

VIRAL HEPATITIS MAPPING PROJECT

Geographic diversity in chronic hepatitis B and C prevalence, management and treatment

NATIONAL REPORT 2020



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WHO COLLABORATING CENTRE FOR VIRAL HEPATITIS,
THE PETER DOHERTY INSTITUTE FOR INFECTION AND IMMUNITY
AUSTRALASIAN SOCIETY FOR HIV, VIRAL HEPATITIS
AND SEXUAL HEALTH MEDICINE



Viral Hepatitis Mapping Project: *Geographic diversity in chronic hepatitis B and C prevalence, management and treatment*
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ABBREVIATIONS

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AIR	Australian Immunisation Register
ASGS	Australian Statistical Geography Standard
ASHM	Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine
CHB	chronic hepatitis B
CHC	chronic hepatitis C
DAA	direct-acting antiviral
GP	general practitioner
HBV	hepatitis B virus
HCV	hepatitis C virus
MBS	Medicare Benefits Schedule
NNDSS	National Notifiable Diseases Surveillance System
NSW	New South Wales
NT	Northern Territory
PBS	Pharmaceutical Benefits Scheme
PCR	polymerase chain reaction
PHN	Primary Health Network
POLAR	population level analysis and reporting
Qld	Queensland
SA	South Australia
SA2	Statistical Area 2 (geographic boundary)
SA3	Statistical Area 3 (geographic boundary)
SVR	sustained virological response
Tas.	Tasmania
Vic.	Victoria
WA	Western Australia
WHO	World Health Organization

For a list of data terms and definitions, see [Section D – Data sources and methodology](#).

EXECUTIVE SUMMARY

HEPATITIS B TREATMENT AND CARE

- Treatment uptake for chronic hepatitis B (CHB) in 2020 was 10.7%, half the National Hepatitis B Strategy target of 20% by 2022.
- Engagement in care (either treatment or monitoring) in 2020 was 22.6%, less than half the National Strategy target of 50% by 2022.
- Treatment uptake progress slowed and monitoring uptake reduced in 2020, likely due to the effects of COVID-19 (and related restrictions) on health service access.
- Regions showing the most severe effects on progress in CHB treatment uptake included **Central and Eastern Sydney, Hunter New England and Central Coast, Country SA, and Western Sydney**.
- Regions where CHB monitoring uptake declined most severely included **Murrumbidgee, South Eastern Melbourne, Eastern Melbourne, and North Western Melbourne**.
- Ten of Australia's 324 Statistical Area 3s (SA3s) have already reached the 2022 National Strategy treatment uptake target of 20%, while three have reached the 50% care uptake target.
- General practitioner (GP) prescribing increased more rapidly in 2020 than during 2016–2019, and 22.8% of people treated for CHB in 2020 had a GP prescribe at least one of their scripts.

HEPATITIS B IMMUNISATION

- Australia overall reached the 95% National Strategy target for infant hepatitis B immunisation in 2020, including in 22 of 31 Primary Health Networks (PHNs), though coverage was lower among Aboriginal and Torres Strait Islander children.

HEPATITIS C TREATMENT

- By the end of 2020, 47.0% of people estimated to be living with chronic hepatitis C (CHC) at the start of 2016 had received treatment.
- Treatment numbers continue to decline over time, and following these trends Australia is not currently projected to meet the National Hepatitis C strategy target of 65% uptake by 2022 nor the 2030 Global Health Sector Strategy target of 80% treatment uptake.
- CHC treatment uptake nationally declined at a similar rate in 2020 compared to 2019; however, the decline was more rapid in **Northern Sydney, North Western Melbourne, South Eastern Melbourne, Gippsland, and Western Victoria**, where uptake declined by 40% or more.
- Treatment uptake continued to be generally lower in remote regions and regions of higher prevalence.
- Since 2016, 68.5% of people who completed CHC treatment had a sustained virological response (SVR) test to confirm cure.
- During 2020, GPs prescribed 43.6% of CHC treatment courses, and this was more common in regional and remote areas.

HEPATITIS B AND C TESTING – NATIONAL

- The number of hepatitis serology tests occurring through Medicare in 2020 reduced by 15% in 2020, in contrast to previous increases. This reduction was most pronounced in NSW and Victoria.

HEPATITIS B AND C TESTING – PRIMARY CARE COHORT

- Analysis of data from 435 primary care practices in Victoria demonstrated that of all patients recommended for hepatitis B and/or C testing, 29.3% had a record of having had a test.
- Testing uptake appeared to be lowest among those with an ethnicity that is associated with higher prevalence, and insufficient among those with a diagnosis of liver disease and at highest risk of adverse outcomes.

LIVER CANCER

- Liver cancer rates in Australia were highly variable according to region.
- In the **North Western Melbourne, Western Sydney, Central and Eastern Sydney, Northern Territory**, and **South Western Sydney** PHNs, the majority of Statistical Area 2s (SA2s) had liver cancer rates above the national average.
- The five PHNs with the highest liver cancer rates also had above average prevalence of CHB (**North Western Melbourne** and **Western Sydney**), or had above average prevalence of both CHB and CHC (**Central and Eastern Sydney, Northern Territory**, and **South Western Sydney**).

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INTRODUCTION

WHAT'S NEW IN THIS REPORT?

- Assessment of the effects of COVID-19 on hepatitis B and C testing, diagnosis, care and treatment
- Updated data regarding liver cancer incidence according to PHN
- Updated estimates of hepatitis B prevalence based on 2020 migration data
- Updated projections assessing which PHNs are on track to meet strategic targets for CHB and CHC, including varied scenarios depending on trends after 2020
- Data from primary care assessing uptake of screening for CHB and CHC according to priority population

The Viral Hepatitis Mapping Project aims to assess geographic variations in the prevalence of viral hepatitis and disparities in access to care, in order to identify priority areas for response. This publication comprises the Seventh National Hepatitis B Mapping Report and the Fourth National Hepatitis C Mapping Report.

This report presents the most recent available estimates to the end of 2020, including assessment of the health service effects of the COVID-19 pandemic and associated restrictions on progress in CHB and CHC testing, treatment and care. The report enables readers to identify the prevalence of viral hepatitis in local areas, and to assess progress in delivering care to those affected.

It provides a basis for assessing geographic variations in Australia's progress towards meeting the targets set out in the Third National Hepatitis B Strategy and Fifth National Hepatitis C Strategy, which cover the period 2018–2022, as well as the World Health Organization (WHO) Global Health Sector Strategy on Viral Hepatitis targets for the elimination of viral hepatitis as a public health threat by 2030. Improving access to care and treatment for viral hepatitis is needed in order to reduce the burden of attributable liver disease and cancer, the distribution of which is also geographically disparate.

The report is divided into four sections:

- Section A covers hepatitis B prevalence, diagnosis, treatment and management
- Section B covers hepatitis C prevalence, treatment and management
- Section C covers topics related to both hepatitis B and C, i.e. testing uptake and liver cancer incidence
- Section D outlines the data sources and methodology.

For further information about the Mapping Project, to access previous reports, and view frequently asked questions, please visit the [project website](#). To explore the data included in this report, visit the [online portal](#), which provides interactive visualisations of these variations at the state and territory, PHN and SA3 level. For further information or resources related to viral hepatitis and the Mapping Project, visit www.ashm.org.au/resources and www.doherty.edu.au/whoccvh. The Mapping Project is constantly evolving in response to valued feedback and guidance. To provide feedback, or to request further information or specific data, please contact jennifer.maclachlan@mh.org.au.

This report would not be possible without the contributions of the data custodians who provided information, and we gratefully acknowledge their support.

SECTION A: HEPATITIS B

SECTION A1: NATIONAL SNAPSHOT AND COVID-19 IMPACTS – HEPATITIS B

IN THIS SECTION

- National and state/territory level estimates
- Trends over time in treatment uptake during 2016–2020
- Assessment of variation according to demographic and clinical factors
- Progress and projections towards the National Hepatitis B Strategy and WHO Global Health Sector Strategy treatment targets

KEY FINDINGS

- Treatment uptake was 10.7% in 2020; however, progress slowed due to a reduction in new initiations beginning in April.
- Care uptake was 22.6% in 2020, a reduction from 2019 due to a drop in the number of people receiving viral load monitoring tests.
- The reduction in monitoring in 2020 was concentrated in PHNs located in Sydney, Melbourne, and non-metropolitan NSW.
- Australia overall is not on track to reach treatment and care targets set out in global and national strategies without very significant increases in uptake.
- Infant immunisation uptake for hepatitis B has reached the National Strategy target of 95% overall and in the majority of PHNs.

Table A.1: Heat map of CHB prevalence, treatment uptake and care uptake in Australia, by PHN, 2020

Primary Health Network	PREVALENCE Proportion of the population living with CHB	TREATMENT Proportion of people with CHB who received treatment	CARE Proportion of people with CHB who received treatment or monitoring
AUSTRALIA	0.86%	10.7%	22.6%
Northern Territory	1.84%	9.1%	24.8%
South Western Sydney	1.33%	19.5%	37.9%
Central and Eastern Sydney	1.33%	12.7%	26.1%
Western Sydney	1.25%	16.4%	36.1%
North Western Melbourne	1.23%	11.5%	25.3%
Northern Sydney	1.14%	14.6%	30.5%
Eastern Melbourne	1.13%	12.3%	27.4%
Country WA	1.04%	2.5%	3.8%
Western Queensland	0.96%	2.0%	5.4%
South Eastern Melbourne	0.93%	11.5%	25.4%
Brisbane South	0.89%	13.1%	30.7%
Perth North	0.85%	8.5%	12.5%
Perth South	0.84%	8.0%	11.8%
Australian Capital Territory	0.74%	12.5%	25.7%
Adelaide	0.74%	9.9%	18.4%
Northern Queensland	0.74%	4.9%	15.1%
Western NSW	0.68%	3.9%	11.0%
Brisbane North	0.61%	7.4%	14.8%
Gold Coast	0.61%	7.0%	13.3%
Nepean Blue Mountains	0.57%	7.4%	17.8%
Murrumbidgee	0.57%	3.7%	8.5%
South Eastern NSW	0.56%	5.3%	12.7%
Darling Downs and West Moreton	0.53%	6.1%	14.6%
Hunter New England and Central Coast	0.52%	4.6%	10.1%
North Coast	0.51%	5.1%	11.3%
Murray	0.50%	6.3%	14.8%
Western Victoria	0.49%	4.8%	12.3%
Gippsland	0.47%	5.4%	11.6%
Central Queensland, Wide Bay, Sunshine Coast	0.44%	5.5%	10.7%
Country SA	0.42%	3.7%	8.9%
Tasmania	0.28%	8.5%	17.3%

Key: Green denotes lowest prevalence, and highest care and treatment uptake, with a colour gradient through to red denoting highest prevalence and lowest care and treatment uptake.

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

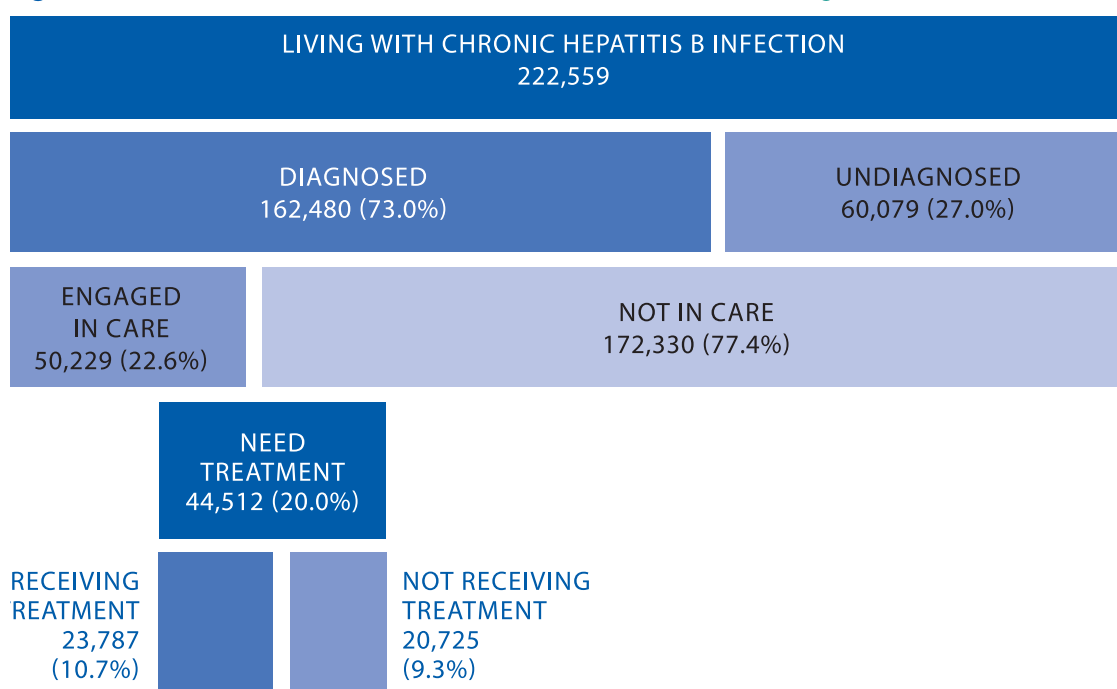
THE CASCADE OF CARE

Australia's National Hepatitis B Strategy (2018–2022) targets include:¹

- 80% of people living with CHB diagnosed
- 50% of people living with CHB engaged in care
- 20% of people living with CHB receiving treatment.

In 2020 in Australia, an estimated 222,559 people were living with CHB. Of those, 162,480 (73.0%) had ever been diagnosed; 50,229 (22.6%) people received care (either treatment or monitoring); and 23,787 (10.7%) received antiviral treatment (Figure A.1). The variation in each of these cascade indicators by geographic area is explored in later sections of this report. Trends show gradual increases in treatment and care uptake over time (Table A.2), but at a rate well below that needed to reach current national targets by 2022, or even by 2030. In 2020 moreover, there was a reduction in progress towards the care uptake target, due to reductions in monitoring for CHB.

Figure A.1: CHB cascade of care, Australia, 2020 ([link to data for this figure](#))



Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Proportion diagnosed estimated using modelling combined with notifications data. Treatment and care data sourced from Department of Human Services Medicare statistics.

Table A.2: Progress made towards 2022 National Hepatitis B Strategy targets for diagnosis, care and treatment, 2018–2020

Indicator	2018 level	2019 level	2020 level	Target by 2022	Year Australia projected to reach target*
Diagnosis	70.9%	71.3%	73.0%	80.0%	2023
Care (treatment or monitoring)	22.8%	23.2%	22.6%	50.0%	2045
Treatment	9.7%	10.2%	10.7%	20.0%	2046

* Presuming trends in population living with CHB and change in indicators over time remain stable. See National Surveillance Report for Hepatitis B Indicators Report 2020² for more information about the assumptions and projections used.

It should be noted that the 'engaged in care' indicator reflects only a snapshot of the proportion of people with CHB who received items of guideline-based care (treatment or monitoring) in a given year. Of all people living with CHB, it is estimated only 45.2% have ever received a viral load test. In 2020, only 35.2% had a viral load test in the past five years, and this proportion has remained unchanged over time. Only 11.9% of people living with CHB were receiving the optimal annual monitoring recommended in clinical guidelines. These findings highlight that, of the estimated 22.6% of people engaged in care in 2020, a significant subgroup were not in fact engaged in regular, guideline-based care, but had merely received once-off monitoring and require more regular care provision. In addition, a substantial number of people living with CHB have not yet had the opportunity to be engaged in monitoring. Improving the uptake of viral load testing is essential in order to improve treatment uptake. For more information regarding these data, see section A.1 *Engagement in care over time*.

PREVALENCE

In 2020 in Australia, an estimated 222,559 people were living with CHB, representing 0.87% of the total population² (Table A.3).

In 2020, the estimated prevalence of CHB in Australia decreased for the first time since the 1990s, because of international border closures due to the COVID-19 pandemic. Data in this iteration of the report have also been adjusted to incorporate more granular historical migration data. These changes are explored in detail in the *National Surveillance for Hepatitis B Indicators Report 2020*.²

PREVALENCE ACROSS STATES AND TERRITORIES

The highest prevalence of CHB was estimated to be in the NT at 1.84%, and the lowest prevalence in Tas. at 0.28%. Among other jurisdictions, the prevalence of CHB was also above the national average of 0.86% in NSW (0.97%) and Vic. (0.96%). Prevalence was similar to the national average in WA (0.88%), and below it in ACT (0.74%), Qld (0.65%), and SA (0.65%). (Table A.3). These prevalence estimates have been recently revised and represent updated data from the previous National Viral Hepatitis Mapping Report. In addition, reduced international migration in 2020 led to reduced prevalence of CHB in ACT, Vic., and NSW.²

Table A.3: Estimated prevalence of CHB, by state and territory, 2020

State/territory	Total population	People living with CHB	CHB prevalence (%)
ACT	431,702	3,211	0.74%
NSW	8,203,662	79,522	0.97%
NT	246,243	4,538	1.84%
Qld.	5,200,873	33,987	0.65%
SA	1,774,607	11,507	0.65%
Tas.	542,458	1,513	0.28%
Vic.	6,744,725	64,632	0.96%
WA	2,673,953	23,649	0.88%
AUSTRALIA	25,818,223	222,559	0.86%

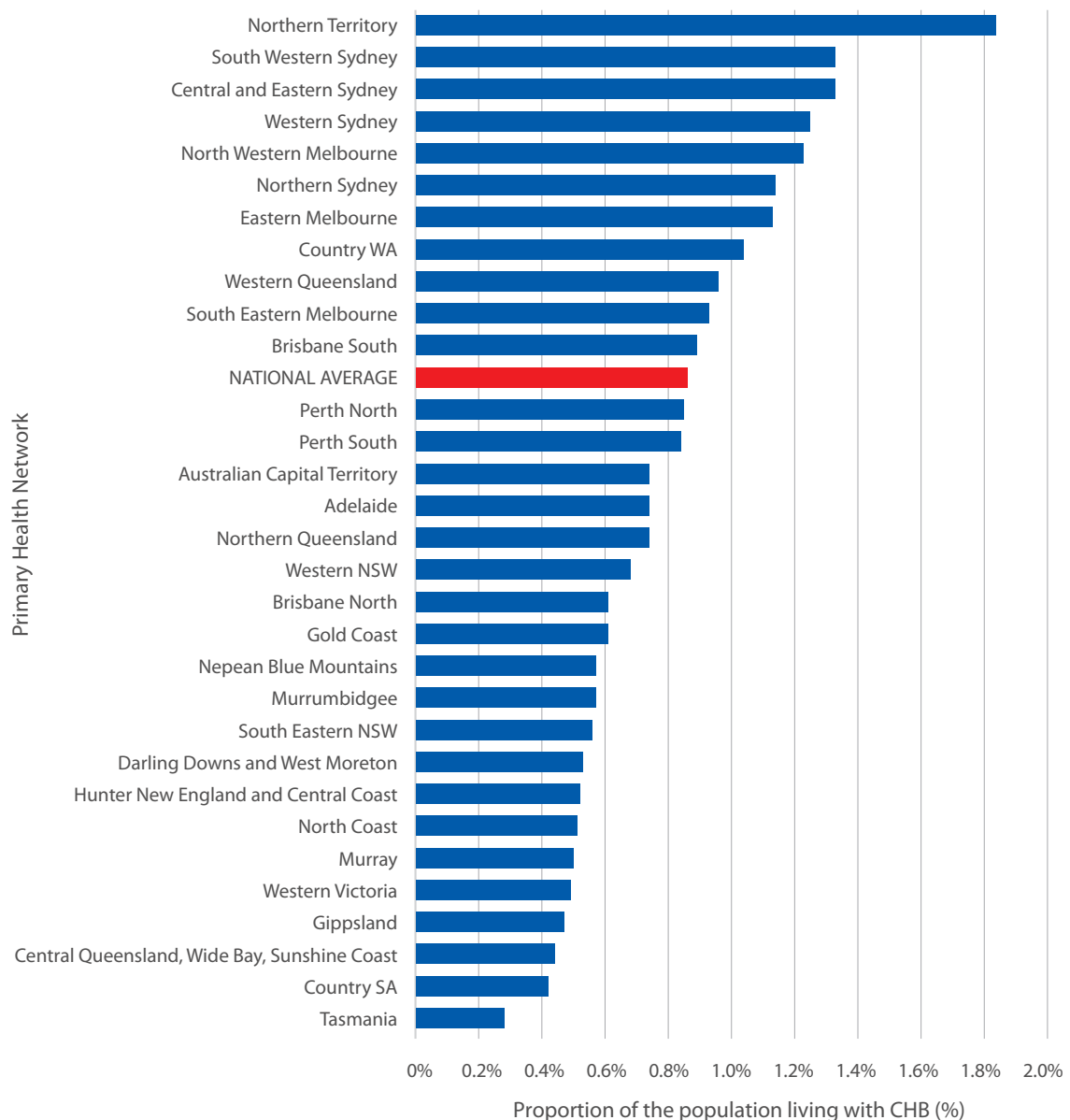
Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data.

Note: Totals may not add up due to inclusion of people without a state/territory of residence recorded in source data.

PREVALENCE ACROSS PRIMARY HEALTH NETWORKS

The **Northern Territory** PHN comprises the whole jurisdiction, and had the highest CHB prevalence in 2020 (1.84%), more than six times higher than the lowest prevalence PHNs. Outside the NT, prevalence was highest in metropolitan NSW and Vic. (Figure A.2), particularly in the following PHNs: **South Western Sydney** (1.33%), **Central and Eastern Sydney** (1.33%), **Western Sydney** (1.25%), **North Western Melbourne** (1.23%), **Northern Sydney** (1.14%), and **Eastern Melbourne** (1.13%). PHNs where prevalence was above average were mostly metropolitan, but there was also higher prevalence in **Country WA** (1.04%) and **Western Queensland** (0.96%).

Figure A.2: CHB prevalence by PHN, 2020



Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data.

[\(link to data for this figure\)](#)

PREVALENCE ACROSS REMOTENESS AREAS

CHB prevalence in 2020 was highest in very remote regions (2.98%), where it was more than triple the national average, and it was also above average in remote regions (1.37%, Table A.4). Prevalence was lowest in inner regional parts of Australia (0.47%). These prevalence variations reflect the variation in the proportion of the population which belong to the key priority populations for CHB (people born overseas in endemic regions and Aboriginal and Torres Strait Islander people), discussed below.

Table A.4: CHB prevalence by remoteness category, 2020

Remoteness level	Total population	People living with CHB	CHB prevalence (%)
Major cities	19,011,918	181,752	0.96%
Inner regional	4,489,038	20,942	0.47%
Outer regional	1,931,528	12,097	0.63%
Remote	232,229	3,190	1.37%
Very remote	153,509	4,578	2.98%
AUSTRALIA	25,818,223	222,559	0.86%

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data.

Note: Totals may not add up due to inclusion of people without a state/territory of residence recorded in source data.

PRIORITY POPULATIONS FOR CHB IN AUSTRALIA

The majority of people living with CHB in Australia were born overseas, with the most common regions of origin being North-East Asia (23.1% of the total) and South-East Asia (19.3% of the total, Table A.5 and Figure A.3). Smaller proportions were born in the regions of Europe (8.1%), Sub-Saharan Africa (3.4%), and North Africa and the Middle East (2.3%). Aboriginal and Torres Strait Islander people make up 7.2% of those affected. These proportions differ significantly across Australia due to differences in population distribution. For Aboriginal and Torres Strait Islander populations, in addition to differences in distribution, there are differences in prevalence according to region. Other population groups with a higher than average burden include people who inject drugs, who are estimated to represent 5.6% of the total population with CHB, and men who have sex with men, representing 4.3% of the total.

Note that while an individual may belong to more than one of these population groups, they were allocated to only one priority population based on the predominant transmission risk. Further detail regarding methodology for sourcing these estimates is available in *Section D: Data sources and methodology*.

These estimates are based on the most recently available Australian Census data (from 2016) regarding demographics according to region. However, it is anticipated that the distribution of Australia's population according to country of birth will have shifted significantly in recent years, particularly 2020. In the next iteration of the Mapping Report these estimates will be comprehensively updated using data from the 2021 Census, as well as newly available literature about the prevalence of CHB in specific population groups.

Table A.5: People living with CHB in Australia, by priority population, 2020

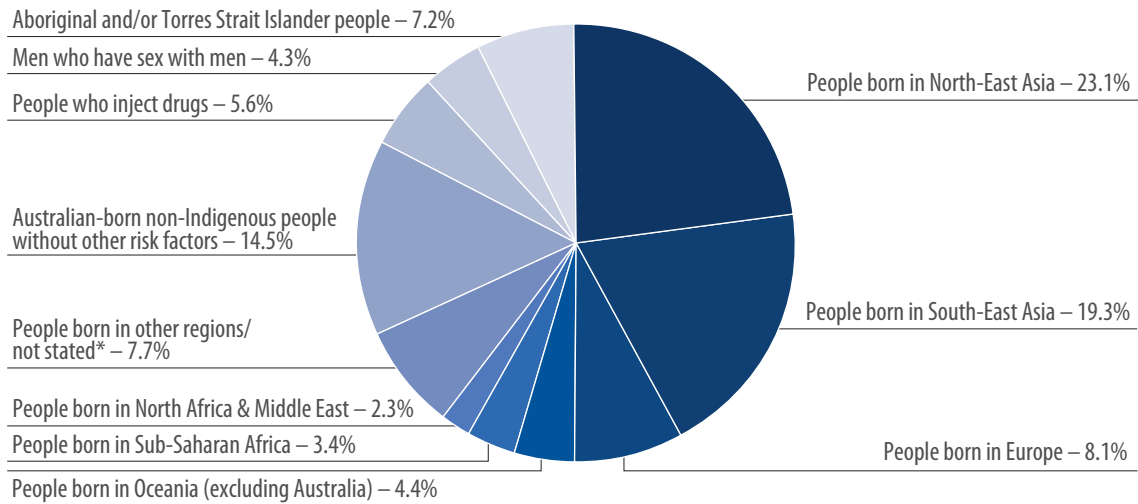
Population	People living with CHB	Proportion of all people living with CHB(%)	Prevalence (%)
People born in Australia (total)	70,345	31.6%	0.4%
Australian-born non-Indigenous people without other risk factors	32,371	14.5%	0.2%
People who inject drugs	12,356	5.6%	3.7%
Men who have sex with men	9,664	4.3%	2.8%
Aboriginal and/or Torres Strait Islander people	15,954	7.2%	2.0%
People born overseas (total)	152,214	68.4%	1.9%
People born in North-East Asia	51,460	23.1%	6.2%
People born in South-East Asia	42,868	19.3%	4.8%
People born in Europe	18,068	8.1%	0.8%
People born in Oceania (excluding Australia)	9,825	4.4%	1.5%
People born in Sub-Saharan Africa	7,648	3.4%	2.4%
People born in North Africa and Middle East	5,195	2.3%	1.3%
People born in other regions*	6,409	2.8%	0.2%
Region of birth not stated (total)	11,050	4.9%	0.7%
AUSTRALIA	222,559	-	-

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data.

Note: While individuals may belong to more than one population group, they were allocated to only one in the model, based on evidence regarding predominant transmission risk.

* Born in other regions includes people born in the Americas and Southern and Central Asia.

Figure A.3: People living with CHB in Australia, by priority population, 2020



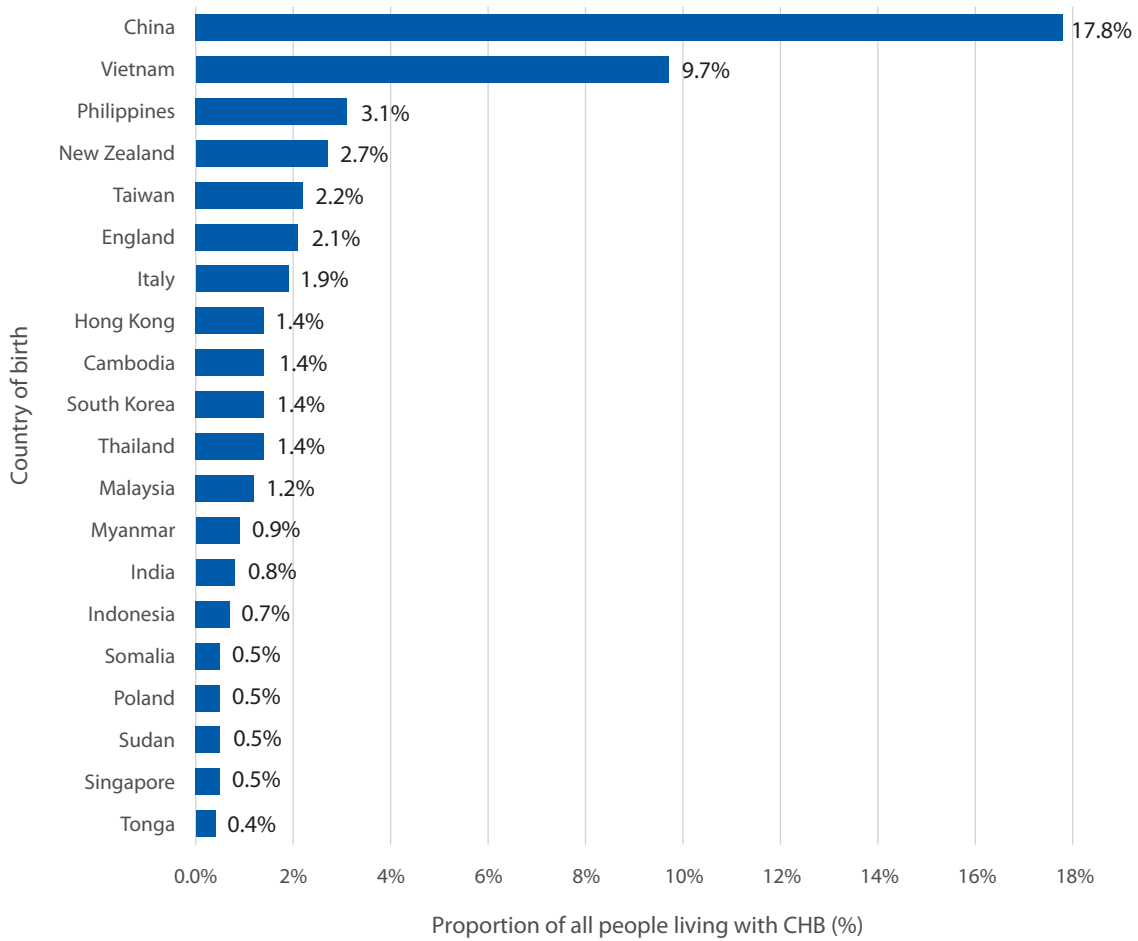
Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data.

Note: While individuals may belong to more than one population group, they were allocated to only one in the model based on evidence regarding predominant transmission risk.

* Born in other regions includes people born in the Americas and Southern and Central Asia.

Among all people living with CHB in Australia who were born overseas, the majority were born in a relatively small number of countries, predominately in the Asia–Pacific region (Figure A.3). The most common countries of birth are China (17.8%) and Vietnam (9.7%) (Figure A.4), which together represented more than one-quarter of people with CHB. The top 15 countries of birth comprise half of all people living with CHB in Australia. Some countries, such as New Zealand and the United Kingdom, rank highly due to their very large populations within Australia, despite not being high-prevalence countries (although they may contain high-prevalence subpopulations, such as Māori).

Figure A.4: Proportion of all people living with CHB in Australia, by country of birth (top 15 countries), 2020

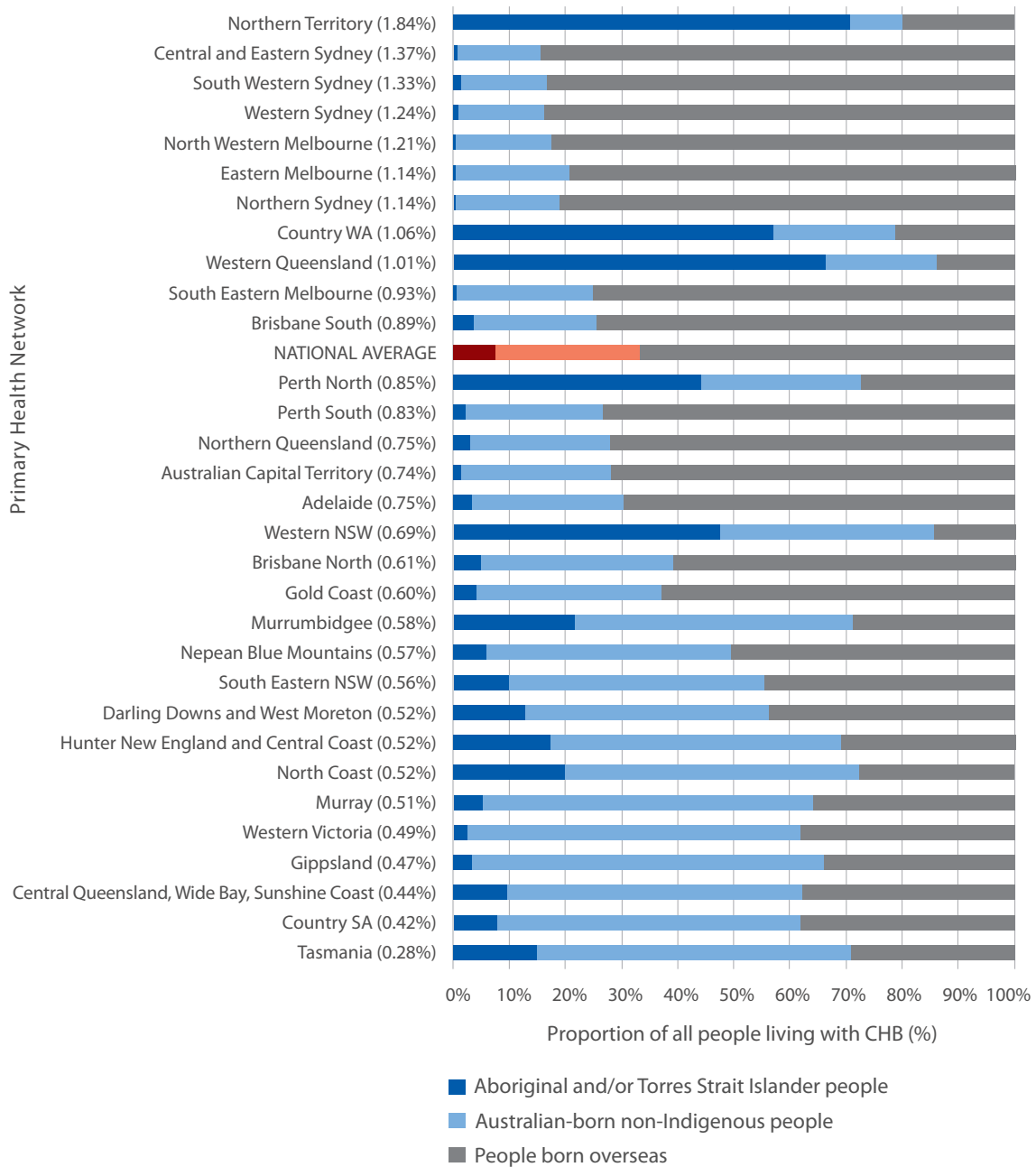


Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Country-specific data sourced predominately from local antenatal studies.^{3,4}

In most PHNs, people born overseas are the predominant group living with CHB, reflecting the overall national distribution. However, in five PHNs, Aboriginal and Torres Strait Islander people make up the largest group of people living with CHB: **Northern Territory, Western Queensland, Country WA, Northern Queensland, and Western NSW** (Figure A.5). The responses to CHB in each local area and PHN must consider the particular priority populations affected in each region, in order to tailor culturally appropriate and effective public health approaches for the local community.

As discussed above, these estimates of top countries of birth and distribution according to PHN will be comprehensively revised in the next Mapping Report, in accordance with the findings from the 2021 Australian Census.

Figure A.5: Proportion of people living with CHB according to priority population, by PHN, ordered by CHB prevalence, 2020



Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data.

Note: While individuals may belong to more than one population group, they are allocated to only one in the model based on evidence regarding predominant transmission risk. Proportions were derived after excluding those with country of birth/Indigenous status not stated.

[\(link to data for this figure\)](#)

DIAGNOSIS

Overall, in Australia it is estimated that only 73.0% of people living with CHB in 2020 have ever been diagnosed, based on data on notified cases of CHB. It should be noted that this does not necessarily represent an effective diagnosis experience from the perspective of the person living with CHB, only a minimum requirement for potential engagement in care.

Since 2011 there have been only modest increases in the estimated proportion of people living with CHB who have been diagnosed. The proportion diagnosed remains at levels below those needed to meet the National Strategy target of 80% diagnosed by 2022. The proportion diagnosed saw a greater than average increase in 2020, predominately due to the reduced number of people estimated to be living with CHB due to the effect of international border closures in relation to the COVID-19 pandemic.

The estimated proportion diagnosed varied greatly between jurisdictions, with NSW (79.2%) and Qld (73.4%) having the highest proportion diagnosed as of 2020. Estimates for all other states and territories were below the national average of 73.0%, with higher levels seen in the NT (70.0%), ACT (69.3%), and SA (67.2%), than in Vic. (63.0%), WA (57.3%) or Tas. (53.1%).

It is anticipated that the estimated proportion diagnosed with CHB will be readjusted downwards in future years, as the effect of duplicate notifications across jurisdictions is enumerated by a national surveillance data linkage project, which is currently under way.

Table A.6: Estimated proportion of people living with CHB who have been diagnosed, by state and territory, 2020

State/territory	People living with CHB	Proportion who have been diagnosed (%)	Number who have been diagnosed	Number remaining undiagnosed
ACT	3,211	69.3%	2,225	986
NSW	79,522	79.2%	62,981	16,541
NT	4,538	70.0%	3,177	1,361
Qld	33,987	73.4%	24,946	9,041
SA	11,507	67.2%	7,733	3,774
Tas.	1,513	53.1%	803	710
Vic.	64,632	63.0%	40,718	23,914
WA	23,649	57.3%	13,551	10,098
AUSTRALIA	222,559	73.0%	162,468	60,091

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Proportion diagnosed estimated using modelling combined with notifications data.

Note: Totals may not add up due to inclusion of people without a state/territory of residence recorded in source data.

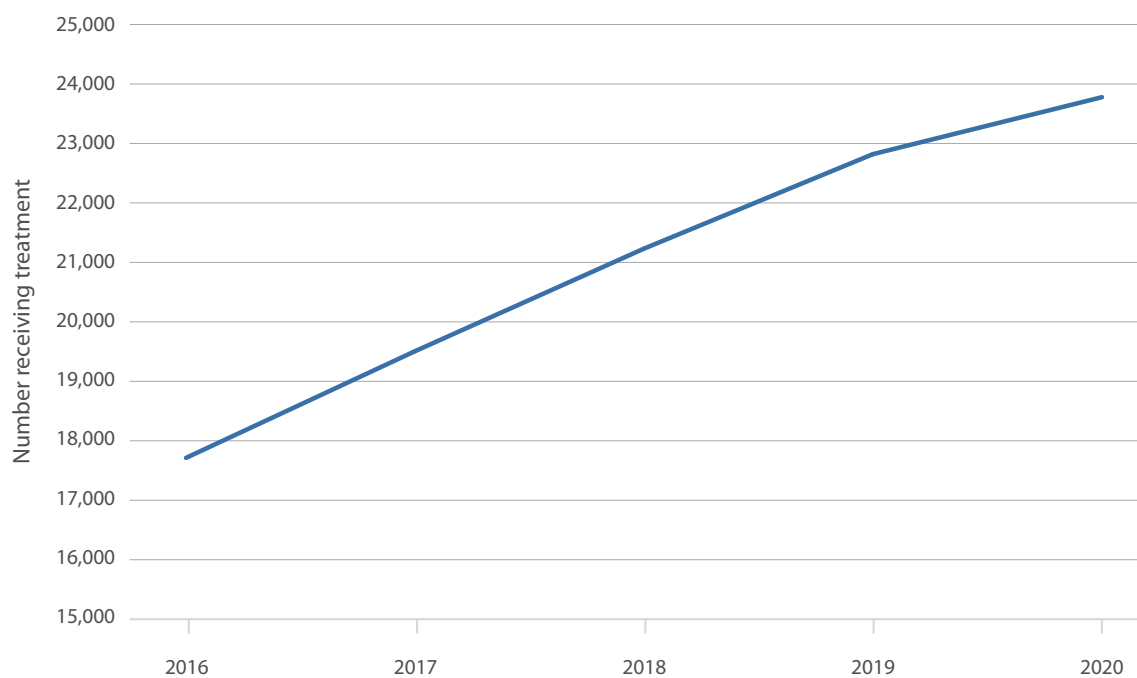
TREATMENT

The overall number of people who received treatment for CHB in Australia in 2020 was 23,787, or 10.7% of the total number living with CHB. This meets only half the National Hepatitis B Strategy target of 20% by 2022.

TREATMENT TRENDS OVER TIME AND COVID-19 IMPACTS

The number of people who receive CHB treatment has increased over time, from 17,714 in 2016 to 23,787 in 2020. This represents a 34.3% increase overall, or an average increase of 8.6% per year. However, the size of this yearly increase has reduced over time, so that in 2020, treatment numbers only increased by 4.2% (Figure A.6).

Figure A.6: Number of individuals receiving treatment for CHB, 2016–2020



Data source: Treatment data sourced from Department of Human Services Medicare statistics.

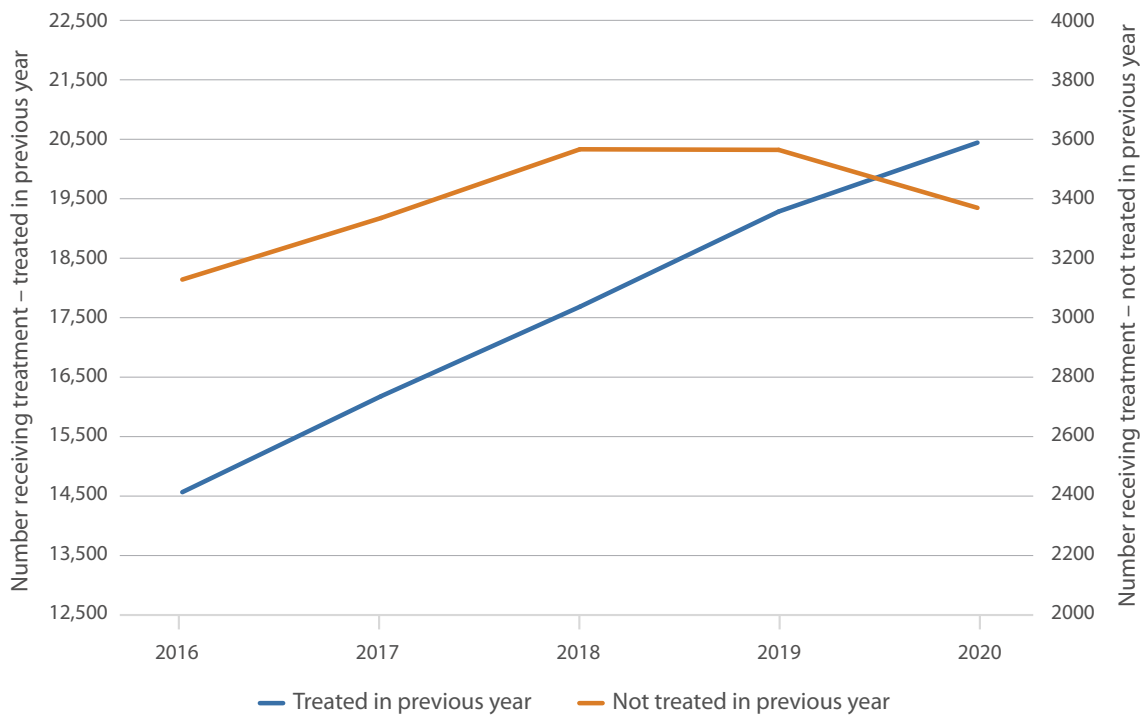
This change in 2020 was driven by reduced new initiations of treatment. The majority of people receiving treatment for hepatitis B in a given year continued to receive treatment in subsequent years, with this pattern being stable during 2020 (Figure A.7, below). The proportion of people who remained on treatment from the previous year was 85.8% in 2020, compared to 84.4% in 2019, suggesting there is no evidence of people with CHB dropping out of ongoing treatment due to the health service disruptions associated with COVID-19 in 2020.

However, the number of people receiving treatment for hepatitis B who had **not** received treatment in the past year declined by 5.4% in 2020, in contrast to previous trends, indicating a reduction in the number of people who were started on hepatitis B treatment compared to the number that would normally be expected. This is in line with findings regarding viral load testing trends in 2020 (see *Monitoring* section). The relative effects of COVID-19 by state and territory, by PHN and SA3, and by factors such as provider type and demographics, are discussed in the relevant sections below, and in relation to testing uptake.

As discussed above, the number of people estimated to be living with CHB reduced in 2020, due to migration effects from international border closures due to COVID-19, which may have had an effect

on reducing the number of new initiations. However, given treatment numbers need to significantly increase in order to prevent attributable morbidity and mortality, this is nonetheless a problematic trend. Furthermore, analysis of historical data demonstrates that 60% of people who initiated treatment in 2019 had a record of prior Medicare Benefits Schedule (MBS) testing, indicating the majority of new initiations in a given year are not occurring in those who have only recently migrated.

Figure A.7: Number of individuals receiving treatment for CHB by year and past treatment history status, 2016–2020 (note separate axes)



Data source: Treatment data sourced from Department of Human Services Medicare statistics.

TREATMENT ACROSS STATES AND TERRITORIES

Treatment uptake in 2020 varied greatly between jurisdictions, but no state or territory approached the national target of 20% (Table A.7). Treatment uptake was highest in NSW (12.9%) and ACT (12.5%); was similar to the national average in Vic. (11.0%); and below the national average in the NT (9.1%), SA (8.8%), Tas. (8.5%), Qld (8.3%), and WA (6.9%).

Table A.7: CHB treatment and care uptake, by state and territory, 2020

State/territory	People living with CHB	People receiving treatment	Treatment uptake (%)	People receiving monitoring	Care uptake (treatment and monitoring) (%)	People not in care
ACT	3,211	402	12.5%	423	25.7%	2,386
NSW	79,522	10,260	12.9%	11,213	27.0%	58,049
NT	4,538	414	9.1%	713	24.8%	3,411
Qld	33,987	2,804	8.3%	3,583	18.8%	27,600
SA	11,507	1,013	8.8%	905	16.7%	9,589
Tas.	1,513	128	8.5%	134	17.3%	1,251
Vic.	64,632	7,121	11.0%	8,686	24.5%	48,825
WA	23,649	1,635	6.9%	775	10.2%	21,239
AUSTRALIA	222,559	23,787	10.7%	26,442	22.6%	172,330

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Note: Totals may not add up due to inclusion of people without a state/territory of residence recorded in source data.

TREATMENT TRENDS OVER TIME AND COVID-19 IMPACTS BY STATE AND TERRITORY

The national trend observed in treatment uptake during 2020, where the increase in treatment numbers was smaller than in previous years, was also replicated in all states and territories, with the exception of Tas. and ACT. This change was most apparent in NSW, where treatment numbers only increased by 0.6%, compared to 4.7% the previous year.

TREATMENT ACROSS PRIMARY HEALTH NETWORKS

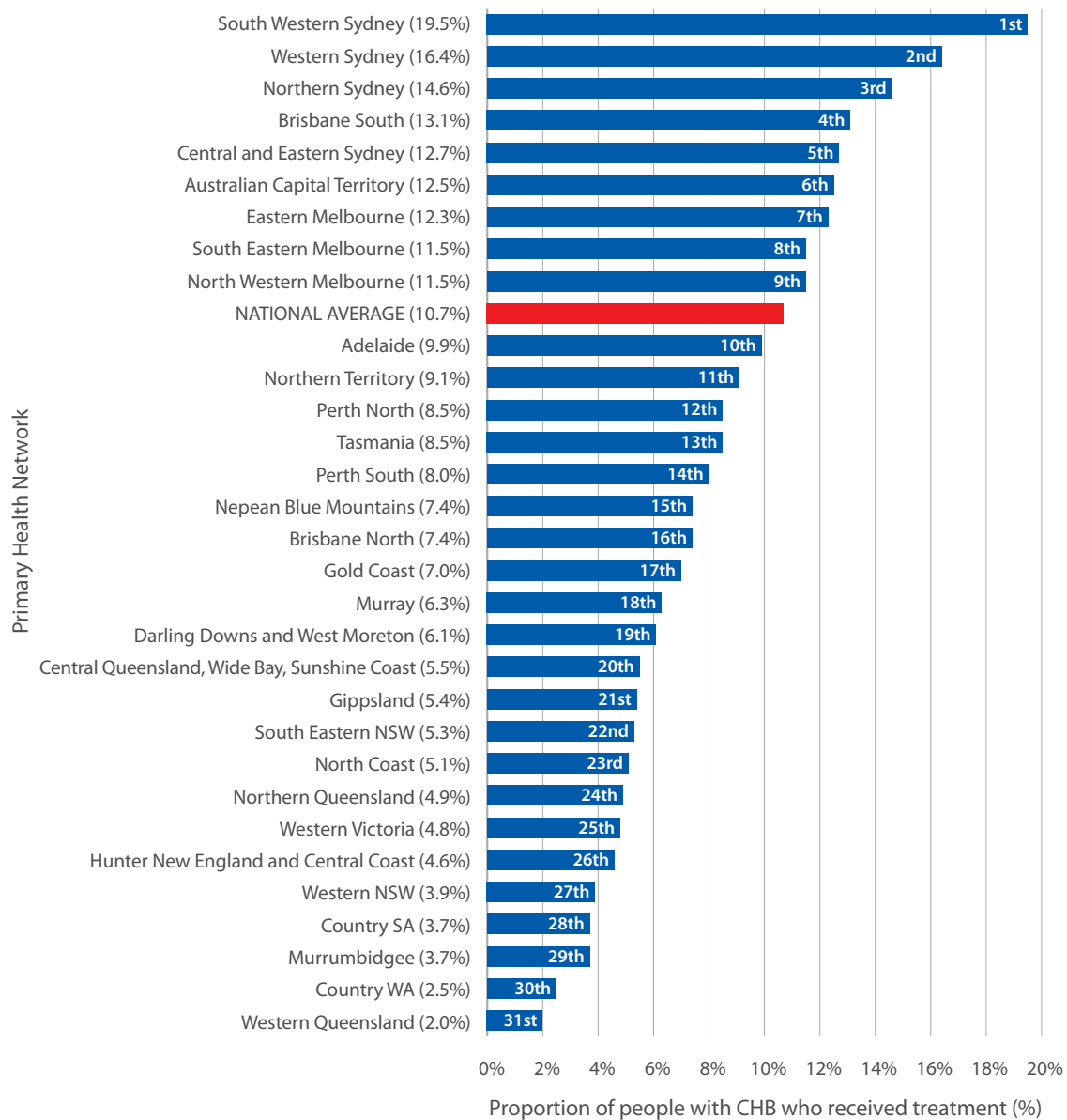
Treatment uptake was highest in PHNs in Sydney, Melbourne, Brisbane, and in the ACT (Figure A.8). No PHN has yet exceeded the National Hepatitis B Strategy target of 20% by 2022. The target was approached in **South Western Sydney** (19.5% uptake); however, if the static trend observed in 2020 continues, this PHN would still not reach 20% by 2022. PHNs where uptake was lowest were generally located in the most rural and remote regions of Australia, such as **Western Queensland** and **Country WA**, reflecting the challenges in service delivery to people living with CHB in these regions.

TREATMENT TRENDS OVER TIME AND COVID-19 IMPACTS BY PRIMARY HEALTH NETWORK

Reflecting the changes identified at the national and state/territory level, most PHNs saw reduced progress in treatment uptake during 2020 compared to 2019. Three PHNs had either a decline in the number of people receiving treatment for CHB (**Central and Eastern Sydney** and **Hunter New England and Central Coast**) or numbers remaining stable (**Country SA**), in contrast to prior increases. Other PHNs where the number of people treated in 2020 was much lower than expected based on 2019 trends included **Western Sydney** and **Darling Downs and West Moreton**.

Some PHNs saw an increase in treatment numbers that was greater than the prior trend, with almost all of them located in regional NSW (**Murrumbidgee**, **North Coast NSW**, **Nepean Blue Mountains**), as well as **Tasmania** PHN.

Figure A.8: CHB treatment uptake and ranking by PHN, 2020



Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

PROGRESS TOWARDS TREATMENT TARGETS ACROSS PRIMARY HEALTH NETWORKS

For the full reporting of Australia's current status and projected future progress towards targets for diagnosis, treatment, care, and mortality reduction, see the *National Surveillance for Hepatitis B Indicators Report 2020*.²

Based on current trends in treatment uptake and in the number of people living with CHB, Australia is not on track to meet the National Strategy treatment uptake target of 20% by 2022, nor the Global Health Sector Strategy target of 80% of eligible people treated. In Australia, this would be approximately 23% of all people with CHB.

It is estimated that Australia will reach treatment uptake levels of 11.1% by 2022, and reach 17.3% by 2030. This is despite the projected reductions in the number of people living with CHB due to reduced migration during 2020–2023.

No state or territory is projected to reach the 2022 or 2030 treatment uptake targets; however, at the PHN level some regions may be on track. If trends in treatment uptake, proportion eligible, and the number of people living with CHB remain stable, the three Sydney PHNs with the highest level of treatment uptake (**Western Sydney, Northern Sydney, and South Western Sydney**) would be on track to meet the 2030 targets. However, this assumes that the trend during 2020 of decreased progress in treatment coverage is reversed in future years.

These estimates are subject to significant uncertainty, and additional years of data will allow for more accurate future projections based on observed trends in migration and treatment uptake.

TREATMENT ACROSS REMOTENESS AREAS

CHB treatment uptake was considerably higher in major cities (11.9%, Table A.8), where it was similar to the national average of 10.7%, while in all other remoteness areas uptake was only half the national average or lower. Uptake was lowest in remote regions (3.0%).

Table A.8: CHB treatment and care uptake by remoteness category, 2020

Remoteness level	Total population	People living with CHB	People on treatment	Treatment uptake (%)	People receiving monitoring	Care uptake (treatment and monitoring) (%)
Major cities	19,011,918	181,752	21,674	11.9%	23,497	24.9%
Inner regional	4,489,038	20,942	1,018	4.9%	1,194	10.6%
Outer regional	1,931,528	12,097	726	6.0%	864	13.1%
Remote	232,229	3,190	97	3.0%	289	12.1%
Very remote	153,509	4,578	212	4.6%	517	15.9%
AUSTRALIA	25,818,223	222,559	23,787	10.7%	26,442	22.6%

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

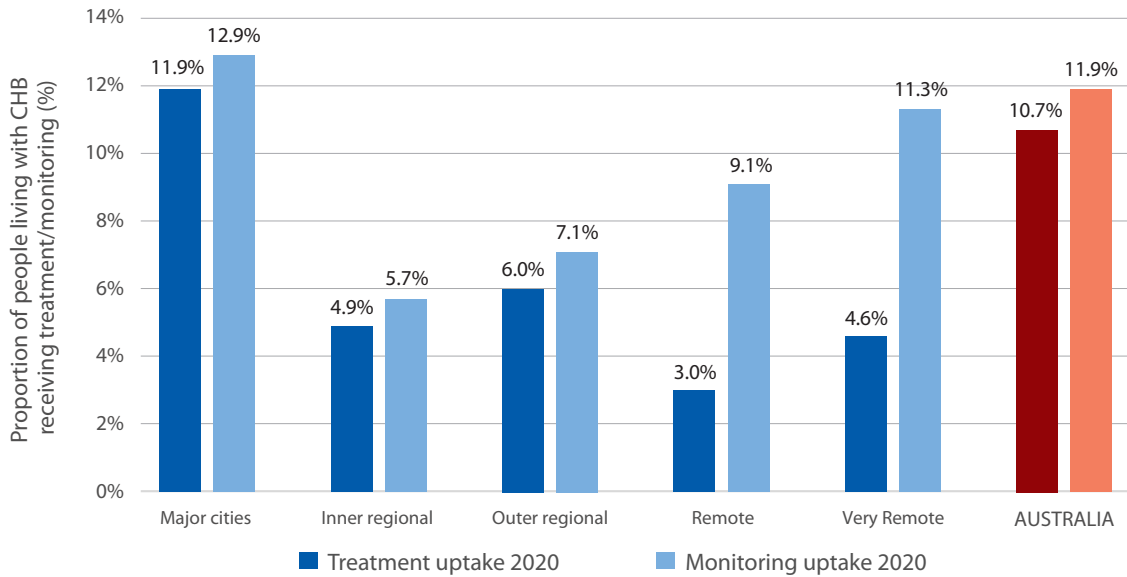
Note: Totals may not add up due to inclusion of people without an area of residence recorded in source data.

TREATMENT TRENDS OVER TIME AND COVID-19 IMPACTS BY REMOTENESS AREA

Reflecting the changes identified at the national and state/territory level, most remoteness areas saw a smaller increase in treatment numbers during 2020 than during 2019. The exception was the very remote regions, where the trend in treatment remained stable, and in inner regional areas, where the trend only declined slightly.

New initiations of treatment declined in all remoteness areas; however, the magnitude varied greatly; the largest decline was seen in remote areas (37.5% decline) and major cities (9.9%), while in very remote regions the decline was only 2.1%.

Figure A.9: CHB treatment and monitoring uptake by remoteness area, 2020



Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

TREATMENT PROVIDERS

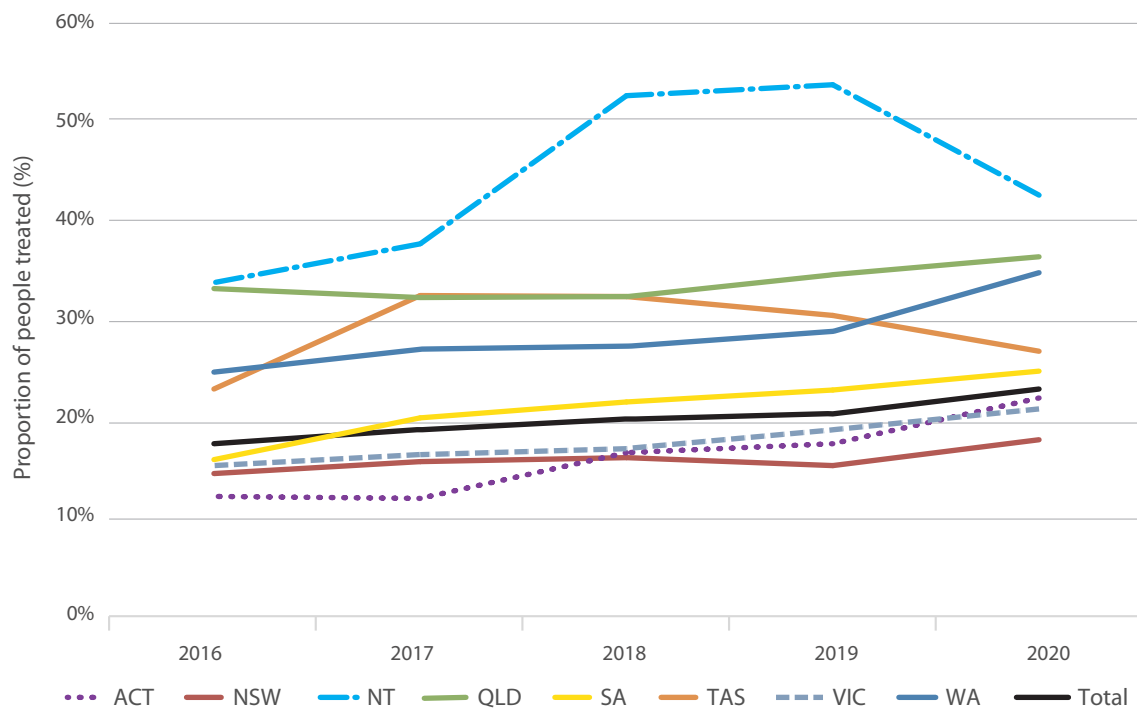
In 2020, 5,427 individuals (22.8% of the total that received CHB treatment) had at least one of their scripts prescribed by a general practitioner (GP). This included 2,529 individuals who were treated exclusively by a GP (10.6% of the total treated), while the remainder were prescribed scripts by both a GP and a specialist physician and/or other unspecified provider (12.2%). These categories are based on the derived classifications used by Medicare, which are generated using a practitioner’s recent service history. Providers in the ‘other’ category can include temporary resident doctors, locum relief doctors, nurse practitioners, and others not able to be classified as either GP or specialist. See *Section D: Data sources and methodology* for more details on provider classifications.

The proportion of people who were prescribed treatment for CHB by a GP has increased gradually over time, from 17.3% in 2016 to 22.8% in 2020. This increase was most pronounced in 2020, when it increased by 12.2%, the largest increase during the period 2016–2020. This change was driven by an increase in the number of people receiving shared care from a GP and another provider during 2020. This shift may reflect transitions from specialist to GP services, in response to the disrupted health service provision due to COVID-19.

GP prescribing varied considerably according to state and territory; however, all states have seen a generally increasing trend since 2016 (Figure A.10). The proportion of treatment prescribed by a GP was consistently highest in the NT (42.3% in 2020). Other states with above average proportions of GP prescribing included Qld (36.1%), WA (34.6%), Tas. (26.6%), and SA (24.6%). These findings are consistent with the service access limitations in these jurisdictions, where remote residence is common for people living with CHB and specialist services may not be available. These findings were similar when assessing the proportion of people who received their treatment exclusively from a GP.

There was also an increase observed in the number of Statistical Areas in which residents received GP prescribing during this period: from 271 to 308 SA3s (83.6% to 95.1% of total SA3s). This reflects an increasingly wide geographic range in which GP prescribing is potentially available to people with CHB, although the provider may not be located in their area.

Figure A.10: Proportion of individuals with a GP involved[^] in treatment prescribing, 2016–2020



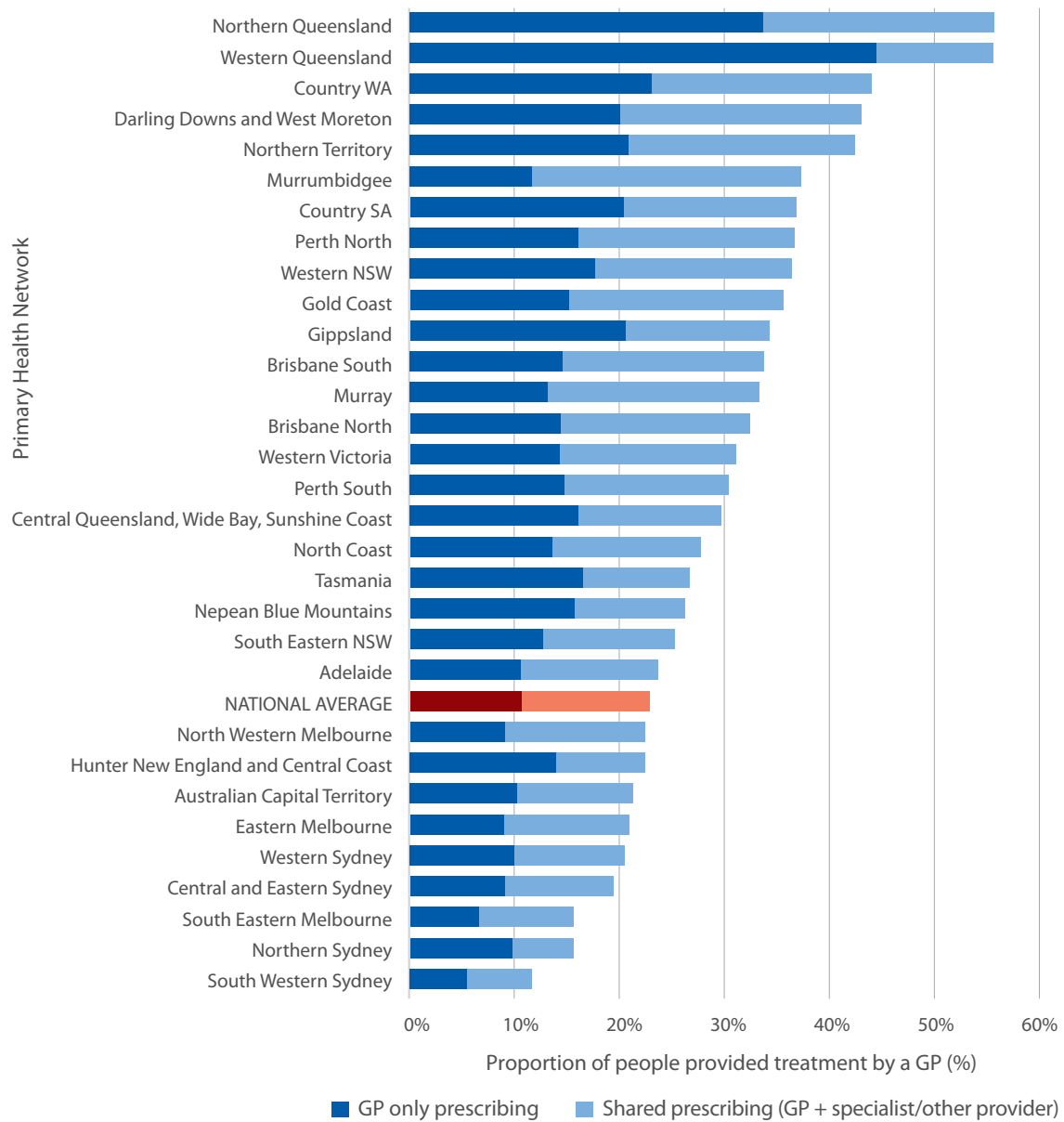
Data source: Treatment data sourced from Department of Human Services Medicare statistics. Provider type is derived by Medicare using the clinician's service history.

[^]A GP involved represents individuals for whom a GP prescribed at least one of their treatment scripts that year.

[\(link to data for this figure\)](#)

When assessed within states and territories, the proportion of people treated by a GP (either exclusively GP prescribed or shared prescribing) was highest in the **Northern Queensland** (55.6%), **Western Queensland** (55.6%), **Country WA** (43.9%), **Darling Downs and West Moreton** (42.9%), and **Northern Territory** (42.3%) PHNs. Figure A.11 shows the ranking by PHN, as including the proportion of individuals prescribed exclusively by a GP and those who were prescribed by both a GP and another provider.

Figure A.11: Proportion of individuals with a GP involved in treatment prescribing[^], by PHN, 2016–2020 ([link to data for this figure](#))



Data source: Treatment data sourced from Department of Human Services Medicare statistics. Provider type is derived by Medicare using the clinician's service history.

[^] 'A GP involved' represents individuals for whom a GP prescribed at least one of their treatment scripts that year. 'Shared prescribing' represents individuals who were prescribed scripts by multiple providers, with at least one provided by a GP. 'GP only prescribing' represents individuals who had all their scripts provided by a GP.

All but one of the PHNs with below-average GP prescribing are located in the major cities of Melbourne and Sydney, reflecting findings at the state level of the correlation between GP prescribing and remoteness of residence for people with CHB.

TREATMENT DEMOGRAPHICS

Individuals who received CHB treatment in 2020 were most commonly male (59.9%), and most commonly in the 50–59 year age group (25.9%) or the ≥ 60 year age group (33.5%). This proportion has decreased slightly since 2014, when males made up 64.4% of the total number treated. The age distribution has also shifted somewhat, with the proportion of people aged > 60 increasing from 24.7% in 2014, while the proportion aged 50–59 declined (from 29.7% in 2014).

TREATMENT TYPES

The majority of people who received CHB treatment in 2020 were prescribed first line monotherapy (93.5% of the total treated), either entecavir (61.6% of the total treated) or tenofovir (31.9%). The proportion of people treated with lamivudine and/or adefovir has continued to decline over time, from 9.1% in 2016 to 5.1% in 2020. The number of people receiving interferon treatment remained very low, declining further to 0.08% of the total treated in 2020.

CARE

In 2020 in Australia, there were 26,442 individuals who were not on treatment but received a viral load test. When combined with the number who were on treatment, this meant that 50,229 people, or 22.6% of the total number living with CHB, were provided with care in 2020. Clinical guidelines recommend that all people living with CHB should be engaged in care,^{5,6} and the National Hepatitis B Strategy 2018–2022 has set a target of 50%, which Australia is not on track to meet with current trends. Further, the estimate of care engagement is an optimistic estimate, given it represents only treatment or viral load testing provided in the given year of 2020, and not necessarily ongoing care.

CARE TRENDS OVER TIME AND COVID-19 IMPACTS

The number of people who received monitoring for CHB while not on treatment had been increasing, but plateaued in 2019 at 29,064, then in 2020 declined by 9.0% to 26,442. This led to a reduction in the overall proportion of people estimated to be engaged in care from 23.2% in 2019 to 22.6% in 2020.

CARE ACROSS STATES AND TERRITORIES

As the measure of care used includes treatment as a component, variations in care often reflect variations in treatment; however, in some areas the association differs. Care uptake, like treatment uptake, was highest in 2020 in NSW (26.9%) and ACT (25.7%) (Table A.7). Care uptake in the NT (24.8%) was above the national average of 22.6%, despite treatment uptake in the NT being below average, due to the NT having the highest level of off-treatment monitoring of any state or territory in Australia. This variation may reflect the challenges in initiating ongoing treatment, as opposed to once-yearly monitoring, in predominantly rural and remote regions, and possibly the limited availability of eligible prescribers in these locations. Systematic efforts to improve delivery of care and treatment for Aboriginal and Torres Strait Islander people living with CHB in the NT are currently underway,⁷ and are likely reflected by the high level of engagement in monitoring in that jurisdiction (Table A.9).

Care uptake was also above the national average in Vic. (24.5%), while being below the national average in Qld (18.8%), Tas. (17.3%), SA (16.7%), and WA (10.2%). However, estimation of the number of viral load tests uses Medicare data, and is therefore unable to include viral load testing services through funding streams outside Medicare, such as in public hospitals and other state-based services. There was a substantial apparent decline in hepatitis B viral load testing via Medicare in SA during 2019 and 2020, with the total number of individuals tested (both on treatment and not on treatment) declining by nearly 60%. It is likely that this is driven by viral load testing conducted outside Medicare, given the magnitude of the change and that treatment numbers remained stable during this time. Further information about this trend is discussed in the *Section A2: South Australia – CHB care*. It is also possible that this is the cause of the low apparent uptake of care in WA, which is much more pronounced than the disparity in treatment uptake. Further investigation into these changes will be reported on in future Mapping Reports.

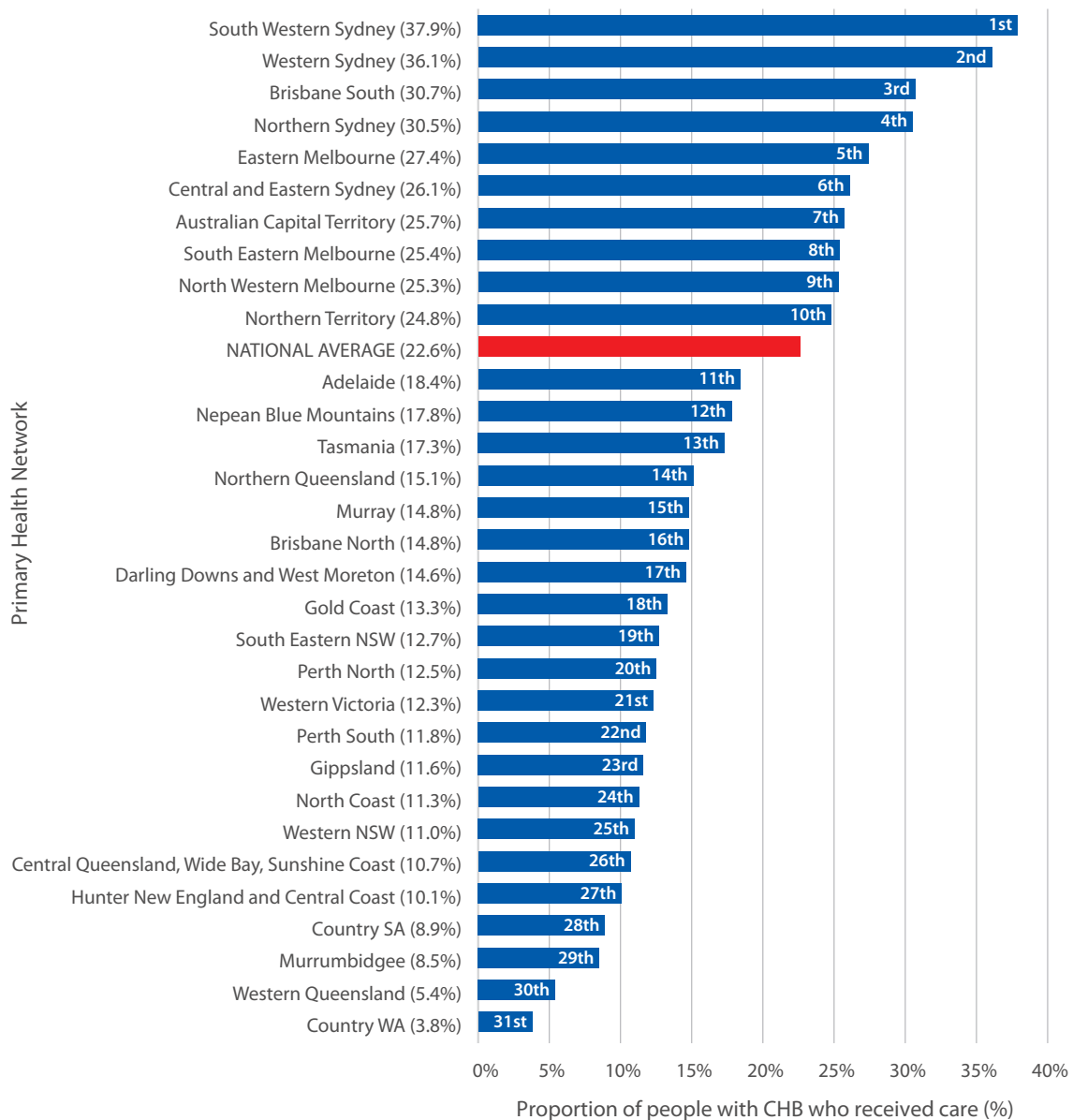
CARE TRENDS OVER TIME AND COVID-19 IMPACTS BY STATE AND TERRITORY

The trend in monitoring for people not receiving treatment varied according to state and territory. In some states, numbers remained stable (ACT and Qld), and the most severe declines were seen in Vic. (13.0% decline) and Tas. (12.4%).

CARE ACROSS PRIMARY HEALTH NETWORKS

Care uptake by PHN generally reflects the ranking of PHNs according to treatment uptake, with uptake highest in PHNs in Sydney, Melbourne, and Brisbane, as well as ACT (Figure A.12). In some areas there was a disparity between treatment uptake and care uptake ranking, such as in **Northern Queensland** (ranked 14th for care uptake but 24th for treatment uptake), and **Central Queensland, Wide Bay, Sunshine Coast** (ranked 20th for treatment uptake but 26th for care uptake). These differences are discussed further for each relevant state and territory in Section B.2.

Figure A.12: CHB care uptake, ranked by PHN, 2020



Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Care data (treatment and monitoring) sourced from Department of Human Services Medicare statistics.

CARE TRENDS OVER TIME AND COVID-19 IMPACTS BY PRIMARY HEALTH NETWORK

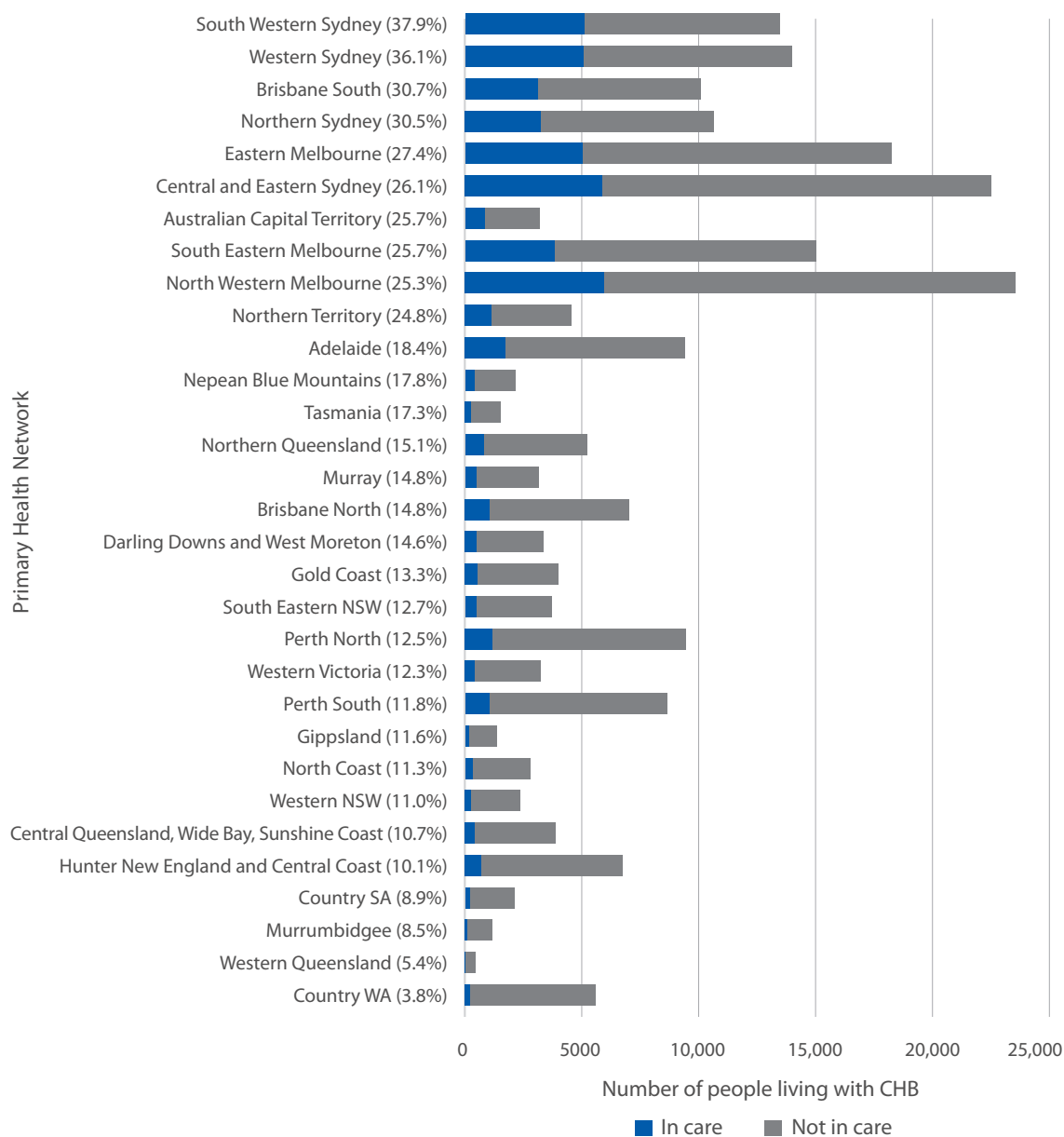
The PHNs with the largest reduction in care uptake during 2020 were **Murrumbidgee** (reduced from 9.4% to 8.5%), **South Eastern Melbourne** (27.0% to 25.4%, reducing in rank from 6th to 8th), **Hunter New England and Central Coast** (10.6% to 10.1%), **Eastern Melbourne** (28.8% to 27.4%), **North Western Melbourne** (26.5% to 25.3%, reducing in rank from 8th to 9th), and **Western Sydney** (37.8% to 36.1%). These shifts were almost entirely driven by reductions in off-treatment monitoring, as treatment numbers mostly remained stable in these PHNs (with the exception of **Hunter New England and Central Coast**). Overall, care uptake decreased in 14 of 31 PHNs, 12 of which were located in NSW or Vic.

Large declines were also observed in **Adelaide** and **Country SA** PHNs, which likely relate to data issues discussed in *Care across states and territories*, above.

NUMBER NOT IN CARE ACROSS PRIMARY HEALTH NETWORKS

Although the proportion of people with CHB in care was generally highest in PHNs in Sydney, Melbourne, and Brisbane, the large number of people living with CHB in major cities means that these are also the locations with the highest number of people not engaged in care (Figure A.13). Of the estimated 172,000 people not engaged in care for CHB in 2020, nearly half (48.4%) resided in the seven Sydney and Melbourne PHNs. Because of the decreases in monitoring uptake in many of these regions with high numbers of people living with CHB, the total number of people not engaged in care increased during 2020.

Figure A.13: Number of people living with CHB in care and not in care, by PHN, ordered by proportional care uptake, 2020



Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Care data (treatment and monitoring) sourced from Department of Human Services Medicare statistics.

[\(link to data for this figure\)](#)

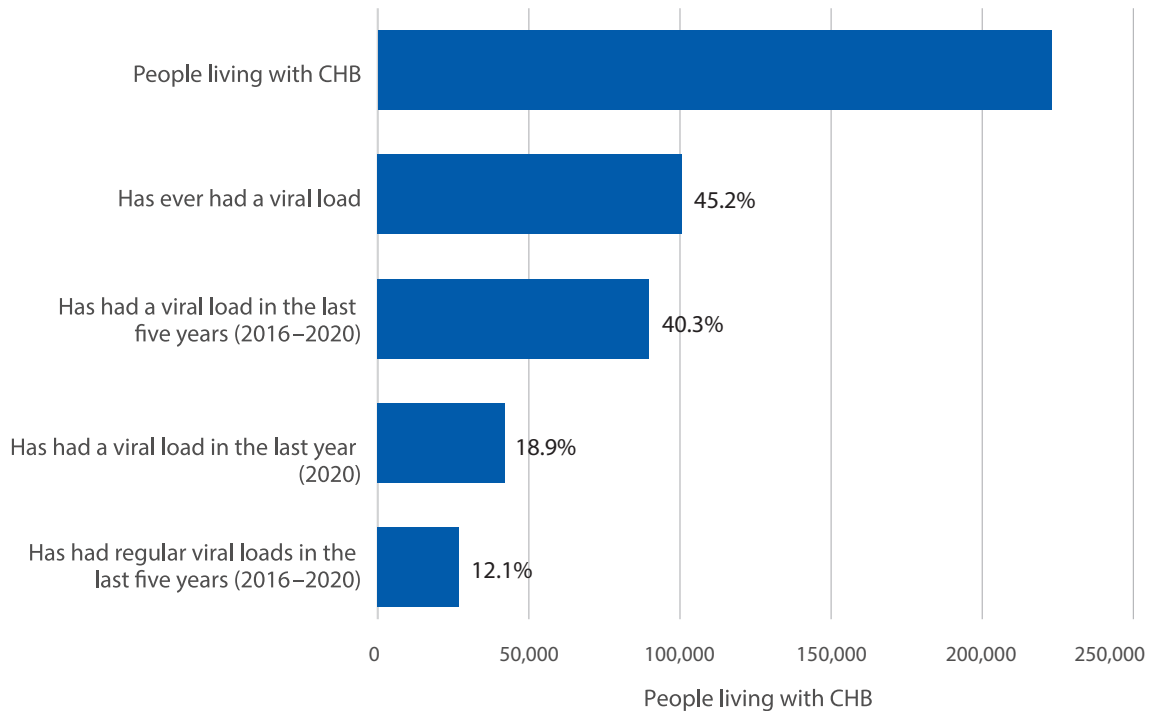
ENGAGEMENT IN CARE OVER TIME

It has previously been estimated that 45.2% of people living with CHB in Australia had ever had a viral load test, based on research linking Medicare data with notifications (see previous Mapping Report⁸ for methodological details). This estimate has not been able to be updated with more recent data, but it is not anticipated that it would have shifted significantly given overall trends in care uptake.

National data during 2016–2020 demonstrate that few people with CHB are receiving viral load testing at a frequency in line with best practice guidelines. Less than half (40.3%) of people living with CHB had a viral load test in the past five years, and only 12.1% of people had regular guideline-based viral load testing, defined as one test approximately every year (Figure A.14).

These findings highlight that estimates of engagement in care based on a single year are optimistic, and include a significant number of people whose viral load was monitored during the year in question but were not sufficiently engaged in guideline-based care over time.

Figure A.14: Historical engagement in care for people living with CHB in 2020



Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. 'Has ever had a viral load test' estimate sourced from the Victorian Liver Cancer Prevention Linkage Study. All other monitoring data sourced from Department of Human Services Medicare statistics.

ENGAGEMENT IN CARE OVER TIME ACROSS STATES AND TERRITORIES

The proportion of people engaged in regular care for CHB varied significantly according to state and territory (Table A.9), though largely reflecting differences seen in the treatment uptake indicator (Table A.7). The proportion of people who had a recent viral load test (within the last five years) was above the national average in NSW (48.5%), the NT (45.9%), ACT (44.9%) and Vic. (43.7%). The proportion with regular viral load testing (approximately each year during the last five years) was below average in the NT (8.2%); however, this likely relates to the rapid increase in the uptake of monitoring in that jurisdiction; when analysing the same indicator for only the period 2018 to 2020, uptake in the NT was as high as the national average. The very low proportion of people who received monitoring in 2020 in WA and SA suggests a gap in the collection of viral load testing data, potentially due to private funding of these tests outside of the MBS. For more information on this, see *Care across states and territories*.

Table A.9: CHB monitoring uptake for people living with CHB in 2020, by state and territory

State/territory	People living with CHB	Proportion who had a viral load test in last 5 years (%)	Proportion who had a viral load test in last year (%)	Proportion who had regular viral load tests* in last 5 years (%)
ACT	3,211	44.9%	20.7%	12.5%
NSW	79,522	48.5%	24.2%	15.1%
NT	4,538	45.9%	19.8%	8.2%
Qld	33,987	29.9%	14.5%	9.1%
SA	11,507	40.4%	10.5%	10.8%
Tas.	1,513	36.0%	12.8%	7.9%
Vic.	64,632	43.7%	21.5%	14.7%
WA	23,649	16.3%	4.5%	1.0%
AUSTRALIA	222,559	40.3%	18.9%	12.1%

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Monitoring data sourced from Department of Human Services Medicare statistics.

Note: Totals may not add up due to inclusion of people without a state/territory of residence recorded in source data.

* Regular viral load tests means four viral load tests in the last five years, or approximately one per year.

PROGRESS TOWARDS CARE TARGETS ACROSS PRIMARY HEALTH NETWORKS

For the full reporting of Australia's progress towards targets for diagnosis, treatment, care, and mortality reduction, see the National Surveillance for Hepatitis B Indicators Report 2020.²

Based on current trends in treatment uptake and changes in the number of people living with CHB, Australia is not on track to meet the National Strategy care uptake target of 50% by 2022. It is estimated that Australia will reach care uptake levels of 23.5% by 2022, and reach 31.8% by 2030. This is despite the projected reductions in the number of people living with CHB through reduced international migration during 2020–2023. No state or territory is projected to reach the 2022 care uptake target. These estimates are subject to significant uncertainty, and future estimates will be allowed more accurate projections based on observed trends in migration and treatment uptake.

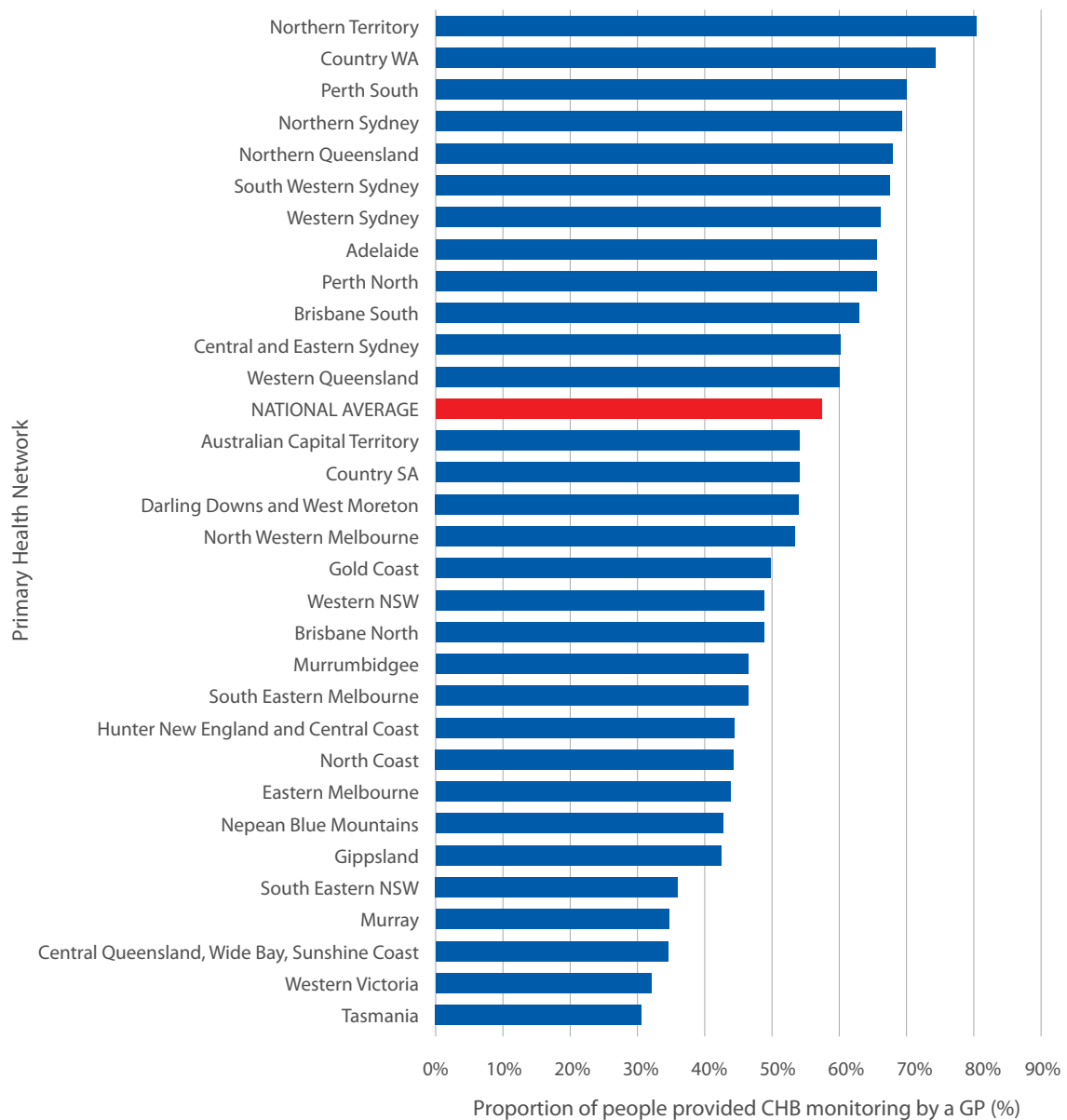
MONITORING WHILE RECEIVING TREATMENT

Clinical guidelines recommend that people receiving treatment for CHB should be monitored more regularly than those not on treatment, including a viral load test every six months. In 2020, 66.8% of people who were receiving treatment had at least one viral load monitoring test. This proportion declined over time; however, did not decline any more rapidly during 2020 than in previous years.

MONITORING PROVIDERS

The majority of monitoring viral load tests in people not receiving treatment in 2020 were provided by GPs (57.4%). As shown in Figure A.15, this proportion varied widely according to PHN, and did not always correspond to the level of GP prescribing. PHNs with the highest levels of GP monitoring were **Northern Territory, Country WA, Perth South, Northern Sydney**, and **Northern Queensland**, where GPs made up more than 65% of providers of monitoring tests in people not on treatment. The proportion provided by GPs was generally lowest in regional Victoria and regional NSW PHNs, and **Tasmania** PHN. Although GP monitoring was above average in all PHNs in Sydney, GP prescribing in these regions is among the lowest of all PHNs nationally.

Figure A.15: Proportion of CHB monitoring provided by a GP, 2020



Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Monitoring data sourced from Department of Human Services Medicare statistics.

[\(link to data for this figure\)](#)

CARE DEMOGRAPHICS

People receiving monitoring while not on treatment in 2020 were evenly distributed by sex (52.5% female and 47.5% male), and similar proportions were in each of the age groups 30–39 years (22.2%), 40–49 years (23.7%), 50–59 years (22.5%) and 60+ years (25.2%). The proportion female has increased slightly since 2016, when it was 50.3%, as did the proportion aged 60+ years, from 19.7% in 2016, while other age groups remained at relatively stable proportions.

CARE ACROSS REMOTENESS AREAS

The variations between treatment uptake and care uptake seen according to PHN are reflected in the underlying variations according to remoteness. In very remote areas, which includes large proportions of the **Northern Territory** and **Western Queensland** PHNs, care uptake was above the national average while treatment uptake was below it.

CARE TRENDS OVER TIME AND COVID-19 IMPACTS BY REMOTENESS AREA

Trends over time in CHB monitoring varied greatly according to remoteness area. Uptake reduced nationally by 9% between 2019 and 2020 and this occurred in all remoteness classifications; however, the change was most pronounced in outer regional areas (declined by 13%) and major cities (9.1%). The smallest decline occurred in very remote regions (2.8%). This trend was also seen in treatment changes. The decline in major cities likely reflects the increased relative effect of health service disruption due to restrictions related to COVID-19 in Sydney and Melbourne during 2020. Outer regional locations are disproportionately located in SA, which experienced an apparent significant decline in hepatitis B monitoring during 2019 and 2020, and this may be the cause of the shifts in this remoteness category (see *Care across states and territories*).

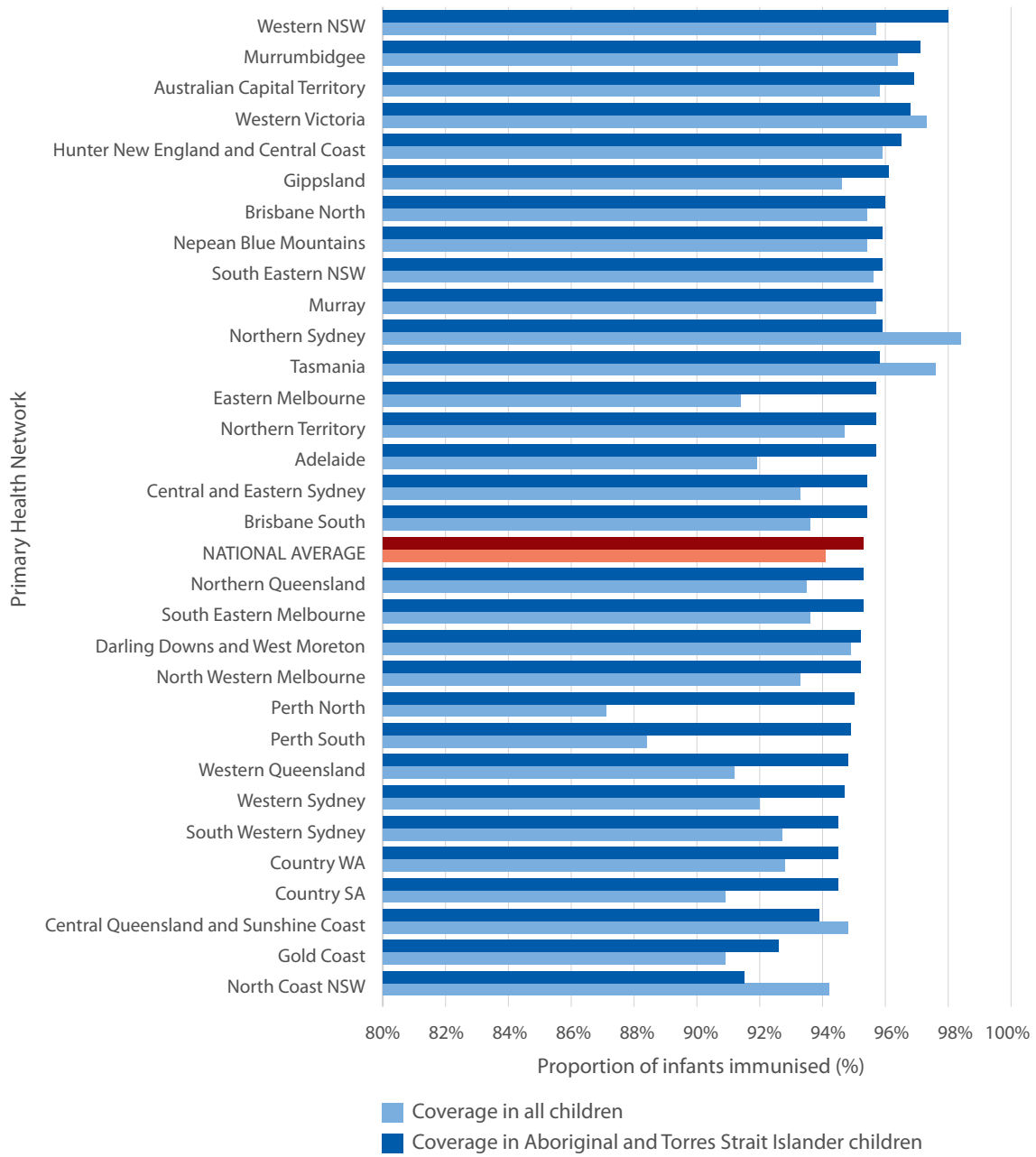
IMMUNISATION

Hepatitis B infant immunisation coverage among 12-month-old children was 95.3% in 2020, surpassing the National Strategy target of 95% by 2022. Of the 31 PHNs, 22 had coverage above 95% (Figure A.16), an increase from 15 PHNs in 2019 and nine in 2018. A further six PHNs had uptake between 94.5% and 94.9%, close to the target level. Only three PHNs had uptake <94.5% – **Central Queensland, Wide Bay, and Sunshine Coast; Gold Coast;** and **North Coast NSW**.

Coverage decreased in five PHNs during 2020, one of which (**Western Queensland**) no longer met the 95% target after having done so in 2019. However, it should be noted that this PHN has a small population, which limits interpretation of changes over time. The other PHNs which saw a decline during 2020 were **Eastern Melbourne, South Eastern Melbourne, Western Sydney,** and **Country SA**, all PHNs which also had above average declines in either CHB treatment progress or monitoring uptake.

Coverage among Aboriginal and Torres Strait Islander children was 94.1%, lower than among the overall total population of children. Only 11 PHNs met the 95% target among Aboriginal and Torres Strait Islander children specifically; however, this was an increase from seven PHNs in 2018. In general, PHNs with high overall uptake had high uptake among Aboriginal and Torres Strait Islander children; however, two of the three lowest uptake PHNs for all children (**Central Queensland, Wide Bay, and Sunshine Coast** and **North Coast NSW**) had above average uptake for Aboriginal and Torres Strait Islander children.

Figure A.16: Hepatitis B immunisation coverage for 12-month-olds, among all children and among Aboriginal and Torres Strait Islander children, by PHN, 2020



Data source: Australian Immunisation Register.

[\(link to data for this figure\)](#)

SECTION A2: GEOGRAPHIC DIVERSITY AND TRENDS IN CHRONIC HEPATITIS B BY STATE AND TERRITORY

IN THIS SECTION

- Estimates of CHB treatment and care uptake for each Primary Health Network and Statistical Area across Australia
- Measurement of progress towards National Strategy targets and geographic trends
- Assessment of the drivers of variation at a local level

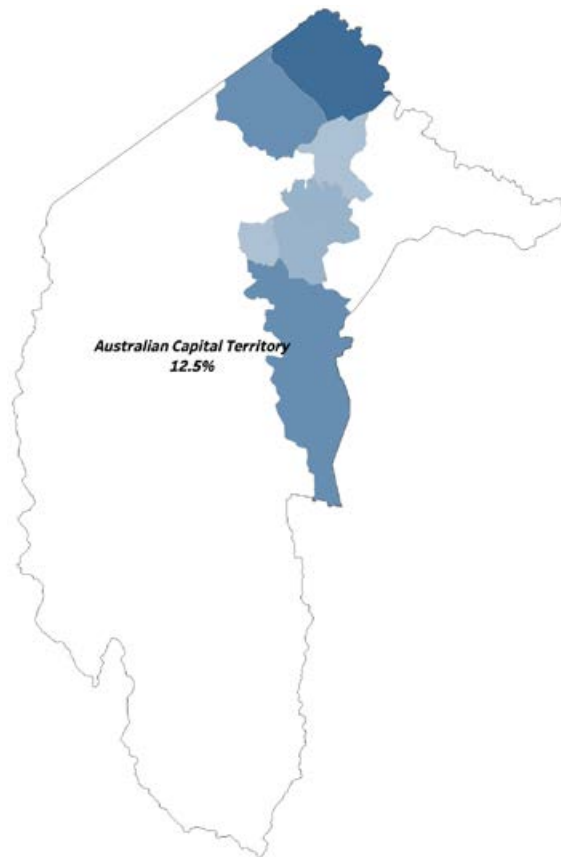
AUSTRALIAN CAPITAL TERRITORY

- CHB treatment uptake in ACT in 2020 was 12.5%, higher than the national average of 10.7%
- CHB care uptake in ACT in 2020 was 25.7%, higher than the national average of 22.6%
- ACT ranked 2nd for CHB treatment uptake and 2nd for CHB care uptake of the eight states and territories
- ACT maintained stable treatment and care trends during 2020

CHB TREATMENT

CHB treatment uptake in the **Australian Capital Territory** PHN overall in 2020 was 12.5%, higher than the national average of 10.7% (Table A.10). Within the PHN, uptake was highest in **Gungahlin** (17.4%), **Tuggeranong** (13.0%), and **Belconnen** (12.9%) (Figure A.17). Notably, these were also the only three SA3s in the PHN which continued to see an increase in treatment numbers during 2020, with uptake in **Gungahlin** and **Belconnen** increasing more rapidly than during the previous year. In contrast, treatment uptake in the remaining SA3s declined during 2020, in contrast to generally stable or increasing trends during 2019. These SA3s all had uptake below the national average (**North Canberra**, 7.0%; **Weston Creek**, 7.0%; **Woden**, 8.4%; and **South Canberra**, 8.6%).

Figure A.17: Geographic variation in CHB treatment uptake in the ACT PHN, by SA3, 2020



Key: Darker shade of blue denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

CHB CARE

CHB care uptake in the **Australian Capital Territory** PHN in 2020 was 25.7%, higher than the national average of 22.6%. Variations by SA3 largely reflected those in treatment uptake; however, **South Canberra** had relatively higher monitoring uptake and so reached care levels similar to the PHN average. The number of monitoring viral load tests conducted decreased considerably in most SA3s, but increased in **Belconnen** by 38%, meaning that on average the monitoring uptake in ACT remained stable. In some SA3s like **Weston Creek**, **North Canberra**, and **Woden**, the proportion of people in care has declined since 2018, despite estimated reductions in the number of people living with CHB in those areas during that time, which would lead to increased uptake if care numbers had remained stable.

Table A.10: CHB prevalence, treatment uptake, and care uptake in ACT, by SA3, 2020

PHN and SA3	Total population	People living with CHB	CHB prevalence (%)	Treatment uptake (%)	Care uptake (%)
Australian Capital Territory PHN	431,702	3,211	0.74%	12.5%	25.7%
Belconnen	102,583	805	0.78%	12.9%	28.6%
Gungahlin	85,615	816	0.95%	17.4%	31.6%
North Canberra	59,995	544	0.91%	7.0%	15.3%
South Canberra	30,849	187	0.61%	8.6%	23.6%
Tuggeranong	86,271	453	0.52%	13.0%	27.4%
Weston Creek	28,895	158	0.55%	7.0%	13.3%
Woden	37,495	249	0.66%	8.4%	15.3%

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Note: Totals may not add up due to inclusion of people without an SA3 of residence recorded in source data.

Data suppressed where number receiving treatment or care was <6. SA3s not listed where population <3000.

NEW SOUTH WALES

- CHB treatment uptake in NSW in 2020 was 12.9%, higher than the national average of 10.7%
- CHB care uptake in NSW in 2020 was 27.0%, higher than the national average of 22.6%
- NSW ranked 1st for CHB treatment uptake and 1st for CHB care uptake of the eight states and territories
- Higher treatment and care uptake were generally seen in PHNs in Sydney, with lower uptake in regional and remote areas
- Treatment numbers in NSW remained stable in 2020, in contrast to the positive trend seen in previous years, and in two PHNs treatment numbers decreased (Central and Eastern Sydney and Hunter New England and Central Coast)
- Off-treatment monitoring also declined in 2020, consistent with national trends, reducing the proportion of people in care in NSW

CHB TREATMENT

Treatment uptake in NSW overall in 2020 was 12.9%, higher than the national average of 10.7%. Uptake varied greatly across the 10 PHNs in NSW (Figure A.18 and Figure A.19).

Treatment uptake in NSW was highest in the **South Western Sydney** PHN (19.5%), where it almost reached the 2022 National Strategy target of 20%. Treatment uptake varied greatly within the PHN, which covers a diverse range of regions. Uptake was highest within the regions of the PHN closest to central Sydney, including two which have met the National Strategy treatment target of 20% – **Fairfield** (25.8%) and **Bankstown** (21.0%). As the target is a conservative estimate, treatment may need to be higher in some regions due to the demographic and clinical characteristics of the people with CHB in that region. And despite this higher than average uptake, **Bankstown** SA3 saw a decline in the number of people on treatment during 2020. If this trend continues, the region would no longer meet the National Strategy target.

In **Western Sydney** PHN (overall uptake 16.4%), the areas with higher treatment were also those closer to central Sydney. SA3s which had already reached the 20% National Strategy Target included **Carlingford** (22.4%) and **Merrylands – Guildford** (22.1%). All other SA3s in the PHN had treatment uptake similar to or above the national average. Two SA3s however (**Auburn** and **Paramatta**), saw a reduction in CHB treatment numbers during 2020, in contrast to previous increasing trends. Unless this is reversed, it could limit progress to the National Strategy target of 20%.

In **Northern Sydney**, treatment uptake was 14.6% overall; however, it varied widely according to SA3. Uptake was highest in **Pennant Hills – Epping** (21.2%), where it reached the 2020 National Strategy target of 20%, and also above the PHN average in **Ku-ring-gai** (16.8%), **Hornsby** (16.4%), and **Ryde – Hunters Hill** (15.4%). The PHN also maintained more stable treatment levels than other PHNs in Sydney, which all saw declines in overall numbers receiving treatment in at least some SA3s.

Treatment uptake in **Central and Eastern Sydney** was 12.7%. Within the PHN, uptake was highest the SA3 of **Hurstville** (20.4%), where it had already reached the 20% National Strategy target for 2022. Treatment was also above the PHN average in **Canterbury** (17.8%), **Marrickville – Sydenham – Petersham** (17.4%), **Kogarah – Rockdale** (16.2%), and **Strathfield – Burwood – Ashfield** (13.3%). Declines in treatment numbers occurred in the **Cronulla – Miranda – Caringbah** and **Botany** SA3s.

Treatment uptake was below the NSW average (12.9%) in all non-metropolitan NSW PHNs. The highest uptake occurred in **Nepean Blue Mountains** PHN (7.4%), and treatment numbers in this PHN increased more rapidly during 2020 than during 2019, in contrast to the national and NSW overall trends. Uptake within this PHN was highest in **Penrith** (8.4%) and **St Marys** (8.4%). More rapid increases

in treatment were also seen in **Murrumbidgee** PHN and in **North Coast NSW** PHN, which increased in rank from 25th in 2019 to 23rd in 2020.

Treatment numbers slightly declined during 2020 in the **Hunter New England and Central Coast** PHN (uptake 4.6%), in contrast to the previous years. This reduced the PHN's overall ranking nationally for treatment uptake from 23rd in 2019 to 26th in 2020. Other rural PHNs where treatment numbers did not increase as rapidly in previous years included **South Eastern NSW** and **Western NSW**.

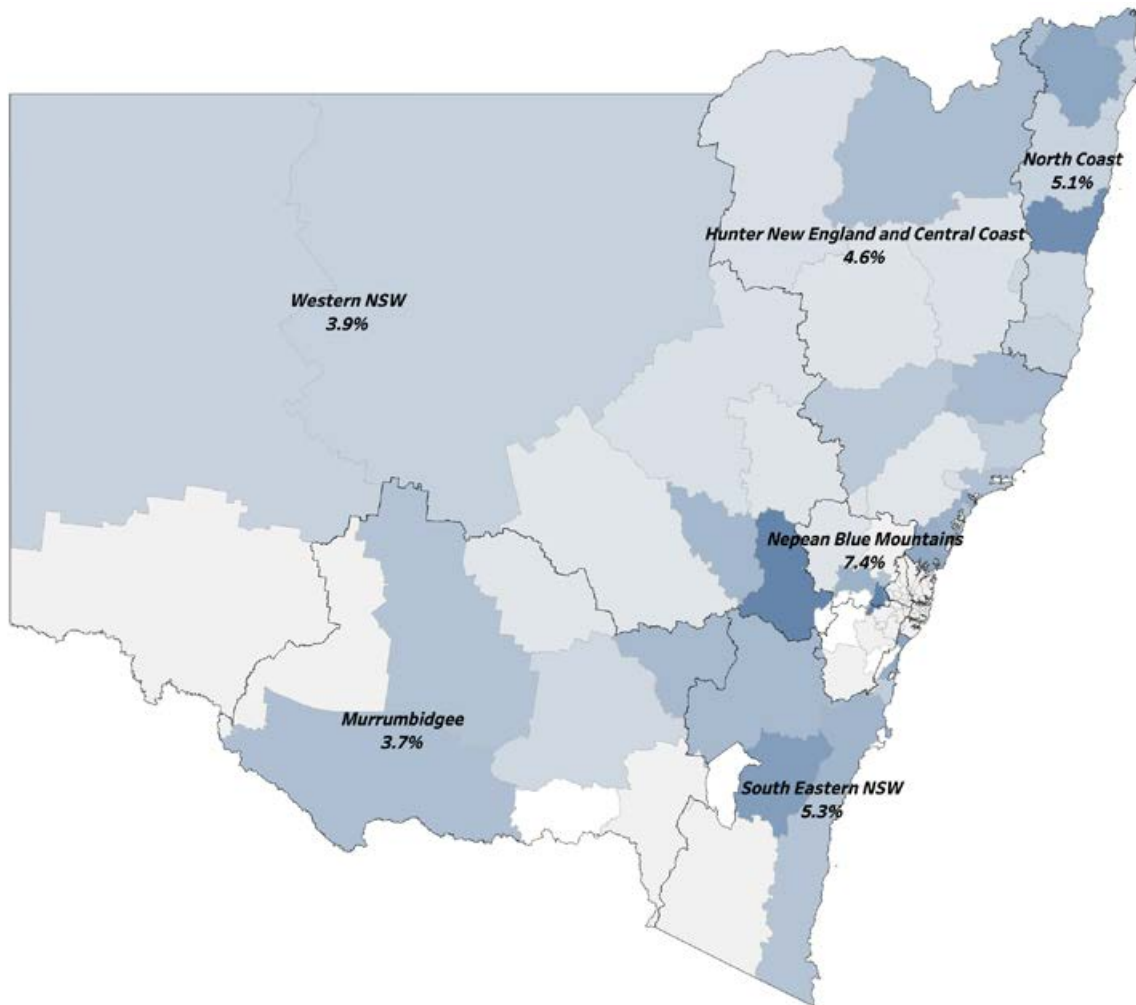
CHB CARE

In NSW, care uptake largely reflected treatment uptake, which means Sydney PHNs ranked highly. However, a number of Sydney PHNs saw significant declines in the number of people receiving off-treatment viral load monitoring tests, and subsequent declines in the proportion in care. In **Northern Sydney** this reduced the PHNs in rank for care uptake nationally from 3rd to 4th, now below **Brisbane South**.

A number of SA3s within Sydney PHNs had care uptake that approached the National Strategy target of 50%, including **Fairfield** (48.4% uptake) in **South Western Sydney**, and **Merrylands – Guildford** and **Carlingford** (both 46.7% uptake) in **Western Sydney**. However, in all three of these SA3s the number of people receiving monitoring has been declining while treatment remains stable, suggesting they are not on track to reach 50% by 2022 without changes to these trends.

The number of people receiving monitoring also declined in all rural PHNs except for **Western NSW**, which increased in national rank from 24th to 25th.

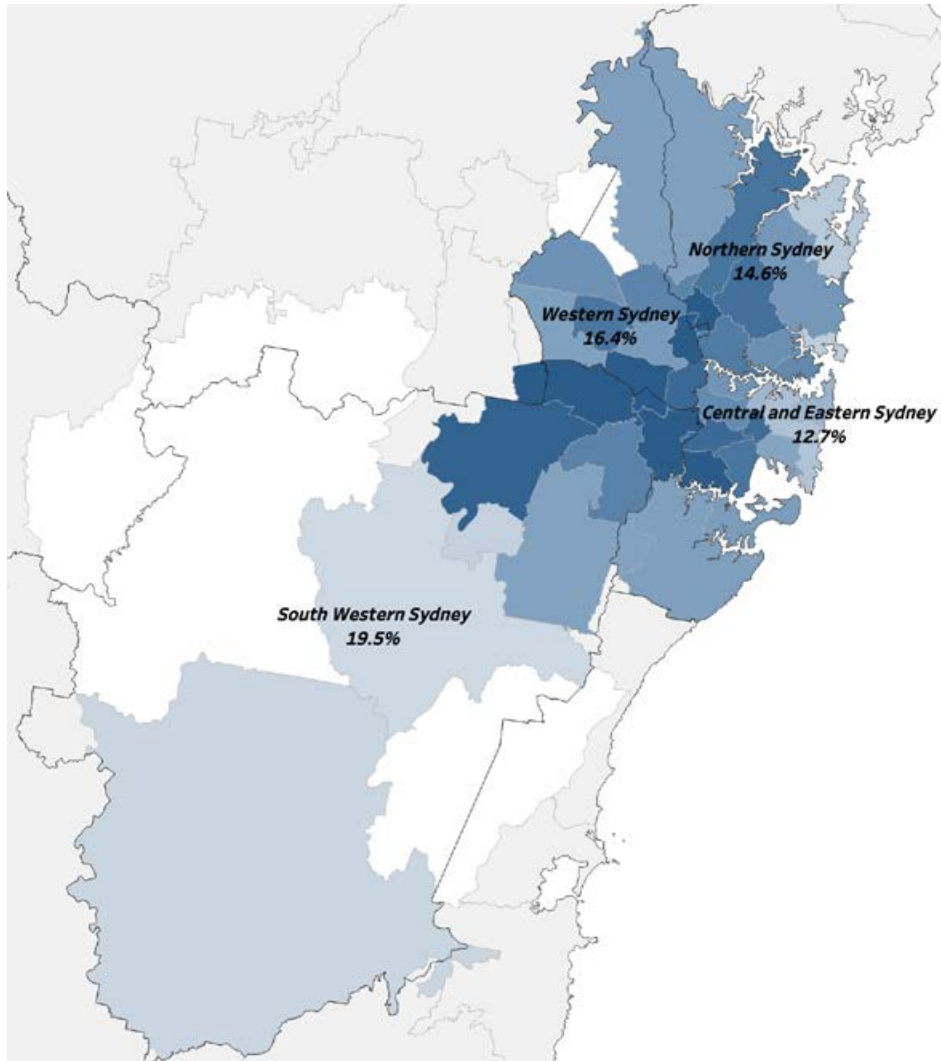
Figure A.18: Geographic variation in CHB treatment uptake in NSW (other than Greater Sydney), by PHN and SA3, 2020



Key: Darker shade of blue denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Figure A.19: Geographic variation in CHB treatment uptake in Greater Sydney, by PHN and SA3, 2020



Key: Darker shade of blue denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Table A.11: CHB prevalence and treatment uptake in NSW by PHN and SA3, 2020

PHN and SA3	Total population	People living with CHB	CHB prevalence (%)	Treatment uptake (%)	Care uptake (%)
Central and Eastern Sydney PHN	1,693,551	22,513	1.33%	12.7%	26.1%
Botany	52,380	751	1.43%	10.1%	18.4%
Canada Bay	95,128	1,385	1.46%	12.1%	24.5%
Canterbury	134,753	2,243	1.66%	17.8%	40.0%
Cronulla – Miranda – Caringbah	117,965	715	0.61%	11.1%	20.7%
Eastern Suburbs – North	141,480	979	0.69%	8.4%	17.3%
Eastern Suburbs – South	171,691	2,105	1.23%	6.6%	12.9%
Hurstville	142,986	2,841	1.99%	20.4%	39.7%
Kogarah – Rockdale	166,848	2,421	1.45%	16.2%	30.9%
Leichhardt	62,705	421	0.67%	8.1%	17.3%
Marrickville – Sydenham – Petersham	59,853	661	1.10%	17.4%	34.6%
Strathfield – Burwood – Ashfield	174,820	3,186	1.82%	13.3%	29.3%
Sutherland – Menai – Heathcote	117,177	655	0.56%	10.7%	21.4%
Sydney Inner City	255,766	4,150	1.62%	7.0%	15.9%
Northern Sydney PHN	937,282	10,640	1.14%	14.6%	30.5%
Chatswood – Lane Cove	135,695	1,881	1.39%	12.7%	27.7%
Hornsby	86,652	1,006	1.16%	16.4%	35.7%
Ku-ring-gai	145,418	1,760	1.21%	16.8%	35.1%
Manly	57,776	360	0.62%	5.6%	10.8%
North Sydney – Mosman	90,276	723	0.80%	13.5%	29.9%
Pennant Hills – Epping	46,146	862	1.87%	21.2%	43.4%
Pittwater	74,584	372	0.50%	5.9%	10.2%
Ryde – Hunters Hill	155,074	2,638	1.70%	15.4%	32.2%
Warringah	145,661	1,038	0.71%	11.8%	21.9%
South Western Sydney PHN	1,011,141	13,470	1.33%	19.5%	37.9%
Bankstown	182,812	2,753	1.51%	21.0%	42.6%
Bringelly – Green Valley	124,499	1,557	1.25%	18.9%	37.7%
Camden	93,692	479	0.51%	5.2%	11.9%
Campbelltown (NSW)	180,984	1,489	0.82%	10.5%	21.7%
Fairfield	198,560	5,088	2.56%	25.8%	48.4%

PHN and SA3	Total population	People living with CHB	CHB prevalence (%)	Treatment uptake (%)	Care uptake (%)
Liverpool	145,608	1,692	1.16%	14.4%	27.0%
Southern Highlands	51,491	255	0.50%	4.7%	10.6%
Wollondilly	33,494	156	0.47%	4.5%	10.3%
Western Sydney PHN	1,115,480	13,980	1.25%	16.4%	36.1%
Auburn	112,349	2,539	2.26%	17.8%	42.2%
Baulkham Hills	219,966	2,309	1.05%	14.2%	27.5%
Blacktown	132,788	1,355	1.02%	16.0%	33.4%
Blacktown – North	123,450	1,012	0.82%	12.5%	26.7%
Carlingford	72,267	1,292	1.79%	22.4%	46.7%
Dural – Wisemans Ferry	18,607	122	0.65%	10.7%	26.3%
Merrylands – Guildford	137,531	2,133	1.55%	22.1%	46.7%
Mount Druitt	116,025	1,221	1.05%	10.6%	30.3%
Parramatta	182,497	1,999	1.10%	11.4%	26.6%
Hunter New England and Central Coast PHN	1,304,118	6,724	0.52%	4.6%	10.1%
Armidale	39,126	246	0.63%	2.8%	6.9%
Gosford	179,541	929	0.52%	6.0%	12.6%
Great Lakes	32,183	156	0.49%	3.8%	6.4%
Inverell – Tenterfield	36,728	230	0.63%	4.8%	10.0%
Lake Macquarie – East	140,858	617	0.44%	4.4%	10.2%
Lake Macquarie – West	57,353	258	0.45%	5.4%	12.4%
Lower Hunter	87,443	413	0.47%	2.7%	5.8%
Maitland	107,601	473	0.44%	3.0%	6.3%
Moree – Narrabri	26,225	238	0.91%	2.9%	10.5%
Newcastle	175,609	994	0.57%	5.7%	13.1%
Port Stephens	74,614	355	0.48%	4.5%	8.4%
Tamworth – Gunnedah	85,192	544	0.64%	2.8%	6.4%
Taree – Gloucester	56,526	282	0.50%	5.0%	7.8%
Upper Hunter	30,905	169	0.55%	4.1%	8.9%
Wyong	174,212	820	0.47%	5.7%	13.2%
Murrumbidgee PHN	204,713	1,169	0.57%	3.7%	8.5%
Griffith – Murrumbidgee (West)	48,275	360	0.75%	4.4%	9.2%
Tumut – Tumbarumba	13,856	72	0.52%	#	#
Upper Murray exc. Albury	42,027	193	0.46%	4.7%	10.9%
Wagga Wagga	100,555	544	0.54%	3.3%	8.1%

PHN and SA3	Total population	People living with CHB	CHB prevalence (%)	Treatment uptake (%)	Care uptake (%)
Nepean Blue Mountains PHN	377,023	2,166	0.57%	7.4%	17.8%
Blue Mountains	80,488	384	0.48%	5.5%	15.4%
Hawkesbury	11,666	52	0.44%	#	#
Penrith	160,008	927	0.58%	8.4%	19.7%
Richmond – Windsor	60,117	292	0.49%	4.5%	9.6%
St Marys	64,744	512	0.79%	8.4%	20.7%
North Coast PHN	543,100	2,784	0.51%	5.1%	11.3%
Clarence Valley	49,759	251	0.50%	3.6%	8.0%
Coffs Harbour	93,608	535	0.57%	7.7%	15.3%
Kempsey – Nambucca	52,154	323	0.62%	3.4%	9.6%
Port Macquarie	86,367	411	0.48%	3.6%	7.8%
Richmond Valley – Coastal	87,971	414	0.47%	3.6%	11.6%
Richmond Valley – Hinterland	75,439	388	0.51%	6.2%	12.1%
Tweed Valley	97,803	463	0.47%	5.6%	11.9%
South Eastern NSW PHN	668,963	3,723	0.56%	5.3%	12.7%
Dapto – Port Kembla	78,530	450	0.57%	5.6%	16.2%
Goulburn – Yass	76,627	362	0.47%	5.0%	8.6%
Kiama – Shellharbour	102,541	485	0.47%	3.9%	12.2%
Queanbeyan	67,015	360	0.54%	6.7%	13.6%
Shoalhaven	107,451	552	0.51%	5.3%	12.7%
Snowy Mountains	20,382	105	0.51%	#	#
South Coast	74,848	388	0.52%	4.4%	10.6%
Wollongong	141,570	1,023	0.72%	6.2%	13.6%
Western NSW PHN	348,292	2,353	0.68%	3.9%	11.0%
Bathurst	50,520	254	0.50%	8.3%	14.2%
Bourke – Cobar – Coonamble	22,957	349	1.52%	3.7%	18.9%
Broken Hill and Far West	19,894	164	0.83%	3.7%	15.2%
Dubbo	74,564	546	0.73%	2.9%	9.2%
Lachlan Valley	57,262	381	0.67%	2.6%	4.5%
Lithgow – Mudgee	48,484	257	0.53%	2.7%	7.4%
Lower Murray	13,241	88	0.66%	2.3%	9.1%
Orange	61,372	313	0.51%	5.1%	12.1%

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Note: Totals may not add up due to inclusion of people without an SA3 of residence recorded in source data.

Data suppressed where number receiving treatment or care was <6. SA3s not listed where population <3000.

NORTHERN TERRITORY

- CHB treatment uptake in the NT in 2020 was 9.1%, lower than the national average of 10.7%
- CHB care uptake in the NT in 2020 was 24.8%, higher than the national average of 22.6%
- The the NT ranked 4th for CHB treatment uptake and 3rd for CHB care uptake of the eight states and territories
- Treatment uptake in the NT did not increase as rapidly in 2020 as it did in 2019, consistent with national trends
- Care uptake in the NT declined by less than the national average trend during 2020

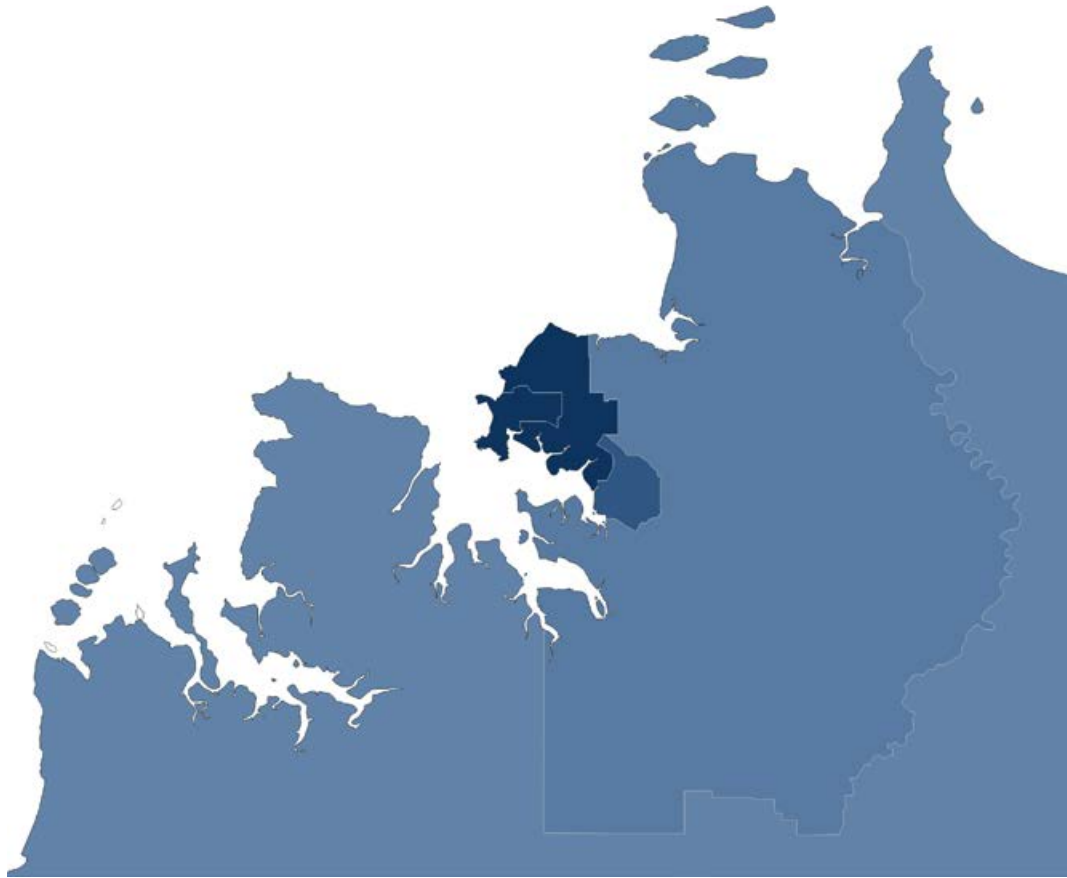
CHB TREATMENT

CHB treatment uptake in the **Northern Territory** PHN was 9.1%, just below the national average of 10.7%. This represents a continuing improving trend, compared to 2016 when treatment uptake was only half the national average. It should be noted that due to the small populations and the imprecision of postcode regions in the NT, differentiation of treatment and care uptake by region is subject to more uncertainty than in most other jurisdictions. However, based on the available data, treatment uptake appeared to be highest in **Darwin City** (17.8%), **East Arnhem** (17.2%), and **Darwin Suburbs** (15.0%) (Figure A.20 and Figure A.21). Treatment uptake improved in all but one SA3 during 2020. If these recent trends continue, **Darwin City** and **East Arnhem** could be on track to meet the 2022 National Strategy target of 20% treatment uptake, along with only 14 other SA3s of the 324 total nationally.

CHB CARE

CHB care within the NT was highest in **East Arnhem** (58.7%), where it had already met the 50% National Strategy target for care uptake, along with only four other SA3s nationally. Uptake was also above the national average in **Darwin City** (40.1%) and **Daly – Tiwi – West Arnhem** (29.3%). The number of individuals receiving off-treatment monitoring appeared to decline during 2019 and 2020, reducing the overall care uptake in the NT. Potential drivers of this trend (such as billing of viral loads outside Medicare) will be explored in future reports.

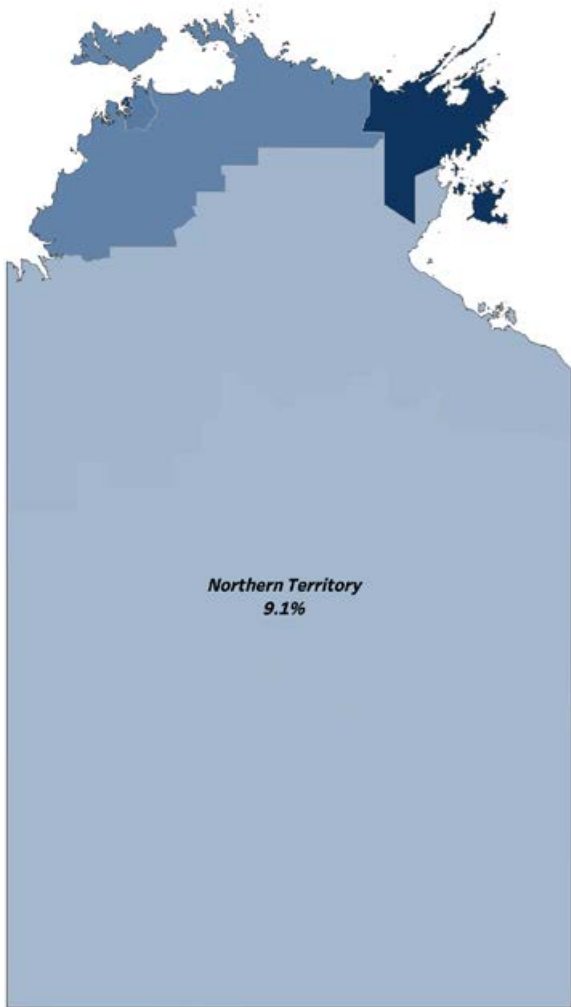
Figure A.20: Geographic variation in CHB treatment uptake in Greater Darwin, by SA3, 2020



Key: Darker shade of blue denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Figure A.21: Geographic variation in CHB treatment uptake in the NT by SA3, 2020



Key: Darker shade of blue denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Table A.12: CHB prevalence and treatment uptake in the NT, by SA3, 2020

PHN and SA3	Total population	People living with CHB	CHB prevalence (%)	Treatment uptake (%)	Care uptake (%)
Northern Territory PHN	246,243	4,538	1.84%	9.1%	24.8%
Alice Springs	43,624	1,141	2.61%	5.1%	21.1%
Barkly	4,122	135	3.29%	5.1%	13.9%
Daly – Tiwi – West Arnhem	30,969	1,156	3.73%	8.4%	29.3%
Darwin City	27,297	265	0.97%	17.8%	40.1%
Darwin Suburbs	54,735	613	1.12%	15.0%	23.3%
East Arnhem	6,728	162	2.41%	17.2%	58.7%
Katherine	20,043	570	2.85%	5.3%	15.8%
Litchfield	20,093	147	0.73%	9.0%	#
Palmerston	38,632	349	0.90%	11.7%	22.3%

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Note: Totals may not add up due to inclusion of people without an SA3 of residence recorded in source data.

Data suppressed where number receiving treatment or care was <6. SA3s not listed where population <3000.

QUEENSLAND

- CHB treatment uptake in Qld in 2020 was 8.3%, lower than the national average of 10.7%
- CHB care uptake in Qld in 2020 was 18.8%, lower than the national average of 22.6%
- Qld ranked 7th for CHB treatment uptake and 5th for CHB care uptake of the eight states and territories
- The highest treatment uptake was in PHNs in southeast Qld metropolitan regions, with lower uptake in the most remote areas, while care uptake was highest in Brisbane South and Northern Queensland
- Treatment numbers in Qld increased in 2020 but by less than during 2019, consistent with national trends
- Off-treatment monitoring uptake was stable in 2020, in contrast to the decline that occurred nationally and in most jurisdictions; however, declines were seen in the most rural PHNs

CHB TREATMENT

Treatment uptake in Qld overall in 2020 was 8.3%, lower than the national average of 10.7%.

Treatment uptake within Qld was highest in **Brisbane South** PHN (13.1%) (Figure A.22). The PHN maintained more stable treatment numbers than many other PHNs, and therefore increased in rankings for treatment uptake nationally, from 5th in 2019 to 4th among all PHNs in 2020. Two **Brisbane South** SA3s had met the 20% National Strategy treatment uptake target in 2020, **Forest Lake – Oxley** (21.9% uptake) and **Nathan** (22.5% uptake) (Table A.13).

In **Brisbane North** PHN treatment uptake also continued to increase, improving the national rank of the PHN from 17th to 16th. Uptake in 2020 was 7.4% overall, and was highest within the PHN in the **Sandgate** (14.5%), **The Gap – Enoggera** (11.3%), and **Nundah** (10.1%) SA3s.

In **Gold Coast** PHN, treatment uptake was 7.0% overall, and was highest in the SA3 of **Gold Coast – North** (13.6%). This PHN overall maintained stable treatment numbers; however, it contained several SA3s which had some of the most significant declines in treatment numbers in Qld, including **Surfers Paradise**, **Robina**, and **Nerang**. As a PHN with above average proportions of cross-border prescribing, the effects of COVID-19 and related restrictions may have affected service delivery in this region.

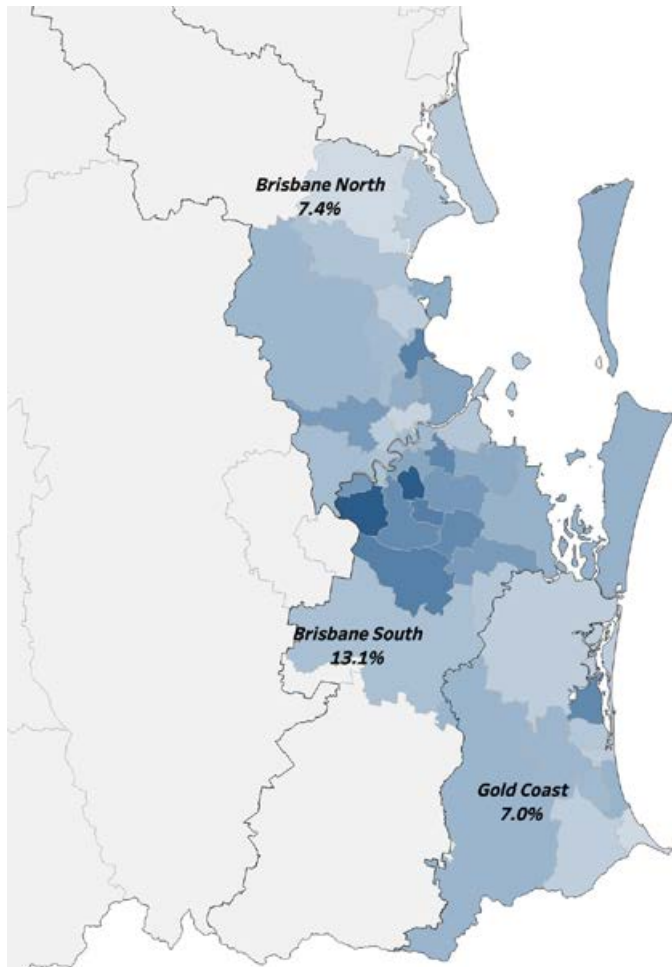
Treatment uptake in **Darling Downs and West Moreton** PHN was 6.1%, but was higher in **Springfield – Redbank** (9.8%) and **Ipswich Hinterland** (8.3%) (Figure A.23). The majority of the SA3s in this PHN showed a decline in the number of people on treatment during 2020.

In the SA3s in **Central Queensland, Wide Bay, and Sunshine Coast** PHN, treatment numbers were largely stable or increased during 2020, increasing the national treatment uptake rank of the PHN from 21st to 20th. Overall, uptake was 5.5%, and was highest in the **Gympie – Cooloola** (8.4%), **Maroochy** (6.3%), and **Rockhampton** (6.2%) SA3s.

Northern Queensland PHN contained the SA3 with the highest treatment uptake in non-metropolitan Qld, **Cairns – North** (9.5%). This represented a substantial increase in uptake over time, nearly doubling since 2018. Higher uptake within the PHN was also seen in **Cairns – South** (7.6%) and **Far North** (5.9%) SA3s.

Within **Western Queensland**, where treatment uptake overall was 2.0%, variation could not be effectively measured due to the low population size, which necessitates suppression of data in **Outback – South** SA3.

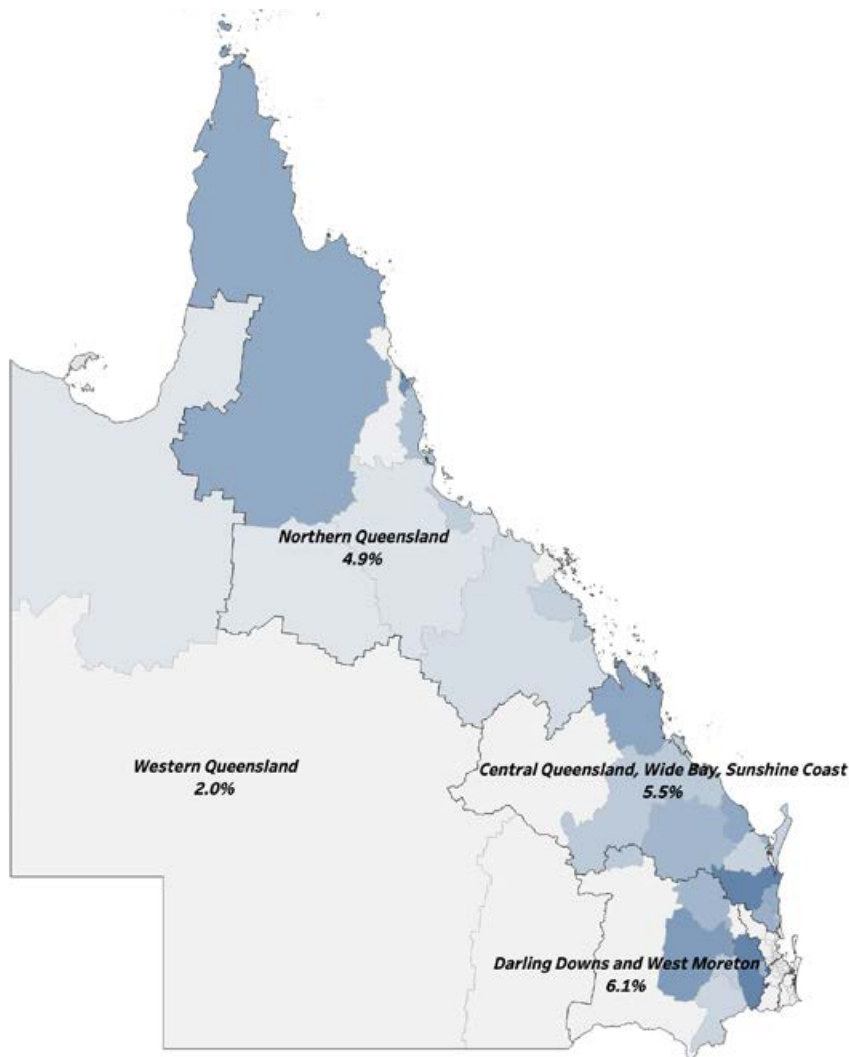
Figure A.22: Geographic variation in CHB treatment uptake in Greater Brisbane and Gold Coast, by PHN and SA3, 2020



Key: Darker shade of blue denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Figure A.23: Geographic variation in CHB treatment uptake in Qld (other than Greater Brisbane and Gold Coast), by PHN and SA3, 2020



Key: Darker shade of blue denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

CHB CARE

In Qld, care uptake was highest in **Brisbane South** (30.7%), reflecting treatment uptake trends. **Forest Lake – Oxley** (care uptake 56.2%, Table A.13) was among only four SA3s to reach the 2022 care uptake target of 50%. The SA3 of **Nathan** had care uptake of >50% in 2018; however, reductions in monitoring uptake during both 2019 and 2020 meant care uptake reduced to 45.6%, below the target level (Table A.12). Overall, **Brisbane South** saw stable care uptake during 2020, which contrasted with reductions in other major cities, and increased its rank nationally for care uptake from 4th to 3rd. This also occurred in **Brisbane North** (increased rank from 17th to 16th) and **Central Queensland, Sunshine Coast, and Wide Bay** (increased rank from 28th to 26th).

Northern Queensland PHN ranked 14th nationally for care uptake, well above its rank for treatment uptake of 24th, due to higher than average levels of off-treatment monitoring in this PHN. This was highest in the **Far North** SA3 (care uptake 30.5%), which had care uptake that was nearly double the state average.

The higher levels of care uptake relative to treatment uptake in this region may reflect the challenges in delivery of treatment in rural and remote areas, which may require more frequent health service access compared to monitoring. It may also be related to a different clinical course of disease in people living with CHB in this region, resulting in fewer people who require treatment. These factors emphasise the importance of assessing progress towards the care uptake target, which is not susceptible to variations in the proportion of people who need treatment.

During 2020, there were declines in monitoring for people not on treatment in the three Qld PHNs with the greatest proportion of rural and remote residents (**Northern Queensland, Western Queensland, and Darling Downs and West Moreton**). This was in contrast to stable or increasing trends in previous years, and may relate to health service and access disruptions associated with COVID-19 and resultant restrictions, including border closures potentially complicating interstate outreach services.

Table A.13: CHB prevalence and treatment uptake in Qld by PHN and SA3, 2020

PHN and SA3	Total population	People living with CHB	CHB prevalence (%)	Treatment uptake (%)	Care uptake (%)
Brisbane North PHN	1,149,486	7,036	0.61%	7.4%	14.8%
Bald Hills – Everton Park	56,939	303	0.53%	7.6%	18.2%
Bribie – Beachmere	30,581	133	0.44%	#	#
Brisbane Inner	91,949	898	0.98%	7.3%	17.4%
Brisbane Inner – North	122,654	855	0.70%	5.0%	10.4%
Brisbane Inner – West	56,348	338	0.60%	5.9%	14.2%
Caboolture	88,786	484	0.55%	4.3%	7.6%
Caboolture Hinterland	12,852	65	0.51%	#	#
Chermside	81,143	538	0.66%	9.1%	15.6%
Hills District	76,561	333	0.44%	8.1%	17.1%
Kenmore – Brookfield – Moggill	48,392	281	0.58%	7.5%	13.9%
Narangba – Burpengary	64,774	308	0.48%	6.8%	13.3%
North Lakes	94,285	498	0.53%	5.6%	11.6%
Nundah	44,190	256	0.58%	10.1%	21.1%
Redcliffe	64,357	326	0.51%	9.5%	16.0%
Sandgate	53,609	304	0.57%	14.5%	26.3%
Sherwood – Indooroopilly	67,511	656	0.97%	6.9%	13.6%
Strathpine	61,131	302	0.49%	7.6%	14.3%
The Gap – Enoggera	33,425	159	0.48%	11.3%	23.9%
Brisbane South PHN	1,132,909	10,078	0.89%	13.1%	30.7%
Beaudesert	23,051	90	0.39%	#	#
Beenleigh	62,590	355	0.57%	6.5%	13.0%
Brisbane Inner – East	46,349	243	0.52%	7.8%	17.3%
Browns Plains	73,916	603	0.82%	14.8%	34.5%
Capalaba	82,221	407	0.50%	9.6%	18.9%

PHN and SA3	Total population	People living with CHB	CHB prevalence (%)	Treatment uptake (%)	Care uptake (%)
Carindale	50,098	324	0.65%	13.9%	28.1%
Centenary	34,537	289	0.84%	11.8%	29.5%
Cleveland – Stradbroke	84,610	393	0.46%	8.7%	16.5%
Forest Lake – Oxley	71,842	1,164	1.62%	21.9%	56.2%
Holland Park – Yeronga	90,145	615	0.68%	10.1%	20.2%
Jimboomba	48,318	253	0.52%	7.1%	16.6%
Loganlea – Carbrook	71,333	466	0.65%	11.4%	21.9%
Mt Gravatt	87,916	1,171	1.33%	11.6%	27.6%
Nathan	29,702	276	0.93%	22.5%	45.6%
Rocklea – Acacia Ridge	65,802	1,042	1.58%	13.2%	37.5%
Springwood – Kingston	83,696	830	0.99%	13.5%	29.9%
Sunnybank	49,655	1,152	2.32%	14.9%	34.5%
Wynnum – Manly	77,127	406	0.53%	6.4%	16.7%
Gold Coast PHN	650,375	3,971	0.61%	7.0%	13.3%
Broadbeach – Burleigh	68,916	377	0.55%	8.5%	18.0%
Coolangatta	61,177	273	0.45%	4.4%	7.0%
Gold Coast – North	41,204	257	0.62%	13.6%	27.3%
Gold Coast Hinterland	16,431	72	0.44%	#	#
Mudgeeraba – Tallebudgera	37,893	179	0.47%	5.6%	11.7%
Nerang	65,596	366	0.56%	8.2%	13.1%
Ormeau – Oxenford	153,821	832	0.54%	5.6%	12.6%
Robina	62,759	464	0.74%	7.8%	12.7%
Southport	95,372	783	0.82%	6.4%	10.3%
Surfers Paradise	47,207	368	0.78%	5.7%	13.1%
Central Queensland, Wide Bay, Sunshine Coast PHN	877,744	3,875	0.44%	5.5%	10.7%
Buderim	69,901	331	0.47%	4.2%	7.5%
Bundaberg	91,223	402	0.44%	6.0%	12.9%
Caloundra	94,667	410	0.43%	5.1%	7.8%
Central Highlands (Qld)	25,509	144	0.57%	#	#
Gladstone – Biloela	76,850	367	0.48%	4.1%	9.5%
Gympie – Cooloola	54,576	215	0.39%	8.4%	12.5%
Hervey Bay	64,539	282	0.44%	5.7%	8.5%
Maroochy	66,792	302	0.45%	6.3%	12.3%
Maryborough	42,013	166	0.39%	3.6%	13.9%

PHN and SA3	Total population	People living with CHB	CHB prevalence (%)	Treatment uptake (%)	Care uptake (%)
Nambour – Pomona	77,050	320	0.42%	5.9%	10.0%
Noosa	38,376	171	0.44%	5.9%	10.5%
Rockhampton	127,431	567	0.45%	6.2%	13.9%
Sunshine Coast Hinterland	48,815	198	0.41%	5.6%	10.6%
Darling Downs and West Moreton PHN	635,196	3,350	0.53%	6.1%	14.6%
Burnett	48,317	233	0.48%	5.2%	9.0%
Darling Downs (East)	39,093	162	0.41%	6.8%	#
Darling Downs (West) – Maranoa	45,687	240	0.53%	#	#
Granite Belt	40,269	172	0.43%	3.5%	8.2%
Ipswich Hinterland	54,278	218	0.40%	8.3%	13.8%
Ipswich Inner	135,494	632	0.47%	5.5%	11.2%
Springfield – Redbank	105,617	876	0.83%	9.8%	27.5%
Toowoomba	166,441	818	0.49%	3.9%	10.4%
Northern Queensland PHN	709,088	5,234	0.74%	4.9%	15.1%
Bowen Basin – North	32,682	193	0.59%	3.1%	6.2%
Cairns – North	36,486	221	0.61%	9.5%	21.3%
Cairns – South	127,970	1,085	0.85%	7.6%	21.7%
Charters Towers – Ayr – Ingham	38,704	216	0.56%	2.8%	6.0%
Far North	29,193	807	2.76%	5.9%	30.5%
Innisfail – Cassowary Coast	39,625	327	0.82%	4.6%	14.4%
Mackay	119,449	560	0.47%	3.8%	7.0%
Port Douglas – Daintree	12,341	83	0.67%	#	#
Tablelands (East) – Kuranda	46,969	324	0.69%	2.2%	6.8%
Townsville	202,355	1,293	0.64%	3.9%	9.0%
Whitsunday	23,314	126	0.54%	#	#
Western Queensland PHN	46,076	443	0.96%	2.0%	5.4%
Outback – North	29,070	300	1.03%	2.7%	6.3%
Outback – South	17,006	143	0.84%	#	#

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Note: Totals may not add up due to inclusion of people without an SA3 of residence recorded in source data.

Data suppressed where number receiving treatment or care was <6. SA3s not listed where population <3000.

SOUTH AUSTRALIA

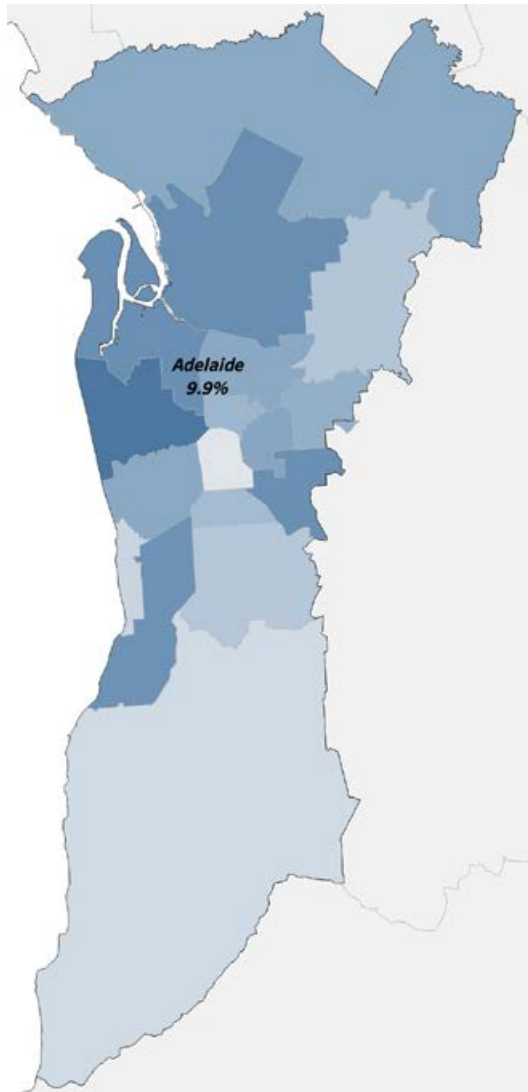
- CHB treatment uptake in SA in 2020 was 8.8%, lower than the national average of 10.7%
- CHB care uptake in SA in 2020 was 16.7%, lower than the national average of 22.6%
- SA ranked 5th for CHB treatment uptake and 7th for CHB care uptake of the eight states and territories
- Treatment and care uptake were highest in Adelaide and lower in more remote regions
- Treatment numbers in SA increased only gradually in 2020, in contrast to substantial increases during 2019
- Off-treatment monitoring uptake appeared to decline sharply during 2019 and 2020 (see discussion)

CHB TREATMENT

Treatment uptake in SA overall was 8.8%, below the national average of 10.7%. During 2019, uptake increased in SA more than in any other state or territory, but this was not maintained during 2020. Treatment uptake was higher in **Adelaide** PHN (9.9%), and within the PHN was highest in the [Charles Sturt](#) (15.9%), [Port Adelaide – West](#) (12.8%), [Salisbury](#) (12.8%), [Burnside](#) (12.7%), and [Marion](#) (12.4%) SA3s (Figure A.24, Table A.14). Despite this, in a number of these higher-uptake SA3s, treatment initiations declined during 2020, in contrast to previous increasing trends.

Assessing variation in treatment uptake within **Country SA** is difficult as most SA3s in the region have a small population, leading to high uncertainty within the data. The available data does not suggest substantial variation in uptake within the PHN. Treatment uptake in this PHN has increased more slowly than the national average, leading to a reduction in treatment uptake rank between 2019 and 2020 (from 27th to 28th).

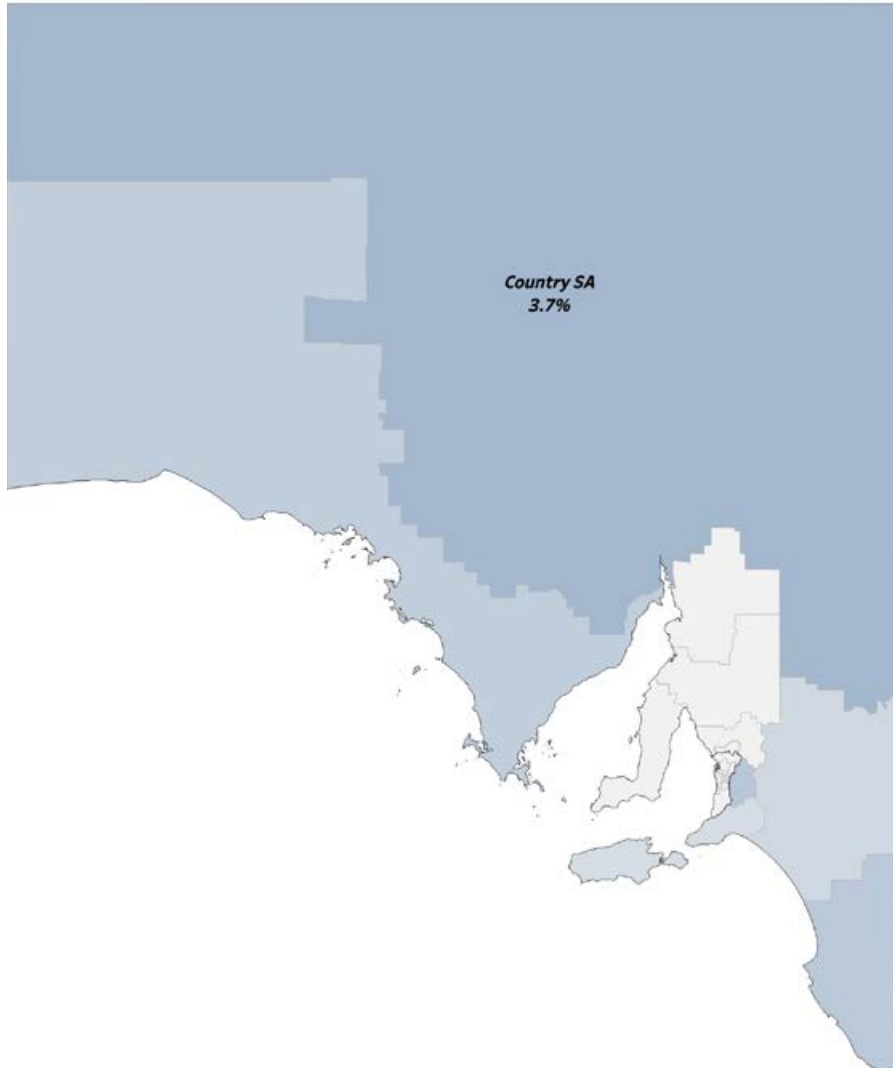
Figure A.24: Geographic variation in CHB treatment uptake in Greater Adelaide, by PHN and SA3, 2020



Key: Darker shade of blue denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Figure A.25: Geographic variation in CHB treatment uptake in SA (other than Greater Adelaide), by PHN and SA3, 2020



Key: Darker shade of blue denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

CHB CARE

Estimation of CHB care uptake in SA is limited, given the substantial reductions in Medicare-billed viral load tests in this jurisdiction during 2019 and 2020, which indicates a likely shift to provision of services outside the MBS. This observed decline was consistent across all SA3s in SA, with the exception of the [Mid North – Barossa](#) region. The number of viral load tests conducted through the MBS in SA was stable through 2016–2018, then sharply reduced by more than half between May and September 2019, and has remained stable at that level through 2020. No apparent reduction in viral load tests was observed during the period affected by COVID-19 restrictions during 2020, however this may have occurred for tests provided outside of Medicare.

When assessing the data available, care uptake variations by region within SA PHNs largely reflected treatment uptake.

Table A.14: CHB treatment uptake in SA by PHN and SA3, 2020

PHN and SA3	Total population	People living with CHB	CHB prevalence (%)	Treatment uptake (%)	Care uptake (%)
Adelaide PHN	1,269,001	9,396	0.74%	9.9%	18.4%
Adelaide City	26,265	400	1.52%	3.3%	8.5%
Burnside	46,345	378	0.82%	12.7%	20.1%
Campbelltown (SA)	64,592	562	0.87%	8.9%	16.4%
Charles Sturt	107,114	833	0.78%	15.9%	24.1%
Holdfast Bay	43,587	207	0.48%	4.8%	8.7%
Marion	75,961	476	0.63%	12.4%	23.5%
Mitcham	77,893	459	0.59%	6.3%	11.5%
Norwood – Payneham – St Peters	34,779	277	0.80%	10.1%	16.6%
Onkaparinga	170,185	727	0.43%	4.3%	7.8%
Playford	96,670	625	0.65%	9.8%	20.0%
Port Adelaide – East	73,817	745	1.01%	9.7%	20.7%
Port Adelaide – West	64,298	737	1.15%	12.8%	23.9%
Prospect – Walkerville	33,900	245	0.72%	8.2%	16.3%
Salisbury	141,376	1,374	0.97%	12.8%	24.8%
Tea Tree Gully	93,745	464	0.49%	6.5%	13.6%
Unley	40,010	276	0.69%	7.6%	15.6%
West Torrens	78,464	611	0.78%	9.8%	16.2%
Country SA PHN	505,605	2,111	0.42%	3.7%	8.9%
Adelaide Hills	76,511	283	0.37%	4.2%	9.5%
Barossa	36,986	124	0.34%	#	#
Eyre Peninsula and South West	58,104	258	0.44%	3.9%	10.5%
Fleurieu – Kangaroo Island	52,900	194	0.37%	3.1%	7.7%
Gawler – Two Wells	39,163	153	0.39%	#	#
Limestone Coast	67,692	291	0.43%	4.1%	11.3%
Lower North	23,224	84	0.36%	#	#
Mid North	27,560	109	0.40%	#	#
Murray and Mallee	72,560	361	0.50%	3.3%	6.7%
Outback – North and East	24,247	156	0.64%	5.1%	10.9%
Yorke Peninsula	26,659	98	0.37%	#	#

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Note: Totals may not add up due to inclusion of people without an SA3 of residence recorded in source data.

Data suppressed where number receiving treatment or care was <6. SA3s not listed where population <3000.

TASMANIA

- CHB treatment uptake in Tas. in 2020 was 8.5%, lower than the national average of 10.7%
- CHB care uptake in Tas. in 2020 was 17.3%, higher than the national average of 22.6%
- Tas. ranked 6th for CHB treatment uptake and 6th for CHB care uptake of the 8 states and territories
- Treatment uptake in Tas. increased during 2020 by more than any other state or territory
- Monitoring uptake in Tas. declined during 2020, consistent with national trends

CHB TREATMENT

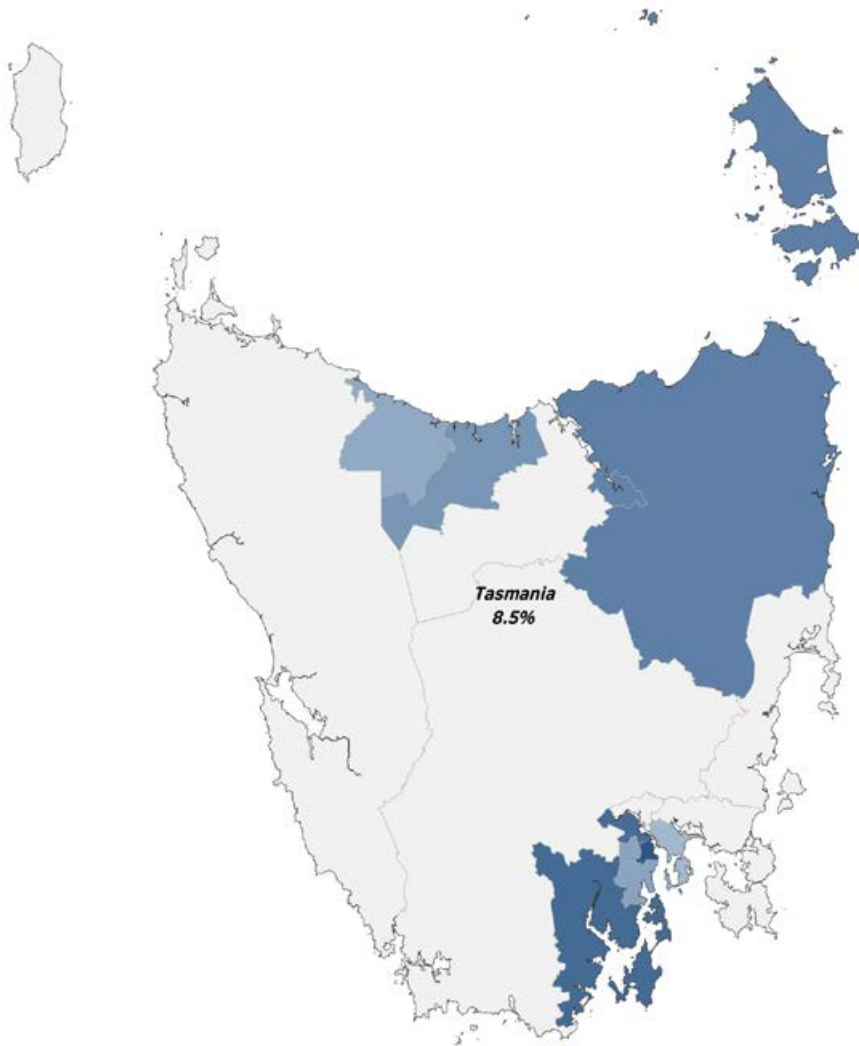
Treatment uptake in Tas. overall was 8.5%, below the national average of 10.7%. However, Tas. had the second-highest increase in treatment numbers of any PHN, increasing its national rank for treatment uptake from 14th to 12th between 2019 and 2020. This increase in treatment occurred in almost all SA3s, and was greatest in the [Hobart – Inner](#) SA3.

Assessing variations in treatment uptake in Tas. is limited by the small number of people with CHB in most SA3s, and there was no apparent pattern of uptake variation according to remoteness in those SA3s that could be assessed (Figure A.26, Table A.15). No SA3 in Tas. reached or approached the National Strategy treatment uptake target of 20%.

CHB CARE

The variation in care uptake across [Tasmania](#) PHN largely reflected treatment uptake. CHB care uptake in Tas. remained stable between 2019 and 2020; however, this was due to the considerable increase in treatment uptake, which is a component of care. The number of viral load monitoring tests conducted in Tas. declined during 2020, consistent with national trends. This decline occurred in most SA3s.

Figure A.26: Geographic variation in CHB treatment uptake in Tas., by SA3, 2020



Key: Darker shade of blue denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Table A.15: CHB treatment uptake in Tas., by SA3, 2020

PHN and SA3	Total population	People living with CHB	CHB prevalence (%)	Treatment uptake (%)	Care uptake (%)
Tasmania PHN	542,458	1,513	0.28%	8.5%	17.3%
Brighton	25,332	59	0.23%	#	#
Burnie – Ulverstone	56,053	134	0.24%	#	#
Central Highlands (Tas.)	3,255	#	#	#	#
Devonport	45,132	111	0.25%	7.2%	13.5%
Hobart Inner	54,443	239	0.44%	11.7%	22.2%
Hobart – North East	55,873	137	0.24%	5.1%	14.6%
Hobart – North West	58,124	180	0.31%	10.0%	23.8%
Hobart – South and West	34,804	95	0.27%	6.3%	17.8%
Huon – Bruny Island	22,902	59	0.26%	#	#
Launceston	88,318	264	0.30%	8.3%	17.8%
Meander Valley – West Tamar	20,928	47	0.23%	#	#
North East	40,611	93	0.23%	8.6%	15.0%
Sorell – Dodges Ferry	17,916	41	0.23%	#	#
South East Coast	5,851	14	0.24%	#	#
West Coast	12,917	32	0.25%	#	#

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Note: Totals may not add up due to inclusion of people without an SA3 of residence recorded in source data.

Data suppressed where number receiving treatment or monitoring was <6. SA3s not listed where population <3000

VICTORIA

- CHB treatment uptake in Vic. in 2020 was 11.0%, similar to the national average of 10.7%
- CHB care uptake in Vic. in 2020 was 24.5%, higher than the national average of 22.6%
- Vic. ranked 3rd for CHB treatment uptake and 4th for CHB care uptake of the 8 states and territories
- Treatment and care uptake were highest in PHNs in the Melbourne metropolitan region, with lower uptake in the more regional areas
- Treatment numbers in Vic. increased in 2020 but by less than during 2019, consistent with national trends
- Off-treatment monitoring uptake in Vic. declined more than any other state or territory during 2020, reducing overall care uptake

CHB TREATMENT

CHB treatment in Vic. overall was 11.0%, very similar to the national average of 10.7%. Uptake was similarly high across the three Melbourne PHNs; however, considerable variation was seen within the PHNs.

In **North Western Melbourne**, uptake was highest in Brimbank (27.2%), where it had already met the National Strategy target of 20%. Treatment uptake was also above the PHN average in the **Maribyrnong** (17.1%), **Darebin North** (13.7%), **Keilor** (13.0%), **Tullamarine – Broadmeadows** (11.7%), and **Yarra** (11.9%) SA3s (Figure A.27, Table A.16). With the exception of Melbourne City, treatment uptake was generally lower in more regional parts of the PHN. The lower uptake in **Melbourne City** may reflect the younger and more temporarily resident population, which is less likely to require treatment and more likely to be Medicare ineligible.⁹

Uptake in **South Eastern Melbourne** overall was 11.5%. This was driven by **Dandenong** SA3 (20.2%), which had the highest uptake and which for the first time met the 2022 National Strategy target of 20% uptake. Uptake was also above average in **Casey North** (13.6%) but considerably lower in the remaining SA3s, ranging between 5.2%–9.6%.

In contrast, in **Eastern Melbourne**, treatment uptake was above the state average in almost all SA3s, but none met the 2022 target level of 20%. Uptake was highest in **Manningham – West** (17.3%), **Manningham – East** (16.1%), **Whitehorse – East** (15.7%), and **Maroondah** (14.4%), and lowest in **Yarra Ranges** SA3 (5.0%). Treatment numbers increased in all SA3s in this PHN during 2020.

Within non-metropolitan Vic. PHNs, uptake was highest in **Murray** PHN, especially in the **Murray River – Swan Hill** SA3, which was the only SA3 in regional Vic. to exceed the state average treatment uptake (Figure A.28). Uptake in this region increased substantially during 2019 and 2020. Uptake above the PHN average was also observed in **Bendigo** (9.2%), **Mildura** (8.3%), **Heathcote – Kyneton – Castlemaine** (8.3%), and **Shepparton** (7.8%).

Uptake in **Gippsland** PHN overall was 5.4%, though was higher than this in **Wellington** (uptake 8.2%), which had a substantial increase in treatment during 2019 and 2020. Uptake in **Western Victoria** was 4.8%, with higher uptake SA3s within the PHN including **Creswick – Daylesford – Ballan** (6.7%) and **Geelong** (6.0%).

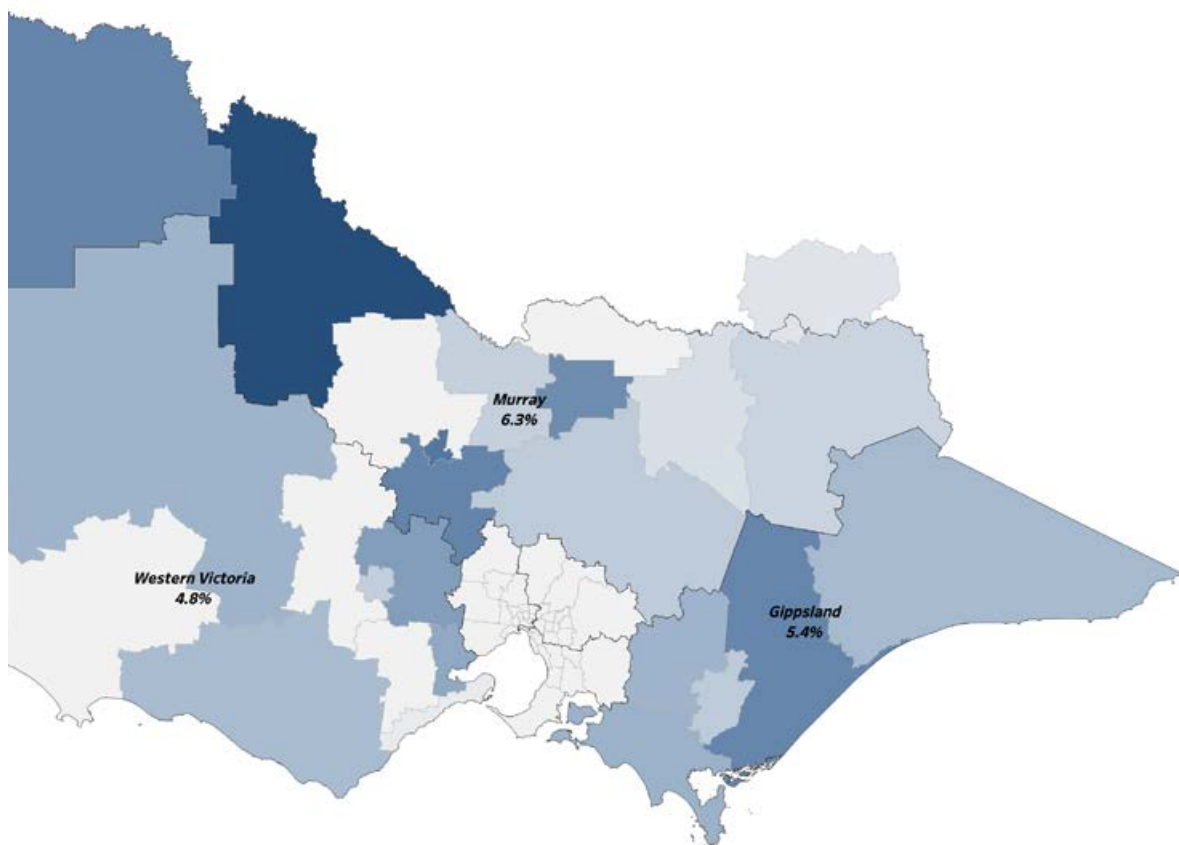
CHB CARE

Care uptake in Vic. largely reflected treatment uptake according to region. The only SA3 in Vic. which had already reached the 2022 National Strategy target for care uptake was **Brimbank** (58.9%) in **North Western Melbourne**, while it was above 40% in **Dandenong** (43.4%) in **South Eastern Melbourne**.

CHB care uptake declined in all three metropolitan Vic. PHNs during 2020, reducing the national care uptake rank of **South Eastern Melbourne** from 6th to 8th, while **North Western Melbourne** reduced from 8th to 9th. **Eastern Melbourne** also had a reduction in monitoring; however, the greater stability in treatment numbers prevented a reduction in overall care uptake.

Care uptake remained stable in the **Western Victoria** and **Murray** PHNs, while **Gippsland** was one of the few PHNs to have an increase in monitoring uptake, moving in national care rank from 25th to 23rd. However, this masked considerable variation in care uptake trends within the PHN, as care uptake reduced within the **Latrobe Valley** SA3, while increases occurred in **Gippsland – South West** and **Wellington**. A substantial increase was also seen in Geelong in **Western Victoria** during 2019 and 2020.

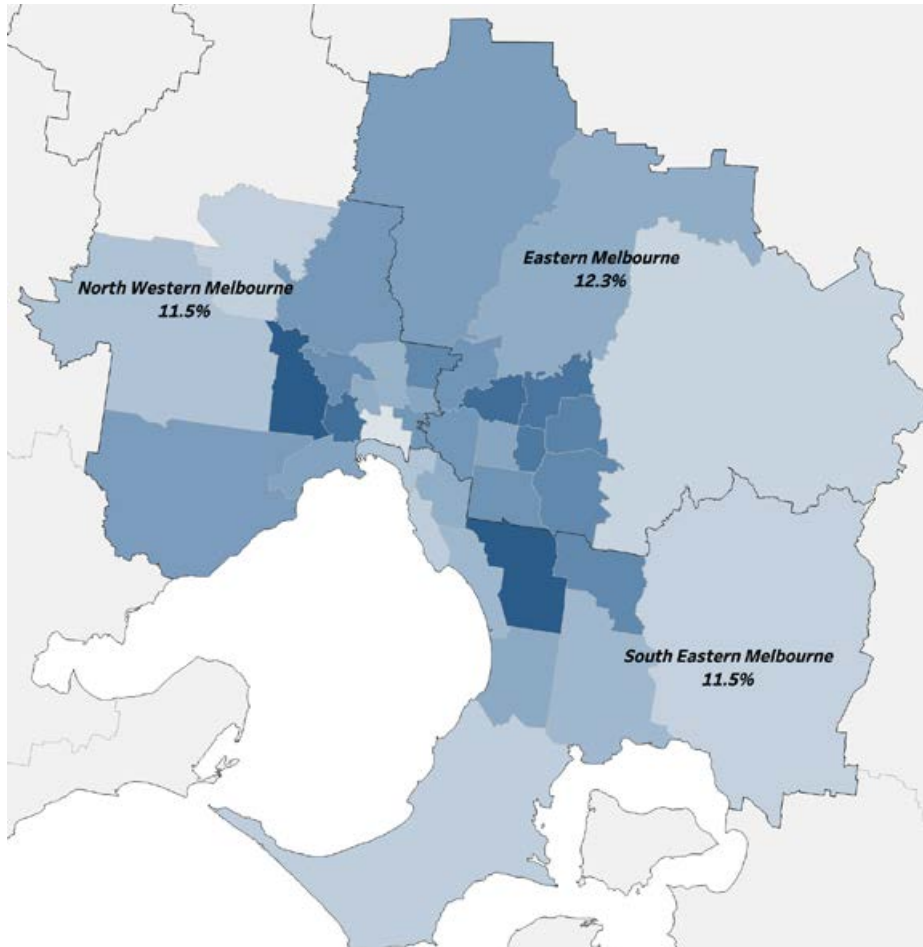
Figure A.27: Geographic variation in CHB treatment uptake in Vic. (other than Greater Melbourne), by PHN and SA3, 2020



Key: Darker shade of blue denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Figure A.28: Geographic variation in CHB treatment uptake in Greater Melbourne, by PHN and SA3, 2020



Key: Darker shade of blue denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Table A.16: CHB treatment uptake in Vic., by PHN and SA3, 2020

PHN and SA3	Total population	People living with CHB	CHB prevalence (%)	People treated, 2016–2020	Treatment uptake, end of 2020 (%)
Eastern Melbourne PHN	1,618,010	18,266	1.13%	12.3%	27.4%
Banyule	126,562	1,027	0.81%	12.1%	26.7%
Boroondara	190,049	2,249	1.18%	11.9%	27.3%
Knox	175,474	1,674	0.95%	13.6%	30.5%
Manningham – East	29,746	229	0.77%	16.1%	28.3%
Manningham – West	100,814	1,703	1.69%	17.3%	37.7%
Maroondah	104,490	898	0.86%	14.4%	34.2%
Monash	197,322	3,512	1.78%	12.3%	26.6%
Nillumbik – Kinglake	59,185	281	0.47%	9.3%	22.4%
Whitehorse – East	65,491	930	1.42%	15.7%	32.4%
Whitehorse – West	127,227	2,167	1.70%	10.1%	24.9%
Whittlesea – Wallan	279,790	2,775	0.99%	11.0%	23.9%
Yarra Ranges	161,861	822	0.51%	5.0%	12.2%
North Western Melbourne PHN	1,908,410	23,546	1.23%	11.5%	25.3%
Brimbank	137,725	3,014	2.19%	27.2%	58.9%
Brunswick – Coburg	98,048	861	0.88%	8.7%	18.7%
Darebin – North	94,894	1,139	1.20%	13.7%	30.4%
Darebin – South	61,770	446	0.72%	10.1%	19.9%
Essendon	78,889	874	1.11%	9.4%	22.9%
Hobsons Bay	95,478	834	0.87%	10.4%	21.0%
Keilor	66,283	593	0.89%	13.0%	25.6%
Macedon Ranges	31,916	136	0.43%	#	#
Maribyrnong	82,481	1,435	1.74%	17.1%	36.9%
Melbourne City	184,529	4,309	2.33%	3.5%	7.5%
Melton – Bacchus Marsh	251,275	2,688	1.07%	6.7%	14.9%
Moreland – North	85,629	763	0.89%	8.6%	21.2%
Sunbury	44,785	223	0.50%	5.4%	10.7%
Tullamarine – Broadmeadows	202,291	1,797	0.89%	11.7%	25.8%
Wyndham	292,420	3,348	1.14%	11.1%	25.4%
Yarra	99,996	1,086	1.09%	11.9%	26.3%

PHN and SA3	Total population	People living with CHB	CHB prevalence (%)	People treated, 2016–2020	Treatment uptake, end of 2020 (%)
South Eastern Melbourne PHN	1,618,758	15,034	0.93%	11.5%	25.4%
Bayside	107,336	723	0.67%	5.7%	14.1%
Cardinia	114,502	613	0.54%	5.2%	16.1%
Casey – North	111,069	1,012	0.91%	13.6%	30.4%
Casey – South	269,432	2,298	0.85%	8.0%	18.8%
Dandenong	199,900	4,237	2.12%	20.2%	43.4%
Frankston	127,231	732	0.58%	9.6%	18.0%
Glen Eira	152,122	1,561	1.03%	9.2%	20.9%
Kingston	129,022	960	0.74%	8.0%	18.3%
Mornington Peninsula	173,122	806	0.47%	5.6%	12.3%
Port Phillip	119,504	928	0.78%	6.6%	13.4%
Stonnington – East	37,798	412	1.09%	9.2%	19.4%
Stonnington – West	77,722	752	0.97%	6.6%	13.4%
Gippsland PHN	291,433	1,362	0.47%	5.4%	11.6%
Baw Baw	52,022	225	0.43%	5.3%	12.0%
Gippsland – East	47,678	221	0.46%	5.0%	9.5%
Gippsland – South West	69,940	311	0.44%	5.5%	14.1%
Latrobe Valley	78,060	397	0.51%	4.0%	8.8%
Wellington	43,732	207	0.47%	8.2%	15.0%
Murray PHN	639,220	3,174	0.50%	6.3%	14.8%
Albury	66,675	335	0.50%	2.7%	8.7%
Bendigo	110,812	523	0.47%	9.2%	24.3%
Campaspe	37,492	161	0.43%	3.7%	10.0%
Heathcote – Castlemaine – Kyneton	45,568	217	0.48%	8.3%	16.6%
Loddon – Elmore	8,724	36	0.41%	#	#
Mildura	55,507	327	0.59%	8.3%	16.2%
Moira	31,395	140	0.45%	#	#
Murray River – Swan Hill	36,843	207	0.56%	12.5%	26.1%
Shepparton	66,715	412	0.62%	7.8%	17.0%
Upper Goulburn Valley	57,824	274	0.47%	4.0%	10.6%
Wangaratta – Benalla	47,263	202	0.43%	3.0%	8.4%
Wodonga – Alpine	74,403	340	0.46%	3.5%	8.5%

PHN and SA3	Total population	People living with CHB	CHB prevalence (%)	People treated, 2016–2020	Treatment uptake, end of 2020 (%)
Western Victoria PHN	668,893	3,250	0.49%	4.8%	12.3%
Ballarat	126,588	601	0.47%	3.8%	8.2%
Barwon – West	19,248	75	0.39%	#	#
Creswick – Daylesford – Ballan	24,074	105	0.43%	6.7%	13.4%
Geelong	205,018	1,184	0.58%	6.0%	18.7%
Glenelg – Southern Grampians	35,459	151	0.42%	#	#
Grampians	58,812	261	0.44%	5.4%	11.5%
Maryborough – Pyrenees	19,049	80	0.42%	#	#
Surf Coast – Bellarine Peninsula	90,206	386	0.43%	2.3%	5.7%
Warrnambool – Otway Ranges	90,439	409	0.45%	4.9%	10.0%

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Note: Totals may not add up due to inclusion of people without an SA3 of residence recorded in source data.

Data suppressed where number receiving treatment or care was <6. SA3s not listed where population <3000.

WESTERN AUSTRALIA

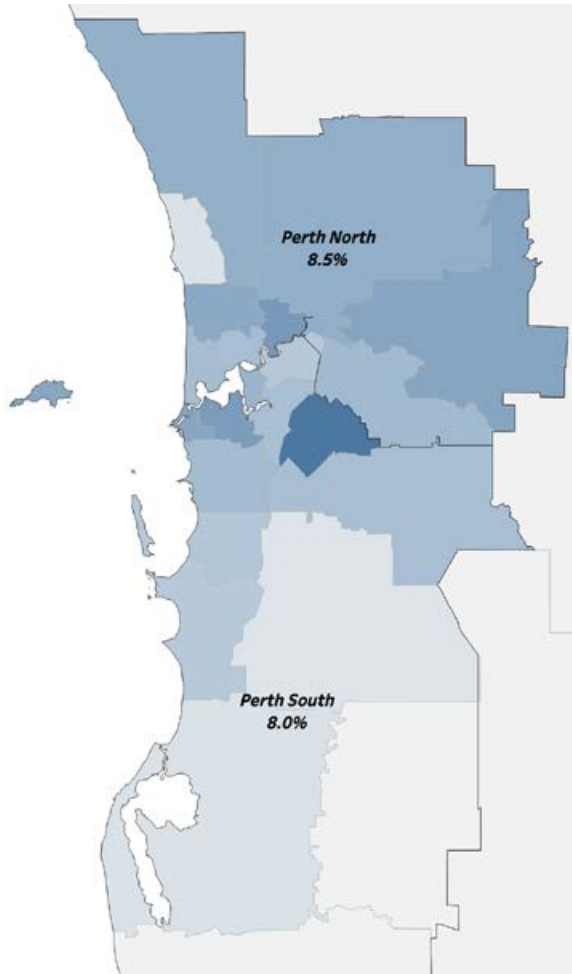
- CHB treatment uptake in WA in 2020 was 6.9%, lower than the national average of 10.7%
- CHB care uptake in WA in 2020 was 10.2%, lower than the national average of 22.6%
- WA ranked 8th for CHB treatment uptake and 8th for CHB care uptake of the eight states and territories
- Treatment and care uptake were highest in the two PHNs in the Perth metropolitan region, with lower uptake in more regional areas
- Treatment numbers in WA increased in 2020 but by less than during 2019, consistent with national trends
- Off-treatment monitoring uptake was stable in 2020 in WA, in contrast to the decline that occurred nationally and in most jurisdictions

CHB TREATMENT

Treatment uptake was similar in **Perth North** (8.5%) and **Perth South** PHNs (8.0%) (Figure A.29), after treatment numbers increased more rapidly during 2019 and 2020 in **Perth South**. Treatment uptake was highest in the **Bayswater – Bassendean** (11.4%) SA3 in **Perth North**, and in **Gosnells** (15.9%) and **Melville** (11.0%) SA3s in **Perth South** (Table A.17).

Treatment uptake in **Country WA**, where more than half of all people living with CHB live in remote areas, was 2.5%, lower than the state average. Treatment uptake appeared similar across the SA3s of the PHN; however, low numbers limit robust comparisons across these regions (Figure A.30).

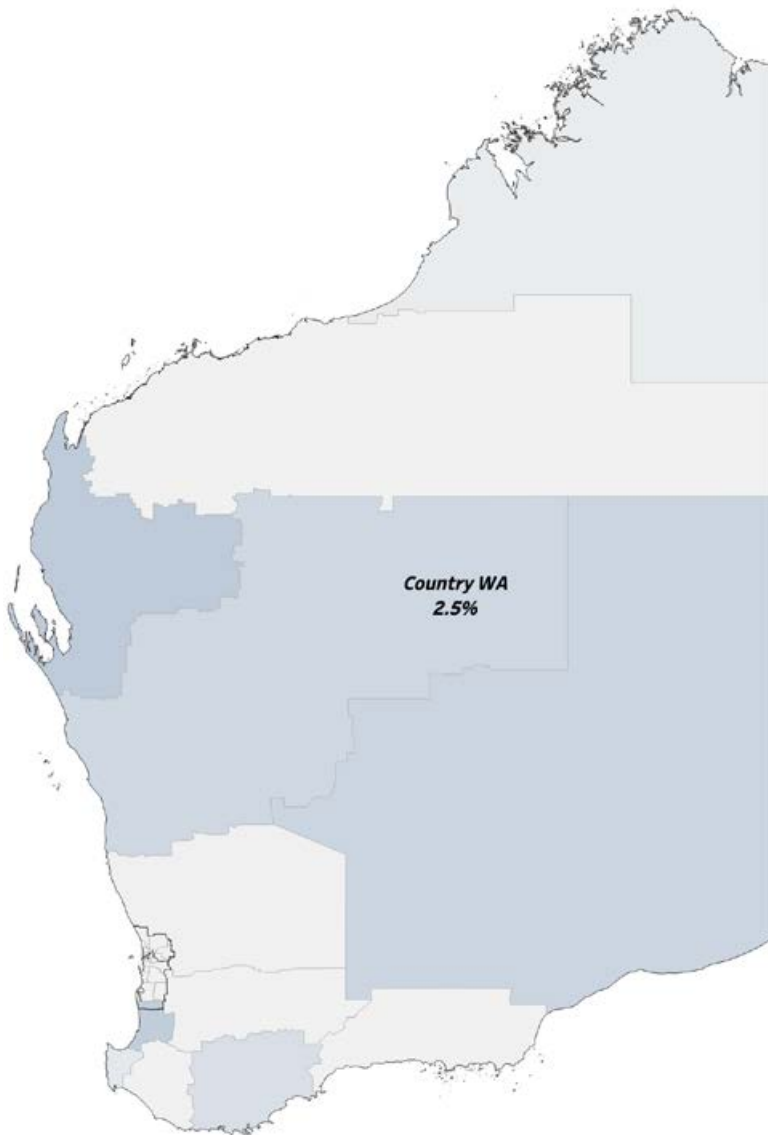
Figure A.29: Geographic variation in CHB treatment uptake in Greater Perth, by PHN and SA3, 2020



Key: Darker shade of blue denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Figure A.30: Geographic variation in CHB treatment uptake in WA (other than Greater Perth), by PHN and SA3, 2020



Key: Darker shade of blue denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

CHB CARE

Care uptake within WA generally reflected treatment uptake, varying in similar patterns and being higher in metropolitan compared to rural areas. Overall in WA the number of people receiving monitoring while not on treatment remained stable; however, this was not consistent by area; monitoring levels declined during 2020 in **Perth North** PHN, while in **Perth South** PHN they remained stable after declines during 2019.

Table A.17: CHB treatment uptake in WA by PHN and SA3, 2020

PHN and SA3	Total population	People living with CHB	CHB prevalence (%)	Treatment uptake (%)	Care uptake (%)
Perth North PHN	1,105,743	9,438	0.85%	8.5%	12.5%
Bayswater – Bassendean	84,182	903	1.07%	11.4%	16.4%
Cottesloe – Claremont	64,946	504	0.78%	7.3%	11.3%
Joondalup	151,626	922	0.61%	3.6%	6.6%
Kalamunda	53,264	308	0.58%	7.8%	13.3%
Mundaring	25,416	128	0.50%	#	#
Perth City	134,051	1,220	0.91%	7.3%	10.2%
Stirling	212,162	2,137	1.01%	9.7%	12.4%
Swan	167,102	1,389	0.83%	9.0%	14.8%
Wanneroo	212,995	1,928	0.91%	9.0%	13.2%
Perth South PHN	1,033,388	8,645	0.84%	8.0%	11.8%
Armadale	94,243	705	0.75%	7.2%	11.2%
Belmont – Victoria Park	76,777	861	1.12%	6.2%	9.9%
Canning	148,348	1,965	1.32%	7.1%	10.4%
Cockburn	132,140	1,042	0.79%	7.6%	10.6%
Fremantle	32,996	191	0.58%	9.9%	14.1%
Gosnells	81,450	804	0.99%	15.9%	22.5%
Kwinana	46,929	372	0.79%	6.5%	9.7%
Mandurah	105,689	564	0.53%	3.5%	6.0%
Melville	97,322	770	0.79%	11.0%	16.6%
Rockingham	138,987	783	0.56%	6.1%	9.2%
Serpentine – Jarrahdale	34,218	181	0.53%	3.3%	6.6%
South Perth	44,289	406	0.92%	8.4%	11.6%
Country WA PHN	534,822	5,566	1.04%	2.5%	3.8%
Albany	61,592	407	0.66%	3.0%	5.2%
Augusta – Margaret River – Busselton	57,247	282	0.49%	2.5%	#
Bunbury	106,317	568	0.53%	3.9%	6.2%
Esperance	15,810	114	0.72%	#	#
Gascoyne	9,282	174	1.88%	#	#
Goldfields	37,281	461	1.24%	3.5%	6.1%
Kimberley	36,166	1,429	3.95%	2.3%	2.9%
Manjimup	23,120	123	0.53%	#	#
Mid West	52,867	513	0.97%	3.3%	4.7%

PHN and SA3	Total population	People living with CHB	CHB prevalence (%)	Treatment uptake (%)	Care uptake (%)
Pilbara	62,665	1,029	1.64%	1.0%	2.5%
Wheat Belt – North	52,746	341	0.65%	#	#
Wheat Belt – South	19,727	126	0.64%	#	#

Data source: CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. Treatment data sourced from Department of Human Services Medicare statistics.

Note: Totals may not add up due to inclusion of people without an SA3 of residence recorded in source data.

Data suppressed where number receiving treatment or care was <6. SA3s not listed where population <3000.

SECTION B: HEPATITIS C

SECTION B1: NATIONAL SNAPSHOT AND COVID-19 IMPACTS – HEPATITIS C

IN THIS SECTION

- National and state/territory level estimates
- Trends over time in treatment uptake during 2016–2020
- Assessment of variation according to demographic and clinical factors
- Progress and projections towards the National Hepatitis C Strategy and World Health Organization Global Health Sector Strategy treatment targets

KEY FINDINGS

- Overall treatment uptake reached 47.0% by the end of 2020; however, the number treated continued to decline steadily.
- Without improvement in treatment trends, Australia is not on track to reach the 2022 National Strategy target or the 2030 global target.
- The decline in treatment numbers for hepatitis C during 2020 was similar to the decline in 2019 at the national level; however, greater declines were seen in the **Gippsland, South Eastern Melbourne, Western Victoria, Darling Downs and West Moreton, Northern Sydney, and Central and Eastern Sydney** PHNs.

Table B.1: Heat map of CHC prevalence (start of 2016) and treatment uptake (at end of 2020) by PHN

PHN	PREVALENCE Proportion of the population living with CHC, start of 2016	TREATMENT Proportion of people with CHC who received treatment, by end of 2020
AUSTRALIA	0.78%	47.0%
Northern Territory	1.54%	21.6%
Western NSW	1.38%	40.9%
North Coast	1.28%	59.5%
Western Queensland	1.28%	21.3%
Murrumbidgee	1.13%	38.9%
Northern Queensland	1.09%	39.1%
South Eastern NSW	0.96%	48.3%
Country WA	0.95%	37.3%
Darling Downs and West Moreton	0.95%	41.0%
Hunter New England and Central Coast	0.91%	53.5%
Central and Eastern Sydney	0.91%	39.6%
Gold Coast	0.88%	45.2%
Central Queensland, Wide Bay, Sunshine Coast	0.87%	51.2%
Tasmania	0.85%	47.4%
South Western Sydney	0.83%	42.1%
Brisbane North	0.83%	41.3%
Brisbane South	0.81%	44.6%
Gippsland	0.80%	62.5%
Murray	0.80%	48.9%
Nepean Blue Mountains	0.80%	41.5%
North Western Melbourne	0.72%	54.0%
Australian Capital Territory	0.69%	46.0%
Perth South	0.68%	44.3%
Western Sydney	0.67%	41.1%
South Eastern Melbourne	0.67%	55.1%
Western Victoria	0.67%	65.4%
Perth North	0.66%	43.6%
Country SA	0.55%	53.5%
Adelaide	0.50%	60.0%
Eastern Melbourne	0.44%	53.0%
Northern Sydney	0.36%	45.7%

Key: Green denotes lowest prevalence and highest treatment uptake, with a colour gradient through to red which denotes highest prevalence and lowest treatment uptake.

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

PREVALENCE

At the start of 2016 in Australia, an estimated 188,951 people were living with CHC (viremic infection), representing 0.78% of the total population¹⁰ (Table B.2). All prevalence data in this report are based on this number and time point, and treatment uptake data represent the cumulative number of people treated between March 2016 and December 2020, in order to measure against the National Strategy Target of 65% treatment uptake by 2022. As a result of the introduction of direct-acting antiviral (DAA) treatments and the associated high cure rates, the number of people estimated to be still living with CHC at the end of 2019 (after accounting for mortality and new infections) was 122,264.¹¹

PREVALENCE ACROSS STATES AND TERRITORIES

The highest prevalence of CHC was estimated to be in the NT at 1.54%, and the lowest prevalence in SA at 0.51%. The prevalence of CHC was above the national average in NSW (0.86%), Qld (0.90%) and Tas. (0.85%), and below the national average in WA (0.73%), the ACT (0.69%) and Vic. (0.65%) (Table B.2).

PREVALENCE ACROSS PRIMARY HEALTH NETWORKS

The prevalence of CHC also varied considerably by PHN, ranging from 0.36% to 1.54% in relation to the national average of 0.78% (Figure B.1), the highest prevalence occurred in the **Northern Territory** PHN, while the lowest prevalence occurred in **Northern Sydney**. Prevalence was generally higher in rural and regional PHNs; however, due to urban population concentration, the highest absolute numbers of people living with CHC were in metropolitan areas. The distribution of people living with CHC across non-metropolitan regions presents challenges for access to care and treatment, particularly in regions where specialist services may be limited. The highest prevalence PHNs in Australia were the **Northern Territory** (1.54%), **Western NSW** (1.38%), **North Coast NSW** (1.28%), **Western Queensland** (1.28%), **Murrumbidgee NSW** (1.13%), and **Northern Queensland** (1.09%), all of which are predominantly rural (Figure B.1).

Prevalence could potentially be overestimated in a PHN or SA3 if testing rates for hepatitis C were higher than average. However, comparison of prevalence estimates with other data sources, including rates of testing for hepatitis serology and hepatitis C RNA testing through the MBS, did not suggest screening is systematically higher in these regions. Blood donor prevalence data¹² also show consistently higher prevalence in the NT, consistent with estimates in this report. Additionally, data from the National Drug Strategy Household Survey suggest that the proportion of people in rural and remote Qld, NSW, and the NT who have a history of injecting drug use is higher than the national average, which would likely correlate to a higher CHC prevalence. Systematic data regarding CHC screening and information regarding seroprevalence would assist in clarifying these variations according to region, and allow for verification of treatment uptake estimates, as well as the linkage of data regarding notifications and treatment uptake, which would allow for more precision with estimating uptake at an individual level.

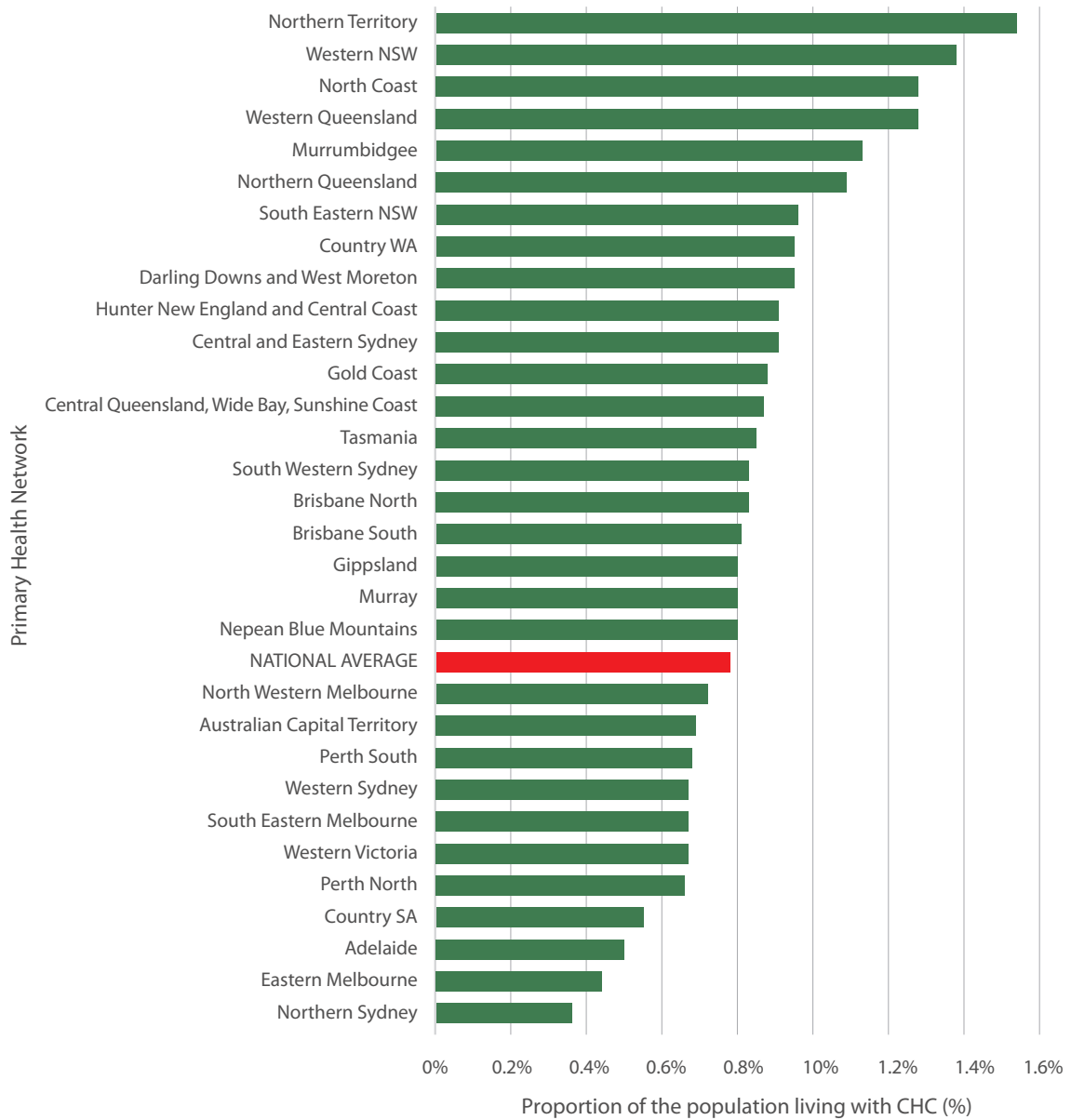
Table B.2: Estimated prevalence of CHC, by state and territory, start of 2016

State/territory	Total population	People living with CHC	CHC prevalence (%)
ACT	410,111	2,832	0.69%
NSW	7,690,136	65,965	0.86%
NT	237,919	3,663	1.54%
Qld	4,872,829	43,641	0.90%
SA	1,736,438	8,934	0.51%
Tas.	528,674	4,471	0.85%
Vic.	6,215,133	40,161	0.65%
WA	2,562,195	18,646	0.73%
AUSTRALIA	24,253,435	188,951	0.78%

Data source: CHC prevalence estimates based on published national estimates and notifications distribution.

Note: Totals may not add up due to inclusion of people without a state or territory of residence recorded in source data.

Figure B.1: Estimated prevalence of CHC, by Primary Health Network, start of 2016



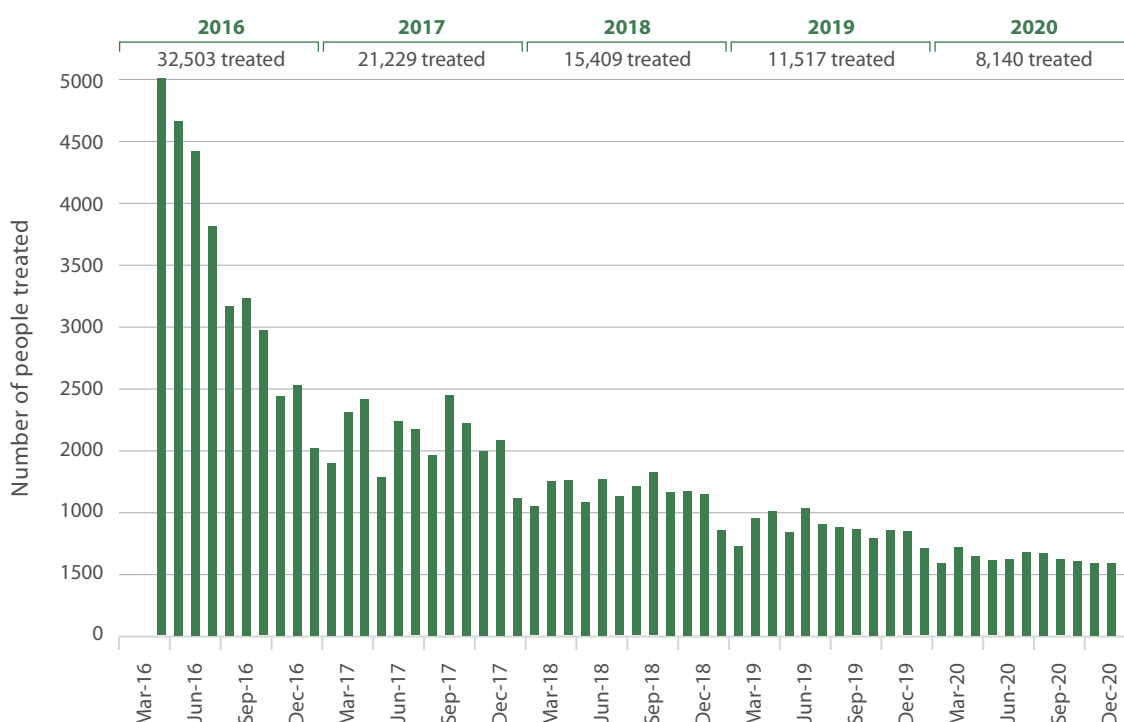
Data source: CHC prevalence estimates based on published national estimates and notifications distribution.

[\(link to data for this figure\)](#)

TREATMENT

A total of 88,798 people received hepatitis C treatment between March 2016 and December 2020, 47.0% of the total number living with CHC at the start of 2016. The number of people who received treatment was highest in 2016 and has declined steadily over time, from 32,049 in 2016 to 8,140 people during 2020 (Figure B.2).

Figure B.2: CHC treatment in Australia, by month, March 2016 – December 2020



Data source: Treatment data sourced from Department of Human Services Medicare statistics.

[\(link to data for this figure\)](#)

TREATMENT ACROSS STATES AND TERRITORIES

At the end of 2020, cumulative CHC treatment since 2016 was highest in SA (58.0%) and in Vic. (55.2%) (Table B.3). Uptake was similar to the national average of 47.0% in Tas. (47.4%), ACT (46.0%), and NSW (45.6%), and it was below the national average in Qld (43.3%), WA (42.1%), and the NT (21.6%).

Table B.3: CHC treatment uptake by state/territory, end of 2020

State/territory	Total population, 2016	People living with CHC, start of 2016	CHC prevalence, 2016 (%)	Number of people received treatment, 2016–2020	Treatment uptake (%), end of 2020
ACT	410,111	2,832	0.69%	1,303	46.0%
NSW	7,690,136	65,965	0.86%	30,170	45.7%
NT	237,919	3,663	1.54%	790	21.6%
Qld	4,872,829	43,641	0.90%	18,916	43.3%
SA	1,736,438	8,934	0.51%	5,184	58.0%
Tas.	528,674	4,471	0.85%	2,118	47.4%
Vic.	6,215,133	40,161	0.65%	22,150	55.2%
WA	2,562,195	18,646	0.73%	7,847	42.1%
AUSTRALIA	24,259,041	188,951	0.78%	88,798	47.0%

Data source: CHC prevalence estimates based on published national estimates and notifications distribution.

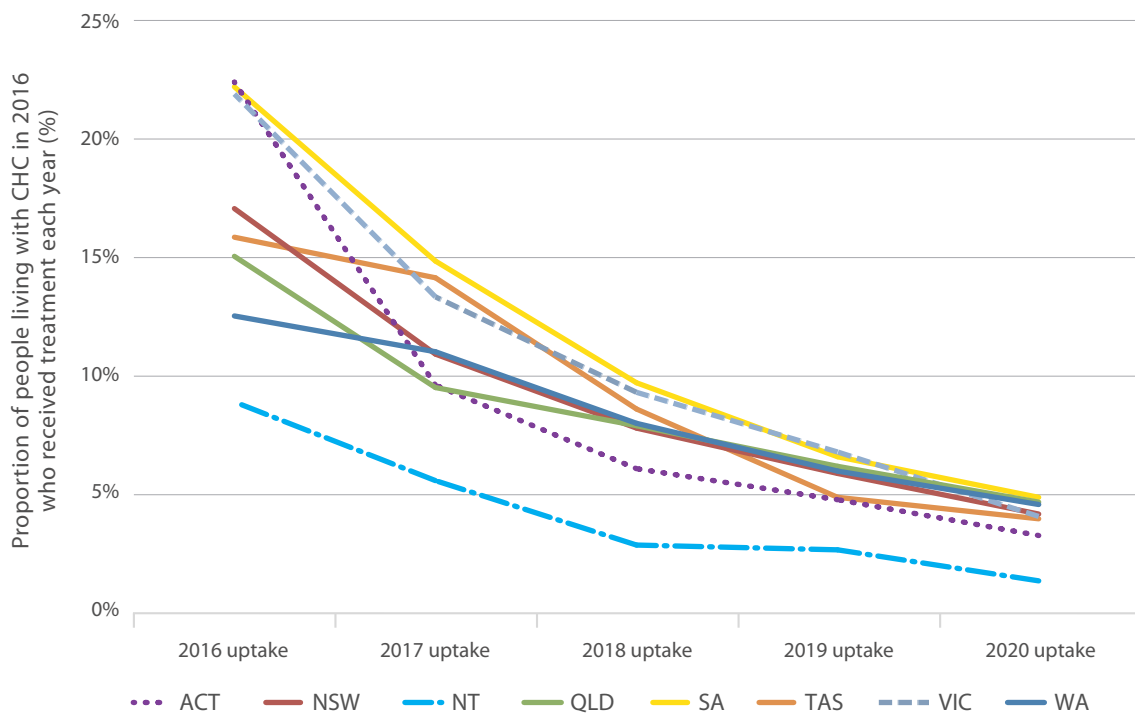
Treatment data sourced from Department of Human Services Medicare statistics.

Note: Totals may not add up due to inclusion of people without a state or territory of residence recorded in source data.

TREATMENT TRENDS OVER TIME AND COVID-19 IMPACTS

The number of people treated overall in Australia declined by a similar proportion each year (25–35% per year since 2016). However, variations according to state and territory were seen, and in 2020 particularly reflected the disparate effects of COVID-19 on health service provision according to region. The trend in hepatitis C treatment uptake according to year and state/territory is shown in Figure B.3. These data represent the proportion of people living with CHC at the start of 2016 who were treated in each subsequent year.

Figure B.3: Proportion of people living with CHC at the start of 2016 treated each year, by state/territory, 2016–2020



Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

[\(link to data for this figure\)](#)

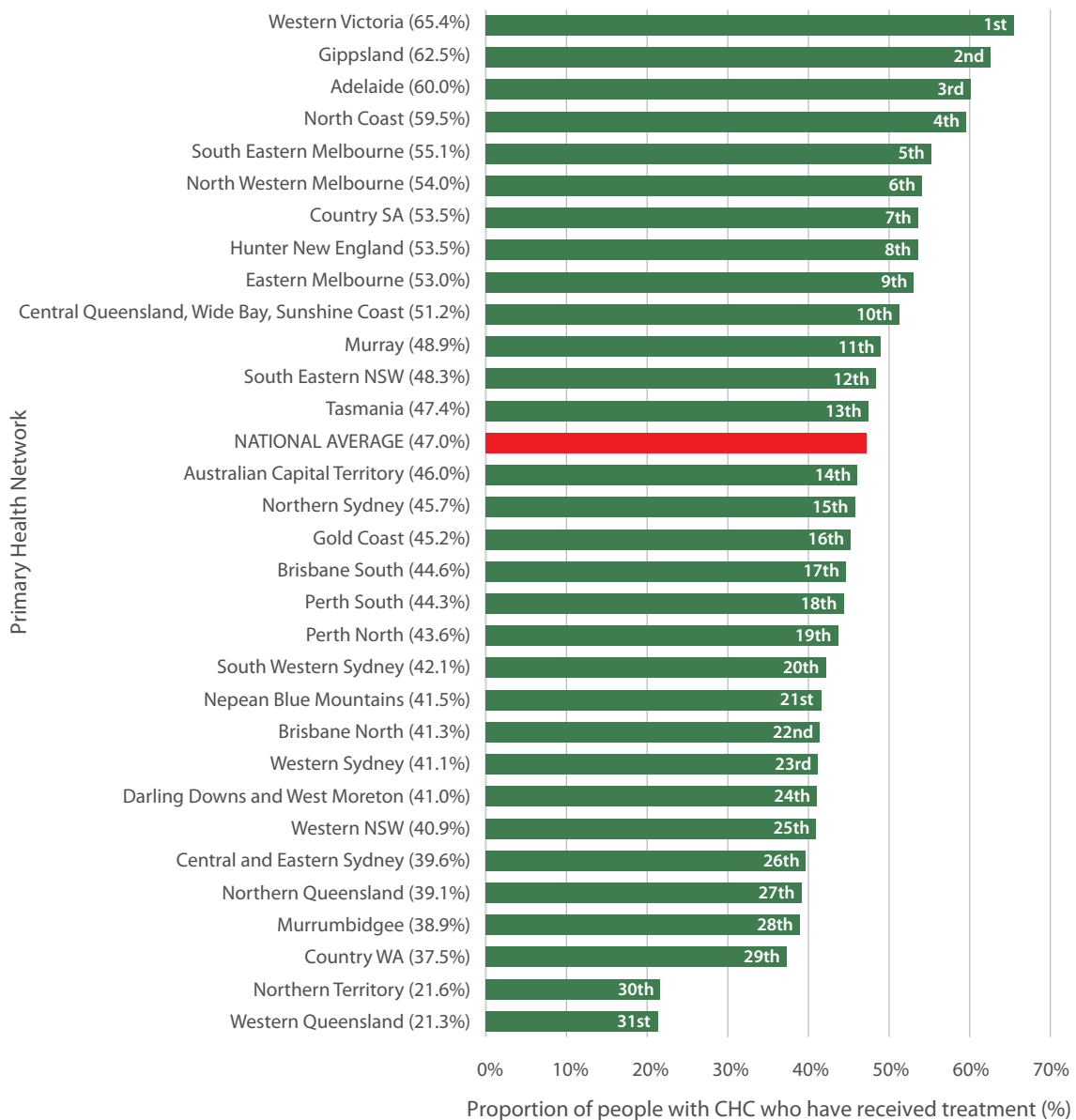
The decline during 2020 was most pronounced in Vic. (39.8% decline), the state with the most severe COVID-19 outbreak and lockdown responses. This meant that during 2020, Victoria was ranked only 5th highest of the eight states and territories for treatment uptake, whereas during 2019 it ranked 1st. The NT also recorded a 47.5% decline; however, the very small numbers mean this trend needs to be interpreted with caution, and large fluctuations are seen year to year (Figure B.3).

In most other states and territories the decline during 2020 was similar to the decline during 2019; however, in Tas. (decline of 19.5%) and SA (decline of 25.9%) it was less pronounced than the previous year.

TREATMENT ACROSS PRIMARY HEALTH NETWORKS

Treatment uptake at the end of 2020 was highest in **Western Victoria** PHN (65.4%), the only PHN in Australia to have already reached the 2022 National Strategy target of 65% uptake. Other PHNs with higher treatment uptake included **Gippsland** (62.5%), **Adelaide** (60.0%), **North Coast** (59.5%), and **South Eastern Melbourne** (55.1%) (Figure B.4).

Figure B.4: CHC treatment uptake and ranking, by PHN, end of 2020



Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

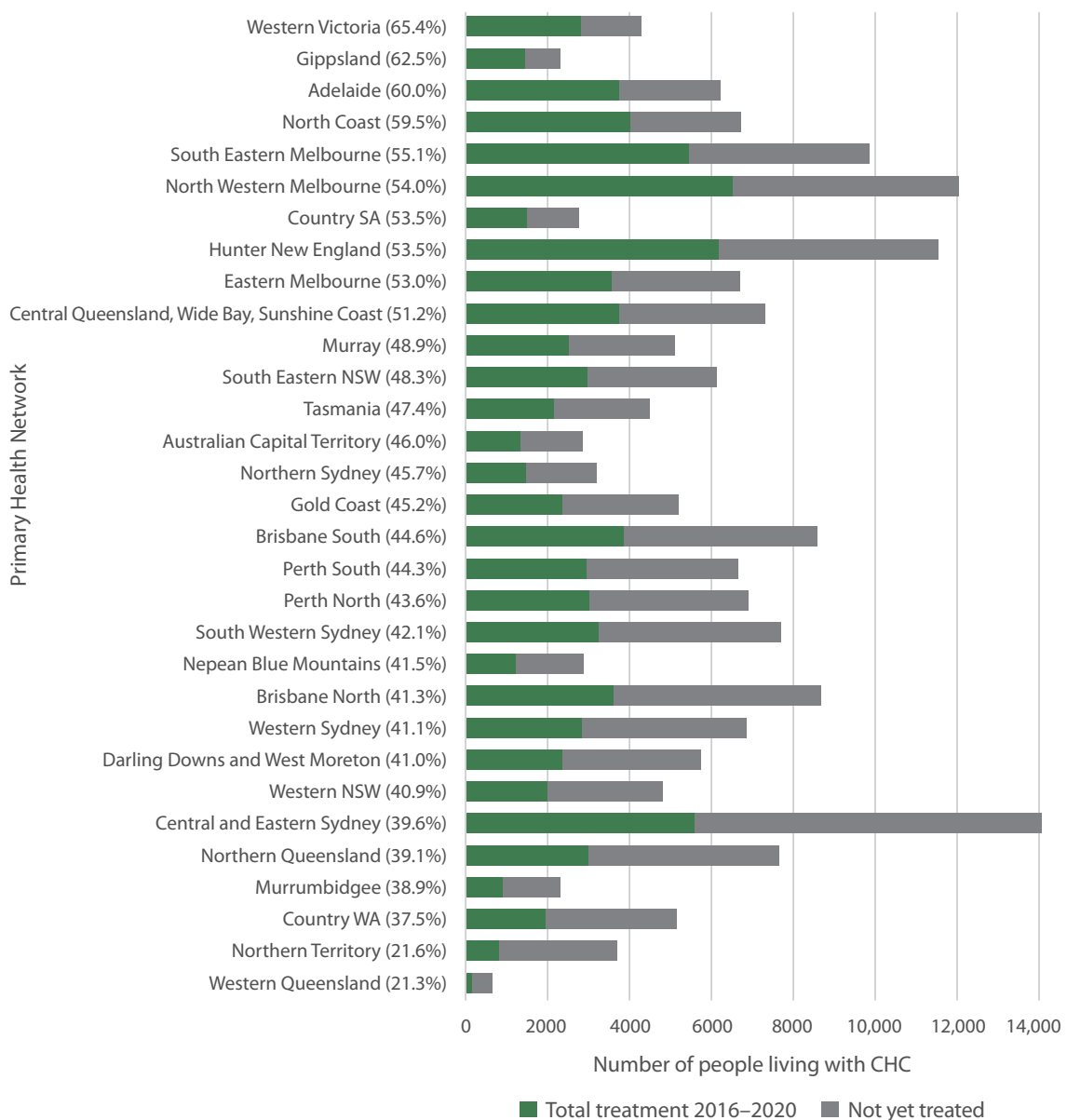
The lowest treatment uptake was seen in **Western Queensland** (21.3%), **Northern Territory** (21.6%), **Country WA** (37.5%), **Northern Queensland** (39.1%), and **Central and Eastern Sydney** (39.6%).

A number of PHNs have increased their overall treatment uptake rank compared to previous reports due to higher than average uptake in more recent years compared to 2016–17. These include **Perth South; Darling Downs and West Moreton; Central Queensland, Wide Bay and Sunshine Coast; and Nepean Blue Mountains** (see trends over time section).

The seven PHNs with the lowest treatment uptake all had above average prevalence. 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. This combination of factors makes it difficult to determine the precise drivers of disparities in treatment uptake between PHNs. Causes of this are likely to be multifactorial and vary according to region. More research into individual-level barriers to treatment will help to identify the causes of these variations.

Treatment uptake, when estimated only as a proportion of the population living with CHC, can obscure areas which continue to have a high number of people living with CHC not yet treated. The PHNs with the largest number of residents living with CHC who have not yet been treated include **Central and Eastern Sydney, Brisbane North, North Western Melbourne**, and **Hunter New England and Central Coast** (Figure B.5). Some PHNs with low treatment uptake, such as **Western Queensland, Northern Territory** and **Country WA**, have low absolute numbers of people living with CHC distributed across a large geographic region, highlighting the challenges in reaching treatment targets where service access may be limited by distance.

Figure B.5: CHC treatment uptake in Australia relative to number living with CHC, by PHN, ordered by proportional treatment uptake, end of 2020



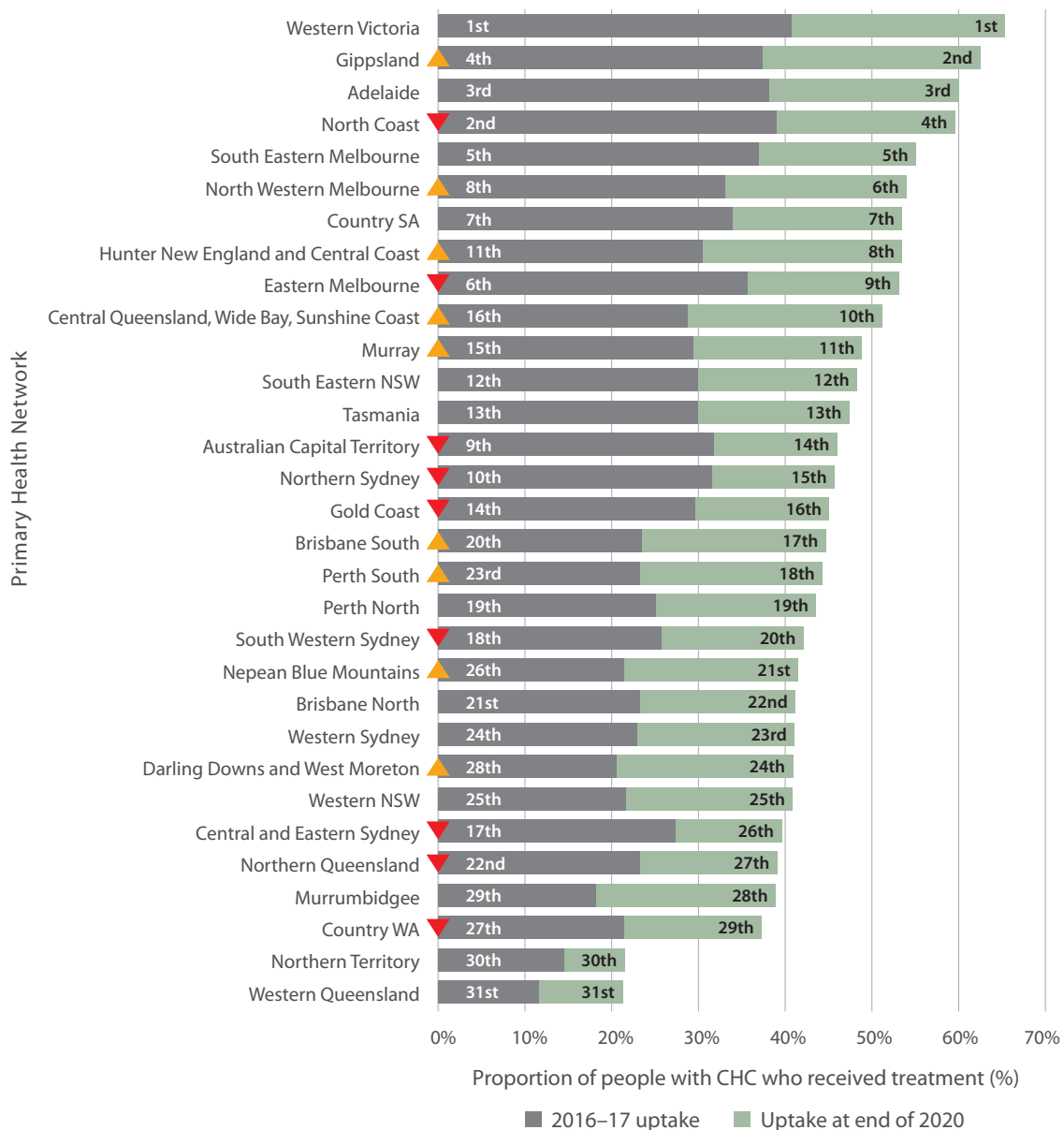
Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

[\(link to data for this figure\)](#)

TREATMENT TRENDS OVER TIME AND COVID-19 IMPACTS BY PRIMARY HEALTH NETWORK

Declines have occurred in the number of people receiving hepatitis C treatment during 2016 to 2020 in all PHNs; however, this decline has been more pronounced in some PHNs compared to others. This is shown in Figure B.6 below, which compares the relative rank in treatment uptake of each PHN, during the two time periods 2016–17 and 2018–20.

Figure B.6: CHC treatment uptake and ranking by PHN, comparing current uptake (at end of 2020) to initial uptake (at end of 2017); changes in rankings indicated by arrows; no arrow indicates minimal or no change



Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

[\(link to data for this figure\)](#)

The most notable increases in ranking during the two periods occurred in **Central Queensland, Wide Bay, and Sunshine Coast** (16th to 10th), **Perth South** (23rd to 18th), and **Nepean Blue Mountains** (26th to 21st).

The largest decrease in rank occurred in **Central and Eastern Sydney** (17th to 26th), followed by **Northern Queensland** (22nd to 27th), **Northern Sydney** (10th to 15th), and **Australian Capital Territory** (9th to 14th).

Many of the highest and lowest ranked PHNs during 2016–2017 retained a similarly high ranking (**Western Victoria, Adelaide, South Eastern Melbourne**) or low ranking (**Western Queensland, Northern Territory, Country WA**).

Despite national trends remaining relatively stable, some PHNs experienced a significantly greater decline in hepatitis C treatment uptake during 2020 than they had during previous years, suggesting an effect on treatment uptake from the COVID-19 pandemic and resultant restrictions. As expected, this was more pronounced in those regions where cases of COVID-19 were most concentrated, such as NSW and Vic.

Those 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 Victoria**, and **Darling Downs and West Moreton**. This trend was also seen in **Northern Queensland**, and **Northern Territory**; however, lower overall numbers mean this trend should be interpreted with more caution in these PHNs. In some PHNs the reduction in treatment uptake during 2020 was smaller than in the previous year, such as in **Country SA, Central Queensland, Wide Bay and Sunshine Coast**, and **Tasmania** PHNs.

PROGRESS TOWARDS TREATMENT TARGETS ACROSS PRIMARY HEALTH NETWORKS

Estimation of post-2020 trends

The number of individuals initiating hepatitis C treatment has been declining since 2016, and the trajectory has been relatively stable in scale at the national level (ranging between 25% and 35% per year). However, these trends vary substantially by state and territory (Figure B.3, above) and according to PHN.

Previous uptake projections in the Mapping Report 2018–19 used the previous year's trend as an indication of future uptake; however, the abnormal trends occurring in 2020 limit the validity of this method. It is unclear what will occur in future years in relation to COVID-19 related disruptions, so in this report, projections were modelled using the average yearly reduction in uptake during 2016–2020. Additionally, plausible ranges were generated using the maximum and minimum yearly reduction in uptake, as a method to estimate what trends could potentially occur in future under both more optimistic and more pessimistic scenarios. These scenarios are described in Table B.4 and shown graphically in Figure B.7. In each state and territory, and in each PHN, the same approach was used, meaning each region's projection relies on past trends as plausible future ranges.

In all scenarios, treatment was projected to plateau from 2022 onwards, as assumptions regarding trends beyond this point become less certain. This is considered an overall optimistic approach, given the ongoing pattern of declining uptake.

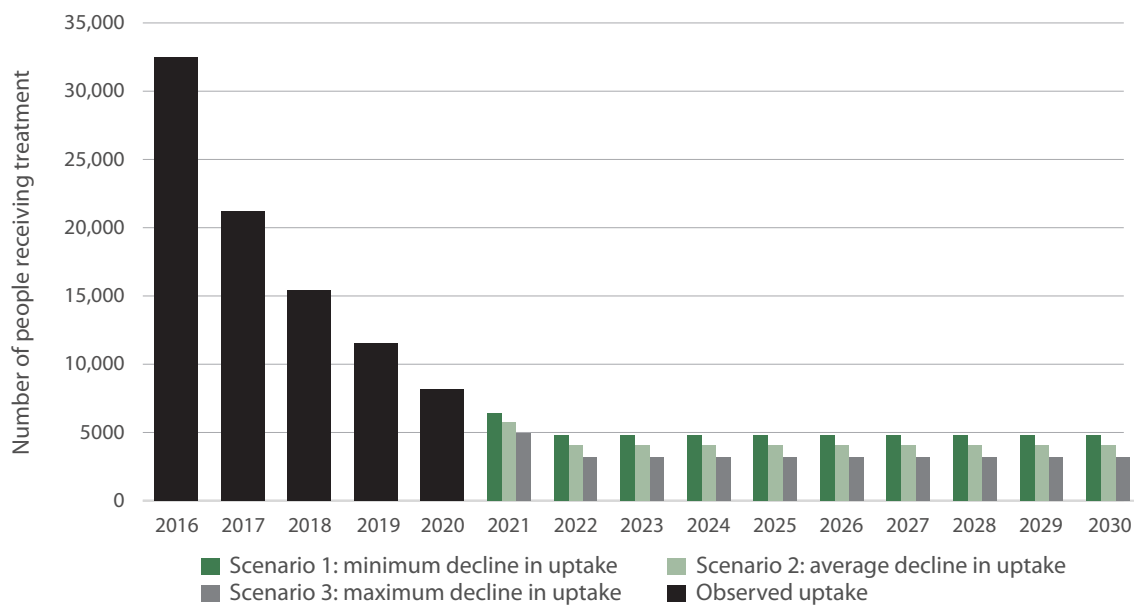
These projections estimate progress towards the Australian National Strategy target of 65% uptake by 2022 and the WHO Global Health Sector Strategy target of 80% uptake by 2030 (although using 2016 as the baseline year rather than 2015, due to the timing of DAA availability in Australia).

Importantly, these projections are intended as an extrapolation of what would occur if current trends are maintained, rather than a prediction of what will occur regarding treatment uptake. Substantial changes in programmatic and policy responses could shift these trajectories.

Table B.4: Scenarios used for future projections of hepatitis C treatment uptake

Scenario	Description	National yearly change (%)
1	Predicted trend based on smallest per cent yearly change in treatment uptake	-25%
2	Predicted trend based on average (mean) per cent yearly change in treatment uptake	-29%
3	Predicted trend based on largest per cent yearly change in treatment uptake	-35%

Figure B.7: Observed uptake and projected future CHC treatment trends, based on various yearly change trends, 2016–2030 ([link to data for this figure](#))



Data source: Observed treatment data sourced from Department of Human Services Medicare data. Projected treatment based on past trends in uptake.

National and state/territory future projections – 2022

Between 2016 and 2020, 88,798 people received hepatitis C treatment in Australia, or 47.0% of the number living with hepatitis C at the start of 2016. In order to reach the National Strategy target of 65% uptake by 2022, an additional 34,000 people would need to be treated, or 17,000 per year. This is double the number that received treatment in 2020, meaning treatment numbers need to increase substantially in order to meet the target.

Under the trend scenarios used, based on prior decreases in treatment uptake, Australia overall is not projected to reach the 2022 target. Under the ‘average’ trend of decline, national uptake would be predicted to reach 52.2% by 2022 (range 51.3% to 52.9%, depending on the scenario).

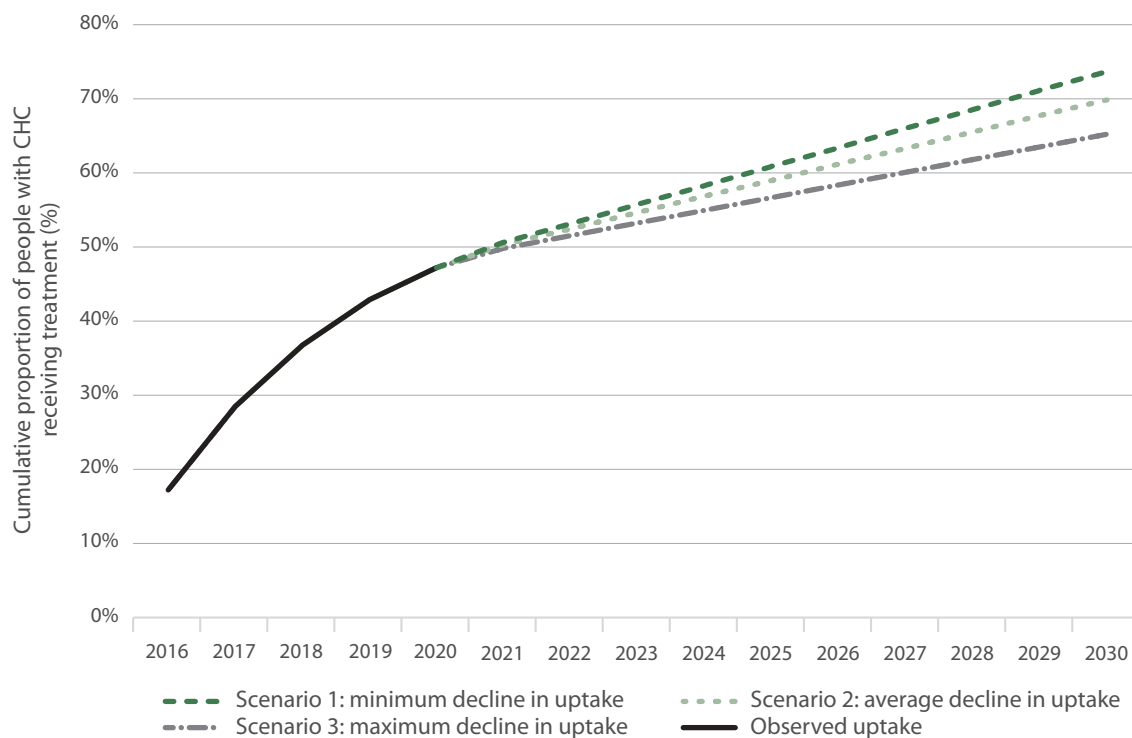
At the state and territory level, no state would be predicted to reach the target even under the minimum decline scenario 1, although it would be nearly met in SA (64.5%).

National and state/territory future projections – 2030

At a national level the 2030 Global Health Sector Strategy target of 80% would not be met under these trends, with Australia predicted to reach an uptake level of 69.5% (range 64.5% to 73.3%, Figure B.8). However, the 80% target could be met in SA, Vic., Tas. and WA if these states had only minimal decline during 2021–2030, as per scenario 1.

It is important to note that these are merely plausible scenarios based on prior trends, and targets could still be met with more significant changes to uptake levels. However, for most states and territories, they would need to go beyond what has previously occurred in order to reach these goals.

Figure B.8: Observed uptake and projected future CHC treatment uptake trends, based on various prior yearly change trends, 2016–2030



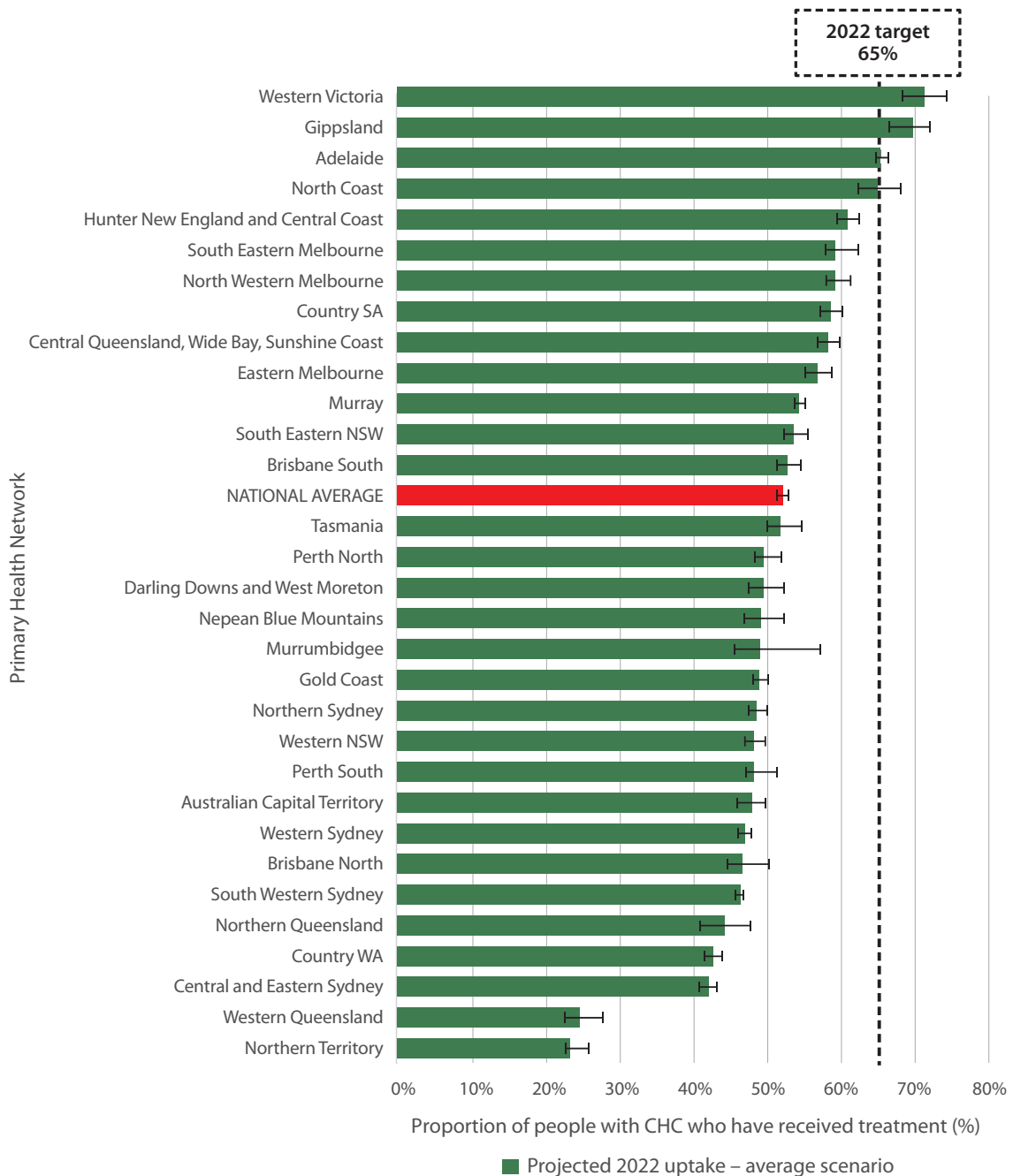
Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Observed treatment data sourced from Department of Human Services Medicare data. Projected treatment based on past trends in uptake.

[\(link to data for this figure\)](#)

Primary Health Networks future projections – 2022

Under the average trend scenario, only four of Australia’s 31 PHNs – **Gippsland, Western Victoria, Adelaide, and North Coast** – are on track to meet the 2022 National Strategy target of 65% uptake. Figure B.9 shows these projections for each PHN, and the range according scenario, which demonstrates that even under the most optimistic scenario 1, no other PHNs would be projected to meet the 2022 target.

Figure B.9: Projected CHC treatment uptake at end of 2022 by PHN; error bars denote upper and lower estimates based on various prior yearly change trends ([link to data for this figure](#))

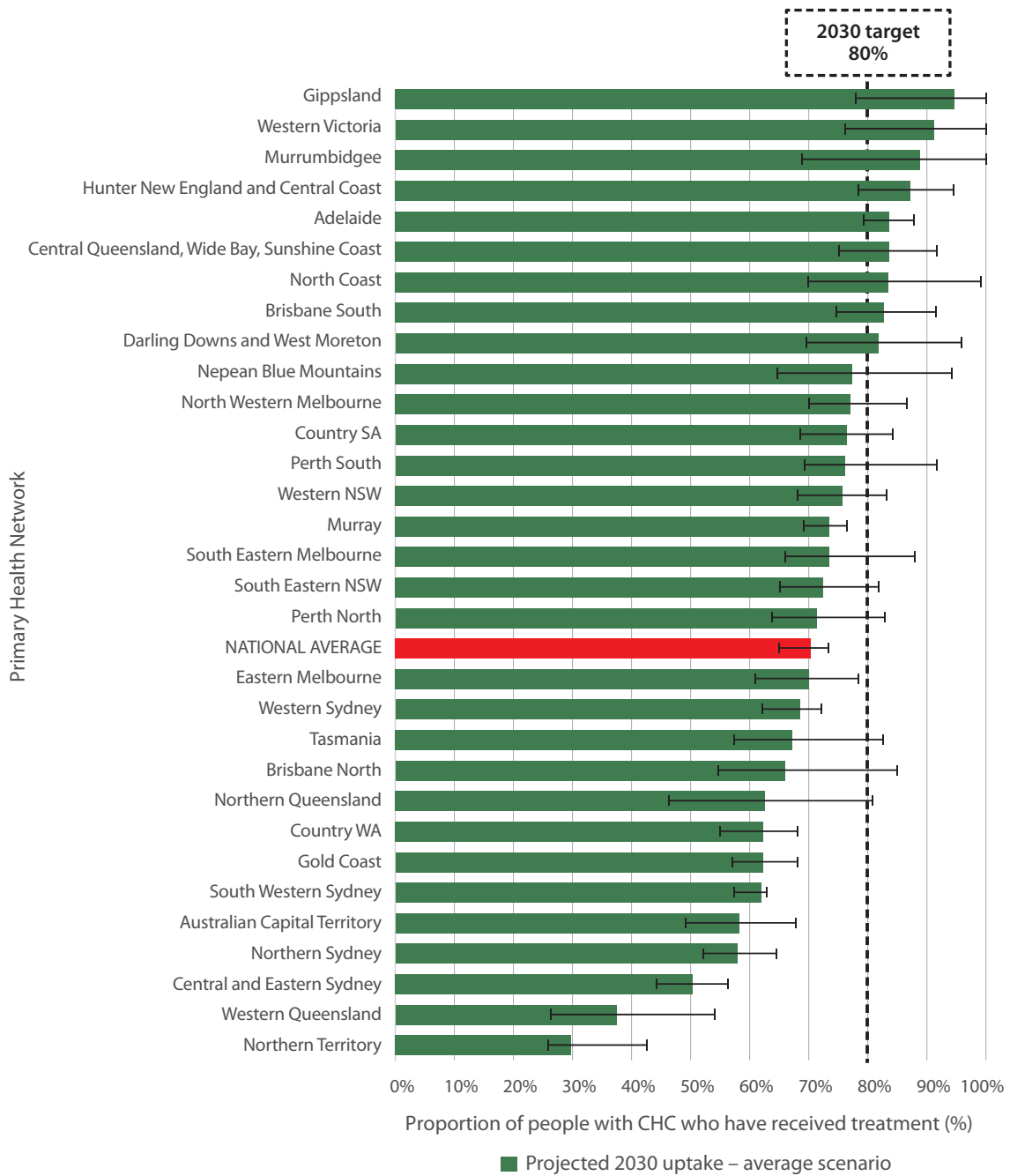


Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Observed treatment data sourced from Department of Human Services Medicare data. Projected treatment based on past trends in uptake in each PHN.

Primary Health Networks future projections – 2030

In relation to the 80% treatment uptake target for 2030, nine of Australia's 31 PHNs are projected to meet the target under the average scenario (Figure B.10), noting that this scenario assumes a plateau in treatment numbers from 2023–2030. Under scenario 1, assuming more minimal declines in uptake, a further 11 PHNs would meet the target. Notably, under the more pessimistic scenario that assumes a greater decline in numbers during 2021 and 2022, no PHNs would be on track to meet the target. These findings demonstrate the importance of 2021 and 2022 trends, and recovery from COVID-19 disruptions, in future treatment goals.

Figure B.10: Projected CHC treatment uptake at end of 2030 by PHN; error bars denote upper and lower estimates based on various prior yearly change trends



Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Observed treatment data sourced from Department of Human Services Medicare data. Projected treatment based on past trends in uptake in each PHN.

[\(link to data for this figure\)](#)

Treatment across remoteness areas

Table B.5: CHC treatment by remoteness category, end of 2020

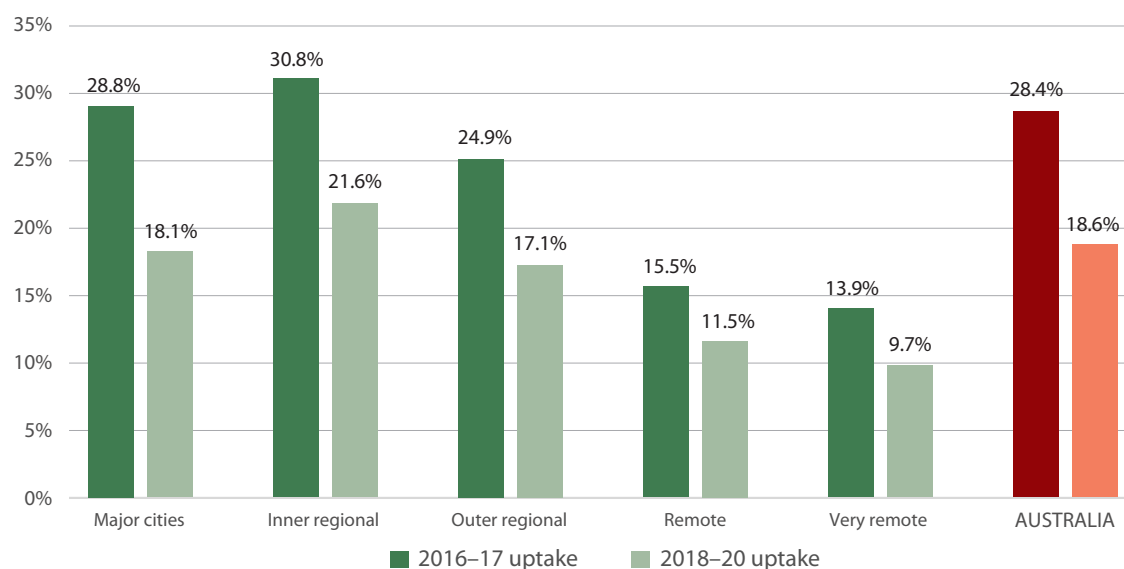
Remoteness level	Total population, 2016	People with CHC, start of 2016	CHC prevalence, 2016 (%)	People who received treatment, 2016–2020	Treatment uptake, end of 2020 (%)
Major cities	17,573,276	124,912	0.88%	58,598	46.9%
Inner regional	4,369,426	38,542	0.71%	20,179	52.4%
Outer regional	1,929,059	20,527	1.06%	8,627	42.0%
Remote	233,231	2,794	1.20%	755	27.0%
Very remote	149,363	1,604	1.07%	379	23.6%
AUSTRALIA	24,2593,435	188,951	0.78%	88,798	47.0%

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare data.

Note: Totals may not add up due to inclusion of people without a state or territory of residence recorded in source data.

CHC treatment uptake continued to be highest in inner regional areas (52.4%) and major cities (46.9%), and lowest in very remote regions (23.6%) (Table B.5). This geographic disparity in treatment uptake is reflected in state-based and territory-based indicators, where jurisdictions with the largest non-urban populations (such as the NT and WA) have lower than average treatment uptake. The decline in treatment uptake over time occurred regardless of remoteness category (Figure B.11); however, it was most pronounced in major cities.

Figure B.11: CHC treatment uptake by remoteness area and time period, 2016–2020



Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare data.

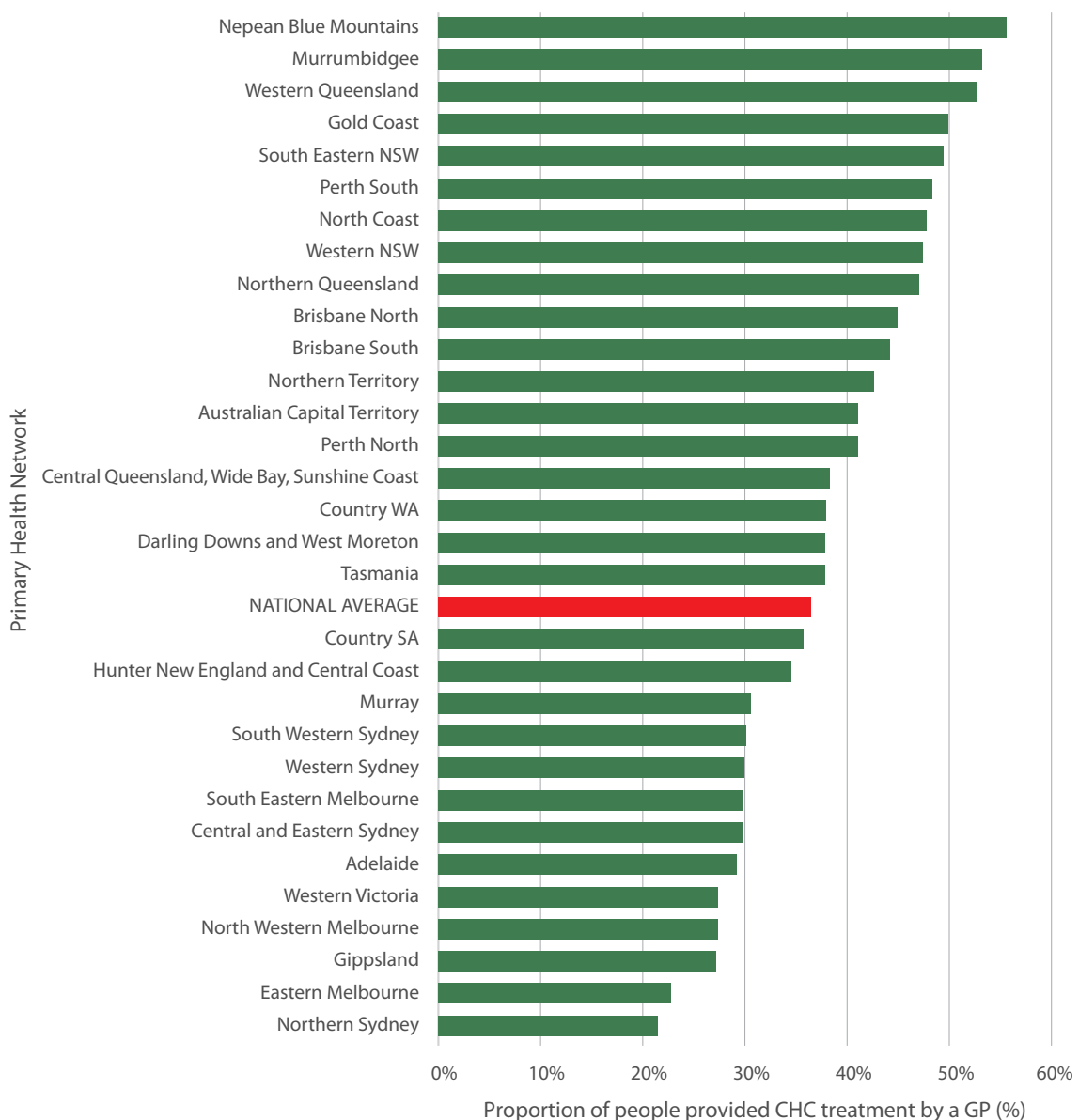
[\(link to data for this figure\)](#)

TREATMENT PROVIDERS

GPs have been the most common prescribers of CHC treatment since 2018. In 2020, GPs were the prescriber for 43.6% of all CHC treatment initiations, while specialists prescribed 33.2%, and 23.0% were 'other' unclassified prescribers.

Prescribing by the 'other' category had been stable during 2016–2019 but in March 2020 it began to increase, while there was a concurrent decrease in prescribing by GPs and specialists. 'Other providers' included nurse practitioners, temporary resident doctors, locum relief doctors, and others not able to be classified as either GP or specialist. These practitioner categories are the classifications used by Medicare, and are based on a practitioner's recent service history (see *Section C: Data sources and methodology*). In future reports, data will be provided regarding more specific identification of providers by specialty.

Figure B.12: Proportion of CHC treatment prescribed by GPs*, by PHN, end of 2020



Data source: Treatment data sourced from Department of Human Services Medicare Statistics.

* Provider type is derived by Medicare using the clinician's service history. Proportion represents individuals who had their first treatment script prescribed by a GP.

[\(link to data for this figure\)](#)

The proportion of treatment prescribed by GPs by the end of 2020 was highest in **Nepean Blue Mountains** (55.6%), **Murrumbidgee** (53.2%), and **Western Queensland** (52.7%) PHNs, where GPs made up more than half of all initiations (Figure B.12).

PHNs with a higher proportion of GP prescribing also saw less significant declines in treatment uptake during 2020. The average decrease in treatment for PHNs with above average GP prescribing was 24.9%, compared to a decrease of 34.9% in PHNs with below average GP prescribing. This could suggest PHNs with established GP prescribing models may have been more resilient to health service disruptions during COVID-19 than those more reliant on hospital-based specialist models.

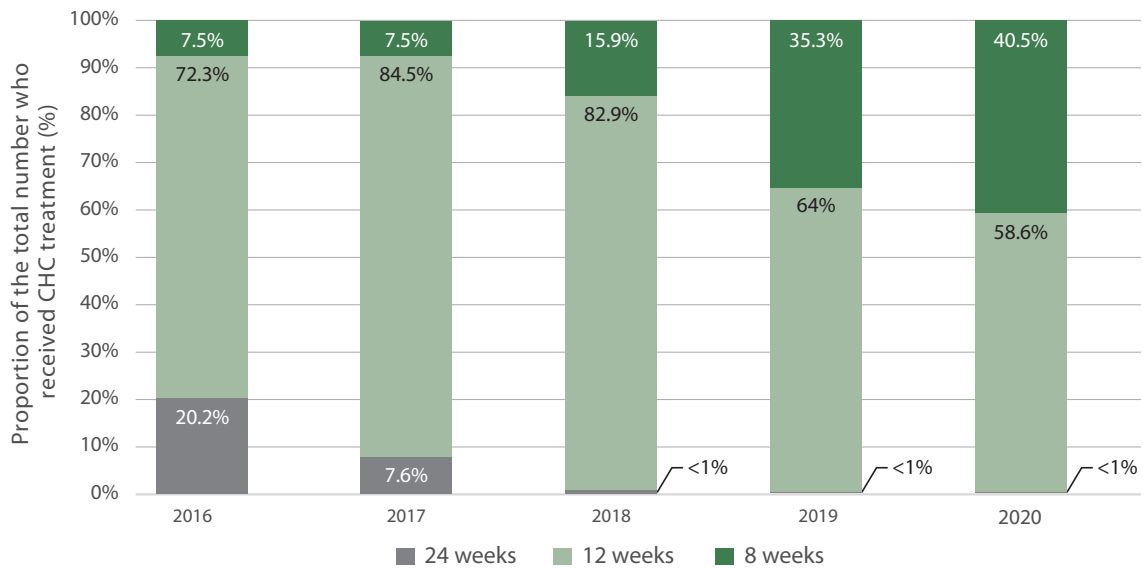
Generally, GP prescribing was more common in regional and rural PHNs, which likely reflects the relative lack of specialist prescriber availability outside urban areas. Identifying the characteristics of higher-prevalence PHNs with greater than average treatment uptake and high levels of GP prescribing could provide insights into how to scale up GP-based treatment and care for people living with CHC in the future. In a number of PHNs with very high levels of specialist prescribing, such as **Central and Eastern Sydney** and **Northern Sydney**, treatment uptake since 2016 has declined much more rapidly than in other PHNs, suggesting a need for expansion beyond hospital models in these settings in order to progress towards targets.

People treated by specialists were older on average, with 55.0% over 50 years of age, compared to 37.7% of those treated by GPs. GPs overwhelmingly prescribed 8 or 12-week durations of therapy, making up 95.8% of GP treatment initiations, compared to 85.9% of specialist treatment initiations. These data reflect that GPs are more likely to manage CHC in people without previous treatment history and without cirrhosis; therefore the group treated by GPs is more likely to be younger and require shorter treatment durations.¹³ Trends in GP management therefore relate to trends in treatment duration, discussed below.

TREATMENT DURATION

The distribution of treatment duration for CHC courses has shifted substantially over time, with an increase in the proportion of eight-week scripts (from 7.5% in 2016 to 40.5% in 2020) and a decrease in the proportion of 12-week scripts (from 72.3% to 58.6%) (Figure B.13). The proportion of 24-week scripts reduced from 20.2% to only 0.2%, reflecting the reduced prevalence of cirrhosis among those currently receiving treatment¹⁴ and the increased availability of shorter treatment durations for those with cirrhosis.¹⁵

Figure B.13: Proportion of CHC treatment by course duration, by year, 2016–2020



Data source: Treatment data sourced from Department of Human Services Medicare Statistics. Treatment duration is based on the duration specified by the PBS item number.

[\(link to data for this figure\)](#)

TREATMENT IN CORRECTIONAL FACILITIES

There is a significant and multifactorial association between injecting drug use, hepatitis C infection and imprisonment. As a result, people who have been incarcerated represent a key population for scale-up of hepatitis C testing and treatment.^{16–18} In Australian correctional facilities, the prevalence of CHC has been estimated at 10–15%¹⁶ and it is estimated that annually approximately 10,000 people living with CHC will spend time in a correctional facility. When DAAs were listed on the PBS in March 2016, there were specific provisions created for people who were incarcerated to receive prescriptions via Section 100.¹⁹ This universal access to DAAs in Australia has been supported by evidence that shows that increasing treatment uptake among people who inject drugs, including prisoners, results in reduced prevalence and incidence in the prison setting.²⁰ Since 2019, more than a quarter of people initiating hepatitis C treatment nationally did so from prison.²¹

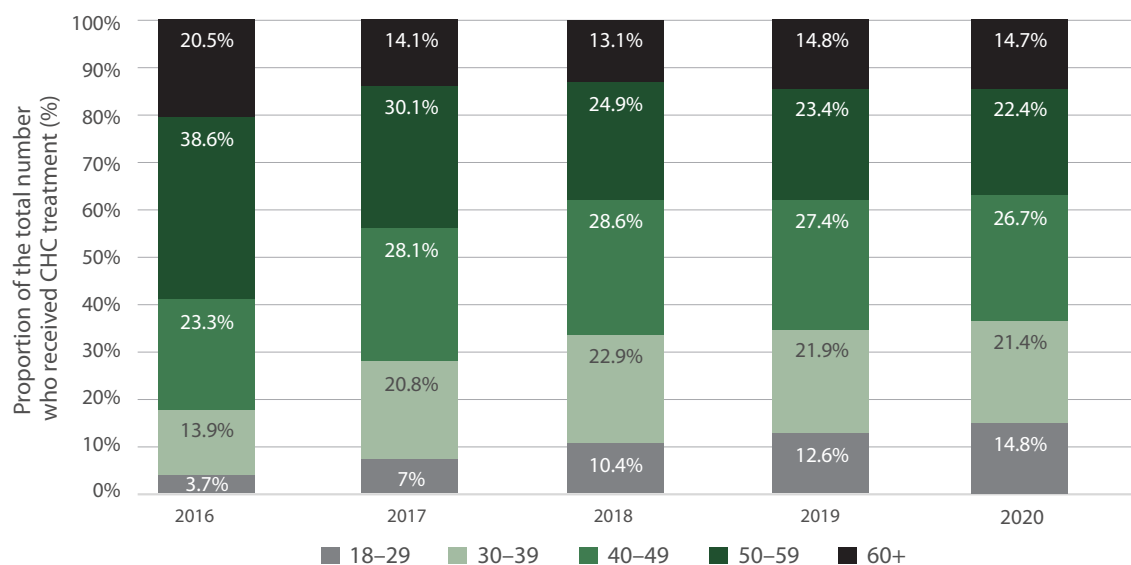
The National Prisons Hepatitis Network (nphn.net.au) is a collaboration between key stakeholders (including clinicians, policy makers, academics and advocates) and representatives from the corrections health sector in all states and territories. It meets annually and has a workplan to underpin knowledge exchange and advocacy, with an overall goal to facilitate enhanced capacity and infrastructure for scale-up of hepatitis C virus (HCV) testing and treatment in Australian prisons. The National Prisons Hepatitis Network workplan includes AusHep, a new national survey to estimate the prevalence of blood-borne viruses and engagement in the care cascade in the prison sector, and a national dashboard to share and report service and surveillance data by state and territory.

TREATMENT DEMOGRAPHICS

The age distribution of people treated for CHC has shifted over time, with a reduction in the proportion aged over 50 and increases in younger age groups since 2016. In 2016, people aged 50–59 were the most common group treated, making up 38.6% of the total (Figure B.14); however, by 2020, people treated were most commonly aged 40–49 years. The proportion aged under 30 has increased from 3.7% to 14.8% between 2016 and 2020, while the proportion aged 60 and over has declined from 20.5% to 14.7%.

This age distribution and the trend towards younger people being treated was broadly similar across the states and territories, although the proportion aged over 40 years was lower than the national average of 73.6% in Tas, WA and Qld (68–70%), and higher in SA (83.0%) and the NT (80.9%). This shift in the predominant age groups receiving treatment likely reflects the initial uptake being concentrated in people who were older and who had more severe liver disease. Now that many of those older people have been treated, a higher proportion of treatment is prescribed to younger people whose risk of adverse outcomes is less immediate. Most people treated for CHC were male (68.1%), which reflects the epidemiology of CHC in Australia; this was also consistent across age groups.

Figure B.14: Proportion of CHC treatment by age, by year, 2016–2020 ([link to data for this figure](#))



Data source: Treatment data sourced from Department of Human Services Medicare Statistics.

POST-TREATMENT FOLLOW-UP

Testing to confirm a sustained virological response (SVR) subsequent to treatment completion is recommended in Australian clinical guidelines,¹³ despite the very high cure rates of DAA therapies. In Australia during the period 2016–2020, 68.5% of individuals had an SVR test after they completed their treatment course (Table B.6). SVR testing is particularly important in people with pre-existing liver disease and those with prior treatment failure. However, even in those treated for 24 weeks (recommended for many people with cirrhosis or prior treatment experience), SVR testing uptake was only 74.6%. The proportion of people who had an SVR test was higher in those over 50 (81.7% compared to 70.9%), and in women (74.6%) compared to men (65.5%).

The proportion of individuals who had an SVR test has 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 males and females, all age groups, all states and territories, and for those treated by both specialists and 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. 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 cases. This proportion increased over time, reaching 51.3% in 2019.

Table B.6: CHC treatment and SVR testing uptake by state and territory, 2016–2019[^]

State/territory	Total population, 2016	People with CHC, start of 2016	Treatment uptake, end of 2020 (%)	Proportion of those treated who received an SVR test (%), 2016–2019 [^]
ACT	411,030	2,899	45.9%	71.2%
NSW	7,692,347	65,969	45.8%	71.6%
NT	237,919	3,663	21.6%	50.1%
Qld	4,872,829	43,641	43.3%	64.7%
SA	1,736,438	8,934	58.0%	67.5%
Tas.	528,674	4471	47.4%	71.8%
Vic.	6,215,133	40,161	55.2%	73.9%
WA	2,564,671	19,214	40.9%	50.7%
AUSTRALIA	24,2593,435	188,951	47.0%	68.5%

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

Note: Totals may not add up due to inclusion of people without a state or territory of residence recorded in source data.

[^] Data are for people treated to the end of 2019, as one year of time is included for the SVR test after treatment has ceased.

The proportion of people who had an SVR test varied considerably according to geographic region, and was highest in regions with the greatest access to health services (major cities and inner regional areas). As SVR testing is driven by a number of factors at the patient, provider, and health service level, all of which may vary according to geographic area, these aspects all likely play a role in variations by region.

Although the SVR test is recommended to be provided at least 12 weeks subsequent to the completion of the treatment course, for a significant proportion of people treated, their test was less than 12 weeks after their last treatment. The median time between the last day of treatment and the SVR test was 3.9 months, and 32.3% of people had a test less than three months after treatment completion.

SECTION B2: GEOGRAPHIC DIVERSITY AND TRENDS IN CHRONIC HEPATITIS C BY STATE AND TERRITORY

IN THIS SECTION

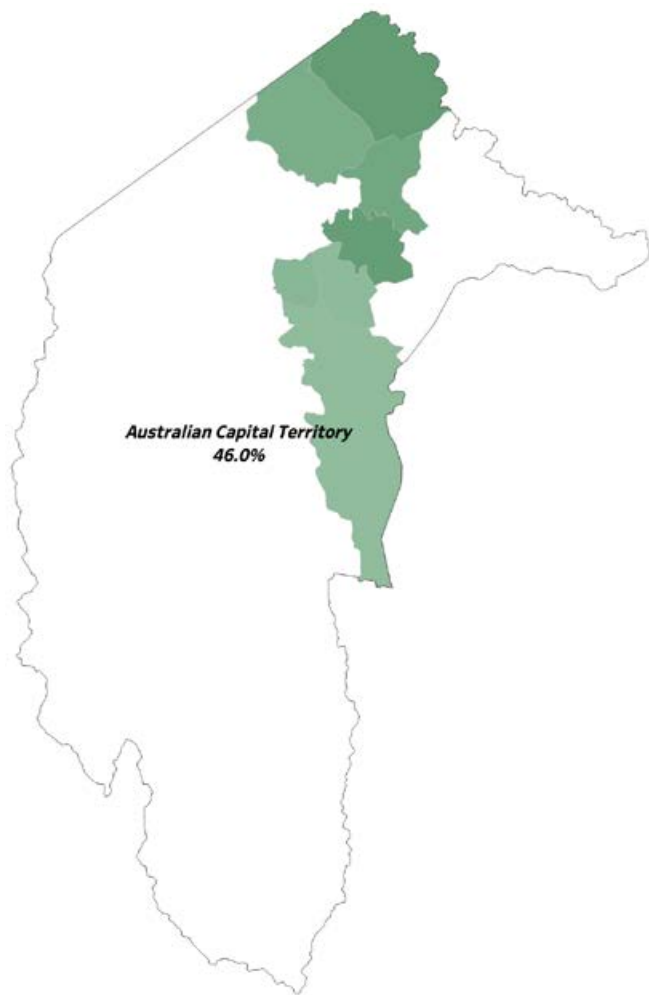
- Estimates of CHC treatment uptake for each Primary Health Network across Australia
- Measurement of progress towards National Strategy targets and geographic trends
- Assessment of the drivers of variation at a local level

AUSTRALIAN CAPITAL TERRITORY

- CHC treatment uptake in ACT at the end of 2020 was 46.0%, similar to the national average of 47.0%
- ACT ranked 4th of eight states and territories for CHC treatment uptake
- The decline in treatment uptake in ACT has been more rapid than the average national trend

By the end of 2020, 46.0% of people living with CHC in the **Australian Capital Territory** PHN had been treated (Table B.7, Figure B.15). Variation in treatment uptake was minimal according to SA3 within the ACT PHN, ranging from 40.7% to 53.0% (Table B.6). Uptake was highest in *Gungahlin* (53.0%) and *South Canberra* (52.1%) SA3s. The decline in treatment uptake after 2016 was larger than average in the ACT compared to other PHNs, reducing its overall ranking from 5th to 13th, and this decline was of a similar magnitude across SA3s, with the exception of *North Canberra*, which declined more slowly.

Figure B.15: Geographic variation in CHC treatment uptake in the ACT PHN, by SA3, end of 2020



Key: Darker shade of green denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

Table B.7: CHC prevalence and treatment uptake in ACT by SA3, end of 2020

PHN and SA3	Total population, 2016	People living with CHC, 2016	CHC prevalence, 2016 (%)	People treated, Mar 2016 – Dec 2020	Treatment uptake, end 2020 (%)
Australian Capital Territory PHN	410,111	2,832	0.69%	1,303	46.0%
Belconnen	99,776	677	0.68%	313	46.2%
Gungahlin	73,603	202	0.27%	107	53.0%
North Canberra	55,048	623	1.13%	303	48.6%
South Canberra	28,030	296	1.05%	154	52.1%
Tuggeranong	88,446	629	0.71%	256	40.7%
Weston Creek	29,103	150	0.51%	64	42.8%
Woden	36,104	256	0.71%	106	41.4%

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

Note: Totals may not add up due to inclusion of people without an SA3 of residence recorded in source data.

NEW SOUTH WALES

- CHC treatment uptake in NSW at the end of 2020 was 45.7%, similar to the national average of 47.0%
- NSW ranked 5th of the eight states and territories for CHC treatment uptake
- Higher treatment uptake was generally seen in PHNs in coastal regional areas, with lower uptake in urban regions as well as those in more remote locations
- The decline in treatment uptake in NSW overall has been similar to the average national trend; however, it was more rapid in urban PHNs

Treatment uptake in NSW overall at the end of 2020 was 45.7%, similar to the national average of 47.0%. Uptake varied greatly across the ten PHNs in NSW, more widely than in any other state or territory.

At the end of 2020 treatment uptake was highest in **North Coast** (59.5%), which ranked fourth highest of all PHNs in Australia (Figure B.4). This PHN declined slightly in relative rank compared to the period to the end of 2017, when it ranked 2nd nationally (Figure B.6). Uptake at the end of 2020 was above the state average of 45.7% in all the SA3s within **North Coast**, ranging from 52.2% to 84.9%. The SA3s with the highest treatment uptake were **Kempey – Nambucca** (84.9%) and **Clarence Valley** (65.1%), which had both already reached the National Strategy target of 65% (Figure B.16).

Hunter New England and **Central Coast** PHN had the second-highest level of treatment uptake in NSW at the end of 2020 (53.5%), improving in rank nationally since the end of 2017 from 11th to 8th (Figure B.6). Uptake was above the National Strategy target in **Lake Macquarie – West** (80.6%) and **Great Lakes** (66.3%). Uptake was lower than the national average of 47.0% in **Moree – Narrabri** (43.7%) and **Upper Hunter** (43.9%); however, only minimally, and the disparity within the PHN continued to reduce over time.

Uptake was similar to the national average in **South Eastern NSW** (48.3%). Treatment uptake was highest in the **Snowy Mountains** SA3 (70.0%), where uptake exceeded the National Strategy target of 65%, and was also higher in the **Shoalhaven** (59.1%) and **South Coast** (56.9%) SA3s. Uptake was less than half the state average in **Queanbeyan** (21.2%), but the estimate of prevalence in this region may have been increased by the inclusion of notified cases from ACT correctional services centres; these individuals are not long-term residents of this SA3.

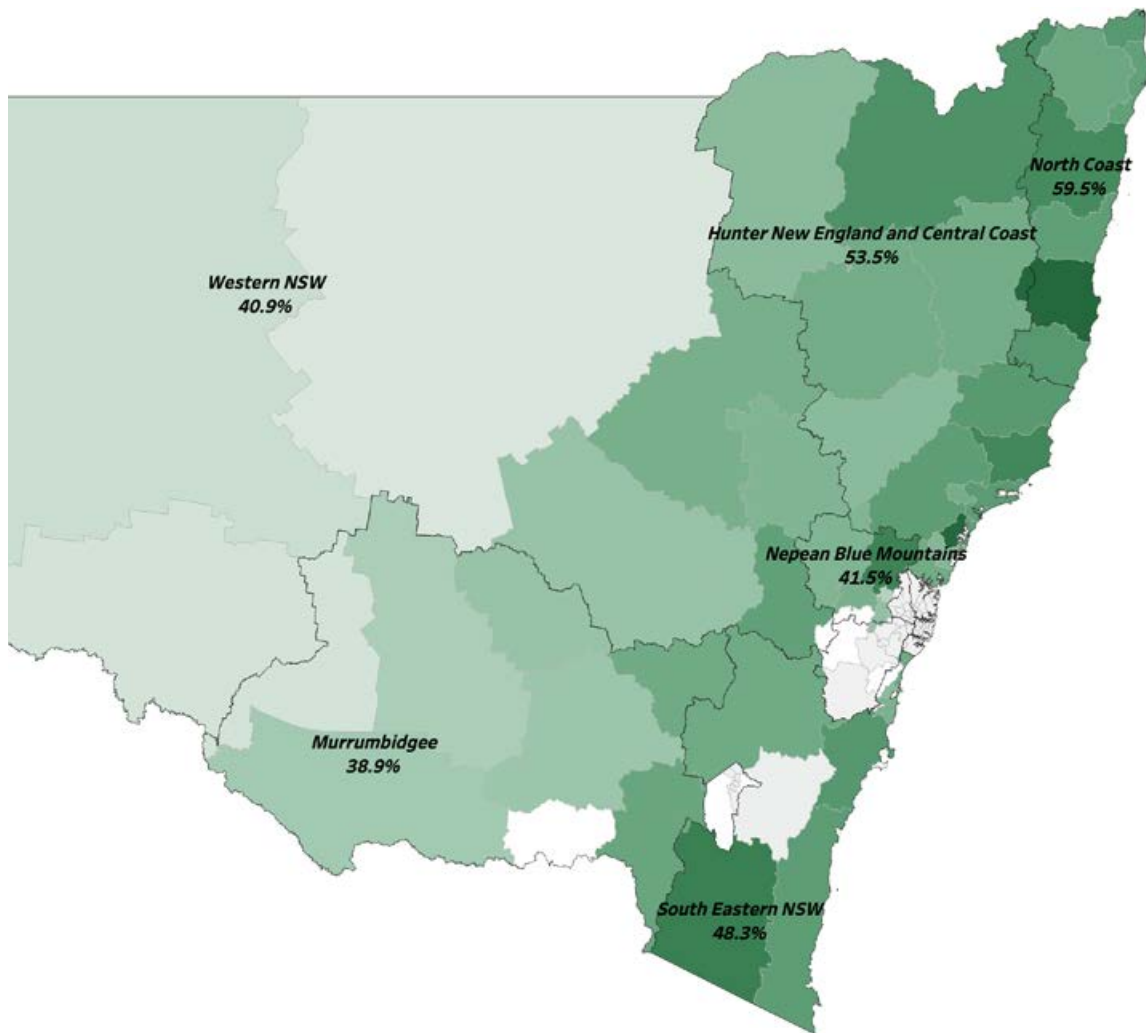
Treatment uptake in **Nepean Blue Mountains** was 41.5%, and while this was below the national average the PHN continued to increase in national rank from 26th at the end of 2017 to 21st by the end of 2020 (Figure B.6). Treatment uptake was greater than the PHN average in SA3s adjacent to high-treatment areas of **Western NSW**, such as **Hawkesbury** (68.1%), where treatment exceeded the National Strategy target of 65%, as well as **Blue Mountains** (48.8%). Uptake was lower in SA3s closer to the Sydney metropolitan area, such as **Richmond – Windsor** (33.1%).

Uptake within **Western NSW** (40.9%) was below the national average; however, uptake was highly variable, and generally higher in inner regional SA3s such as **Bathurst** (55.5%), **Dubbo** (48.7%) and **Lithgow – Mudgee** (46.5%), compared to the more remote and outer regional areas of the PHN.

CHC treatment uptake at the end of 2020 in **Murrumbidgee** PHN was 38.9%, below the national average, and within the PHN uptake was highest in **Tumut – Tumbarumba** (53.3%) (Table B.8).

Notably, despite being below average at the end of 2020, these three rural NSW PHNs (**Nepean Blue Mountains**, **Western NSW**, and **Murrumbidgee**) are predicted to reach average or above average treatment levels by 2030 if current trends continue. They have experienced much less pronounced declines in treatment numbers since 2016 than many other PHNs which had high initial numbers followed by rapid drop off in coverage, such as **Central and Eastern Sydney** and **Northern Sydney**.

Figure B.16: Geographic variation in CHC treatment uptake in NSW (other than Greater Sydney), by PHN and SA3, end of 2020



Key: Darker shade of green denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

Within metropolitan NSW, the highest uptake was in **Northern Sydney** PHN (45.7%); however, by the end of 2020 none of the state's metropolitan PHNs were ranked above the national average (Table B.8). Treatment uptake within **Northern Sydney** was highest in Warringah (61.5%), Hornsby (55.6%), and Pennant Hills – Epping (53.1%) (Figure B.17). Treatment numbers in **Northern Sydney** continued to decline more rapidly than the national average, and the PHN further declined in rank nationally from 9th at the end of 2017 to 15th at the end of 2020.

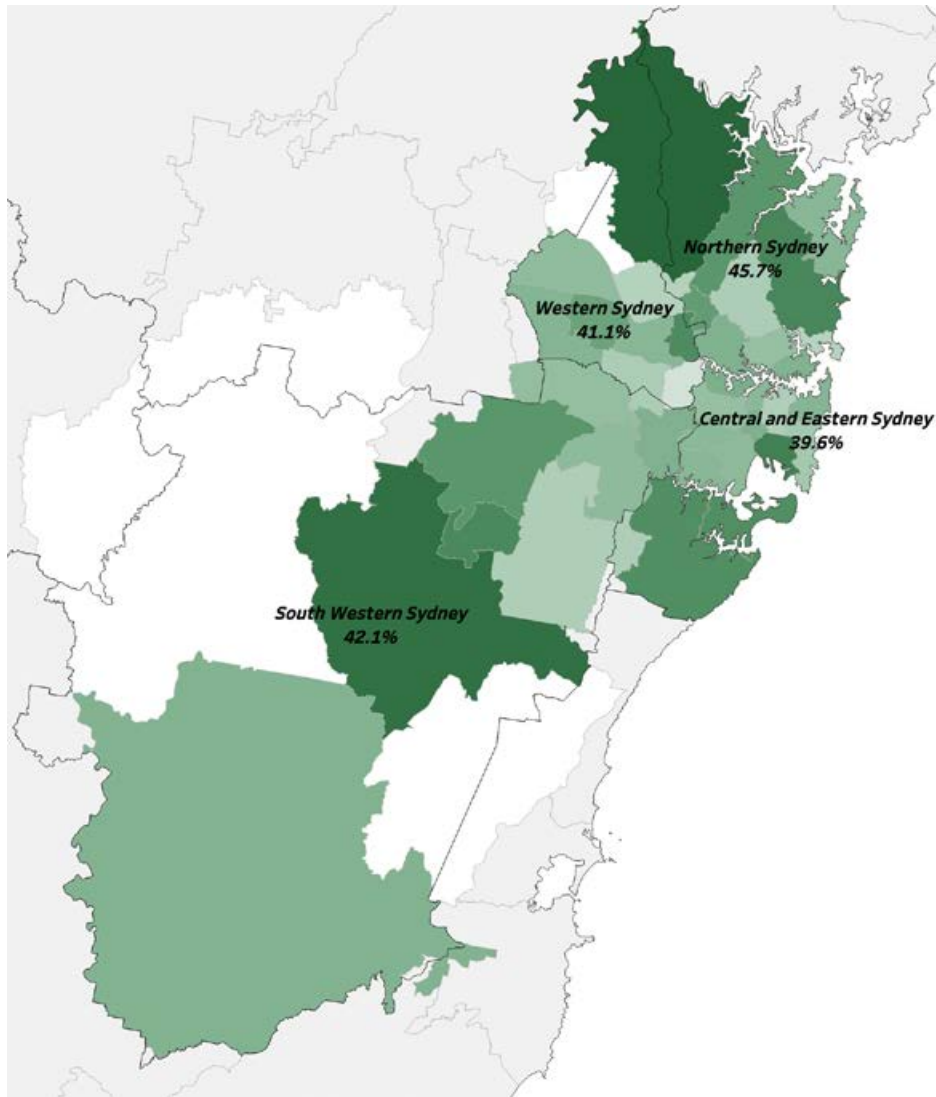
Treatment uptake in **Central and Eastern Sydney** was 39.6%, below the national average. Uptake was highest in the Botany (64.0%), Cronulla – Miranda – Caringbah (58.4%), and Sutherland – Menai – Heathcote (58.6%) SA3s. In this PHN, uptake continued to decline more rapidly than the national average, reducing its national treatment uptake rank further from 17th at the end of 2017 to 26th at the end of 2020, the largest ranking decline of any PHN in Australia.

In **South Western Sydney**, where uptake overall was 42.1%, treatment uptake was generally higher in the SA3s further from central Sydney. The Wollondilly SA3 reached 70.1% treatment uptake, the

only SA3 in a metropolitan NSW PHN to reach the National Strategy target of 65%. Higher uptake was also seen in Camden (60.8%) and Bringelly – Green Valley (55.5%).

Uptake in **Western Sydney** was 41.1% by the end of 2020, similar to other metropolitan NSW PHNs. Uptake was highest in the Carlingford (59.6%) and Blacktown (50.3%) SA3s, while uptake was less than half that level in Auburn (25.9%).

Figure B.17: Geographic variation in CHC treatment uptake in Greater Sydney, by PHN and SA3, 2020



Key: Darker shade of green denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

Table B.8: CHC prevalence and treatment uptake in NSW by PHN and SA3, end of 2020

PHN and SA3	Total population, 2016	People living with CHC, 2016	CHC prevalence, 2016 (%)	People treated, 2016–2020	Treatment uptake, end 2020 (%)
Central and Eastern Sydney PHN	1,551,709	14,053	0.91%	5,559	39.6%
Botany	44,289	286	0.65%	183	64.0%
Canada Bay	88,658	349	0.39%	159	45.5%
Canterbury	126,653	966	0.76%	406	42.0%
Cronulla – Miranda – Caringbah	111,158	435	0.39%	254	58.4%
Eastern Suburbs – North	131,270	803	0.61%	346	43.1%
Eastern Suburbs – South	157,927	1,663	1.05%	598	36.0%
Hurstville	134,007	646	0.48%	275	42.6%
Kogarah – Rockdale	150,573	840	0.56%	348	41.4%
Leichhardt	58,278	678	1.16%	285	42.0%
Marrickville – Sydenham – Petersham	55,629	723	1.30%	326	45.1%
Strathfield – Burwood – Ashfield	158,922	1,056	0.66%	417	39.5%
Sutherland – Menai – Heathcote	115,148	353	0.31%	207	58.6%
Sydney Inner City	219,196	5,253	2.40%	1,755	33.4%
Northern Sydney PHN	873,200	3,167	0.36%	1,448	45.7%
Chatswood – Lane Cove	125,504	427	0.34%	168	39.3%
Hornsby	82,136	286	0.35%	159	55.6%
Ku-ring-gai	137,829	335	0.24%	114	34.0%
Manly	53,714	257	0.48%	82	31.9%
North Sydney – Mosman	84,186	349	0.42%	154	44.1%
Pennant Hills – Epping	41,403	96	0.23%	51	53.1%
Pittwater	71,337	327	0.46%	139	42.5%
Ryde – Hunters Hill	139,485	525	0.38%	234	44.6%
Warringah	137,607	564	0.41%	347	61.5%
South Western Sydney PHN	920,395	7,668	0.83%	3,225	42.1%
Bankstown	170,149	1,281	0.75%	574	44.8%
Bringelly – Green Valley	100,265	705	0.70%	391	55.5%
Camden	81,644	210	0.26%	128	60.8%
Campbelltown (NSW)	167,109	1,968	1.18%	664	33.7%
Fairfield	191,840	1,943	1.01%	776	39.9%

PHN and SA3	Total population, 2016	People living with CHC, 2016	CHC prevalence, 2016 (%)	People treated, 2016–2020	Treatment uptake, end 2020 (%)
Liverpool	129,766	1,067	0.82%	438	41.1%
Southern Highlands	48,833	358	0.73%	158	44.2%
Wollondilly	30,788	137	0.44%	96	70.1%
Western Sydney PHN	1,016,308	6,832	0.67%	2,810	41.1%
Auburn	97,290	717	0.74%	186	25.9%
Baulkham Hills	207,408	468	0.23%	151	32.3%
Blacktown	126,664	1,177	0.93%	592	50.3%
Blacktown – North	96,035	384	0.40%	157	40.9%
Carlingford	65,444	356	0.54%	212	59.6%
Dural – Wisemans Ferry	17,965	#	#	#	#
Merrylands – Guildford	126,618	1,308	1.03%	448	34.3%
Mount Druitt	111,962	1,169	1.04%	509	43.6%
Parramatta	166,923	1,199	0.72%	514	42.9%
Hunter New England and Central Coast PHN	1,260,409	11,513	0.91%	6,160	53.5%
Armidale	38,830	327	0.84%	164	50.2%
Gosford	174,430	1,506	0.86%	760	50.5%
Great Lakes	31,780	358	1.13%	237	66.3%
Inverell – Tenterfield	37,399	366	0.98%	226	61.8%
Lake Macquarie – East	138,897	924	0.66%	518	56.1%
Lake Macquarie – West	54,610	411	0.75%	331	80.6%
Lower Hunter	82,854	819	0.99%	463	56.5%
Maitland	96,984	486	0.50%	243	50.0%
Moree – Narrabri	26,735	306	1.15%	134	43.7%
Newcastle	166,444	1,667	1.00%	941	56.4%
Port Stephens	72,116	539	0.75%	310	57.5%
Tamworth – Gunnedah	83,836	756	0.90%	378	50.0%
Taree – Gloucester	55,390	623	1.13%	363	58.3%
Upper Hunter	31,295	413	1.32%	181	43.9%
Wyong	168,809	2,013	1.19%	911	45.3%
Murrumbidgee PHN	201,763	2,277	1.13%	886	38.9%
Griffith – Murrumbidgee (West)	47,571	419	0.88%	148	35.3%
Tumut – Tumbarumba	14,182	133*	0.94%	71	53.3%

PHN and SA3	Total population, 2016	People living with CHC, 2016	CHC prevalence, 2016 (%)	People treated, 2016–2020	Treatment uptake, end 2020 (%)
Upper Murray exc. Albury	41,405	386	0.93%	144	37.3%
Wagga Wagga	98,605	1,338	1.36%	523	39.1%
Nepean Blue Mountains PHN	359,044	2,865	0.80%	1,190	41.5%
Blue Mountains	79,935	568	0.71%	277	48.8%
Hawkesbury	11,489	94	0.82%	64	68.1%
Penrith	145,900	1,134	0.78%	470	41.4%
Richmond – Windsor	59,229	601	1.01%	199	33.1%
St Marys	62,491	468	0.75%	180	38.5%
North Coast PHN	524,036	6,697	1.28%	3,987	59.5%
Clarence Valley	49,808	722*	1.45%	470	65.1%
Coffs Harbour	90,477	1,126	1.24%	632	56.1%
Kempsey – Nambucca	51,590	603*	1.17%	512	84.9%
Port Macquarie	80,930	662	0.82%	390	58.9%
Richmond Valley – Coastal	81,906	1,179	1.44%	655	55.6%
Richmond Valley – Hinterland	76,306	1,265	1.66%	660	52.2%
Tweed Valley	93,020	1,140	1.23%	668	58.6%
South Eastern NSW PHN	637,611	6,105	0.96%	2,946	48.3%
Dapto – Port Kembla	75,507	815	1.08%	352	43.2%
Goulburn – Yass	75,313	607	0.81%	310	51.1%
Kiama – Shellharbour	96,088	597	0.62%	285	47.8%
Queanbeyan	61,682	891*	1.44%	189	21.2%
Shoalhaven	102,275	1,114	1.09%	658	59.1%
Snowy Mountains	20,180	190	0.94%	133	70.0%
South Coast	73,304	889	1.21%	506	56.9%
Wollongong	133,261	1,003	0.75%	513	51.1%
Western NSW PHN	345,659	4,787	1.38%	1,959	40.9%
Bathurst	48,820	535	1.10%	297	55.5%
Bourke – Cobar – Coonamble	24,166	650	2.69%	161	24.8%
Broken Hill and Far West	20,953	374	1.78%	106	28.3%
Dubbo	72,274	1,065*	1.47%	519	48.7%

PHN and SA3	Total population, 2016	People living with CHC, 2016	CHC prevalence, 2016 (%)	People treated, 2016–2020	Treatment uptake, end 2020 (%)
Lachlan Valley	58,095	654	1.13%	263	40.2%
Lithgow – Mudgee	48,059	494	1.03%	230	46.5%
Lower Murray	13,315	194	1.46%	51	26.3%
Orange	59,977	821	1.37%	332	40.4%

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

Note: Totals may not add up due to inclusion of people without an SA3 of residence recorded in source data and due to random adjustment of cells to prevent re-identification of suppressed cells.

Data suppressed where number receiving treatment was <6, population was <3000, or average notifications per year were <5.

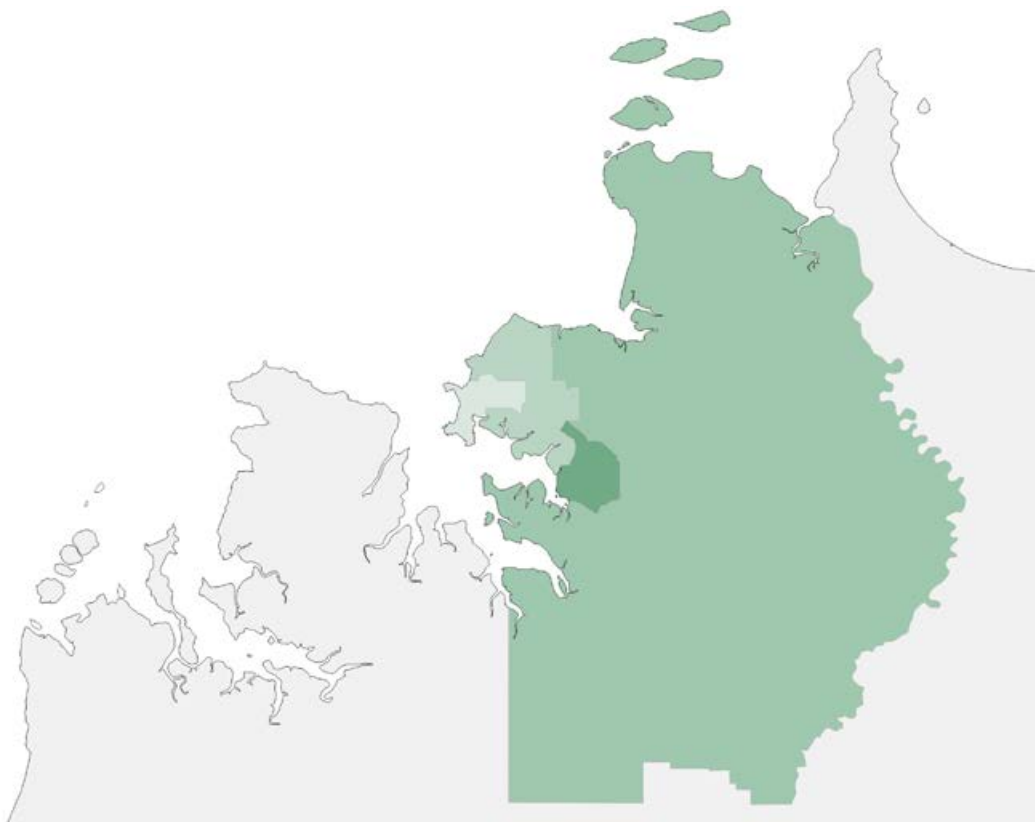
* Data adjusted due to a significant proportion of the population diagnosed in a correctional facility.

NORTHERN TERRITORY

- CHC treatment uptake in the NT at the end of 2020 was 21.6%, lower than the national average of 47.0%
- The NT ranked 8th of the eight states and territories for CHC treatment uptake
- The decline in treatment uptake in the NT has been less rapid than the average national trend

Uptake of hepatitis C treatment in the **Northern Territory** PHN by the end of 2020 was estimated to be 21.6% (Figure B.19), with uptake varying widely according to SA3 within the territory (although in some remote regions, uptake may not be accurately estimated due to low population numbers). Areas where uptake was higher than the PHN average were generally those classified as outer regional, and located in the areas surrounding the city of Darwin (Table B.9, Figure B.18), such as **Palmerston** (46.1%), **Litchfield** (31.4%) and **Darwin Suburbs** (24.1%). The **Darwin City** SA3 had lower than average uptake (15.5%). This prevalence estimate has been adjusted to account for correctional diagnoses; however, it may still overestimate the number living with hepatitis C and thus underestimate treatment uptake. Treatment uptake was lowest in the remote and very remote regions of **Daly – Tiwi – West Arnhem** (8.6%) and **Katherine** (13.9%), emphasising the challenges in reaching people living with CHC in sparsely populated remote regions (Table B.9).

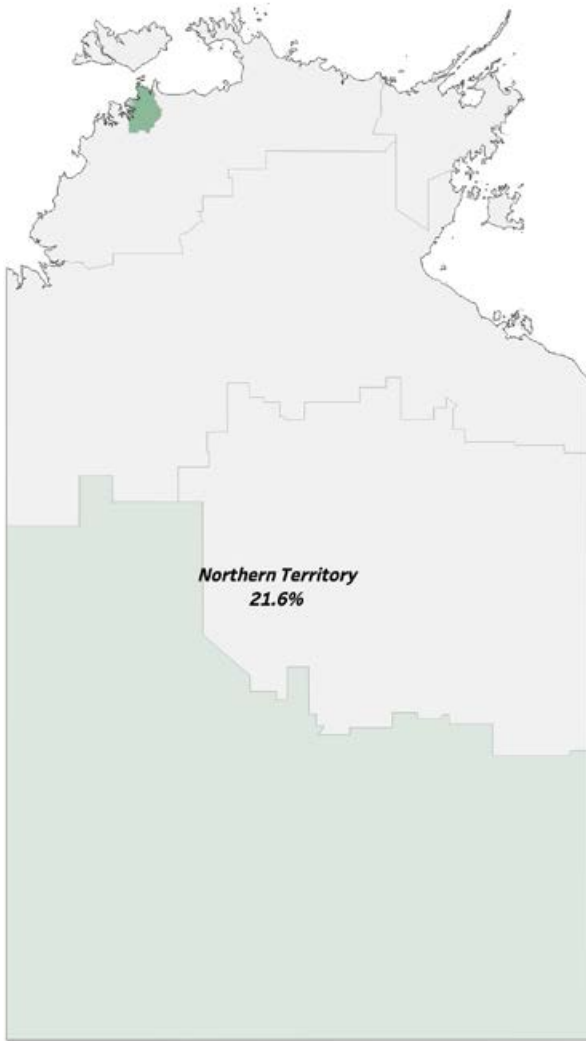
Figure B.18: Geographic variation in CHC treatment uptake in Greater Darwin, by SA3, end of 2020



Key: Darker shade of green denotes higher treatment uptake. PHN outline is denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low numbers (number treated <6).

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

Figure B.19: Geographic variation in CHC treatment uptake in the NT by SA3, end of 2020



Key: Darker shade of green denotes higher treatment uptake. PHN outline, name and overall treatment estimate is denoted in black. Grey areas represent SA3 regions with data suppressed due to low treatment numbers (<6).

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

Table B.9: CHC prevalence and treatment uptake in the NT, by SA3, end of 2020

PHN and SA3	Total population, 2016	People living with CHC, 2016	CHC prevalence, 2016 (%)	People treated, 2016–2020	Treatment uptake, end 2020 (%)
Northern Territory PHN	237,919	3,663	1.54%	790	21.6%
Alice Springs	42,018	653	1.55%	117	17.9%
Barkly	3,904	#	#	#	#
Daly – Tiwi – West Arnhem	29,286	185	0.63%	16	8.6%
Darwin City	26,919	955*	3.55%	148	15.5%
Darwin Suburbs	55,742	915	1.64%	221	24.1%
East Arnhem	6,322	#	#	#	#
Katherine	18,871	237	1.25%	33	13.9%
Litchfield	19,769	302	1.53%	95	31.4%
Palmerston	35,087	310	0.88%	143	46.1%

Data source: CHC prevalence estimates based on published national estimates and notifications distribution.

Treatment data sourced from Department of Human Services Medicare statistics.

Note: Totals may not add up due to inclusion of people without an SA3 of residence recorded in source data and due to random adjustment of cells to prevent re-identification of suppressed cells.

Data suppressed where number receiving treatment was <6, population was <3000, or average notifications per year <5.

* Data adjusted due to a significant proportion of the population diagnosed in a correctional facility.

QUEENSLAND

- CHC treatment uptake in Qld at the end of 2020 was 43.3%, lower than the national average of 47.0%
- Qld ranked 6th of the eight states and territories for CHC treatment uptake
- The lowest uptake generally occurred in PHNs in remote and very remote regions
- The decline in treatment uptake in Qld overall has been less rapid than the average national trend, and this was consistent in most PHNs

Treatment uptake in Queensland overall by the end of 2020 was 43.3%, lower than the national average of 47.0%.

Treatment uptake in Queensland was highest in **Central Queensland, Wide Bay and Sunshine Coast** PHN (51.2%). Uptake within this PHN was highest in *Maryborough* (85.2%), where it has already reached the 65% National Strategy target, *Gympie – Cooloola* (63.9%), and *Sunshine Coast Hinterland* (58.3%) (Table B.10). This PHN has had the largest increase in national uptake rank of all PHNs, from 16th at the end of 2017 to 10th at the end of 2020. It is now the only Queensland PHN to reach uptake levels above the national average, and during 2020 actually increased the number of people treated in four SA3s (*Central Highlands*, *Buderim*, *Maroochy*, and *Sunshine Coast Hinterland*), in contrast to the decreasing trend in almost all SA3s nationally.

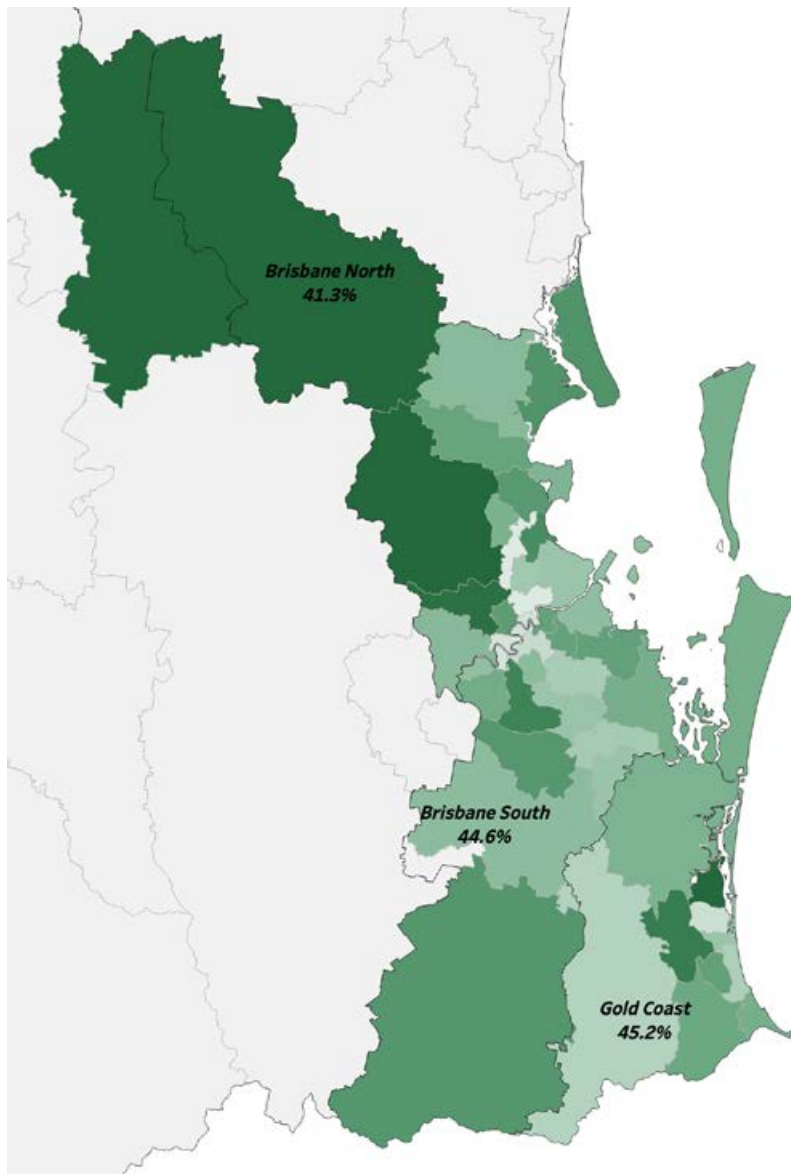
In **Gold Coast PHN**, 45.2% of people living with CHC had been treated by the end of 2020 (Figure B.20), just below the national average. Uptake was highest in *Nerang* (70.9%), where the 65% National Strategy target had already been met; it was also above the PHN average in *Robina* (55.4%), *Mudgeeraba – Tallebudgera* (52.1%), *Coolangatta* (49.1%), and *Ormeau – Oxford* (47.4%) (Table B.10). Treatment uptake has declined more rapidly than average in **Gold Coast** PHN than in other Queensland PHNs, reducing its national rank from 14th during 2016–17 to 16th at the end of 2020 (Figure B.6).

Treatment uptake at the end of 2020 was higher in **Brisbane South** (44.6%) than in **Brisbane North** (41.3%). These two PHNs had similar treatment uptake in prior years; however, **Brisbane South** maintained more stable treatment levels during 2019 and 2020 to increase in national ranking from 20th to 17th, while **Brisbane North** declined in ranking. **Brisbane North** also had greater diversity within the PHN, ranging from 23.8% to 82.9%, while in **Brisbane South** uptake ranged from 29.1% to 67.7%.

Three SA3s in **Brisbane North** have already reached or are approaching the National Strategy treatment target of 65%: *Hills District* (82.9%), *The Gap – Enoggera* (76.4%) and *Sandgate* (63.9%). Uptake was also above average in *Bribie – Beachmere* (61.1%). The lowest uptake was seen in a cluster of SA3s surrounding the central Brisbane area in both PHNs, including *Brisbane Inner* (26.7%), *Brisbane Inner – North* (23.8%) and *Sherwood – Indooroopilly* (25.6%) in **Brisbane North**; and *Holland Park – Yeronga* (29.1%) in **Brisbane South**.

However, many other SA3s surrounding central Brisbane had uptake higher than the national average, most notably *Rocklea – Acacia Ridge* (67.7%), which has already met the National Strategy target of 65% and which was one of the few SA3s to increase treatment numbers between 2019 and 2020. Other regions with higher uptake in **Brisbane South** included *Beaudesert* (59.5%), *Browns Plains* (59.1%), *Brisbane Inner – East* (54.7%), *Carindale* (54.4%), and *Capalaba* (55.2%) (Figure B.20).

Figure B.20: Geographic variation in CHC treatment uptake in Greater Brisbane and Gold Coast, by PHN and SA3, end of 2020



Key: Darker shade of green denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

Uptake in **Darling Downs and West Moreton** PHN was 41.0%, below the national average. Uptake was highest in Ipswich Hinterland (59.7%), Darling Downs – East (54.5%), Burnett (51.9%) and Granite Belt (50.8%) SA3s (Figure B.21). The PHN increased in rank nationally from 28th at the end of 2017 to 24th by the end of 2020.

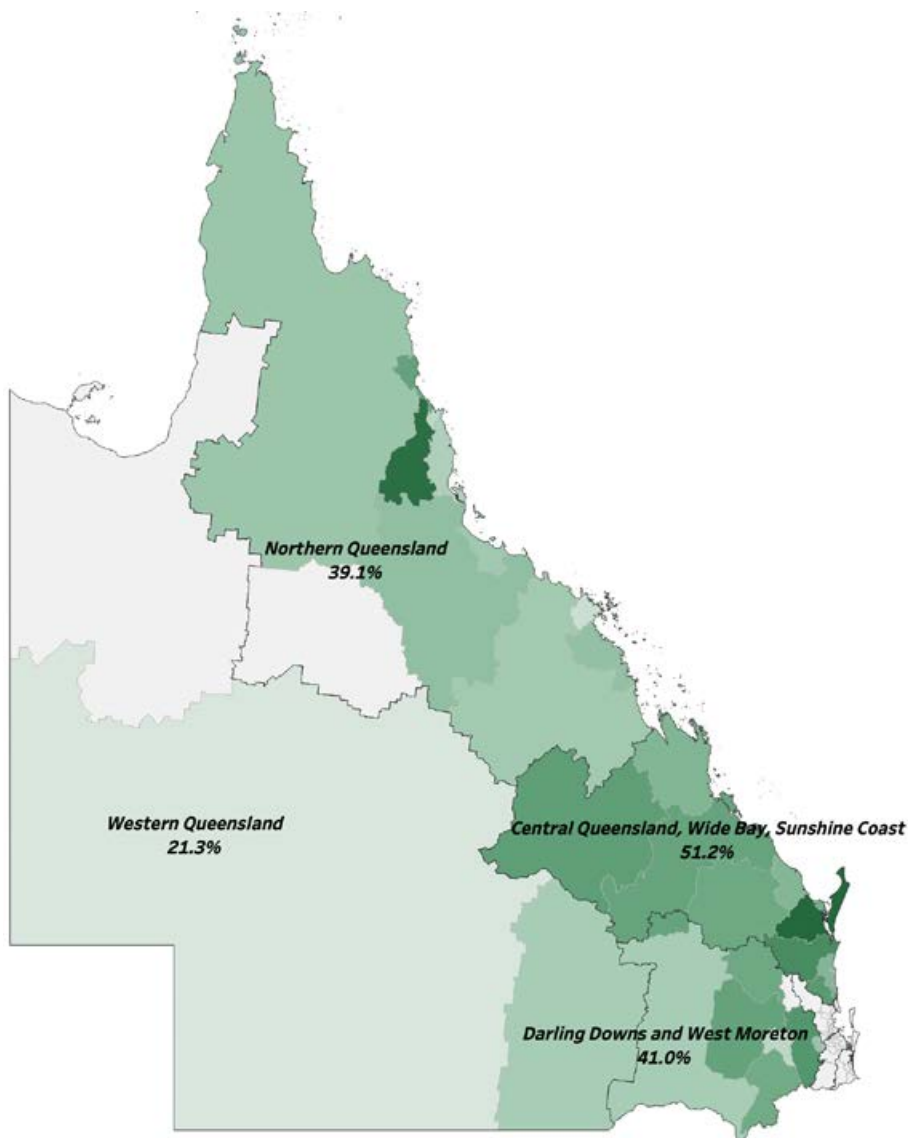
In **Northern Queensland**, which has a high proportion of its population located in outer regional and remote areas, treatment uptake was 39.1% at the end of 2020. Uptake was highest in Tablelands (East) – Kuranda (76.9%), where the 65% National Strategy treatment target had already been reached. Uptake was also above the state average in Cairns – North (54.4%) and Port Douglas – Daintree (54.5%), and lowest in Whitsunday (27.9%).

Western Queensland has the highest population of remote residents of any Australian PHN, and continued to have the lowest treatment uptake in Australia (21.3%). Treatment uptake was similar in both of **Western Queensland's** SA3s (19.5% in *Outback – North* and 25.0% in *Outback – South*). This PHN was the only one to maintain stable treatment numbers between 2019 and 2020.

These PHNs reflect the significant challenges of hepatitis C treatment access in geographically isolated locations.

These relatively low uptake figures raise the possibility that the prevalence of CHC in these two PHNs has been overestimated (see *Prevalence in Section B.1*). However, even if the prevalence in **Western Queensland** were half what is estimated here, treatment uptake would still be below the national average. Systematic data regarding CHC screening and information regarding seroprevalence would assist in clarifying these variations according to region, and allow for verification of treatment uptake estimates.

Figure B.21: Geographic variation in CHC treatment uptake in Qld (other than Greater Brisbane and Gold Coast), by PHN and SA3, end of 2020



Key: Darker shade of green denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHC prevalence estimates based on **published national estimates and notifications distribution**. Treatment data sourced from Department of Human Services Medicare statistics.

Table B.10: CHC prevalence and treatment uptake in Qld by PHN and SA3, end of 2020

PHN and SA3	Total population, 2016	People living with CHC, 2016	CHC prevalence, 2016 (%)	People treated, 2016–2020	Treatment uptake, end 2020 (%)
Brisbane North PHN	1,045,539	8,669	0.83%	3,576	41.3%
Bald Hills – Everton Park	52,436	304	0.58%	72	23.7%
Bribie – Beachmere	28,293	278	0.98%	170	61.1%
Brisbane Inner	74,046	1,948	2.63%	521	26.7%
Brisbane Inner – North	106,372	1,162	1.09%	277	23.8%
Brisbane Inner – West	52,003	266	0.51%	152	57.2%
Caboolture	80,511	805	1.00%	355	44.1%
Caboolture Hinterland	11,913	#	#	#	#
Chermside	76,682	635	0.83%	240	37.8%
Hills District	73,411	159	0.22%	132	82.9%
Kenmore – Brookfield – Moggill	46,985	115	0.24%	51	44.5%
Narangba – Burpengary	61,153	448	0.73%	241	53.8%
North Lakes	76,605	272	0.35%	159	58.5%
Nundah	40,180	329	0.82%	130	39.5%
Redcliffe	61,766	820	1.33%	383	46.7%
Sandgate	50,922	321	0.63%	205	63.9%
Sherwood – Indooroopilly	61,849	266	0.43%	68	25.6%
Strathpine	58,934	329	0.56%	158	48.0%
The Gap – Enoggera	31,481	164	0.52%	125	76.4%
Brisbane South PHN	1,054,346	8,563	0.81%	3,822	44.6%
Beaudesert	21,890	113*	0.51%	67	59.5%
Beenleigh	57,348	563	0.98%	224	39.8%
Brisbane Inner – East	41,795	236	0.56%	129	54.7%
Browns Plains	67,642	448	0.66%	265	59.1%
Capalaba	80,500	416	0.52%	230	55.2%
Carindale	46,414	176	0.38%	96	54.5%
Centenary	34,140	134	0.39%	56	41.8%
Cleveland – Stradbroke	78,234	675	0.86%	333	49.3%
Forest Lake – Oxley	67,170	870	1.29%	437	50.2%
Holland Park – Yeronga	82,051	952	1.16%	277	29.1%
Jimboomba	37,956	255	0.67%	110	43.2%
Loganlea – Carbrook	67,445	557	0.83%	205	36.8%

PHN and SA3	Total population, 2016	People living with CHC, 2016	CHC prevalence, 2016 (%)	People treated, 2016–2020	Treatment uptake, end 2020 (%)
Mt Gravatt	79,887	414	0.52%	149	36.0%
Nathan	27,852	280	1.01%	122	43.5%
Rocklea – Acacia Ridge	59,990	431	0.72%	292	67.7%
Springwood – Kingston	83,376	1,160	1.39%	465	40.1%
Sunnybank	47,481	312	0.66%	124	39.7%
Wynnum – Manly	73,173	571	0.78%	241	42.2%
Gold Coast PHN	589,352	5,174	0.88%	2,337	45.2%
Broadbeach – Burleigh	65,545	809	1.23%	282	34.8%
Coolangatta	57,170	737	1.29%	362	49.1%
Gold Coast – North	38,882	270	0.69%	§	§
Gold Coast Hinterland	15,456	238	1.54%	79	33.2%
Mudgeeraba – Tallebudgera	35,666	198	0.55%	103	52.1%
Nerang	63,155	365*	0.58%	259	70.9%
Ormeau – Oxenford	122,114	550	0.45%	261	47.4%
Robina	58,156	253	0.43%	140	55.4%
Southport	90,791	1,277	1.41%	355	27.8%
Surfers Paradise	42,416	478	1.13%	189	39.5%
Central Queensland, Wide Bay, Sunshine Coast PHN	837,072	7,283	0.87%	3,729	51.2%
Buderim	64,735	297	0.46%	146	49.1%
Bundaberg	90,781	1,062	1.17%	484	45.6%
Caloundra	83,625	540	0.65%	274	50.8%
Central Highlands (Qld)	25,705	121	0.47%	68	56.2%
Gladstone – Biloela	77,070	569	0.74%	307	53.9%
Gympie – Cooloola	52,865	463	0.88%	296	63.9%
Hervey Bay	61,850	686	1.11%	342	49.8%
Maroochy	62,309	627	1.01%	271	43.2%
Maryborough	41,416	447*	1.08%	381	85.2%
Nambour – Pomona	70,372	752	1.07%	347	46.1%
Noosa	34,946	365	1.05%	148	40.5%
Rockhampton	126,747	1,016*	0.80%	468	46.0%

PHN and SA3	Total population, 2016	People living with CHC, 2016	CHC prevalence, 2016 (%)	People treated, 2016–2020	Treatment uptake, end 2020 (%)
Sunshine Coast Hinterland	44,652	338	0.76%	197	58.3%
Darling Downs and West Moreton PHN	599,728	5,719	0.95%	2,342	41.0%
Burnett	49,253	478	0.97%	248	51.9%
Darling Downs (East)	39,839	285	0.71%	155	54.5%
Darling Downs (West) – Maranoa	46,037	355	0.77%	128	36.1%
Granite Belt	41,003	323	0.79%	164	50.8%
Ipswich Hinterland	51,353	435	0.85%	260	59.7%
Ipswich Inner	124,245	1,473*	1.19%	587	39.9%
Springfield – Redbank	87,151	833	0.96%	319	38.3%
Toowoomba	160,848	1,538*	0.96%	481	31.3%
Northern Queensland PHN	698,673	7,619	1.09%	2,979	39.1%
Bowen Basin – North	33,522	238	0.71%	89	37.4%
Cairns – North	34,205	380	1.11%	207	54.4%
Cairns – South	124,848	2,094	1.68%	649	31.0%
Charters Towers – Ayr – Ingham	40,289	319	0.79%	134	42.1%
Far North	27,246	242	0.89%	95	39.2%
Innisfail – Cassowary Coast	39,155	599	1.53%	207	34.6%
Mackay	120,466	981	0.81%	405	41.3%
Port Douglas – Daintree	12,045	174	1.45%	95	54.5%
Tablelands (East) – Kuranda	46,203	394*	0.85%	303	76.9%
Townsville	198,587	1,885*	0.95%	708	37.6%
Whitsunday	22,108	312	1.41%	87	27.9%
Western Queensland PHN	48,119	614	1.28%	131	21.3%
Outback – North	29,893	410	1.37%	80	19.5%
Outback – South	18,226	204	1.12%	51	25.0%

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

Note: Totals may not add up due to inclusion of people without an SA3 of residence recorded in source data and due to random adjustment of cells to prevent re-identification of suppressed cells.

Data suppressed where number receiving treatment was <6, population was <3000, or average notifications per year <5.

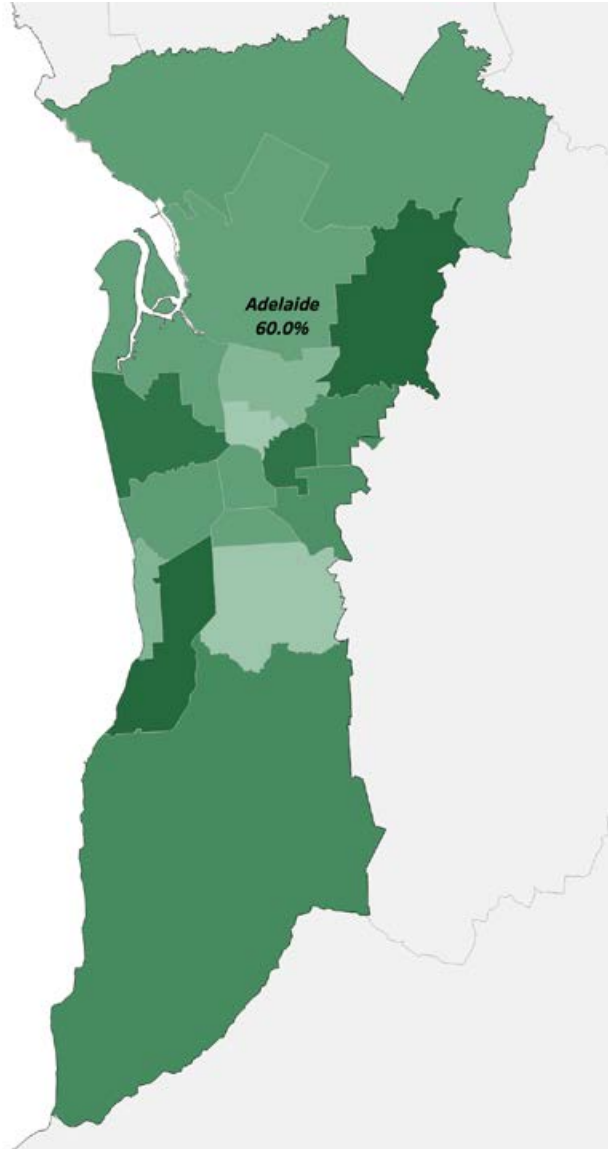
*.Data adjusted due to a significant proportion of the population diagnosed in a correctional facility.

SOUTH AUSTRALIA

- CHC treatment uptake in SA at the end of 2020 was 58.0%, higher than the national average of 47.0%
- SA ranked 1st of the eight states and territories for CHC treatment uptake
- The lowest uptake generally occurred in remote and very remote regions
- The decline in treatment uptake in SA overall has been similar to the average national trend, and this was consistent in both PHNs

Treatment uptake in **Adelaide** PHN was 60.0% by the end of 2020, (Figure B.22), the third highest of all PHNs in Australia. Uptake was above or similar to the national average of 47.0% in all of **Adelaide's** SA3s, with the exception of **Prospect – Walkerville** (37.6%) and **Mitcham** (38.9%). Uptake reached or approached the National Strategy target of 65% uptake in **Tea Tree Gully** (>85%), **Marion** (>85%), **Norwood – Payneham – St Peters** (75.0%), **Charles Sturt** (74.6%), **Onkaparinga** (65.1%), and **Campbelltown** (64.2%) (Table B.11). Adelaide's ranking among PHNs remained stable during 2016–2020 (Figure B.6).

Figure B.22: Geographic variation in CHC treatment uptake in Greater Adelaide, by PHN and SA3, end of 2020

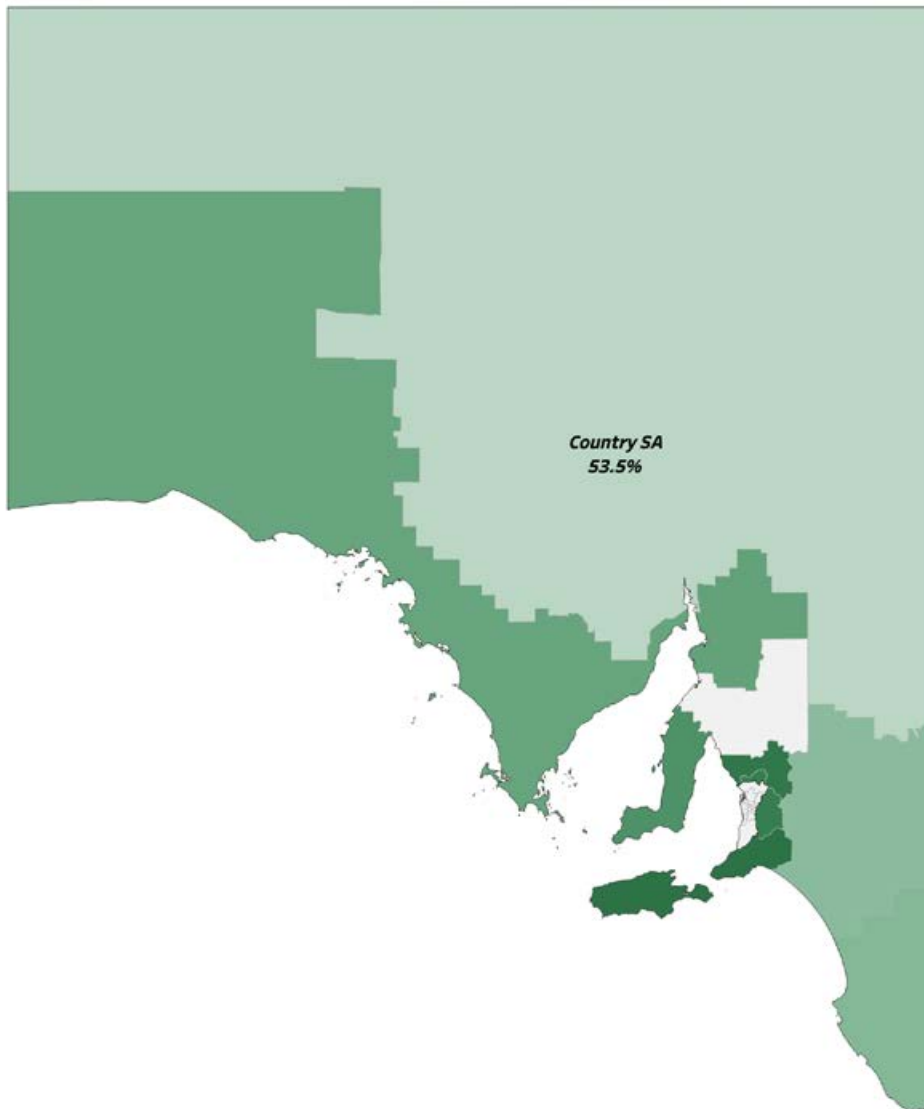


Key: Darker shade of green denotes higher treatment uptake. PHN outline, name and overall treatment estimate is denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

Treatment uptake was also above the national average in the **Country SA** PHN (53.5%), and a number of SA3s reached the 65% National Strategy target, including Barossa (73.2%), Fleurieu – Kangaroo Island (75.8%), Adelaide Hills (70.9%), and Gawler – Two Wells (70.6%) (Figure B.23). Uptake was often lower in regions further from the urban centre, most notably in Outback – North and East (31.7%).

Figure B.23: Geographic variation in CHC treatment uptake in SA (other than Greater Adelaide), by PHN and SA3, end of 2020



Key: Darker shade of green denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

Table B.11: CHC treatment uptake in SA by PHN and SA3, end of 2020

PHN and SA3	Total population, 2016	People living with CHC, 2016	CHC prevalence, 2016 (%)	People treated, 2016–2020	Treatment uptake, end of 2020 (%)
Adelaide PHN	1,237,593	6,197	0.50%	3,719	60.0%
Adelaide City	22,920	270*	1.18%	151	55.9%
Burnside	45,662	109	0.24%	68	62.3%
Campbelltown (SA)	62,991	184	0.29%	118	64.2%
Charles Sturt	102,555	574	0.56%	428	74.6%

PHN and SA3	Total population, 2016	People living with CHC, 2016	CHC prevalence, 2016 (%)	People treated, 2016–2020	Treatment uptake, end of 2020 (%)
Holdfast Bay	42,267	129	0.31%	60	46.4%
Marion	73,366	297	0.40%	^	> 85%^
Mitcham	76,967	218	0.28%	85	38.9%
Norwood – Payneham – St Peters	33,972	133	0.39%	100	75.0%
Onkaparinga	168,229	738	0.44%	480	65.1%
Playford	92,688	762	0.82%	433	56.8%
Port Adelaide – East	70,072	608	0.87%	278	45.7%
Port Adelaide – West	63,623	588	0.92%	325	55.3%
Prospect – Walkerville	32,921	160	0.48%	60	37.6%
Salisbury	139,416	800	0.57%	438	54.7%
Tea Tree Gully	94,065	188	0.20%	^	> 85%^
Unley	39,622	121	0.31%	66	54.4%
West Torrens	76,259	317	0.42%	181	57.0%
Country SA PHN	498,845	2,736	0.55%	1,465	53.5%
Adelaide Hills	73,565	121	0.16%	86	70.9%
Barossa	35,905	93	0.26%	68	73.2%
Eyre Peninsula and South West	58,961	396	0.67%	213	53.8%
Fleurieu – Kangaroo Island	50,818	220	0.43%	167	75.8%
Gawler – Two Wells	37,859	152	0.40%	107	70.6%
Limestone Coast	67,370	501	0.74%	227	45.3%
Lower North	23,526	#	#	#	#
Mid North	28,219	180	0.64%	99	55.0%
Murray and Mallee	71,383	639	0.89%	279	43.7%
Outback – North and East	24,935	259	1.04%	82	31.7%
Yorke Peninsula	26,304	113	0.43%	70	61.9%

Data source: CHC prevalence estimates based on published national estimates and notifications distribution.

Note: Totals may not add up due to inclusion of people without an SA3 of residence recorded in source data and due to random adjustment of cells to prevent re-identification of suppressed cells.

Data suppressed where number receiving treatment was <6, population was <3000, or average notifications per year <5.

* Data adjusted due to a significant proportion of the population living in a correctional facility.

^ Data approximated at upper levels of uptake and raw numbers suppressed.

TASMANIA

- CHC treatment uptake in Tas. at the end of 2020 was 47.4%, similar to the national average of 47.0%
- Tas. ranked 3rd of the eight states and territories for CHC treatment uptake
- The decline in treatment uptake in Tas. has been similar to the average national trend

Treatment uptake in the **Tasmania** PHN at the end of 2020 continued to be similar to the national average, at 47.4% (Figure B.24). Uptake was highest in the *Sorrel – Dodges Ferry* (56.5%) SA3, but nearly all regions within the PHN had uptake similar to or above the national average (Table B.12).

Figure B.24: Geographic variation in CHC treatment uptake in Tas., by SA3, end of 2020



Key: Darker shade of green denotes higher treatment uptake. PHN outline, name and overall treatment estimate is denoted in black. Grey areas represent SA3 regions with data suppressed due to low treatment numbers (<6).

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

Table B.12: CHC treatment uptake in Tasmania, by SA3, end of 2020

PHN and SA3	Total population, 2016	People living with CHC, 2016	CHC prevalence, 2016 (%)	People treated, 2016–2020	Treatment uptake, end of 2020 (%)
Tasmania PHN	528,674	4,471	0.85%	2,118	47.4%
Brighton	23,908	225	0.94%	114	50.8%
Burnie – Ulverstone	56,036	523	0.93%	209	39.9%
Central Highlands (Tas.)	3,217	#	#	#	#
Devonport	43,984	371	0.84%	173	46.6%
Hobart Inner	51,583	455	0.88%	236	51.8%
Hobart – North East	53,978	535*	0.99%	278	52.0%
Hobart – North West	57,964	624	1.08%	319	51.1%
Hobart – South and West	33,540	165	0.49%	76	46.1%
Huon – Bruny Island	21,429	220	1.03%	78	35.4%
Launceston	86,495	546	0.63%	220	40.3%
Meander Valley – West Tamar	20,659	148	0.72%	65	43.8%
North East	40,193	334	0.83%	147	44.0%
Sorell – Dodges Ferry	16,806	126	0.75%	71	56.5%
South East Coast	5,679	#	#	#	#
West Coast	13,202	132	1.00%	69	52.3%

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

Note: Totals may not add up due to inclusion of people without an SA3 of residence recorded in source data and due to random adjustment of cells to prevent re-identification of suppressed cells. # Data suppressed where number receiving treatment was <6, population was <3000, or average notifications per year <5. * Data adjusted due to a significant proportion of the population being diagnosed in a correctional facility.

VICTORIA

- CHC treatment uptake in Vic. at the end of 2020 was 55.2%, higher than the national average of 47.0%
- Vic. ranked 2nd of the eight states and territories for CHC treatment uptake
- All PHNs in Vic. had treatment uptake above the national average, and uptake was generally higher in regional PHNs
- The decline in treatment uptake in Vic. overall has been much more rapid than the average national trend, and this was most pronounced in **Western Victoria** and **Gippsland** PHNs

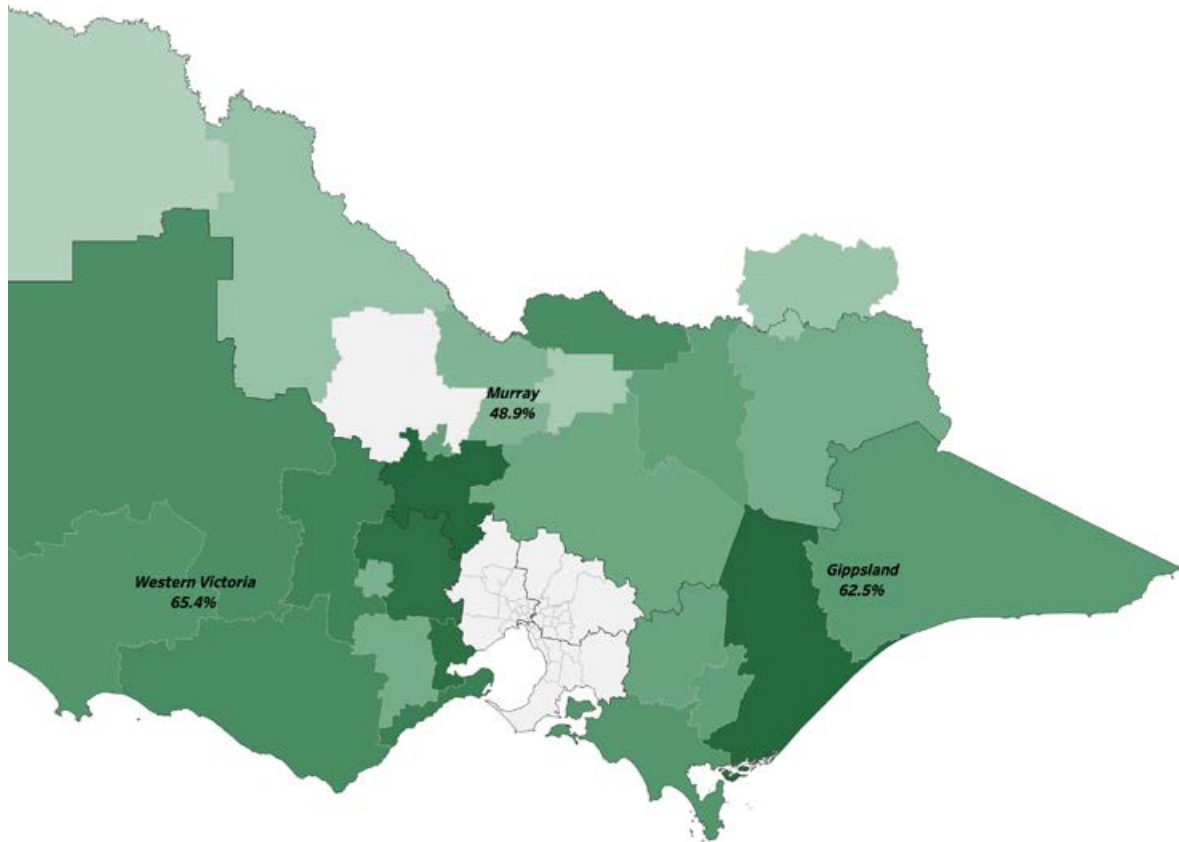
Treatment uptake by the end of 2020 was above the national average in Victoria overall and in all of Victoria's six PHNs. **Western Victoria** and **Gippsland** were the two highest uptake PHNs in Australia. **Western Victoria** has already met and **Gippsland** is on track to meet the 2022 National Strategy target of 65%. However, neither is track to meet the 2030 target under current trends due to the rapid decline in treatment uptake in recent years (Figure B.10). Within **Gippsland** and **Western Victoria**, treatment uptake declined by approximately 50%, more than double the national average trend.

All SA3s within **Western Victoria** had treatment uptake above the national average of 47.0% (Figure B.25), and the highest levels were observed in **Creswick – Daylesford – Ballan** (75.9%), **Surf Coast – Bellarine Peninsula** (69.3%), **Geelong** (76.3%), **Maryborough – Pyrenees** (67.7%), and **Warrnambool – Otway Ranges** (64.4%), all of which reached or closely approached the National Strategy target of 65% by 2022 (Table B.13). The PHN overall had treatment uptake of 65.4% at the end of 2020, the only PHN in Australia to already reach the 2022 National Strategy target of 65%.

Treatment uptake was also uniformly high within **Gippsland**, where uptake overall was 62.5%. Uptake was highest within the **Wellington** SA3 (>85%), where it reached above the National Strategy target; this is possibly related to the presence of a correctional facility, which may influence treatment numbers and prevalence estimates.

Uptake varied by SA3 within **Murray** PHN, which overall had uptake of 48.9%. Uptake reached 85.4% in **Heathcote – Castlemaine – Kyneton**, which is adjacent to high-uptake regions in **Western Victoria** and also is the location of a correctional facility, which may influence treatment uptake and/or prevalence estimates. Treatment levels were above the national average in **Bendigo** (55.1%), **Upper Goulburn Valley** (52.6%) and **Wangaratta – Benalla** (55.8%), but lower than average in **Shepparton** (36.8%), **Mildura** (33.9%), **Albury** (39.6%), and **Murray River – Swan Hill** (40.7%). Treatment in **Murray** declined at a slower rate compared to the other two regional Victorian PHNs, although still more rapidly than the national average.

Figure B.25: Geographic variation in CHC treatment uptake in Victoria (other than Greater Melbourne), by PHN and SA3, end of 2020



Key: Darker shade of green denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

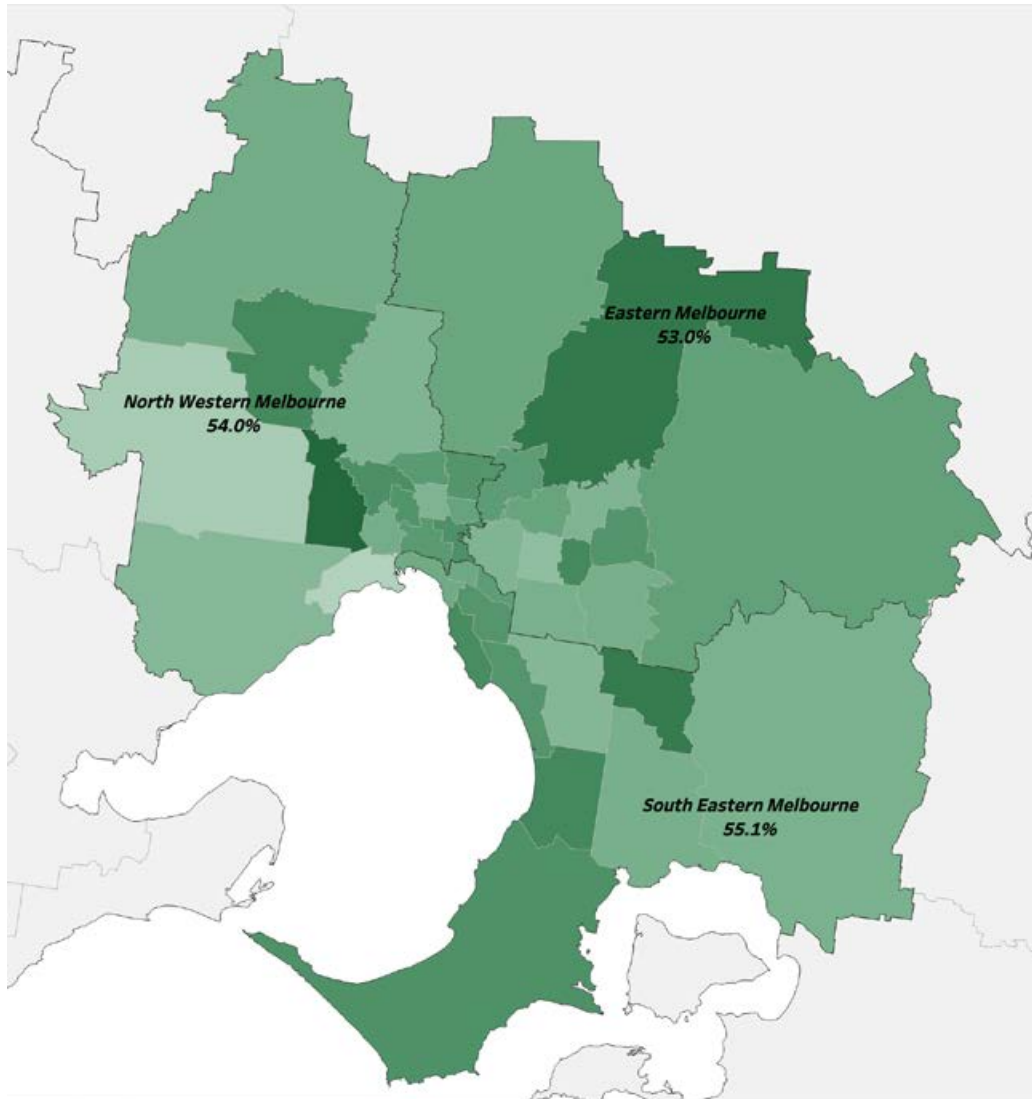
Hepatitis C treatment uptake was very similar across the three Melbourne PHNs at the end of 2020 (Figure B.26).

Within **North Western Melbourne** (overall uptake 54.0%) treatment was highest in the Brimbank (84.0%) and Sunbury (65.5%) SA3s, both of which reached the 65% National Strategy target, and in Keilor (62.6%). The SA3 of Wyndham (45.0%) had uptake similar to the national average, an improvement compared to past years, due to a smaller than average decline in uptake during 2020 compared to Vic. overall. Uptake was only below the national average in the Hobsons Bay (33.5%) and Melton – Bacchus Marsh (36.2%) SA3s.

In **Eastern Melbourne**, where overall uptake was 53.0%, treatment uptake was highest in the Nilumbik – Kinglake SA3 (73.1%), as well as in Whitehorse – East (65.4%), which maintained stable treatment levels in 2020, unlike most Vic. SA3s which saw major declines. Treatment uptake was also above that of the PHN average in Banyule (57.1%), Maroondah (60.4%), and Yarra Ranges (55.4%). The only SA3 in this PHN to have uptake below the national average was Whitehorse – West (42.5%).

Within **South Eastern Melbourne** (overall uptake 55.1%) there was little disparity according to SA3, and all reached treatment levels similar to or above the national average level. Treatment reached or approached the National Strategy target of 65% treatment uptake in the Casey – North (71.7%), Frankston (65.8%), and Bayside (64.1%) SA3s.

Figure B.26: Geographic variation in CHC treatment uptake in Greater Melbourne, by PHN and SA3, end of 2020



Key: Darker shade of green denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

Table B.13: CHC treatment uptake in Victoria, by PHN and SA3, end of 2020

PHN and SA3	Total population, 2016	People living with CHC, 2016	CHC prevalence, 2016 (%)	People treated, 2016–2020	Treatment uptake, end of 2020 (%)
Eastern Melbourne PHN	1,522,751	6,679	0.44%	3,541	53.0%
Banyule	122,136	750	0.61%	428	57.1%
Boroondara	181,618	578	0.32%	270	46.7%
Knox	171,238	760	0.44%	373	49.1%
Manningham – East	29,530	#	#	#	#
Manningham – West	93,725	314	0.33%	169	53.8%
Maroondah	100,866	538	0.53%	325	60.4%
Monash	183,989	768	0.42%	373	48.6%
Nillumbik – Kinglake	58,106	178	0.31%	130	73.1%
Whitehorse – East	63,117	228	0.36%	149	65.4%
Whitehorse – West	117,488	522	0.44%	222	42.5%
Whittlesea – Wallan	242,710	1,008	0.42%	533	52.9%
Yarra Ranges	158,229	976	0.62%	540	55.4%
North Western Melbourne PHN	1,659,844	12,017	0.72%	6,490	54.0%
Brimbank	134,338	1,305	0.97%	1,097	84.0%
Brunswick – Coburg	87,167	604	0.69%	284	47.0%
Darebin – North	87,494	868	0.99%	522	60.2%
Darebin – South	56,893	400	0.70%	216	54.0%
Essendon	72,334	338	0.47%	205	60.7%
Hobsons Bay	90,436	850	0.94%	285	33.5%
Keilor	62,570	206	0.33%	129	62.6%
Macedon Ranges	29,951	94	0.31%	47	50.0%
Maribyrnong	74,708	856	1.15%	427	49.9%
Melbourne City	142,970	1,490*	1.04%	863	57.9%
Melton – Bacchus Marsh	209,800	1,124*	0.54%	407	36.2%
Moreland – North	78,127	450	0.58%	261	58.0%
Sunbury	40,568	142	0.35%	93	65.5%
Tullamarine – Broadmeadows	169,559	876	0.52%	408	46.6%
Wyndham	234,899	1,474*	0.63%	664	45.0%
Yarra	88,030	942	1.07%	582	61.8%

PHN and SA3	Total population, 2016	People living with CHC, 2016	CHC prevalence, 2016 (%)	People treated, 2016–2020	Treatment uptake, end of 2020 (%)
South Eastern Melbourne PHN	1,474,885	9,832	0.67%	5,415	55.1%
Bayside	101,315	412	0.41%	264	64.1%
Cardinia	96,858	504	0.52%	242	48.0%
Casey – North	107,057	518	0.48%	371	71.7%
Casey – South	212,967	938	0.44%	459	49.0%
Dandenong	189,532	2,173	1.15%	987	45.4%
Frankston	124,455	1,120	0.90%	737	65.8%
Glen Eira	141,561	694	0.49%	416	60.0%
Kingston	121,320	606	0.50%	363	59.9%
Mornington Peninsula	166,092	980	0.59%	605	61.8%
Port Phillip	108,239	1,359	1.26%	691	50.8%
Stonnington – East	35,501	134	0.38%	76	56.7%
Stonnington – West	69,987	396	0.57%	204	51.5%
Gippsland PHN	284,189	2,286	0.80%	1,429	62.5%
Baw Baw	48,100	290*	0.60%	157	54.2%
Gippsland – East	47,035	476	1.01%	275	57.8%
Gippsland – South West	66,475	424	0.64%	254	59.9%
Latrobe Valley	78,739	768	0.97%	429	55.9%
Wellington	43,841	329*	0.75%	^	>85.0%^
Murray PHN	632,711	5,084	0.80%	2,487	48.9%
Albury	64,967	644	0.99%	255	39.6%
Bendigo	106,652	736	0.69%	405	55.1%
Campaspe	38,491	282	0.73%	131	46.5%
Heathcote – Castlemaine – Kyneton	44,058	350*	0.79%	299	85.4%
Loddon – Elmore	8,953	#	#	#	#
Mildura	55,882	540	0.97%	183	33.9%
Moira	31,818	186	0.58%	119	64.0%
Murray River – Swan Hill	38,822	342	0.88%	139	40.7%
Shepparton	66,290	736*	1.11%	271	36.8%
Upper Goulburn Valley	56,022	356	0.64%	187	52.6%
Wangaratta – Benalla	47,952	330	0.69%	184	55.8%
Wodonga – Alpine	72,804	516	0.71%	257	49.8%

PHN and SA3	Total population, 2016	People living with CHC, 2016	CHC prevalence, 2016 (%)	People treated, 2016–2020	Treatment uptake, end of 2020 (%)
Western Victoria PHN	640,753	4,263	0.67%	2,788	65.4%
Ballarat	120,870	830	0.69%	401	48.3%
Barwon – West	17,976	100	0.56%	50	50.0%
Creswick – Daylesford – Ballan	23,779	166	0.70%	126	75.9%
Geelong	192,404	1,425*	0.74%	1,087	76.3%
Glenelg – Southern Grampians	36,822	274	0.74%	165	60.2%
Grampians	61,042	395*	0.65%	249	63.0%
Maryborough – Pyrenees	19,239	158*	0.82%	107	67.7%
Surf Coast – Bellarine Peninsula	77,761	264	0.34%	183	69.3%
Warrnambool – Otway Ranges	90,861	652*	0.72%	420	64.4%

Data source: CHC prevalence estimates based on published national estimates and notifications distribution.

Note: Totals may not add up due to inclusion of people without an SA3 of residence recorded in source data and due to random adjustment of cells to prevent re-identification of suppressed cells.

Data suppressed where number receiving treatment was <6, population was <3000, or average notifications per year <5.

* Data adjusted due to a significant proportion of the population living in a correctional facility.

^ Data approximated at upper levels of uptake and raw numbers suppressed.

WESTERN AUSTRALIA

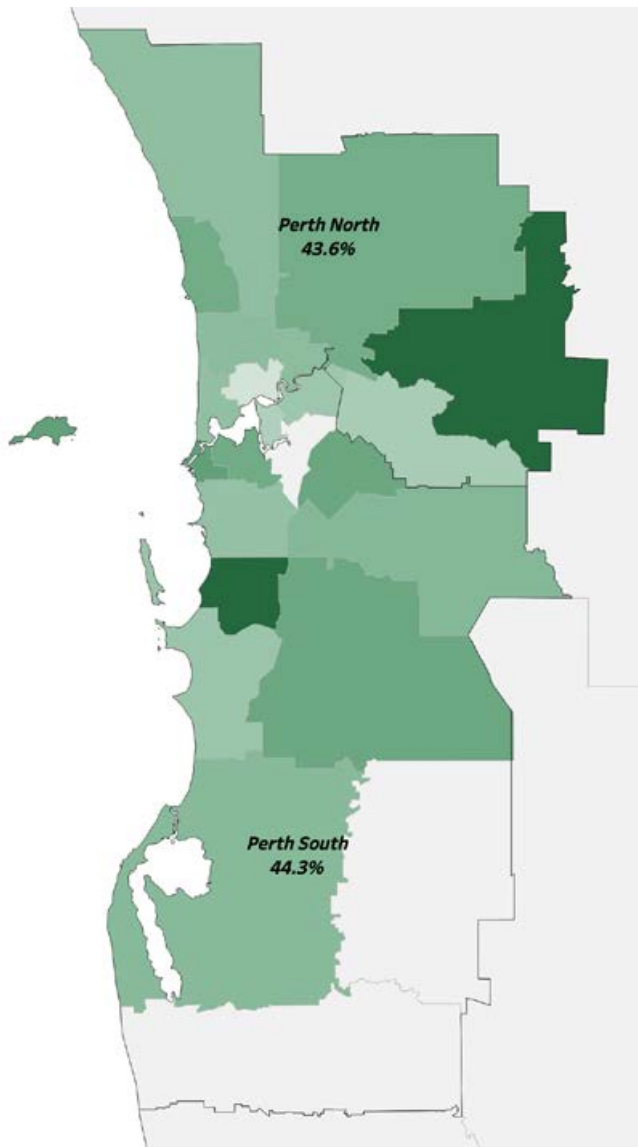
- CHC treatment uptake in WA at the end of 2020 was 42.1%, lower than the national average of 47.0%
- WA ranked 7th of the eight states and territories for CHC treatment uptake
- Uptake was higher in the urban PHNs compared to regional WA
- The decline in treatment uptake in WA overall has been less rapid than the average national trend, and this was relatively consistent across PHNs

Treatment uptake in WA overall by mid-2019 was 42.1%, lower than the national average of 47.0%.

Treatment uptake in **Perth South** overall was 44.3%, and within the PHN was highest in the SA3s **Fremantle** (55.2%), **Gosnells** (52.6%), **Serpentine – Jarrahdale** (52.4%), and **Melville** (50.6%). Uptake was similar to, or slightly below, the national average in the remaining SA3s, with the exception of **Canning** (19.7%). The ranking of the PHN at a national level improved from 19th at the end of 2017 to 17th at mid-2019 (Figure B.6). This PHN improved in rank from 23rd at the end of 2017 to 18th at the end of 2020, one of the largest rank improvements of any PHN nationally.

In **Perth North**, overall uptake was 43.6%. Treatment levels were estimated to be highest in **Mundaring** (>85%) (Table B.14); however, the presence of a correctional facility in this SA3 may have a substantial influence on treatment uptake estimates, and may have also affected ascertainment of prevalence. Uptake was also above the national average in **Joondalup** (50.4%) and **Swan** (49.9%) SA3s. Uptake was lowest in the inner urban SA3 of **Perth City** (26.1%).

Figure B.27: Geographic variation in CHC treatment uptake in Greater Perth, by PHN and SA3, end of 2020

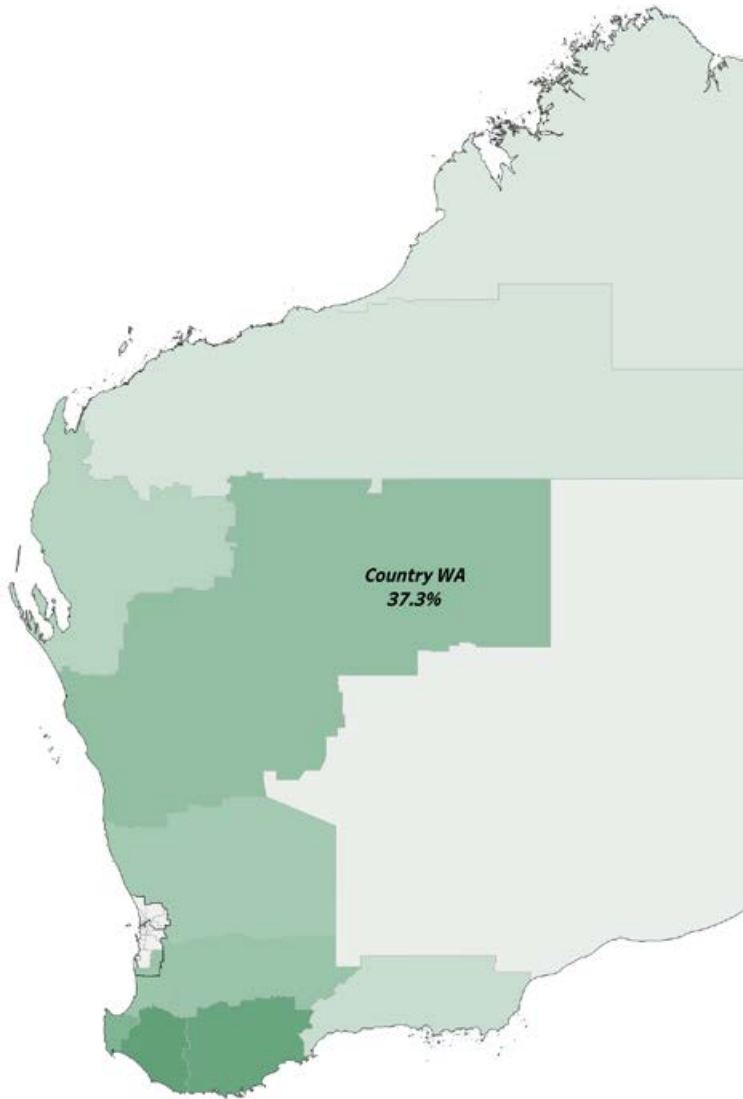


Key: Darker shade of green denotes higher treatment uptake. PHN outlines, names and overall treatment estimates are denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN, or those with data suppressed due to low treatment numbers (<6).

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

In **Country WA**, uptake varied widely between SA3s compared to the PHN average of 37.3% (Figure B.28). Uptake was highest in the southwestern part of the state, in the regions of **Manjimup** (55.4%), **Augusta – Margaret River – Busselton** (46.4%), and **Albany** (53.5%). Treatment uptake was lowest in the more remote regions of **Country WA** where population and service distribution are most sparse, highlighting the challenges in access to care for people living in these regions.

Figure B.28: Geographic variation in CHC treatment uptake in WA (other than Greater Perth), by PHN and SA3, end of 2020



Key: Darker shade of green denotes higher treatment uptake. PHN outlines, name and overall treatment estimate is denoted in black. Grey areas represent SA3 regions outside the boundary of the PHN.

Data source: CHC prevalence estimates based on published national estimates and notifications distribution. Treatment data sourced from Department of Human Services Medicare statistics.

Table B.14: CHC treatment uptake in WA by PHN and SA3, end of 2020

PHN and SA3	Total population, 2016	People living with CHC, 2016	CHC prevalence, 2016 (%)	People treated, 2016–2020	Treatment uptake, end of 2020 (%)
Perth North PHN	1,049,819	6,888	0.66%	3,001	43.6%
Bayswater – Bassendean	83,161	668	0.80%	288	43.1%
Cottesloe – Claremont	62,041	279	0.45%	116	41.6%
Joondalup	150,717	522	0.35%	263	50.4%
Kalamunda	53,444	289	0.54%	104	36.0%
Mundaring	25,604	307*	1.20%	^	>85.0%^

PHN and SA3	Total population, 2016	People living with CHC, 2016	CHC prevalence, 2016 (%)	People treated, 2016–2020	Treatment uptake, end of 2020 (%)
Perth City	123,926	1,683	1.36%	439	26.1%
Stirling	205,639	1,350	0.66%	585	43.3%
Swan	150,062	802*	0.53%	400	49.9%
Wanneroo	195,225	989	0.51%	419	42.4%
Perth South PHN	973,237	6,616	0.68%	2,929	44.3%
Armada	82,701	547	0.66%	247	45.2%
Belmont – Victoria Park	73,453	664	0.90%	257	38.7%
Canning	146,995	1,042*	0.71%	205	19.7%
Cockburn	121,606	774	0.64%	318	41.1%
Fremantle	31,456	485	1.54%	268	55.2%
Gosnells	79,073	559	0.71%	294	52.6%
Kwinana	40,425	266*	0.66%	^	>85% [^]
Mandurah	100,492	774	0.77%	344	44.4%
Melville	95,501	338	0.35%	171	50.6%
Rockingham	129,951	834	0.64%	328	39.4%
Serpentine – Jarrahdale	27,919	97*	0.35%	51	52.4%
South Perth	43,665	236	0.54%	81	34.4%
Country WA PHN	539,140	5,142	0.95%	1,917	37.3%
Albany	61,556	578	0.94%	308	53.3%
Augusta – Margaret River – Busselton	52,918	418	0.79%	194	46.4%
Bunbury	106,807	901	0.84%	354	39.3%
Esperance	16,582	219	1.32%	63	28.8%
Gascoyne	9,811	143	1.46%	47	32.8%
Goldfields	39,543	487	1.23%	105	21.5%
Kimberley	35,697	487	1.37%	120	24.6%
Manjimup	23,495	197	0.84%	109	55.4%
Mid West	56,044	592	1.06%	248	41.9%
Pilbara	61,611	466	0.76%	121	25.9%
Wheat Belt – North	54,245	471	0.87%	175	37.2%
Wheat Belt – South	20,831	182	0.87%	73	40.1%

Data source: CHC prevalence estimates based on published national estimates and notifications distribution.

Note: Totals may not add up due to inclusion of people without an SA3 of residence recorded in source data.

* Data adjusted due to a significant proportion of the population living in a correctional facility.

[^] Data approximated at upper levels of uptake and raw numbers suppressed.

SECTION C:
TESTING AND
LIVER CANCER
DATA

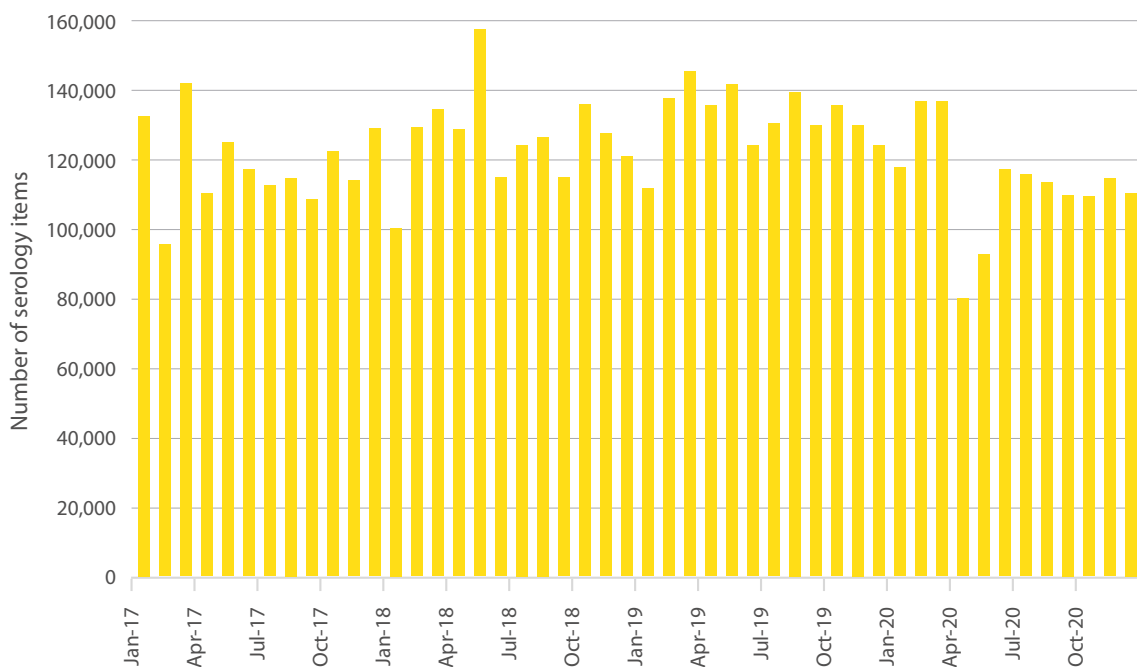
SECTION C1: VIRAL HEPATITIS SEROLOGY TESTING – NATIONAL AND STATE/TERRITORY TRENDS

The essential first step in the cascade of care for hepatitis B and hepatitis C is diagnosis, which requires serological testing to identify an individual’s status. Data are available from Medicare regarding the number of viral hepatitis serology tests conducted, and trends in these data can provide evidence regarding the uptake of testing, which needs to increase if National Strategy targets regarding hepatitis B and C diagnosis are to be met. Although the Medicare item for these tests does not distinguish which hepatitis serology test is being conducted, it is likely that the majority of tests are for diagnosing hepatitis B and C, and for monitoring hepatitis B.

The number of hepatitis serology tests has been consistently increasing over time, and between 2017 and 2019, the number increased by an average of 5% per year, from 1,346,927 items to 1,584,349 items. This increase occurred in all states and territories.

However, in 2020, the number of items declined by 14.6%, reducing to 1,353,508. The number of items per month during the period 2017 to 2020 is shown in Figure C.1, below. The number of tests declined rapidly during April and May 2020, during the first period of widespread social distancing and travel restrictions in response to the COVID-19 outbreak. The number of items increased during June 2020, but thereafter remained stable at a level 7% lower than 2019 numbers, with no subsequent increasing trend. Overall, there were 230,000 fewer items in 2020 compared to 2019. Further, given the previous increasing trend, there were approximately 280,000 fewer items than the expected number for 2020.

Figure C.1: Number of hepatitis serology test items, by month, 2017–2020



Data source: Testing data sourced from Department of Human Services Medicare statistics.

[\(link to data for this figure\)](#)

EFFECT ON DIAGNOSIS

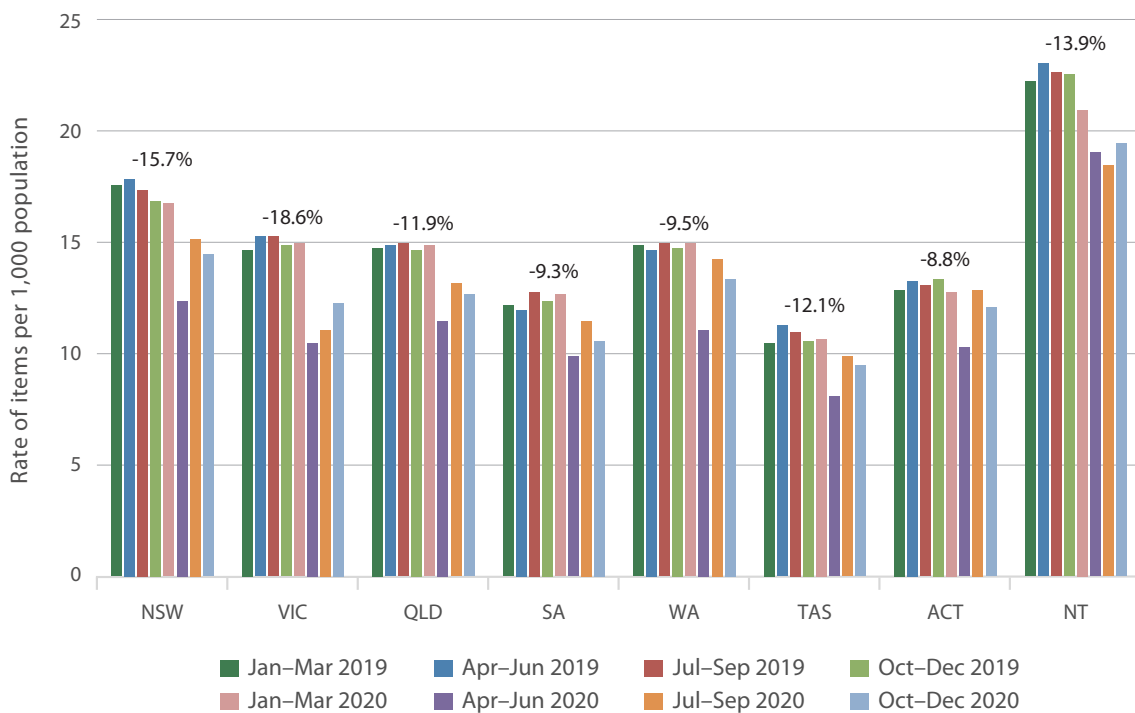
This decrease in testing was reflected in a 14.8% decline in unspecified (chronic) hepatitis B notifications during 2020 compared to 2019, which represents at least 500 fewer new diagnoses of hepatitis B during this period. This decline is much more rapid than the previous year, when notifications reduced by only 4.1%.

Conversely, the decline in unspecified (chronic) hepatitis C notifications during this period (11.4%) was consistent with the decline in the previous year (10.5%). This is consistent with estimates that the proportion undiagnosed for hepatitis C is lower than for hepatitis B. Further, a significant proportion of new diagnoses of hepatitis B occur through migration screening, and migration reduced as a result of the international border closures imposed during 2020.

TRENDS BY STATE AND TERRITORY

The observed decline during 2020 occurred in all states and territories, but varied in magnitude, from an 18.6% decline in Victoria to an 8.8% decline in ACT. Most states and territories had a decline in testing during April to June 2020 and a subsequent increase during the remainder of the year; however, these increases were almost all to levels lower than previous trends, and in all cases were insufficient to offset previous declines (Figure C.2).

Figure C.2: Rate of hepatitis serology items per 1,000 population, by state and territory and calendar quarter, 2019–2020; % labels show proportional change between 2019 and 2020



Data source: Testing data sourced from Department of Human Services Medicare statistics. Population denominator sourced from Australian Bureau of Statistics Estimated Resident Population.

[\(link to data for this figure\)](#)

SECTION C2: VIRAL HEPATITIS SEROLOGY TESTING – GUIDELINE-BASED SCREENING IN PRIMARY CARE

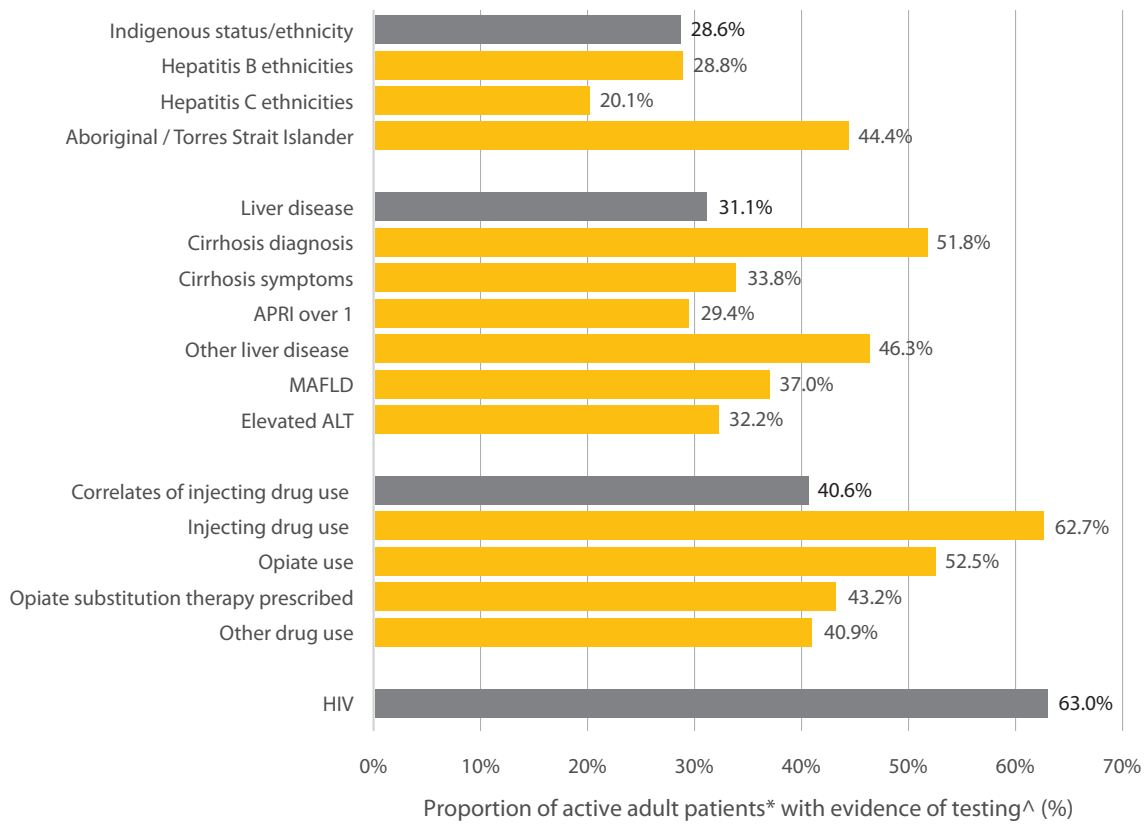
Although serology testing data are available from Medicare, until recently there were no data available regarding the uptake of screening for CHB/CHC in a representative group of primary care patients. Recent analysis was conducted on a dataset comprising routinely collected primary care patient records, extracted from the Population Level Analysis and Reporting program for general practice (POLAR). The POLAR dataset used in this study contained de-identified data from the computerised medical records of patients attending 456 participating GP clinics in three of the six PHNs in Vic. (**Eastern Melbourne, South Eastern Melbourne, and Gippsland**). The dataset is estimated to represent 25% of all primary care practices in Vic.²²

This analysis demonstrated gaps in the uptake of screening of people with a recommendation for testing, and large variation according to eligibility criteria. Of the 1,674,893 active adult patients in the cohort (those aged ≥ 18 years who had visited the practice at least three times in the past two years), 461,312 (27.5%) met at least one criterion for hepatitis B and/or hepatitis C screening as per national guidelines.^{5,23,24} Of those who met at least one screening criterion, 135,309 (29.3%) had a record of hepatitis serology testing.

The presence of a history of screening was highest for those with HIV (63.0%), those with a diagnosis of cirrhosis (51.8%), and those with a documented history of injecting drug use (62.7%) or opiate dependence (52.5%). Screening history was lower for those with an ethnicity correlated with CHB (28.8%) and CHC (20.1%).

The low uptake of testing observed overall could include patients who have had testing elsewhere, or that screening is recorded elsewhere in the GP's electronic medical record. It highlights the need for better data sharing, and improved access to decision support for clinicians working in primary care. However, the disparities according to group suggest that improvements are needed in those eligible for hepatitis B and C testing based on their ethnicity. These data also only reflect these three PHNs within Vic., and uptake may vary considerably in other regions, emphasising the need for improved data on viral hepatitis testing and management in primary care settings across Australia.

Figure C.3: Proportion of active adult patients* in population level analysis and reporting (POLAR) practices who had evidence of testing for hepatitis B/C^ (%), by category and subcategory



Data source: analysis of medical record data from the POLAR network of 435 primary care practices in Vic.

* Patients aged ≥ 18 who attended the practice at least three times in the past two years.

^ Testing for hepatitis B or C represents a record of a test for hepatitis serology in the available pathology records.

APRI, aspartate aminotransferase (AST) to platelet ratio index. MAFLD, metabolic associated fatty liver disease. ALT, alanine aminotransferase. HIV, human immunodeficiency virus.

Elevated alanine transaminase threshold used was ≥ 30 for women and ≥ 45 for men. See Methods for description of source for indications.

SECTION C3: LIVER CANCER

LIVER CANCER IN AUSTRALIA

Liver cancer is the fastest-increasing cause of cancer death in Australia, and most cases are preventable and linked to identifiable risk factors.²⁵ This makes assessment of geographic variations in incidence particularly important, as it can identify regions where the burden of diseases is especially high and prevention activities should be prioritised. These factors include CHB and CHC, which together are the predominant cause of liver cancer in Australia, as well as alcohol consumption, smoking and obesity, which all contribute to the incidence of liver cancer.^{26, 27} Previous analyses have demonstrated the strong geographic pattern of liver cancer incidence,²⁸ and data on incidence compared to these risk factors were explored in the National Viral Hepatitis Mapping Report 2017.²⁹ In this iteration of the report, this analysis has been updated with new liver cancer incidence data to 2016, courtesy of the Australian Cancer Atlas.

AUSTRALIAN CANCER ATLAS

The Australian Cancer Atlas is a collaborative project, led by Cancer Council Queensland, Queensland University of Technology, and Frontier SI, which aims to provide a national perspective of how the burden of cancer varies by geographical area. It draws source data from each state and territory cancer registry, which collect all cancer diagnoses through mandatory reporting requirements. It uses spatial models to generate 'smoothed' estimates at the Statistical Area 2 (SA2) level to assess variation from the national average, and quantifies the certainty of these estimates. These models allow highly granular and robust measurement of variation in cancer incidence and survival, while preserving confidentiality of the data. The primary aim of the Australian Cancer Atlas was to provide a national perspective of how the burden of cancer varies by geographic area.

Permission has been given for the use of modelled estimates for liver cancer incidence from the Australian Cancer Atlas in this Report. For more detail on the Australian Cancer Atlas and to interact with the online mapping, visit atlas.cancer.org.au. In this report, we assessed the proportion of SA2s which had an above-average incidence rate of liver cancer in each SA3 and PHN, using a 60% probability cut-off for inclusion, as this suggests the area is genuinely above the Australian average (see [Section D – Data sources and methodology](#)).

VARIATION IN LIVER CANCER INCIDENCE ACROSS AUSTRALIA

Liver cancer incidence in Australia varied widely according to region, and in some areas reached more than three times the overall national incidence rate. Overall in Australia, 18.7% of SA2s are estimated to have a liver cancer rate that is genuinely above the national average. As shown in Figure C.4, in the **North Western Melbourne, Northern Territory, South Western Sydney, Central and Eastern Sydney**, and **Western Sydney** PHNs, the majority of SA2s had liver cancer rates above average. In **South Eastern Melbourne, Western Queensland, Adelaide**, and **Hunter New England and Central Coast**, the proportion of elevated-incidence SA2s was also above the national average of 18.7%.

All five PHNs where liver cancer rates are highest had above-average prevalence of CHB (**North Western Melbourne** and **Western Sydney**) or both CHB and CHC (**Northern Territory, Central and Eastern Sydney**, and **South Western Sydney**).

The heat map below (Table C.1) shows the distribution of liver cancer rates by PHN in relation to prevalence of CHB and CHC, as well as other risk factors for liver cancer. A correlation can be seen between liver cancer and CHB prevalence, with the five PHNs that had the highest proportion of high-incidence SA2s also ranking highest for CHB prevalence. This association is influenced by the

population distribution of people living with CHB, given that people born overseas in countries with high prevalence of CHB most often live in particular regions of capital cities such as Sydney and Melbourne. In addition, Aboriginal and Torres Strait Islander people are more likely than non-Indigenous people to be living in outer regional and remote parts of jurisdictions such as SA, the NT, Qld and WA. In contrast, the prevalence of CHC is more evenly distributed according to region, and there are fewer regions of very high CHC prevalence.

Table C.1: Heat map of liver cancer incidence and related factors in Australia, by PHN

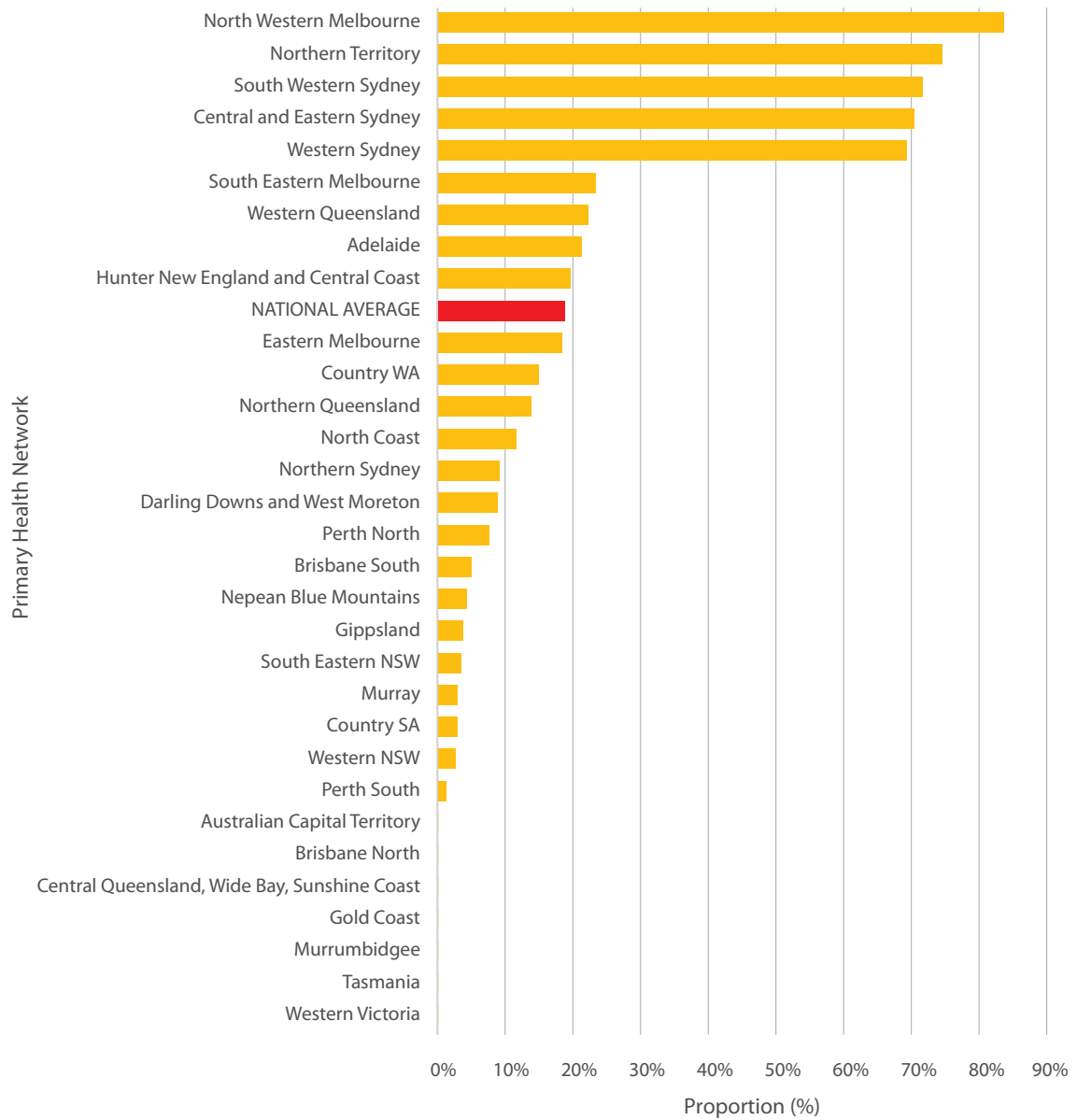
PHN	LIVER CANCER: Proportion of SA2s where rate was above average	CHB: Proportion of the population living with CHB	CHC: Proportion of the population living with CHC	OBESITY: Proportion of the adult population who were obese	SMOKING: Proportion of the adult population who were current smokers	ALCOHOL: Proportion of the adult population who consumed of ≥ 2 alcoholic drinks per day
NATIONAL AVERAGE	18.7%	0.86%	0.78%	32.0	15.7	16.8
North Western Melbourne	83.8%	1.23%	0.72%	32.7	16.2	11.1
Northern Territory	74.6%	1.84%	1.54%	29.3	21.1	21.0
South Western Sydney	71.7%	1.33%	0.83%	33.3	15.7	10.6
Central and Eastern Sydney	70.5%	1.33%	0.91%	24.3	12.3	14.3
Western Sydney	69.4%	1.25%	0.67%	28.9	12.8	8.3
South Eastern Melbourne	23.3%	0.93%	0.67%	28.7	14.6	14.4
Western Queensland	22.2%	0.96%	1.28%	*	*	*
Adelaide	21.3%	0.74%	0.50%	31.3	14.5	13.8
Hunter New England and Central Coast	19.6%	0.52%	0.91%	37.5	18.1	19.5
Eastern Melbourne	18.3%	1.13%	0.44%	26.7	12.4	13.9
Country WA	14.9%	1.04%	0.95%	32.8	19.9	23.7
Northern Queensland	13.7%	0.74%	1.09%	36.2	19.7	23.0
North Coast	11.6%	0.51%	1.28%	35.1	17.4	20.0
Northern Sydney	9.1%	1.14%	0.36%	20.1	7.9	16.6
Darling Downs and West Moreton	8.8%	0.53%	0.95%	37.4	17.7	17.2

PHN	LIVER CANCER: Proportion of SA2s where rate was above average	CHB: Proportion of the population living with CHB	CHC: Proportion of the population living with CHC	OBESITY: Proportion of the adult population who were obese	SMOKING: Proportion of the adult population who were current smokers	ALCOHOL: Proportion of the adult population who consumed of ≥ 2 alcoholic drinks per day
Perth North	7.6%	0.85%	0.66%	27.0	12.5	16.9
Brisbane South	4.9%	0.89%	0.81%	31.1	14.2	15.3
Nepean Blue Mountains	4.2%	0.57%	0.80%	36.2	15.7	16.8
Gippsland	3.7%	0.47%	0.80%	38.2	20.3	19.7
South Eastern NSW	3.4%	0.56%	0.96%	35.0	16.2	18.1
Murray	2.9%	0.50%	0.80%	38.0	19.4	19.0
Country SA	2.8%	0.42%	0.55%	36.5	17.8	19.2
Western NSW	2.6%	0.68%	1.38%	42.5	19.6	21.0
Perth South	1.2%	0.84%	0.68%	28.7	14.0	16.0
Australian Capital Territory	0.0%	0.74%	0.69%	28.6	10.1	15.0
Brisbane North	0.0%	0.61%	0.83%	30.9	13.2	17.1
Central Qld, Wide Bay, Sunshine Coast	0.0%	0.44%	0.87%	32.7	17.6	19.5
Gold Coast	0.0%	0.61%	0.88%	30.4	16.3	18.8
Murrumbidgee	0.0%	0.57%	1.13%	36.1	17.9	20.4
Tasmania	0.0%	0.28%	0.85%	33.6	17.9	19.0
Western Victoria	0.0%	0.49%	0.67%	36.1	18.4	18.7

Legend: Green denotes lowest proportion, with a colour gradient through to red denoting highest proportion.

Data source: Cancer data based on modelled estimates from the Australian Cancer Atlas. CHB prevalence estimates based on mathematical modelling incorporating population-specific prevalence and ABS population data. CHC prevalence estimates based on published national estimates and notifications distribution. Smoking, obesity, and alcohol use sourced from the Social Health Atlas produced by the Public Health Information Data Unit, and represent modelled estimates for 2018–19. * Note: Western Queensland data not available due to low numbers.

Figure C.4: Proportion of SA2s where the rate of liver cancer was above the Australian average by PHN, 2007–2016



Data source: Cancer data based on modelled estimates from the Australian Cancer Atlas.

[\(link to data for this figure\)](#)

SECTION D: DATA SOURCES AND METHODOLOGY

If you have questions regarding methodology, data sources, or findings of the Mapping Report, please visit our [FAQ page](#). If you have further queries or would like to provide feedback, please contact jennifer.maclachlan@mh.org.au.

Table D.1a: Hepatitis B: summary of data sources

Indicator	Method of estimation	Source	Basis of geographic data
CHB prevalence	Calculated using prevalence data according to population group (e.g. country of birth)	Published seroprevalence surveys and 2016 Census data according to population	Postcode of residence when a person completed the 2016 Census
CHB prevalence in Aboriginal and Torres Strait Islander people	Calculated using seroprevalence study data according to state/territory, supplemented with notifications data	Published seroprevalence surveys, 2016 Census data according to population, and NNDSS data	Postcode of residence when a person completed the 2016 Census
CHB treatment	Number of individuals prescribed antiviral medications indicated for hepatitis B (adefovir, entecavir, lamivudine, pegylated interferon alfa-2a, or tenofovir)	PBS data	Postcode of residence when a person was prescribed treatment (as recorded in Medicare data)
CHB monitoring	Number of individuals who received a viral load test during the specified time period	MBS data	Postcode of residence when provided with a test (as recorded in Medicare data)
Recent CHB monitoring	Number of individuals provided with monitoring at least once during the past five years	MBS data	Postcode of residence when provided with a test (as recorded in Medicare data)
Regular CHB monitoring	Number of individuals provided with monitoring at least four times during the past five years (approximately once per year)	MBS data	Postcode of residence when provided with a test (as recorded in Medicare data)
CHB care (treatment or monitoring)	Number of individuals who either received treatment or were provided with monitoring in the last year	MBS data	Postcode of residence when provided with a test or treatment (as recorded in Medicare data)
Hepatitis B immunisation	Proportion of children fully immunised for hepatitis B (doses at two, four and six months) at one year of age	Australian Immunisation Register data	Postcode of residence for the child at one year of age

NNDSS, National Notifiable Diseases Surveillance System. MBS, Medicare Benefits Schedule. PBS, Pharmaceutical Benefits Scheme.

Table D.1b: Hepatitis C: summary of data sources

Indicator	Method of estimation	Source	Basis of geographic data
CHC prevalence, start of 2016	Calculated by applying national prevalence data proportionally to geographic areas according to the distribution of notified cases	Published national prevalence data and NNDSS data (for the period 2007–2016)	Postcode of residence when the person tested positive for hepatitis C
CHC treatment	Number of individuals prescribed DAA medications indicated for hepatitis C during the period March 2016 – December 2020	PBS data	Postcode of residence when a person was first prescribed treatment (as recorded in Medicare data)
SVR test	Number of individuals who received a hepatitis C PCR test after they finished their treatment*	MBS data	Postcode of residence when a person was tested (as recorded in Medicare data)

* Only people from the Medicare data who both completed their course of treatment and had at least one year of follow-up time were included in this measure, to ensure sufficient time had passed for them to receive an SVR test; the measure covers treatments initiated from March 2016 to December 2019.

NNDSS, National Notifiable Diseases Surveillance System. DAA, direct-acting antiviral. MBS, Medicare Benefits Schedule. PBS, Pharmaceutical Benefits Scheme. PCR, polymerase chain reaction. SVR, sustained virological response..

Table D.1c: Screening and liver cancer: summary of data sources

Indicator	Method of estimation	Source	Basis of geographic data
Liver cancer above average	In each PHN or SA3, the proportion of SA2 regions where the incidence rate of liver cancer was “genuinely” [^] above the national average	Australian Cancer Atlas, a statistical model of cancer incidence based on data from cancer registries	Where a person was living when they were diagnosed with cancer
Number of hepatitis serology items	Number of items for hepatitis serology testing items provided through Medicare	MBS	State/territory of residence when a person was tested (as recorded in Medicare data)
Testing for viral hepatitis in primary care	Medical record indicates history of hepatitis serology pathology test had been ordered	POLAR GP network	Not applicable; data are reported only as overall uptake figures for the three Victorian PHNs included in the network (Gippsland, Eastern Melbourne, South Eastern Melbourne).

[^] Thresholds for average based on 95% confidence intervals.

PHN, Primary Health Network. SA, Statistical Area. MBS, Medicare Benefits Schedule. POLAR, Population Level Analysis and Reporting. GP, general practitioner.

Table D.2: Common data terms

Term	Definition
Provider type	Practitioner category of doctor prescribing treatment or ordering a test, as derived by Medicare based on the practitioner's service history. Broad groups were GP, specialist, and other (includes nurse practitioner, temporary resident doctor, locum relief doctor and others not able to be classified as GP or specialist).
PHN (Primary Health Network)	Geographic area derived as part of the national health reform agenda; populations usually range between 60,000 and 1.7 million residents. There are 31 PHNs in Australia.
SA3 (Statistical Area 3)	Geographic area defined by the Australian Bureau of Statistics; populations usually range between 30,000 and 130,000 residents. There are 324 residential SA3s in Australia and each PHN contains multiple SA3s. This report used 2011 SA3 boundaries to ensure concordance across data sources.
CHB prevalence/CHC prevalence	Proportion of the total population living with chronic hepatitis B/chronic hepatitis C. Calculated by dividing estimated number living with chronic hepatitis B/chronic hepatitis C by the total population.
Remoteness area	Geographic area defined by the ABS based on measures of relative access to services; categories are major cities, inner regional, outer regional, remote and very remote.
Data suppression	Data are not reported when the number of individuals is fewer than six. Suppression is to protect individuals' confidentiality, in accordance with data access agreements. Data are also suppressed when the number of people is so low that it reduces the reliability of estimates, and when treatment uptake is estimated to be above 90%.

DETAILED STATISTICAL METHODOLOGY

Hepatitis B prevalence

DATA SOURCES

- Mathematical model of hepatitis B in Australia
- Census data according to country of birth and Aboriginal and Torres Strait Islander status
- Published estimates of seroprevalence

DETAILS

Prevalence model

The overall number of people living with CHB in Australia and in each state and territory was estimated using a deterministic compartmental mathematical model of HBV infection in the Australian population from 1951 to 2050, which incorporates existing mathematical models, surveillance notifications, epidemiological research, clinical studies and demographic and mortality data.³⁰ Further information regarding the model can be found in the associated paper³⁰ and report.²

The number of people living with CHB in each region is modelled based on the distribution of priority populations in that region, namely people born overseas and Aboriginal and Torres Strait Islander people. Although men who have sex with men and people who inject drugs are also priority populations for CHB, region-specific estimates for these populations are not available, and they are apportioned in each region using the national model. Further detail regarding population prevalence estimates among these groups, and more specific methodology, can be found in the associated publication.³¹

The number of people living with CHB born in each country (including Australia) are derived using local antenatal seroprevalence data,^{4, 32, 33} which were adjusted upwards to correct for the discrepancy in CHB prevalence by sex, according to the differential between men and women observed in published serosurveys.³⁴ Prevalence estimates for countries for which data were not available from local source estimates were generated from global systematic review papers.^{35, 36} These prevalence data were combined with data according to country of birth obtained from the 2016 Census. These data were extracted at the level of postcode and then assigned to each remoteness area, SA3 and PHN using the postcode of residence and concordances published by the ABS³⁷ and the Department of Health.³⁸ This ensured consistency with other measures (such as notifications) which use postcode to derive geography. Census-based estimates were adjusted to reflect the 2018 population using the ABS data regarding Estimated Resident Population according to SA3.

Prevalence data for Aboriginal and Torres Strait Islander people are also derived predominately using antenatal seroprevalence data, which were available according to birth cohort and remoteness area of residence for several states and territories.^{3, 39, 40} For jurisdictions with no seroprevalence data, notifications data were used to estimate differential prevalence according to region. These were sourced from the National Notifiable Diseases Surveillance System (NNDSS; more information about notifications data can be found under *Hepatitis C prevalence*, below). The remoteness classifications used were established by the ABS, and are based on measures of relative access to services. Specific Aboriginal and Torres Strait Islander population data are available from the ABS for each of these regions.⁴¹ These data sources were combined to generate tailored figures for estimated hepatitis B prevalence in each rurality classification, within each state/territory. These data are available in the *Viral Hepatitis Mapping Project National Report 2017*, and will be comprehensively revised with new data from the 2021 Census, available in 2022.

Differentiation of priority populations

Estimates according to priority population are derived as described above in the *Prevalence model* section, using a combination of population and prevalence data. Although individuals may belong to more than one of the priority groups used to calculate prevalence, these estimates indicate the most relevant risk factor for each individual. For example, prevalence estimates for people born overseas and Aboriginal and Torres Strait Islander people will likely include a proportion of people who acquired their infection through injecting drug use or through sexual transmission. However, given the far greater risk of chronic infection associated with mother to child transmission, their country of birth or Indigenous status is considered to be the more relevant characteristic for the purposes of identifying priority populations. Furthermore, the available estimates are not sufficiently detailed to allow calculation of these crossover subgroups. For the purposes of deriving these estimates, people born overseas and Aboriginal and Torres Strait Islander people are considered mutually exclusive.

Hepatitis B proportion diagnosed

DATA SOURCES

- Mathematical model incorporating hepatitis B prevalence
- Notifications from the NNDSS

DETAILS

The proportion of people living with CHB who had been diagnosed was estimated using model-derived estimates of the total number of people who had ever had CHB in Australia as the denominator, and the cumulative number of notifications of CHB from 1971 to 2020 as the numerator. Mortality was not included in the model, therefore the proportion derived represents people ever having lived with CHB who have ever been diagnosed. More information on source information and methodology can be found in the referenced publication³⁰ and report.²

Hepatitis C prevalence

DATA SOURCES

- Published estimates of national prevalence
- Notifications from the NNDSS

DETAILS

Estimates of the number of people living with CHC and the population prevalence were derived by applying published national prevalence estimates⁴² to each geographic area proportionally, according to the distribution of diagnosed cases reported to the NNDSS. All positive diagnoses of hepatitis C (defined as a positive HCV antibody **or** positive HCV nucleic acid test result) are legally required to be reported to jurisdictional departments of health by the diagnosing laboratory, and are collated and published by the NNDSS. Notifications are de-duplicated by jurisdictions, and the aim is to record only one positive diagnosis per individual per state or territory. However, duplicates may exist if individuals have been diagnosed in multiple jurisdictions. Use of these data was approved by the Department of Health and the Communicable Diseases Network of Australia.

Due to the inclusion of antibody-positive cases as notifications, the data used are likely to have included a proportion of people who had previously been infected but did not have active infection at the time of testing. However, the denominator data used, and therefore the prevalence data generated, only include people living with chronic infection.

Data were provided according to postcode, and were assigned to each remoteness area, SA3 and PHN using the concordances published by the ABS³⁷ and the Department of Health.³⁸ Cases in which the postcode was unknown but the jurisdiction was provided were distributed proportionally to each region across each jurisdiction. All estimates were based on diagnosed cases which occurred during the period 2007 to 2016, but sensitivity analyses were conducted to assess the effect of different years of source data (the periods 1997–2016 and 2016 only), and the 10-year period was then selected as the most representative (see Viral Hepatitis Mapping Project National Report 2017, *Section D: Data sources and methodology* for further detail).

CORRECTIONAL FACILITY ADJUSTMENTS

The number of hepatitis C notifications is disproportionately concentrated in some geographic regions due to the presence of correctional facilities, which often have high rates both of CHC and of screening, leading to a large number of infections detected each year. Data which allowed assessment of the effect of correctional facilities on the overall number of notifications in a given area, through the collection of a correctional facility status variable, were readily available from jurisdictional departments of health in Vic. and Qld. Data were requested that provided the proportions of hepatitis C notifications from correctional facilities in each region. When the data indicated that more than 50% of notifications originated from a correctional facility, prevalence calculations for hepatitis C were adjusted, so that notifications by correctional facilities were excluded from the data for that region and redistributed across the rest of the state or territory.

Adjustments were applied to selected regions in NSW, the NT, SA, Tas. and WA and were identified using Census data that indicated the presence of correctional facilities⁴³ and outliers in hepatitis C notification rates. These SA3s where adjustment was applied are indicated in Tables B.7–B.14.

Hepatitis B and C testing, treatment and care

DATA SOURCE

- Medicare Benefits Schedule records
- Pharmaceutical Benefits Scheme records

DETAILS

These sources include all services provided through Australia's national subsidised health care system, Medicare. Data were provided regarding the period 1 January 2014 to 31 December 2020. Analysis of hepatitis B treatment and care uptake is done for each year, while hepatitis C treatment uptake is measured cumulatively as the total proportion of people treated of those living with hepatitis C at the start of 2016.

Regions of residence were assigned by the Department of Human Services according to SA3, derived from Medicare data using the postcode of residence for the individual at the time of the prescription dispensing or service provision. Data were assigned to each SA3 using the concordances published by the ABS.^{37, 44, 45} These SA3s were then assigned to each remoteness area and PHN using the postcode of residence and concordances published by the ABS³⁷ and the Department of Health.³⁸ These residential details depend on individuals updating their information with Medicare, so they may not have been up to date for all individuals. All time periods are based on the date of service, which represents the date the patient was supplied with their medication by a pharmacy or the date a test was performed.

These data do not include services that were not provided by Medicare, such as those paid for by individual patients, or subsidised by state government services. Previous analyses and comparison with other source data demonstrated that the vast majority of testing and treatment services for patients with hepatitis B and C are provided through Medicare and included in these estimates;³¹ however, in 2019, the number of MBS services for hepatitis B viral load tests declined rapidly in SA, raising the possibility that a significant proportion of tests have not been counted in these data. This issue will be explored further in future reports.

The data do not include pharmaceutical company compassionate-access programs or clinical trials, but access to hepatitis C treatment through these channels will mostly have been limited to the period before the listing of DAAs on the PBS in March 2016, which is not assessed in this report.

Provider type

The provider type used by Medicare is a derived designation, based on a practitioner's service history, and broadly grouped as GP, specialist or 'other' (which includes nurse practitioners, temporary resident doctors, locum relief doctors and others not able to be classified as either GP or specialist). Practitioners in training were categorised into their prospective occupational categories (for example, specialist trainees were classified as specialists rather than as 'other').

For hepatitis C, the provider type is designated using the provider who prescribed the first treatment script of a person's course. For hepatitis B, two measures were used: GP only, where all treatment scripts in a given year were prescribed by a GP, and shared care, where both a GP and another provider (specialist or other provider) prescribed treatment scripts during the given year. These two groups are combined to assess the total proportion where a GP was involved in treatment prescribing, i.e. prescribed one or more of the scripts.

Treatment

Treatment data for CHB represent the number of individuals prescribed any drug listed on the PBS⁴⁶ for the treatment of CHB (adefovir, entecavir, lamivudine, pegylated interferon alfa-2a, and tenofovir).

Treatment data for CHC represent the number of individuals prescribed any drug listed on the PBS⁴⁶ for the treatment of CHC during March 2016 to December 2020. These drugs and drug combinations

included daclatasvir +/- sofosbuvir; glecaprevir + pibrentasvir; grazopresvir + elbasvir +/- ribavirin; sofosbuvir +/- ledipasvir; sofosbuvir + ribavirin; paritaprevir + ritonavir + obmitasvir + dasabuvir +/- ribavirin; peginterferon alfa-2a or alfa-2b; and sofosbuvir + velpatasvir. Individuals treated multiple times were only counted once, to effectively measure overall uptake as a proportion of the number living with CHC.

Treatment uptake was derived by dividing the number of people receiving treatment by the total estimated population living with CHB or CHC in a given geographic area (see Hepatitis B prevalence and Hepatitis C prevalence sections for detail).

Hepatitis C SVR testing

Estimates of SVR testing uptake were generated by calculating the proportion of people who had a qualitative or quantitative hepatitis C PCR test (any of the MBS items 69445, 69451, 69488, 69489, 69499, 69500) after treatment. This analysis was restricted to those who completed their treatment course and had sufficient follow-up time. Treatment completion was defined as collecting the total number of scripts specified in the item prescribed (for example, two scripts for an eight-week course of treatment). The date of the end of treatment was extrapolated from the date of the last script collected. Sufficient follow-up time was determined to be one year, given that 90% of people who had an SVR test during the period of observation had their test within a year of completing treatment. No minimum time threshold was applied for the SVR test, due to the significant number of individuals who had an SVR test fewer than 12 weeks after completing treatment.

Hepatitis B monitoring and care

Hepatitis B monitoring is measured using viral load testing (MBS items 68482 and 69483), which is an essential component of the recommended care for people with CHB regardless of whether or not they are receiving treatment. Recent monitoring is defined as receiving a viral load test at any point in the last five years, while regular monitoring is defined as receiving more than four viral load tests in the past five years (equating to one viral load test every 1.3 years, to account for variation in the timing of recommended annual viral load testing). Both these measures include people who are receiving treatment as well as people who are not receiving treatment.

The third measure of hepatitis B monitoring is the 'in care' indicator, which is defined as receiving either treatment or a viral load test in the past 12 months. This indicator includes viral load tests only for people who have not been prescribed any hepatitis B treatment in the past 12 months. These measures are all summarised in Table C.1.

The proportion of people living with CHB who have ever received a viral load test was estimated using data derived from the Victorian Liver Cancer Prevention Linkage Study, which combines data from both MBS records and notifications data to identify the service history of all people ever diagnosed with CHB in Vic. The proportion of the cohort population who had ever received a viral load was adjusted to account for the undiagnosed population, as well as to account for undercounting of unlinked individuals.

Hepatitis B projections

Future projections for hepatitis B at the national and state/territory level were derived from the National Hepatitis B Indicators Report 2020.² These projections incorporate population, demographic, migration, vaccine uptake, and mortality data. Estimates of treatment and care uptake in 2022 by PHN were based on the average national change in uptake for these indicators, as trends by each PHN are highly variable. Due to the extremely high uncertainty in future total population, CHB prevalence, and treatment and care uptake trends, PHN-level projections beyond 2022 were not generated in this report.

Hepatitis C projections

Future projections for hepatitis C were generated based on historical trends, for Australia overall, and tailored for each state and territory and each PHN. Previous uptake projections in the Mapping Report 2018–19 used the past year's trend as an indication of future uptake; however, the abnormal trends occurring in 2020 limit the validity of this method. In this report projections were modelled using the average yearly reduction in uptake during 2016–2020. Plausible ranges were generated using the maximum and minimum yearly reduction in uptake. These scenarios are described and shown graphically in the body of the report. In each state and territory, and in each PHN, the same approach was used, meaning each region's projection relies on past trends as plausible ranges. In all scenarios, treatment was projected to plateau from 2022 onwards. These projections estimate progress towards the Australian National Strategy target of 65% uptake by 2022 and the WHO Global Health Sector Strategy target of 80% uptake by 2030 (although using 2016 as the baseline year rather than 2015, due to the timing of DAA availability in Australia).

As with overall treatment uptake, the number of people living with CHC at the start of 2016 was used as the denominator.

Immunisation coverage

DATA SOURCE

Australian Immunisation Register (AIR)

DETAILS

The immunisation schedule for hepatitis B includes three doses of vaccine at two, four and six months, and the AIR records data regarding what proportion of children received complete immunisation by the age of 12 months. The AIR is a national register that includes all children registered with Medicare, and coverage is estimated to be 99% of all Australian children.

Publicly available data were obtained for coverage according to state and territory and PHN for all children and for Aboriginal and Torres Strait Islander children, for 2019 and 2020.

Viral hepatitis serology testing – national, state and territory trends

DATA SOURCE

Aggregated MBS records

DETAILS

Data were extracted from the publicly available data reported by the Department of Human Services regarding MBS items 69475, 69478, and 69481, which provide for hepatitis serology testing (hepatitis A–E included, but predominantly hepatitis B and C). The items provide for one, two or three hepatitis serology tests, respectively. The aggregate number of items provided through the MBS was assessed for each month from January 2017 to December 2020, with a focus on the time period of April 2020 onwards, representing the start of the first widespread social distancing and travel restrictions due to COVID-19 in Australia. The proportional decline was calculated during this period and for 2020 compared to 2019, as well as the expected number for 2020 based on linear projection of the trend observed during 2017 to 2019.

Data were extracted for each state and territory, and analysed as rates per 1,000 population using Australian Bureau of Statistics Estimated Resident Population by quarter for the period January 2019 to December 2020.

Unlike other estimates presented in this report derived from Medicare data, these data are not disaggregated to the individual level, and so may represent the same individual tested multiple times.

Trends in serology testing were contextualised using unspecified (chronic) hepatitis B and C notification rates by state and territory, extracted from the publicly available data provided by the NNDSS.

Viral hepatitis serological testing – guideline-based screening in primary care

DATA SOURCE

Medical records extracted by the POLAR network from GP practices across Vic.

DETAILS

This analysis was conducted on a dataset comprising routinely collected primary care patient records, extracted on 20th February 2020 from the POLAR program for general practice. Ethics approval for the extraction and use of data by POLAR was obtained from the Royal Australian College of General Practitioners Human Research Ethics Committee (National Research and Evaluation Ethics Committee 17-008), and the use of the data in this analysis specifically was approved by Melbourne Health Human Research Ethics Committee (QA2019074).

The analysis included 1.67 million active adult patients, who were ≥ 18 years of age at the time of data extraction with three or more encounters with the practice in the past two years. Pathology data were available for seven years prior to the date of extraction (01 January 2013 to 19 February 2020) and included all tests requested through the practice. A patient was considered to have been screened for viral hepatitis if they had a record of a test request that included hepatitis serology.

The analysis used Australia's National Hepatitis B and C Testing Policies^{23,24} supplemented with other national guidelines⁵ to identify demographic and clinical characteristics that indicate a patient is at higher risk of having CHB and/or CHC and/or experiencing adverse outcomes from infection, and therefore is recommended for testing. These characteristics fall into four major categories: Indigenous status/cultural background; HIV status; liver disease status; and injecting drug use status. Screening groups were not mutually exclusive, and patient who met more than one of the screening categories was included separately in each category.

Screening indications were largely based on recorded diagnoses; however, in the case of ethnicity and injecting drug use, other fields were parsed to identify patients recommended for screening.

Ethnicities recommended for screening for hepatitis B and C were derived from the ethnicity field, using data from the most recent Australian Bureau of Statistics Census of Population and Housing in 2016^{41,47} correlating ethnicity and country of birth. CHB prevalence according to country of birth was derived from seroprevalence studies in accordance with the methodology used in previous studies,^{4,47,48} while the list of countries of birth eligible for screening for CHC was derived using Australian clinical guidelines.⁴⁹

Injecting drug use history is not a standard variable collected in primary care data, and was derived from a combination of diagnoses and prescriptions data. The categories used were: *patients with a diagnosed history of injecting drug use*; *patients with a diagnosed history of potentially injecting drug use*, which included those with a diagnosis of use of drugs which are associated with injecting; *patients with a history of prescribed opiate substitution therapy* i.e. methadone and/or buprenorphine (non-patch form); and *patients with a history of other drug use*, which included terms such as "narcotic drug user" or "drug dependence".

Cirrhosis symptoms included ascites, hepatic encephalopathy, hepatic failure, jaundice (excluding neonatal jaundice), hepatosplenomegaly, varices, portal hypertension, spider naevi, or splenomegaly, while the threshold for elevated alanine transaminase (ALT) used was approximately 1.5 times the upper limit of normal, ≥ 30 among women and ≥ 45 among men. *Other non-cirrhosis liver disease* included patients with a diagnosis which indicated liver disease but not specifically cirrhosis, using terms such as 'liver disease' or 'abnormal liver function'.

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DATA TABLES TO ACCOMPANY FIGURES

Figure A.1. CHB cascade of care, Australia, 2020

Cascade category	Number of people	Proportion of total living with CHB
Living with chronic hepatitis B infection	222,559	
Diagnosed	162,480	73.0%
Undiagnosed	60,079	27.0%
Engaged in care	50,229	22.5%
Not in care	172,330	27.0%
Need treatment	44,512	20.0%
Receiving treatment	23,787	10.7%
Not receiving treatment	20,725	9.3%

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Figure A.2. CHB prevalence by PHN, 2020

Primary Health Network	Proportion of the population living with CHB, 2020 (%)
Northern Territory	1.84%
South Western Sydney	1.33%
Central and Eastern Sydney	1.33%
Western Sydney	1.25%
North Western Melbourne	1.23%
Northern Sydney	1.14%
Eastern Melbourne	1.13%
Country WA	1.04%
Western Queensland	0.96%
South Eastern Melbourne	0.93%
Brisbane South	0.89%
NATIONAL AVERAGE	0.86%
Perth North	0.85%
Perth South	0.84%
Australian Capital Territory	0.74%
Adelaide	0.74%
Northern Queensland	0.74%
Western NSW	0.68%
Brisbane North	0.61%
Gold Coast	0.61%
Nepean Blue Mountains	0.57%
Murrumbidgee	0.57%
South Eastern NSW	0.56%
Darling Downs and West Moreton	0.53%
Hunter New England and Central Coast	0.52%
North Coast	0.51%
Murray	0.50%
Western Victoria	0.49%
Gippsland	0.47%
Central Queensland, Wide Bay, Sunshine Coast	0.44%
Country SA	0.42%
Tasmania	0.28%

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Figure A.5. Proportion of people living with CHB according to priority population, by PHN, ordered by CHB prevalence, 2020

Primary Health Network and CHB prevalence	Proportion Aboriginal and/or Torres Strait Islander people	Proportion People born overseas	Proportion Australian-born non-Indigenous people
Northern Territory (1.84%)	70.6%	20.0%	9.3%
Central and Eastern Sydney (1.37%)	0.6%	84.6%	14.8%
South Western Sydney (1.33%)	1.3%	83.5%	15.2%
Western Sydney (1.24%)	0.9%	83.9%	15.2%
North Western Melbourne (1.21%)	0.4%	82.6%	17.0%
Eastern Melbourne (1.14%)	0.4%	79.5%	20.2%
Northern Sydney (1.14%)	0.3%	81.2%	18.5%
Country WA (1.06%)	56.9%	21.3%	21.8%
Western Queensland (1.01%)	66.2%	13.9%	19.9%
South Eastern Melbourne (0.93%)	0.5%	75.3%	24.2%
Brisbane South (0.89%)	3.6%	74.6%	21.8%
NATIONAL AVERAGE	7.5%	66.8%	25.7%
Perth North (0.85%)	44.1%	27.6%	28.3%
Perth South (0.83%)	2.2%	73.4%	24.4%
Northern Queensland (0.75%)	3.0%	72.2%	24.8%
Australian Capital Territory (0.74%)	1.4%	72.0%	26.6%
Adelaide (0.75%)	3.3%	69.7%	27.0%
Western NSW (0.69%)	47.4%	14.6%	38.1%
Brisbane North (0.61%)	4.8%	61.0%	34.3%
Gold Coast (0.60%)	4.0%	63.0%	33.1%
Murrumbidgee (0.58%)	21.5%	28.9%	49.6%
Nepean Blue Mountains (0.57%)	5.8%	50.7%	43.5%
South Eastern NSW (0.56%)	9.8%	44.7%	45.5%
Darling Downs and West Moreton (0.52%)	12.7%	43.8%	43.5%
Hunter New England and Central Coast (0.52%)	17.3%	31.1%	51.7%
North Coast (0.52%)	19.8%	27.8%	52.3%
Murray (0.51%)	5.1%	36.0%	58.9%
Western Victoria (0.49%)	2.4%	38.2%	59.4%
Gippsland (0.47%)	3.3%	34.1%	62.6%
Central Queensland, Wide Bay, Sunshine Coast (0.44%)	9.5%	38.0%	52.5%
Country SA (0.42%)	14.8%	29.3%	55.9%
Tasmania (0.28%)	7.7%	38.2%	54.1%

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Figure A.10. Proportion of individuals with a GP involved in treatment prescribing, 2016-2020

State/territory	2016	2017	2018	2019	2020
ACT	12.0%	11.8%	16.4%	17.3%	21.9%
NSW	14.3%	15.5%	15.9%	15.1%	17.7%
NT	33.5%	37.4%	52.3%	53.4%	42.3%
Qld.	32.9%	32.0%	32.1%	34.3%	36.1%
SA	15.7%	19.9%	21.5%	22.7%	24.6%
Tas.	22.8%	32.2%	32.1%	30.2%	26.6%
Vic.	15.1%	16.2%	16.8%	18.7%	20.8%
WA	24.5%	26.8%	27.1%	28.6%	34.5%
NATIONAL AVERAGE	17.3%	18.7%	19.6%	20.3%	22.8%

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Figure A.11. Proportion of individuals with a GP involved in treatment prescribing, by PHN, 2016-2020

PHN	GP only prescribing	Shared prescribing (GP and specialist or other provider)	Total with a GP involved
Northern Queensland	33.6%	22.0%	55.6%
Western Queensland	44.4%	11.1%	55.6%
Country WA	23.0%	20.9%	43.9%
Darling Downs and West Moreton	20.0%	22.9%	42.9%
Northern Territory	20.8%	21.5%	42.3%
Murrumbidgee	11.6%	25.6%	37.2%
Country SA	20.3%	16.5%	36.7%
Perth North	16.0%	20.6%	36.6%
Western NSW	17.6%	18.7%	36.3%
Gold Coast	15.1%	20.4%	35.5%
Gippsland	20.5%	13.7%	34.2%
Brisbane South	14.5%	19.2%	33.6%
Murray	13.1%	20.1%	33.2%
Brisbane North	14.3%	18.1%	32.4%
Western Victoria	14.2%	16.8%	31.0%
Perth South	14.7%	15.6%	30.3%
Central Queensland, Wide Bay, Sunshine Coast	16.0%	13.6%	29.6%
North Coast	13.5%	14.2%	27.7%
Tasmania	16.4%	10.2%	26.6%
Nepean Blue Mountains	15.6%	10.6%	26.3%
South Eastern NSW	12.6%	12.6%	25.1%
Adelaide	10.5%	13.1%	23.6%
NATIONAL AVERAGE	10.6%	12.2%	22.8%
North Western Melbourne	9.0%	13.4%	22.4%
Hunter New England and Central Coast	13.9%	8.4%	22.3%
Australian Capital Territory	10.2%	11.0%	21.2%
Eastern Melbourne	8.9%	12.0%	20.9%
Western Sydney	9.9%	10.5%	20.4%
Central and Eastern Sydney	9.0%	10.4%	19.4%
South Eastern Melbourne	6.5%	9.1%	15.6%
Northern Sydney	9.7%	5.9%	15.5%
South Western Sydney	5.4%	6.2%	11.6%

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Figure A.13 Number of people living with CHB in care and not in care, by PHN, ordered by proportional care uptake, 2020

PHN	In care	Not in care
South Western Sydney (37.9%)	5,101	8,369
Western Sydney (36.1%)	5,048	8,932
Brisbane South (30.7%)	3,097	6,981
Northern Sydney (30.5%)	3,241	7,399
Eastern Melbourne (27.4%)	5,012	13,254
Central and Eastern Sydney (26.1%)	5,873	16,640
Australian Capital Territory (25.7%)	825	2,386
South Eastern Melbourne (25.7%)	3,817	11,217
North Western Melbourne (25.3%)	5,951	17,595
Northern Territory (24.8%)	1,127	3,411
Adelaide (18.4%)	1,730	7,666
Nepean Blue Mountains (17.8%)	385	1,781
Tasmania (17.3%)	262	1,251
Northern Queensland (15.1%)	791	4,443
Murray (14.8%)	470	2,704
Brisbane North (14.8%)	1,039	5,997
Darling Downs and West Moreton (14.6%)	490	2,860
Gold Coast (13.3%)	530	3,441
South Eastern NSW (12.7%)	471	3,252
Perth North (12.5%)	1,176	8,262
Western Victoria (12.3%)	399	2,851
Perth South (11.8%)	1,021	7,624
Gippsland (11.6%)	158	1,204
North Coast (11.3%)	315	2,469
Western NSW (11.0%)	259	2,094
Central Queensland, Wide Bay, Sunshine Coast (10.7%)	416	3,459
Hunter New England and Central Coast (10.1%)	681	6,043
Country SA (8.9%)	188	1,923
Murrumbidgee (8.5%)	99	1,070
Western Queensland (5.4%)	24	419
Country WA (3.8%)	213	5,353

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Figure A.15. Proportion of CHB monitoring provided by a GP, 2020

PHN	Proportion GP monitoring
Northern Territory	80.4%
Country WA	74.3%
Perth South	70.0%
Northern Sydney	69.3%
Northern Queensland	67.9%
South Western Sydney	67.5%
Western Sydney	66.1%
Adelaide	65.6%
Perth North	65.5%
Brisbane South	62.9%
Central and Eastern Sydney	60.1%
Western Queensland	60.0%
NATIONAL AVERAGE	57.4%
Australian Capital Territory	54.1%
Country SA	54.1%
Darling Downs and West Moreton	54.0%
North Western Melbourne	53.4%
Gold Coast	49.8%
Western NSW	48.8%
Brisbane North	48.8%
Murrumbidgee	46.4%
South Eastern Melbourne	46.4%
Hunter New England and Central Coast	44.4%
North Coast	44.3%
Eastern Melbourne	43.8%
Nepean Blue Mountains	42.7%
Gippsland	42.4%
South Eastern NSW	36.0%
Murray	34.7%
Central Queensland, Wide Bay, Sunshine Coast	34.5%
Western Victoria	32.0%
Tasmania	30.6%

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Figure A.16. Hepatitis B immunisation coverage for 12-month-olds, among all children and among Aboriginal and Torres Strait Islander children, by PHN, 2020

PHN	Coverage in all children	Coverage in Aboriginal and Torres Strait Islander children
Western NSW	98.0%	95.7%
Murrumbidgee	97.1%	96.4%
Australian Capital Territory	96.9%	95.8%
Western Victoria	96.8%	97.3%
Hunter New England and Central Coast	96.5%	95.9%
Gippsland	96.1%	94.6%
Brisbane North	96.0%	95.4%
Nepean Blue Mountains	95.9%	95.4%
South Eastern NSW	95.9%	95.6%
Murray	95.9%	95.7%
Northern Sydney	95.9%	98.4%
Tasmania	95.8%	97.6%
Eastern Melbourne	95.7%	91.4%
Northern Territory	95.7%	94.7%
Adelaide	95.7%	91.9%
Central and Eastern Sydney	95.4%	93.3%
Brisbane South	95.4%	93.6%
NATIONAL AVERAGE	95.3%	94.1%
Northern Queensland	95.3%	93.5%
South Eastern Melbourne	95.3%	93.6%
Darling Downs and West Moreton	95.2%	94.9%
North Western Melbourne	95.2%	93.3%
Perth North	95.0%	87.1%
Perth South	94.9%	88.4%
Western Queensland	94.8%	91.2%
Western Sydney	94.7%	92.0%
South Western Sydney	94.5%	92.7%
Country WA	94.5%	92.8%
Country SA	94.5%	90.9%
Central Queensland and Sunshine Coast	93.9%	94.8%
Gold Coast	92.6%	90.9%
North Coast NSW	91.5%	94.2%

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Figure B.1. Estimated prevalence of CHC, by PHN, start of 2016

PHN	Proportion of the population living with CHC (%)
Northern Sydney	0.36%
Eastern Melbourne	0.44%
Adelaide	0.50%
Country SA	0.55%
Perth North	0.66%
Western Victoria	0.67%
South Eastern Melbourne	0.67%
Western Sydney	0.67%
Perth South	0.68%
Australian Capital Territory	0.69%
North Western Melbourne	0.72%
NATIONAL AVERAGE	0.78%
Nepean Blue Mountains	0.80%
Murray	0.80%
Gippsland	0.80%
Brisbane South	0.81%
Brisbane North	0.83%
South Western Sydney	0.83%
Tasmania	0.85%
Central Queensland, Wide Bay, Sunshine Coast	0.87%
Gold Coast	0.88%
Central and Eastern Sydney	0.91%
Hunter New England and Central Coast	0.91%
Darling Downs and West Moreton	0.95%
Country WA	0.95%
South Eastern NSW	0.96%
Northern Queensland	1.09%
Murrumbidgee	1.13%
Western Queensland	1.28%
North Coast	1.28%
Western NSW	1.38%
Northern Territory	1.54%

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Figure B.2. CHC treatment in Australia, by month, March 2016 to December 2020

Month	Number of people treated	Month	Number of people treated	Month	Number of people treated
Mar-16	5,009	Nov-17	1,755	Jul-19	977
Apr-16	4,629	Dec-17	1,238	Aug-19	952
May-16	4,355	Jan-18	1,159	Sep-19	873
Jun-16	3,679	Feb-18	1,386	Oct-19	946
Jul-16	2,961	Mar-18	1,392	Nov-19	933
Aug-16	3,036	Apr-18	1,197	Dec-19	782
Sep-16	2,742	May-18	1,407	Jan-20	648
Oct-16	2,154	Jun-18	1,250	Feb-20	794
Nov-16	2,254	Jul-18	1,339	Mar-20	715
Dec-16	1,684	Aug-18	1,466	Apr-20	674
Jan-17	1,551	Sep-18	1,292	May-20	686
Feb-17	2,008	Oct-18	1,297	Jun-20	752
Mar-17	2,125	Nov-18	1,274	Jul-20	738
Apr-17	1,427	Dec-18	950	Aug-20	681
May-17	1,925	Jan-19	805	Sep-20	669
Jun-17	1,852	Feb-19	1,054	Oct-20	649
Jul-17	1,621	Mar-19	1,116	Nov-20	651
Aug-17	2,157	Apr-19	931	Dec-20	483
Sep-17	1,910	May-19	1,145		
Oct-17	1,660	Jun-19	1,003		

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Figure B.3. Proportion of people living with CHC at the start of 2016 treated each year, by state/territory, 2016-2020

State/territory	2016 uptake	2017 uptake	2018 uptake	2019 uptake	2020 uptake
ACT	22.3%	9.6%	6.1%	4.8%	3.3%
NSW	17.0%	10.9%	7.8%	5.9%	4.2%
NT	8.9%	5.6%	2.9%	2.7%	1.4%
QLD	15.0%	9.5%	7.9%	6.2%	4.7%
SA	22.1%	14.8%	9.7%	6.6%	4.9%
TAS	15.8%	14.1%	8.6%	4.9%	4.0%
VIC	21.8%	13.3%	9.3%	6.8%	4.1%
WA	12.5%	11.0%	8.0%	6.0%	4.6%

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Figure B.5. CHC treatment uptake relative to number living with CHC, by PHN, ordered by proportional treatment uptake, end of 2020

PHN and treatment uptake	Total treated 2016-2020	Not yet treated
Western Queensland (21.3%)	131	483
Northern Territory (21.6%)	790	2,873
Country WA (37.5%)	1917	3,225
Murrumbidgee (38.9%)	886	1,391
Northern Queensland (39.1%)	2979	4,640
Central and Eastern Sydney (39.6%)	5559	8,494
Western NSW (40.9%)	1959	2,828
Darling Downs and West Moreton (41.0%)	2342	3,377
Western Sydney (41.1%)	2810	4,022
Brisbane North (41.3%)	3576	5,093
Nepean Blue Mountains (41.5%)	1190	1,675
South Western Sydney (42.1%)	3225	4,443
Perth North (43.6%)	3001	3,887
Perth South (44.3%)	2929	3,687
Brisbane South (44.6%)	3822	4,741
Gold Coast (45.2%)	2337	2,837
Northern Sydney (45.7%)	1448	1,719
Australian Capital Territory (46.0%)	1303	1,529
Tasmania (47.4%)	2118	2,353
South Eastern NSW (48.3%)	2946	3,159
Murray (48.9%)	2487	2,597
Central Queensland, Wide Bay, Sunshine Coast (51.2%)	3729	3,554
Eastern Melbourne (53.0%)	3541	3,138
Hunter New England (53.5%)	6160	5,353
Country SA (53.5%)	1465	1,271
North Western Melbourne (54.0%)	6490	5,527
South Eastern Melbourne (55.1%)	5415	4,417
North Coast (59.5%)	3987	2,710
Adelaide (60.0%)	3719	2,478
Gippsland (62.5%)	1429	857
Western Victoria (65.4%)	2788	1,475

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Figure B.6. CHC treatment uptake and ranking by PHN, comparing current uptake (at end of 2020) to initial uptake (at end of 2017); changes in rankings indicated by arrows; no arrows indicates minimal or no change

PHN	Uptake at end of 2017	2016-17 rank	Uptake at end of 2020	2020 rank	Arrow label
Western Queensland	11.6%	31st	9.8%	31st	(none)
Northern Territory	14.5%	30th	7.1%	30th	(none)
Country WA	21.4%	27th	15.9%	29th	down
Murrumbidgee	18.2%	29th	20.7%	28th	(none)
Northern Queensland	23.3%	22nd	15.8%	27th	down
Central and Eastern Sydney	27.3%	17th	12.3%	26th	down
Western NSW	21.6%	25th	19.3%	25th	(none)
Darling Downs and West Moreton	20.6%	28th	20.3%	24th	up
Western Sydney	22.9%	24th	18.2%	23rd	(none)
Brisbane North	23.3%	21st	17.9%	22nd	(none)
Nepean Blue Mountains	21.4%	26th	20.1%	21st	up
South Western Sydney	25.7%	18th	16.4%	20th	down
Perth North	25.1%	19th	18.5%	19th	(none)
Perth South	23.3%	23rd	21.0%	18th	up
Brisbane South	23.5%	20th	21.2%	17th	up
Gold Coast	29.6%	14th	15.5%	16th	down
Northern Sydney	31.5%	10th	14.2%	15th	down
Australian Capital Territory	31.8%	9th	14.2%	14th	down
Tasmania	29.9%	13th	17.5%	13th	(none)
South Eastern NSW	29.9%	12th	18.4%	12th	(none)
Murray	29.4%	15th	19.5%	11th	up
Central Queensland, Wide Bay, Sunshine Coast	28.8%	16th	22.4%	10th	up
Eastern Melbourne	35.7%	6th	17.4%	9th	down
Hunter New England and Central Coast	30.5%	11th	23.0%	8th	up
Country SA	33.9%	7th	19.6%	7th	(none)
North Western Melbourne	33.1%	8th	20.9%	6th	up
South Eastern Melbourne	36.9%	5th	18.2%	5th	(none)
North Coast	39.0%	2nd	20.6%	4th	down
Adelaide	38.1%	3rd	21.9%	3rd	(none)
Gippsland	37.4%	4th	25.1%	2nd	up
Western Victoria	40.7%	1st	24.7%	1st	(none)

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Figure B.7. Observed uptake and projected future CHC treatment trends, based on various yearly change trends, 2016-2030

Measure	Year	Scenario 1: minimum decline in uptake	Scenario 2: average decline in uptake	Scenario 3: maximum decline in uptake
Observed uptake	2016	32,503	32,503	32,503
Observed uptake	2017	21,229	21,229	21,229
Observed uptake	2018	15,409	15,409	15,409
Observed uptake	2019	11,517	11,517	11,517
Observed uptake	2020	8,140	8,140	8,140
Projected uptake	2021	6,434	5,778	4,913
Projected uptake	2022	4,809	4,092	3,209
Projected uptake	2023	4,809	4,092	3,209
Projected uptake	2024	4,809	4,092	3,209
Projected uptake	2025	4,809	4,092	3,209
Projected uptake	2026	4,809	4,092	3,209
Projected uptake	2027	4,809	4,092	3,209
Projected uptake	2028	4,809	4,092	3,209
Projected uptake	2029	4,809	4,092	3,209
Projected uptake	2030	4,809	4,092	3,209

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Figure B.8. Observed uptake and projected future CHC treatment uptake trends, based on various prior yearly change trends, 2016-2030

Measure	Year	Scenario 1: minimum decline in uptake	Scenario 2: average decline in uptake	Scenario 3: maximum decline in uptake
Observed uptake	2016	17.2%	17.2%	17.2%
Observed uptake	2017	28.4%	28.4%	28.4%
Observed uptake	2018	36.6%	36.6%	36.6%
Observed uptake	2019	42.7%	42.7%	42.7%
Observed uptake	2020	47.0%	47.0%	47.0%
Projected uptake	2021	50.4%	50.1%	49.6%
Projected uptake	2022	52.9%	52.2%	51.3%
Projected uptake	2023	55.5%	54.4%	53.0%
Projected uptake	2024	58.0%	56.6%	54.7%
Projected uptake	2025	60.6%	58.7%	56.4%
Projected uptake	2026	63.1%	60.9%	58.1%
Projected uptake	2027	65.7%	63.0%	59.8%
Projected uptake	2028	68.2%	65.2%	61.5%
Projected uptake	2029	70.8%	67.4%	63.2%
Projected uptake	2030	73.3%	69.5%	64.9%

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Figure B.9. Projected CHC treatment uptake at end of 2022 by PHN; error bars denote upper and lower estimates based on various prior yearly change trends

PHN	Projected 2022 uptake - average scenario	Upper bound	Lower bound
Northern Territory	23.4%	25.9%	22.7%
Western Queensland	24.7%	27.7%	22.6%
Central and Eastern Sydney	42.1%	43.3%	40.8%
Country WA	42.7%	43.9%	41.4%
Northern Queensland	44.3%	47.8%	41.0%
South Western Sydney	46.5%	46.8%	45.7%
Brisbane North	46.7%	50.3%	44.6%
Western Sydney	47.1%	47.9%	46.0%
Australian Capital Territory	48.0%	50.0%	46.2%
Perth South	48.3%	51.3%	47.1%
Western NSW	48.3%	49.8%	47.0%
Northern Sydney	48.6%	50.0%	47.5%
Gold Coast	49.0%	50.3%	48.1%
Murrumbidgee	49.1%	57.3%	45.6%
Nepean Blue Mountains	49.2%	52.3%	46.9%
Darling Downs and West Moreton	49.6%	52.3%	47.5%
Perth North	49.6%	51.9%	48.3%
Tasmania	51.8%	54.8%	49.9%
NATIONAL AVERAGE	52.2%	52.9%	51.3%
Brisbane South	52.8%	54.6%	51.4%
South Eastern NSW	53.6%	55.6%	52.3%
Murray	54.4%	55.2%	53.7%
Eastern Melbourne	56.9%	58.8%	55.2%
Central Queensland, Wide Bay, Sunshine Coast	58.3%	59.9%	56.8%
Country SA	58.6%	60.3%	57.2%
North Western Melbourne	59.3%	61.3%	58.0%
South Eastern Melbourne	59.3%	62.3%	57.9%
Hunter New England and Central Coast	60.9%	62.5%	59.4%
North Coast	65.0%	68.1%	62.3%
Adelaide	65.4%	66.3%	64.7%
Gippsland	69.8%	72.1%	66.5%
Western Victoria	71.3%	74.3%	68.3%

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Figure B.10. Projected CHC treatment uptake at end of 2030 by PHN; error bars denote upper and lower estimates based on various prior yearly change trends

PHN	Projected 2030 uptake - average scenario	Upper bound	Lower bound
Northern Territory	29.4%	42.6%	25.8%
Western Queensland	37.0%	54.0%	26.2%
Central and Eastern Sydney	49.8%	56.2%	44.1%
Northern Sydney	57.2%	64.4%	52.0%
Australian Capital Territory	57.5%	67.7%	49.1%
South Western Sydney	61.2%	62.9%	57.2%
Gold Coast	61.5%	68.0%	57.0%
Country WA	61.6%	68.0%	54.9%
Northern Queensland	61.9%	80.8%	46.2%
Brisbane North	65.2%	84.9%	54.6%
Tasmania	66.4%	82.6%	57.2%
Western Sydney	67.7%	72.1%	62.1%
Eastern Melbourne	69.2%	78.4%	60.9%
NATIONAL AVERAGE	69.5%	73.3%	64.9%
Perth North	70.5%	82.8%	63.6%
South Eastern NSW	71.6%	81.8%	65.0%
South Eastern Melbourne	72.6%	87.9%	65.9%
Murray	72.6%	76.5%	69.1%
Western NSW	74.8%	83.2%	68.1%
Perth South	75.2%	91.7%	69.2%
Country SA	75.5%	84.2%	68.4%
North Western Melbourne	76.2%	86.6%	70.0%
Nepean Blue Mountains	76.5%	94.1%	64.5%
Darling Downs and West Moreton	80.8%	95.8%	69.5%
Brisbane South	81.8%	91.5%	74.6%
North Coast	82.5%	99.1%	69.8%
Central Queensland, Wide Bay, Sunshine Coast	82.7%	91.6%	75.0%
Adelaide	82.7%	87.7%	79.2%
Hunter New England and Central Coast	86.2%	94.4%	78.4%
Murrumbidgee	87.8%	100.0%	68.8%
Western Victoria	90.1%	100.0%	76.0%
Gippsland	93.6%	100.0%	77.8%

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Figure B.11. CHC treatment uptake by remoteness area and time period, 2016-2020

Remoteness Area	2016-17 uptake	2018-20 uptake
Major cities	28.8%	18.1%
Inner regional	30.8%	21.6%
Outer regional	24.9%	17.1%
Remote	15.5%	11.5%
Very Remote	13.9%	9.7%
AUSTRALIA	28.4%	18.6%

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Figure B.12. Proportion of CHC treatment prescribed by GPs, end of 2020

PHN	GP proportion, 2016-2020
Northern Sydney	21.5%
Eastern Melbourne	22.8%
Gippsland	27.2%
North Western Melbourne	27.4%
Western Victoria	27.4%
Adelaide	29.2%
Central and Eastern Sydney	29.8%
South Eastern Melbourne	29.9%
Western Sydney	30.0%
South Western Sydney	30.1%
Murray	30.6%
Hunter New England and Central Coast	34.6%
Country SA	35.8%
NATIONAL AVERAGE	36.5%
Tasmania	37.9%
Darling Downs and West Moreton	37.9%
Country WA	38.0%
Central Queensland, Wide Bay, Sunshine Coast	38.3%
Perth North	41.1%
Australian Capital Territory	41.1%
Northern Territory	42.7%
Brisbane South	44.2%
Brisbane North	45.0%
Northern Queensland	47.1%
Western NSW	47.4%
North Coast	47.8%
Perth South	48.4%
South Eastern NSW	49.5%
Gold Coast	49.9%
Western Queensland	52.7%
Murrumbidgee	53.2%
Nepean Blue Mountains	55.6%

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Figure B.13. Proportion of CHC treatment by course duration, 2016-2020

Year	8 weeks	12 weeks	24 weeks
2016	7.5%	72.3%	20.2%
2017	7.5%	84.5%	7.6%
2018	15.9%	82.9%	<1%
2019	35.3%	64.0%	<1%
2020	40.5%	58.6%	<1%

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Figure B.14. Proportion of CHC treatment by age, by year, 2016-2020

Year	18-29	30-39	40-49	50-59	60+
2016	3.7%	13.9%	23.3%	38.6%	20.5%
2017	7.0%	20.8%	28.1%	30.1%	14.1%
2018	10.4%	22.9%	28.6%	24.9%	13.1%
2019	12.6%	21.9%	27.4%	23.4%	14.8%
2020	14.8%	21.4%	26.7%	22.4%	14.7%

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Figure C.1. Number of hepatitis serology test items, by month, 2017-2020

Month	Number of serology items
Jan-17	132,529
Feb-17	95,409
Mar-17	141,957
Apr-17	110,160
May-17	124,897
Jun-17	117,187
Jul-17	112,535
Aug-17	114,672
Sep-17	108,452
Oct-17	122,287
Nov-17	113,936
Dec-17	128,823
Jan-18	100,286
Feb-18	129,230
Mar-18	134,304
Apr-18	128,617
May-18	157,443
Jun-18	114,709
Jul-18	124,126
Aug-18	126,469
Sep-18	114,822
Oct-18	135,896
Nov-18	127,400
Dec-18	120,945
Jan-19	111,580
Feb-19	137,527
Mar-19	145,214
Apr-19	135,603
May-19	141,679
Jun-19	123,915
Jul-19	130,282
Aug-19	139,449
Sep-19	129,695
Oct-19	135,584
Nov-19	129,905
Dec-19	123,916
Jan-20	117,736
Feb-20	136,648
Mar-20	136,627

Month	Number of serology items
Apr-20	80,011
May-20	92,596
Jun-20	117,194
Jul-20	115,637
Aug-20	113,262
Sep-20	109,740
Oct-20	109,307
Nov-20	114,439
Dec-20	110,311

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Figure C.2. Rate of hepatitis serology items per 1,000 population, by state and territory and calendar quarter, 2019-2020; labels show proportional change between 2019 and 2020

Quarter	NSW	VIC	QLD	SA	WA	TAS	ACT	NT
Jan-Mar 2019	17.6	14.7	14.8	12.2	14.9	10.5	12.9	22.3
Apr-Jun 2019	17.9	15.3	14.9	12.0	14.7	11.3	13.3	23.1
Jul-Sep 2019	17.4	15.3	15.0	12.8	15.0	11.0	13.1	22.7
Oct-Dec 2019	16.9	14.9	14.7	12.4	14.8	10.6	13.4	22.6
Jan-Mar 2020	16.8	15.0	14.9	12.7	15.0	10.7	12.8	21.0
Apr-Jun 2020	12.4	10.5	11.5	9.9	11.1	8.1	10.3	19.1
Jul-Sep 2020	15.2	11.1	13.2	11.5	14.3	9.9	12.9	18.5
Oct-Dec 2020	14.5	12.3	12.7	10.6	13.4	9.5	12.1	19.5

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Figure C.4. Proportion of SA2s where the rate of liver cancer was above the Australian average, 2007-2016

PHN	Proportion of SA2s
North Western Melbourne	83.8%
Northern Territory	74.6%
South Western Sydney	71.7%
Central and Eastern Sydney	70.5%
Western Sydney	69.4%
South Eastern Melbourne	23.3%
Western Queensland	22.2%
Adelaide	21.3%
Hunter New England and Central Coast	19.6%
NATIONAL AVERAGE	18.7%
Eastern Melbourne	18.3%
Country WA	14.9%
Northern Queensland	13.7%
North Coast	11.6%
Northern Sydney	9.1%
Darling Downs and West Moreton	8.8%
Perth North	7.6%
Brisbane South	4.9%
Nepean Blue Mountains	4.2%
Gippsland	3.7%
South Eastern NSW	3.4%
Murray	2.9%
Country SA	2.8%
Western NSW	2.6%
Perth South	1.2%
Australian Capital Territory	0.0%
Brisbane North	0.0%
Central Queensland, Wide Bay, Sunshine Coast	0.0%
Gold Coast	0.0%
Murrumbidgee	0.0%
Tasmania	0.0%
Western Victoria	0.0%
#N/A	0.0%

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THE PETER DOHERTY INSTITUTE FOR INFECTION AND IMMUNITY
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