Australia's progress towards hepatitis C elimination

Annual Report 2021

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Contents

Preface

Hepatitis C is a significant public health issue in Australia. Until direct-acting antivirals (DAAs) became available to all Medicare-eligible Australians with hepatitis C 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.[1] At the end of 2015 an estimated 188 690 people had chronic hepatitis C infection in Australia.[2]

In the past five years Australia has made great strides towards hepatitis C elimination. Access to DAA treatment, a highly tolerable and effective medication,[3] through public subsidy since March 2016 means Australia is well placed to eliminate hepatitis C as a public health threat by 2030. At the end of 2020, an estimated 117 800 people were living with chronic hepatitis C infection*.[4,5] To achieve hepatitis C elimination, DAA treatment 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 third 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 at the end of 2020 were derived in the updated National hepatitis C diagnosis and care cascade (Chapter Three).[4,5]

† The Fifth National Hepatitis C Strategy 2018–2022 identifies six priority populations: people living with hepatitis C, people who inject drugs and/or accessing drug treatment programs, people who have previously injected drugs, people in custodial settings, Aboriginal and Torres Strait Islander peoples, and people from culturally and linguistically diverse backgrounds.[6]

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 Schedule
NSP	needle and syringe program
OAT	opioid agonist 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

Figures

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Executive Summary

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

Moving to unrestricted access to DAAs for the treatment of hepatitis C in March 2016 provoked a catalytic change in Australia's hepatitis C response. Recent (past two years) policy changes, including removing the need for hepatitis C genotype testing prior to treatment and approval of point-of-care testing devices to simplify diagnosis, further facilitates access to treatment.

Australia has made considerable progress towards elimination in recent years with 88 790 people receiving DAA treatment between March 2016 and the end of 2020 (equivalent to 47% of the 188 690 individuals estimated to have chronic hepatitis C at the end of 2015). Where available, estimates of incidence show the rate of new infections has declined, particularly among priority populations of HIV-positive gay, bisexual, and other men who have sex with men (GBM) and people in prison. Of note is the significant and increasing contribution of prison-based hepatitis services in progressing Australia's elimination goals. This is demonstrated by the high proportion of all DAA initiations conducted in prisons in 2019 (30%) and 2020 (37%), with the prison-based hepatitis programs estimated to be reaching a high proportion of the annual treatment targets of 4 200–5 400 people who inject drugs*. These data underscore the crucial role prison hepatitis services may play in reaching people at risk of hepatitis C in the future and Australia achieving its elimination goals.

Despite Australia's success over the past five years an estimated 117 800 people were living with hepatitis C at the end of 2020; this includes an estimated 3 500 people acquiring new infections each year, highlighting the considerable challenge that remains to eliminate hepatitis C in Australia. Levels of hepatitis C testing, and therefore diagnosis and treatment have declined. To ensure elimination goals are met, considerable effort and investment is needed to raise awareness of hepatitis C and the availability of treatment. Convenient and acceptable models of care are needed to ensure people living with or at risk of hepatitis C access testing and treatment. Importantly, this report highlights that stigma and discrimination towards people at risk of and living with hepatitis C remains prevalent and can result in decreased engagement with hepatitis C testing and treatment services. Interventions to reduce stigma in the community and health care settings will be necessary to continue progress towards elimination.

* Scott et al. in Chapter Eight, Australia's progress towards hepatitis C elimination: annual report 2020, Burnet Institute and Kirby Institute; 2020.

The COVID-19 pandemic has been significant, causing morbidity, mortality, and societal disruption on a global scale. In Australia, the effects of the pandemic and related public health control measures and restrictions have caused disruptions to health care service provision. Whilst primary care and emergency health care was available during periods of restrictions in movement, people may have delayed seeking routine and/or primary care, potentially reducing opportunities for hepatitis C testing and treatment. However, changes in service provision such as publicly subsidised telehealth, may have increased access to primary care. New ways of delivering care may prove to be an important strategy to increase access to hepatitis C diagnosis and care in priority populations. Monitoring the impacts and improvement in key hepatitis C indicators through 2021 and beyond will allow evaluation of the longer-term effects of the COVID-19 pandemic on hepatitis C diagnosis and treatment. With this information, efforts can be targeted to re-engage people living with or at risk of hepatitis C, and keep Australia on track to meet its hepatitis C elimination goals.

One

Newly acquired hepatitis C infections

Measuring the rate of new hepatitis C infections helps monitor strategies that aim to prevent ongoing transmission, including primary 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.[7] These notifications may reflect incident infections because younger people are likely to have initiated injecting drug use (IDU) relatively recently.[8]

Hepatitis C incidence estimates in Australia are also available from data collated by the Australian Collaboration for Coordinated Enhanced Sentinel Surveillance of Sexually Transmissible Infections and Blood Borne Viruses (ACCESS),[9] which links individuals' diagnostic testing data over time.[10,11] ACCESS includes primary care clinics that provide specialist health services to people who inject drugs (PWID), such as needle and syringe programs (NSPs), opioid agonist therapy (OAT), and hepatitis C testing and treatment. ACCESS 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 Chapter Two) 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 HIV-positive GBM (GBM and sexual health clinics). Data from 31 ACCESS sites across seven jurisdictions, and 13 669 individuals were included in incidence estimates. Most primary care clinics in ACCESS are in Victoria (VIC), and most GBM and sexual health clinics are in VIC and New South Wales (NSW).

The Surveillance and Treatment of Prisoners with hepatitis C (SToP-C) study enrolled 3 691 participants from four prisons in NSW between October 2014 and September 2019 of whom 1 643 were at risk of HCV infection or reinfection. The StoP-C study involved treatment scale-up in the prisons from mid-2017, and measured overall incidence, as well as primary HCV infection incidence and HCV reinfection incidence over time.[12]

PROGRESS ON REDUCING NEW INFECTIONS

The number of hepatitis C notifications among people aged 15–19 years has remained relatively stable in recent years. Among men and women aged 20–24 years, notifications have declined since 2017 (Figure 1). The monitoring of hepatitis C notifications among people aged 15–24 years as a surrogate measure for hepatitis C incidence needs to consider levels of testing and their influence on trends.

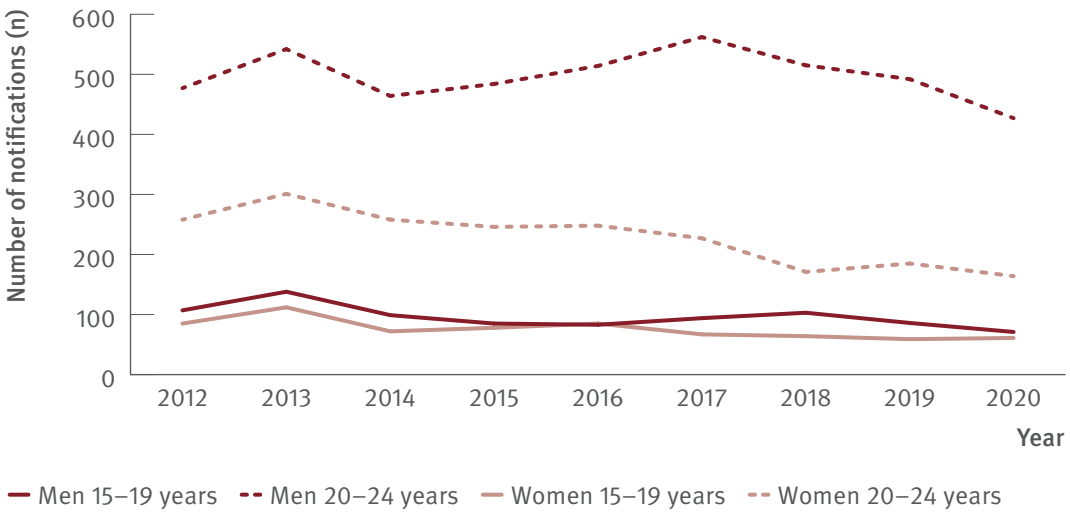
Declines in hepatitis C incidence were observed among individuals tested at ACCESS primary care clinics and among HIV-positive GBM tested at ACCESS GBM or sexual health clinics between 2012 and 2020 (Figures 2 and 3).

In the StoP-C study, the overall HCV incidence (primary infection and reinfection) for the study period was 6.1 per 100 person-years (95% confidence interval (CI): 5.1–7.4); incidence was increasing October 2014–December 2017, prior to the scale-up of hepatitis C treatment, with declines seen post-treatment scale-up, through to December 2019 (Figure 4). Comparing overall incidence before treatment scale-up (2014–2017) to after (2018–2019), incidence reduced from 8.3 per 100 person-years (95% CI: 6.5–10.5) to 4.4 per 100 person-years (95% CI: 3.2–5.9). A total of 1 083 participants were at risk of HCV primary infection (i.e., had a negative HCV antibody test). Primary infection HCV incidence was 4.6 per 100 person-years (95% CI: 3.6–6.0). The estimates of HCV incidence are in the context of 21.5% of participants (797/3 691) reporting injecting drugs in the previous month during the current imprisonment, among whom, 90.5% (722/797) reported re-use of any injecting equipment after someone else had used it.

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

Monitoring new hepatitis C infections

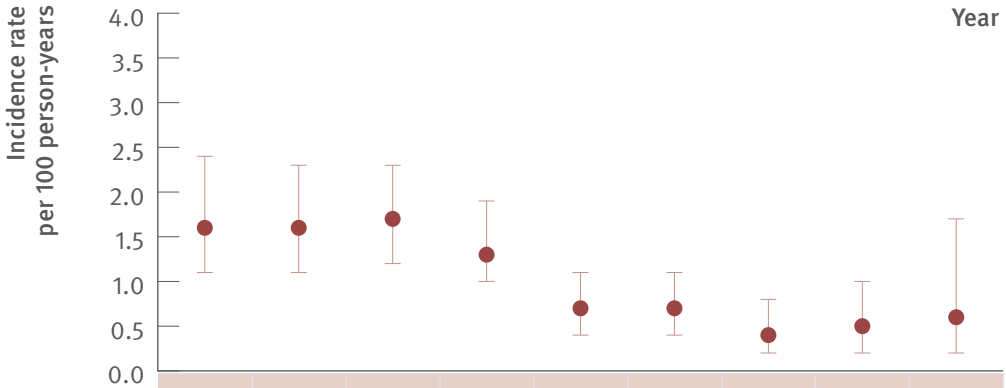
Figure 1. Number of hepatitis C (unspecified) notifications by age group and gender, 2012–2020



Source: Australian National Notifiable Diseases Surveillance System.[7]

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, ACCESS, 2012–2020



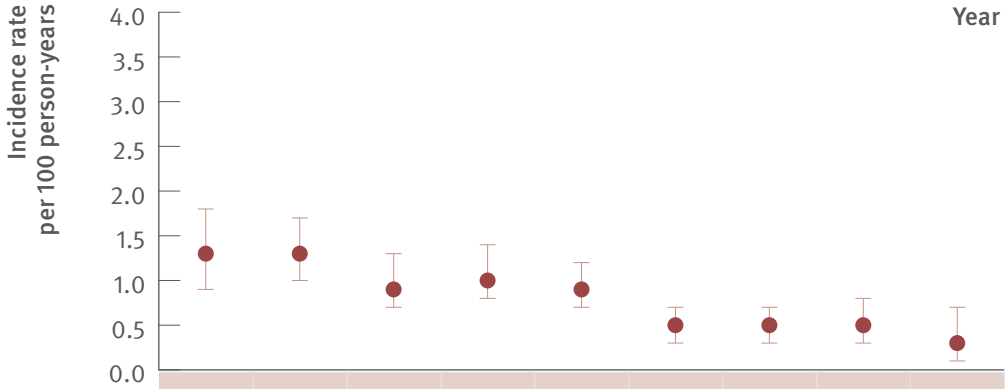
	2012	2013	2014	2015	2016	2017	2018	2019	2020
Incident infections	25	31	39	34	17	17	9	7	3
Person-years	1520.7	1938.4	2335.4	2520.5	2556.8	2404.8	2005.7	1455.4	530.0

Observed incidence rate — 95% CI

Source: ACCESS.[9]

Notes: N=6 593. Analysis includes 11 sites: nine in VIC, one in Western Australia (WA), and one in Queensland (QLD). 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 infection date was assigned as the midpoint between the positive HCV antibody or HCV RNA test date and previous HCV antibody negative test date. ACCESS collates data from January 2009. Individuals included tested HCV antibody negative on their first test observed and had at least one follow-up test (HCV antibody or HCV RNA or both before 31st December 2020). Individuals were 15 years or older. CI: confidence interval.

Figure 3. Incidence of primary hepatitis C infection among HIV-positive GBM tested at ACCESS GBM or sexual health clinics, ACCESS, 2012–2020



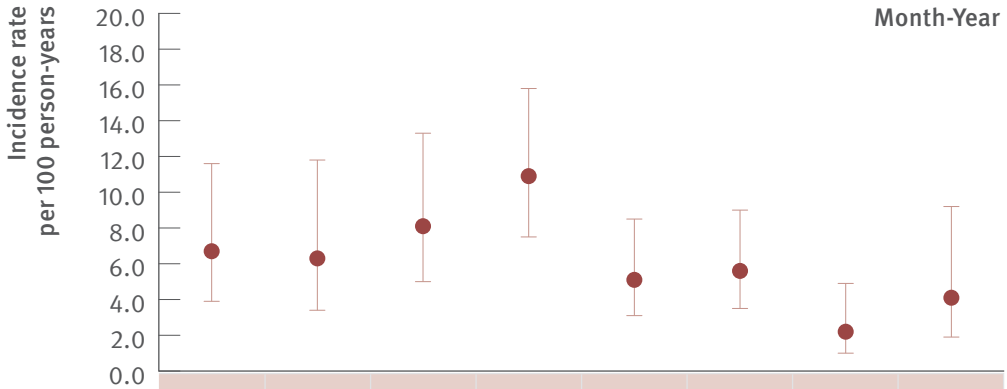
	2012	2013	2014	2015	2016	2017	2018	2019	2020
Incident infections	38	46	39	46	42	22	21	20	5
Person-years	2 974.6	3 565.5	4 108.5	4 465.2	4 634.6	4 657.5	4 490.3	3 761.5	1 668.6

● Observed incidence rate — 95% CI

Source: ACCESS.[9]

Notes: N=7 076. Analysis includes 20 sites: nine in NSW, four in VIC, two in South Australia (SA), two in Australian Capital Territory (ACT), one in WA, one in QLD, and one in Tasmania (TAS). The TAS site contributed data from 2013 onwards. GBM were classed as being HIV-positive for the entire calendar year of their diagnosis and were 15 years or older. First incident infection only included in analysis. Incident infection date was assigned as the midpoint between the positive HCV antibody or HCV RNA test date and previous HCV antibody negative test date. ACCESS collates data from January 2009. Individuals included tested HCV antibody negative on their first test observed, and had at least one follow-up test (HCV antibody or HCV RNA or both before 31st December 2020). CI: confidence interval.

Figure 4. Incidence of hepatitis C infection among people in prison participating in the SToP-C study, 2014–2019



Enrolment period	Oct 2014–Jun 2016	Jul–Dec 2016	Jan–Jun 2017	Jul–Dec 2017	Jan–Jun 2018	Jul–Dec 2018	Jan–Jun 2019	Jul–Dec 2019
Incident infections	13	10	16	28	15	17	6	6
Person-years	193.1	157.7	197.1	256.3	292.2	303.8	272.7	145.0

● Observed incidence rate — 95% CI

Source: Hajarizadeh et al., *Lancet Gastroenterol Hepatol* 2021.[12]

Notes: The time period between October 2014 and June 2016, was merged to increase person-years of follow-up. CI: confidence interval.

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 longitudinal 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.

The Real world Efficacy of Antiviral therapy in Chronic Hepatitis C (REACH-C) project is a national observational cohort that collected data from 33 diverse study sites and reported data from each jurisdiction.[13,14,15] The REACH-C project includes individuals with chronic hepatitis C who have initiated treatment in the DAA era (from March 2016, through the Pharmaceutical Benefits Scheme (PBS)). Participants were 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 individuals initiating treatment between March 2016 and June 2019. By October 2020, 3.0% (320/10 843) of individuals in REACH-C received retreatment and an additional 1.4% (147/10 843) had been treated with DAA therapy prior to entering REACH-C. Of those with baseline treatment and retreatment documented in REACH-C, 66.6% (213/320) were retreated for virological failure, 27.5% (88/320) for reinfection and 5.9% (19/320) for unclassified post-treatment viraemia; overall 0.8% (88/10 843) of individuals were retreated for reinfection. Among those in REACH-C with known IDU, 20.2% (1 775/8 782) had injected drugs during the study period, and of these 4.1% (73/1 775) were retreated for reinfection. However, this is a lower limit estimate for reinfection, as individuals reinfected may have been undiagnosed, not treated, or treated through services outside the REACH-C network.

The SToP-C study enrolled 3 691 participants from four prisons in NSW between October 2014 and September 2019 of which 1 643 were at risk of HCV infection or reinfection. The StoP-C study included supporting treatment scale-up in the prisons from mid-2017. Reinfection was 9.3 per 100 person-years (95% CI: 7.1–12.2). Reinfection incidence decreased from 12.4 per 100 person-years (95% CI: 8.6–17.8) to 7.3 per 100 person-years (95% CI: 4.9–10.8).[12]

Two

Testing and diagnosis

Eliminating hepatitis C in Australia relies on finding people living with chronic hepatitis C through diagnostic testing and facilitating appropriate care and treatment. Testing for the presence of HCV antibodies is used as an initial screening for hepatitis C infection. The presence of antibodies indicates exposure to HCV but does not indicate current infection. To diagnose current infection, antibody positive individuals need an HCV RNA test.[16]

ACCESS collates data on consultations, HCV antibody and RNA tests conducted, and test outcomes from sites that offer targeted services for people at risk of hepatitis C, including people currently or with a history of injecting drugs, people accessing OAT, and HIV-positive GBM. ACCESS can provide data on hepatitis C testing among attendees of primary care and sexual health clinics, and within primary care, for the priority population of individuals accessing OAT. Also, a subset of sexual health clinics participating in ACCESS that had data available for this report, had high completion of the Aboriginal and Torres Strait Islander status of individuals (only 7.5% had status not recorded, 4.8% were Aboriginal and/or Torres Strait Islander). When restricted to individuals contributing one test per year, data from the ACCESS sites can be used to describe trends in test uptake (tests conducted divided by consultations) and positivity (positive tests divided by tests conducted).

The ATLAS network is an established national sexually transmissible infections (STIs) and blood-borne viruses (BBVs) surveillance network specific to Aboriginal and Torres Strait Islander peoples. Data from the ATLAS network was provided by Aboriginal Community Controlled Health Services (ACCHSs) located in urban regional and remote areas for this report (32 services). ATLAS can provide trends in hepatitis C testing rate, the proportion of individuals receiving an HCV antibody test, and among those testing positive, the proportion then tested for HCV RNA or 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 (38 Needle Syringe Programs in 2020). In 2020, COVID-19 related restrictions meant the ANSPS was not conducted in VIC and overall (all other jurisdictions combined) recruitment was approximately 30% less than previous years. 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 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 Schedule (MBS) claims dataset, when item numbers are restricted to 69499 and 69500. These item numbers are specifically used for testing to detect HCV RNA and not used for tests associated with treatment monitoring.[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 (in the previous six months) or are currently receiving OAT. Participants were enrolled through drug and alcohol clinics, OAT clinics, and NSPs (25 sites in Wave 1 and 21 sites in Wave 2, across NSW, QLD, SA, and WA, May 2018–June 2021). ETHOS Engage collects self-reported data on uptake of HCV antibody and RNA testing. Participants 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 OAT who are living with hepatitis C.[20]

PROGRESS ON DIAGNOSIS OF HEPATITIS C INFECTION

Broadly, within ACCESS sites, a decline in hepatitis C testing activity was seen between 2019 and 2020, with larger declines seen at primary care clinics compared to GBM and sexual health clinics; most primary care clinics are in VIC, the jurisdiction with longer periods of COVID-19 related restrictions in 2020.

From 2012, uptake of annual hepatitis C testing (HCV antibody or RNA) at ACCESS primary care clinics remained stable through to 2019 at ~8.0% of individuals tested, with a decline seen in 2020 (Figure 5). Among HIV-positive GBM attending ACCESS GBM or sexual health clinics, testing increased through to 2017, remained relatively stable, with a decline then seen in 2020 (Figure 6). Among individuals attending primary care clinics ever prescribed OAT, the proportion tested peaked in 2016 then declined through to 2020 (Figure 7). Among Aboriginal and Torres Strait Islander individuals attending sexual health clinics, test uptake increased 2012–2014 then was largely stable at ~25% (Figure 8).

HCV antibody testing uptake at ACCESS primary care clinics was largely stable 2012–2017, with an increase 2018–2019, then a decline in 2020; more testing occurred among women than men (Figure 9). Among HIV-positive GBM attending ACCESS GBM or sexual health clinics, HCV antibody testing steadily increased to 2017, then remained relatively stable, followed by a decline in 2020 (Figure 10). HCV antibody testing among individuals attending primary care clinics ever prescribed OAT was largely stable among women and fewer women than men were tested. Among men HCV antibody testing was largely stable 2012–2016, with an increase 2017–2019, and a decline in 2020 (Figure 11). Among Aboriginal and Torres Strait Islander individuals attending sexual health clinics, HCV antibody test uptake increased from 2012 to a peak in 2018, followed by a decline in 2019 and 2020 (Figure 12).

PROGRESS ON DIAGNOSIS OF HEPATITIS C INFECTIONS (CONTINUED)

HCV antibody positivity among individuals tested at ACCESS primary care clinics declined from 2017 onwards with positivity higher among men compared to women (Figure 9). Among HIV-positive GBM, HCV antibody positivity remained stable 2012–2020 (Figure 10). Among individuals attending primary care clinics ever prescribed OAT HCV, antibody positivity remained ›60% 2012–2020 with minimal difference between men and women in positivity (Figure 11). Among Aboriginal and Torres Strait Islander individuals attending sexual health clinics, HCV antibody positivity declined from a peak in 2013 through to ~8% in 2020 (Figure 12).

In the ATLAS network, the proportion of individuals aged 15 years or older attending an ACCHS who were tested for HCV (antibody or RNA) remained stable; 10.2% in both 2016 and 2020, with a peak testing proportion of 12.2% in 2019 (Figure 13). Between 2016 and 2020, 7.1% (1 558/21 849) of ACCHS clients tested for hepatitis C antibodies were positive and 56.4% (878/1 558) were subsequently tested for HCV RNA or viral load (Figure 14). More HCV tests were conducted among women compared to men and this remained consistent between 2016 and 2020 (Figure 15). It is important to note that testing for HCV within ACCHSs is risk-based and not intended to meet whole population-level coverage.

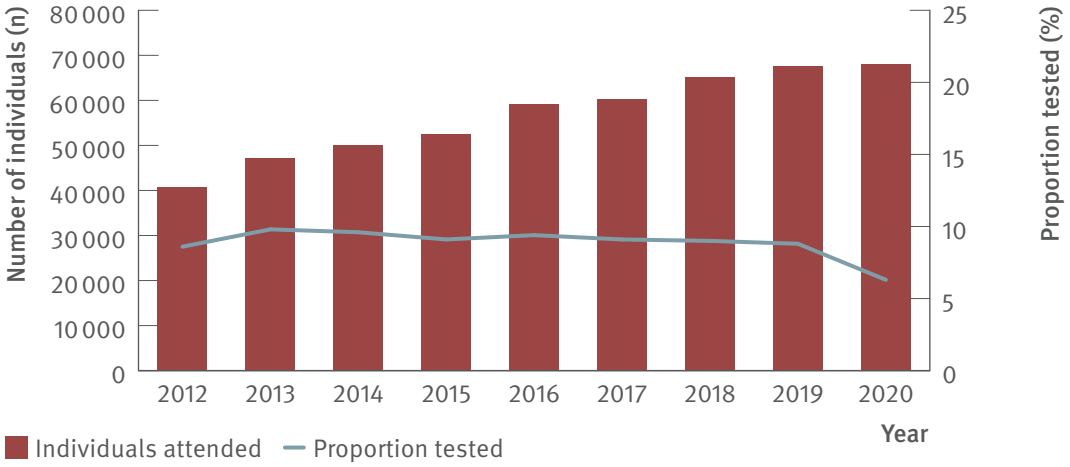
Approximately half of ANSPS respondents reported testing for hepatitis C infection in the previous year. In 2020, all participating jurisdictions had a decline in the proportion of respondents tested with notable declines in the proportion having tested in the previous year in ACT and NT (Figure 16). There was limited difference in test uptake by gender (Figure 17), or by Indigenous status (Figure 18).

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 19).

In the ETHOS Engage study Wave 1, 87.2% (1 250/1 433) of participants reported having ever been tested for HCV antibody and 81.3% (1 016/1 250) were HCV antibody positive. Among people who were HCV antibody positive, 77.5% (787/1 016) had ever received HCV RNA testing. In Wave 2, 87.0% (1 053/1 211) of participants reported having ever been tested for HCV antibody and 78.0% (821/1 053) were HCV antibody positive. Among people who were HCV antibody positive, 85.0% (698/821) had ever received HCV RNA testing (Figure 20).

Monitoring hepatitis C testing

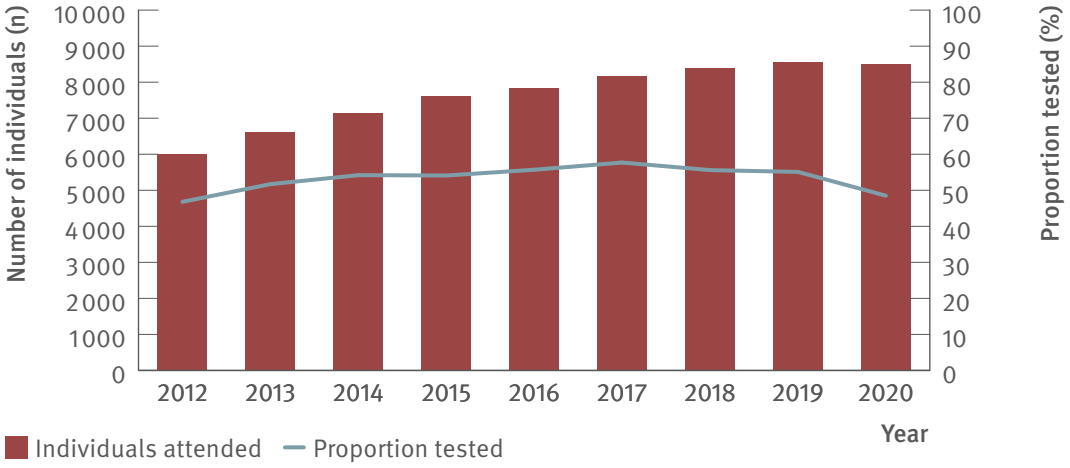
Figure 5. Number of individuals attending ACCESS primary care clinics and proportion tested for HCV (HCV antibody only or HCV antibody and RNA or HCV RNA only), ACCESS, 2012–2020



Source: ACCESS.[9]

Notes: Analysis includes 11 sites: nine in VIC, one in WA, and one in QLD. 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. Clinic attendances included in-person and telehealth consultations. Individuals were 15 years or older and contributed one consultation and one test per year.

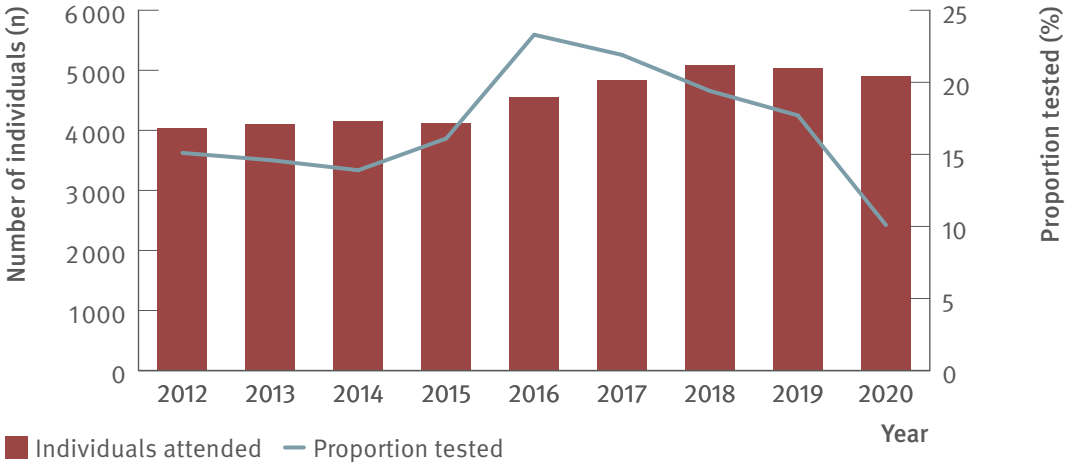
Figure 6. Number of HIV-positive GBM attending ACCESS GBM or sexual health clinics and proportion tested for HCV (HCV antibody only or HCV antibody and RNA or HCV RNA only), ACCESS, 2012–2020



Source: ACCESS.[9]

Notes: Analysis includes 20 sites: nine in NSW, four in VIC, two in SA, two in ACT, one in WA, one in QLD, and one in TAS. The TAS site contributed data from 2013 onwards. Clinic attendances included in-person and telehealth consultations. GBM were classed as being HIV-positive for the entire calendar year of their diagnosis, were 15 years or older, and contributed one consultation and one test per year.

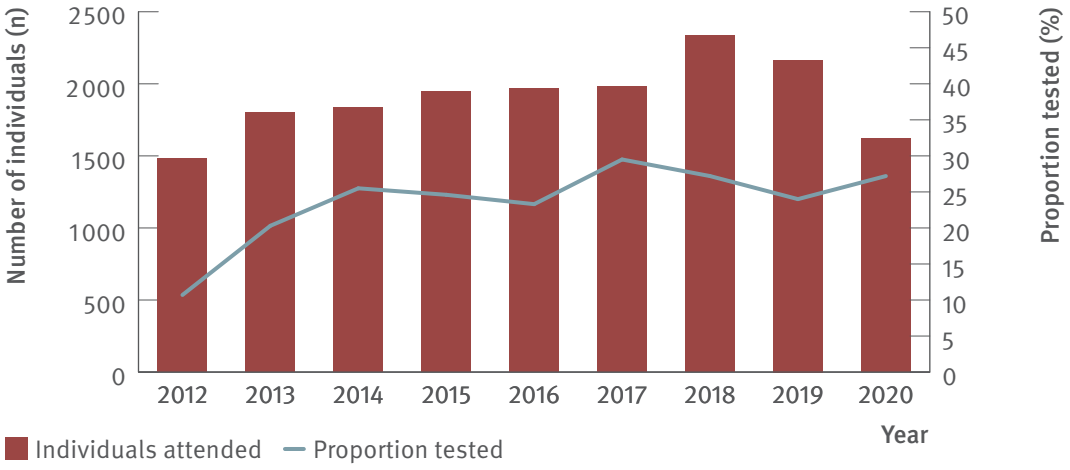
Figure 7. Number of individuals ever prescribed OAT attending ACCESS primary care clinics and proportion tested for HCV (HCV antibody only or HCV antibody and RNA or HCV RNA only), ACCESS, 2012–2020



Source: ACCESS.[9]

Notes: Analysis includes 11 sites: nine in VIC, one in WA, and one in QLD. 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. Clinic attendances included in-person and telehealth consultations. Individuals were 15 years or older, had at least one electronic medical record of a prescription for OAT between January 2009 and December 2020, and contributed one consultation and one test per year.

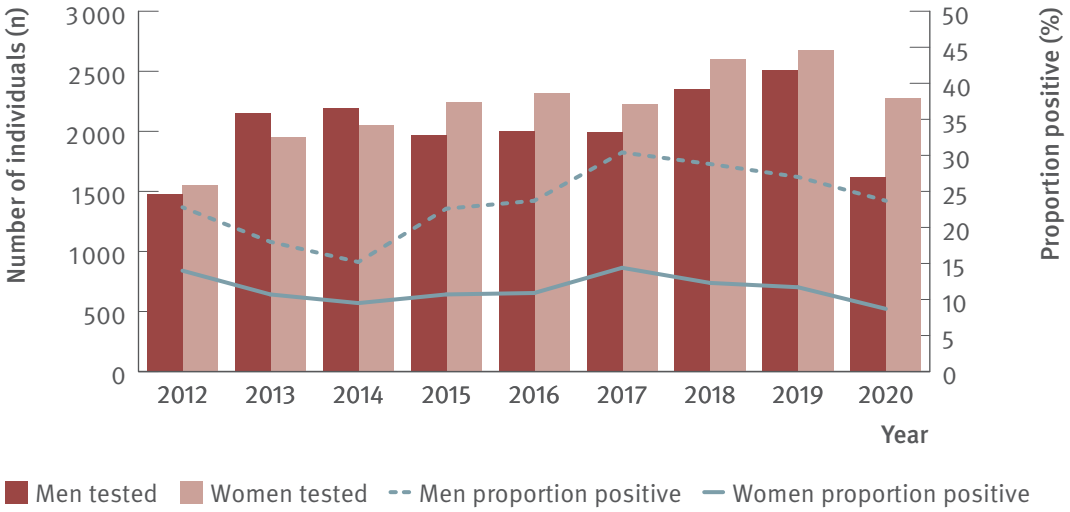
Figure 8. Number of Aboriginal and Torres Strait Islanders attending ACCESS sexual health clinics and proportion tested for HCV (HCV antibody only or HCV antibody and RNA or HCV RNA only), ACCESS, 2012–2020



Source: ACCESS.[9]

Notes: Analysis includes 10 sites: six in NSW, one in VIC, one in ACT, one in SA, and one in TAS. The TAS site contributed data from 2013 onwards. Clinic attendances included in-person and telehealth consultations. Individuals were 15 years or older and contributed one consultation and one test per year.

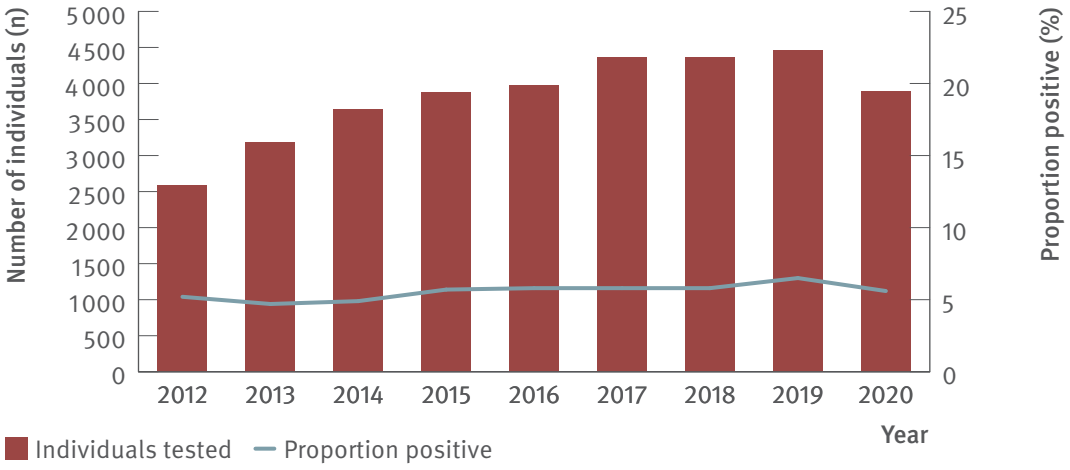
Figure 9. Number of individuals tested for HCV antibody at ACCESS primary care clinics and proportion of HCV antibody tests positive by gender, ACCESS, 2012–2020



Source: ACCESS.[9]

Notes: Analysis includes 11 sites: nine in VIC, one in WA, and one in QLD. 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. Clinic attendances included in-person and telehealth consultations. Individuals were 15 years or older and contributed one test per year. Individuals recorded as 'Other' sex or sex was not recorded were not included due to the small sample size.

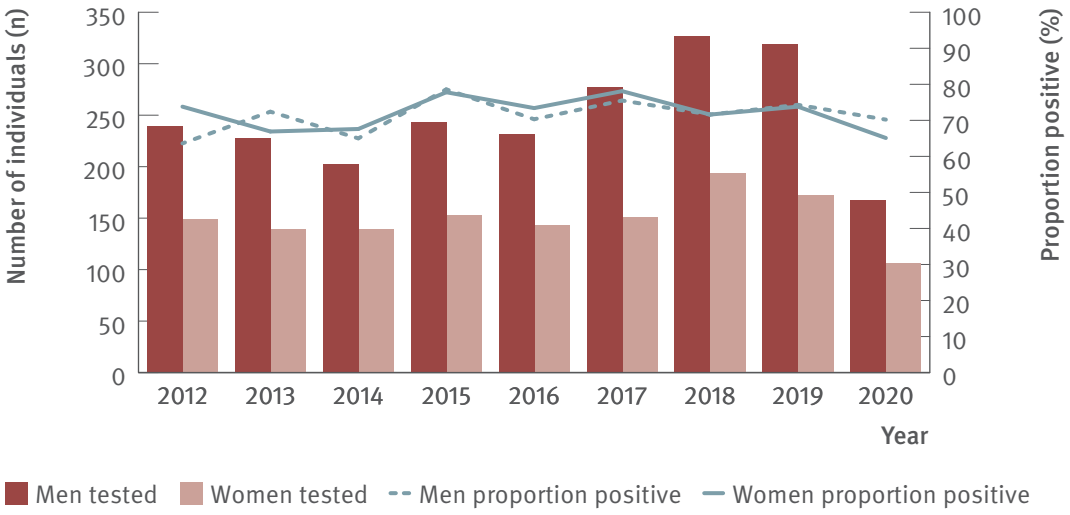
Figure 10. Number of HIV-positive GBM tested for HCV antibody at ACCESS GBM or sexual health clinics and proportion of HCV antibody tests positive, ACCESS, 2012–2020



Source: ACCESS.[9]

Notes: Analysis includes 20 sites: nine in NSW, four in VIC, two in SA, two in ACT, one in WA, one in QLD, and one in TAS. The TAS site contributed data from 2013 onwards. GBM were classed as being HIV-positive for the entire calendar year of their diagnosis, were 15 years or older, and contributed one test per year.

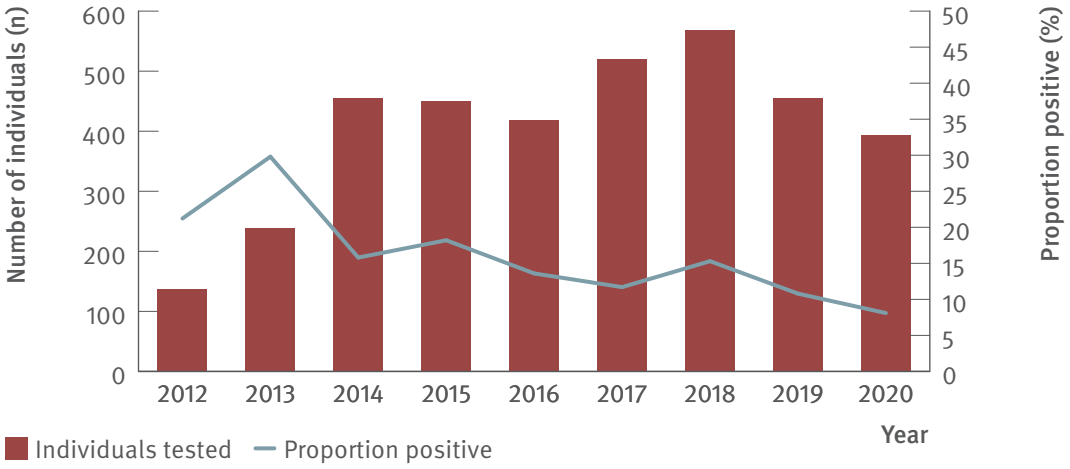
Figure 11. Number of individuals ever prescribed OAT tested for HCV antibody at ACCESS primary care clinics and proportion of HCV antibody tests positive by gender, ACCESS, 2012–2020



Source: ACCESS.[9]

Notes: Analysis includes 11 sites: nine in VIC, one in WA, and one in QLD. 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 were 15 years or older, had at least one electronic medical record of a prescription for OAT between January 2009 and December 2020, and contributed one test per year. Individuals recorded as 'Other' sex or sex was not recorded were not included due to the small sample size.

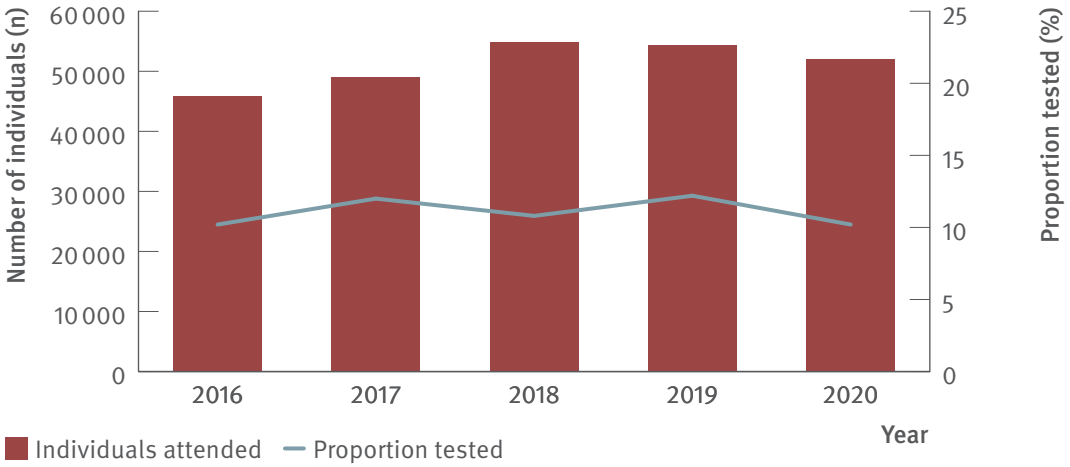
Figure 12. Number of Aboriginal and Torres Strait Islanders tested for HCV antibody at ACCESS sexual health clinics and proportion of HCV antibody tests positive, ACCESS, 2012–2020



Source: ACCESS.[9]

Notes: Analysis includes 10 sites: six in NSW, one in VIC, one in ACT, one in SA, and one in TAS. The TAS site contributed data from 2013 onwards. Clinic attendances included in-person and telehealth consultations. Individuals were 15 years or older and contributed one test per year.

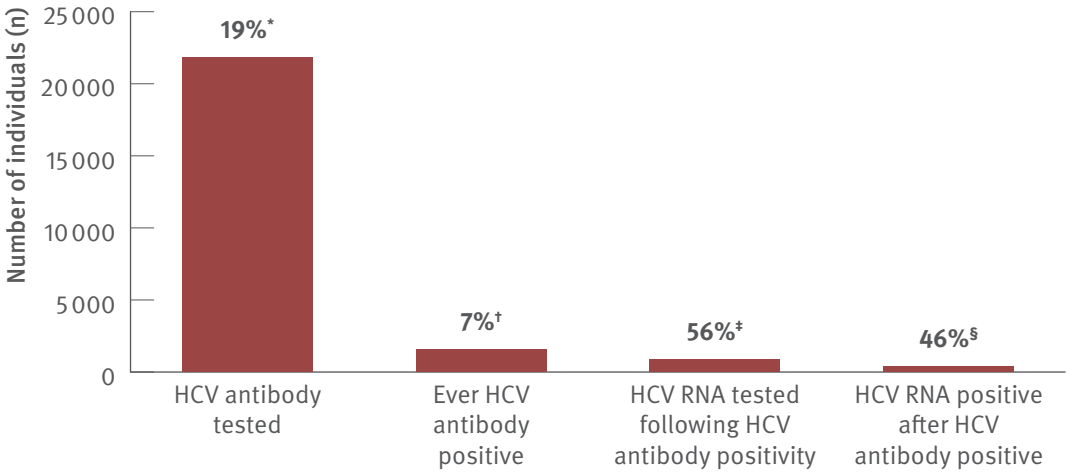
Figure 13. Number of individuals attending ACCHSs and proportion tested for HCV (HCV antibody only or HCV antibody and RNA or HCV RNA only), ATLAS network, 2016–2020



Source: ATLAS sexual health surveillance network, 2016–2020.[17]

Notes: Individuals defined as people aged 15 years or older, who visited a doctor, nurse, or Aboriginal health practitioner ('medical consultations') between 2016 and 2020.

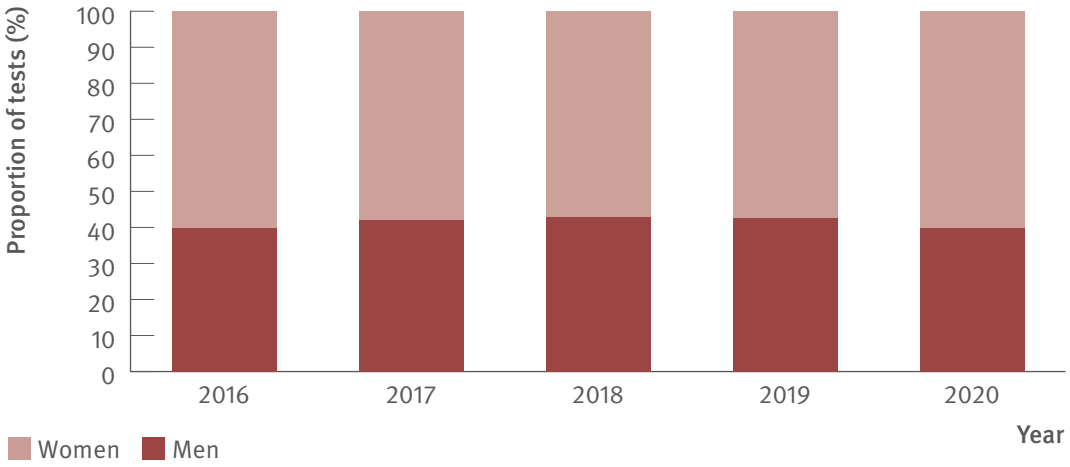
Figure 14. Hepatitis C testing cascade: number and proportion of individuals attending ACCHSs tested for HCV antibody or RNA and among those tested, the number and proportion testing positive, ATLAS network, aggregated for years 2016–2020



Source: ATLAS sexual health surveillance network, 2016–2020.[17]

Notes: Individuals defined as people aged 15 years or older, who visited a doctor, nurse, or Aboriginal health practitioner ('medical consultations') between 2016 and 2020. '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 2020). *A total of 117 549 individuals aged 15 years or older attended medical appointments between 2016 and 2020, of whom 18.6% (21 849/117 549) had an HCV antibody test. †Of those tested for HCV antibody, 7.1% (1 558/21 849) tested HCV antibody positive. ‡Of those HCV antibody positive, 56.4% (878/1 158) had an HCV RNA test following HCV antibody positivity of which §46.2% (406/878) were HCV RNA positive.

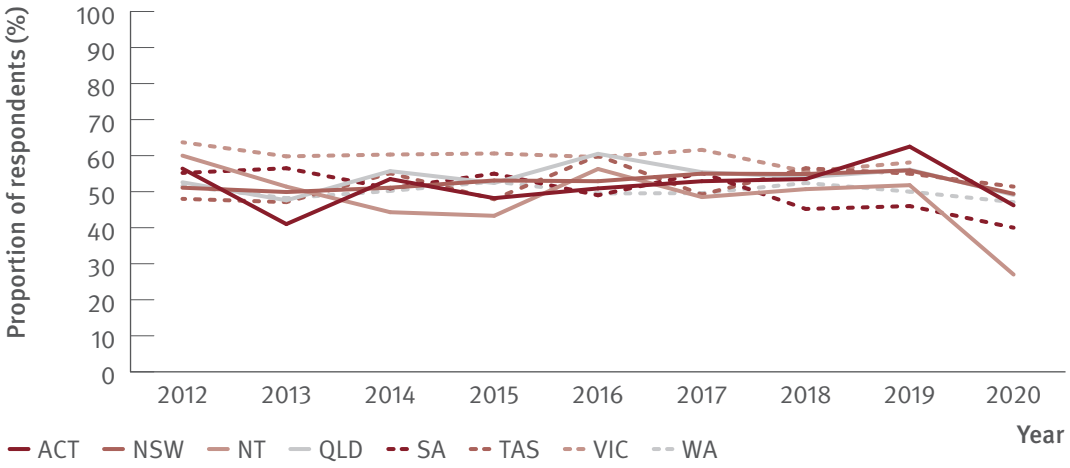
Figure 15. Proportion of HCV tests (HCV antibody only or HCV antibody and RNA or HCV RNA only) at ACCHSs by gender, ATLAS network, 2016–2020



Source: ATLAS sexual health surveillance network, 2016–2020.[17]

Notes: Individuals defined as people aged 15 years or older, who visited a doctor, nurse, or Aboriginal health practitioner ('medical consultations') between 2016 and 2020. Number of people tested per year as follows: 2016: 1 868 men, 2 836 women; 2017: 2 476 men, 3 426 women; 2018: 2 536 men, 3 363 women; 2019: 2 841 men, 3 811 women; 2020: 2 110 men, 3 202 women.

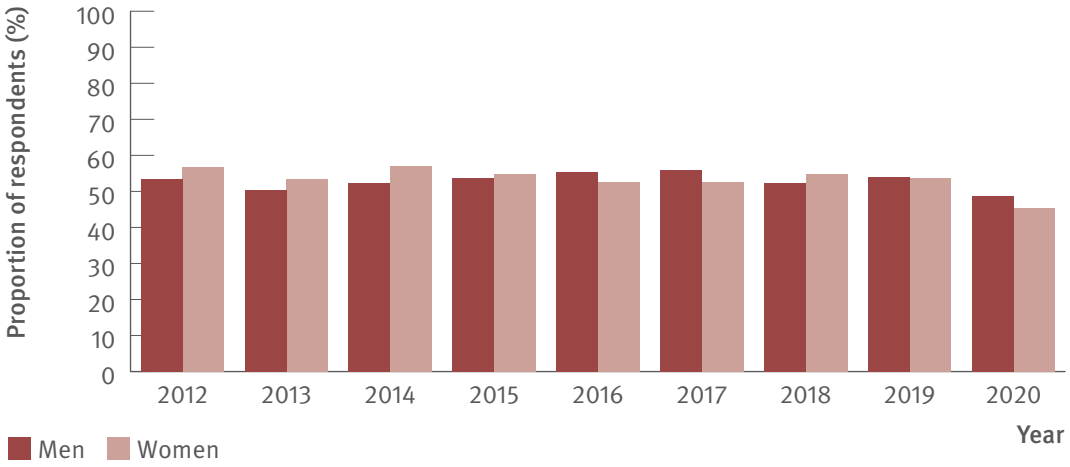
Figure 16. Proportion of ANSPS respondents self-reporting recent (past 12 months) hepatitis C testing by jurisdiction, 2012–2020



Source: Australian Needle Syringe Program Survey. National Data Report 2016–2020.[18]

Notes: No participant recruitment occurred in VIC in 2020.

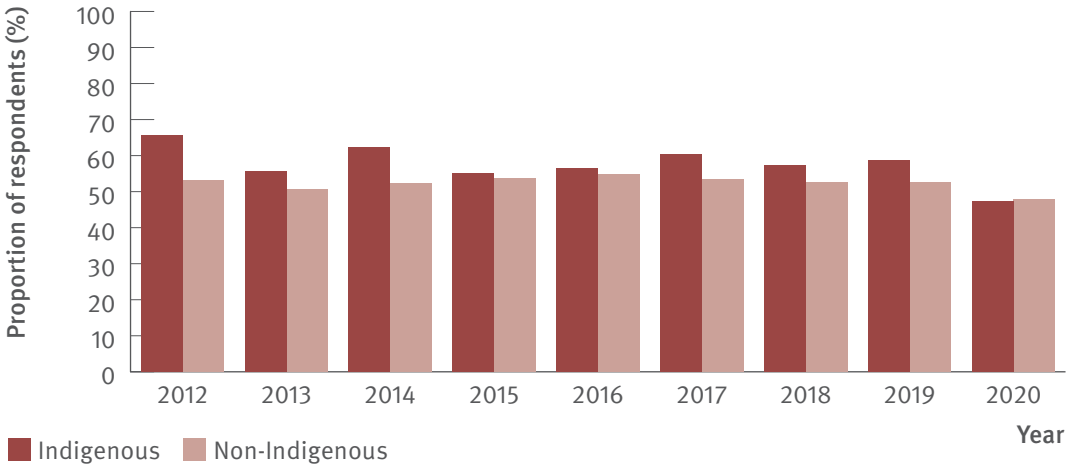
Figure 17. Proportion of ANSPS respondents reporting recent (past 12 months) hepatitis C testing by gender, 2012–2020



Source: Australian Needle Syringe Program Survey. National Data Report 2016–2020.[18]

Notes: No participant recruitment occurred in VIC in 2020.

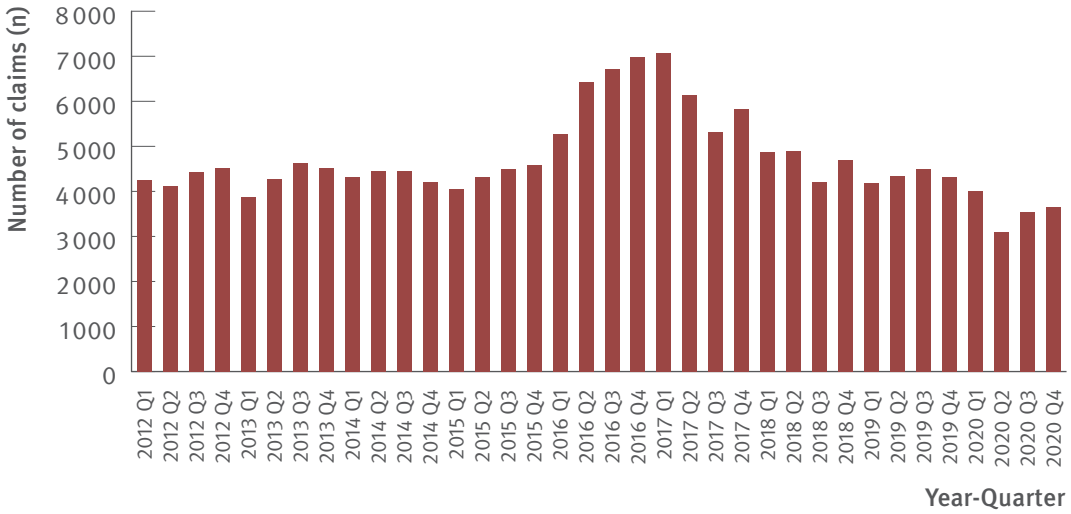
Figure 18. Proportion of ANSPS respondents reporting recent (past 12 months) hepatitis C testing by Indigenous status, 2012–2020



Source: Australian Needle Syringe Program Survey. National Data Report 2016–2020.[18]

Notes: No participant recruitment occurred in VIC in 2020.

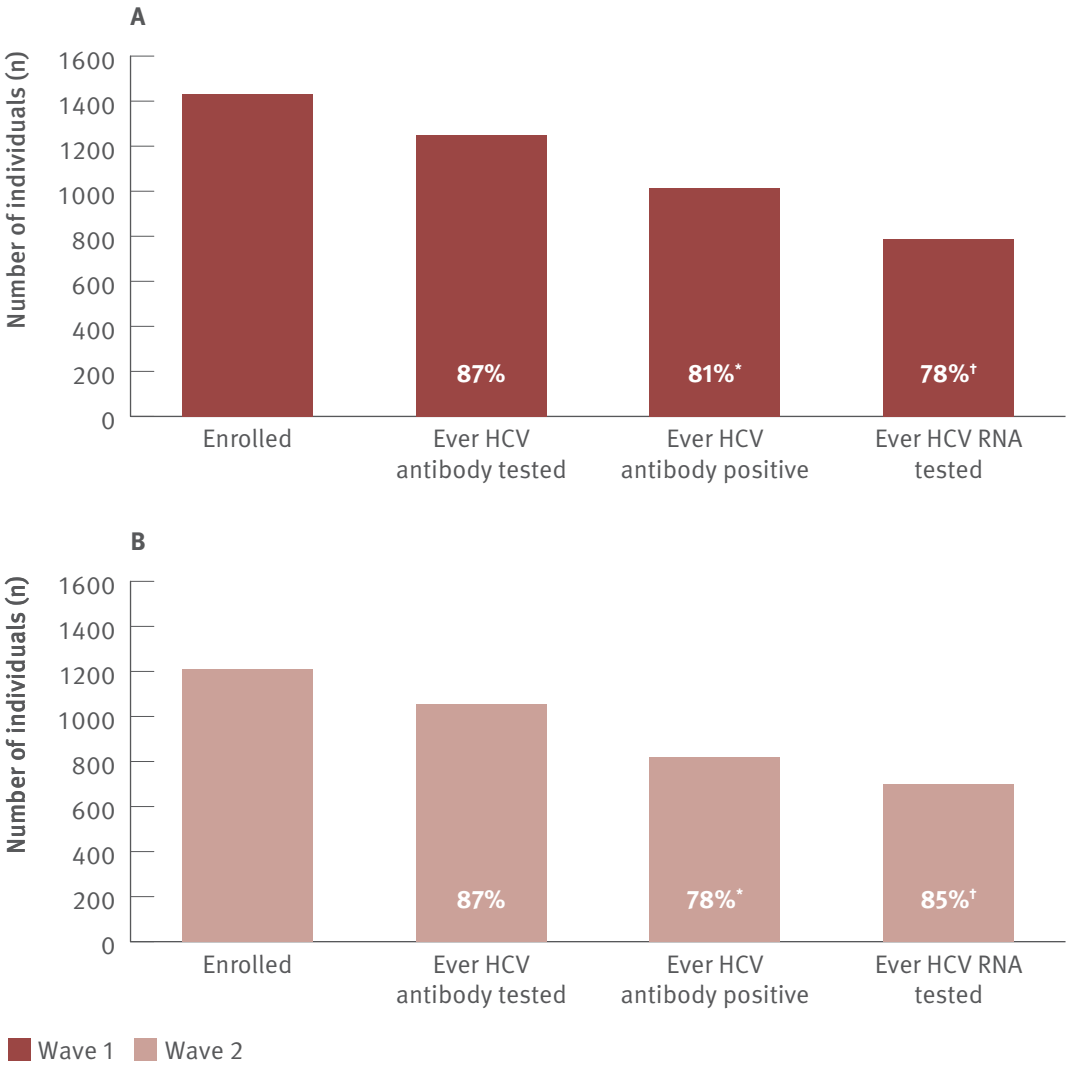
Figure 19. Number of claims to Medicare for items 69499 and 69500 (detection of HCV RNA, new infections only), 2012–2020



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. Prison-based testing not included in MBS data.

Figure 20. Number of individuals enrolled in ETHOS Engage who were HCV antibody tested, HCV antibody positive and HCV RNA tested, A: Wave 1 (May 2018–September 2019) and B: Wave 2 (November 2019–June 2021)



Source: ETHOS Engage study.[20] Wave 2 data, ETHOS Engage study, unpublished data.

Notes: ETHOS Engage was conducted over two distinct recruitment waves: A: Wave 1 (May 2018–September 2019) and B: Wave 2 (November 2019–June 2021). 1 433 participants were recruited in Wave 1 and 1 211 participants were recruited in Wave 2. Recruitment was from the same drug and alcohol treatment, OAT, and NSP sites, 12–36 months apart (21 sites participating in both; 25 sites Wave 1; 21 sites Wave 2), with sites in NSW, QLD, SA, and WA. '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 HCV, 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.

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.[21,22,23,24] DAAs for the treatment of hepatitis C have a high cure rate, are tolerable,[3] and following listing on the PBS in March 2016, are available at minimal 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 2020. DAA treatment initiations by jurisdiction and provider type are described.[2,25]

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 on the number of DAA treatments initiated in 103 (2019) and 94 (2020) prisons across eight states and territories.[26] The monitoring treatment uptake in Australia project uses PBS data of DAA dispensation for all individuals who initiated DAA treatment between March 2016 and December 2020.[2,25] While in-prison treatments cannot be reliably delineated from community treatments in the PBS database, the proportion of total treatments initiated among prisoners can be estimated by assessing prison treatment numbers relative to estimates of the number of individuals accessing DAA treatment for hepatitis C treatment in the community.

Treatment outcomes

The REACH-C project can provide proportions of individuals achieving sustained virological response (SVR) by patient characteristics.[13,14,15]

The Viral Hepatitis Mapping Project collated data on individuals that had undertaken hepatitis C treatment through the PBS. See Chapter Seven for data on treatment outcomes reported by this project.[27]

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 2020 and includes individuals who had a clinical consultation within the three years prior (2016–2020).[9,28]

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 (2016–2020).

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

The National hepatitis C diagnosis and care cascade is estimated annually as part of the National update of HIV, viral hepatitis and sexually transmissible infections in Australia report,[4,5,18] providing a general estimate of hepatitis C treatment uptake and cure to the end of 2020.

PROGRESS ON INCREASING TREATMENT UPTAKE

Treatment uptake

Between March 2016 and December 2020, an estimated 88 792 people living with chronic hepatitis C initiated DAA treatment, including 33 201 people in 2016, 20 969 people in 2017, 15 209 in 2018, 11 314 in 2019, and 8 099 in 2020 (Figure 21). An estimated 47.1% of the total number of people living with hepatitis C at the end of 2015 were treated between 2016 and 2020, with variations in uptake by jurisdiction (Figure 22). 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 by non-specialists (Figure 23).

Overall lifetime treatment uptake among ANSPS respondents rose considerably from 28.6% (184/643) in 2016 to 62.3% (180/289) in 2020. In 2020, 61.8% (118/191) of men and 62.5% (60/96) of women reported a lifetime history of hepatitis C treatment (Figure 24).

In 2020, an estimated 3 005 hepatitis C treatment episodes were commenced in prisons across all Australian jurisdictions. This is estimated to represent 37.1% (3 005/8 099) of all hepatitis C treatment episodes in Australia in 2020, highlighting the importance of the prison sector in national elimination efforts. The number of treatment initiations recorded in each jurisdiction is presented in Figure 25. In 2020, across the various jurisdictions, the proportion of DAA initiations occurring in the prisons ranged from 8.5% to 51.1% of the jurisdictional total.

The commencement of treatment for hepatitis C within prisons varies across jurisdictions according to the prevalence of disease within the jurisdiction, the size of the prison population, the number of prisoners previously treated in prison or the community, and the number of new diagnoses. While the most recent nation-wide estimate (2016) of HCV antibody positivity among prisoners was 22%, the prevalence varies considerably between jurisdictions.[29] The jurisdictional variance reflects differences in the characteristics of people incarcerated and in particular the proportion of people incarcerated who have histories of IDU. As only the total annual number of treatment initiations is provided, without reliable information on 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 initiate systematic surveillance studies. 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)

Treatment outcomes

Among 10 843 individuals in REACH-C initiating treatment between March 2016 and June 2019, SVR rates ›90% were observed across a range of sub-populations (Figure 26). SVR outcome was unknown in 14.6% (1 584/10 843) of individuals and of these, 4.9% (79/1 584) were deceased. Rates of unknown SVR increased over time: 2016, 8.6% (459/5 337); 2017, 16.5% (514/3 109); 2018, 24.9% (457/1 837); 2019, 27.5% (154/560).

Cascades of care

At the end of 2020, among those with a clinical consultation at ACCESS primary care clinics between 2016 and 2020 and an HCV RNA positive test recorded in ACCESS (n=4 509), 53.3% (2 403/4 509) had initiated treatment and of those treated, 50.8% (1 220/2 403) had an HCV RNA test ›8 weeks post-treatment, of which 92.8% (1 132/1 220) were HCV RNA negative (Figure 27).

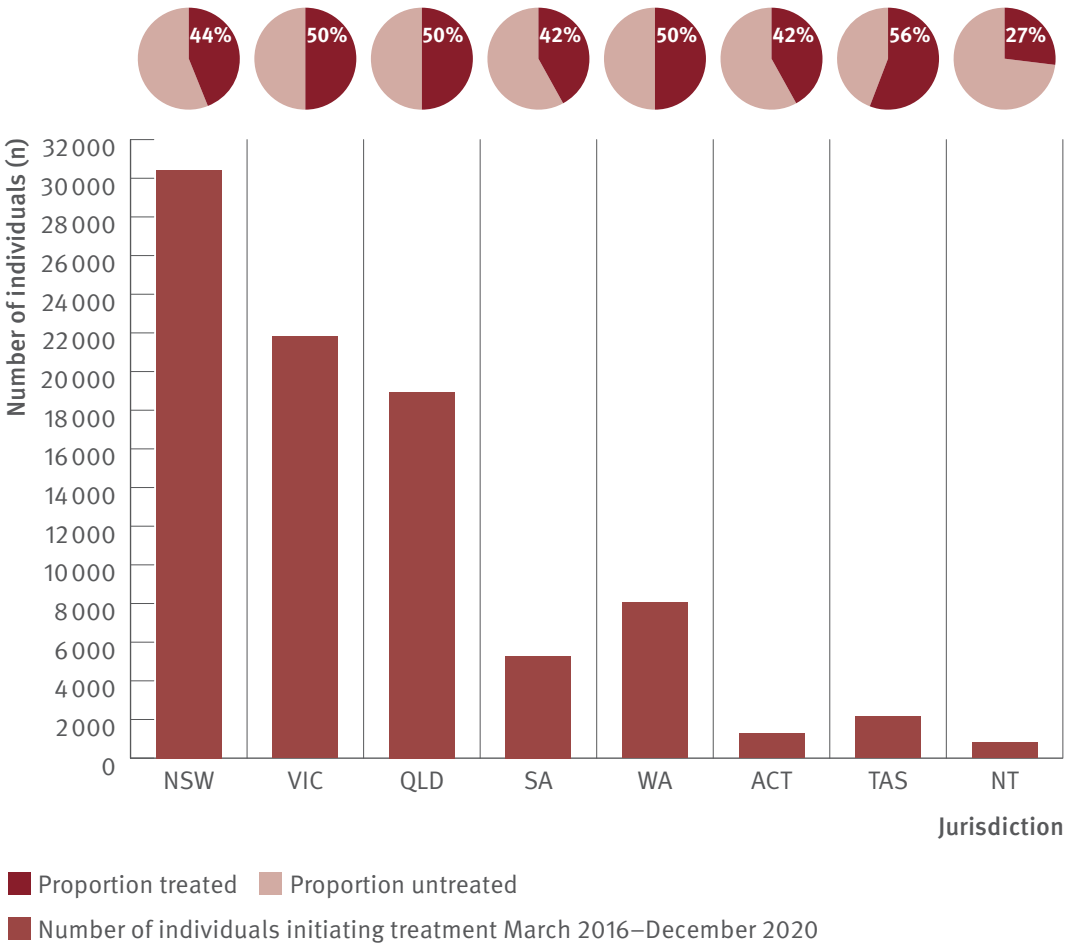
Over the five years of the ATLAS network data, (2016–2020) 282 individuals received DAA treatment from an ACCHS participating in the ATLAS network following a positive HCV RNA test. Of those prescribed DAAs, 36.5% (103/282) were tested for HCV RNA or HCV viral load following treatment. Of those with an HCV RNA or HCV viral load test post-treatment, 87.4% (90/103) appeared to achieve an undetectable HCV viral load (Figure 28).

Between May 2018 and September 2019, of the 788 individuals enrolled in ETHOS Engage in Wave 1 with a history of hepatitis C through self-report or point-of-care serology, 87.1% (686/788) were linked to care and 66.0% (520/788) were treated. Between November 2019 and June 2021, of the 611 individuals enrolled in ETHOS Engage in Wave 2, 83.5% (510/611) were linked to care and 77.9% (476/611) were treated (Figure 29).

National hepatitis C diagnosis and care cascade estimated 117 814 people were living with hepatitis C at the end of 2020. An estimated 76.9% (90 562/117 814) were diagnosed with hepatitis C and of these, 75.0% (67 921/90 562) had an HCV RNA confirmed diagnosis (Figure 30).

Monitoring treatment uptake

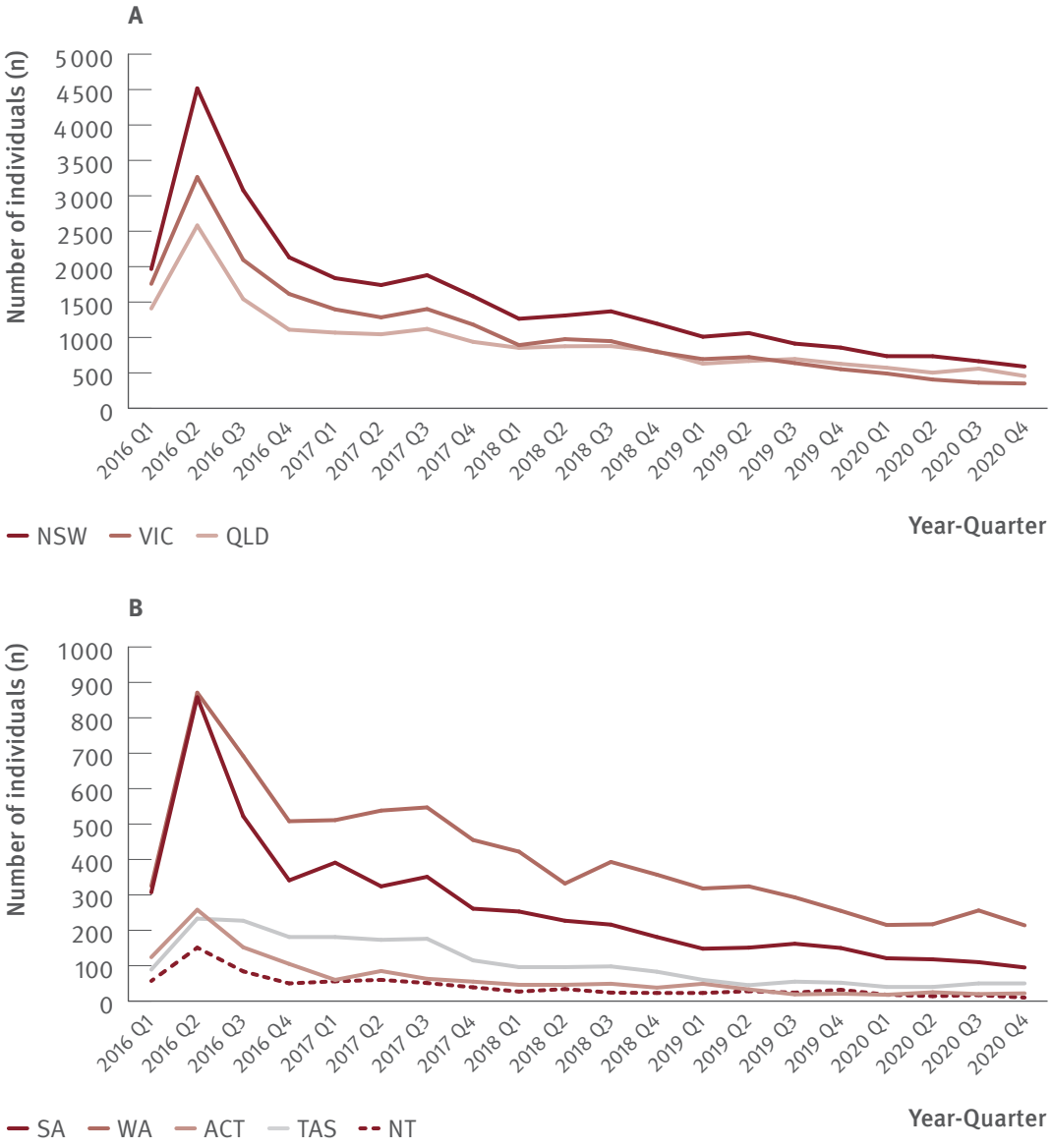
Figure 21. Estimated number of individuals initiating DAA treatment and the proportion of individuals living with chronic hepatitis C who initiated DAA treatment by jurisdiction, PBS database, March 2016–December 2020



Source: Monitoring hepatitis C treatment uptake in Australia.[2,25]

Notes: Treatment numbers may vary from previous or future reports due to refinements made to the PBS data between releases. Estimated proportion of individuals living with chronic hepatitis C who initiated DAA treatment was based on people living with chronic hepatitis C by the end of 2015 and does not encompass individuals with new infections from 2016, some of whom will have been treated.

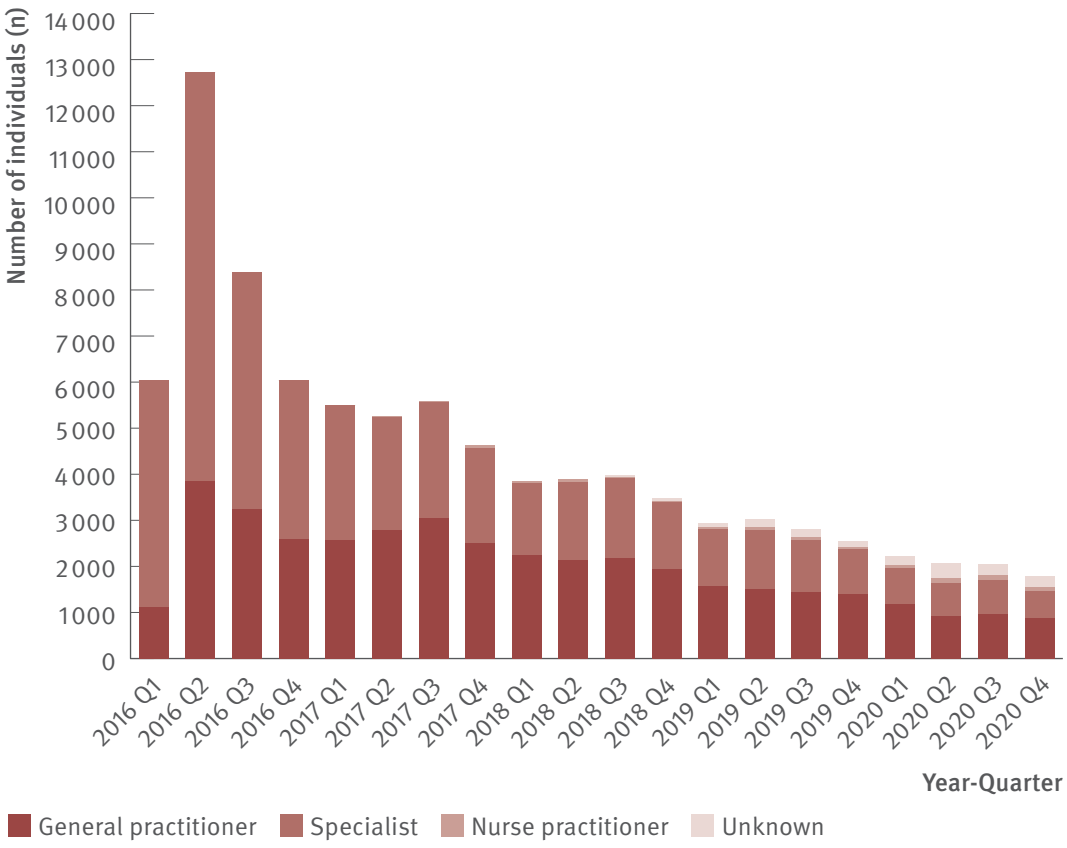
Figure 22. Estimated number of individuals initiating DAA treatment by jurisdiction, PBS database, March 2016–December 2020



Source: Monitoring hepatitis C treatment uptake in Australia.[2,25]

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

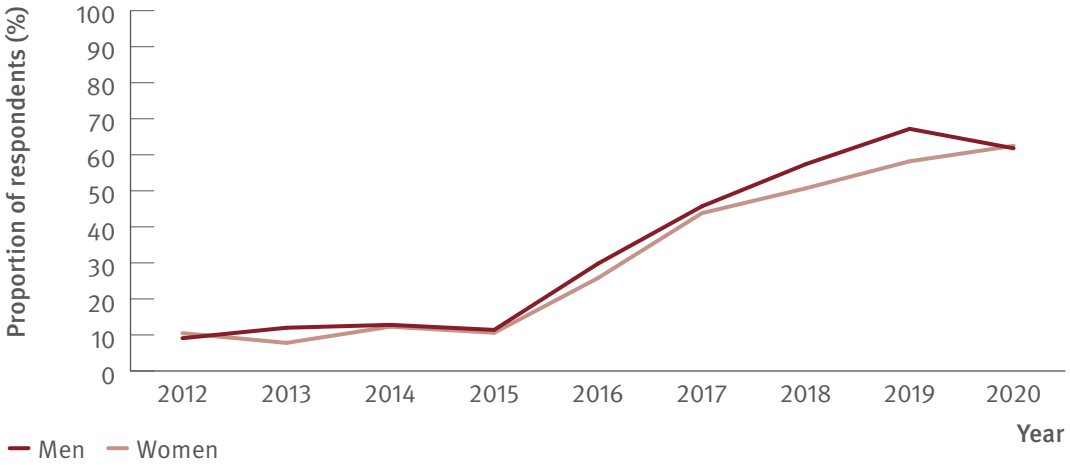
Figure 23. Estimated number of individuals initiating DAA treatment by prescriber type, PBS database, March 2016–December 2020



Source: Monitoring hepatitis C treatment uptake in Australia.[2,25]

Notes: 2016 Q1 is data from March 2016 only. Treatment numbers may vary from previous or future reports due to refinements made to the PBS data between releases. Nurse practitioners have been authorised to prescribe DAAs for hepatitis C treatment since June 2017. The proportion of treatment initiations by prescriber type between 2019 and 2020 should be interpreted cautiously given the increasing number of unidentified prescriber type in these years.

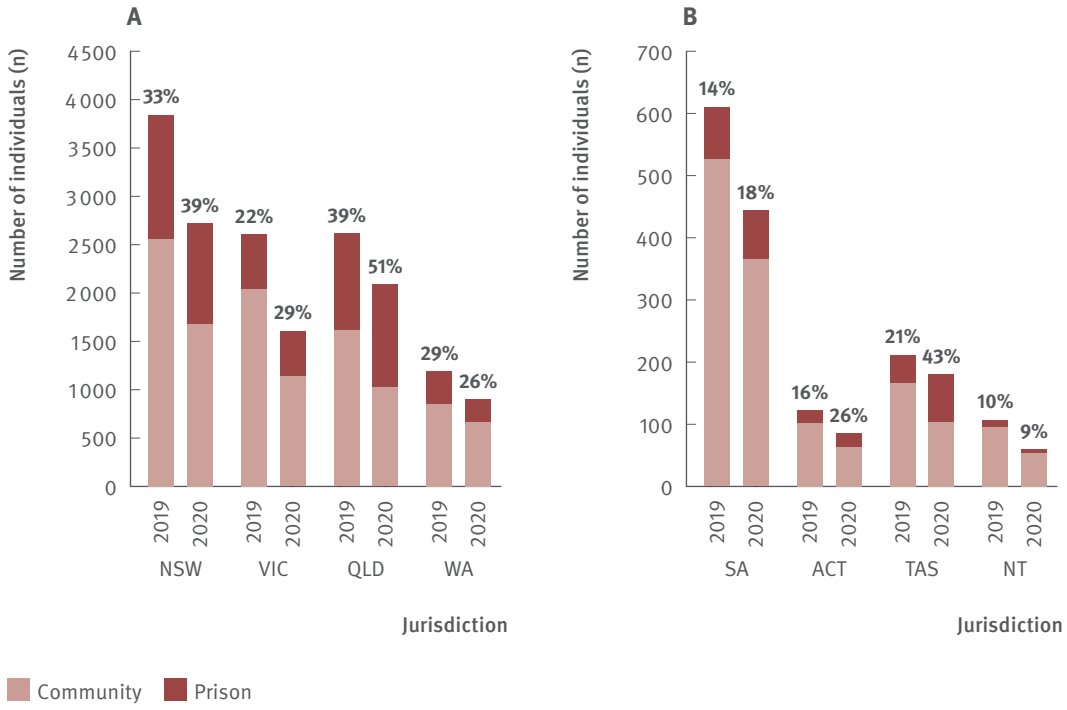
Figure 24. Proportion of ANSPS respondents who tested HCV antibody positive, self-reporting lifetime history of hepatitis C treatment by gender, 2012–2020



Source: Australian Needle Syringe Program Survey. National Data Report 2016–2020.[18]

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

Figure 25. Number and estimated proportion* of individuals who initiated DAA treatment in prison versus in the community by jurisdiction, 2019 and 2020



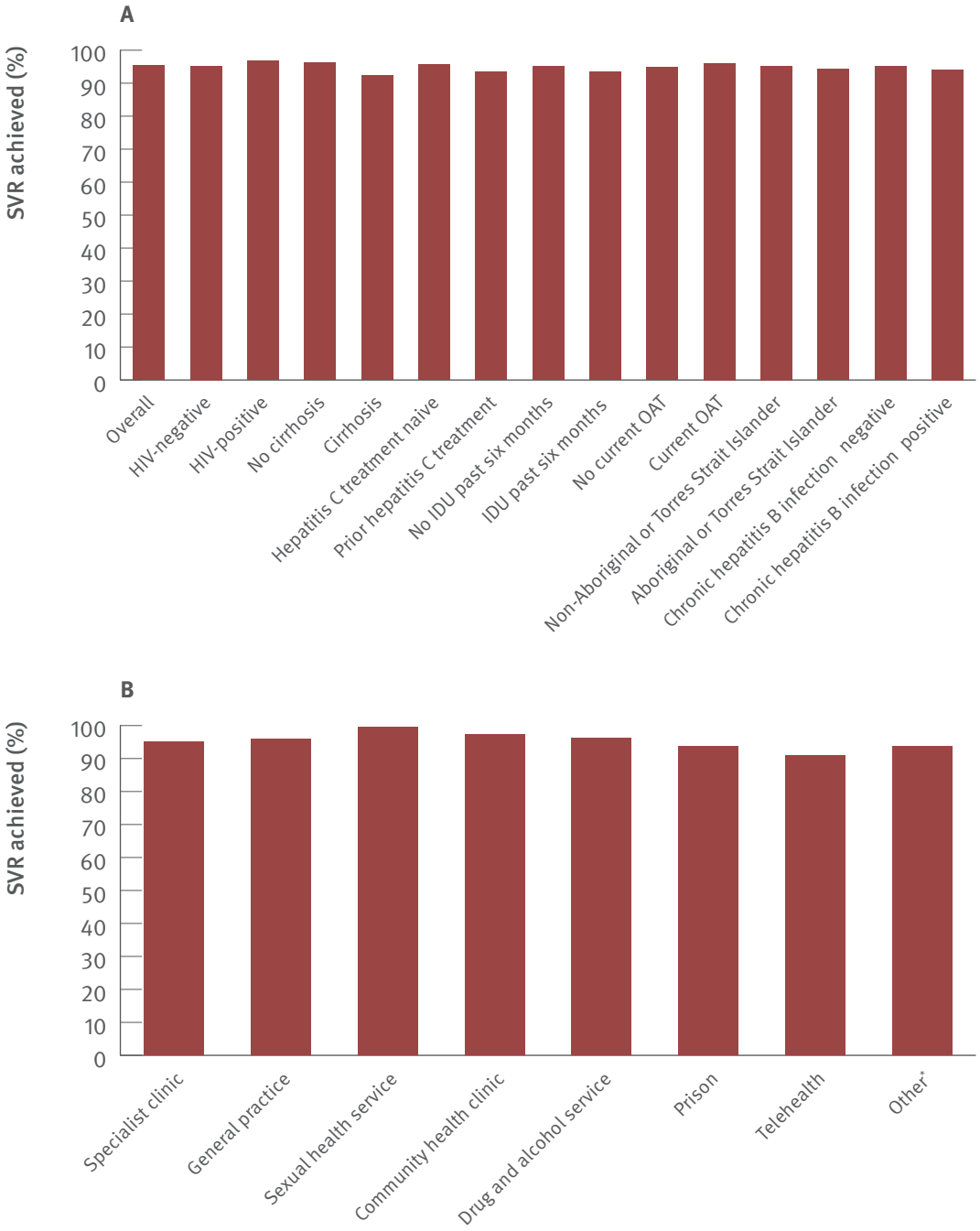
	National	NSW	VIC	QLD	WA	SA	ACT	TAS	NT
2019									
Number of prisons	103	39	14	14	17	9	2[b]	5	3[c]
Number of individuals initiating DAA treatment in prisons	3 360	1 281	569	1 008	341	85	20	45	11
Total DAA treatments (PBS)	11 314[a]	3 842	2 607	2 621	1 190	611	122	212	107
2020									
Number of prisons	96	34[d]	14	14	17	9	1	5	2
Number of individuals initiating DAA treatment in prisons	3 005	1 048	472	1 068	234	79	22	77	5
Total DAA treatments (PBS)	8 099[a]	2 725	1 609	2 091	902	444	85	180	59

Sources: State and Territory justice health authorities via the National Prisons Hepatitis Network.[26] Monitoring treatment uptake in Australia.[2,25]

Notes: *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 the PBS database. PBS treatment numbers may vary from previous or future reports due to refinements made to PBS data between releases (2019 and 2020 data from 2021 release of data). [a]National total includes DAA treatment initiations with unknown jurisdictions; therefore the national total treatments will not add to the sum of the jurisdictional totals. [b]One prison and one mental health correctional facility; [c]Two prisons and one youth detention; [d] Between 2019 and 2020, five prisons closed. Data were collected from 31 public prisons (January–December) and one private prison (January–June 2020), data were not collected from two private prisons.

Monitoring treatment outcomes

Figure 26. Proportion of individuals with SVR by clinical characteristics (A) and treatment setting (B) in the per protocol population, REACH-C, March 2016–October 2020

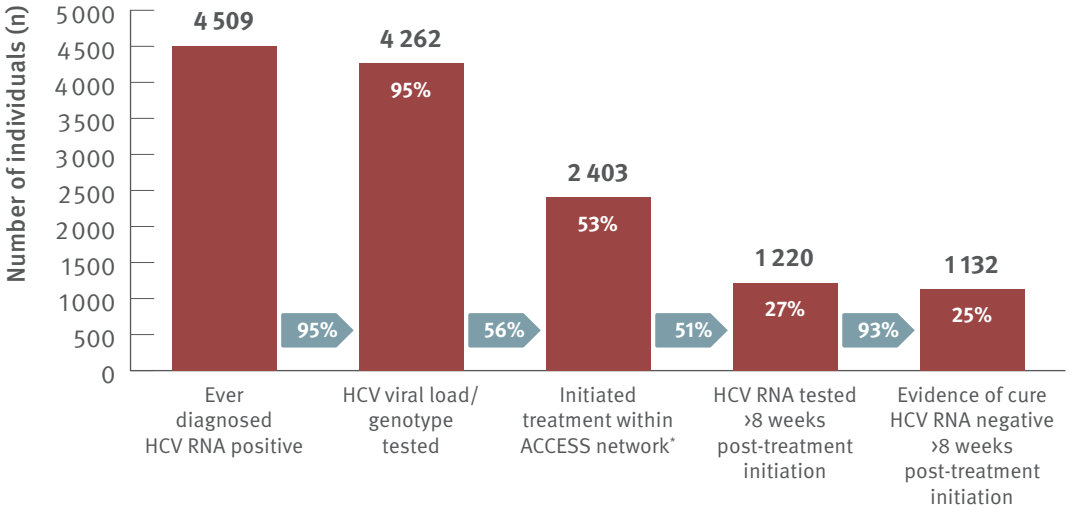


Source: REACH-C.[13,14,15]

Notes: Per protocol population was individuals with a known HCV RNA test result 12 weeks post-treatment by October 2020. 'Chronic hepatitis B infection positive' defined as hepatitis B surface antigen positive. '*Other' includes Aboriginal health service, mental health, and outreach. Treatment outcome was unknown in 14.6% (1 584/10 843) of individuals (1 584/10 843) and of these 4.9% (79/1 584) had died prior to SVR12. Rates of unknown SVR increased over time: 2016, 8.6% (459/5 337); 2017, 16.5% (514/3 109); 2018, 24.9% (457/1 837); 2019 27.5% (154/560).

Cascades of care

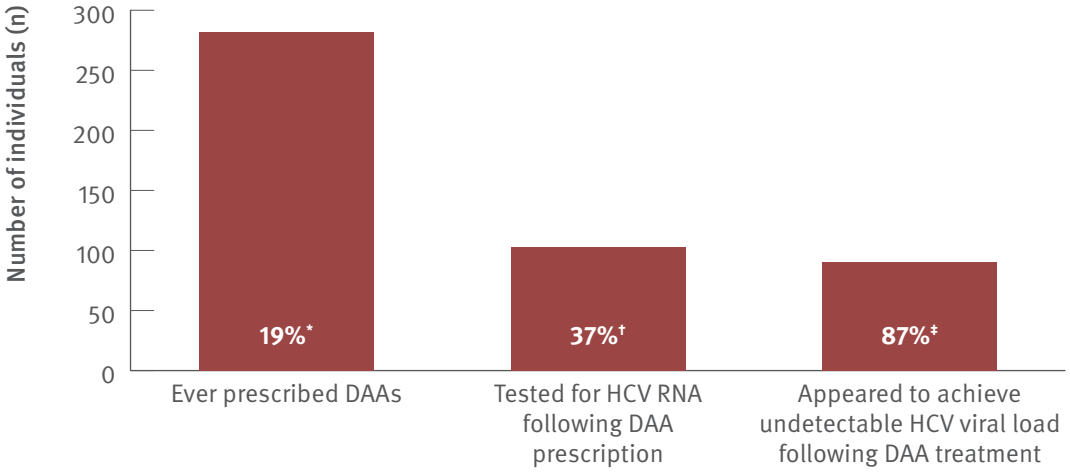
Figure 27. Hepatitis C treatment cascade at ACCESS primary care clinics: number of individuals hepatitis C diagnosed, number and proportion of individuals who initiated treatment, and tested for HCV RNA post-treatment initiation, 2016–2020



Source: ACCESS.[9] Updated from Traeger et al., *PLOS One* 2020.[28]

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 at 31st December 2020 and is restricted to individuals who had a clinical consultation within the five years prior (2016–2020). Includes individuals attending ACCESS primary care clinics (same primary care clinics as other ACCESS sections in report). *Treatment initiation is indicated by the presence of an electronic medical record of a prescription of DAA therapy recorded at an ACCESS clinic. Individuals are assumed to have progressed through preceding cascade stages if evidence of reaching a subsequent stage is present.

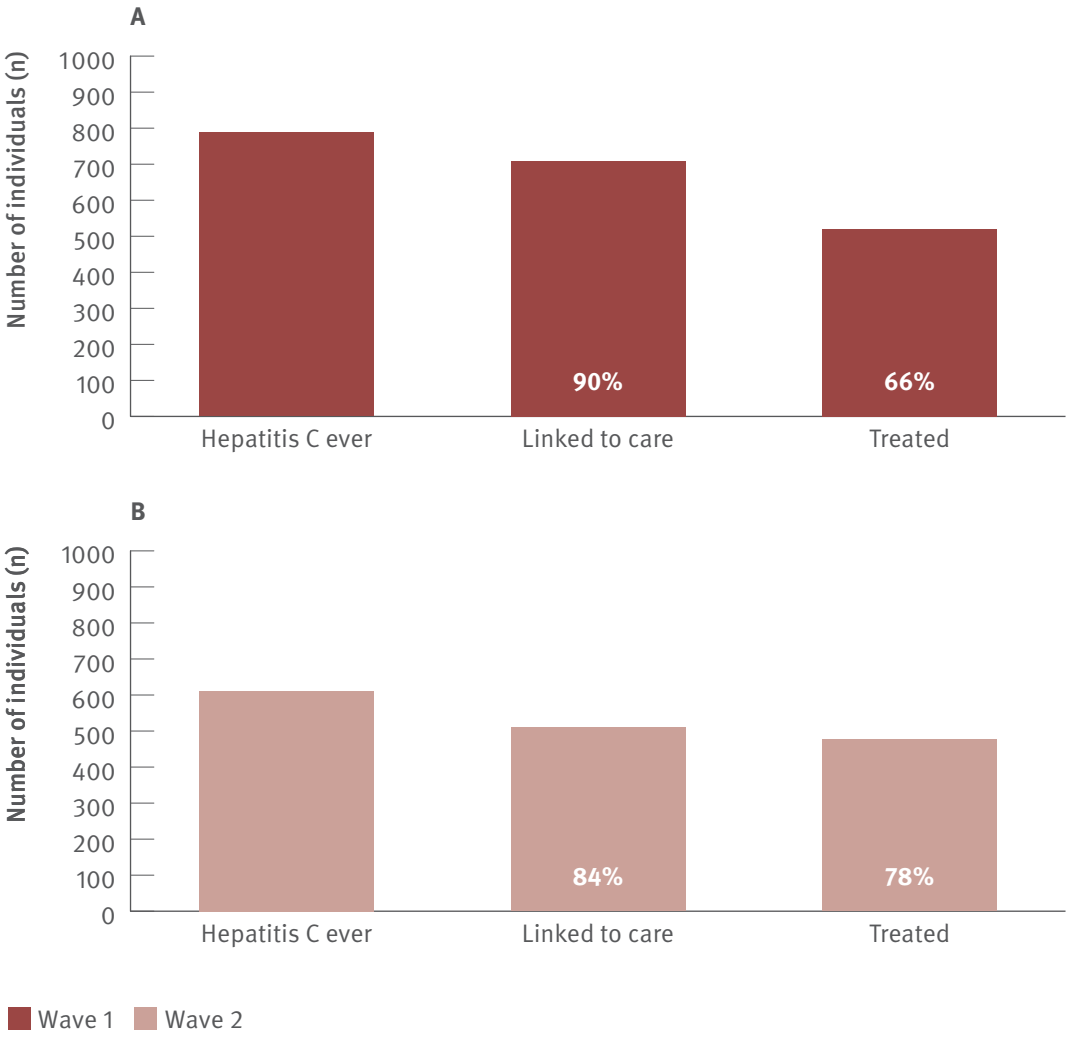
Figure 28. Hepatitis C treatment cascade: number and proportion of individuals attending ACCHSs tested for HCV RNA and prescribed DAAs, and among those treated, the number and proportion who appeared to achieve an undetectable HCV viral load, ATLAS network, aggregated for years 2016–2020



Source: ATLAS sexual health surveillance network, 2016–2020.[17]

Notes: Individuals defined as people aged 15 years or older, who visited a doctor, nurse, or Aboriginal health practitioner ('medical consultations') between 2016 and 2020. 'Undetectable viral load' defined as testing negative for HCV RNA or HCV viral load following DAA treatment. A total of 117 549 individuals aged 15 years or older attended medical appointments between 2016 and 2020. *Of individuals who were ever HCV RNA tested, 18.7% (282/1 507) were prescribed DAA treatment. †Of those prescribed DAAs, 36.5% (103/282) had an HCV RNA test following treatment, of whom ‡87.4% (90/103) had an undetectable HCV viral load and 12.6% (13/103) were either positive or not tested (data unavailable to define these 13 further).

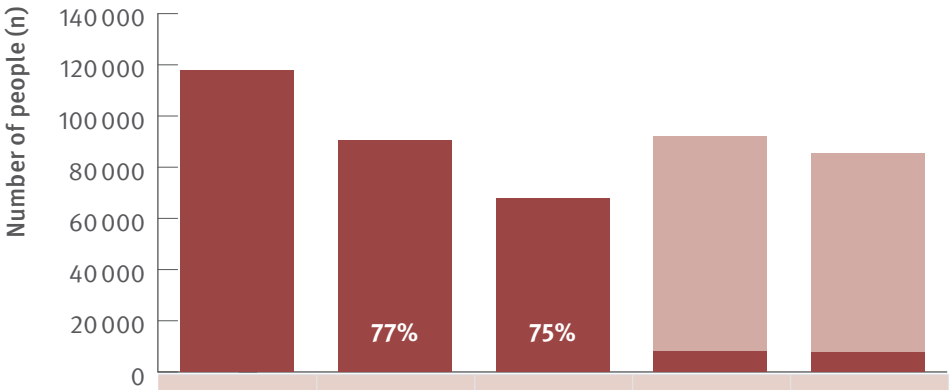
Figure 29. Number of individuals and proportion enrolled in ETHOS Engage that were ever hepatitis C infected, linked to care, and treated, A: Wave 1 (May 2018–September 2019) and B: Wave 2 (November 2019–June 2021)



Source ETHOS Engage study.[20] Wave 2 data, ETHOS Engage study, unpublished data.

Notes: HCV ever determined by a combination of results obtained from point-of-care HCV RNA testing and self-reported hepatitis C status. Linked to care was defined as those who had ever been to a doctor or specialist to discuss their hepatitis C, had ever received a fibroscan after diagnosis, or had ever received hepatitis C treatment. 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: Wave 1, 87.1% (686/788) were linked to care and 66.0% (520/788) were treated; Wave 2, 83.5% (510/611) were linked to care and 77.9% (476/611) were treated. In Wave 1, treatment uptake was positively associated with being male, aged 45 years (median participant age) or older, and currently receiving OAT. In Wave 2, treatment uptake was positively associated with being aged 45 years (median participant age) or older and ever receiving OAT (past and current). Although treatment uptake was less likely among those who were homeless and with higher injecting frequency (daily or more), in Wave 1 uptake was greater than 47.6% in almost all subpopulations and uptake was greater than 61.8% in Wave 2 in all subpopulations.

Figure 30. The hepatitis C diagnosis and care cascade, 2020



	Living with hepatitis C	Diagnosed with hepatitis C	RNA confirmed hepatitis C	Received treatment (DAA)	Cured
2015–2019 combined				84 121	77 970
To the end of 2020	117 814	90 562	67 921	8 099	7 613

Source: Updated by Kirby Institute; National update on HIV, viral hepatitis and sexually transmissible infections in Australia: 2009–2018.[4,5,18]

Notes: The number of people diagnosed is the estimated number diagnosed at the end 2020, whereas the estimated number treated is the cumulative number since 2015 (n=92 220) and cured is the cumulatively cured since 2015 (n=85 583) to the end of 2020.

Four

Hepatitis C-attributable morbidity: transplantation

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

People with cirrhosis who are cured through DAA treatment have a very low risk of progression to liver failure but remain at risk (albeit reduced compared to those not cured) of liver cancer. Due to this, observed declines in cases of liver cancer are likely to be delayed. However, reductions in the incidence of liver failure and subsequent liver transplants due to liver failure may be more immediate indicators.

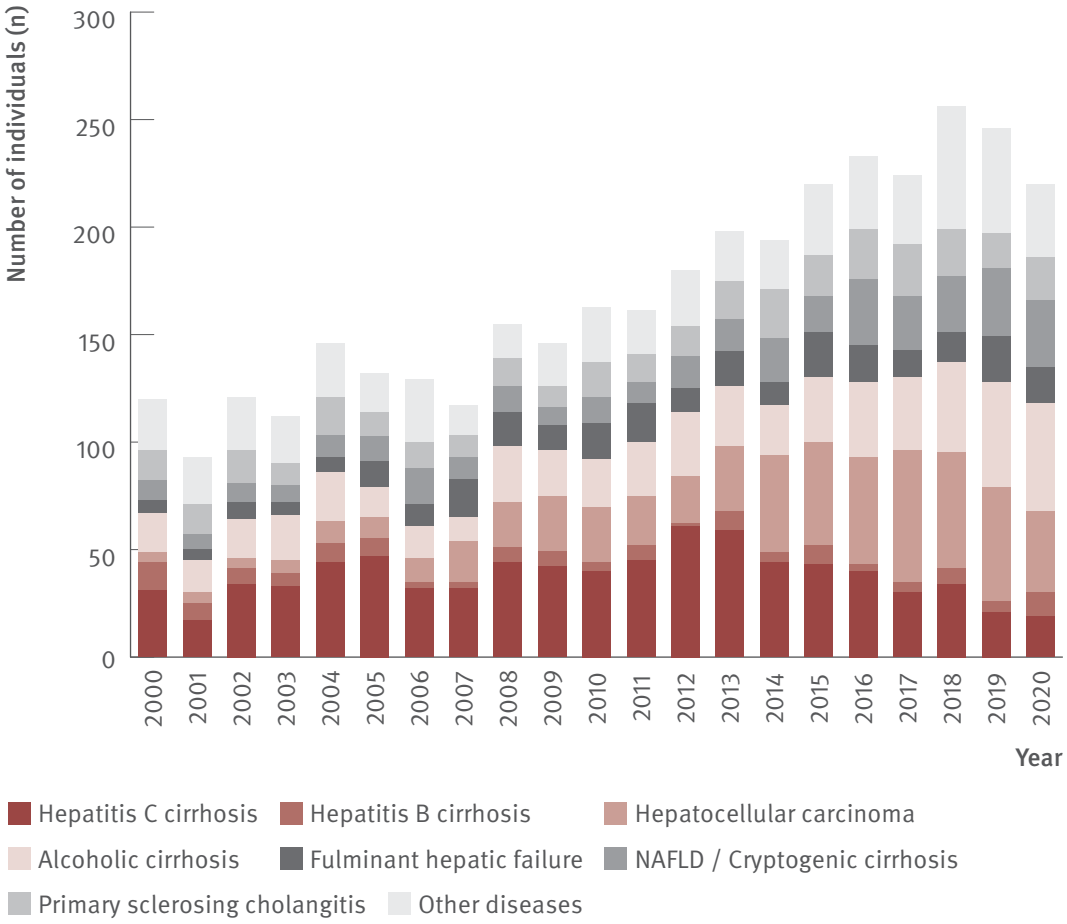
No national registry collates data on morbidity and mortality outcomes among people diagnosed with hepatitis C. However, the Australia and New Zealand Liver and Intestinal Transplant Registry collates data on the primary diagnosis of liver transplant recipients.

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 C cirrhosis declined in the past eight years (Figure 31).

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 31. Number of Australian adult liver transplant recipients by primary diagnosis and year of first transplant, 2001–2020



Source: Australia and New Zealand Liver and Intestinal Transplant Registry.[30]

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

Five

Stigma and discrimination experienced by people living with hepatitis C

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 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 has been undertaken in Australia since 2016, with tools developed as part of the Stigma Indicators Monitoring Project available to provide insights into experiences of stigma related to hepatitis C and IDU.[31] The Stigma Indicators Monitoring Project periodically includes indicators of the experience and expression of stigma in cross sectional surveys of priority population groups, health care workers, and the general public.[32]

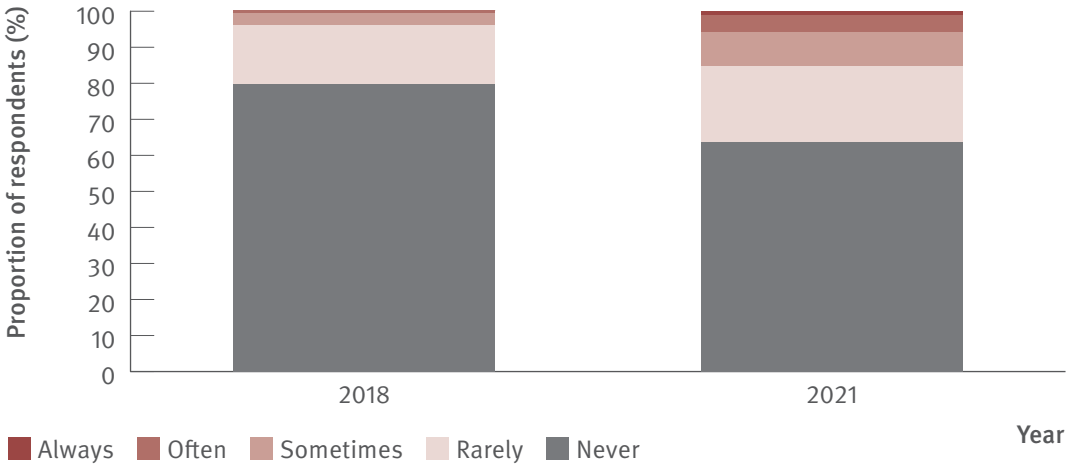
An indicator of expressed stigma towards people living with hepatitis C and PWID was included in online surveys of Australian health care workers in 2018 and 2021, completed by 551 and 907 health care workers, respectively. In 2018, participants were recruited via paid Facebook advertising and in 2021 they were recruited via Qualtrics.

PROGRESS ON REDUCING STIGMA

Data suggests that stigma and discrimination towards people living with hepatitis C and PWID continue to exist within health care settings. Results from the Stigma Indicators Monitoring Project have shown that health care workers are less likely to report stigmatising attitudes or discriminatory behaviour towards people living with hepatitis C and PWID than the general Australian public,[32] however, there remains a need to reduce stigma in health care. Health care workers in the 2021 survey were more likely to report that they would behave negatively towards people living with hepatitis C and PWID than those in the 2018 survey. However, caution should be exercised when comparing these results due to different recruitment strategies used in each survey.

Australian health care workers were more likely to report stigmatising attitudes and discriminatory behaviour towards PWID than people living with hepatitis C (Figures 32 and 33). 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 health care workers. Ongoing monitoring of stigma from these varied perspectives is necessary to understand any changes in experiences and effects of stigma over time, as well as the impact of any interventions to reduce stigma.

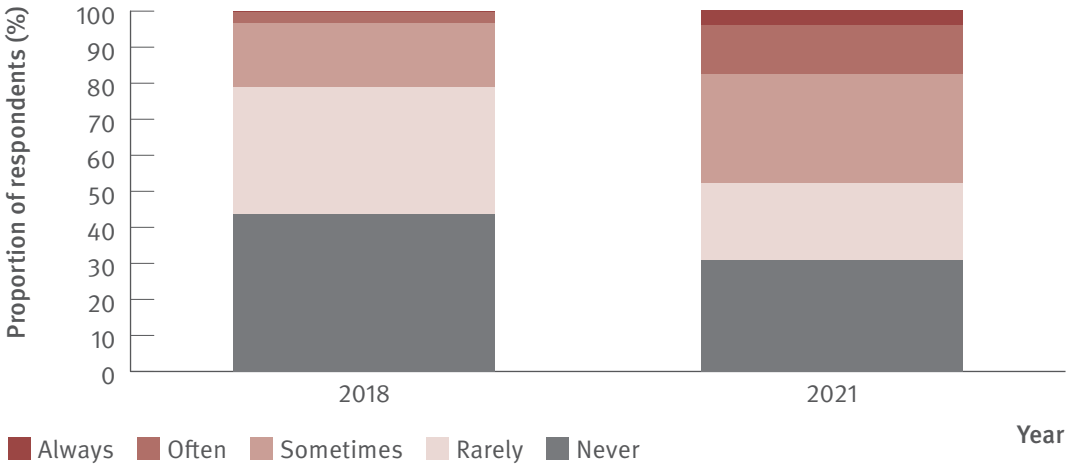
Figure 32. Reports of stigma or discrimination by health care workers towards other people because of their hepatitis C status, 2018 and 2021



Source: Stigma Indicators Monitoring Project.[31] 2021 data Stigma Indicators Monitoring Project, unpublished data.

Notes: Different recruitment methods were used between 2018 and 2021, therefore, comparisons between time points should be made cautiously.

Figure 33. Reports of stigma or discrimination by health care workers towards other people because of their IDU, 2018 and 2021



Source: Stigma Indicators Monitoring Project.[31] 2021 data Stigma Indicators Monitoring Project, unpublished data.

Notes: Different recruitment methods were used between 2018 and 2021, 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.[33] The annual ANSPS[18] and the Illicit Drug Reporting System (IDRS)[34] 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.[35,36]

PROGRESS ON PREVENTION OF HEPATITIS C ACQUISITION

The number of needles and syringes distributed in Australia has increased steadily over the past decade and in 2019 the highest number of needles and syringes distributed since 2007 was recorded (Figure 34).

Approximately one in five respondents in the ANSPS reported receptive sharing of needles and syringes in the past month and this proportion has remained relatively stable over the past nine years (Figure 35).

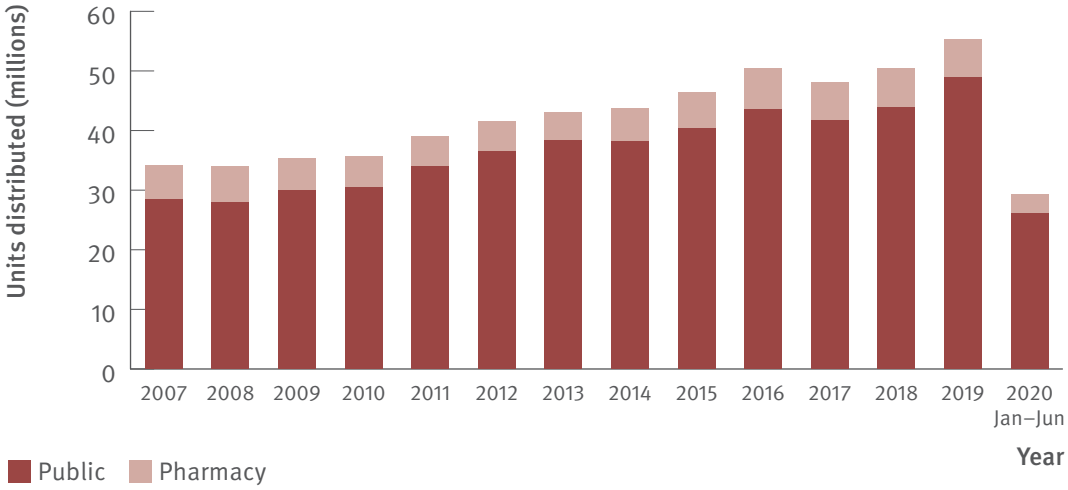
In 2020, overall HCV antibody positivity among ANSPS respondents was 39.3% (507/1 291), the fourth consecutive year that positivity was ‹50%, following two decades of HCV antibody prevalence ≥50% (all years between 1999 and 2016).[18] Between 2015 and 2020, at least half of ANSPS respondents of Aboriginal and/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 positivity declined from 15.6% (20/128) to 6.1% (5/82) between 2015 and 2020 (unpublished data, Kirby Institute, 2021).

Among ANSPS respondents tested for HCV RNA, positivity (weighted by HCV antibody status and gender) declined from 50.7% (496/978) to 16.0% (187/1 168) between 2015 and 2020. Among men HCV RNA tested, positivity declined from 53.2% (350/658) to 16.5% (132/798) between 2015 and 2020. Among women, HCV RNA positivity declined from 45.3% (141/311) to 15.2% (56/369) between 2015 and 2020. The proportion of HCV antibody positive respondents with detectable HCV RNA also declined from 76.0% (424/555) in 2015 to 39.9% in 2020 (183/459).[18] These trends are suggestive of a recent treatment-as-prevention impact.

The IDRS has shown declines over time in the receptive and distributive sharing of needles and syringes with borrowing of needles reported by ‹10% of respondents since 2012 and lending needles reported by ‹10% of respondents in 2020 (Figure 36).

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 37).

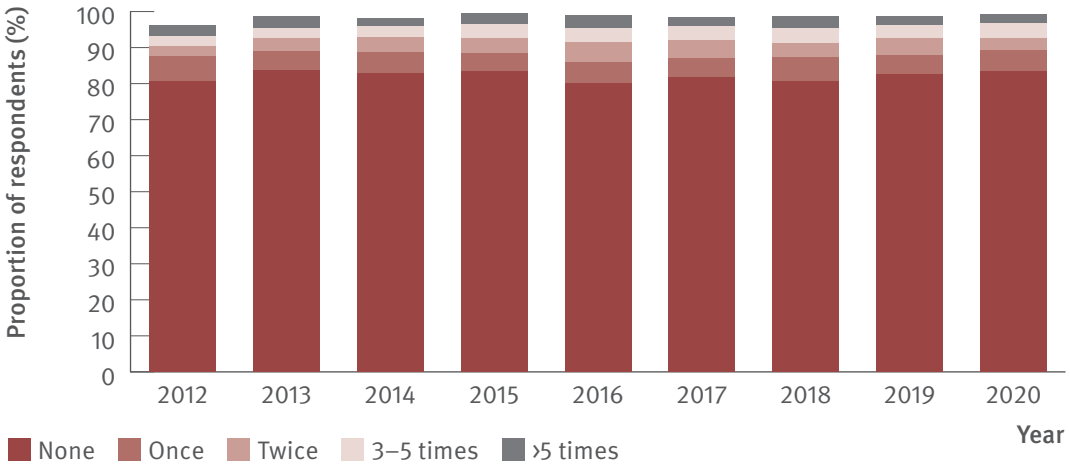
Figure 34. Number of needle and syringe units distributed by public and pharmacy sector, 2007–June 2020



Source: Needle Syringe Program National Minimum Data Collection. National Data Report 2020.[33]

Notes: July–December 2020 data not available at the time of reporting.

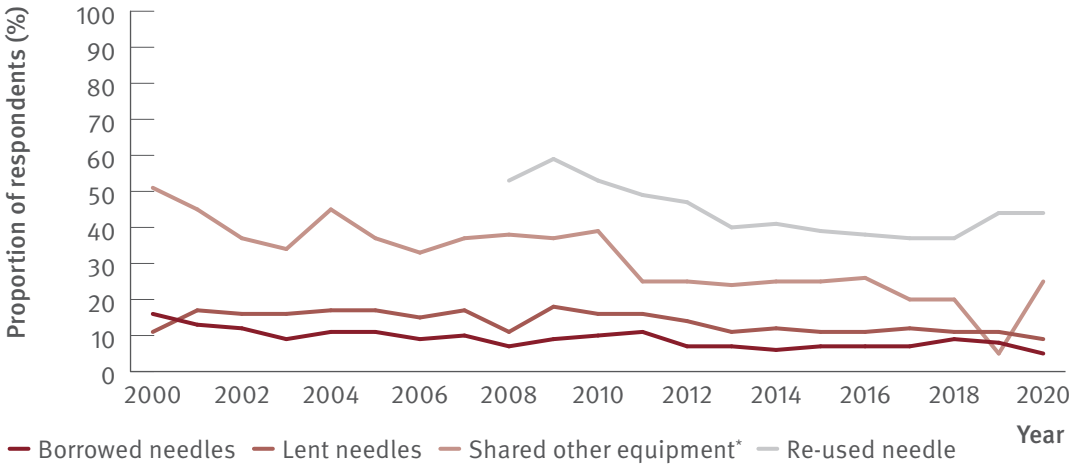
Figure 35. Proportion of respondents reporting re-use of someone else's needles and syringes in the past month, 2012–2020



Source: Australian Needle Syringe Program Survey. National Data Report 2016–2020.[18]

Notes: Not reported not included. Injection risk behaviour variables are presented among those who injected in the past month, not the entire sample. For 2012–2020, sample size was (in order): 2 127, 2 111, 2 141, 2 071, 1 993, 2 314, 2 452, 2 333, and 1 173.

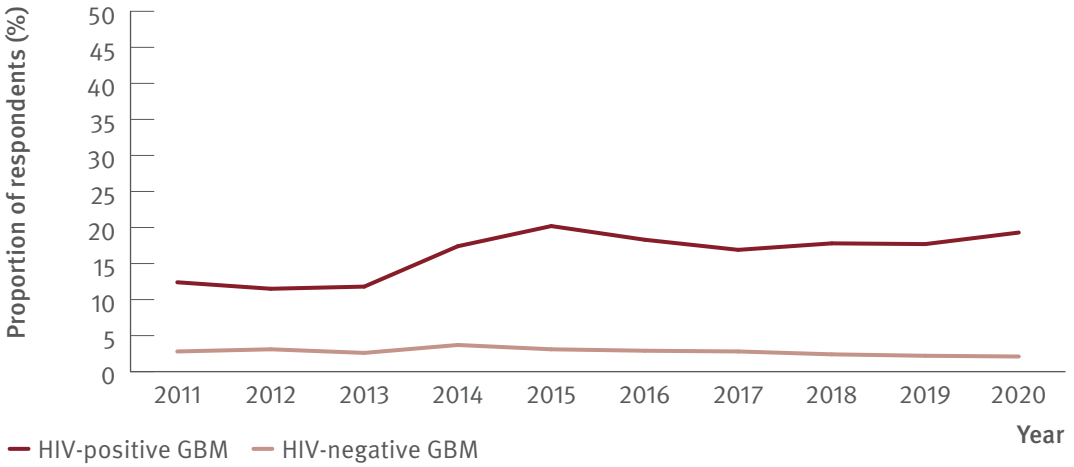
Figure 36. Proportion of respondents reporting borrowing and lending of needles, sharing of injecting equipment, and re-use of needles in the past month, national, 2000–2020



Source: Australian Drug Trends 2020. Key findings from the National Illicit Drug Reporting System (IDRS) Interviews.[34]

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

Figure 37. Proportion of GBM who reported any drug injection in the six months prior to the survey by HIV status, national, 2011–2020



Source: Gay Community Periodic Survey, Annual Report of Trends in Behaviour 2020: HIV and STIs in Australia.[35,36]

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 jurisdictions 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 insight into geographic diversity in these outcomes.[27]

PROGRESS TOWARDS EQUITY

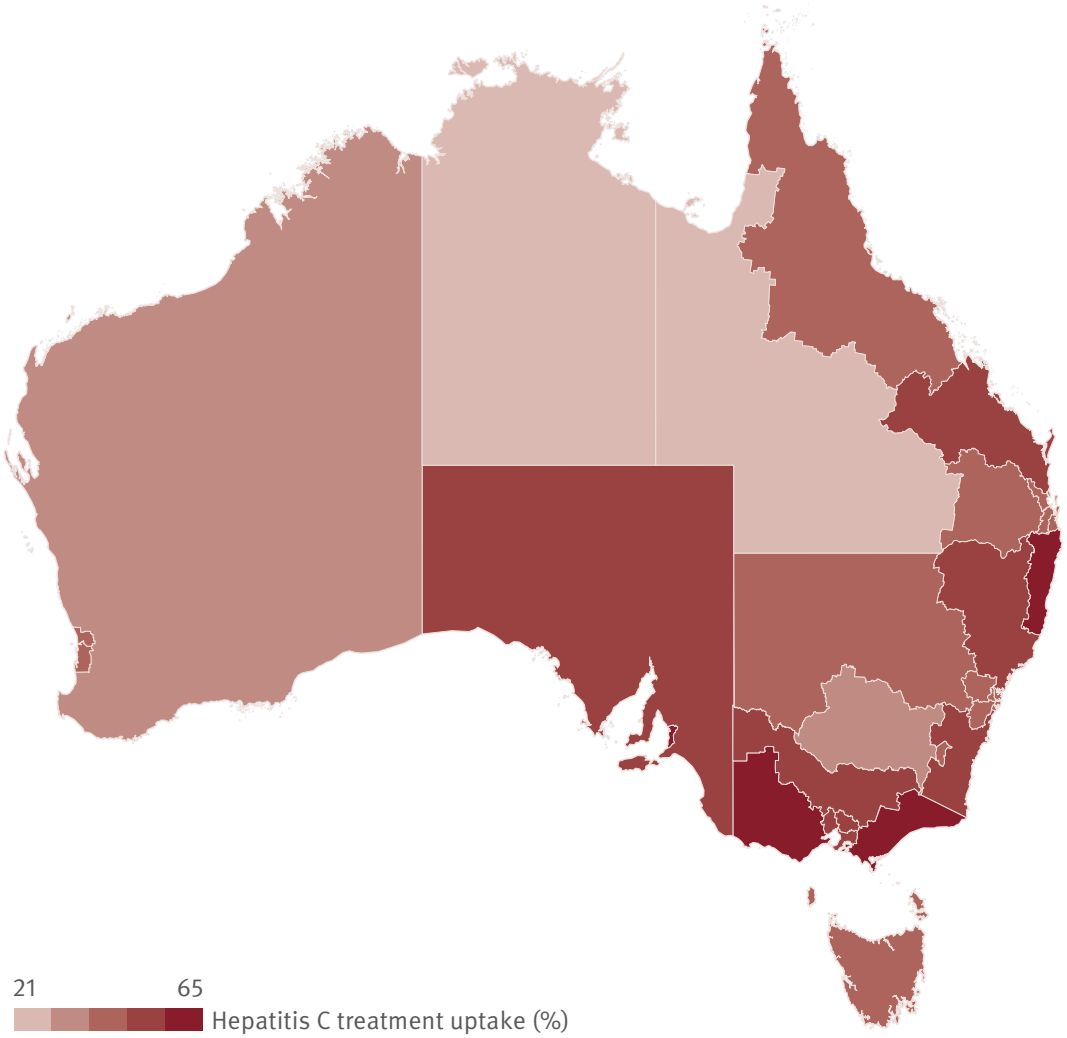
Treatment uptake

Treatment uptake at the end of 2020 was highest in the Western VIC PHN (65.4%), the only PHN in Australia to have already reached the 2022 National Strategy target of 65% uptake. Other PHNs with high treatment uptake included Gippsland (62.5%), Adelaide (60.0%), North Coast (59.5%), and South Eastern Melbourne (55.1%). The lowest treatment uptake was seen in Western QLD (21.3%), NT (21.6%), Country WA (37.5%), Northern QLD (39.1%), and Central and Eastern Sydney (39.6%; Figure 38).

The seven PHNs with the lowest treatment uptake all had hepatitis C prevalence above the national average. Conversely, of the seven PHNs with the highest uptake, only two had a prevalence above the national average. Higher-prevalence PHNs are predominantly those outside metropolitan areas, those with greater socioeconomic disadvantage in the population, and those with more limited access to specialist services (Figure 39). 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.

Despite national trends remaining relatively stable, some PHNs had a much greater decline in hepatitis C treatment uptake during 2020 than they had during previous years, suggesting an impact on treatment uptake from the COVID-19 pandemic. As expected, this was more pronounced in those regions where the pandemic and resultant stay-at-home directions were most pronounced, that is, NSW and VIC. PHNs where the decline during 2020 was considerably more pronounced than during 2019 were Northern Sydney, Central and Eastern Sydney, South Eastern Melbourne, Gippsland, Western VIC, and Darling Downs and West Moreton.

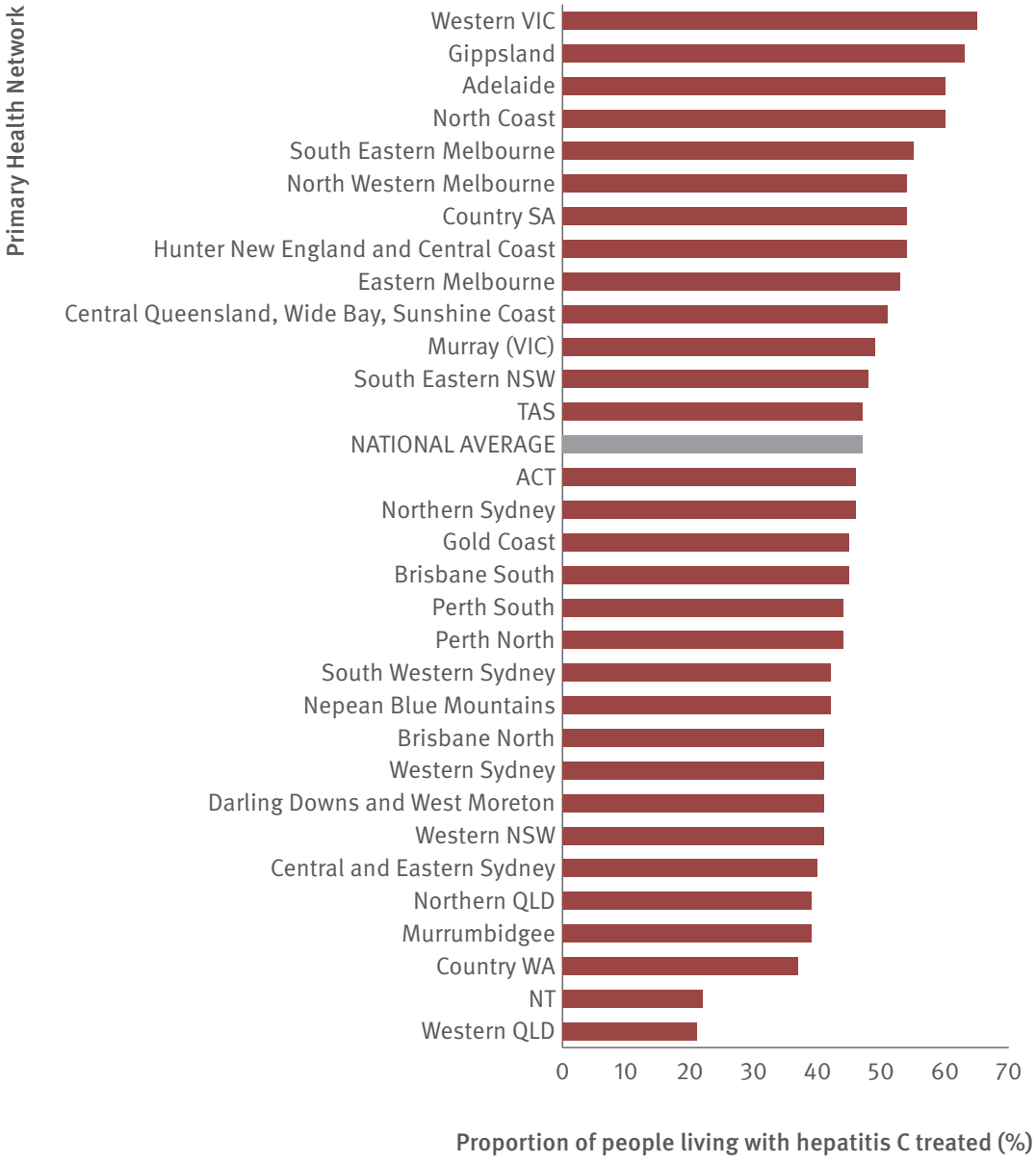
Figure 38. Geographic variation in hepatitis C treatment uptake, March 2016–December 2020



Source: The National Viral Hepatitis Mapping Project (WHO Collaborating Centre for Viral Hepatitis, The Doherty Institute).[27]

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 39. Hepatitis C treatment uptake in Australia by PHN, March 2016–December 2020



Source: The National Viral Hepatitis Mapping Project (WHO Collaborating Centre for Viral Hepatitis, The Doherty Institute).[27]

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

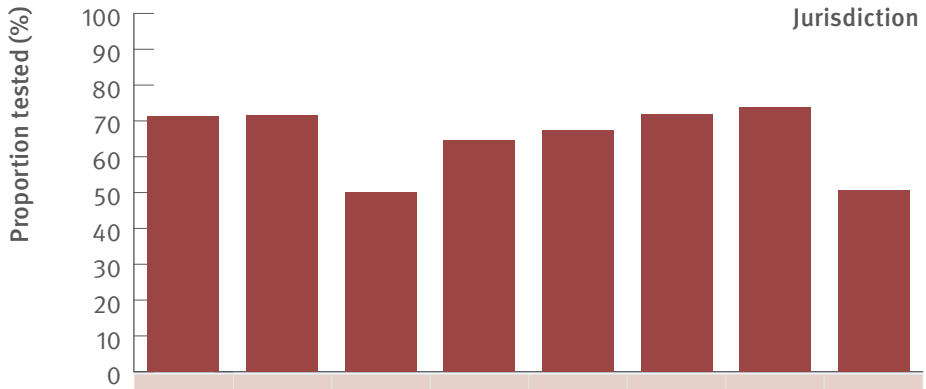
The Viral Hepatitis Mapping Project, WHO Collaborating Centre for Viral Hepatitis at the Doherty Institute also collates data on treatment outcomes by jurisdictions, and individual-level characteristics.

Testing to confirm SVR after treatment completion is recommended in Australian clinical guidelines,[37] despite the known high cure rates of DAA treatment. In Australia, between 2016 and 2020, 68.5% of individuals had an SVR test after they completed treatment. The proportion of people who had an SVR test varied between jurisdictions (Figure 40).

The proportion of individuals who had an SVR test decreased over time, from 78.4% for those who initiated treatment in 2016 to 47.9% for those who began in 2019. This metric includes only those who had at least one year of data after completing treatment, which restricts assessment to those treated up to the end of 2019. The decline in SVR testing occurred in both men and women, all age groups, all jurisdictions, and for those treated by specialists or General Practitioners (GPs). 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.

There was evidence of a shared care model of post-treatment management between specialists and GPs in SVR testing. Overall, between 2016 and 2019, in people who had their treatment initiated by a specialist, the SVR test was provided by a GP or other provider who was not a specialist physician in 29.7% of individuals. This proportion increased over time, reaching 51.3% in 2019.

Figure 40. Proportion of individuals that completed treatment and 12 months of follow-up time, who had an SVR test by jurisdiction, 2016–2020*



	ACT	NSW	NT	QLD	SA	TAS	VIC	WA
Number of people who completed treatment	1 166	25 757	694	15 630	4 470	1 853	19 352	6 537

Source: The National Viral Hepatitis Mapping Project (WHO Collaborating Centre for Viral Hepatitis, The Doherty Institute).[27]

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 those treated between 2016 and 2019.

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

Modelling from the Kirby Institute showed hepatitis C incidence and prevalence reduction goals[38] would be met under optimistic (annual treatment numbers are maintained at 2019 levels; 11 310 each year from 2021 onwards), intermediate (annual treatment numbers maintained at 2020 levels; 8 100 each year from 2021 onwards), and pessimistic (annual treatment numbers declined and maintained at 6 790 each year from 2021 onwards) treatment scenarios. The Kirby Institute model estimates that under the intermediate treatment scenario (maintaining 8 100 people treated annually), Australia will achieve the 80% treatment coverage and the 90% reduction in hepatitis C incidence targets by 2028 (Figure 41 and Table 1). This model uses an estimate of the number of people living with hepatitis C and the resulting time trends by first producing a specific estimate for the year 2015 using cumulative notifications and spontaneous clearance, mortality, and migration estimates. The estimate of this number is revised each year with updated data, with the current overall estimate of people living with hepatitis C in 2015 reduced by 17% (from 227 306 to 188 688) due to updated data of hepatitis C notifications, mortality, and the number of people treated, as well as the spontaneous clearance rate and accounting for duplicates of hepatitis C notifications.

Burnet Institute modelling was used to estimate the impact and cost-effectiveness of Australia's investment in DAAs. Without any treatment scale-up, 68 800 new hepatitis C infections and 18 540 hepatitis C-related deaths were projected to occur in Australia between 2016 and 2030. This was estimated to incur a total health system cost (testing, treatment, disease management) of $3.01 billion, and $26.14 billion in lost productivity due to absenteeism, presenteeism, and premature deaths (Figure 42).

If trends in actual testing/treatment numbers between 2016 and 2021 were maintained up to 2030, then 15 700 (22.8%) new infections and 8 500 (45.8%) deaths are likely to be averted between 2016 and 2030. This is estimated to incur $472 million more in health system costs than a scenario without treatment scale-up ($1.65 billion more in testing/treatment but $1.20 billion less in disease costs; $1 888 per QALY gained from a health systems perspective). It is also estimated to reduce productivity loss by $6.17 billion. Therefore, if Australia can maintain trends in testing/treatment up to 2030, testing/treatment scale-up becomes cost-saving from a societal perspective by 2022 with a net economic benefit of $5.70 billion by 2030.

However, further testing/treatment scale-up is required between 2021 and 2030 to achieve elimination, which could avert an additional 930 deaths and 10 000 new infections. This is estimated to incur $243 million more in direct health costs compared with the current trends ($6 075 per QALY gained from a health systems perspective), but increase the net economic benefit at 2030 by $272 million.

Figure 41. 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)

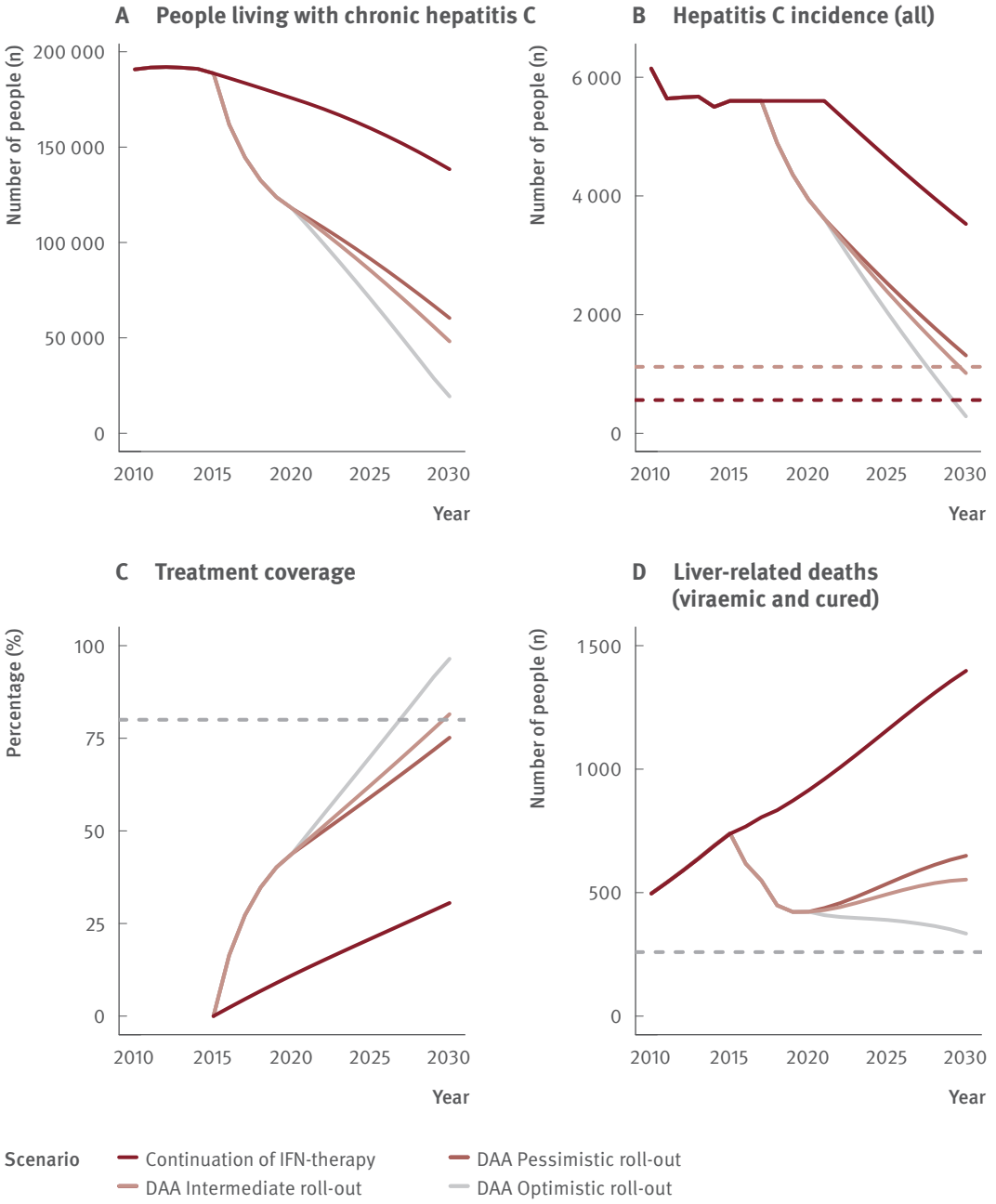
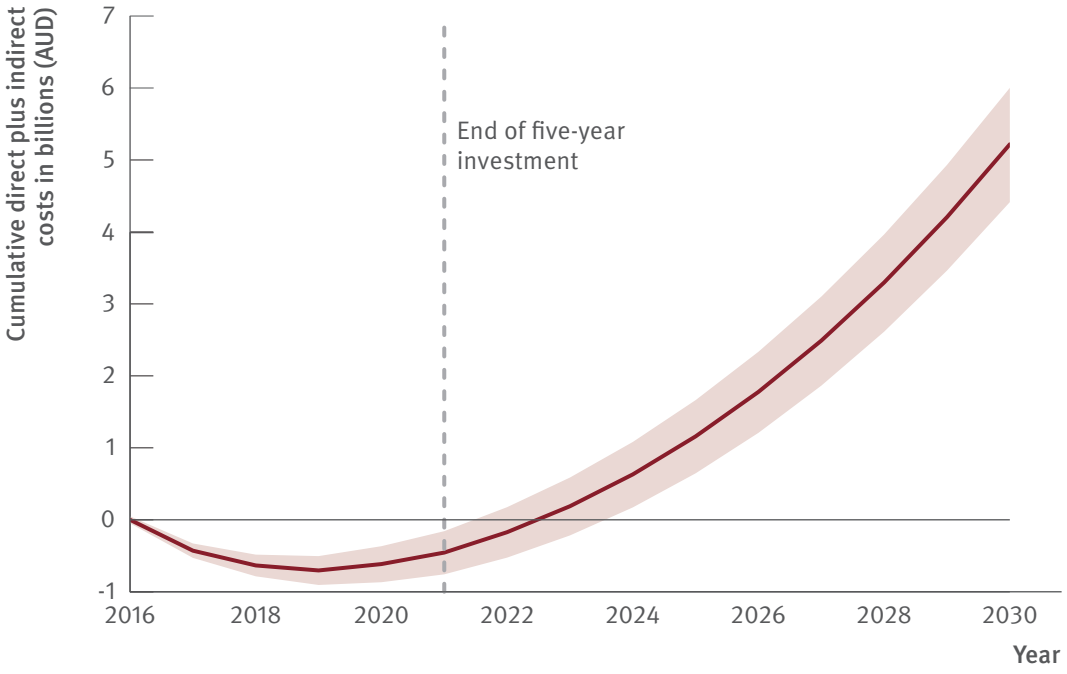


Table 1. Scenarios for the annual number of people in Australia receiving DAA

Treatment roll-out scenarios	2015 (Interferon + DAA)	2016	2017	2018	2019	2020	Post -2021
Pessimistic roll-out	4 720	33 200	20 970	15 210	11 310	8 100	6 790
Intermediate roll-out	4 720	33 200	20 970	15 210	11 310	8 100	8 100
Optimistic roll-out	4 720	33 200	20 970	15 210	11 310	8 100	11 310

Source: Updated from Kwon et al., *J. Viral Hepat.* 2019.[22]

Figure 42. Net economic benefits of hepatitis C treatment scale-up, based on continued current trends in testing and treatment. The figure shows the difference in cumulative costs (testing, treatment, disease management and productivity losses) between a scenario with no treatment scale-up, and a scenario with testing/treatment as actually occurred 2016–2021 and trends continued. The initial negative cumulative costs represent the up-front investment in testing and treatment, before benefits begin to accrue over time



Source: Updated from Scott, 12th Australasian Viral Hepatitis Conference 2021.[39]

Methods

This report brings together national data sources to assess progress towards eliminating hepatitis C as a public health threat in Australia. Some data were not available at the time of reporting; future reports will aim to provide the most comprehensive picture possible.

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

ACCESS was established to monitor STI and BBV testing and test outcomes among priority populations.[9,10,11] ACCESS focusses on recruiting sites (health services) that serve priority populations, including PWID and HIV-positive GBM. ACCESS collates data on consultations, hepatitis C testing and test outcomes from participating sites. Please note that the data included in this report may differ to those presented in previous or subsequent reports due to the availability of expanded data and associated enhancement of analytical, linkage, and processing methods.

Record linkage

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

Sites

Data from 31 sites were used and stratified into primary care clinics that specialise in the health of PWID as well as providing general primary care (11 sites (one site has three health services counted as one site and one site has eight health services counted as one site)), and sexual health clinics (10 sites) and primary care clinics specialising in the health of GBM (10 sites). Primary care clinics included nine in VIC, one in WA, and one in QLD; of these clinics seven had onsite NSPs and all 11 clinics had OAT providers at the time of reporting. GBM clinics included three in VIC, three in NSW, one in SA, one in WA, one in ACT, and one in QLD. Sexual health clinics included one in VIC, six in NSW, one in SA, one in ACT and one in TAS. 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,[40] or
- were HIV-positive and had ever had a syphilis test at an ACCESS clinic (algorithm developed by Burnet Institute based on syphilis epidemiology and prevalence among HIV-positive GBM populations in VIC).

Note that at the GBM clinics, only a small proportion of individuals could be classified on recorded sexuality alone, meaning that classification of individuals as GBM at these clinics is based largely on 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 the ACCESS network.

Incidence definition

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

Incident hepatitis C infections were defined as:

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

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

Test uptake

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

Proportion positive

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

Treatment

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

The Surveillance and Treatment of Prisoners with hepatitis C (SToP-C) study

The methodology of the SToP-C study has been described in detail elsewhere.[12] In brief, the SToP-C study was a prospective study, including a before-and-after analysis, within a cohort of people incarcerated in four prisons in NSW, including two maximum-security men's prisons (Goulburn and Lithgow) and two medium-security prisons (one men's (Outer Metropolitan Multi-Purpose Correctional Centre (OMMPCC), and one women's (Dillwynia)). All prison inmates aged at least 18 years were eligible for enrolment, regardless of HCV or drug use status. After HCV testing, participants were monitored for risk behaviours and HCV infection, among three sub-populations: uninfected (HCV antibody negative); previously infected (HCV antibody positive and HCV RNA negative); and infected (HCV antibody positive and HCV RNA positive). Uninfected participants were followed up every three–six months to detect HCV primary infection and previously infected participants were followed up every three–six months to detect reinfection. Participants with HCV infection were assessed for treatment, initially standard-of-care treatment (administered by prison health services) from 2014 to mid-2017, then direct-acting antiviral (DAA) treatment scale-up from mid-2017 onwards (12 weeks of sofosbuvir plus velpatasvir, administered through SToP-C). The primary study outcome was HCV incidence before and after DAA treatment scale-up among participants at risk of HCV primary infection or reinfection.

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 OAT were collected through review of medical records. Information about hepatitis C treatment date, regimen, and duration and were also recorded. Data were collected for all individuals commencing DAA therapy from March 2016 to June 2019. Individuals were followed up for treatment outcomes until October 2020. Retreatment data were collected from March 2016 to October 2020.

Efficacy of treatment was determined by the proportion of individuals who achieved SVR, defined as HCV RNA below the lower limit of quantification at least 12 weeks post-treatment (SVR12). Clinics were asked to provide a reason if SVR12 was not achieved (virological failure, reinfection, or unknown).

Individuals were classified as having unknown SVR if, by the time of data submission (October 2020), they had not returned to clinic at least 12 weeks post-treatment for confirmation of cure testing. Individuals viraemic at SVR12 were classified as reinfected if the genotype was different to pre-treatment, and virological failure if the genotype was the same as pre-treatment.

Retreatment for reinfection includes individuals identified as reinfected at SVR12 by genotype switch, and individuals who became viraemic after achieving SVR12. Retreatment for virological failure includes individuals who did not attain SVR12 and retreatment genotype was the same as pre-treatment. Unclassified retreatments includes individuals who had an unknown SVR12 result and a retreatment genotype that could not be distinguished from the pre-treatment genotype as it was the same genotype or there was missing genotype information at baseline or retreatment.

Analysis of treatment outcomes was performed by per protocol, i.e., including only individuals with a known SVR12 outcome.

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

ETHOS Engage is an observational cohort study recruiting participants from OAT sites, drug and alcohol treatment sites, and NSPs. ETHOS Engage participants had either recent IDU (previous six months) or were currently receiving OAT. 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; 2016–2021) has established a STI and BBV sentinel surveillance network representative of ACCHSs—known as the ATLAS network. ATLAS augments the National Notifiable Disease Surveillance System[7] and helps us understand the burden of disease due to STIs and BBVs among Aboriginal and Torres Strait Islander peoples.

The ATLAS network currently includes 32 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 ACCHS.

Funding secured in 2021 will facilitate the continued operation and expansion of the ATLAS network, which is led by Principal Investigator Professor James Ward from the University of Queensland's Poche Centre for Indigenous Health.

Monitoring hepatitis C treatment uptake in Australia

The methods for the estimations have been described in detail elsewhere.[2,25] In brief, the total PBS data of DAA dispensation for all individuals who initiated treatment between March 2016 and December 2020 in Australia were used to estimate the number of individuals initiating DAA treatment, and for all subgroup analyses of DAA uptake. The data of the second or further courses of treatment (for treatment failure or HCV reinfection) were not included. Prescriber speciality was based on the prescriber derived major speciality codes recorded by the PBS. In this coding system, medical trainees (i.e., registrars) are also considered as specialists. The proportion of treatment initiations by prescriber type between 2019 and 2020 should be interpreted cautiously given the increasing number of unidentified prescriber type in these years. Jurisdictions are based on the patients' residence at the time of treatment prescription.

It should be noted that this is the first year that 100% PBS data of DAA dispensation was used for the treatment uptake analysis. In previous years, the treatment number in each jurisdiction was estimated using the 10% random sample of PBS data. Using 100% PBS data provided an opportunity to analyse treatment uptake more accurately. However, the difference in methodology has made treatment numbers in some of smaller jurisdictions inconsistent with what expected based on the previous year's numbers. Estimates of people living with hepatitis C were derived from the updated National hepatitis C diagnosis and care cascade.[4,5]

National Prisons Hepatitis Network

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

For some jurisdictions, there are slight differences in the number and type of prisons included in data collection between 2019 and 2020. Data from both public and private prisons were included for all jurisdictions except NSW. For NSW, data from 31 public prisons and data from one private prison were included for the period January–June 2020, data from two private prisons were not included. Between 2019 and 2020, five prisons closed in NSW. For the ACT in 2019, treatment initiations were included for one mental health correctional facility which was not included in 2020. For the NT in 2019, treatment initiations were included for one juvenile justice facility which was not included in 2020.

Australian Capital Territory

Data on newly initiated hepatitis C therapies were entered by clinical staff, reviewed from electronic medical records and audited from pharmacy and MedChart Electronic Medication Management.

New South Wales

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

Northern Territory

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

Queensland

Data were 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 was based on pharmacy prescriptions filled.

Victoria

Data were 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

The number of treatment initiations was based on pharmacy prescriptions filled; cross checked against prisoner data recorded on the WA Department of Justice electronic patient health record (EcHO).

Australia and New Zealand Liver and Intestinal Transplant Registry

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

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.[27]

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 each 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 between March 2016 and December 2020. 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.

Stigma Indicators Monitoring Project

For more information about the development of the stigma indicator, see Broady et al.[31]

2018 Health Care Worker Survey

In 2018, an indicator of expressed stigma was included in an online survey of Australian health care workers. Participants were recruited through paid Facebook advertising. A total of 551 health care workers completed the survey.

2021 Health Care Worker Survey

In 2021, an indicator of expressed stigma was included in an online survey of Australian health care workers. Participants were recruited via Qualtrics. A total of 907 health care workers 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 focussed on metropolitan areas. Its methods are described in detail elsewhere.[35,36]

Modelling the Australian response to hepatitis C

To produce the model estimates for the number of people living with HCV and the resulting time trends, a specific estimate for the year 2015 was produced using cumulative notifications and spontaneous clearance, mortality, and migration rate estimates. The estimate of the number of people living with hepatitis C in 2015 are revised each year with updated data. In earlier reports, the assumption was made that there were no duplicate hepatitis C notifications. However, linkage studies being conducted in NSW and VIC estimate that around 7–11% of notifications are duplicates. Given this evidence, it was assumed that 9% (range: 7–11%) of all notifications are duplicates nationally.[41] Also, recent evidence from British Columbia[42] suggests the spontaneous clearance rate of HCV infection is 28% (3% higher than what was used in previous reports). This resulted in a 12% reduction in the cumulative number of HCV notifications. The overall estimate of people living with hepatitis C in 2015 is reduced by 17% (from 227 306 to 188 688) due to updated data of hepatitis C notifications, mortality, and the number of people treated, as well as the spontaneous clearance rate and accounting for duplicates of hepatitis C notifications.

The model also updated morbidity and mortality due to hepatitis C infections. A higher risk of liver-related deaths among the population with excessive alcohol consumption (defined as ›50g per day) was incorporated in the model. The relative risk of cirrhosis associated with excess alcohol intake was estimated at 2.3 (95% CI 1.7–3.3).[43] The disease progression rate among the population without excess alcohol consumption was also included in the model. In NSW linkage, around 14–51% of people living with HCV with decompensated cirrhosis/hepatocellular carcinoma had excess alcohol consumption during 2001–2018. Compared to this population, around 13% of people without decompensated cirrhosis/hepatocellular carcinoma were diagnosed with excessive alcohol consumption during 1995–2017 in NSW linkage and 37% from the ETHOS study.[20] The model was then calibrated to the number of liver-related deaths in the NSW linkage, and an estimate of 19% excessive alcohol consumption among people without decompensated cirrhosis /hepatocellular carcinoma was used for the national estimates.

Methods associated with the Kirby Institute's modelling have been published in detail.[22]

Methods associated with the Burnet Institute's modelling of the hepatitis C epidemic and the response to hepatitis C are yet to be published.[39]

Publicly available data

Notifications of hepatitis C

Notifications of newly acquired hepatitis C were acquired from the National Notifiable Diseases Surveillance System[7] with details of notification requirements, procedures, and case definitions available from the Australian Government Department of Health.[44] Notifications are also reported in the *National update on HIV, viral hepatitis and sexually transmissible infections in Australia: 2009–2018*.[4]

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 infections in Australia 2009–2018*,[4] with methods associated with the updated cascade described in detail elsewhere.[5]

The Needle Syringe Program National Minimum Data Collection

The Needle syringe Program National Minimum Data Collection publishes an annual report, with full details of methods included.[33]

The Illicit Drug Reporting System

The Illicit Drug Reporting System publishes an annual report, with full details of methods included.[34]

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The Surveillance and Treatment of Prisoners with hepatitis C (SToP-C) study

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

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Stigma Indicators Monitoring Project

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Gay community Periodic Survey

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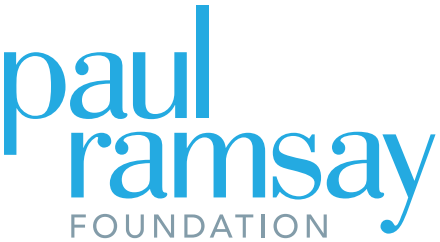

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