Australia's progress towards hepatitis C elimination

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Preface

Hepatitis C is a significant public health issue in Australia; at the end of 2019, an estimated 121 560 people had chronic hepatitis C infection*.[1,2,3,4] Until direct-acting antivirals (DAAs) became available to all Medicare-eligible Australians with hepatitis C infection on 1st 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 infection.[5]

In the past four years Australia has made great strides towards hepatitis C elimination. Increasing access to DAA therapy, a highly tolerable and effective medication,[6] through public subsidy means Australia is well placed to eliminate hepatitis C as a public health threat by 2030. To achieve hepatitis C elimination, DAA therapy needs to be combined with effective primary prevention measures, raised awareness about hepatitis C treatment and cure, and increased testing and linkage to care among people at risk of hepatitis C infection. Convenient, accessible, and acceptable models of care help ensure all people living with hepatitis C benefit from curative treatment and reduce stigma among affected communities.

To understand progress towards hepatitis C elimination, monitoring trends in data to assess the impact of these components is required, from estimates of new infections, testing and treatment through to projections based on mathematical modelling. This is the second 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. Future reports will aim to fill gaps identified and collate data for all priority populations† and settings.

* Estimates of people living with hepatitis C derived from modelling estimate of 129 640 people living with hepatitis C at the end of 2018,[1] with an estimated 11 580 people treated for hepatitis C in 2019,[2,3] and an estimated 3 500 incident infections in 2019 (Scott N, personal communication based on re-calibrated model using updated people living with hepatitis C estimates.[4]

† The Fifth National Hepatitis C Strategy 2018–2022 identifies six priority populations: people from culturally and linguistically diverse backgrounds, Aboriginal and Torres Strait Islander people, people in custodial settings, people living with hepatitis C, people who inject drugs and/or accessing drug treatment programs, and people who previously injected drugs.[7]

Abbreviations

ACCHS	Aboriginal Community-Controlled Health Service
ANSPS	Australian Needle Syringe Program Survey
CI	confidence interval
DAA	direct-acting antiviral
GBM	gay, bisexual, and other men who have sex with men
HCV	hepatitis C virus
HIV	human immunodeficiency virus
IDU	injecting drug use
MBS	Medical Benefits Scheme
NSP	needle and syringe program
OST	opioid substitution therapy
PWID	people who inject drugs
PBS	Pharmaceutical Benefits Scheme
PHN	Primary Health Network
RNA	ribonucleic acid
SVR	sustained virological response
UNSW	University of New South Wales
WHO	World Health Organization

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Executive Summary

Australia is working to eliminate hepatitis C as a public health threat by 2030. This elimination goal is in line with global targets set by the World Health Organization (WHO) and targets included in Australia's National Hepatitis C Strategy 2018–2022.

Moving to unrestricted access to direct-acting antivirals (DAAs) for the treatment of hepatitis C in March 2016 provoked a catalytic change in Australia's hepatitis C response. Recent policy changes, including removing the need for hepatitis C genotype testing prior to treatment and approval of point-of-care testing devices will simplify diagnosis and further facilitate access to treatment. Australia has made considerable progress towards elimination in recent years, with around 82 000 people receiving DAA therapy by the end of 2019 (equivalent to 44% of the estimated chronic hepatitis C population in 2016). However, rates of DAA treatment uptake have declined in the past two years. As well, the COVID-19 pandemic and the response to it may have further reduced the number of people undergoing hepatitis C treatment. These factors underline the need for increased efforts to engage hepatitis C-affected populations in testing and treatment.

Encouragingly, treatment uptake has been relatively high in some priority populations. Among people who inject drugs (PWID) and HIV-positive gay, bisexual, and other men who have sex with men (GBM), treatment uptake appears to be proportionately higher than for other people living with hepatitis C. Early evidence of a treatment-as-prevention benefit comes from studies showing declining hepatitis C incidence in these two groups, and lower prevalence of infection among people reporting recent initiation of injecting drug use (IDU).

Taking advantage of this encouraging progress towards elimination requires ongoing maintenance and enhancement of primary prevention of hepatitis C infections, as well as strategies to increase knowledge and awareness of hepatitis C risk and treatment options and ensuring there is equitable access to testing and treatment for all people living with hepatitis C. To achieve hepatitis C elimination, a renewed focus on case finding and linkage to treatment is needed, as well as a better understanding of differences in health-seeking behaviours and healthcare access among priority populations. Workforce development, particularly in primary care, that focusses on promoting and delivering hepatitis C testing and treatment is fundamental to Australia's hepatitis C elimination efforts. Also, stigma and discrimination towards people at risk of and living with hepatitis C remain prevalent and can result in decreased engagement with hepatitis C testing and treatment services. Interventions to reduce stigma in the community and healthcare settings will be necessary to continue progress towards elimination.

As well as the overarching problem of COVID-19 reducing people's ability to seek health care, current challenges to achieving hepatitis C elimination include gaps in our knowledge of the epidemic among some priority populations and in specific settings. Data measuring progress towards hepatitis C elimination among Aboriginal and Torres Strait Islanders, prisoners, and people living in rural and remote areas are crucial. Comprehensive and ongoing action is needed to improve our understanding of the hepatitis C epidemic and identify the needs of people at risk of and living with hepatitis C, and the barriers they face in accessing hepatitis C care.

One

Newly acquired hepatitis C infections

The rate of new hepatitis C infections is used to monitor strategies that aim to prevent ongoing transmission, including primary prevention and secondary prevention (testing and treatment). New acquisition of hepatitis C is best measured using incidence estimates that describe the rate at which people test positive for the 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 important to note that incidence estimates are sensitive to changes in testing patterns, as occurred when DAAs were introduced in 2016. Also, regular and repeat testing among specific cohorts improves the reliability of incidence estimates. The data on rates of hepatitis C incidence remains somewhat limited.

Estimated 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.[8] These notifications may reflect incident infections because younger people are likely to have initiated IDU relatively recently.[9]

Hepatitis C incidence estimates in Australia are available from data collated by the Australian Collaboration for Coordinated Enhanced Sentinel Surveillance of blood borne viruses and sexually transmissible infections (ACCESS),[10] which links individuals' diagnostic testing data over time.[11,12] ACCESS includes primary care clinics that provide specialist health services to PWID, such as needle and syringe programs (NSPs), opioid substitution therapy (OST), and hepatitis C testing and treatment. Sites can provide both specialist and general health services, therefore attendees may be currently injecting, former PWID or individuals who have never injected drugs (see Methods, ACCESS section for details on included sites). However, HCV antibody test positivity of >10% at these primary care clinics (see data below) suggest they represent key sentinel sites for monitoring changes in hepatitis C incidence and the impact of hepatitis C prevention efforts. ACCESS also includes clinics that specialise in the health of GBM (GBM clinics). Most primary care and GBM clinics in ACCESS are in Victoria (VIC) and New South Wales (NSW).

PROGRESS ON REDUCING NEW INFECTIONS

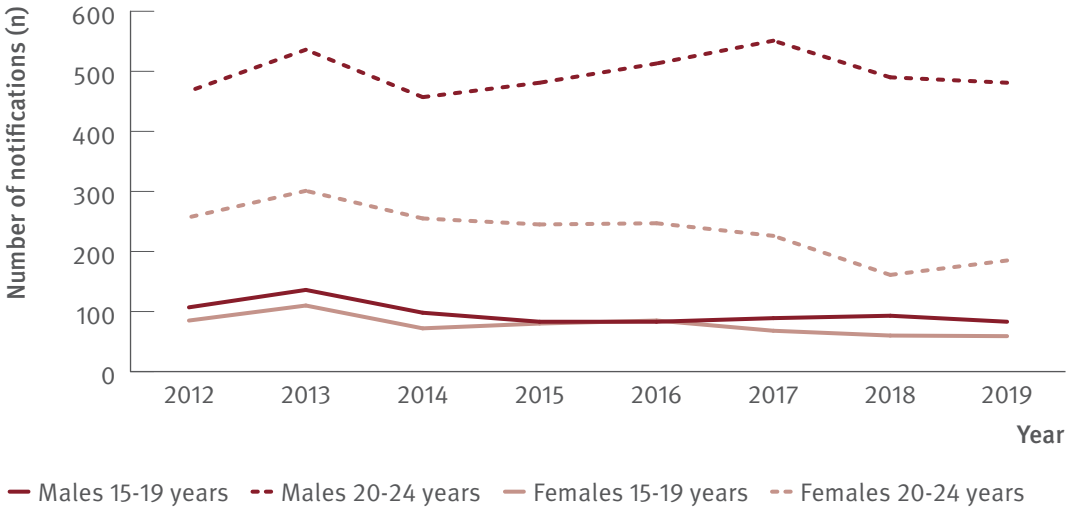
The number of hepatitis C notifications among people aged 15–24 years has remained stable in recent years (Figure 1). However, monitoring of hepatitis C notifications among people aged 15–24 years as a surrogate measure for hepatitis C incidence needs to consider levels of testing and their influence on trends.

Declines in hepatitis C incidence were observed among individuals tested at ACCESS primary care clinics and among HIV-positive GBM tested at ACCESS GBM clinics between 2012 and 2019 (Figures 2 and 3).

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, including Aboriginal and Torres Strait Islanders and prisoners, as well as within specific geographic areas to help inform targeted strategies.

Monitoring new hepatitis C infections

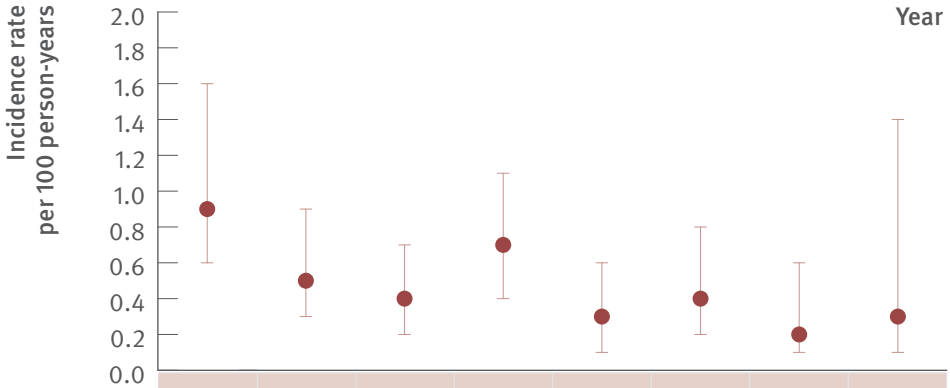
Figure 1. Number of hepatitis C (unspecified) notifications, by age group and sex, 2012–2019



Source: Australian National Notifiable Diseases Surveillance System.[8]

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

Figure 2. Incidence of primary hepatitis C infection among individuals tested at ACCESS primary care clinics and who tested HCV antibody negative less than two years ago, ACCESS, 2012–2019



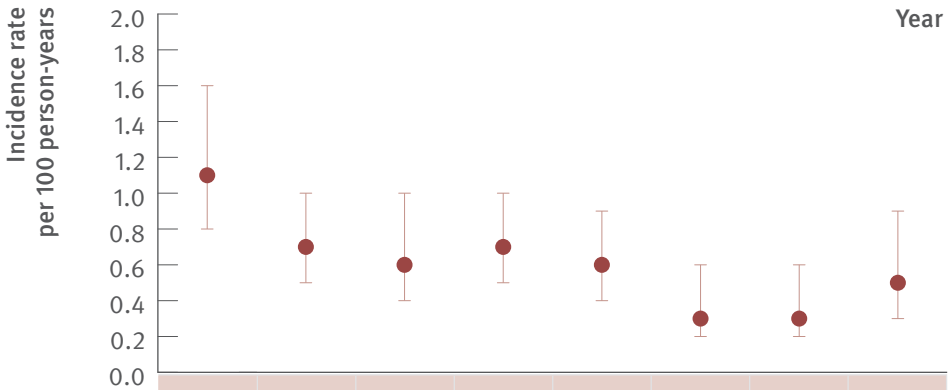
	2012	2013	2014	2015	2016	2017	2018	2019
Cases	15	10	9	16	6	8	3	2
Person-years/100	16.0	19.8	23.2	24.3	23.7	21.0	15.3	5.8

Observed incidence rate — 95% CI

Source: ACCESS.[10]

Notes: Analysis includes 13 sites: 12 in VIC and one in Western Australia (WA). The WA site contributed data from 2016 onwards. Primary care clinics see high caseloads of people at risk of hepatitis C and provide both specialist services to current or former PWID as well as general health services. First incident infection only included in analysis. Incident case date is assigned as the mid-point between positive HCV antibody test date and previous HCV antibody negative test. A restriction of less than two years between incident case date and previous test was applied to align with the Australian notifiable diseases case definition for newly acquired hepatitis C, which uses negative anti-hepatitis C antibody test within the past 24 months to assign notifications as newly acquired cases of hepatitis C.[13] Individuals included tested HCV antibody negative on their first test observed; ACCESS collates data from January 2009. CI: confidence interval.

Figure 3. Incidence of primary hepatitis C infection among HIV-positive GBM tested at ACCESS GBM clinics and who tested HCV antibody negative less than two years ago, ACCESS, 2012–2019



	2012	2013	2014	2015	2016	2017	2018	2019
Cases	30	23	24	29	26	13	11	9
Person-years/100	27.3	33.0	37.5	40.3	40.9	39.3	35.0	18.6

● Observed incidence rate — 95% CI

Source: ACCESS.[10]

Notes: Analysis includes 13 sites: four in VIC, three in NSW, two in South Australia (SA), two in Western Australia (WA), and two in Queensland (QLD). One site in VIC and one in QLD contributed data from 2013 onwards. Men were classed as being HIV-positive for the entire calendar year of their diagnosis. First incident infection only included in analysis. Incident case date is assigned as the mid-point between positive HCV antibody test date and previous HCV antibody negative test. A restriction of less than two years between incident case date and previous test was applied to align with the Australian notifiable diseases case definition for newly acquired hepatitis C, which uses negative anti-hepatitis C antibody test within the past 24 months to define notifications as newly acquired cases of hepatitis C.[13] Individuals included tested HCV antibody negative on their first test observed; ACCESS collates data from January 2009.

Monitoring hepatitis C reinfections

People with chronic hepatitis C infection who clear their infection, either spontaneously or following treatment, can be reinfected. It is important to monitor reinfection incidence because reinfections are an indicator of ongoing risk practices and can contribute to further transmission in priority populations. Reliable estimates of reinfection require well-characterised individual-level data on treatment, clearance, and reinfection through ongoing diagnostic testing, and assessment of risk behaviour. Improved treatment coverage and further evaluation of retreatment data over coming years will allow more reliable estimates of hepatitis C reinfection incidence and improved understanding of the role of reinfection in sustaining the hepatitis C epidemic.

There are several sources of data on hepatitis C reinfection. Among 171 individuals newly diagnosed with hepatitis C who attended ACCESS primary care clinics, two (1.2%) individuals had a second hepatitis C infection recorded (two HCV RNA negative tests followed by an HCV RNA positive test) within the ACCESS primary care network between 2012 and 2019. Among 215 HIV-positive GBM newly diagnosed with hepatitis C who attended ACCESS GBM clinics, 14 (6.5%) had a second hepatitis C infection recorded between 2012 and 2019 (see Methods for details on classification of new hepatitis C infections in ACCESS).

In the monitoring treatment uptake in Australia project, a 10% random sample from the Pharmaceutical Benefits Scheme (PBS) database was used to estimate the number of people initiating DAA treatment.[2,3] Of the estimated 82 280 people initiating DAA therapy through the PBS between March 2016 and December 2019, 5 160 (6.3%) received a second course of therapy. Reasons for retreatment included early discontinuation of initial treatment course, virological failure following treatment completion, and hepatitis C reinfection.

The Real world Efficacy of Antiviral therapy in Chronic Hepatitis C (REACH-C) project is a national observational cohort that includes 33 diverse study sites with data from each jurisdiction.[14] The REACH-C project includes individuals with chronic hepatitis C who have initiated treatment in the DAA era (from March 2016, through the PBS). Participants are recruited from clinical services, including specialist liver clinics, drug and alcohol services, sexual health clinics, general practice, community health clinics, and prisons. REACH-C collated data on 10 843 patients initiating treatment between March 2016 and June 2019. By the end of 2019, 287 (2.6%) individuals received retreatment and an additional 149 (1.4%) had been treated with DAA therapy prior to entering REACH-C. Of those with baseline treatment and retreatment documented in REACH-C, 205 (71.4%) were retreated for virological failure, 66 (23.0%) for reinfection, and 16 (5.6%) for unknown reasons (i.e., data not available to distinguish virological failure from reinfection); overall 0.6% (66/10 843) of patients were reinfected. Among those in REACH-C with known IDU, 20.2% (1 770/8 780) had injected drugs during the study period, and of these 2.9% (51/1 770) were retreated for reinfection. However, this is a lower limit estimate for reinfection because reinfection cases may have been undetected, not treated, or treated through services outside the REACH-C network.

The co-EC study recruited 200 HCV/HIV co-infected GBM from four Melbourne clinics, of whom 186 commenced treatment. Median follow-up time after the end of treatment among 147 participants with an HCV RNA negative result at end of treatment was 10.8 months (interquartile range 6.1–13.4). Three individuals had confirmed reinfections over 121.5 person-years of follow-up after treatment. The observed reinfection rate was 2.5 (95% CI 0.8–7.7) per 100 person-years.[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 it does not indicate current infection. To diagnose current infection, exposed individuals need an HCV RNA test.[16]

ACCESS collates data on consultations, HCV antibody and RNA tests conducted, and test outcomes from clinics that have high caseloads of people at risk of hepatitis C (HCV antibody positivity >10%). Individuals' records in ACCESS are linked within and between clinics, and over time. When restricted to individuals contributing one test per year, data from the ACCESS primary care clinics can be used to describe trends in test uptake (tests conducted divided by consultations) and positivity (positive tests divided by tests conducted).

The ATLAS network is an established national sexually transmissible infections and blood borne viruses surveillance network specific to Aboriginal and Torres Strait Islander peoples. ATLAS currently includes 29 Aboriginal Community-Controlled Health Services (ACCHSs) located in five clinical hubs across QLD (two hubs), NSW, SA, and the Kimberley, WA. Deidentified electronic medical record data relating to sexually transmissible infection and blood borne virus testing, treatment, and management are extracted from each ACCHS. These data are analysed centrally against 12 performance measures that assist in monitoring clinical practice and driving continuous quality improvement initiatives within ACCHSs. These measures include hepatitis C testing rate, test cascade (the proportion of individuals receiving an HCV antibody test, and among those testing positive, the proportion then tested for HCV RNA or HCV viral load), and treatment uptake – the proportion of HCV RNA positive individuals prescribed DAA treatment.[17]

The Australian Needle Syringe Program Survey (ANSPS) is an annual survey of attendees at participating NSP sites across Australia (54 in 2019). The ANSPS asks about a range of risk and health-seeking behaviours, including hepatitis C testing. Dried blood spot laboratory testing for HCV antibody is conducted, and HCV RNA testing is performed if there is sufficient dried blood spot sample remaining after HCV antibody testing.[18]

Population-level monitoring of testing related to diagnosis of current hepatitis C infection can be done through the publicly available Medical Benefits Scheme (MBS) claims dataset, when restricted to item numbers 69499 and 69500. These item numbers are specifically used for testing to detect HCV RNA and not used for tests associated with treatment monitoring.[19]

Enhancing Treatment of Hepatitis C in Opioid Substitution Settings (ETHOS) Engage is a national cohort study of people with a history of IDU; participants either report recent IDU (previous six months) or are currently receiving opioid substitution therapy (OST). Participants were enrolled through drug and alcohol, OST, and NSP sites (25 sites across NSW, QLD and SA, May 2018 to September 2019 data available). ETHOS Engage collects self-reported data on uptake of HCV antibody and RNA testing. Participants can also complete point-of-care HCV RNA testing for determination of current hepatitis C infection. This study can provide estimates of uptake of HCV antibody and RNA testing, hepatitis C treatment uptake, and an estimate of the proportion of participants reporting recent IDU or currently receiving OST who are living with hepatitis C.[20]

The GOANNA Survey is a national sexual health survey of Aboriginal and Torres Strait Islander people aged 16–29 years.[21] The first GOANNA Survey was held at sporting and cultural events around Australia between 2011 and 2013. Participants completed an anonymous questionnaire that covered demographics, knowledge, risk behaviours, and health service access for sexually transmissible infections and blood borne viruses. The GOANNA Survey 2 was conducted between September 2017 and January 2020.[22]

PROGRESS ON DIAGNOSIS OF HEPATITIS C INFECTIONS

Between 2012 and 2019, uptake of annual hepatitis C testing (HCV antibody or RNA) at ACCESS primary care clinics declined, plateauing in 2018 and 2019; at ACCESS GBM clinics, testing increased through to 2017 and then remained relatively stable (Figures 4 and 5). HCV antibody testing uptake was largely stable at ACCESS primary care clinics. Among HIV-positive GBM at ACCESS GBM clinics, HCV antibody testing increased through to 2017 then remained stable (Figures 6 and 7). HCV antibody positivity among patients at ACCESS primary care clinics increased from 2014, peaked in 2017 and remained the same in 2018 and 2019. Among HIV-positive GBM, HCV antibody positivity increased from 2014 to 2016 and has remained stable since (Figures 6 and 7).

In the ATLAS network, the proportion of individuals attending ACCHSs who were tested for HCV antibody and/or HCV RNA was between 8.3% and 10.1% in the four years of the study period, 2016–2019 (Figure 8). Over the four years between 2016 and 2019, 5.0% (449/8 994) of HCV antibody tests were positive and 256 (57.0%) of these HCV antibody positive samples were subsequently tested for HCV RNA or HCV viral load (Figure 9). More HCV tests were among females, and this remained consistent between 2016 and 2019 (Figure 10). It is important to note that testing for hepatitis C within ACCHSs is risk-based and not intended to meet whole population-level coverage.

Approximately half of ANSPS respondents reported testing for hepatitis C infection in the previous year, with limited change in this proportion between 2012 and 2019, and only small differences between jurisdictions (Figure 11), by gender (Figure 12), and by Indigenous status (Figure 13).

From the beginning of 2017, Medicare claims for RNA tests related to hepatitis C diagnosis declined steadily to the end of 2018 and have remained largely stable since (Figure 14).

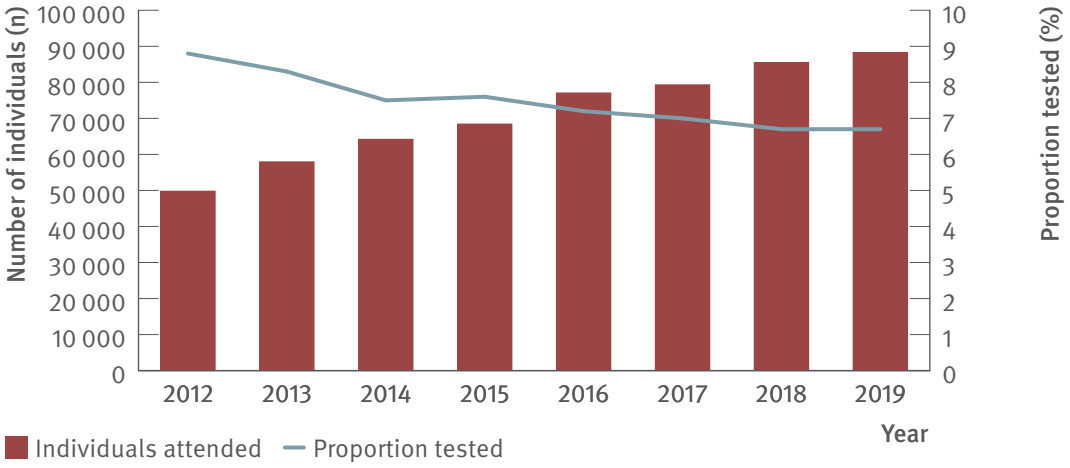
PROGRESS ON DIAGNOSIS OF HEPATITIS C INFECTIONS (CONTINUED)

In the ETHOS Engage study, of the 1 433 participants, 87.2% reported having ever been tested for HCV antibody. Among people who were HCV antibody positive (n=1 016), 77.5% had ever received HCV RNA testing (Figure 15).

Of Aboriginal and Torres Strait Islander participants in the GOANNA Survey 2 who answered questions on hepatitis C testing (N=1 266), 22.7% (n=288) reported testing for hepatitis C infection in the last year and 9.4% (n=119) tested over a year ago. Compared to older participants, a smaller proportion of respondents aged 16–19 years reported being tested in the last year (61/459, 13.3%; Figure 16). Respondents living in regional areas were less likely to report ever being tested for hepatitis C (75/302, 24.8%) than those in urban (255/752, 33.9%) and remote areas (58/136, 42.6%). Of respondents who reported IDU in the past 12 months, 45.5% (15/33) reported ever testing for hepatitis C, and among those who had ever been in prison or a juvenile justice centre, 44.0% (40/91) reported ever testing (Figure 16). Overall, most hepatitis C testing was conducted at an Aboriginal Medical Service (208/399, 52.1%) followed by general practice (130/399, 32.6%), with similar trends observed across age, gender, and residential location strata. Respondents from remote areas were more likely to report hepatitis C testing at an Aboriginal Medical Service (39/56, 69.6%) compared with regional (41/75, 54.7%) and urban respondents (118/250, 47.2%). Aboriginal Medical Services were the most common location for hepatitis C testing reported by respondents reporting IDU in the past 12 months (7/15, 46.7%) and among those with a prison history (20/39, 51.3%; data available in GOANNA Survey 2, 2020 report).

Monitoring hepatitis C testing

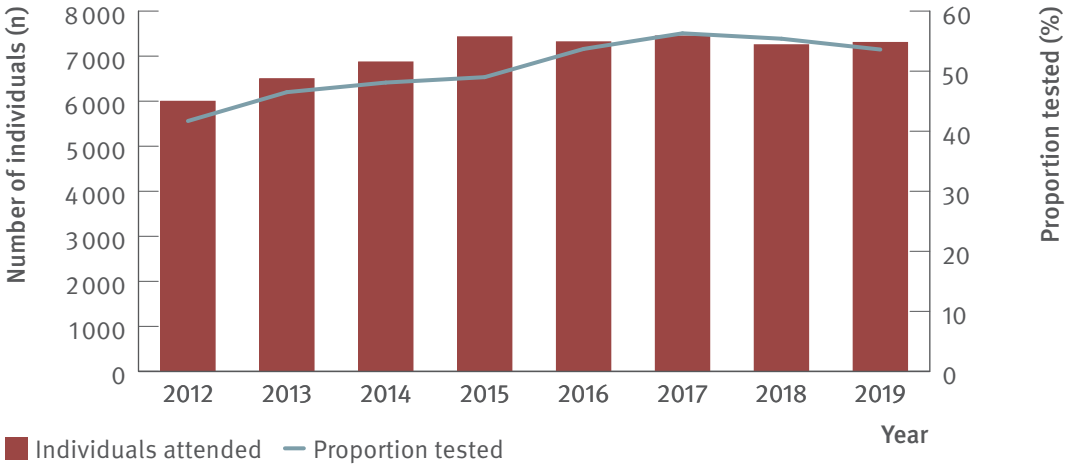
Figure 4. Number of individuals attending ACCESS primary care clinics and proportion tested for HCV (HCV antibody only or HCV antibody and RNA or HCV RNA only), ACCESS, 2012–2019



Source: ACCESS.[10]

Notes: Analysis includes 13 sites: 12 in VIC and one in WA. The WA site contributed data from 2016 onwards. Primary care clinics have high caseloads of people at risk of hepatitis C and provide both specialist services to current and former PWID as well as general health services. Individuals contributed one consultation and one test per year.

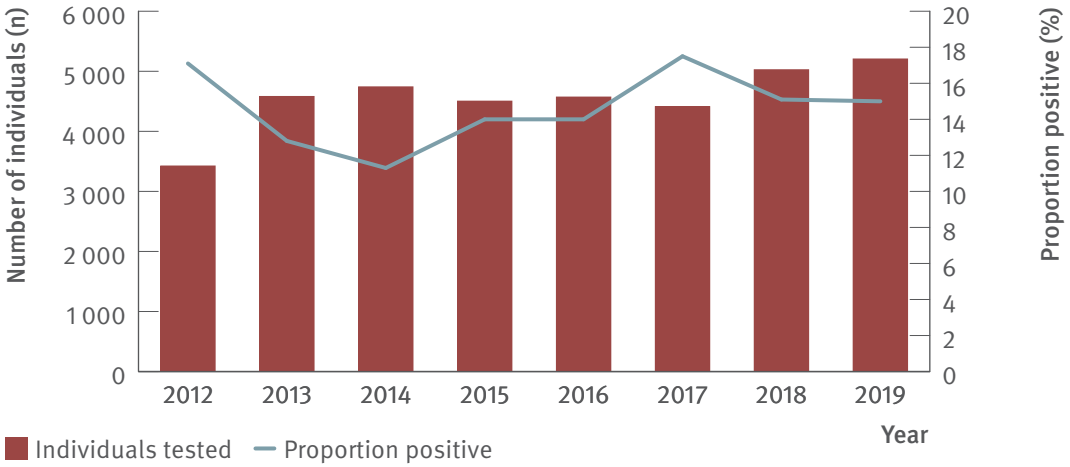
Figure 5. Number of HIV-positive GBM attending ACCESS GBM clinics and proportion tested for HCV (HCV antibody only or HCV antibody and RNA or HCV RNA only), ACCESS, 2012–2019



Source: ACCESS.[10]

Notes: Analysis includes 13 sites: four in VIC, three in NSW, two in SA, two in WA, and two in QLD. One site in Victoria and one in QLD contributed data from 2013 onwards. Individuals contributed one consultation and one test per year.

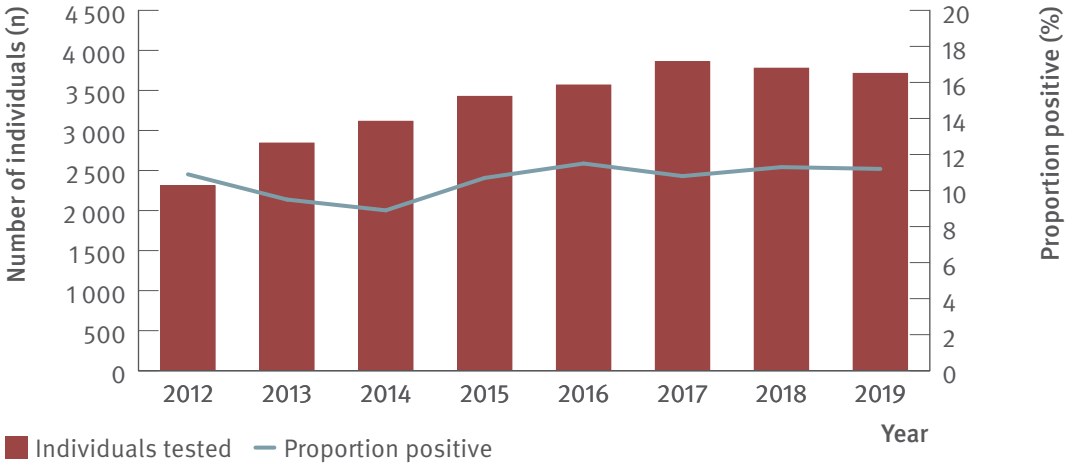
Figure 6. Number of individuals tested for HCV antibody at ACCESS primary care clinics and proportion of HCV antibody tests positive, ACCESS, 2012–2019



Source: ACCESS.[10]

Notes: Analysis includes 13 sites, 12 in VIC and one in WA. The WA site contributed data from 2016 onwards. Primary care clinics have high caseloads of people at risk of hepatitis C and provide both specialist services to current and former PWID as well as general health services. Individuals contributed one test per year.

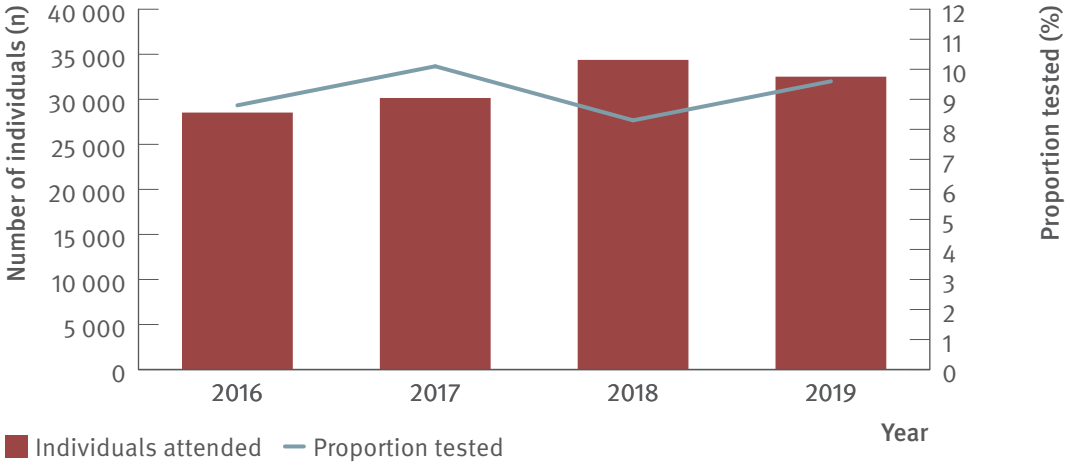
Figure 7. Number of HIV-positive GBM tested for HCV antibody at ACCESS GBM clinics and proportion of HCV antibody tests positive, ACCESS, 2012–2019



Source: ACCESS.[10]

Notes: Analysis includes 13 sites: four in VIC, three in NSW, two in SA, two in WA, and two in QLD. One site in VIC and one in QLD contributed data from 2013 onwards. Individuals contributed one test per year.

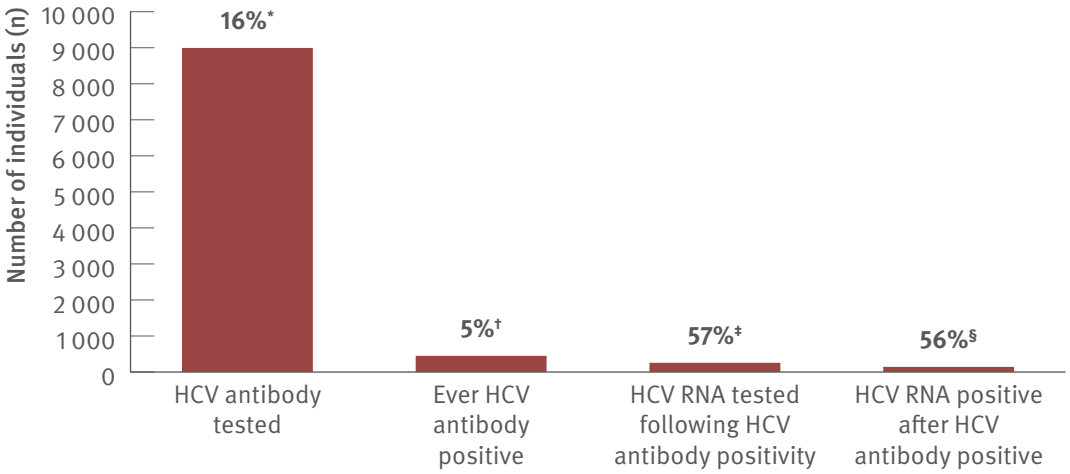
Figure 8. Number of individuals attending ACCHS and proportion tested for HCV (HCV antibody only or HCV antibody and RNA or HCV RNA only), ATLAS network, 2016–2019



Source: ATLAS sexual health surveillance network.[17]

Notes: Individuals defined as people aged 15 years and older, who visited a doctor, nurse or Aboriginal health practitioner ('medical consultations') between 2016 and 2019.

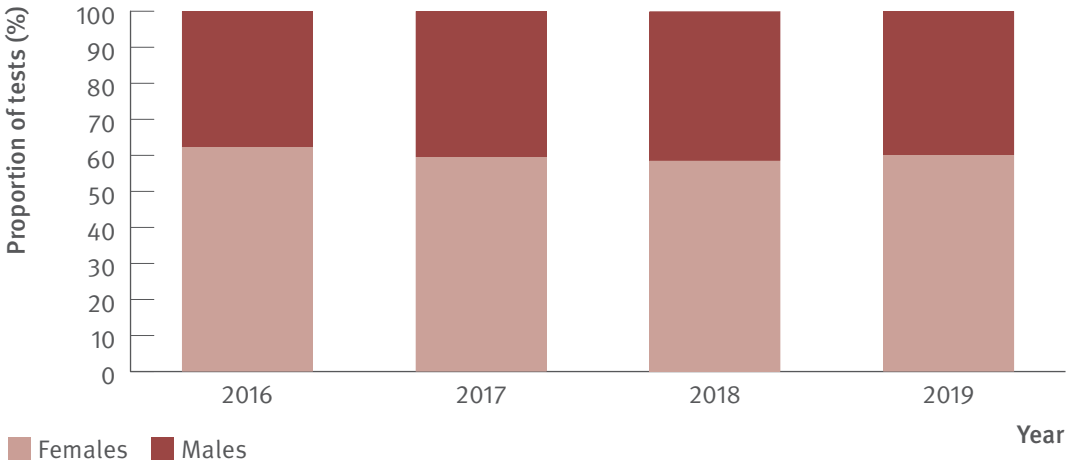
Figure 9. Hepatitis C testing cascade: number and proportion of individuals attending ACCHSs tested for HCV antibody or RNA and among those tested, the number and proportion testing positive, 2016–2019



Source: ATLAS sexual health surveillance network.[17]

Notes: Individuals defined as people aged 15 years and older, who visited a doctor, nurse or Aboriginal health practitioner ('medical consultations') between 2016 and 2019. 'Ever HCV antibody positive' is 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 2019). *A total of 56 493 individuals aged 15 years and older attended medical appointments between 2016–2019, of whom 8 994 (15.9%) had an HCV antibody test. †449 (5.0%) of those tested for HCV antibody were positive. ‡256 (57.0%) individuals had an HCV RNA test following HCV antibody positivity, of whom §143 (55.9%) were HCV RNA positive.

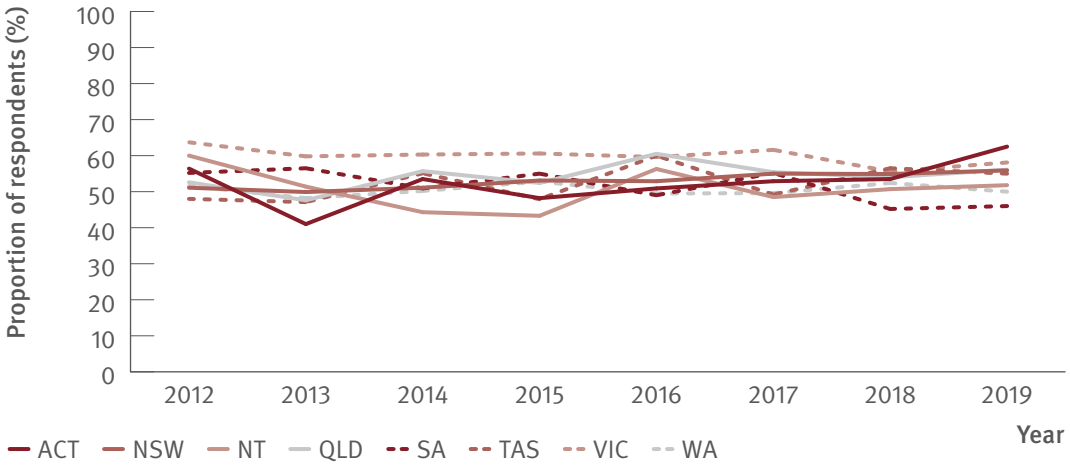
Figure 10. Proportion of HCV tests (HCV antibody only or HCV antibody and RNA or HCV RNA only) at ACCHSs by gender, ATLAS network, 2016–2019



Source: ATLAS sexual health surveillance network.[17]

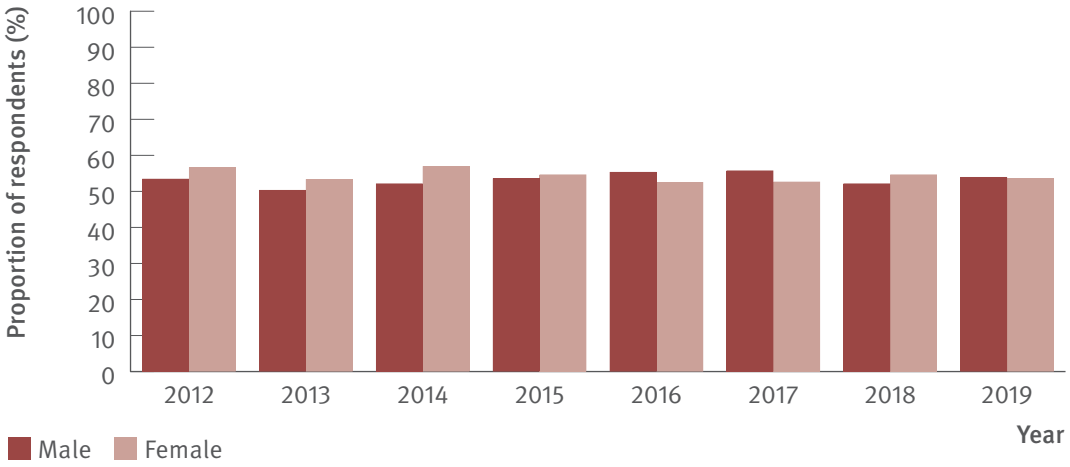
Notes: Individuals defined as people aged 15 years and older, who visited a doctor, nurse or Aboriginal health practitioner ('medical consultations') between 2016 and 2019. Number of people tested per year as follows: 2016: 952 males, 1 568 females; 2017: 1 231 males, 1 806 females; 2018: 1 186 males, 1 675 females; 2019: 1 239 males, 1 869 females.

Figure 11. Proportion of ANSPS respondents self-reporting recent (past 12 months) hepatitis C testing by jurisdiction, 2012–2019



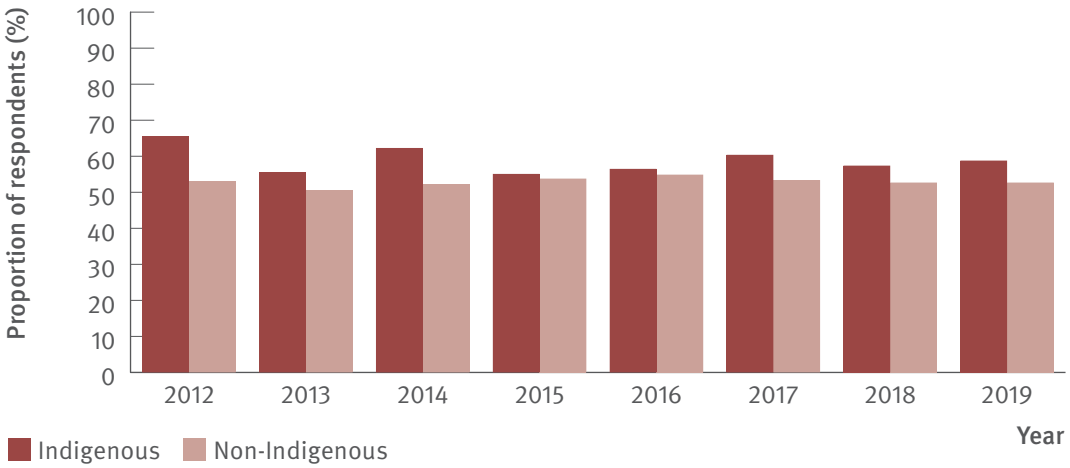
Source: Australian Needle Syringe Program Survey: Prevalence of HIV, HCV and injecting and sexual behaviours among NSP attendees, 25-year National Data Report 1995–2019.[18]

Figure 12. Proportion of ANSPS respondents reporting recent (past 12 months) hepatitis C testing, by gender, 2012–2019



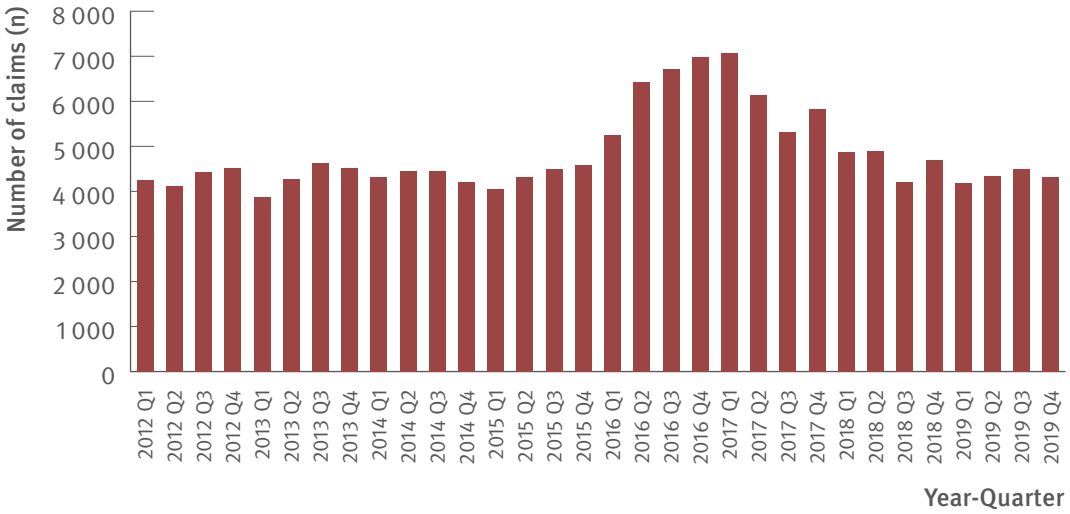
Source: Australian Needle Syringe Program Survey: Prevalence of HIV, HCV and injecting and sexual behaviours among NSP attendees, 25-year National Data Report 1995–2019.[18]

Figure 13. Proportion of ANSPS respondents reporting recent (past 12 months) hepatitis C testing, by Indigenous status, 2012–2019



Source: Australian Needle Syringe Program Survey: Prevalence of HIV, HCV and injecting and sexual behaviours among NSP attendees, 25-year National Data Report 1995–2019.[18]

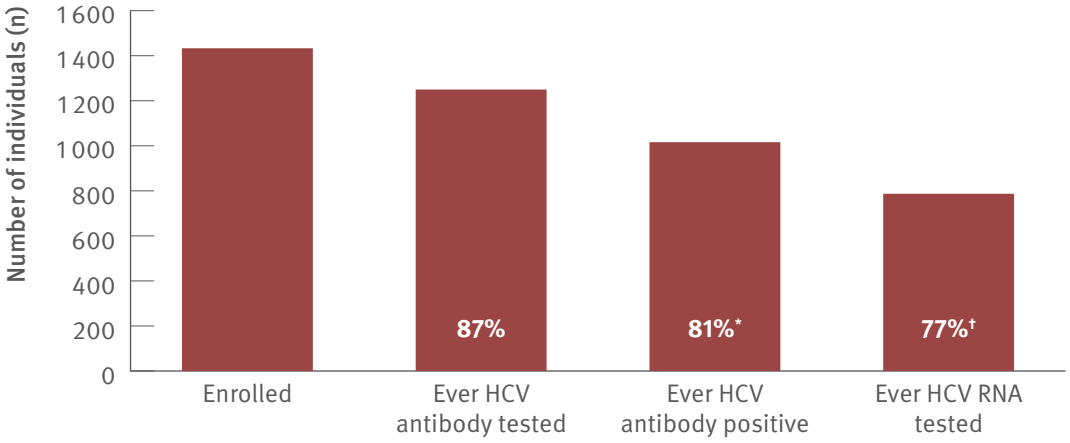
Figure 14. Number of claims to the MBS for items 69499 and 69500 (detection of HCV RNA, new infections only), 2012–2019



Source: Medicare Australia Statistics.[19]

Notes: MBS item numbers (69499 and 69500) are used for testing to detect current hepatitis C infection and not used for tests associated with treatment monitoring.

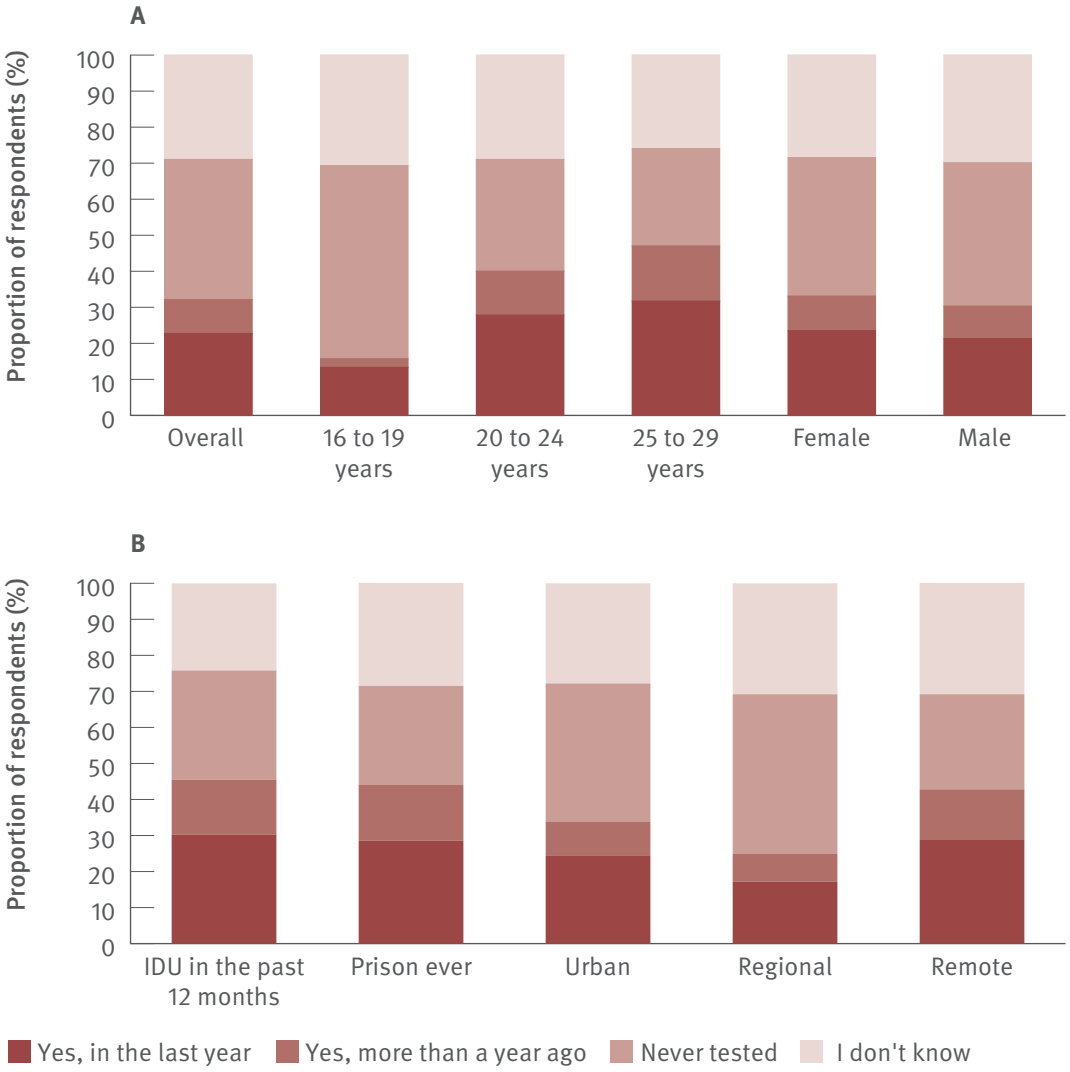
Figure 15. Number of individuals enrolled in ETHOS Engage who were HCV antibody tested, HCV antibody positive and HCV RNA tested, May 2018–September 2019



Source: ETHOS Engage study.[20]

Notes: ETHOS Engage recruited 1 433 participants from drug and alcohol treatment, OST, and NSP sites (25 sites). 'Ever HCV antibody positive' was determined by a combination of results obtained from point-of-care HCV RNA testing and self-report. All participants who tested positive at point-of-care, who indicated ever receiving treatment, or had indicated ever being infected with hepatitis C, were considered HCV antibody positive. 'Ever RNA tested' determined by self-reported HCV RNA testing at enrolment. *Of those HCV antibody tested. †Of those HCV antibody positive.

Figure 16. Proportion of Aboriginal and Torres Strait Islander people aged 16–29 years self-reporting hepatitis C testing*, GOANNA Survey 2, September 2017–January 2020



Source: The GOANNA Survey 2.[21,22]

Notes: N=1 266. Trans or other gender not reported due to small cell size. *Participants were asked "Have you been tested for hepatitis C?".

Three

Uptake of direct-acting antiviral treatment

Achieving hepatitis C elimination in Australia relies on maintenance of 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.[4,23,24,25] DAAs for the treatment of hepatitis C have a high cure rate, are tolerable,[6] and following listing on the PBS in March 2016, are available at low cost to Medicare-eligible Australians.

Treatment uptake

The monitoring treatment uptake in Australia project provides estimates of the number of individuals initiating DAA treatment between March 2016 and December 2019. DAA treatment initiations by jurisdiction, provider type, and characteristics of patients are described in this random sample.[2,3]

The ANSPS provides annual estimates of self-reported hepatitis C treatment uptake among PWID.[18]

The National Prisons Hepatitis Network collated data from hepatitis service providers in 102 prisons across eight states and territories on the number of DAA treatments initiated in prisons in 2019.[26] The monitoring treatment uptake in Australia project estimates the number of individuals accessing DAA therapy for hepatitis C treatment in the community using a 10% random sample from the PBS database.[2,3] While in-prison treatments cannot be reliably delineated from community treatments in the PBS sample, it does provide an accurate overall total. Using the actual number of hepatitis C treatment initiations reported by in-prison hepatitis services, the proportion of treatments initiated among prisoners as a percentage of the state or territory total derived from the PBS sample was estimated.

The GOANNA Survey 2 participants completed an anonymous questionnaire that included questions on hepatitis C treatment uptake.[21, 22]

Treatment outcomes

The REACH-C project can provide proportions of patients achieving sustained virological response (SVR) by patient characteristics.[14]

The Observational Prospective Epidemiological Registry in Australia of Hepatitis C (OPERA-C) is a prospective cohort of patients attending one of 29 tertiary hospitals across Australia that commenced in 2016. Follow-up of hepatitis C treatment and cure outcomes (SVR) among recruited individuals occurs six-monthly.[27]

The Viral Hepatitis Mapping Project collated data on individuals that had undertaken treatment through the PBS. See Chapter Seven for data on treatment outcomes reported by this project.[28]

Cascades of care

ACCESS data from primary care clinics provided a hepatitis C care cascade; the cascade reflects the status of individuals at 31st December 2019 and includes individuals who had a clinical consultation within the three years prior (2016–2019).[10,29]

The ATLAS network provided data of treatment uptake (proportion of HCV RNA positive individuals prescribed DAA treatment) and HCV RNA testing after treatment.[17] 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 (2016–2019).

ETHOS Engage provided data on testing uptake, linkage to care, and treatment outcomes among PWID.[20]

The Australian hepatitis C diagnosis and care cascade is estimated annually as part of the *National update of HIV, viral hepatitis and sexually transmissible infection in Australia* report,[1] providing a general estimate of hepatitis C treatment uptake and cure to the end of 2018.

PROGRESS ON INCREASING TREATMENT UPTAKE

Treatment uptake

Between March 2016 and December 2019, an estimated 82 280 people living with chronic hepatitis C initiated DAA therapy, including 32 650 people in 2016, 21 560 people in 2017, 16 490 in 2018, and 11 580 in 2019 (Figure 17). An estimated 43.6% of the total number of people living with hepatitis C were treated from 2016 to 2019, with variations in uptake by jurisdiction (Figure 18). The months following the listing of DAAs on the PBS in March 2016 saw the peak in hepatitis C treatment initiations. Declining numbers of treatment initiations by specialists were not offset by increased numbers of initiations in non-specialist clinics (Figure 19).

Overall lifetime treatment uptake among ANSPS respondents rose considerably from a low of 11.1% (79/713) in 2015 to 64.2% (428/667) in 2019. In 2019, 67.2% of male respondents (n=1 722) and 58.2% of female respondents (n=861) reported a lifetime history of hepatitis C treatment (Figure 20).

In 2019, an estimated 3 360 hepatitis C treatment episodes were commenced in prisons across all Australian jurisdictions. This is estimated to represent 29.0% (3 360/11 580) of all hepatitis C treatment episodes in Australia in 2019. The number of treatment initiations recorded in each jurisdiction is presented in Figure 21. In the various jurisdictions the proportion of DAA initiations occurring in the prisons range from 10.1% to 39.2% of the state/territory total, highlighting the importance of the prison sector in national elimination efforts.

The commencement of treatment for hepatitis C within the correctional environment varies across jurisdictions according to the prevalence of disease within the State or Territory, the size of the prison population, the number of prisoners previously treated in prison or the community, and the number of new diagnoses. It should be noted that the estimated prevalence of chronic hepatitis C infection among prisoners ranges from 2% to 40% between jurisdictions,[30,31] reflecting differences in the characteristics of people incarcerated and in particular the proportion of people incarcerated who have histories of IDU. As only the total number of treatment initiations during 2019 is provided, without reliable information of the numbers of people eligible for treatment in prison, comparison of individual programs across jurisdictions is not possible. The National Prisons Hepatitis Network aims to harmonise data collection and indicators across jurisdictions, and future reports will aim to provide more comprehensive data on hepatitis C diagnoses and treatments by jurisdiction over time.

PROGRESS ON INCREASING TREATMENT UPTAKE (CONTINUED)

Among the 407 Aboriginal and Torres Strait Islander respondents to the GOANNA Survey 2 (between September 2017 and January 2020) who had tested for hepatitis C ("Have you been tested for hepatitis C?"), 401 responded to the question "Are you hepatitis C positive?" of whom 4.2% (17/401) answered "Yes". Nine of 17 hepatitis C positive respondents (52.9%) had not previously had treatment. Among those who were hepatitis C negative (n=385), 18 had previously been treated for hepatitis C (4.7%) and most had received DAA treatment (11/18, 61.1%).

Treatment outcomes

Among 10 843 patients in REACH-C initiating treatment between March 2016 and June 2019, SVR rates ›90% were observed across a range of sub-populations (Figure 22). SVR outcome was unknown in 15.4% (n=1 669) and of these patients, 4.9% (n=81) were deceased. Rates of unknown SVR increased over time: 2016, 8.9% (474/5 341); 2017, 17.2% (536/3 111); 2018, 26.4% (483/1 831); 2019 31.4% (176/560).

A total of 3 570 patients were recruited to OPERA-C between 2016 and 2019. Treatment data were available for 3 117 patients, of whom 83.6% (n=2 607) achieved SVR with little difference between sub-populations (Figure 23). Patients recruited to date had a mean age of 52 years, 66% were male, 80% Australian-born and 3% Aboriginal or Torres Strait Islander.

Cascades of care

At the end of 2019, among those with a clinical consultation at an ACCESS primary care clinic between 2016 and 2019 and a recorded HCV RNA positive in ACCESS (n=4 025), 50.6% (n=2 037) had initiated treatment and of those treated, 51.5% (1 050/2 037) had an HCV RNA negative ›8 weeks post-treatment initiation (Figure 24).

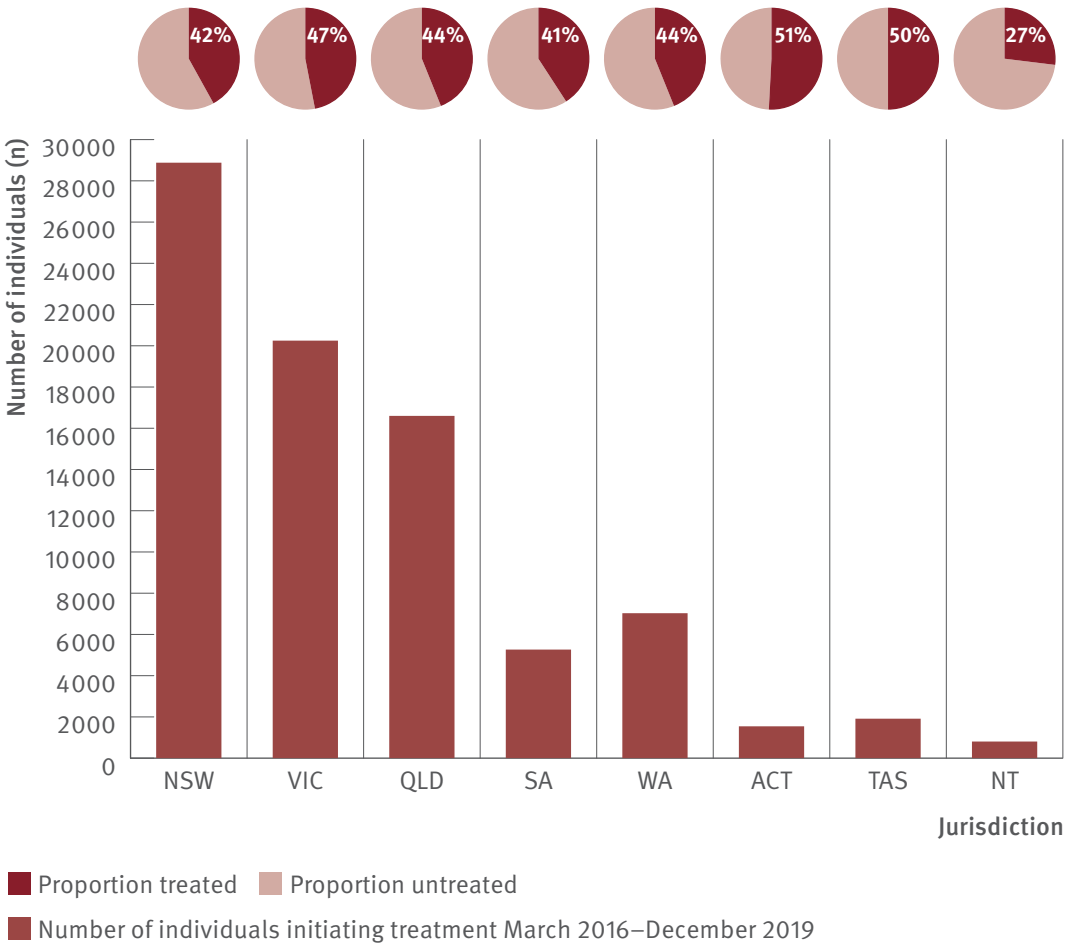
Over the four years of the ATLAS network data, (2016–2019) 112 individuals received DAA treatment. About two-thirds of HCV RNA positive individuals prescribed DAAs were tested for HCV RNA or HCV viral load following treatment (69/112, 61.6%), and a similar proportion of these individuals appeared to achieve an undetectable HCV viral load (40/69, 58.0%; Figure 25).

Between May 2018 and September 2019, of the 788 individuals enrolled in ETHOS Engage with a history of hepatitis C through self-report or point-of-care serology, 686 (87.1%) were linked to care and 520 (66.0%) were treated (Figure 26).

The hepatitis C diagnosis and care cascade highlights a gap between diagnosis and HCV RNA confirmation of diagnosis, although rates of treatment uptake and cure rates following diagnosis of chronic infection are encouraging (Figure 27).

Monitoring treatment uptake

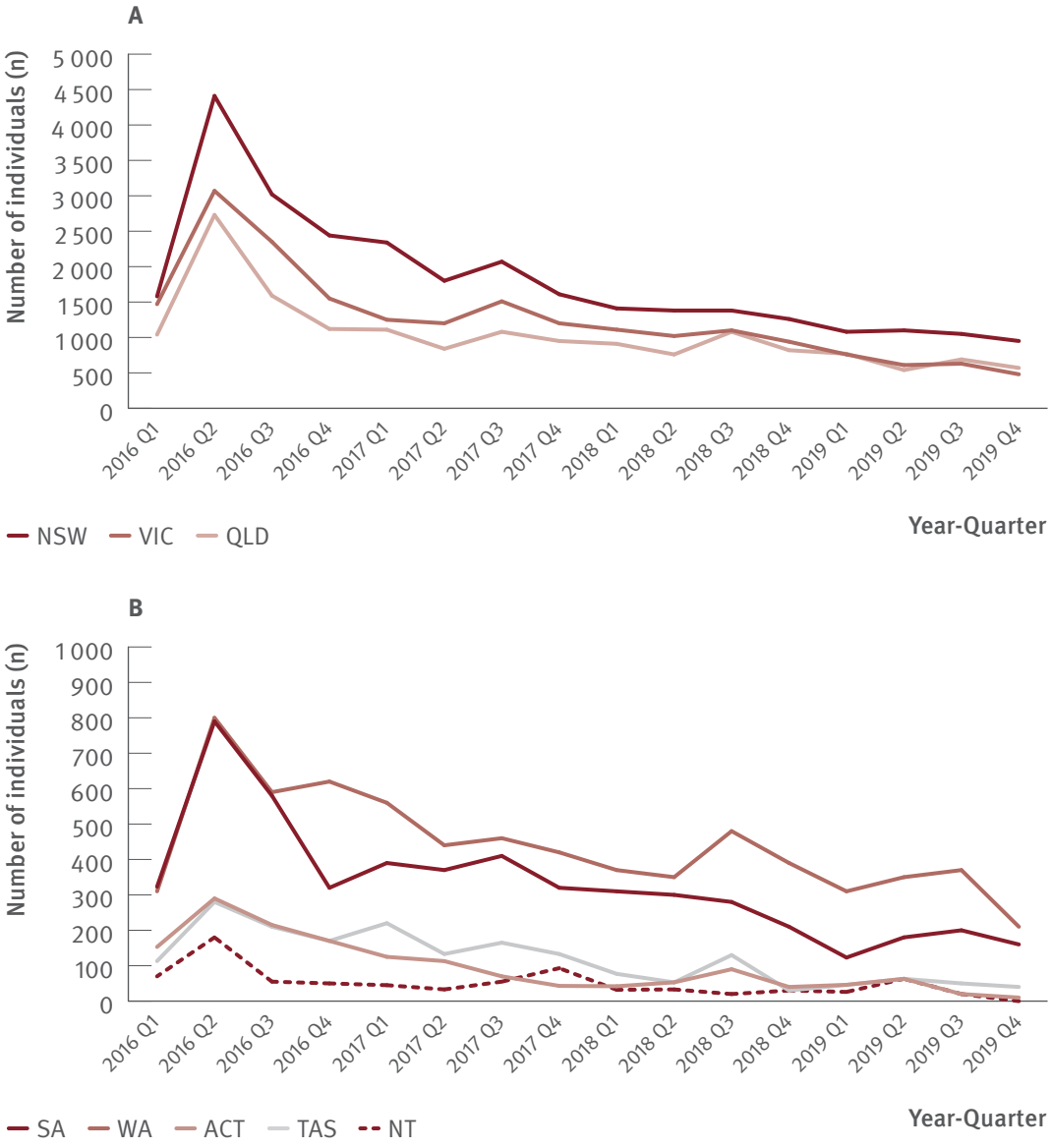
Figure 17. Estimated number of individuals initiating DAA treatment and the proportion of individuals living with chronic hepatitis C who initiated DAA treatment, 10% random sample of the PBS database, by jurisdiction, March 2016–December 2019



Source: Monitoring hepatitis C treatment uptake in Australia.[2,3]

Notes: Treatment numbers may vary from previous or future reports due to refinements made to the 10% random sample of PBS data between releases.

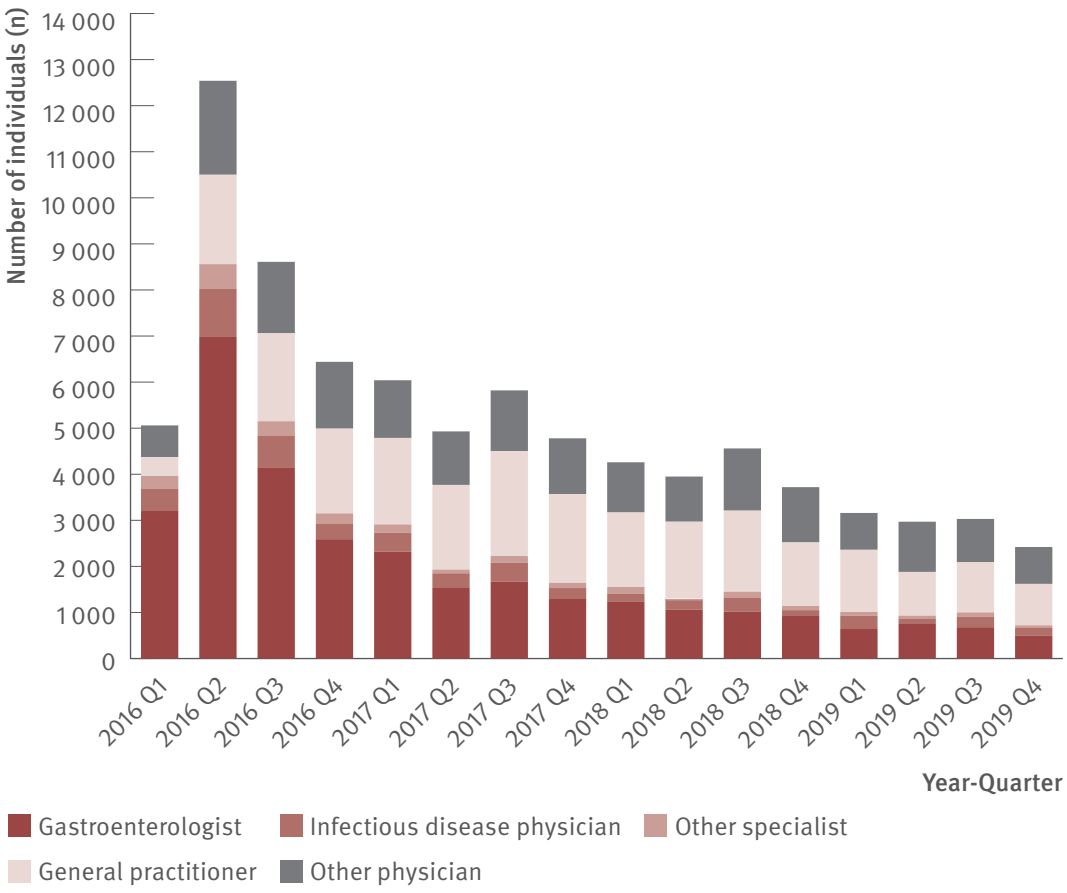
Figure 18. Estimated number of individuals initiating DAA treatment, 10% random sample of the PBS database, by jurisdiction, March 2016–December 2019



Source: Monitoring hepatitis C treatment uptake in Australia.[2,3]

Notes: 2016 Q1 is data from March 2016 only. Treatment numbers may vary from previous or future reports due to refinements made to the 10% random sample of PBS data between releases.

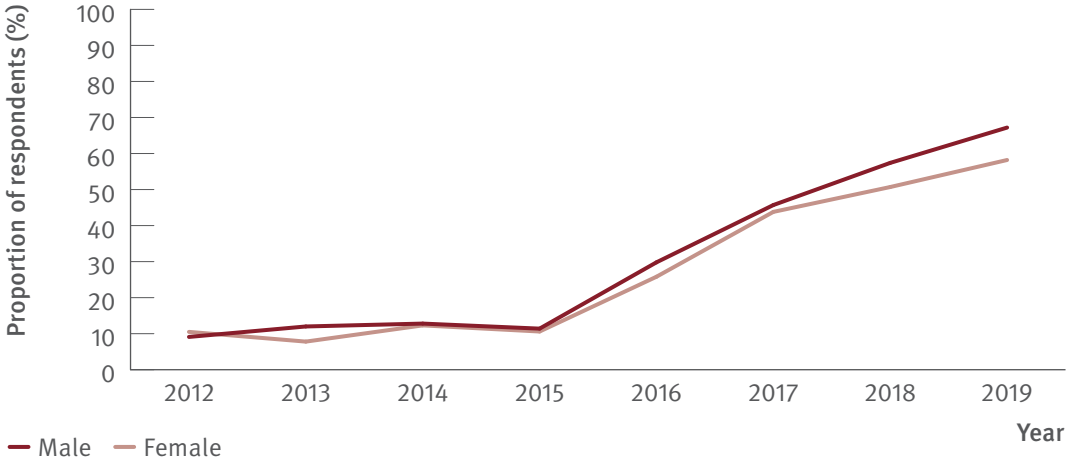
Figure 19. Estimated number of individuals initiating DAA treatment, by prescriber type, 10% random sample of the PBS database, March 2016–December 2019



Source: Monitoring hepatitis C treatment uptake in Australia.[2,3]

Notes: 2016 Q1 is data from March 2016 only. Treatment numbers may vary from previous or future reports due to refinements made to the 10% random sample of PBS data between releases.

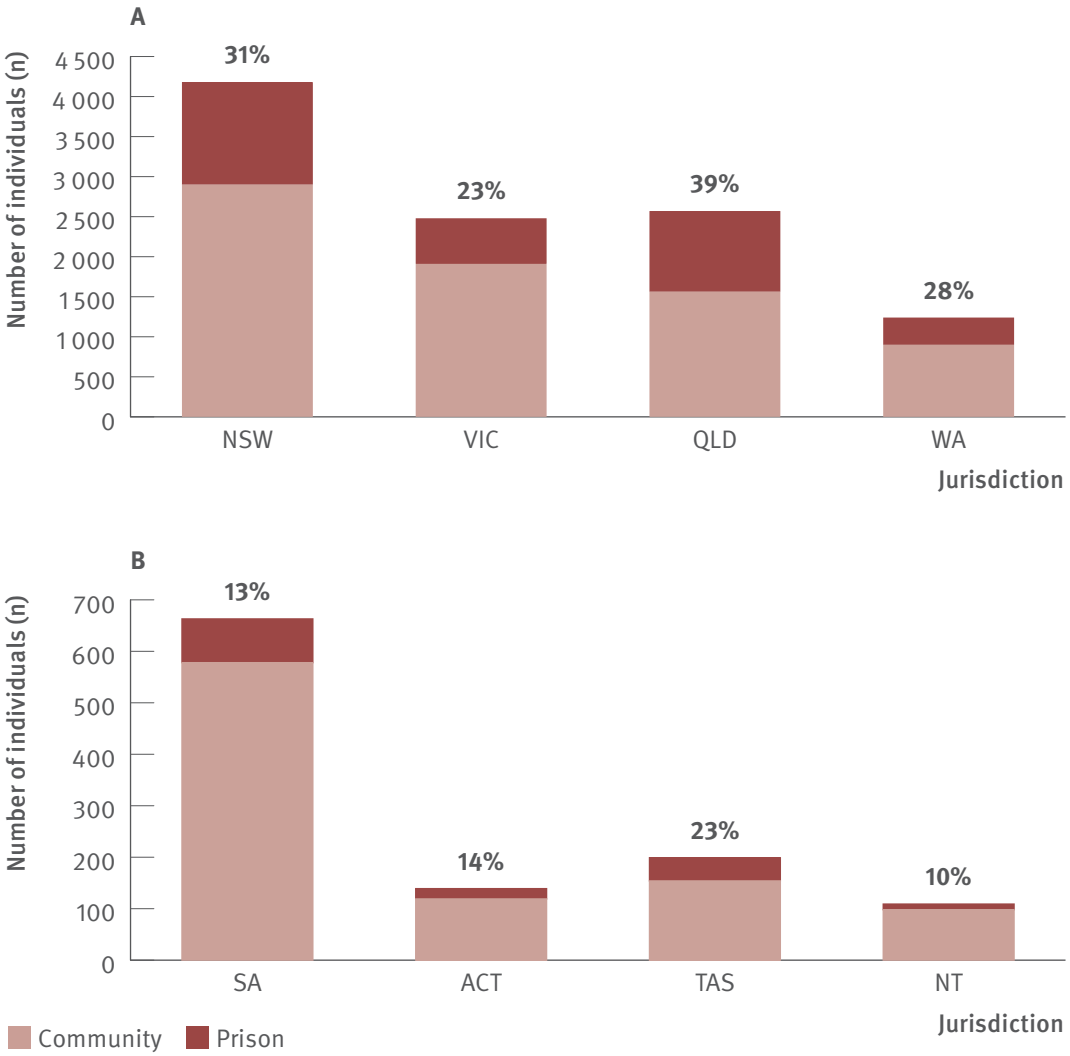
Figure 20. Proportion of ANSPS respondents who tested HCV antibody positive and did not report spontaneous clearance, self-reporting lifetime history of hepatitis C treatment, by gender, 2012–2019



Source: Australian Needle Syringe Program Survey: Prevalence of HIV, HCV and injecting and sexual behaviours among NSP attendees, 25-year National Data Report 1995–2019.[18]

Notes: Respondents who tested HCV antibody positive and excludes those self-reporting spontaneous hepatitis C clearance.

Figure 21. Number* and estimated proportion** of individuals who initiated DAA treatment in prison versus in the community in 2019, by jurisdiction

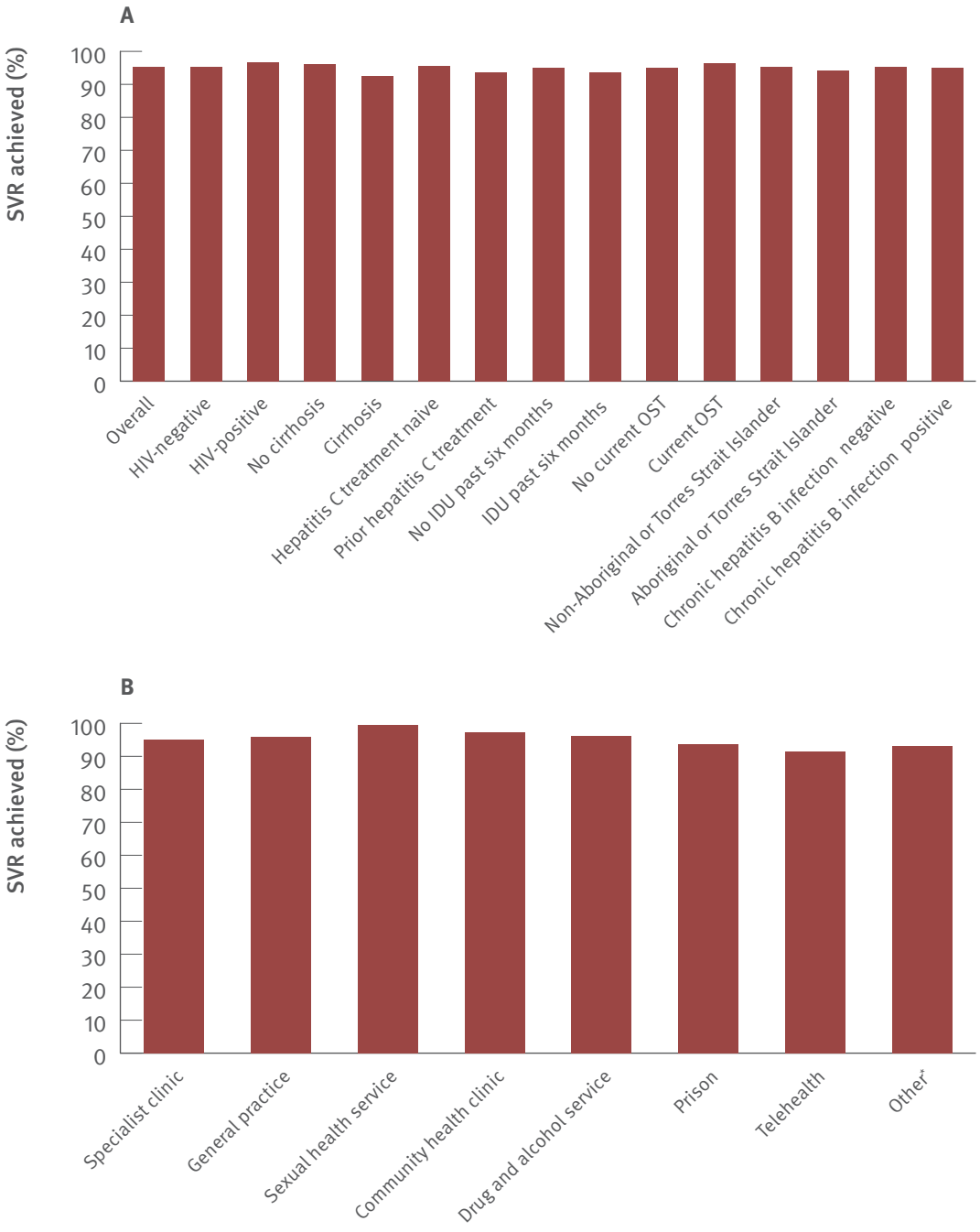


Source: State and Territory justice health authorities via the National Prisons Hepatitis Network.[26] Monitoring treatment uptake in Australia.[2,3]

Notes: Number of prisons in each jurisdiction: NSW=39, VIC=14, QLD=14, WA=17, SA=9, TAS=5, ACT=one prison, and one mental health correctional facility, and NT=two prisons and one youth detention. *Number of individuals initiating treatment in each jurisdiction: NSW=1 281, VIC=569, QLD=1 008, WA=341, SA=85, TAS=45, ACT=20, NT=11. **The proportion of all treatments that were initiated in prisons was estimated using the actual number of treatments reported by jurisdictional hepatitis services as a proportion of all treatments derived from a 10% sample of PBS data.

Monitoring treatment outcomes

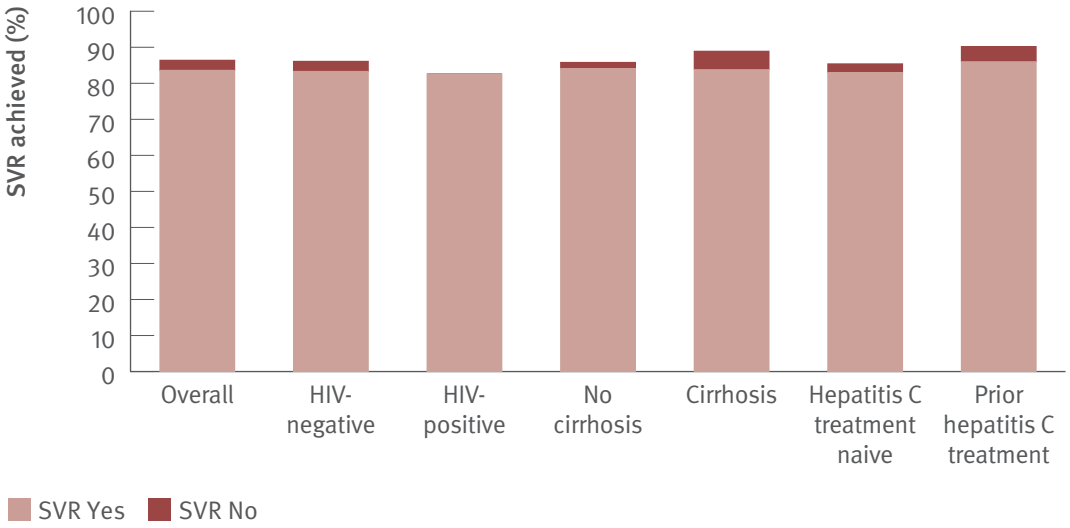
Figure 22. Proportion of individuals with SVR by clinical characteristics (A) and treatment setting (B) in the per protocol population, REACH-C, March 2016–June 2019



Source: REACH-C.[14]

Notes: Per protocol population was individuals with a known HCV RNA test result 12 weeks post-treatment by June 2020. 'Chronic hepatitis B infection positive' defined as hepatitis B surface antigen positive. *'Other' includes Aboriginal health service, mental health and outreach. SVR outcome was unknown in 15.4% (n=1 669) of patients and of these patients, 4.9% (n=81) were deceased. Rates of unknown SVR increased over time: 2016, 8.9% (474/5 341); 2017, 17.2% (536/3 111); 2018, 26.4% (483/1 831); 2019, 31.4% (176/560).

Figure 23. Proportion of individuals with SVR by clinical characteristics at baseline, OPERA-C, March 2016–December 2019

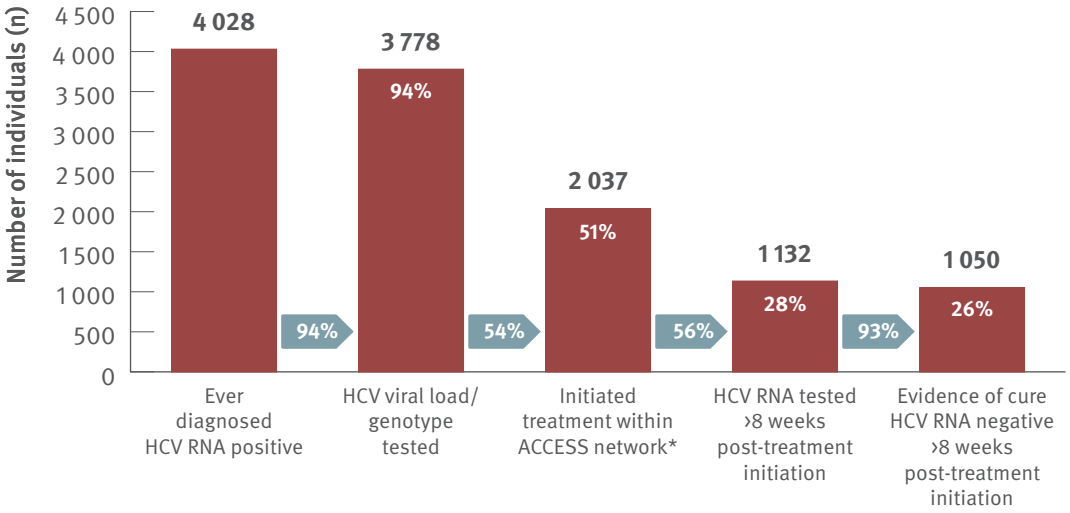


Source: OPERA-C.[27]

Notes: N=3 117. 'SVR No' defined as non-responders or relapse. 'SVR Unknown' (not included) defined as did not return to clinic for a blood test three-months post treatment or lost to follow up. Overall, 13.6% (n=423) of patients did not return for an SVR test or were lost to follow-up. Excludes 320 people awaiting clinical follow up data. Excludes 133 people that were recruited but were not treated with DAAs. All the data on characteristics were collected at baseline.

Cascades of care

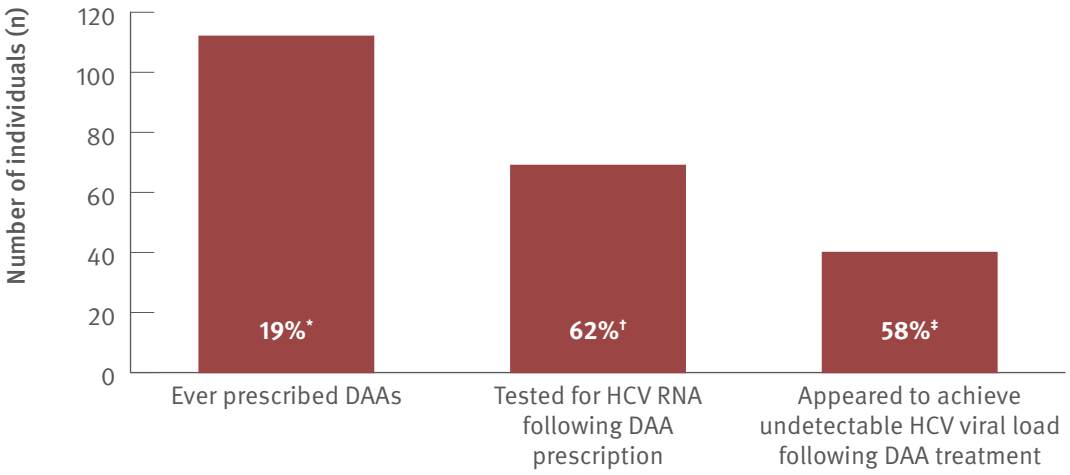
Figure 24. Hepatitis C treatment cascade at ACCESS primary care clinics: number of individuals hepatitis C diagnosed, number and proportion of individuals initiated treatment, and tested for HCV RNA post-treatment initiation, 2016–2019



Source: ACCESS [10]. Updated from Traeger et al., PLOS One 2020.[29]

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 31st December 2019 and is restricted to individuals who had a clinical consultation within the four years prior (2016–2019). Includes individuals attending ACCESS primary care clinics (same primary care clinics as other ACCESS sections in report). *Treatment initiation is indicated by presence of electronic prescription recorded at an ACCESS clinic. Individuals are assumed to have progressed through preceding cascade stages if evidence of reaching a subsequent stage is present.

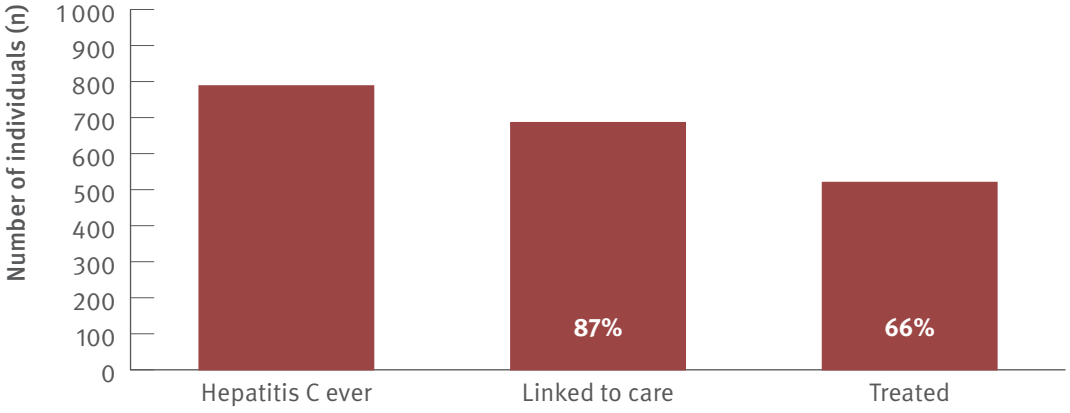
Figure 25. Hepatitis C treatment cascade: number and proportion of individuals attending ACCHS tested for HCV RNA and prescribed DAAs, and among those treated, the number and proportion who appeared to achieve an undetectable HCV viral load, 2016–2019



Source: ATLAS sexual health surveillance network.[17]

Notes: Individuals defined as people aged 15 years and older, who visited a doctor, nurse or Aboriginal health practitioner ('medical consultations'). 'Undetectable HCV viral load' defined as testing negative for HCV RNA or HCV viral load following DAA treatment. A total of 56 493 individuals aged 15 years and older attended medical appointments 2016–2019. *19.4% (n=112) of individuals who were ever HCV RNA tested (n=578) were prescribed DAA treatment 2016–2019. †61.6% (69/112) of these had an HCV RNA test following treatment, ‡58.0% (40/69) of whom had an undetectable HCV viral load and 42% (29/69) who were either positive or not tested (data unavailable to define these 29 further).

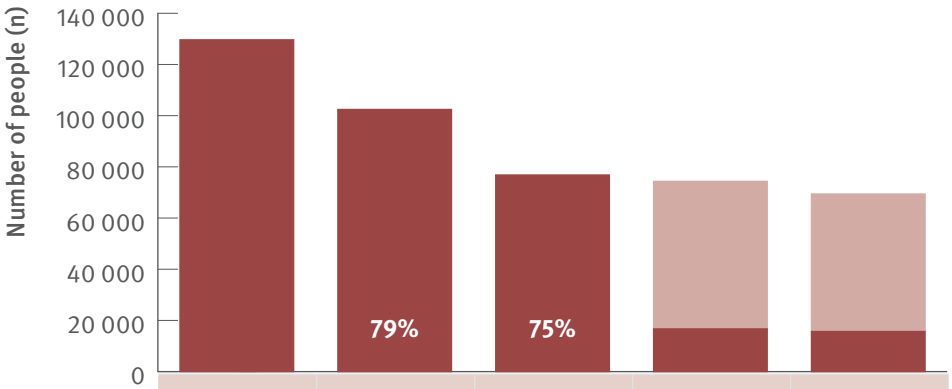
Figure 26. Number of individuals and proportion enrolled in ETHOS Engage that were ever hepatitis C infected, linked to care, and treated, May 2018–September 2019



Source: ETHOS Engage study.[20]

Notes: HCV ever determined by a combination of results obtained from point-of-care HCV RNA testing and self-reported HCV status. Of those diagnosed with hepatitis C, determined by a combination of self-report (previous hepatitis C treatment) and point-of-care HCV RNA testing for detection of current infection, 87.1% (n=686) were linked to care and 66.0% treated (n=520). Treatment uptake was positively associated with being male, aged 45 years (median participant age) or older and currently receiving OST. Although treatment uptake was less likely among those who were homeless and with higher injecting frequency (daily or more), uptake was greater than 45% in almost all sub-populations.

Figure 27. The hepatitis C diagnosis and care cascade, 2018



	Living with hepatitis C	Diagnosed with hepatitis C	RNA confirmed hepatitis C	Received treatment (DAA)	Cured
2015–2018 combined				57 640	53 720
To the end of 2018	129 640	102 420	76 820	16 690	15 670

Source: Kirby Institute, National update on HIV, viral hepatitis and sexually transmissible infections in Australia: 2009–2018.[1]

Four

Hepatitis C-attributable morbidity: transplantation

Reducing hepatitis C-related mortality remains a longer-term goal but is an important elimination target. Given the elevated risk of hepatocellular carcinoma among people with cirrhosis, even following 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 liver cancer. Thus, observed declines in liver cancer numbers are likely to be delayed. However reductions in liver failure and the subsequent liver transplants due to liver failure may be more immediate.

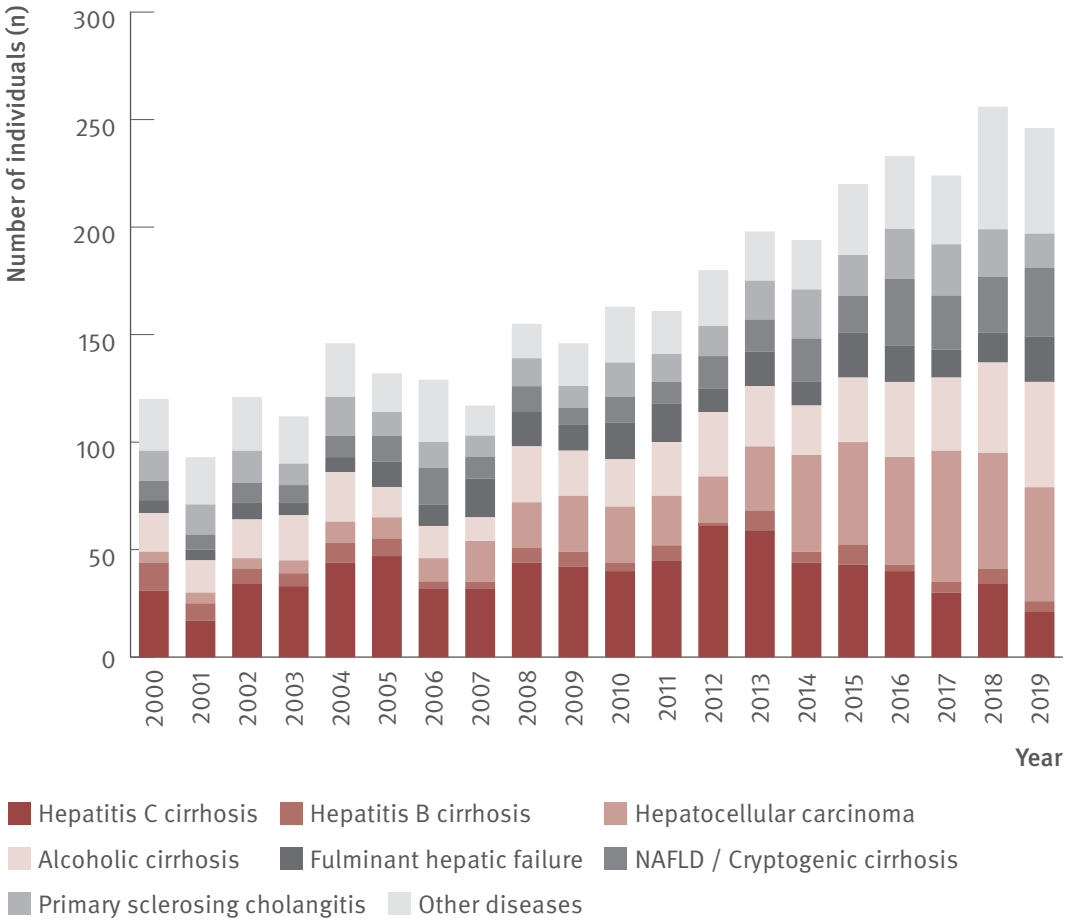
No national registry collates data on morbidity and mortality outcomes among people diagnosed with hepatitis C. However, the Australia and New Zealand Liver and Intestinal Transplant Registry collates data on the primary diagnosis of liver transplant recipients.

PROGRESS ON REDUCING HEPATITIS-C ATTRIBUTABLE MORBIDITY: TRANSPLANTATION

The number of individuals who were recipients of a liver transplant and had a primary diagnosis of hepatitis cirrhosis declined in the past three years (Figure 28).

There are scarce data on mortality, morbidity, and other outcomes related to hepatitis C, 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 28. Number of Australian adult liver transplant recipients' by primary diagnosis and year of first transplant, 2000–2019



Source: Data of transplant recipients in Australia sourced directly from the Australia and New Zealand Liver and Intestinal Transplant Registry.[32]

Notes: Adults defined as ≥16 years of age. NAFLD: non-alcoholic fatty liver disease.

Five

Stigma and discrimination experienced by people living with hepatitis C

Monitoring of perceived stigma is important for understanding barriers individuals face in accessing testing, diagnosis and treatment for hepatitis C, and for understanding and responding to the needs of affected communities. Understanding experiences of hepatitis C-related stigma can provide context to other indicators, such as the lack of progress in testing and treatment uptake overall, among particular groups, or within particular settings. Shame, fear, experiences of discrimination and concerns about privacy can all contribute to individuals not disclosing risk and therefore not being offered or requesting hepatitis C testing. This then flows on to individuals not receiving timely diagnosis and treatment.

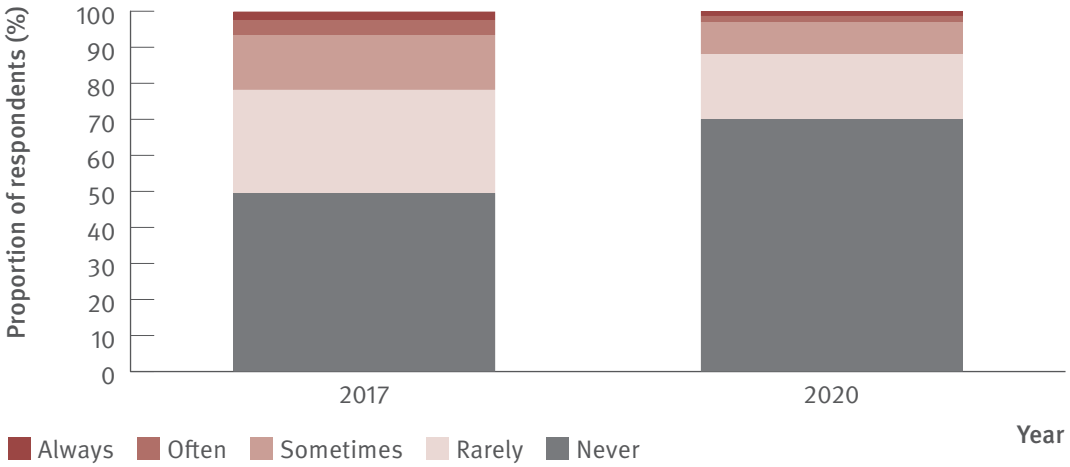
Standardised population-level monitoring of hepatitis C-related stigma is only in its infancy, with tools developed recently as part of the Stigma Indicators Monitoring Project available to provide insights into experiences of stigma related to hepatitis C and IDU.[33] The Stigma Indicators Monitoring Project periodically includes indicators of the experience and expression of stigma in cross sectional surveys of priority population groups, healthcare workers, and the general public.

An indicator of expressed stigma towards people living with hepatitis C and PWID was included in the 2017 Australian Survey of Social Attitudes (a postal survey of a representative sample of the adult Australian population), completed by 1 001 participants. In 2020, the indicator was included in an online survey of the Australian public, recruited via paid advertising on social media. The indicator was completed by 2 010 participants.

PROGRESS ON REDUCING STIGMA

Data suggests there is ongoing stigma and discrimination towards people living with hepatitis C and PWID. Members of the Australian general public were more likely to report stigmatising attitudes and discriminatory behaviour towards PWID than people living with hepatitis C (Figures 29 and 30). However, the impacts of layered stigma (e.g., stigma in relation to both IDU and hepatitis C) are also important to consider. This is particularly notable in situations where a stigmatised condition (i.e., hepatitis C) coexists with a stigmatised behaviour (i.e., IDU) and blame is attributed based on that behaviour. Regular monitoring of stigmatising experiences among PWID and people living with hepatitis C (including those who do not inject drugs) is required, as is continued monitoring of expressed stigma towards these groups by the general public and healthcare workers. Ongoing monitoring of stigma from these varied perspectives is necessary to understand any changes in experiences and effects of stigma over time.

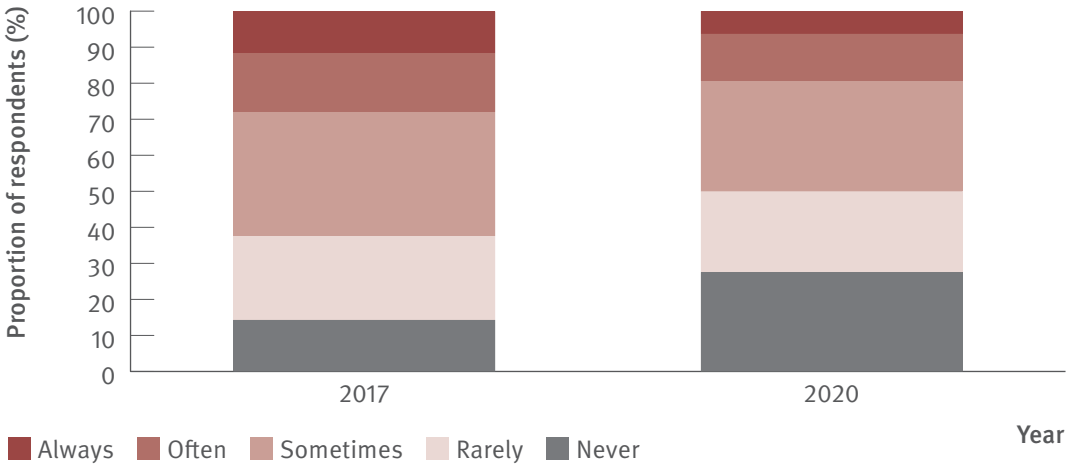
Figure 29. Reports of stigma or discrimination by the general public towards other people because of their hepatitis C status, 2017–2020



Source: Stigma Indicators Monitoring Project.[33]

Notes: Different recruitment methods were used between 2017 and 2020, therefore, comparisons between time points should be made cautiously.

Figure 30. Reports of stigma or discrimination by the general public towards other people because of their IDU, 2017–2020



Source: Stigma Indicators Monitoring Project.[33]

Notes: Different recruitment methods were used between 2017 and 2020, therefore, comparisons between time points should be made cautiously.

Six

Prevention of hepatitis C acquisition

Key actions for preventing the primary transmission of hepatitis C 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 PWID provide important indicators for assessment of hepatitis C prevention efforts.

The Needle Syringe Program Minimum Data Collection reports annually on needles and syringes distributed nationally, providing an overview of activity to prevent re-use of needles and syringes.[34] The annual ANSPS[18] and the Illicit Drug Reporting System (IDRS)[35] questionnaires ask participants about episodes of receptive sharing to identify trends in injecting practices.

The Gay Community Periodic Survey provides national estimates on IDU among GBM and gives specific insights into IDU among GBM by HIV status.[36,37]

PROGRESS ON PREVENTION OF HEPATITIS C ACQUISITION

The number of needle and syringes distributed in Australia has increased steadily over the past decade and plateaued over the most recently reported years (Figure 31).

Approximately one in five respondents in the ANSPS reported receptive sharing of needles and syringes in the past month (Figure 32), and this proportion has remained relatively stable over the past eight years.

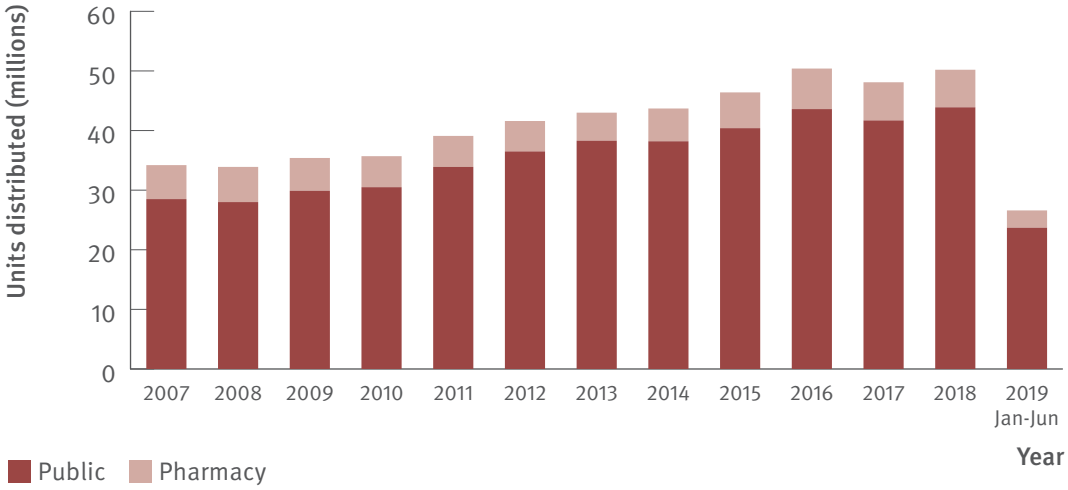
In 2019, overall HCV antibody positivity among ANSPS respondents was 45.5% (1 151/2 531), the third consecutive year that positivity was ‹50%, following two decades of HCV antibody prevalence ≥50% (all years between 1999 and 2016).[18] Between 2015 and 2019, at least half of ANSPS respondents of Aboriginal or Torres Strait origin were HCV antibody positive, and positivity has remained ›50% since 2015. Among ANSPS respondents with a shorter duration of injecting (less than three years), HCV antibody prevalence declined from 16% to 5% between 2015 and 2019 (unpublished data, Kirby Institute, 2020).

Among ANSPS respondents tested for HCV RNA, positivity declined from 50.7% (496/978) to 17.7% (378/2 140) between 2015 and 2019. Among men HCV RNA tested, positivity declined from 53.2% (350/658) to 18.7% (264/1 412) between 2015 and 2019. Among women, HCV RNA positivity declined from 45.3% (141/311) to 15.7% (111/706) between 2015 and 2019. The proportion of HCV antibody positive respondents with detectable HCV RNA also declined from 76% in 2015 to 37% in 2019.[18] These trends are suggestive of a recent treatment-as-prevention impact.

The IDRS has shown declines in receptive sharing of needles and syringes over the past six years, although the decline has plateaued in more recent years (Figure 33).

Data from the Gay Community Periodic Survey shows that IDU is more prevalent among HIV-positive than HIV-negative GBM, with little change in the prevalence of self-reported injecting over the past 10 years (Figure 34).

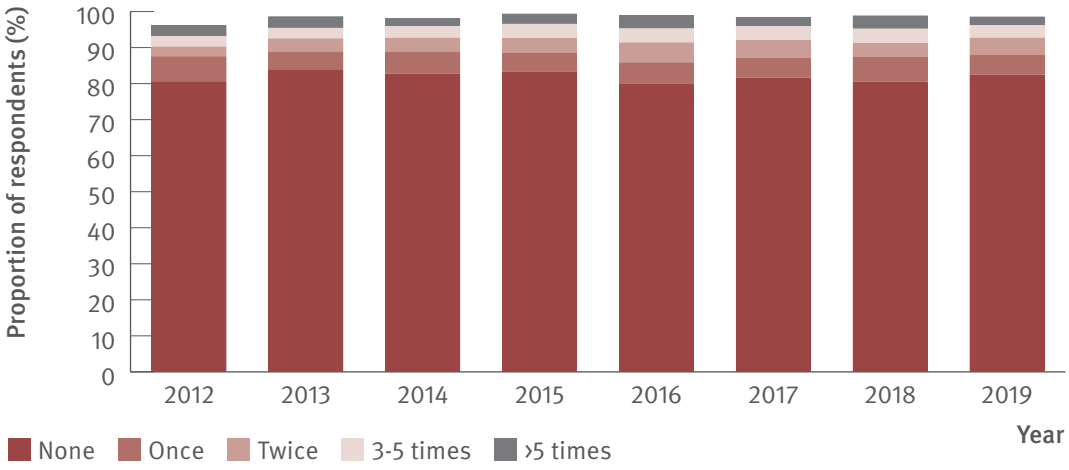
Figure 31. Number of needle and syringe units distributed, by public and pharmacy sector, 2007–June 2019



Source: Needle Syringe Program National Minimum Data Collection: National Data Report 2019.[34]

Notes: July–December 2019 data not available at the time of reporting.

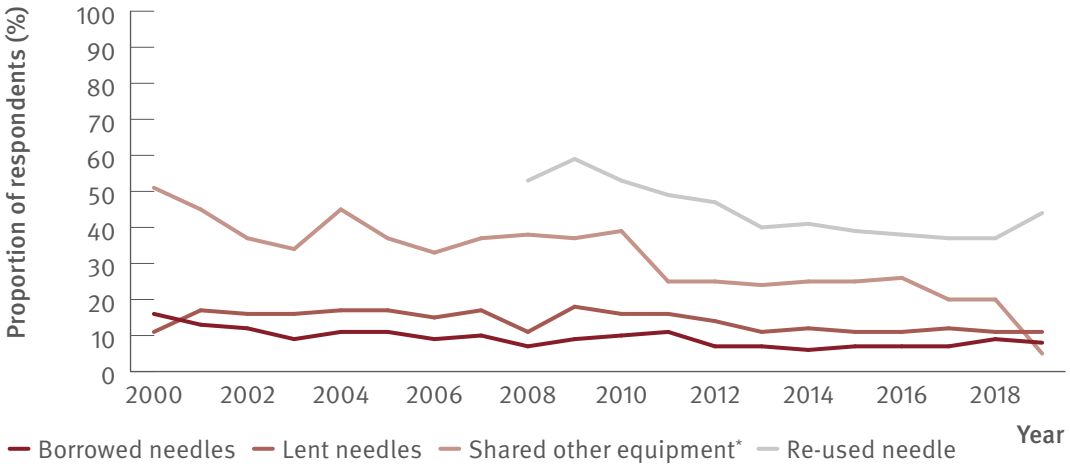
Figure 32. Proportion of respondents reporting re-use of someone else's needles and syringes in the last month, 2012–2019



Source: Australian Needle Syringe Program Survey: Prevalence of HIV, HCV and injecting and sexual behaviours among NSP attendees, 25-year National Data Report 1995–2019.[18]

Notes: Not reported not included. Injection risk behaviour variables are presented among those who injected in the previous month, not the entire sample. For 2012 to 2019, sample size was (in order): 2 128, 2 111, 2 141, 2 071, 1 993, 2 314, 2 452, 2 333.

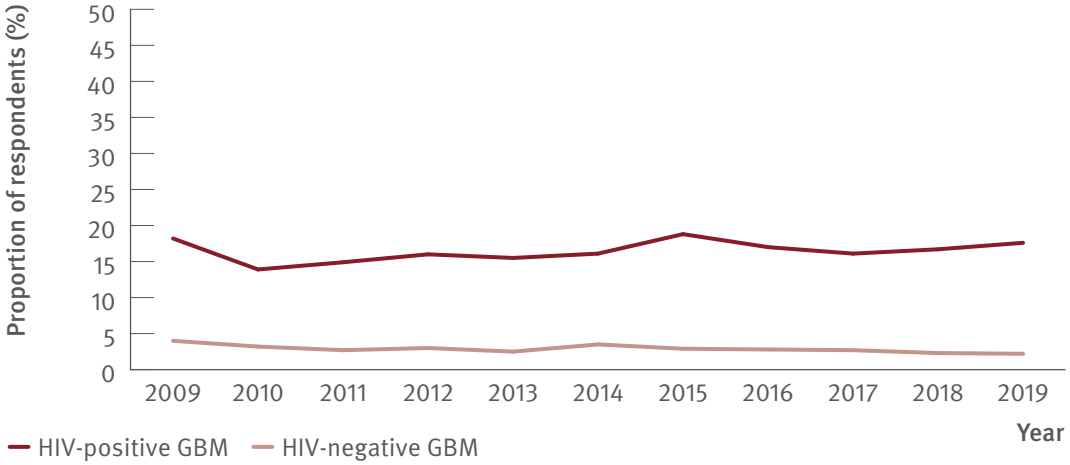
Figure 33. Proportion of respondents reporting borrowing and lending of needles, sharing of injecting equipment, and re-use of needles in the past month, national, 2000–2019



Source: Australian Drug Trends 2019. Key findings from the national IDRS interviews.[35]

Notes: Collection of data about re-use of needles began in 2008. *Includes spoons, water, tourniquets, and filters.

Figure 34. Proportion of GBM who reported any drug injection in the six months prior to the survey, national, by HIV status, 2009–2019



Source: Gay Community Periodic Survey, Annual Report of Trends in Behaviour 2019: HIV and STIs in Australia.[36,37]

Notes: Unadjusted data.

Seven

Health equity mapping

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

The following data are 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), giving insights into geographic diversity in these outcomes.[28]

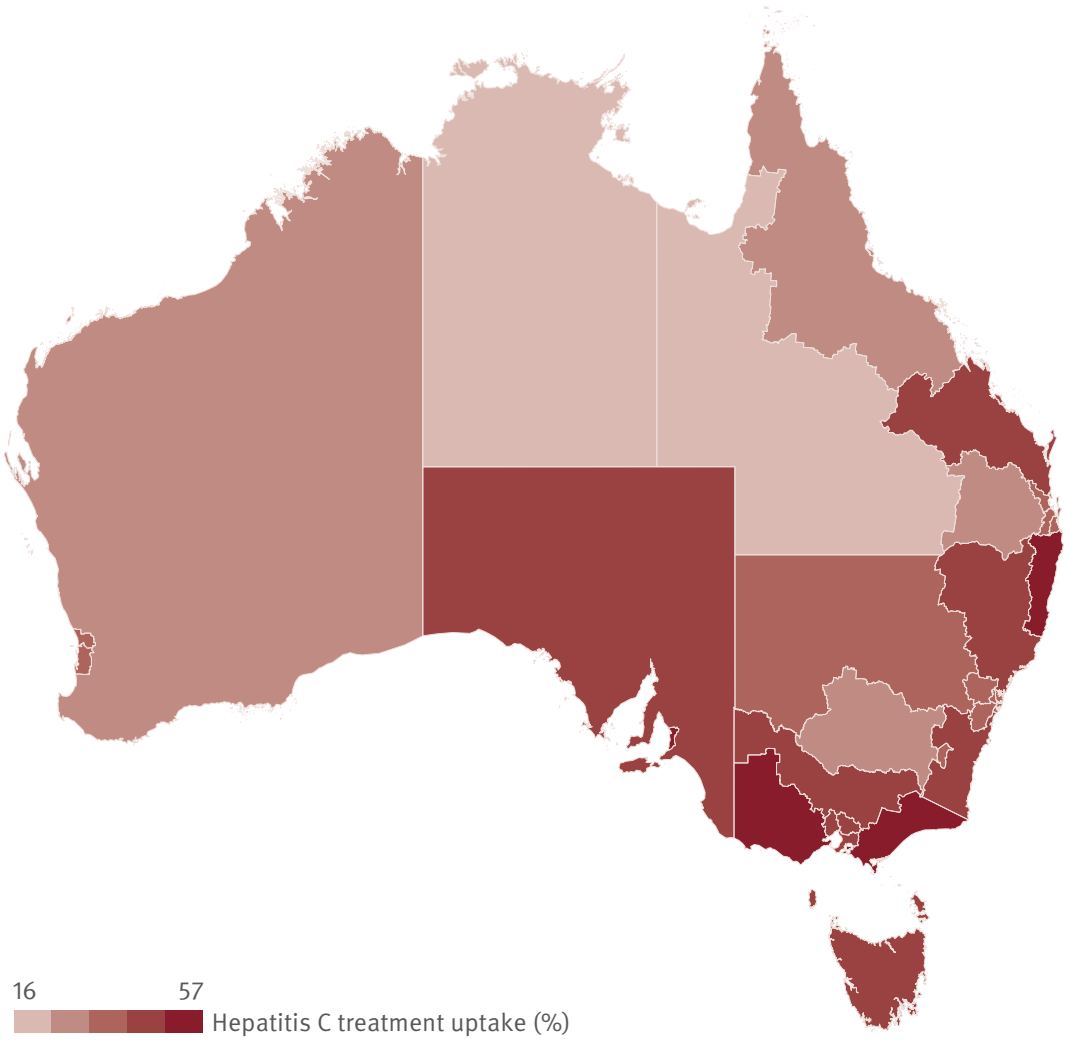
PROGRESS TOWARDS EQUITY

Treatment uptake

Treatment uptake at mid-2019 remained highest in the PHNs of Western VIC, Gippsland VIC, Adelaide, North Coast NSW, and South Eastern Melbourne. The lowest uptake was in Western QLD, the Northern Territory, and Murrumbidgee NSW PHNs (Figure 35). The rate of decline in treatment numbers differed according to region, and the largest decreases generally occurred in PHNs located in major cities or inner regional areas with higher than average initial uptake. This variation in uptake trends will impact the ability of many PHNs to reach strategic targets despite impressive initial uptake levels.

The 10 PHNs with the lowest treatment uptake all had hepatitis C prevalence above the national average and were more likely to be those outside metropolitan areas, those with greater socioeconomic disadvantage, and those with the least access to specialist services (Figure 36). These factors highlight the importance of assessing other barriers to the provision and uptake of hepatitis C treatment in areas with greatest need. To achieve hepatitis C elimination, prioritising treatment access to those areas of highest burden and lowest uptake will be essential.

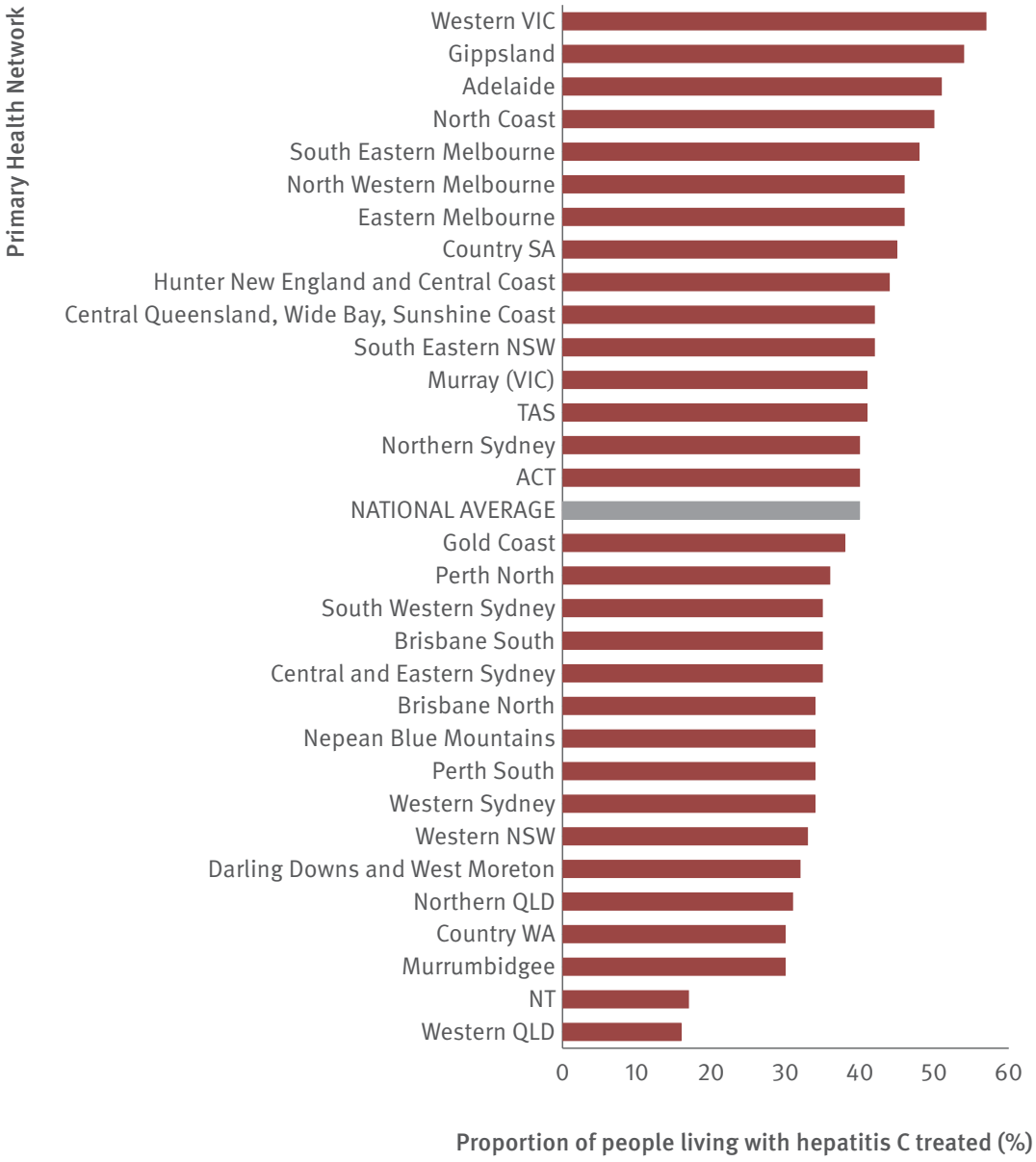
Figure 35. Geographic variation in hepatitis C treatment uptake, March 2016–June 2019



Source: The National Viral Hepatitis Mapping Project (WHO Collaborating Centre for Viral Hepatitis, The Doherty Institute).[28]

Notes: Hepatitis C prevalence estimates based on mathematical modelling incorporating population-specific prevalence and Australian Bureau of Statistics population data. Treatment data sourced from Department of Human Services Medicare statistics.

Figure 36. Hepatitis C treatment uptake in Australia, by PHN, March 2016–June 2019



Source: The National Viral Hepatitis Mapping Project (WHO Collaborating Centre for Viral Hepatitis, The Doherty Institute).[28]

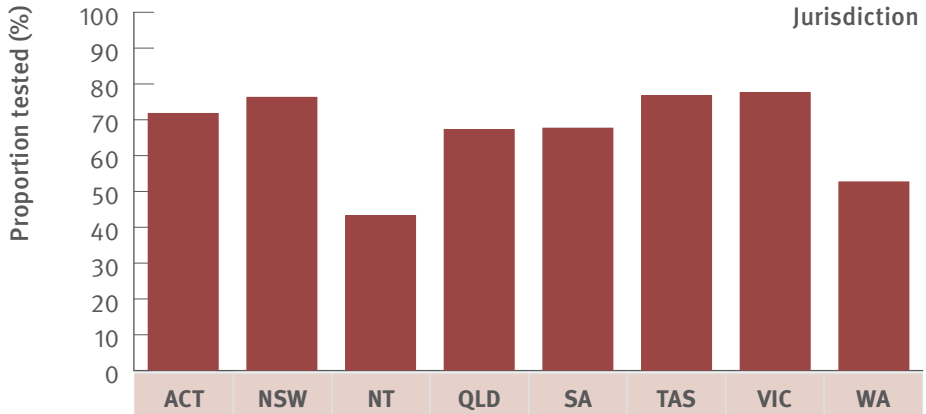
Notes: Hepatitis C prevalence estimates based on mathematical modelling incorporating population-specific prevalence and Australian Bureau of Statistics population data. Treatment data sourced from Department of Human Services Medicare statistics.

Treatment outcomes

Testing to confirm an SVR after treatment completion is recommended in Australian clinical guidelines,[38] despite the known high cure rates of DAA treatment. In Australia, between March 2016 and June 2019, 72.0% of individuals had an SVR test after they completed treatment. The proportion of people who had an SVR test varied between jurisdictions (Figure 37).

SVR testing is particularly important in people with pre-existing liver disease and those with prior treatment failure; however, even in those treated for 24 weeks (recommended for many people with cirrhosis or prior treatment experience), SVR testing uptake was only 73.3%. The proportion of people who had an SVR test was higher in those aged over 50 years (81.9% compared to 71.8%) and in women (76.8%) than men (69.6%). The proportion of individuals who had an SVR test has decreased over time, from 76.6% for those who initiated treatment in 2016 to 65.6% in 2017, and 57.7% for those who began in 2018. This change may reflect decreases in the proportion of people with pre-existing liver disease who are treated (since those people require ongoing post-treatment monitoring), as well as increased experience and confidence with the efficacy of treatments over time.

Figure 37. Proportion of individuals that completed treatment and 12 months of follow-up time, that had an SVR test, by state and territory, 2016–2018*



	ACT	NSW	NT	QLD	SA	TAS	VIC	WA
Number of people who completed treatment	786	15 788	376	9 211	2 881	1 203	11 930	3 719

Source: The National Viral Hepatitis Mapping Project (WHO Collaborating Centre for Viral Hepatitis, The Doherty Institute).[28]

Notes: Treatment data sourced from Department of Human Services Medicare statistics. Treatment completion is defined as all scripts collected of the number indicated by the item code used (e.g., three scripts for a 12-week duration item). *SVR testing data used one year of minimum follow-up time, restricting measures to mid-2018.

Eight

Modelling

Mathematical models are useful tools for identifying key issues affecting 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 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 if key regions or sub-populations are being left behind in the elimination response.

PROGRESS TOWARDS ELIMINATION

The models presented below were developed by the Burnet Institute and Kirby Institute. Both models indicate that by maintaining current treatment numbers Australia is on target to meet its hepatitis C elimination goal. Modelling from the Kirby Institute showed hepatitis C incidence and prevalence reduction goals would be met under optimistic (annual treatment numbers are maintained at 2018 levels; 16 690 per year), intermediate (annual treatment numbers maintained at 2019 levels; 11 580 each year from 2020 onwards), and pessimistic (annual treatment number declined and maintained at 10 010 each year from 2020 onwards) treatment scenarios (Figure 38 and Table 1). The Kirby Institute model estimates that under the intermediate treatment scenario, Australia will achieve the 80% treatment coverage and the 90% reduction in hepatitis C incidence targets by 2028.

Modelling from the Burnet Institute suggests that testing needs to increase to maintain the treatment numbers required to reach the hepatitis C elimination targets (Figure 39). The model estimates that the annual number of HCV RNA tests needs to increase from the 17 000 recorded in 2019 to approximately 28 000 per annum from 2021 onwards. If this occurred, it could increase diagnoses sufficiently to maintain treatment numbers at approximately 2018 levels.

Reaching the incidence reduction target also requires that a sufficient number of treatments are among PWID, in order to achieve treatment-as-prevention benefits. Based on time-varying national estimates of total hepatitis C infections, the total number of PWID, hepatitis C prevalence among PWID, and total treatments, and assuming that between 2016–2020 HCV-infected PWID were twice as likely to be tested and treated as HCV-infected non-PWID, the model estimates that treatment numbers among PWID decreased from 6 300 in 2016 to 2 300 in 2019. To achieve elimination, treatment among PWID would need to be increased to 4 200 – 5 400 per annum from 2021 onwards. Importantly, this number of treatments reflects a larger scale-up in earlier years (2021–2027), to prevent any rebound in infection and maximise treatment-as-prevention benefits compared to a scenario where treatments are evenly distributed across years.

Figure 38. 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)

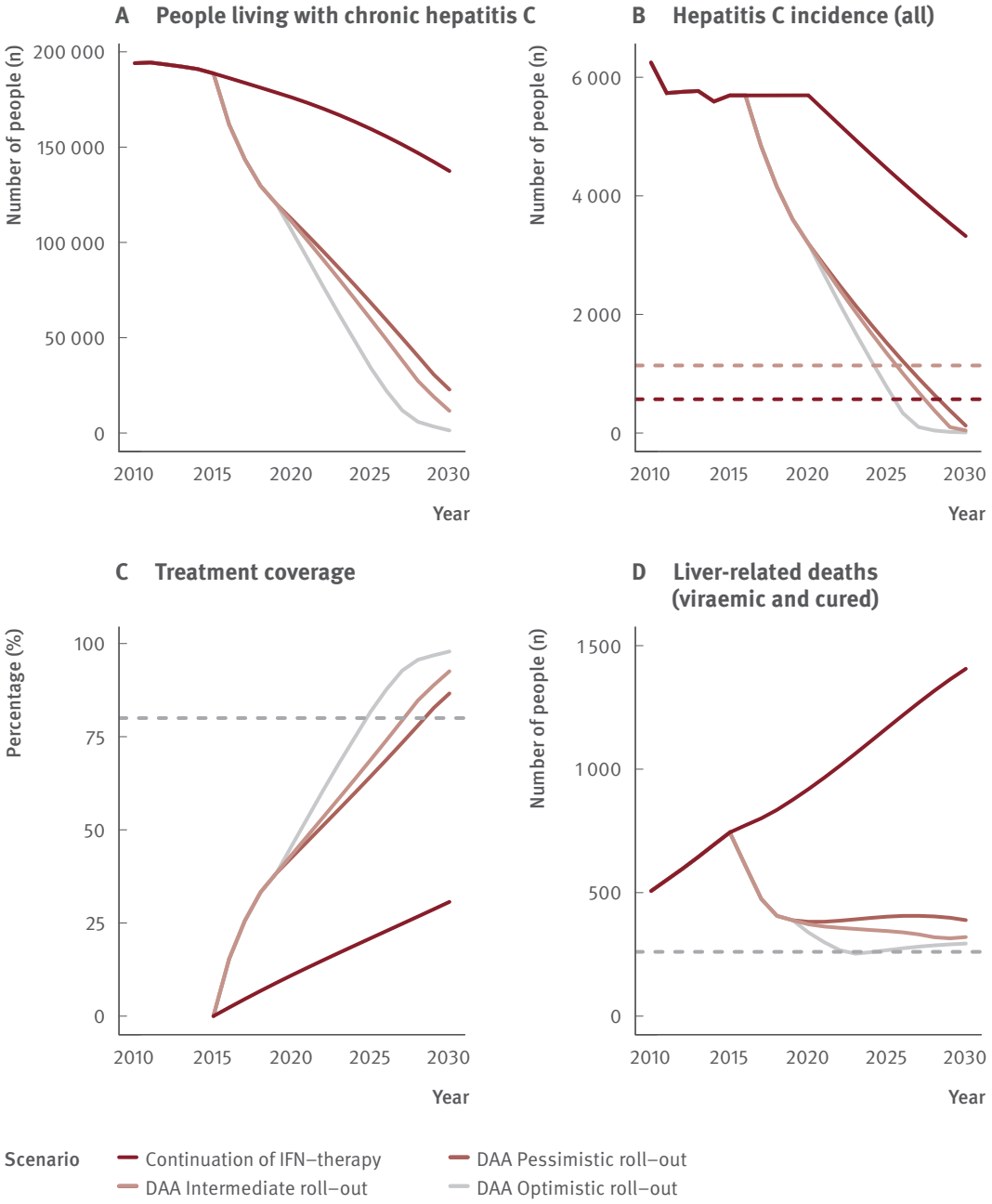
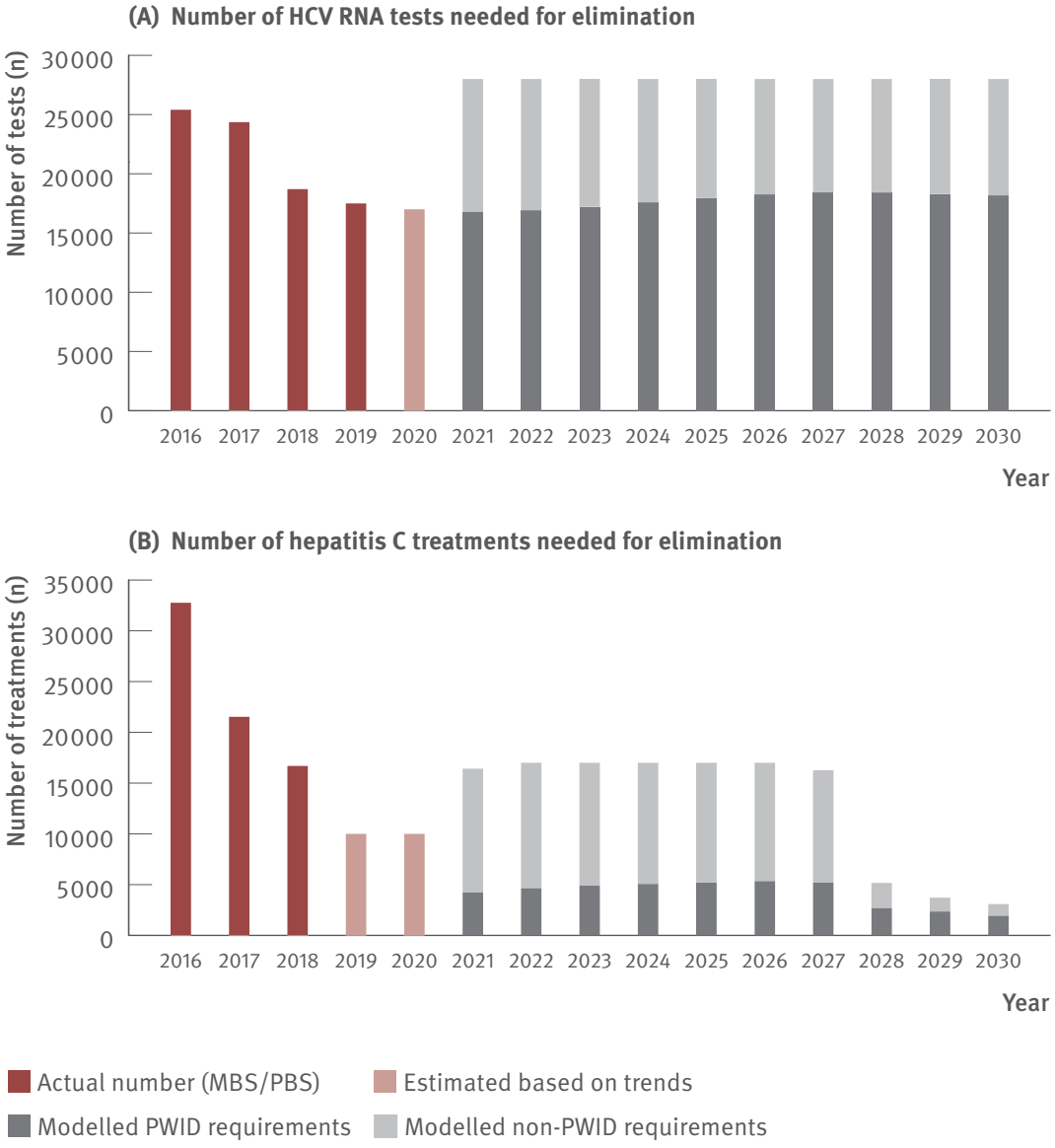


Table 1. Scenarios for the annual number of people in Australia receiving DAA

Treatment roll-out scenarios	2015 (Interferon + DAA)	2016	2017	2018	2019	Post -2020
Pessimistic roll-out	4 720	32 650	21 560	16 690	11 580	10 010
Intermediate roll-out	4 720	32 650	21 560	16 690	11 580	11 580
Optimistic roll-out	4 720	32 650	21 560	16 690	11 580	16 690

Source: Updated from Kwon JA, et al. JVH 2019.[24]

Figure 39. Model projections for the annual number of HCV RNA tests (A) and hepatitis C treatments (B) needed between 2021–2030 to achieve the WHO elimination target of an 80% reduction in incidence by 2030, relative to 2015 levels



Source: Updated from Scott et al., MJA 2020.[4]

Notes: Testing numbers for 2020 and treatment numbers for 2019/2020 were estimated based on past trends.

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.

Australian Collaboration for Coordinated Enhanced Sentinel Surveillance of blood borne viruses and sexually transmissible infections

ACCESS was established to monitor sexually transmissible infection and blood borne virus testing and test outcomes among priority populations.[10,11,12] ACCESS focusses on recruiting sites that serve priority populations, including PWID and HIV-positive GBM. ACCESS collates data on consultations, hepatitis C testing and test outcomes, and treatment from participating sites. Please note that the data included in this report may differ from 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

Patient records were linked between sites using a linkage code and probabilistic matching so that consultation, testing and result data account for patients attending more than one ACCESS site.

Sites

Data from 25 clinics were used and stratified into primary care clinics that specialise in the health of PWID as well as providing general primary care, and clinics specialising in the health of GBM. Primary care clinics included 12 clinics in VIC and one in WA; of these clinics, eight have onsite NSPs and all 13 clinics had OST providers at the time of reporting. GBM clinics included four clinics in VIC, three in NSW, two in SA, two in WA and two in QLD. 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,[39] 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 patients could be classified on recorded sexuality alone, meaning that classification of individuals as GBM at these clinics is based largely on sexually transmissible infection testing history criteria within the algorithm.

HIV-positive GBM

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 ACCESS.

Incidence definition

Patients 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 in the ACCESS dataset from 2009 (at risk for primary infection). Time-at-risk was defined as the cumulative time between each patient'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.

A hepatitis C infection was assigned as incident if the individual's previous negative hepatitis C test result (HCV antibody only or HCV antibody and RNA) was less than 24 months ago, for comparison with Communicable Disease Network Australia's newly acquired case definition.[13] Date for incident infection was assigned as the mid-point between the positive test and prior negative test. Only the first incident infection recorded in ACCESS was included in this analysis.

Reinfection was defined as progression from HCV RNA negative to HCV RNA positive among those with a previous incident case. Classification as a reinfection required two consecutive negative HCV RNA tests prior to the HCV RNA positive. Reinfection was assessed on all individuals attending included clinical sites with no restriction on time between tests applied, to increase the data available for assessing reinfection rates.

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.

Proportion positive

Annual proportion positive was defined as number of individuals tested positive divided by number of individuals tested, with individuals only counted once a year.

Treatment

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

Real-world efficacy of antiviral therapy in chronic hepatitis C in Australia

REACH-C is a national observational cohort that includes 33 diverse study sites from ACT, NSW, NT, QLD, SA, TAS, VIC, and WA. Consecutive individuals commencing DAA therapy were identified at each site. Baseline characteristics such as gender, fibrosis stage, IDU, and OST use were collected through review of medical records. Information about treatment date, regimen, and duration were also recorded. Data were collected for all individuals commencing DAA therapy from March 2016 to June 2019. Individuals were followed up for treatment outcome and retreatment data until December 2019.

Efficacy of treatment was determined by the proportion of individuals who attained SVR, defined as HCV RNA undetectable at least 12 weeks post-treatment. Clinics were asked to provide a reason if SVR was not attained (virological failure, reinfection or other).

Individuals were classified as having unknown SVR if, by the time of data submission (end 2019), they had not returned to clinic at least 12 weeks after treatment for confirmation of cure testing. Individuals viraemic at SVR were classified as reinfected if their genotype was different to that at pre-treatment, and virological failure if their genotype was the same as that at pre-treatment.

Retreatment for reinfection includes individuals identified as reinfected at SVR by genotype switch, and individuals who became viraemic following attainment of SVR. Retreatment for virological failure includes individuals who did not attain SVR and for whom retreatment genotype was the same as pre-treatment. Retreatment for unknown reasons includes individuals who had an unknown SVR result and for whom retreatment genotype was the same as at pre-treatment.

Analysis of treatment outcomes was performed by per protocol (i.e., including only individuals with a known SVR outcome).

It should be noted that data collection from clinics is ongoing and a portion of missing data may be retrievable from study sites in the future.

Enhancing Treatment of Hepatitis C in Opioid Substitution Settings (ETHOS) Engage study

ETHOS Engage is an observational cohort study recruiting participants from OST sites, drug and alcohol treatment sites, and NSPs. ETHOS Engage participants had either recent IDU (previous six months) or were currently receiving OST. The study collected baseline data using a questionnaire and conducted point-of-care tests for hepatitis C.[20]

ATLAS network

The Centre for Research Excellence in Aboriginal Sexual Health and Blood Borne Viruses (NHMRC #1100302) has established a sexually transmissible infection and blood borne virus sentinel surveillance network representative of ACCHS – known as the ATLAS network.

It augments the National Notifiable Disease Surveillance System[8] and helps us understand the burden of disease due to sexually transmissible infections and blood borne viruses among Aboriginal and Torres Strait Islander peoples.

The ATLAS network currently includes 29 ACCHSs located in five 'clinical hubs' across QLD (two hubs), NSW, SA, and the Kimberley, WA. Regular reports addressing 12 performance measures are provided to ACCHSs 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: HCV 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 ACCHSs.

Monitoring hepatitis C treatment uptake in Australia

The methods for the estimations have been described in detail elsewhere.[2,3] In brief, data for a longitudinal cohort of individuals, representing a 10% random sample of the PBS database, were used to estimate the number of individuals initiating DAA treatment between March 2016 and December 2019, and for all subgroup analyses of DAA uptake. The estimated numbers of individuals living with hepatitis C infection in Australia and in each jurisdiction in 2015 were extracted from a modelling study.[1]

Several factors should be considered in interpreting the results. Given that the results were extrapolated from a 10% random sample of the PBS database, the results in subgroups with small numbers might be subject to uncertainties. This analysis provided data about treatment initiations; it does not reflect the number of individuals who completed their treatment course, although treatment discontinuation is expected to be low. The jurisdiction-specific treatment initiation estimates in this report were based on data about dispensing pharmacy location, not patients' residential location, while the estimated numbers of individuals living with hepatitis C were based in part on the number of hepatitis C notifications, which were reported based on residence. Thus, cross-jurisdiction dynamics should be considered in interpreting the jurisdiction-specific data. They could have more impact on the estimates for smaller jurisdictions given smaller populations acting as the denominators.

National Prisons Hepatitis Network

Data on new treatment initiations in Australia's prisons were collated by the National Prisons Hepatitis Network.

Australian Capital Territory

Data on newly initiated hepatitis C therapies are entered by clinical staff, reviewable from electronic medical records and auditable from pharmacy and MedChart Electronic Medication Management.

New South Wales

Data are collected via the Pharmacy dispatch report when medications are dispensed to centres.

Northern Territory

Data are obtained through the Viral Hepatitis Service's hepatitis C clinical database that records treatment initiations. Accuracy and completeness of data are dependent on the quality of the data recorded by the clinicians.

Queensland

Data are obtained directly from Prisoner Health Services in each facility as part of the annual Hepatitis C Treatment Uptake Progress Report.

South Australia

Paper-based health records were used in prisons. The number of treatment initiations is based on pharmacy prescriptions filled.

Victoria

Data are sourced from the Department of Justice and Community Safety (Victorian Government), based on the monthly State-wide Hepatitis Program worksheet reported by St Vincent's Hospital Melbourne.

Western Australia

Data are obtained through the electronic patient health record (EcHO). Accuracy and completeness of data are dependent on the quality of the data recorded in EcHO by prison-based clinicians.

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 more) 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.

Viral Hepatitis Mapping Project

Full details of the methods used by the Viral Hepatitis Mapping Project and additional data and results can be accessed through the project website.[28]

In brief, hepatitis C prevalence is derived by applying published national prevalence estimates to each geographic area proportionally according to the distribution of diagnosed cases

reported in national notifications. All positive diagnoses of HCV antibody or RNA are legally required to be reported to jurisdictional departments of health by the diagnosing laboratory. Estimates were based on diagnosed cases which occurred during the period 2007–2016, selected as the most representative of current residents of a geographic area. Prevalence data are adjusted to account for residents of correctional facilities and correct the resulting skewed rates according to area. However higher hepatitis C screening rates in a particular area could inflate the estimated prevalence and therefore reduce estimated treatment uptake.

Treatment uptake is derived by dividing the number of people receiving treatment by the total estimated population living with hepatitis C in a given geographic area. Treatment data are sourced from Australian Government Department of Human Services Medicare data, and include all individuals who received DAA treatment through the PBS during March 2016–June 2019. Each person living with chronic hepatitis C was counted only once. Treatment data are derived using postcode of residence and may be affected by prison geography if Medicare records are updated to reflect a prison as an incarcerated individual's area of residence. Further exploration of the impact of treatment in prisons on geographic measures will be provided in future reports.

Estimates of SVR testing uptake are generated by calculating the proportion of people who had a qualitative or quantitative HCV RNA test through the MBS after treatment. This analysis was restricted to those who completed their treatment course (indicated by collecting all the scripts indicated by the PBS item number used) and had sufficient minimum follow-up time (one year from end of treatment). No minimum time threshold was applied for the SVR test due to the significant number of individuals who had an SVR test less than 12 weeks after completing treatment.

All data are geographically mapped to regions using postcode of residence as recorded in administrative data.

An Observational, Prospective Epidemiological Registry in Australia of HCV Liver Disease

OPERA-C is an investigator-initiated, prospective study across 29 tertiary hospitals in Australia. Six-monthly data collection tracks hepatitis C treatment and cure (SVR) and any complications such as liver cancer and decompensation. Patient data are collected from the patient's medical charts by trained nurses at sites and data are entered centrally.

Stigma Indicators Monitoring Project

For more information about the development of the stigma indicator, see Broady et al.[33]

Australian Survey of Social Attitudes

In 2017, the Australian Consortium for Social and Political Research Incorporated included a mirrored stigma indicator in the Australian Survey of Social Attitudes, which surveys a representative sample of adult Australians by posting a paper questionnaire to a random sample from the Australian Electoral Roll. A total of 1 001 people completed the stigma indicator.

2020 General Public Survey

In 2020, a mirrored stigma indicator was included in an online survey of the Australian general public. Participants were recruited through paid Facebook advertising. The 2020 online sample was less representative of the Australian population than the Australian Survey of Social Attitudes sample. A total of 2 010 people completed the survey.

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 (UNSW) conducts the survey in seven Australian states and territories, with community-based recruitment focused on metropolitan areas. Its methods are described in detail elsewhere.[36,37]

Modelling the Australian response to hepatitis C

Methods associated with the Kirby Institute's modelling have been published in detail.[24] Methods associated with the Burnet Institute's modelling of the hepatitis C epidemic and the response to hepatitis C have been published.[4]

Publicly available data

Notifications of hepatitis C

Notifications of newly acquired hepatitis C were acquired from the National Notifiable Diseases Surveillance System[8] with details and notifications requirements, procedures, and case definitions available from the Australian Government Department of Health.[13] Notifications are also reported in the *National update on HIV, viral hepatitis and sexually transmissible infection in Australia: 2009–2018*.[1]

GOANNA Survey 2

Methods of the GOANNA Survey 2 have been described previously.[21, 22]

Medicare claims for HCV RNA testing

Data tables of Medicare claims are available through Medicare Australia Statistics.[19]

The Australian Needle Syringe Program Survey

The ANSPS is published annually, with full details of methods included.[18]

Hepatitis C cascade of diagnosis and care

The estimates for the hepatitis C cascade of diagnosis and care are published in the *National update on HIV, viral hepatitis and sexually transmissible infection in Australia 2009–2018*.[1]

The Illicit Drug Reporting System

The Illicit Drug Reporting System publishes an annual report, with full details of methods included.[35]

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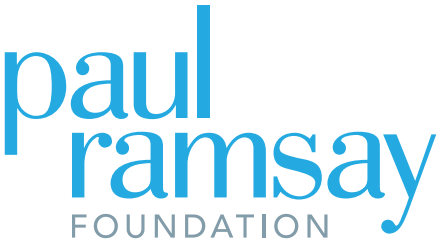

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