NSW, data were included from 30 public prisons; data from three private prisons were not included. For VIC, data were not included from one prison between July and December 2023 only.

Australian Capital Territory

Data on hepatitis C testing and treatment (DAA) were obtained from patients' medical records via the Digital Health Record.

New South Wales

Treatment data (DAA) were collected via the pharmacy dispatch reports of when medications were dispensed to prison centres. The data corresponding to HCV antibody and HCV RNA testing numbers were obtained by using a software script-generated data extraction from existing pathology results in Justice Health electronic Health System (JHeHS) for the period of interest.

Northern Territory

Hepatitis C testing data were provided by Territory Pathology who provide the pathology services to the NT Prisons. Treatment data (DAA) were obtained through the Viral Hepatitis Service's hepatitis C clinical database that records treatment initiations. Accuracy and completeness of data were dependent on the quality of the data recorded by the clinicians. For Darwin Correctional Centre, data were confirmed by pharmacy records.

Queensland

Hepatitis C testing data were obtained from AUSLAB which is an integrated laboratory information system incorporating pathology, clinical measurements, forensics and public health laboratories. It provides real-time results which are uploaded by the pathology labs. Treatment data (DAA) were obtained directly from Prisoner Health Services in each facility as part of the annual Hepatitis C Treatment Uptake Progress Report.

South Australia

Hepatitis C testing data were obtained from the contracted pathology provider (SA Pathology Service). Paper-based health records were used in prisons.; the number of treatment initiations (DAA) was based on records of pharmacy prescriptions filled.

Tasmania

Hepatitis C Treatment Program data were collected from dispensing records maintained by the Correctional Primary Health Service Pharmacy.

Victoria

Data were sourced from the Department of Justice and Community Safety (Victorian Government). Treatment data (DAA) were collected from dispensing records of the pharmacy database maintained by St Vincent's Hospital Melbourne.

Western Australia

Hepatitis C testing data were obtained through the contracted pathology provider. The number of treatment initiations (DAA) was based on pharmacy prescriptions filled, cross checked against prisoner data recorded on the WA Department of Justice electronic patient health record.

Australian Hepatitis and Risk Survey in Prisons

The Australian Hepatitis and Risk Survey in Prisons study has been planned as a repeated cross-sectional bio-behavioural survey of representative populations of people in prison in each jurisdiction in Australia. The first round of the study was conducted from April 2022 to June 2023.[23,24] Twenty-three representative state-run prison centres from six jurisdictions (NSW, NT, QLD, SA, TAS, and WA) were selected as study sites. These jurisdictions collectively housed 83% of people in prison in Australia in 2022.[27] In most jurisdictions, a minimum of one-quarter of the prisons were selected as sites for study enrolment, using a strategy that considered the available infrastructure in each prison for feasibility, while ensuring representation of all prison security classes (minimum, medium, maximum), remoteness of prison location, female prisons, and prisons with a predominant population of First Nations people.

All people in selected prisons, including those on remand and those sentenced, who provided informed consent and were able to speak English were eligible to participate in the study. At each prison, the study population was selected randomly using computer-generated random numbers from the list of all people present in the prison.

All participants provided informed written consent. For each participant, an interviewer-administered survey was conducted by trained study nurses, and included questions about: demographics; risk behaviours for blood-borne viruses, previous HIV, hepatitis B virus, and hepatitis C testing and treatment; and hepatitis B virus vaccination.

Participants provided saliva and fingerstick whole blood samples for point-of-care testing for HIV antibody (HIV Ab), hepatitis B virus surface antigen (HBsAg), HCV antibody and HCV RNA. HCV Ab testing was performed using OraQuick® HCV Rapid Antibody Test (OraSure Technologies, USA) with saliva samples. Participants with a positive HCV antibody test were offered point-of-care HCV RNA testing with a fingerstick whole blood sample, using the Xpert® HCV Viral Load Fingerstick test (Cepheid, USA; lower limit of quantification of 100 IU/mL). HBsAg testing was performed using Alere Determine™ II HBsAg test (Alere International, Ireland) with fingerstick whole blood samples. HIV Ab testing was performed using the OraQuick Advance® Rapid HIV-1/2 Antibody Test (Orasure Technologies, USA) with saliva samples.

For all of the national prevalence estimates, the sample size in each jurisdiction was weighted by the prisoner population size of that jurisdiction and the distribution of gender, and First Nations identity among people in prison, based on data from the Australian Bureau of Statistics in 2022.[27]

Monitoring hepatitis C treatment uptake in Australia

The methods for the estimations have been described in detail elsewhere.[31] In brief, the total PBS data of DAA dispensation for all individuals who initiated treatment between March 2016 and December 2023 in Australia were used to estimate the number of individuals initiating DAA treatment, and for all subgroup analyses of DAA uptake. The data of the second or further courses of treatment (for treatment failure or hepatitis C reinfection) were not included where indicated. Prescriber speciality was based on the prescriber derived major speciality codes recorded by the PBS. In this coding system, medical trainees (i.e., registrars) are also considered as specialists. The proportion of treatment initiations by prescriber type between 2019 and 2021 should be interpreted cautiously given the increasing number of unidentified prescriber type in these years. Jurisdictions are based on the patient residence at the time of treatment prescription.

Hepatitis C cascade of diagnosis and care

The estimates for the hepatitis C cascade of diagnosis and care are published annually in the *HIV, viral hepatitis and sexually transmissible infections in Australia: annual surveillance report*,[4] with methods associated with the updated cascade described in detail.

Modelling the Australian response to hepatitis C

Methods associated with the Kirby Institute's modelling have been previously published.[2,3,4,36]

The hepatitis C cascade estimates and outputs from the hepatitis C model are reviewed annually to ensure they are consistent with available epidemiological data. This includes updating parameter values and input data from clinical studies as results become available. This can lead to major changes in the estimates for the number of hepatitis C and hepatitis C-related liver disease burden and mortality. Observational studies are used for both model inputs and model calibration, in particular the Australian Needle Syringe Program Survey, the ETHOS Engage study, and the SEARCH study (emergency department screening) have reported hepatitis C treatment coverage of greater than 80% in NSW.[19,64,65,66] Model estimates can differ from observed studies; discrepancies may be due to an overestimate of the number of people living with hepatitis C in Australia. Two plausible reasons for this overestimation are: 1) a substantial number of duplicate hepatitis C notifications due to interstate movement, and 2) the possibility of false-positive notifications in low-prevalence settings. The percentage of notifications that are interstate duplicates and the proportion that are false positive is currently unknown. However, a study in QLD is investigating the proportion of notifications that are false positives, and the model may be revised accordingly in the future analyses.

Reinfection and retreatment

The previous model did not track the number of people who were reinfected with hepatitis C. Once an individual received treatment and was cured, they were assumed to have the same risk of hepatitis C infection as before, with no distinction between primary infection and reinfection in the model. This year, the model has incorporated reinfection and retreatment, by distinguishing individuals who are cured and subsequently reinfected. Based on a recent study,[67] the reinfection incidence rate among people who inject drugs who were cured with DAA therapy between 2015 and 2021 was 9.5 per 100 person-years. Given that very few reinfections occur among those with cirrhosis, the model assumed that most reinfections occur in the F0–F2 stage of the disease and have distributed the retreated population across disease stages using data from the ETHOS study. The model was then calibrated with retreatment data from the PHASE study, which examined reinfection-related retreatment using PBS data (updated from Carson et al.).[34]

Australia and New Zealand Liver and Intestinal Transplant Registry

The primary diagnosis at the first liver transplant of each adult patient (aged 16 years or older) who underwent a transplant at one of the five Australian liver transplant centres were sourced from the Australia and New Zealand Liver and Intestinal Transplant Registry.

Stigma Indicators Monitoring Project

For more information about the development of the stigma indicator, see Broady et al.[38]

Survey of people who inject drugs and people diagnosed with hepatitis C

In 2016, the Stigma Indicator was included in an online survey of people who inject drugs (n=124) and people living with hepatitis C (n=108). The survey was promoted through a range of community organisations and online forums.

Between 2018 and 2023, the Stigma Indicator was included in paper surveys of people who inject drugs (n=592–612), including sub-samples who had lived experience of hepatitis C (n=267–274). Participants were recruited via Australian Injecting and Illicit Drug Users League state-based member organisations. From 2021, participants were also given the option of completing an online version of the survey.

Needle Syringe Program National Minimum Data Collection

The Needle Syringe Program National Minimum Data Collection, led by Professor Lisa Maher, provides data from all Australian jurisdictions incorporating the following three components: needle syringe program service type and location, non-identifiable client occasions of service, and needle syringe distribution. The Needle Syringe Program National Minimum Data Collection National Data Report is published annually, with full details of methods included.[19]

The Illicit Drug Reporting System

The Illicit Drug Reporting System publishes an annual report, with full details of methods included.[48]

Gay Community Periodic Survey

The Gay Community Periodic Survey is a repeated, cross-sectional survey of GBM conducted using time-location sampling at gay venues, events, and clinics, supplemented by online recruitment. The Centre for Social Research in Health (University of New South Wales) conducts the survey in seven Australian states and territories, with community-based recruitment focussed on metropolitan areas. Its methods are described in detail elsewhere.[49,50]

Viral Hepatitis Mapping Project

Details of the Viral Hepatitis Mapping Project are published in full elsewhere.[51]

Acknowledgements

This report was funded by the EC Australia Partnership with support from the Burnet Institute Strategic Investment Scheme.

Consultation with community

The following organisations are thanked for their generous contributions during consultation processes:

ASHM
Health Equity Matters
Australian Injecting and Illicit Drug Users League (AIVL)
Hepatitis Australia
National Association of People with HIV Australia (NAPWHA)

Australian Collaboration for Coordinated Enhanced Sentinel Surveillance of Sexually Transmissible Infections and Blood Borne Viruses

As a national surveillance system, ACCESS receives core funding from the Australian Government Department of Health and Aged Care. The Burnet Institute gratefully acknowledges the contribution to this work of the Victorian Operational Infrastructure Support Program.

ACCESS is a collaboration between the Burnet Institute, Kirby Institute, and NRL Quality, and we gratefully acknowledge the role of all collaborating institutions and individuals.

GRHANITE™ developers in the Health and Biomedical Informatics Centre at the University of Melbourne provide systems, software, and support to ACCESS.

Members of the Burnet Institute surveillance group who contributed to the data collection, processing, analysis, and reporting in preparation of this report were (in alphabetical order): Jason Asselin, Nyssa Watson, Carol El-Hayek, Long Nguyen, Thi Nguyen, Victoria Polkinghorne, and Michael Traeger. Margaret Hellard and Mark Stoové made additional contributions to interpretation and reporting of the results.

We gratefully acknowledge the contribution of the members of the ACCESS Executive Committee (in alphabetical order): Jason Asselin, Burnet Institute; Allison Carter, Kirby Institute, Htein Linn Aung, Kirby Institute; Wayne Dimech, NRL Quality; Basil Donovan, Kirby Institute; Rebecca Guy, Kirby Institute; Margaret Hellard, Burnet Institute and Mark Stoové, Burnet Institute.

We gratefully acknowledge the contribution of the ACCESS Advisory Committee members and the contribution of clinicians and practitioners at participating clinics. The sites that contributed data to this report were (in alphabetical order):

Adelaide Sexual Health, Anglesea Medical Centre, Ballarat Community Health, Barwon Health's Drug and Alcohol Service, Bendigo Community Health, Blue Mountains District ANZAC Memorial Hospital Sexual Health Clinic, cohealth (eight sites), Centre Clinic, Clinic 229; Grafton Sexual Health, Clinic 33; Coffs Harbour Sexual Health Clinic, Dandenong SuperClinic, Deen Clinic, EACH, East Sydney Doctors, Fountain Street General Practice, Frankston Healthcare Medical Centre, Gold Coast Sexual Health Service, GP on Beaufort, Hunter New England Sexual Health, Holdsworth House, Kardinia Health, Lismore Sexual Health Service and Tweed Valley Sexual Health Services (Clinic 145),Lygon Court Medical Clinic, Macleay Street Medical Practice, Medeco Medical Centre Inala, MediClinic Clayton, Melbourne Sexual Health Centre, Murrumbidgee Local Health District (Bega Community Health Service, Goulburn Community Health Centre, Narooma Community Health Centre, Queanbeyan Community Health Centre), Nepean Hospital Sexual Health Clinic, North Richmond Community Health, Northside Clinic, RPA Sexual Health, Sexual Health Services Tasmania, South Wangaratta Medical Centre, Stonewall Medical Centre, Taylor Square Private Clinic, Townsville Sexual Health Centre, View Street Medical, Western Local Health District (Bourke Community Health Centre, Dubbo Community Health Centre Sexual Health Service, Lightning Ridge Community Health Centre, Kite Street Community Health Centre), and Yarram and District Health Service.

ATLAS network

ATLAS network: The ATLAS Indigenous Primary Care Surveillance and Research was established by National Health and Medical Research Council CRE Grant 1100302: The Australian Centre of Research Excellence in Aboriginal Sexual Health and Blood Borne Viruses (CRE ASH). ATLAS is now based at the University of Queensland's Poche Centre for Indigenous Health and is funded by National Health and Medical Research Council Partnerships Grant GNT2006987, supported by the Department of Health and Aged Care, and Medical Research Future Fund Primary Healthcare Research Data Infrastructure Grant PHRDI000054. The ATLAS investigator group gratefully acknowledge the contribution and support of our six clinical hubs (Apunipima Cape York Health Council, Institute of Urban Indigenous Health, Aboriginal Health and Medical Research Council of NSW, Aboriginal Health Council of SA, Kimberley Aboriginal Medical Services), and Victorian Aboriginal Community Controlled Health Organisation Inc.), as well as the individual ACCHS participating in the ATLAS network.

MIXMAX Melbourne Cohort

MIXMAX Melbourne Cohort Investigators: Paul Dietze, Lisa Maher, Mathew Hickman, Thomas Kerr, Mark Stoové, Joseph Doyle, Bernadette Ward, Paul Agius, James Trauer, and Jocelyn Jones. The MIXMAX Melbourne Cohort was funded by the Colonial Foundation Trust, the Australian National Medical Research Council, and the Burnet Institute. The investigators gratefully acknowledge the contributions made by the participants, staff at the recruitment sites, and the Burnet Institute fieldwork team. We also acknowledge the contributions made by Margaret Hellard to support blood collection within the study, which has made this work possible.

Australian Needle Syringe Program Survey

The Australian Needle Syringe Program Survey would like to acknowledge the many people who assist each year in the development and conduct of the Australian Needle Syringe Program Survey, particularly the clients, staff, and managers at participating NSP services. We also appreciate the dedication and vision of the founding members of the project and the late Dr Margaret MacDonald who was responsible for the development and conduct of the Australian Needle Syringe Program Survey from 1995 until 2003. Special thanks go to Associate Professor Philip Cunningham OAM, Chief Operating Officer and Deputy Director of Research, Mr Mitchell Starr, Senior Hospital Scientist, Mr Andrew Kelly, Research Assistant and Ms Shannen Butterly, Research Assistant at the NSW State Reference Laboratory for HIV at St Vincent's Hospital and St Vincent's Centre for Applied Medical Research. We also appreciate the assistance provided by Ms Rachel McCleave from the Kirby Institute.

In 2023, the project received support and input from the following members of the Australian Needle Syringe Program Survey National Advisory Group: Mr Phillip Hull (ACT); Ms Kate Patten (NSW); Mr David Decolongon (NT); Ms Kate Kelly (SA); Ms Myf Briggs (TAS); Mr Gary Morris (VIC); Mr Robert Kemp (QLD); Mr Adrian Gorringe and Ms Ele Morrison (Australian Injecting and Illicit Drug Users League); and Ms Sue Heard, Dr Farzaneh Zolala and Professor Lisa Maher (Kirby Institute). We would particularly like to thank Ms Jude Bevan (WA) for chairing the National Advisory Group. The Australian Needle Syringe Program Survey is funded by the Australian Government Department of Health and Aged Care.

National Prisons Hepatitis Network

Australian Capital Territory

Justice Health, Primary Health, Mental Health, Justice Health and Alcohol and Drug Services, Canberra Health Services:

Dr Aleksandar Misev (Visiting Medical Officer, from 2022)

New South Wales

Dr Cristina Sotomayor-Castillo, Katherine Tree, Tracey Brown, Tom Wright, and Colette McGrath (Population Health, Justice Health and Forensic Mental Health Network)

Northern Territory

Dr Catherine Marshall (Viral hepatitis Service, Royal Darwin Hospital, NT Health)
Jaclyn Tate-Baker (Nurse Practitioner Viral hepatitis Service, Royal Darwin Hospital, NT Health)
A/Prof Rob Baird (Territory Pathology, NT Health)

Queensland

Carla Gorton (Communicable Diseases Branch, Department of Health)
Graham Kraak (Offender Health and Wellbeing, Department of Health, Prisoner Health Services staff)

South Australia

Andrew Wiley (Director, SA Prison Health Services)
Dr Tom Turnbull (Medical Director, SA Prison Health Services, from April 2021)
Anton Colman (Nurse Consultant, Hepatology, Royal Adelaide Hospital)
Tom Rees (Manager, STI and BBV Section Communicable Disease Control Branch, SA Health)
Prison health staff, Local Health Network Viral Hepatitis Nurses, Hepatitis SA

Tasmania

Deborah Siddall (Population Health and Special Projects Coordinator, Forensic Health Services)
Dr David Onu (Statewide Specialty Director, Correctional Primary Health Service, Forensic Health Services)

Victoria

Statewide Hepatitis Program, St Vincent's Hospital Melbourne
Custodial Health, Western Health
Victorian Department of Justice and Community Safety

Western Australia

Dr Joy Rowland (Director Medical Services, WA Department of Justice)
Holly Beasley (Senior Project Officer BBV, WA Department of Justice)
Dr Heather Lyttle (HCV GP Prescriber, WA Department of Justice)
Michelle Stamatopoulos (Clinical Nurse Hepatitis C, WA Department of Justice)
WA tertiary hospital hepatology services
Health Services Department of Justice prison clinical staff across WA

The Australian Hepatitis and Risk Survey in Prisons

The Australian Hepatitis and Risk Survey in Prisons study was funded by the Australian Government Department of Health and Aged care. We also gratefully acknowledge the support we received from all our jurisdictional collaborators: NSW: Colette McGrath and Tracey Brown (Justice Health NSW); Luke Grant (CSNSW); TAS: Deb Siddall, Barry Nicholson, and David Onu (Correctional Primary Health Service), Ian Thomas (Tasmania Prison Service); SA: Andrew Wiley, Tom Turnbull, Dan Pronk, and Adam Spicer (SAPHS), Tom Rees (South Australia Health), John Strachan (DCS); QLD: Graham Kraak and Robert Kemp (Queensland Health), Jenny Bell (QCS); WA: Joy Rowland, Holly Beasley, and Peter Illich (Department of Justice); NT: Priscilla Moore and Dy Kelaart (Northern Territory Health), Bill Carroll and David Gordon (NTCS); VIC: Teri van Geelen and Helen Meyer-Tinning (Justice Health); ACT: Cameron Edgell, Alex Misev, and Katerina Lagios (Justice Health ACT). The investigators thank all the on-the-ground staff at the participating sites, including the general managers/governors, nursing staff, and correctional staff.

Australia and New Zealand Liver and Intestinal Transplant Registry

Michael Fink (Director) and Wing-Yee Lo (Manager), Victorian Liver Transplant Unit, Austin Health

Australian Liver Transplant Units:

Simone Strasser, Australian National Liver Transplant Unit, Royal Prince Alfred Hospital
Peter Hodgkinson, QLD Liver Transplant Service, Princess Alexandra Hospital
John Chen, SA Liver Transplant Unit, Flinders Medical Centre
Robert Jones, VIC Liver Transplant Unit, Austin Health
Bryon Jaques, WA Liver Transplantation Service, Sir Charles Gairdner Hospital

Stigma Indicators Monitoring Project

The Stigma Indicators Monitoring Project is funded by the Australian Government Department of Health. The project team would like to thank study participants for their valuable contribution to the research and each of the organisations who assisted with participant recruitment.

Needle and Syringe Program National Minimum Data Collection

The Needle Syringe Program National Minimum Data Collection project is grateful for support and input from the following members of the NSP NMDC Reference Group in 2023: Philip Hull (ACT); Kate Jennings (NSW); David Decolongon (NT); Robert Kemp (QLD); Michelle Spudic and Kate Kelly (SA); Myf Briggs (TAS); Gary Morris (VIC); Jude Bevan (WA); Adrian Gorringe & Ele Morrison (Australian Injecting and Illicit Drug Users League); Sione Crawford (Harm Reduction Victoria) and Charles Henderson (NSW Users and AIDS Association). We also appreciate the valuable assistance provided by Stephanie Stephens (ACT), Benet Brogan (QLD), Michelle Rutter (SA), Rob Knight (VIC), Hollie Chester (WA), and NSP attendees and staff and managers at NSP services. The Needle Syringe Program National Minimum Data Collection is funded by the Australian Government Department of Health and Aged Care.

Illicit Drug Reporting System

Dr Rachel Sutherland, Fiona Jones, Udesha Chandrasena, Antonia Karlsson, Julia Uporova, Daisy Gibbs, Olivia Price, Cate King, Professor Louisa Degenhardt, Professor Michael Farrell, and Associate Professor Amy Peacock (National Drug and Alcohol Research Centre, University of New South Wales); Joanna Wilson, Dr Campbell Aiken, and Professor Paul Dietze (Burnet Institute); Yalei Wilson and Associate Professor Raimondo Bruno (School of Psychology, University of Tasmania); Dr Seraina Agramunt and Professor Simon Lenton (National Drug Research Institute and enAble Institute, Curtin University); and Catherine Daly, Dr Jennifer Juckel, Dr Natalie Thomas, and Associate Professor Caroline Salom (Institute for Social Science Research, The University of Queensland).

Gay Community Periodic Survey

The Gay Community Periodic Surveys are funded by state and territory health departments, the Australian Government Department of Health, and the National Health and Medical Research Council (GNT2002625).

Project team

Martin Holt, Benjamin Bavinton, Timothy Broady, Curtis Chan, James MacGibbon, Anthony KJ Smith, and Limin Mao.

References

1. Alavi M, Law MG, Valerio H, et al. Declining hepatitis C virus-related liver disease burden in the direct-acting antiviral therapy era in New South Wales, Australia. *J Hepatol*. 2019;**71**(2):281–8. doi: https://doi.org/10.1016/j.jhep.2019.04.014.

2. Kwon JA, Dore GJ, Grebely J, et al. Australia on track to achieve WHO HCV elimination targets following rapid initial DAA treatment uptake: a modelling study. *J Viral Hepat*. 2019;**26**(1):83–92. doi: https://doi.org/10.1111/jvh.13013.

3. Kwon JA, Dore GJ, Hajarizadeh B, 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;**16**(9):e0257369. doi: https://doi.org/10.1371/journal.pone.0257369.

4. King J, McManus H, Kwon JA, Gray R, McGregor S. HIV, viral hepatitis and sexually transmissible infections in Australia: annual surveillance report 2023. Sydney, Australia: Kirby Institute, UNSW Sydney; 2023. Available at: https://www.kirby.unsw.edu.au/research/reports/asr2023 (accessed: 15th February 2024).

5. Kirby Institute. Progress towards hepatitis C elimination among Aboriginal and Torres Strait Islander people in Australia: monitoring and evaluation report, 2021. Sydney, Australia: Kirby Institute, UNSW Sydney; 2021. Available at: https://kirby.unsw.edu.au/report/progress-towards-hepatitis-c-elimination-among-aboriginal-and-torres-strait-islander-people (accessed: 26th August 2024).

6. Dore GJ, Feld JJ. Hepatitis C virus therapeutic development: in pursuit of "perfectovir". *Clin Infect Dis*. 2015;**60**(12):1829–36. doi: https://doi.org/10.1093/cid/civ197.

7. Doyle JS, Aspinall E, Liew D, et al. Current and emerging antiviral treatments for hepatitis C infection. *British J Clinical Pharmacol*. 2013;**75**(4):931–43. doi: https://doi.org/10.1111/j.1365-2125.2012.04419.x.

8. Australian Government, Department of Health and Aged Care. Fifth National Hepatitis Strategy 2018–2022. Canberra, Australia: Australian Government, Department of Health and Aged Care; 2018. Available at: https://www.health.gov.au/resources/publications/fifth-national-hepatitis-c-strategy-2018-2022 (accessed: 19th August 2024).

9. Australian Government, Department of Health and Aged Care. National Notifiable Disease Surveillance System. Canberra, Australia: Australian Government, Department of Health and Aged Care; 2024. Available at: https://www.health.gov.au/initiatives-and-programs/nndss (accessed: 18th September 2024).

10. O'Keefe D, Horyniak D, Dietze P. From initiating injecting drug use to regular injecting: retrospective survival analysis of injecting progression within a sample of people who inject drugs regularly. *Drug Alcohol Depend*. 2016;**158**:177–80. doi: https://doi.org/10.1016/j.drugalcdep.2015.11.022.

11. Burnet Institute, Kirby Institute, and NRL Quality. The Australian Colloboration for Coordinated Enhanced Sentinel Surveillance of Sexually Transmissible Infections and Blood Borne Viruses (ACCESS). Melbourne, Australia: Burnet Institute, Kirby Institute, and National Reference Laboratory; 2024. Available at: https://accessproject.org.au/ (accessed: 15th October 2024).

12. Callander D, Moreira C, El-Hayek C, et al. Monitoring the control of sexually transmissible infections and blood-borne viruses: protocol for the Australian Collaboration for Coordinated Enhanced Sentinel Surveillance (ACCESS). *JMIR Res Protoc*. 2018;**7**(11):e11028. doi: https://www.researchprotocols.org/2018/11/e11028/.

13. Nguyen L, Stoové M, Boyle D, et al. Privacy-preserving record linkage of deidentified records within a public health surveillance system: evaluation study. *J Med Internet Res*. 2020;**22**(6):e16757. doi: https://www.jmir.org/2020/6/e16757/.

14. Van Den Boom W, Quiroga MDM, O'Keefe D, et al. Cohort profile: the Melbourne Injecting Drug User Cohort Study (SuperMIX). *Int J Epidemiol*. 2022;**51**(3):e123-e30. doi: https://doi.org/10.1093/ije/dyab231.

15. Fisher T, Smith P, Higgs P, et al. Changes in hepatitis C prevalence and incidence associated with access to direct-acting antivirals in a prospective cohort of people who inject drugs in Melbourne, Australia. Darwin, Australia: Australasian Viral Hepatitis Conference; 2024. Available at: https://airdrive.eventsair.com/eventsairaueprod/production-ashm-public/d52baa613f2f4f1fad5a0fcde2a8fcbd (accessed: 30th September 2024).

16. ASHM. National Hepatitis C Testing Policy v1.4 2020. Sydney, Australia: ASHM; 2020. Available at: http://testingportal.ashm.org.au/national-hcv-testing-policy/ (accessed: 1st June 2024).

17. Hepatitis C Virus Infection Consensus Statement Working Group. Australian recommendations for the management of hepatitis C virus infection: a consensus statement (2022). Melbourne, Australia: Gasteroenterological Society of Australia; 2022. Available at: https://www.hepcguidelines.org.au/ (accessed: 3rd October 2024).

18. Bradley C, Hengel B, Crawford K, et al. Establishment of a sentinel surveillance network for sexually transmissible infections and blood borne viruses in Aboriginal primary care services across Australia: the ATLAS project. *BMC Health Services Research*. 2020;**20**(769). doi: https://doi.org/10.1186/s12913-020-05388-y.

19. Heard S and Maher L. Australian Needle Syringe Program Survey National Data Report 2019–2023: prevalence of HIV, HCV and injecting and sexual behaviour among NSP attendees. Sydney, Australia: Kirby Institute, UNSW Sydney; 2024. Available at: https://www.kirby.unsw.edu.au/research/reports/australian-nsp-survey-national-data-report-2019-2023 (accessed: 1st September 2024).

20. Australian Government. Medicare Australia Statistics. Canberra, Australia: Australian Government, Services Australia; 2022. Available at: http://medicarestatistics.humanservices.gov.au/statistics/mbs_item.jsp (accessed: 5th August 2024).

21. Kirby Institute at UNSW Sydney and the Flinders University International Centre for Point-of-Care Testing. Australian Hepatitis C Point-of-Care Testing Program. Sydney, Australia: Kirby Institute, UNSW Sydney; 2024. Available at: https://hepcpoct.com.au/ (accessed: 15th September 2024).

22. National Prisons Hepatitis Network. Sydney, Australia: Kirby Institute, UNSW Sydney; 2024. Available at: https://www.nphn.net.au/about (accessed: 5th October 2024).

23. Bah R, Sheehan Y, Li X, et al. Challenges and facilitators in repeated bio-behavioural surveys for blood-borne virus infections in Australian prisons. *Int J Drug Policy*. 2024:104401. doi: https://doi.org/10.1016/j.drugpo.2024.104401.

24. Bah R, Sheehan Y, Li X, et al. Prevalence of blood borne viruses and uptake of hepatitis C testing and treatment in Australian prisons: the AusHep Study. *The Lancet Reg Health Western Pac*. 2024;([Online ahead of print]). doi: https://doi.org.10.1016/j.lanwpc.2024.101240.

25. Maher L, Wand H, Heard S, et al. Utilising Integrated Bio-behavioural Surveillance (IBBS) to investigate declining hepatitis C antibody prevalence among people who inject drugs in the Australian Needle and Syringe Program Survey. *Int J Drug Policy*. 2024;**131**([Online ahead of print]):104545. doi: https://doi.org/10.1016/j.drugpo.2024.104576.

26. Heard S, Iversen J, Geedes L, et al. Australian NSP survey: prevalence of HIV, HCV and injecting and sexual behaviour among NSP attendees, 25-year National Data Report 1995–2019. Sydney, Australia: Kirby Institute, UNSW Sydney; 2020. Available at: https://kirby.unsw.edu.au/report/australian-nsp-survey-25-year-national-data-report-1995-2019 (accessed: 15th April 2024).

27. Australian Bureau of Statistics. Prisoners in Australia. Canberra, Australia: Commonwealth of Australia; 2022. Available at: https://www.abs.gov.au/statistics/people/crime-and-justice/prisoners-australia/2022 (accessed: 1st September 2024).

28. Scott N, Sacks-Davis R, Wade AJ, et al. Australia needs to increase testing to achieve hepatitis C elimination. *Med J Aust*. 2020;**212**(8):365–70. doi: https://doi.org/10.5694/mja2.50544.

29. Martin NK, Thornton A, Hickman M, et al. Can hepatitis C Virus (HCV) direct-acting antiviral treatment as prevention reverse the HCV epidemic among men who have sex with men in the United Kingdom? Epidemiological and modeling insights. *Clin Infect Dis*. 2016;**62**(9):1072–80. doi: https://doi.org/10.1093/cid/ciw075.

30. Scott N, McBryde ES, Thompson A, et al. Treatment scale-up to achieve global HCV incidence and mortality elimination targets: a cost-effectiveness model. *Gut*. 2017;**66**(8):1507–15. doi: http://dx.doi.org/10.1136/gutjnl-2016-311504.

31. Kirby Institute. Monitoring hepatitis C treatment uptake in Australia (Issue 14). Sydney, Australia: Kirby Institute, UNSW Sydney; July 2024. Available at: https://www.kirby.unsw.edu.au/research/reports/monitoring-hepatitis-c-treatment-uptake-australia-issue-14-july-2024 (accessed: 4th August 2024).

32. Yee J, Carson J, Hanson J, et al. Real world efficacy of antiviral therapy in chronic hepatitis C in Australia (REACH-C). Sydney, Australia: Kirby Institute, UNSW Sydney; 2019. Available at: https://kirby.unsw.edu.au/project/reach-c (accessed: 4th October 2024).

33. Carson JM, Hajarizadeh B, Hanson J, et al. Retreatment for hepatitis C virus direct acting antiviral therapy virological failure in primary and tertiary settings: the REACH-C cohort. *J Viral Hepat*. 2022;**9**(24):661–76. doi: https://doi.org/10.1111/jvh.13705.

34. Carson JM, Barbieri S, Matthews GV, et al. National trends in retreatment of HCV due to reinfection or treatment failure in Australia. *J Hepatol*. 2022;**78**(2):260–70. doi: https://doi.org/10.1016/j.jhep.2022.09.011.

35. Traeger MW, Pedrana AE, van Santen DK, et al. The impact of universal access to direct-acting antiviral therapy on the hepatitis C cascade of care among individuals attending primary and community health services. *PLoS One*. 2020;**15**(6):e0235445. doi: https://doi.org/10.1371/journal.pone.0235445.

36. Burnet Institute and Kirby Institute. Australia's progress towards hepatitis C elimination: annual report 2023. Melbourne, Australia: Burnet Institute; 2023. Available at: https://www.burnet.edu.au/knowledge-and-media/research-reports-plus-policy-briefs/australia-s-progress-towards-hepatitis-c-elimination-annual-report-2022/ (accessed: 5th September 2024).

37. Australia and New Zealand Liver and Intestinal Transplant Registry. Melbourne, Australia: Austin Hospital; 2024. Available at: https://www.anzlitr.org/ (accessed: 24th August 2024).

38. Broady TR, Cama E, Brener L, et al. Responding to a national policy need: development of a stigma indicator for blood-borne viruses and sexually transmissible infections. *Aust NZ J Public Health*. 2018;**42**(6):513–5. doi: https://doi.org/10.1111/1753-6405.12809.

39. Broady TR, Brener L, Vuong T, et al. Online interventions to reduce stigma towards population groups affected by blood borne viruses in Australia. *Int J Drug Policy*. 2021;**96**:103292. doi: https://doi.org/10.1016/j.drugpo.2021.103292.

40. Livingston JD, Milne T, Fang ML, et al. The effectiveness of interventions for reducing stigma related to substance use disorders: a systematic review. *Addiction*. 2012;**107**(1):39-50. doi: https://doi.org/10.1111/j.1360-0443.2011.03601.x.

41. Gronholm PC, Henderson C, Deb T, et al. Interventions to reduce discrimination and stigma: the state of the art. *Soc Psychiatry Psychiatr Epidemiol*. 2017;**52**(3):249-58. doi: https://doi.org/10.1007/s00127-017-1341-9.

42. Broady T, Brener L, Cama E, et al. Stigma snapshot: people who inject drugs 2023. Sydney, Australia: Centre for Social Research in Health, UNSW Sydney; 2023. Available at: https://doi.org/10.26190/cpyt-yz29 (accessed: 15th September 2024).

43. Broady T, Brener L, Cama E, Treloar C. Stigma snapshot: people living with hepatitis C 2023. Sydney, Australia: Centre for Social Research in Health, UNSW Sydney; 2023. Available at: https://doi.org/10.26190/svt5-dk21 (accessed: 15th September 2024).

44. Heard S, Zolala F, Kwon JA, et al. Needle Syringe Program National Minimum Data Collection: National Data Report 2023. Sydney, Australia: Kirby Institute, UNSW Sydney; 2023. Available at: https://www.kirby.unsw.edu.au/research/projects/nsp-nmdc#:~:text=The%20NSP%20National%20Minimum%20Data%20Collection (accessed: 25th September 2024).

45. Merone L, Ashton S, Harris A, et al. A complex increase in hepatitis C virus in a correctional facility: bumps in the road. *Aust N Z J Public Health*. 2022;**46**(3):377–81. doi: https://doi.org/10.1111/1753-6405.13238.

46. Hajarizadeh B, Grebely J, Byrne M, et al. Evaluation of hepatitis C treatment-as-prevention within Australian prisons (SToP-C): a prospective cohort study. *Lancet Gastroenterol Hepatol*. 2021;**6**(7):533–46. doi: https://doi.org/10.1016/S2468-1253(21)00077-7.

47. Cunningham EB, Hajarizadeh B, Bretana NA, et al. Ongoing incident hepatitis C virus infection among people with a history of injecting drug use in an Australian prison setting, 2005–2014: the HITS-p study. *J Viral Hepat*. 2017;**24**(9):733–41. doi: https://doi.org/10.1111/jvh.12701.

48. Sutherland R, Karlsson A, Uporova J, et al. Australian Drug Trends 2024: key findings from the National Illicit Drug Reporting System (IDRS) Interviews. Sydney, Australia: National Drug and Alcohol Research Centre, UNSW Sydney; 2024. Available at: https://www.unsw.edu.au/research/ndarc/resources/australian-drug-trends-2024-key-findings-from-the-idrs (accessed: 8th October 2024).

49. Broady T, Rance J, Cama E, et al. Annual Report of Trends in Behaviour 2024: HIV and STIs in Australia. Sydney, Australia: Centre for Social Research in Health, UNSW Sydney; 2024. Available at: https://www.arts.unsw.edu.au/centre-social-research-health/our-projects/annual-report-trends-behaviour (accessed: 3rd October 2024).

50. Holt M, Lea T, Mao L, et al. Adapting behavioural surveillance to antiretroviral-based HIV prevention: reviewing and anticipating trends in the Australian Gay Community Periodic Surveys. *Sex Health*. 2017;**14**(1):72–9. doi: https://doi.org/10.1071/SH16072.

51. MacLachlan J, Purcell I, Romero N, et al. Viral Hepatitis Mapping Project: National Report 2021–2023. Sydney, Australia: ASHM; 2024. Available at: https://ashm.org.au/programs/Viral-Hepatitis-Mapping-Project/ (accessed: 7th October 2024).

52. The Royal College of Pathologists of Australasia. Position statement: reflex Hepatitis C PCR tests on antibody indeterminate and HCV antibody positive samples as a pathologist determinable test. Sydney, Australia: The Royal College of Pathologists of Australasia; 2022. Available at: https://www.rcpa.edu.au/getattachment/074a10bb-1fb5-4f45-af46-0f3e14912631/HCV-Reflex-Testing.aspx (accessed: 31st August 2024).

53. Yousafzai MT, Alavi M, Valerio H, et al. Hepatitis C care cascade before and during the direct-acting antiviral eras in New South Wales, Australia: a population-based linkage study. *J Viral Hepat*. 2023;**30**(3):250-61. doi: https://doi.org/10.1111/jvh.13791.

54. Iversen J, Dore GJ, Starr M, et al. Estimating the Consensus hepatitis C Cascade of Care among people who inject drugs in Australia: pre and post availability of direct acting antiviral therapy. *Int J Drug Policy*. 2020;**83**:102837. doi: https://doi.org/10.1016/j.drugpo.2020.102837.

55. Howell J, Traeger MW, Williams B, et al. The impact of point-of-care hepatitis C testing in needle and syringe exchange programs on linkage to care and treatment uptake among people who inject drugs: an Australian pilot study. *J Viral Hepat*. 2022;**29**(5):375-84. doi: https://doi.org/10.1111/jvh.13664.

56. Khuroo MS, Khuroo NS, Khuroo MS. Diagnostic accuracy of point-of-care tests for hepatitis C virus infection: a systematic review and meta-analysis. *PLoS One*. 2015;**10**(3):e0121450. doi: https://doi.org/10.1371/journal.pone.0121450.

57. Catlett B, Hajarizadeh B, Cunningham E, et al. Diagnostic accuracy of assays using point-of-care testing or dried blood spot samples for the determination of hepatitis C virus RNA: a systematic review. *J Infect Dis*. 2022;**226**(6):1005-21. doi: https://doi.org/10.1093/infdis/jiac049.

58. Mohamed Z, Scott N, Al-Kurdi D, et al. Cost-effectiveness of strategies to improve HCV screening, linkage-to-care and treatment in remand prison settings in England. *Liver Int*. 2020;**40**(12):2950-60. doi: https://doi.org/10.1111/liv.14628.

59. Shih STF, Cheng Q, Carson J, et al. Optimizing point-of-care testing strategies for diagnosis and treatment of hepatitis C virus infection in Australia: a model-based cost-effectiveness analysis. *Lancet Reg Health West Pac*. 2023;**36**:100750. doi: https://doi.org/10.1016/j.lanwpc.2023.100750.

60. Australian Government Department of Health and Aged Care. MBS Online. Canberra, Australia: Commonwealth of Australia; 2024. Available at: https://www.mbsonline.gov.au/internet/mbsonline/publishing.nsf/Content/Home (accessed: 18th March 2024).

61. Scott N, Palmer A, Tidhar T, et al. Assessment of the cost-effectiveness of Australia's risk-sharing agreement for direct-acting antiviral treatments for hepatitis C: a modelling study. *Lancet Reg Health West Pac*. 2022;**18**:100316. doi: https://doi.org/10.1016/j.lanwpc.2021.100316.

62. Australian Government, Department of Health and Aged Care. Australian national notifiable diseases and case definitions. Canberra, Australia: Australian Government, Department of Health and Aged Care; 2021. Available at: https://www.health.gov.au/resources/collections/cdna-surveillance-case-definitions?utm_source=health.gov.au&utm_medium=callout-auto-custom&utm_campaign=digital_transformation (accessed: 1st October 2024).

63. Ampt FH, El Hayek C, Agius PA, et al. Anorectal swabs as a marker of male-to-male sexual exposure in STI surveillance systems. *Epidemiol Infect*. 2017;**145**(12):2530–5. doi: https://doi.org/10.1017/S095026881700098X.

64. Prince DS, Pipicella JL, Fraser M, et al. Screening Emergency Admissions at Risk of Chronic Hepatitis C (SEARCH) to diagnose or 're-diagnose' infections is effective in Australia. *J Viral Hepat*. 2021;**28**(1):121–8. doi: https://doi.org/10.1111/jvh.13393.

65. Valerio H, Alavi M, Conway A, et al. Declining prevalence of current HCV infection and increased treatment uptake among people who inject drugs: the ETHOS Engage study. *Int J Drug Policy*. 2022;**105**:103706. doi: https://doi.org/10.1016/j.drugpo.2022.103706.

66. Kirby Institute. Hepatitis C elimination in NSW: monitoring and evaluation report, 2024. Sydney, Australia: Kirby Institute UNSW, Sydney; 2024. Available at: https://www.kirby.unsw.edu.au/research/reports/hepatitis-c-elimination-nsw-monitoring-and-evaluation-report-2024#:~:text=This%20report%20evaluates%20progress%20towards (accessed: 4th October 2024).

67. Read P, Tang BZH, Silins E, et al. Hepatitis C reinfection and risk factors among clients of a low-threshold primary healthcare service for people who inject drugs in Sydney, Australia. *Viruses*. 2024;**16**(6). doi: https://doi.org/10.3390/v16060957.

This page is intentionally blank.

Supported by

Data contributors

ACCESS

CREASHBBV
Centre for Research Excellence in Aboriginal Sexual Health and Blood Borne Viruses

SAHMRI
South Australian Health & Medical Research Institute

The University Of Queensland
AUSTRALIA

NPHN
NATIONAL PRISONS HEPATITIS NETWORK

ACT Government | Canberra Health Services

NSW GOVERNMENT | Health
Justice Health and Forensic Mental Health Network

NORTHERN TERRITORY GOVERNMENT

Queensland Government

Government of South Australia | Health
Central Adelaide Local Health Network

Government of Western Australia
Department of Justice

Tasmanian Government

Australia & New Zealand Liver and Intestinal Transplant Registry ANZLITR

CSRH UNSW Centre for Social Research in Health

This page is intentionally blank.