

HEPATITIS B MAPPING PROJECT

Estimates of chronic hepatitis B prevalence,
diagnosis, monitoring and treatment
by Primary Health Network



NATIONAL REPORT 2014/15

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AUSTRALASIAN SOCIETY FOR HIV, VIRAL HEPATITIS AND SEXUAL HEALTH MEDICINE
AND VICTORIAN INFECTIOUS DISEASES REFERENCE LABORATORY, THE DOHERTY INSTITUTE



Hepatitis B Mapping Project: Estimates of chronic hepatitis B prevalence, diagnosis, monitoring and treatment by Primary Health Network, 2014/15 - National Report

Published by:

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First published 2016

Previous mapping reports can be found at <http://www.ashm.org.au/HBV/more-about/hepatitis-b-mapping-project>

ISBN: 978-1-921850-26-4

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 ABN 48 264 545 457
 CFN 17788

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EXECUTIVE SUMMARY

SECTION 1: MEASURING PROGRESS – CHRONIC HEPATITIS B IN AUSTRALIA AND THE CASCADE OF CARE

PREVALENCE

- The estimated prevalence of chronic hepatitis B (CHB) in Australia in 2015 was 239,167, representing 1.0% of the population

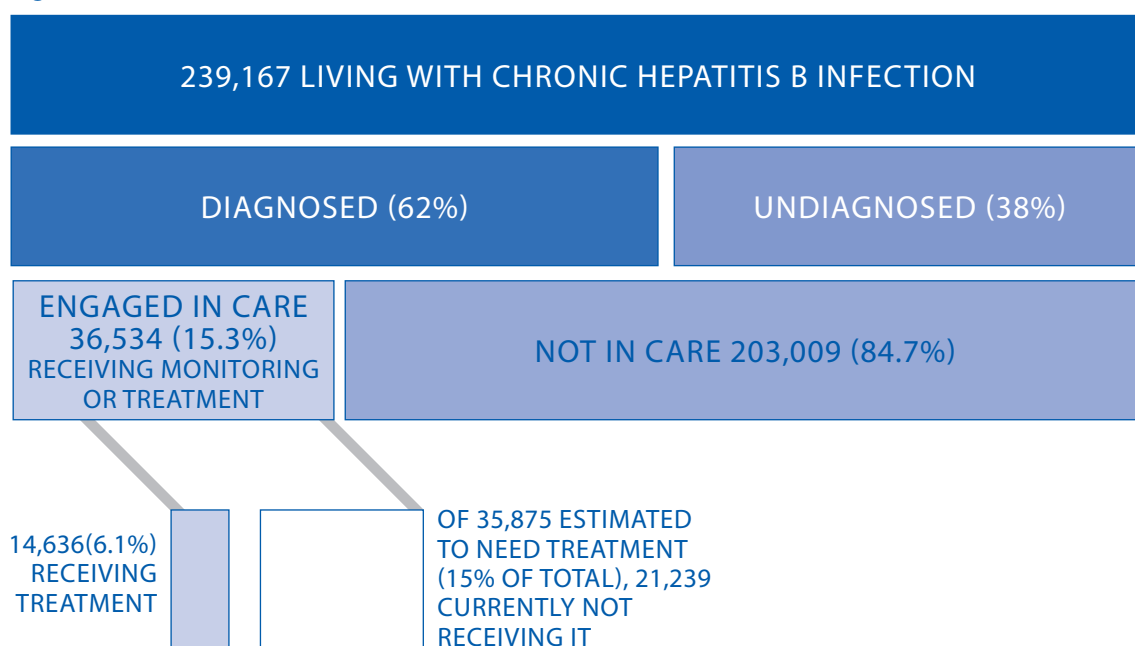
DIAGNOSIS

- The number of notifications for new diagnoses of CHB in 2015 was 6,363, a rate of 26.8 per 100,000
- The number of new diagnoses in 2015 was similar to the number in 2014 (6,400), and the notification rate has remained stable since 2005
- The proportion of people living with CHB who have been diagnosed is estimated to be 62%, well below the 80% target set in Australia's National Hepatitis B Strategy 2014-2017

TREATMENT AND CARE

- Treatment was prescribed to 14,636 people in 2015, 6.1% of the total living with CHB
- Treatment uptake increased compared to 2014 (5.8% uptake), however was still less than half the national target of 15%
- The number of people living with CHB engaged in care (monitoring or treatment) in 2015 was 36,534, 15.3% of the total living with CHB
- The proportion of people engaged in care increased slightly in 2015 compared to 2014 (15% in care)

Figure: The cascade of care for CHB in Australia, 2015 – see Section 1 text



IMMUNISATION

- Immunisation coverage of infants in 2015 was 92.3%, a notable increase compared to 2014 (90.7% coverage)
- Immunisation coverage did not reach the National Strategy target of 95%, however was higher in 2015 than in any year since hepatitis B was added to the national schedule in 2000

SECTION 2: MAPPING VARIATION – GEOGRAPHIC DIVERSITY AND TRENDS IN CHRONIC HEPATITIS B ACROSS AUSTRALIA

- Prevalence of CHB in Australia varied according to Primary Health Network, at its highest in NT and metropolitan Sydney and at its lowest in rural Victoria
- The CHB notification rate across PHNs reflected estimated prevalence and was highly concentrated, with half of all new diagnoses occurring in just five PHNs (Central and Eastern Sydney, North Western Melbourne, Western Sydney, Eastern Melbourne, and Northern Sydney)
- No PHN achieved the National Strategy treatment target of 15%, however uptake was 10% or more in Northern Sydney, Western Sydney, and South Western Sydney PHNs
- Although all people living with CHB should be engaged in care (monitoring or treatment), no PHNs had a proportion in care higher than 35%
- Some PHNs with relatively low treatment uptake had a higher than average uptake of care, such as NT
- Three PHNs reached the National Strategy target of 95% immunisation uptake (Murrumbidgee, Hunter New England & Central Coast, and ACT) and one quarter of all PHNs reached 94% or higher

CHB burden and access to care by Primary Health Network, 2014

State/ Territory	Primary Health Network	Prevalence	Diagnosis	Treatment	Care
		Proportion of the population living with CHB	CHB notification rate per 100,000	Proportion of people receiving CHB treatment	Proportion of people receiving CHB treatment or monitoring
NT	Northern Territory	1.77%	61.6	3.1%	17.0%
NSW	South Western Sydney	1.61%	41.1	13.7%	31.2%
NSW	Western Sydney	1.55%	64.8	10.0%	23.3%
NSW	Central and Eastern Sydney	1.44%	52.3	8.8%	22.8%
VIC	North Western Melbourne	1.35%	48.1	6.8%	21.4%
QLD	Western Queensland	1.19%	26.9	0.8%	1.8%
VIC	Eastern Melbourne	1.14%	32.7	7.6%	23.0%
NSW	Northern Sydney	1.11%	46.7	9.9%	26.2%
VIC	South Eastern Melbourne	1.10%	23.9	6.4%	19.8%
QLD	Brisbane South	1.09%	37.7	5.4%	12.9%
ACT	Australian Capital Territory	1.01%	24.7	5.5%	14.7%
SA	Adelaide	0.99%	22.5	4.2%	6.2%
WA	Perth North	0.98%	25.9	4.4%	7.5%
WA	Perth South	0.96%	26.4	3.5%	6.4%
QLD	Northern Queensland	0.95%	16.6	1.6%	4.3%
WA	Country WA	0.92%	18.3	1.0%	3.0%
NSW	Western NSW	0.84%	15.7	1.3%	3.9%
QLD	Brisbane North	0.76%	18.2	2.5%	5.1%
QLD	Darling Downs and West Moreton	0.73%	9.6	2.3%	5.3%
NSW	Nepean Blue Mountains	0.73%	6.1	3.0%	7.0%
QLD	Gold Coast	0.71%	14.1	3.4%	6.5%
NSW	South Eastern NSW	0.71%	8.9	2.4%	6.5%
TAS	Tasmania	0.68%	10.7	1.4%	3.4%
NSW	Murrumbidgee	0.66%	16.7	1.8%	5.0%
NSW	Hunter New England and Central Coast	0.66%	8.8	2.0%	5.4%
NSW	North Coast	0.66%	7.5	1.9%	5.2%
QLD	Central Queensland and Sunshine Coast	0.63%	7.0	1.5%	3.0%
SA	Country SA	0.63%	10.9	1.2%	1.9%
VIC	Murray	0.61%	8.9	2.6%	7.9%
VIC	Gippsland	0.57%	6.0	2.1%	5.5%
VIC	Grampians and Barwon South West	0.56%	8.1	1.6%	6.9%

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FUNDED BY:

[The Australian Government Department of Health](#)

Disclaimer: Whilst the Australian Department of Health provides financial assistance to ASHM, the material contained in this resource produced by ASHM should not be taken to represent the views of the Australian Department of Health. The content of this resource is the sole responsibility of ASHM and The Doherty Institute.

We would like to acknowledge the following national and jurisdictional organisations for the provision of the data used in preparing the statistics contained in this report:

Australian Bureau of Statistics
Australian Government Department of Health
Australian Government Department of Human Services
National Health Performance Authority

INTRODUCTION AND BACKGROUND

WHAT'S NEW IN THIS REPORT?

- Updated estimates of prevalence, diagnosis, treatment and monitoring for 2015
- Data reported for each of the newly generated Primary Health Networks
- Information on treatment now includes patient demographics such as age and sex
- Inclusion of treatment provider type and drug prescribing patterns
- Measurement of trends over time according to Primary Health Network

MEASURING ONGOING PROGRESS IN CHRONIC HEPATITIS B

The Second National Hepatitis B Mapping Project Report, published in June 2015¹, represented the first comprehensive estimation of the level of diagnosis, engagement in care, and uptake of treatment for chronic hepatitis B (CHB) across Australia. It provided a baseline for progress towards the indicators and targets set out in Australia's Second National Hepatitis B Strategy 2014-17², and a resource for identification of the highest priority areas for improving access to services for people living with CHB.

That report revealed the disproportionate burden of CHB in many urban areas, as well as rural and regional hotspots for increased rates of infection. It highlighted the fact that although treatment uptake varied significantly across Australia, from between 1-13%, no geographic area reached the National Strategy target of 15% of people living with CHB receiving treatment. The report represented an important benchmark, however continued measurement and analysis is needed to assess areas of progress and identify regions of Australia which have demonstrated improvement in care for people living with CHB.

THE THIRD NATIONAL MAPPING REPORT

This Third National Mapping Report presents updated estimates of diagnosis, immunisation, access to care and treatment for hepatitis B, allowing for assessment of trends and changes over time, and re-evaluation of priority areas for focus. Significant changes in the landscape of CHB have occurred in the last two years, including including PBS changes allowing general practitioners general practitioners to initiate treatment for CHB in the community and medications to be dispensed by community pharmacies. We have presented here for the first time analysis of the provider type prescribing CHB treatment, to measure the extent of the provision of CHB care by GPs in Australia.

The data we have used here reflect the provision of treatment and monitoring through Australia's national health insurance scheme, Medicare, which provides the vast majority of services to people living with CHB. Treatment uptake measures are based on prescribing of antiviral treatments indicated for CHB infection; combining this with data regarding the number of people receiving a viral load test while not receiving treatment allows for calculation of the total number of people living with CHB who are receiving care. These parameters are based on guidelines³ that a person living with CHB should

receive a viral load test yearly to assess their stage of infection; although this is not sufficient for guideline-based care, it is a necessary aspect and able to be measured using routinely collected data. The denominator data used for this analysis are estimates of the total number of people living with CHB, based on projections of burden according to population group. We also assessed the number of new diagnoses of unspecified hepatitis B infection (in this report assumed to be CHB) by examining data regarding notifications of positive tests provided to the Australian Government Department of Health.

PRIMARY HEALTH NETWORKS

All indicators examined in this report are presented according to geographic area, and this report reflects the establishment on July 1, 2015 of Australia's system of Primary Health Networks, replacing the previous Medicare Local organisations. This shift ensures that the reporting provided is accessible at the most up to date and relevant regional boundaries. The 31 Primary Health Networks include three comprising an entire state/territory (ACT, NT, TAS); ten in NSW, seven in QLD, six in VIC, three in WA, and two in SA. The relative population size of PHNs varies, with the largest (North Western Melbourne) home to more than 1.5 million people, and the smallest (Western Queensland) having a population of 70,000. These boundaries influence estimates of prevalence, as PHNs which combine many disparate areas with variable population demographics are likely to have lower CHB prevalence than those with a smaller, more homogeneous population. This is particularly evident in Victoria, which has the highest average population per PHN of any state or territory. It also means that divisions of PHNs in metropolitan and non-metropolitan designations are not fully representative, as nearly all PHNs contain both urban and rural/regional areas.

CHB PREVALENCE IN 2015

This report presents the first detailed update since 2013 of estimates of CHB prevalence, extrapolated from previous data by incorporating updated estimates of population projections according to geographic area. These updated prevalence estimates are used as the denominator for calculations of treatment and monitoring uptake, in anticipation of a major update to CHB prevalence estimates based on the results of the 2016 Census. Future updates will include adjustments to the baseline prevalence for Australian-born individuals living with CHB in areas of low background prevalence, which was raised as a limitation in relation to estimates for Tasmania in the previous report, and may result in underestimates of the proportion of people in these areas who are receiving care and treatment.

DATA COLLECTION

Producing the National Mapping Report involves collating a wide range of different administrative datasets, obtained from various government custodians responsible for collecting health service data at a national and regional level. This approach allows for timely, highly geographically granular estimates to be produced, and this whole-of-population approach limits the potential biases associated with sampled data. However, these data must be considered in the context of their collection methods, and some limitations exist regarding their applicability and utility. We

have aimed to provide the most relevant and up to date estimates available, which has necessitated the distinction in this report between national and jurisdictional level estimates which are available for the most recent year (2015), and those more specific data which require more time for collation and analysis and are presented for the period 2013-2014. In addition, administrative data are subject to variations in practice between areas and providers, particularly in the utilisation of Medicare services and application of item numbers appropriate to the services provided.

The estimates used as denominator data for the number of people living with CHB in a given geographic area are subject to inaccuracies in and variations in the applicability of source data, which may lead to over- or under-estimation of uptake. The estimates presented in this report are intended to be utilised as a guide for priority setting and measuring progress in CHB, and should always be considered within the appropriate context and their application guided by local expertise.

USING THIS REPORT

The mapping report is divided into two sections, dictated by the availability of data sources for the time periods examined.

The first section of this report examines the most recent available information regarding CHB in Australia, including the prevalence of infection, rates of notification, uptake of treatment and care, and immunisation coverage, both nationally and across states and territories. This provides an overall view of the current estimates of CHB in Australia for 2015, and trends over time at the national and state/territory level, measuring progress towards our National Strategy targets.

The second section examines these indicators in more depth at the geographically granular level of the Primary Health Network for the most recent data available, which for most sources was 2014. These are used to determine trends over time according to PHN, and to analyse patterns of prescribing according to clinical and patient demographic factors. They provide a detailed view of the areas of high CHB burden, notable changes, and regions where improving access to care should be a priority.

SECTION 1:

MEASURING PROGRESS - CHRONIC HEPATITIS B IN AUSTRALIA AND THE CASCADE OF CARE

IN THIS SECTION:

- The current state of CHB in Australia in 2015
- Analysis of the CHB cascade of care and identification of gaps in service delivery
- National and state/territory trends and progress towards National Strategy indicators

PREVALENCE

In 2015 in Australia, an estimated 239,167 individuals were living with CHB, representing approximately 1% of the population.

The proportion of the population living with CHB in 2015 varied considerably across states and territories (Table 1), from the highest prevalence in the Northern Territory (1.77%) to the lowest in Tasmania (0.68%). The prevalence of CHB was above average in NSW (1.11%) and VIC (1.06%), similar to the national average in the ACT (1.01%), and below the national average in the remaining jurisdictions, although higher in WA (0.96%) than in SA (0.89%) and QLD (0.84%).

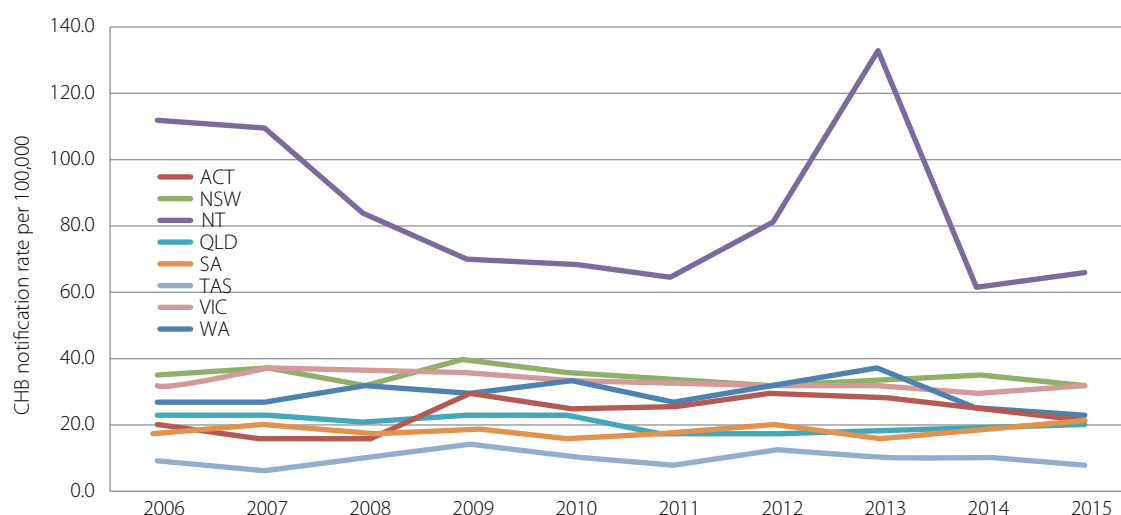
Table 1: CHB prevalence by state and territory, 2015

State/Territory	Total population	People living with CHB	CHB prevalence
ACT	390,706	3,948	1.01%
NSW	7,617,684	84,582	1.11%
NT	244,307	4,315	1.77%
QLD	4,778,854	40,125	0.84%
SA	1,698,660	15,089	0.89%
TAS	516,586	3,532	0.68%
VIC	5,937,481	62,715	1.06%
WA	2,590,259	24,794	0.96%
AUSTRALIA TOTAL	23,777,777	239,167	1.01%

Data source: Estimation of CHB prevalence based on population-specific prevalence and ABS population data⁷. Totals may not add up due to inclusion of those without a state/territory of residence recorded in source data.

DIAGNOSIS

Figure 1: Notifications of CHB by state and territory and year, 2006-2015



Data source: National Notifiable Diseases Surveillance System; ABS Estimated Resident Population.

In 2015, 6,363 Australians were newly diagnosed with chronic hepatitis B, a rate of 26.8 per 100,000 per year. The notification rate varied substantially according to jurisdiction (Table 2) - it was highest in the NT (65.1 cases per 100,000) and lowest in TAS (7.9 cases per 100,000). The rate was higher in NSW (30.9) and VIC (30.6) than in WA (22.2), QLD (20.9), ACT (20.7), and SA (19.8), reflecting prevalence estimates (Table 1).

The number of people diagnosed with CHB was similar in 2015 (6,363 notifications) as in 2014 (6,400 notifications). The rate of CHB notification has remained relatively stable in the last decade at the national level, remaining between 28-33 cases per 100,000 per year, however a gradual decline has been observed between 2009 (32.1 notifications per 100,000 per year) and 2015 (26.8 notifications per 100,000 per year, see Figure 1).

Trends over the previous decade varied according to state and territory (Table 2). Some states experienced a peak in the notification rate in 2009-2010, and a subsequent decline (NSW, VIC, TAS). In QLD, rates also peaked in 2009-2010 and then declined, however increased again in 2013 and 2014. In ACT and in WA, a peak in the notification rate was observed in 2012-2013, after which the rate decreased. In SA notifications have been relatively stable with a slight increase between 2013 and 2015. In NT, the notification rate increased rapidly between 2011 and 2013 to be nearly five times the national rate, subsequently declining and stabilizing at approximately double the national rate.

Table 2: CHB notifications by state and territory, 2015

State/Territory	Total population	CHB notifications	Notification rate per 100,000
ACT	390,706	81	20.7
NSW	7,617,684	2,355	30.9
NT	244,307	159	65.1
QLD	4,778,854	998	20.9
SA	1,698,660	337	19.8
TAS	516,586	41	7.9
VIC	5,937,481	1,816	30.6
WA	2,590,259	576	22.2
AUSTRALIA TOTAL	23,777,777	6,363	26.8

Data source: National Notifiable Diseases Surveillance System; ABS Estimated Resident Population.

TREATMENT UPTAKE

A total of 14,636 individuals received treatment for CHB in 2015, 6.1% of the total estimated to be living with infection, and infection slightly greater than one-third of the national target level of 15% by 2017.

The number of people living with CHB receiving treatment has increased over time, with an increase of approximately 2,000 individuals between 2013 and 2014, and a further 1,000 people in 2015 (see Table 3 and Table 13). When assessed as a proportion of the number of people living with CHB each year, this has led to gradual increases in the proportion receiving treatment (5.0% in 2013, 5.8% in 2014, and 6.1% in 2015).

The proportion of individuals living with CHB who received treatment in 2015 varied widely according to state and territory, with treatment levels highest in NSW (8.6%) and VIC (6.7%). Treatment uptake was similar to the national average in ACT (6.3%), and below the national average in SA (3.9%), NT (3.4%), WA (3.3%), QLD (3.1%), and TAS (1.8%).

Table 3: CHB treatment by state and territory, 2015

State/Territory	People living with CHB	Number receiving treatment	Treatment uptake
ACT	3,948	247	6.3%
NSW	84,582	7,270	8.6%
NT	4,315	148	3.4%
QLD	40,125	1,263	3.1%
SA	15,089	583	3.9%
TAS	3,532	65	1.8%
VIC	62,715	4,233	6.7%
WA	24,794	827	3.3%
AUSTRALIA	239,167	14,636	6.1%

Data source: Department of Human Services Medicare statistics.

ENGAGEMENT IN CARE

When combining the number of people living with CHB receiving antiviral treatment, and those receiving ongoing monitoring for CHB while not receiving treatment, the estimated number of Australians who were engaged in care for their CHB in 2015 was 36,534, 15.3% of the total. Although no specific National Strategy target has been set for engagement in care, all people living with CHB should be engaged in either antiviral treatment where required, or regular monitoring of their viral load.

Incremental change in engagement in care has been observed over time, with the proportion increasing from 13.5% in 2013, to 15.0% in 2014, and an additional smaller increase to 15.3% in 2015.

The increase between 2014 and 2015 was almost exclusively due to a larger number of people receiving treatment (an additional 933 individuals, 6.8% increase) while the number receiving monitoring without treatment remained steady (270 additional individuals, 1.2% increase - see online Appendix). This was also the case between 2013 and 2014, when the proportional increase in the number receiving treatment (2,010 additional individuals, 17% increase) was greater than the increase in the number receiving monitoring without treatment (2,041 individuals, 10% increase).

As the estimates of engagement in care are based in part on treatment data, the variation according to state and territory generally reflects those fluctuations seen in treatment uptake, however there are some differences observed when monitoring data are taken into account. The disparity between NSW and VIC was proportionally less when examining the combined engagement in care indicator – treatment uptake was estimated to be 27% higher in NSW than in VIC, while engagement in care, which also incorporates those receiving monitoring outside of treatment, was 10% higher in NSW than VIC.

NT also had a relatively high proportion of individuals receiving CHB monitoring but a low proportion who have been prescribed treatment. Although treatment uptake in the NT (3.4%) remains below the national average of 6.1%, the total proportion of people living with CHB estimated to be engaged in care (18.5%) was above the national average of 15.3% and ranked third of all states and territories after NSW and VIC.

These disparities between engagement in care and treatment uptake may reflect the relative levels of access to treatment (which until mid-2015 required specialist prescribing arrangements) and access to monitoring (which has always been able to be provided by general practitioners). It may also be influenced by the population composition and demographic aspects of a given geographic area, as the necessity of treatment for CHB is dependent on factors such as age, sex, cultural and linguistic background, comorbidities, and family history. These factors may also impact on the ability of patients to engage

in long-term courses of antiviral therapy, while access to yearly monitoring is more feasible, and these aspects may differ according to geographic area. These factors may make engagement in care a more robust measure of the level of service access than treatment uptake, which is more dependent on individual determinants.

Table 4: Number and proportion of people receiving care for CHB by state and territory, 2015

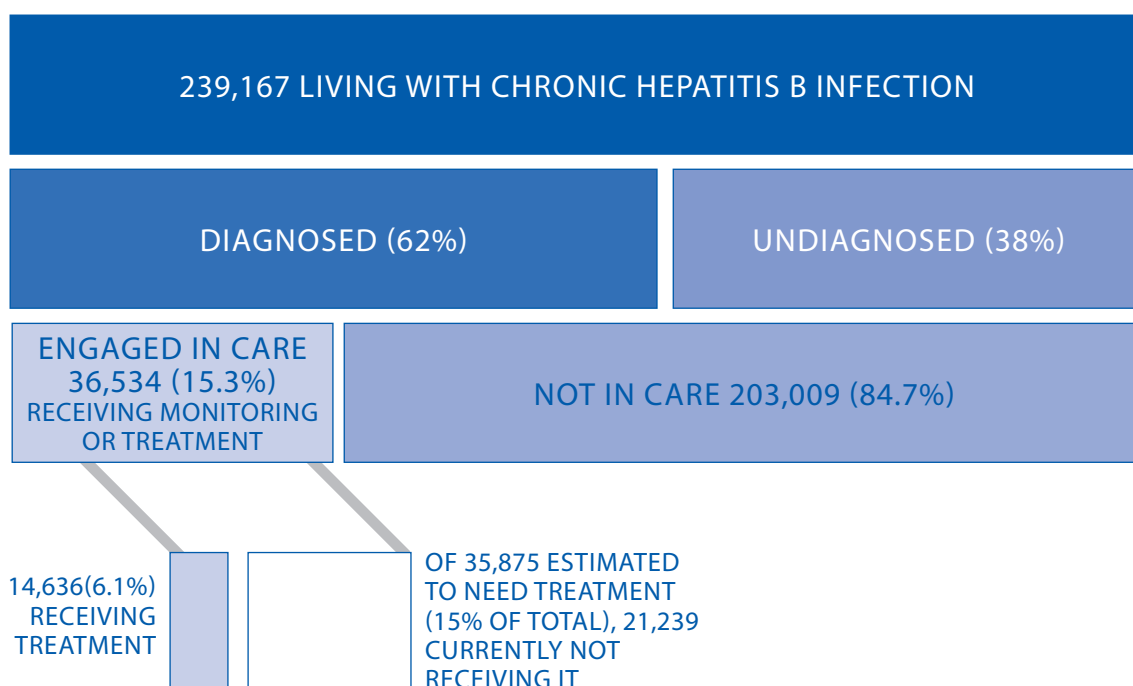
State/Territory	People living with CHB	Number receiving care	Proportion of people in care	Number not receiving care
ACT	3,948	618	15.7%	3,330
NSW	84,582	17,657	20.9%	66,926
NT	4,315	799	18.5%	3,516
QLD	40,125	2,854	7.1%	37,271
SA	15,089	877	5.8%	14,212
TAS	3,532	160	4.5%	3,372
VIC	62,715	11,948	19.1%	50,767
WA	24,794	1,621	6.5%	23,173
AUSTRALIA	239,167	36,534	15.3%	202,633

Data source: Department of Human Services Medicare statistics.

THE CASCADE OF CARE FOR CHB IN AUSTRALIA, 2015

When combining the above data relating to CHB prevalence, care and treatment uptake, as well as modelled estimates of the proportion of people living with CHB who have been diagnosed, it is possible to construct an overall national estimate of the progress of individuals through a cascade of care, identifying major gaps in the pathway of clinical care for a person living with CHB. These can also be considered in the context of Australia's National Strategy targets for the uptake of diagnosis and care for CHB, indicated in Figure 2 below.

Figure 2: The cascade of care for CHB in Australia, 2015

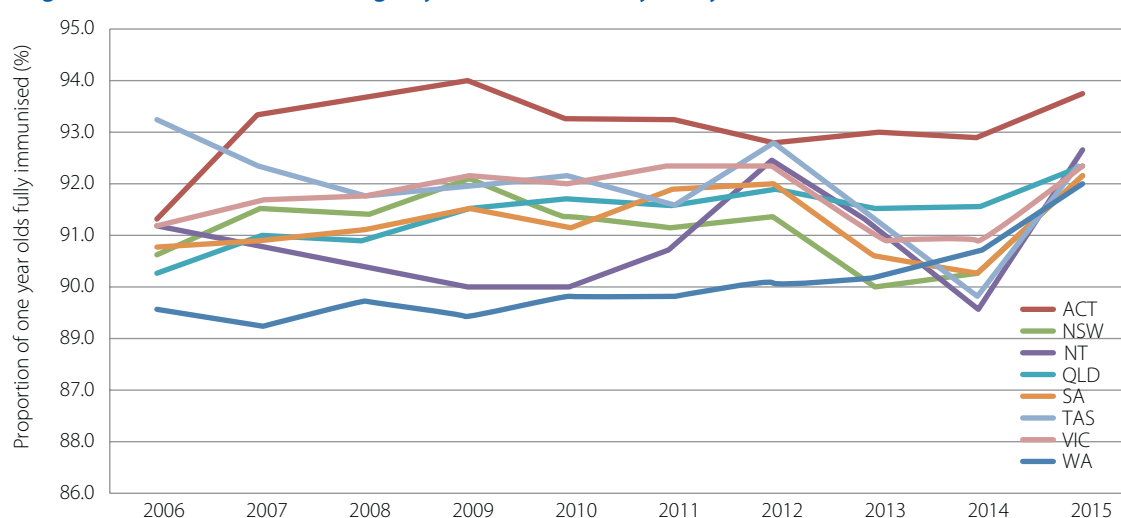


The cascade of care demonstrates that there are gaps in each aspect of the clinical care pathway for people living with CHB. Only 62% of people living with CHB have been diagnosed, representing approximately 90,000 Australians living with undiagnosed CHB and unable to engage in care. In order to reach Australia's National Strategy target of 80% diagnosis by 2017, an additional 43,000 individuals would need to be diagnosed in the next year.

The largest gap in the care cascade is the transition between diagnosis and engagement in care, with only 15.3% of individuals receiving either treatment or monitoring in 2015. Treatment uptake was also short of the National Strategy target of 15%, with an additional 21,000 individuals need to be initiated on treatment in order to reach this goal by 2017. The regional variations in these proportions of people engaged in care and treatment are outlined in Section 2.

IMMUNISATION

Figure 3: Immunisation coverage by state and territory and year, 2006-2015



Data source: Immunise Australia Australian Childhood Immunisation Register statistics.

Immunisation coverage among 1-year-olds in 2015 was the highest level it has been during the period in which hepatitis B immunisation has been included in the national schedule (since 2000)⁴. Coverage in 2015 was 92.3%, a substantial increase from the proportion in 2013 and 2014 (both 90.7%). Immunisation coverage was highest in the ACT (93.8%), however was still below the National Strategy target of 95% coverage. Coverage was very similar in the remaining states, ranging between 92.1% and 92.6%.

This increase between 2014 and 2015 occurred in all states and territories, with proportionally larger increases occurring in those states with a lower baseline (TAS and NT, in which coverage was <90% in 2014). The largest improvement occurred in NT, which had the lowest coverage in 2014 (89.6%) and second highest in 2015 (92.6%).

Table 5: Immunisation coverage by state and territory and year, 2006-15

State/Territory	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
NSW	90.7%	91.5%	91.4%	92.1%	91.4%	91.2%	91.4%	90.0%	90.1%	92.2%
VIC	91.3%	91.7%	91.8%	92.2%	92.0%	92.4%	92.4%	91.0%	90.8%	92.2%
QLD	90.4%	91.0%	90.9%	91.5%	91.7%	91.6%	91.9%	91.6%	91.5%	92.4%
SA	90.8%	90.9%	91.1%	91.5%	91.3%	91.8%	92.0%	90.6%	90.4%	92.4%
WA	89.5%	89.3%	89.8%	89.4%	89.8%	89.8%	90.1%	90.2%	90.7%	92.1%
TAS	93.2%	92.3%	91.8%	92.0%	92.2%	91.6%	92.8%	91.1%	89.8%	92.4%
NT	91.2%	90.8%	90.4%	90.0%	90.0%	90.8%	92.5%	91.2%	89.6%	92.6%
ACT	91.4%	93.4%	93.6%	94.0%	93.3%	93.2%	92.8%	93.0%	92.9%	93.8%
AUSTRALIA	90.7%	91.2%	91.2%	91.7%	91.5%	91.5%	91.7%	90.7%	90.7%	92.3%

Data source: Immunise Australia Australian Childhood Immunisation Register statistics.

SECTION 2:

MAPPING VARIATION – GEOGRAPHIC DIVERSITY AND TRENDS IN CHRONIC HEPATITIS B ACROSS AUSTRALIA

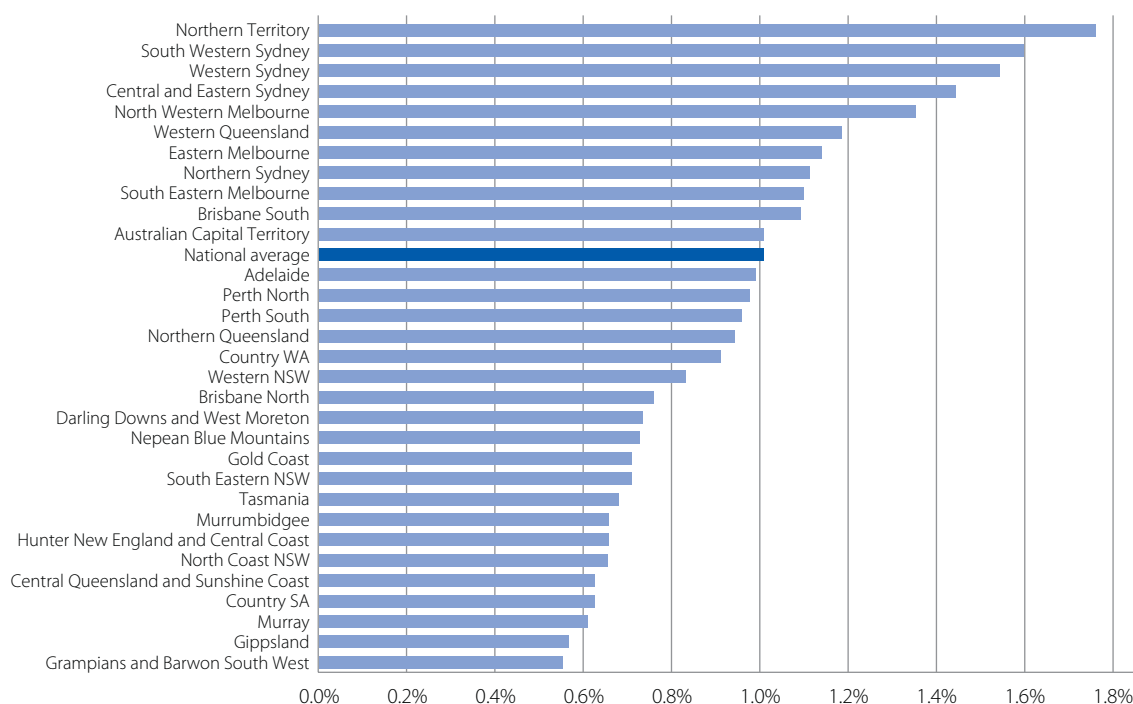
IN THIS SECTION:

- Estimates of CHB burden, care uptake, and immunisation for each Primary Health Network across Australia
- Measurement of progress towards National Strategy targets and trends at a geographically specific level

PREVALENCE

Prevalence by Primary Health Network

Figure 4: CHB prevalence by Primary Health Network, 2015 - proportion of the total population living with CHB (%)



Data source: Estimation of CHB prevalence based on population-specific prevalence and ABS population data⁷. Totals may not add up due to inclusion of those without a state/territory of residence recorded in source data.

The prevalence of CHB varied considerably across Primary Health Networks, often with pronounced differences within each state and territory (Table 8). The highest prevalence PHNs after the NT (1.77%) were in NSW – South Western Sydney, (1.60%), Western Sydney (1.55%) and Central and Eastern Sydney (1.45%). Prevalence in Northern Sydney was lower (1.12%) but still above the national average. Non-metropolitan PHNs in NSW had a CHB prevalence below the national average, with the highest being Western NSW (0.84%), followed by Nepean Blue Mountains (0.73%) and South Eastern NSW (0.71%). Prevalence was very similar in the Murrumbidgee, Hunter New England and Central Coast, and North Coast PHNs (0.67%, 0.66%, and 0.66%, respectively).

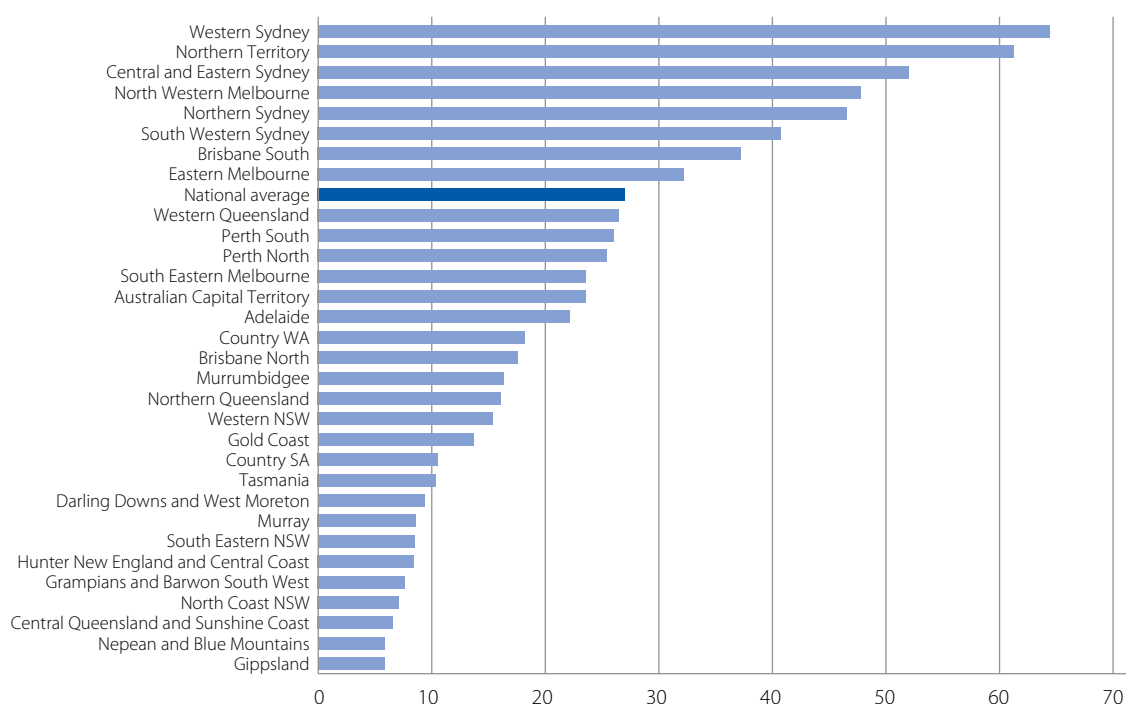
Prevalence was higher than the national average in those PHNs located in metropolitan VIC, with the highest in North Western Melbourne (1.36%), followed by Eastern Melbourne (1.14%) and South Eastern Melbourne (1.10%). The three non-metropolitan PHNs in Victoria all had similarly low prevalence (Murray, 0.61%; Gippsland, 0.57%; and Grampians and Barwon South West, 0.56%).

Within QLD, Brisbane South (1.09%) had substantially higher prevalence than Brisbane North (0.76%). The prevalence in Darling Downs and West Moreton (0.73%) and Gold Coast (0.71%) was similar to Brisbane South. The highest prevalence PHN in QLD was Western Queensland (1.19%), while it was similar to the national average in Northern Queensland (0.95%), and the lowest prevalence PHN in QLD was Central Qld, Wide Bay, and Sunshine Coast (0.63%)

Prevalence was very similar to the national average in Adelaide (0.99%), while being lower in SA's other PHN (Country SA, 0.63%). Within WA prevalence was more stable between PHNs, being similar to the national average in each of Perth North (0.98%), Perth South (0.96%), and Country WA (0.92%).

DIAGNOSIS

Figure 5: CHB diagnosis by Primary Health Network, 2014 - notification rate per 100,000



Data source: National Notifiable Diseases Surveillance System; ABS Estimated Resident Population.

Notifications by Primary Health Network

Within those states and territories with multiple PHNs, the notification rate of CHB varied significantly, with the greatest disparity generally observed between metropolitan and non-metropolitan areas (Table 9). Within NSW, the rates were highest in the PHNs of Western Sydney (64.8 cases per 100,000), Central and Eastern Sydney (52.3), Northern Sydney (46.7), and South Western Sydney (41.1), and all were above the national average. Among non-metropolitan NSW PHNs, higher rates were seen in Murrumbidgee (16.7) and Western NSW (15.7) than in South Eastern NSW (8.9), Hunter New England and Central Coast (8.8), North Coast (7.5), or Nepean Blue Mountains (6.1).

In VIC, the highest rate was observed in the North Western Melbourne PHN (48.1), while the rates in the Eastern Melbourne (32.7) and South Eastern Melbourne (23.9) PHNs were similar to the national average. The three non-metropolitan VIC PHNs had very similar rates (8.9 in Murray, 8.1 in Grampians & Barwon South West, and 6.0 in Gippsland).

In QLD, the rate in Brisbane South (37.7) was approximately double that of either Brisbane North (18.2) or Gold Coast (14.1). The QLD PHN with the second highest rate was Western Queensland (26.9), substantially higher than in other QLD non-metropolitan areas. The rate was higher in Northern Queensland (16.6) than in Darling Downs and West Moreton (9.6) or Central Queensland, Wide Bay, and Sunshine Coast (7.0) PHNs.

In SA the rate in both PHNs was below the national average, however was more than twice as high in Adelaide (22.5) than in Country SA (10.9). In WA, the rate was very similar in both Perth South (26.4) and Perth North (25.9), while both were higher than in Country WA (18.3). However, Country WA is notable in that the notification rate was higher than the majority of other non-metropolitan PHNs across Australia, ranked third after only Western Queensland and the NT.

Trends in notifications by Primary Health Network

Changes in notification rates over time according to state and territory are discussed in Section 1, however some PHNs had trends that differed to their overall state (Table 12). Notifications represent the number of positive CHB diagnoses in a given PHN; therefore declines in the notification rate may represent reduced uptake of testing, or could also reflect those areas in which a high proportion of people have already been diagnosed positive in previous years and which have a decreased necessity for testing. Changes in notification rates may also be influenced by fluctuations in migration patterns, with an increase or decrease in the number of overseas-born individuals settling in a given geographic area leading to a change in the frequency of CHB diagnosis.

In NSW, rates peaked in 2009-2010 and declined afterwards in most PHNs, however in Northern Sydney rates increased in 2013 and 2014 compared to previous years; this was also the case in Western NSW, although overall notification rates were below the state average. Rates in Murrumbidgee also appeared to increase in 2014, however small numbers limit interpretation of trends in this PHN. The rate of decline in notification rates has been more notable in South Western Sydney PHN than in other areas, such as Western Sydney and Central and Eastern Sydney.

In VIC, most PHNs had rates that were stable or displayed no specific trend, however a clearer decline in the notification rate during the period was seen in North Western Melbourne and in Gippsland when compared to other PHNs.

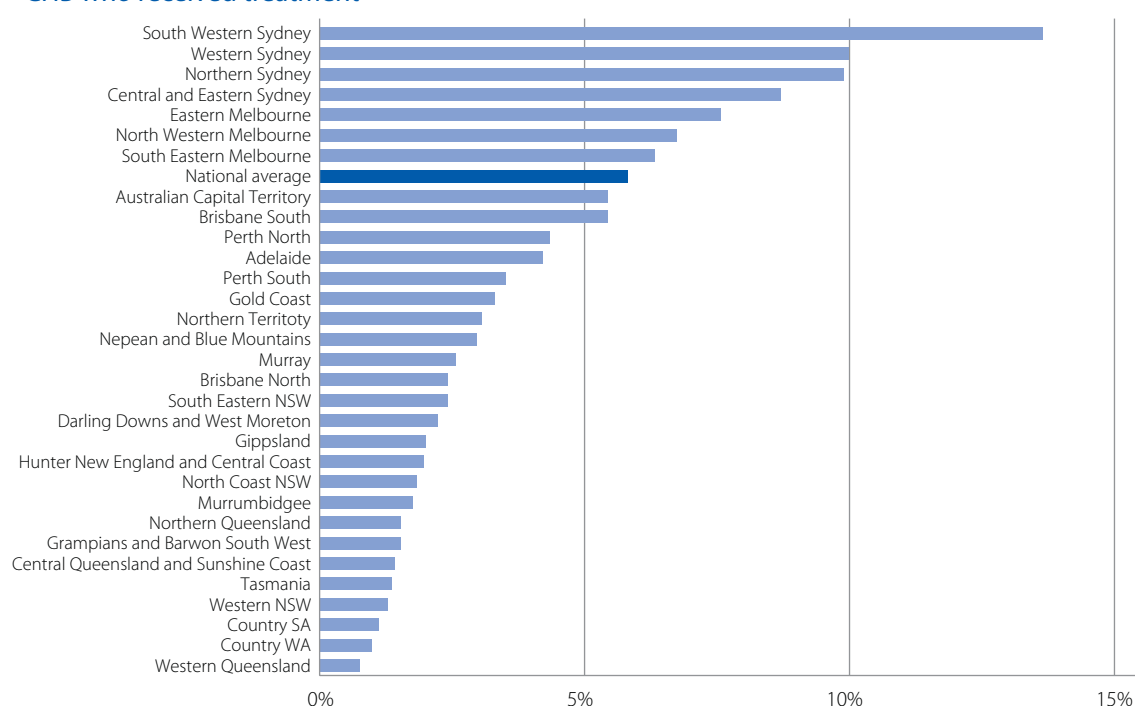
In QLD, most PHNs saw a peak in notification rates in 2008-2010 and a decline between 2011 and 2014, however the rate in Brisbane South increased again in 2013 and 2014, although not as high as previous levels.

In both the Adelaide and Country SA PHNs, notification rates have remained relatively stable, with Country SA demonstrating a more defined increasing trend since 2010.

Notification rates in Country WA PHN have been relatively stable during the period, and in Perth North PHN there was a peak in the notification rate in 2006-2008 in followed by a subsequent decline. Notification rates have fluctuated widely in Perth South PHN, increasing substantially in 2010 and again in 2012-2013 to be nearly double the state average, before declining again in 2014 to rates similar to previous years. On further investigation, it was determined that these changes were solely due to notifications occurring in the Christmas Island Statistical Area, which is part of the Perth South PHN.

TREATMENT

Figure 6: Treatment uptake by Primary Health Network, 2014 - proportion of people living with CHB who received treatment



Data source: Department of Human Services Medicare statistics.

Treatment by Primary Health Network

Treatment uptake across PHNs reflects treatment uptake across states and territories, however there was still considerable variation within those states and territories which have multiple PHNs (NSW, VIC, QLD, SA, and WA, Table 14). Treatment uptake was highest in the NSW metropolitan PHNs, with South Western Sydney (13.7%) having the highest proportion, followed by Western Sydney (10.0%), Northern Sydney (9.9%), and Central and Eastern Sydney (8.8%), all higher than the national average of 6.1%. Treatment was lower in non-metropolitan NSW PHNs, ranging from 1.3-3.0%. Treatment was also higher than the national average in metropolitan PHNs in VIC, with uptake of 7.6% in Eastern Melbourne, 6.8% in North Western Melbourne, and 6.4% in South Eastern Melbourne. Treatment uptake was below 3% in all non-metropolitan VIC PHNs (Murray, 2.6%; Gippsland, 2.1%; and Grampians & Barwon South West, 1.6%).

In QLD, treatment uptake was highest in Brisbane South (5.4%), while uptake was less than half that in the adjacent Brisbane North (2.5%). The level in Gold Coast (3.4%) was slightly higher than Brisbane North. Treatment uptake was below 3% in all non-metropolitan PHNs, however was notably lower in Western Queensland (0.8%) than in the remaining PHNs (2.3% in Darling Downs West Moreton, 1.6% in Northern Queensland, and 1.5% in Central Queensland, Wide Bay, and Sunshine Coast).

Trends in treatment uptake over time by Primary Health Network

The overall increase in treatment uptake between 2013 and 2014 at the national level was 16%, however this varied by Primary Health Network (Table 17). It should be noted that a number of PHNs had a relatively low number of individuals receiving treatment, and large proportional increases may not be a reliable reflection of increasing access to treatment. For this reason, proportional change in treatment uptake was only examined in those PHNs with >100 individuals receiving treatment in 2014.

Those PHNs with a greater than average increase in the proportion of individuals receiving treatment were evenly distributed between metropolitan and non-metropolitan PHNs, however they were all PHNs with average or below-average levels of treatment uptake in 2013. The largest increases, of more than 25%, were seen in the Northern Territory (36.7%), ACT (27.9%), Adelaide (25.5%), and Hunter New England and Central Coast NSW (25.6%) PHNs. Increases of 20-25% in treatment uptake were seen in Brisbane South (24.9%), Perth South (22.7%), and Northern Queensland (20.3%).

Treatment demographics: age and sex

Those treated for CHB in Australia in 2014 were more commonly men (62.9% of the total) than women (37.1%), with the most common age group receiving treatment those aged 41-60 years, making up more than half (53.5%) of all receiving treatment (Table 6). Approximately a quarter of all treated were in the 21-40 (24.4%) and 60+ (23.1%) age groups, with only a very small number of the total treated aged under 20 years (79 individuals, 0.6%). The proportion receiving treatment according to age group was similar in both men and women, although those aged 21-40 and 60+ made up a slightly higher proportion of the total in women than in men.

The proportion of those treated who were women increased slightly from 2013 (36.1%) to 2014 (37.1%), and the proportion aged 41-60 years decreased slightly (53.5% to 51.9%), with a corresponding increase in the proportions aged 21-40 and 60+.

The small number of individuals receiving treatment in many states and territories limited analysis of these demographic trends according to geographic area. However, no substantial differences were observed in the age and sex distribution in those states and territories with sufficient data to analyse those proportions. The proportion of those treated who were male was marginally higher in QLD (65.0%) than in NSW (62.1%) and VIC (62.7%).

Table 6: CHB treatment by age and sex, 2013-14

Number receiving treatment and proportion of total	2013			2014		
Age group	Males	Females	TOTAL	Males	Females	TOTAL
0-20	40	19	59	51	28	79
	0.5%	0.4%	0.5%	0.6%	0.5%	0.6%
21-40	1,726	1,105	2,831	2,042	1,393	3,435
	22.8%	25.9%	23.9%	23.0%	26.7%	24.4%
41-60	4,134	2,194	6,328	4,696	2,613	7,309
	54.7%	51.4%	53.5%	53.0%	50.0%	51.9%
60+	1,657	949	2,606	2,071	1,189	3,260
	21.9%	22.2%	22.0%	23.4%	22.8%	23.1%
TOTAL	7,557	4,267	11,824	8,860	5,223	14,083
	63.9%	36.1%		62.9%	37.1%	

Data source: Department of Human Services Medicare statistics. Totals may not match national data due to patients being included in multiple age categories during a given period. Note due to availability, 2013 treatment data represent the period July-December 2013.

Treatment patterns: provider type

In 2014, the vast majority of treatment prescribed for CHB was provided by practitioners classified by Medicare as specialists (94.3%). However this did represent a slight decrease since 2013 (94.9%) with an additional 190 patients prescribed treatment by a General Practitioner (increasing the proportion from 5.1% to 5.7%, Table 15).

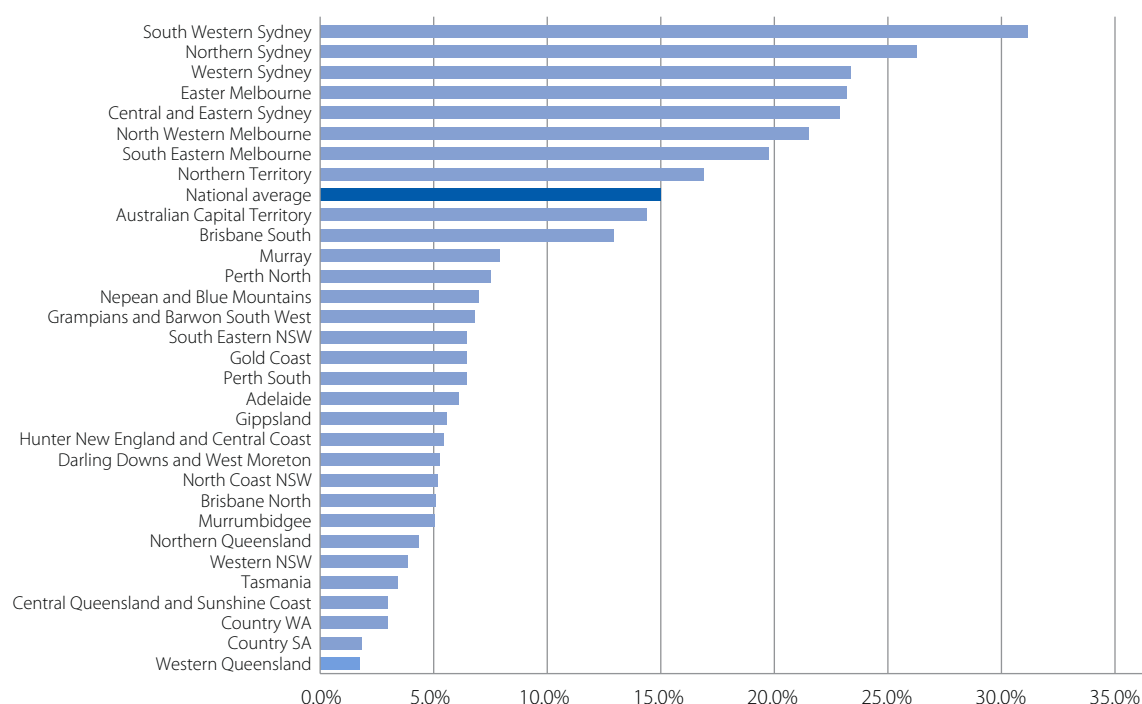
The proportion of patients prescribed treatment by a GP varied considerably according to State and Territory, and was highest in the jurisdictions with lower populations such as the NT (31.1% prescribed by a GP), TAS (15.2%), and ACT (15.6%). GP prescribing was also considerably higher than the national average in QLD (18.4%), and slightly higher than the national average in SA (7.2%). Although most states had an increase in the relative proportion of patients prescribed treatment by a GP, this was not the case in NSW (4.2% to 3.2%) or the NT (33.1% to 31.1%). While the overall number of people prescribed CHB treatment by GPs did increase in NT, this was outweighed by the larger proportional increase in the number prescribed by specialists. The largest increases in the proportion of people prescribed CHB treatment by GPs were in WA (5.6% to 10.5%) and in ACT (10.1% to 15.6%).

Treatment patterns: prescribing by drug regimen

The majority of Australians receiving treatment for CHB in 2014 were prescribed monotherapy with either entecavir (45.5% of the total) or tenofovir (31.3%) (Table 16). The proportion prescribed tenofovir increased from 2013 (28.4% of the total), while the proportion prescribed entecavir was similar to 2013 (45.4%). A minority of individuals received combination therapy, most commonly tenofovir/lamivudine (4.2%). The proportion of individuals receiving interferon-based treatment for CHB remains small, at 1.0% in 2013 and 1.2% in 2014.

ENGAGEMENT IN CARE

Figure 7: Engagement in care by Primary Health Network, 2014 - proportion of people living with CHB who received treatment or monitoring



Data source: Department of Human Services Medicare statistics.

Engagement in care according to Primary Health Network

As treatment uptake is a major component of estimates of engagement in care, the data for PHNs in general reflect the data regarding geographic diversity in treatment (see Tables 14 and 19). However, some PHNs had a level of non-treatment monitoring that was higher than expected given treatment rates. This was most pronounced in the NT, which had below average treatment uptake in 2014 (3.1%) but above average uptake of care (17.0%), due to the high number of monitoring tests conducted in those not receiving treatment (see online Appendix). This may reflect the disparity between access to treatment (which until recently required specialist involvement) and access to monitoring (which can be performed by any doctor).

Other variations in relative proportion receiving treatment were seen within states. In NSW, levels of monitoring were higher in Northern Sydney (26.2%) than Western Sydney (23.3%), although treatment levels were similar (9.9% and 10.0%, respectively). In VIC, Grampians and Barwon South West PHN had higher monitoring rates (6.9%) than Gippsland (5.5%) despite having lower treatment levels (1.6% compared to 2.1%).

NSW, VIC, NT (17.0%), and ACT (14.7%) were the only states with PHNs that achieved a level of care uptake similar or greater than the national average, with no PHNs in QLD, SA, WA, or TAS reaching the level of 15%.

In QLD, the proportion of people in care according to PHN largely reflected treatment uptake, with the level highest in Brisbane South (12.9%), and lower in Gold Coast (6.5%), Brisbane North (5.1%), and Darling Downs and West Moreton (5.3%). Care uptake was slightly higher in Northern Queensland (4.3%) than Central Queensland and Sunshine Coast (3.0%), despite treatment uptake being very similar (1.6% and 1.5%, respectively). As with treatment, the lowest proportion of people in care was in Western Queensland (1.8%).

The level of uptake of care in SA and WA had similar disparities between metropolitan and non-metropolitan PHNs as treatment uptake. In SA, the proportion of people in care was three times higher in Adelaide (6.2%) than in Country SA (1.9%); and in WA, uptake was highest in Perth North (7.5%), followed by Perth South (6.4%), and Country WA (3.0%).

In Tasmania, the proportion of people in care was estimated to be 3.4%, similar to the level in non-metropolitan PHNs in other states.

Engagement in care is predominantly assessed as a measure of the proportion of all individuals living with CHB, however given the high variation on the total number affected according to PHN, it is also important to examine the overall number of individuals receiving care for CHB, and the corresponding number who require improved access to care.

Due to the high concentration of people living in metropolitan PHNs with high prevalence, the six PHNs with the greatest number of people living with CHB who were not engaged in care were all in metropolitan Sydney and Melbourne (Table 19), with the top four being Central and Eastern Sydney (16,734 people not in care), North Western Melbourne (16,726), Eastern Melbourne (12,673), and South Eastern Melbourne (12,549). Although many rural and regional areas have the lowest proportion of people receiving treatment and care, it is clear that a high impact could be made in increasing the number of people in CHB care by focusing on metropolitan PHNs where a very high number of people living with CHB reside.

Trends in engagement in care over time according to Primary Health Network

The overall increase in the proportion of individuals receiving care was 12.9% between 2013 and 2014, with variations between PHNs in the proportional change over time (Table 20). It should be noted that a number of PHNs had a relatively low number of individuals engaged in care, and large proportional increases may not be a reliable reflection of increasing access. For this reason, proportional change in treatment uptake was only examined in those PHNs with >100 individuals engaged in care in 2014 (see Table 19).

While the proportional increase in the ACT was similar to the national average (11.4%), Tasmania had one of the largest proportional increases in the country (41.7%), as did NT (25.0%).

In NSW, most PHNs had an increase in engagement in care that was larger than the 12.9% national average. The exception was South Western Sydney where the proportion increased 8.7%; however, this PHN had the highest baseline level of care uptake in 2013 and remained the highest in the country in 2014. The largest proportional increase in the country was in Western NSW, increasing by more than 50%, although from a low baseline of 2.5%. The proportional increase in engagement in care was approximately 15-20% in all remaining NSW PHNs.

In VIC, only one PHN had a proportional increase higher than the national average – Grampians and Barwon South West, increasing from 5.3 to 6.9% (a 30% increase). Those VIC PHNs located in metropolitan areas had increases of 5-10%, while in Murray the proportion of people receiving engaged in care increased by 11.6%.

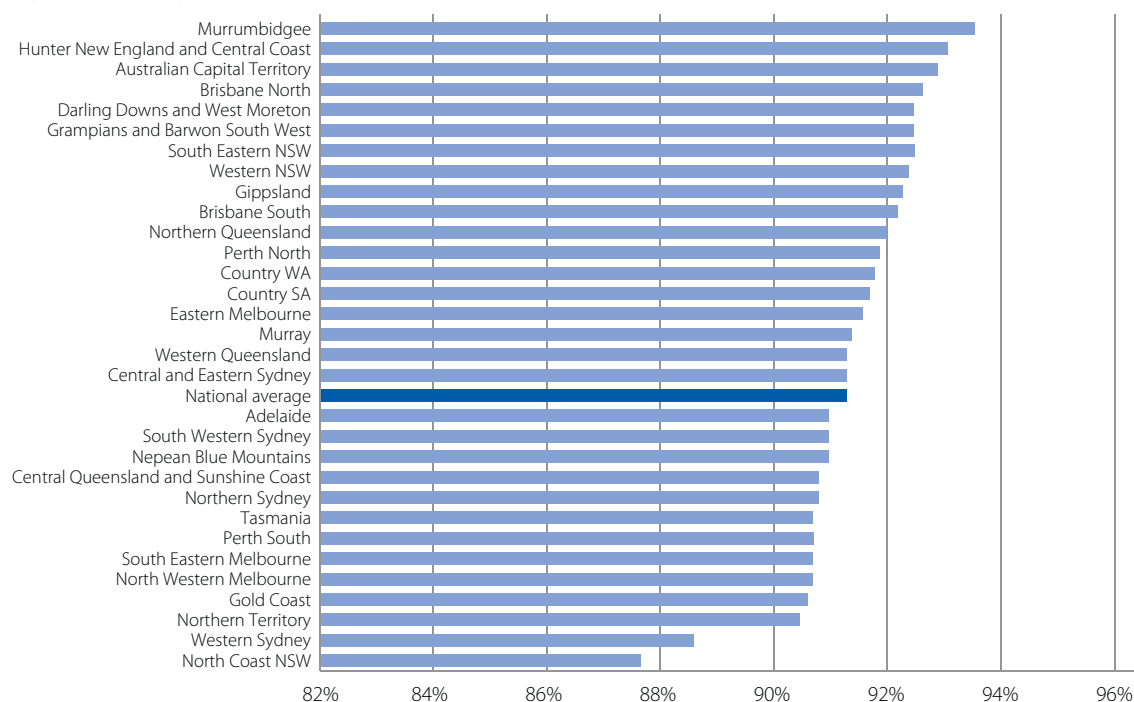
In QLD, larger increases in the proportion of people receiving care were seen in Northern Queensland (29.1%) and Darling Downs and West Moreton (17.5%).

A much larger increase in the proportion of people receiving care was seen in Brisbane South (12.9%) than Brisbane North (2.8%) or Central Queensland and Sunshine Coast (4.7%), while a decrease in the proportion of people in care was seen in Gold Coast (-2.6%).

In SA, the proportional increase in Adelaide was among the highest in the country (26.1%). In WA, the proportional increase in Perth North (13.1%) was similar to the national average, while those PHNs with lower uptake in 2014 had a higher proportional increase (16.2% in Perth South and 19.4% in Country WA).

IMMUNISATION

Figure 8: Hepatitis B immunisation coverage by Primary Health Network, 2014-15 - proportion of 1 year olds fully immunised



Data source: Department of Human Services Medicare statistics.

Immunisation coverage by Primary Health Network

During the period September-December 2015 (Q4 2015, the most recent data available), immunisation coverage for 1 year-olds was 93.0%, below the National Strategy target of 95% (Table 21). However, three PHNs did reach the 95% target – Murrumbidgee (95.1%), Hunter New England and Central Coast (95.0%), and ACT (95.0%). Coverage also approached close to the national target in Gippsland (94.6%), South Eastern NSW (94.5%), Western NSW (94.5%). Note that these national and state and territory uptake estimates are higher than the calendar year total presented in Section 1, indicating uptake was higher in the latter part of the year.

Those PHNs with the lowest immunisation coverage in the country in Q4 2015 were North Coast NSW (90.0%), Western Sydney (91.7%), and Central Queensland, Wide Bay and Sunshine Coast (91.8%). However, it is notable that only three PHNs had coverage below 92% and none were lower than 90%.

Trends in immunisation coverage over time by PHN

The proportion of children fully immunised at 1 year of age increased in all PHNs between the time periods examined, with an average increase at the national level between 2013/14 and 2014/15 of 1.0%, and a further 1.8% increase between 2014/15 and Q4 2015 (Table 21).

Between 2014-15 and Q4 2015, the largest increase was seen in Western Sydney, which had the second-lowest uptake of any PHN in 2014-15 (88.6%) and increased by 3.5% to be 91.7% in Q4 2015. The next largest increases in coverage were seen in Nepean Blue Mountains (2.8% increase), Tasmania (2.7% increase), and North Coast NSW (2.6% increase).

The trends over time generally show substantial progress in immunisation coverage. No PHNs had immunisation coverage below 90% in Q4 2015, compared to one third of all PHNs in 2013-14. The proportion of PHNs with coverage greater than 94% increased from zero in 2013-14 to one quarter of the total in Q4 2015. If these trends continue over time, a substantial proportion of PHNs should be expected to reach the national immunisation coverage target of 95% by 2017.

SOURCE INFORMATION AND METHODOLOGICAL NOTES

Table 7: Data source information and availability

Indicator	Data description	Data source/s	Time periods available	
			By state/ territory	By PHN
CHB prevalence	Calculated based on serosurvey prevalence and total population size according to priority population group (e.g. country of birth, Aboriginal and Torres Strait Islander status)	Published local and international seroprevalence surveys Australian Bureau of Statistics Census and Estimated Resident Population data according to population	2013-2015	2013-2015
Diagnosis	Notifications for chronic (unspecified) hepatitis B notified from laboratories and clinicians to health departments	National Notifiable Diseases Surveillance System, Australian Government Department of Health	2005-2015	2013-2014
Treatment	Number of scripts dispensed for antiviral medications indicated for CHB	Pharmaceutical Benefits Scheme records, Australian Government Department of Human Services	2013-2015	2013-2014
Monitoring	Number of viral load tests performed in people not receiving treatment (item 69482)	Medicare Benefits Schedule records, Australian Government Department of Human Services	2013-2015	2013-2014
Engagement in care	Combined treatment and monitoring numbers	(As above)	2013-2015	2013-2014
Immunisation	Proportion of children fully immunised for hepatitis b at one year of age (three doses)	Reporting provided to the Australian Childhood Immunisation Register, Australian Government Department of Health	2006-2015 (yearly)	2013/14 and 2014/15 (financial years) Sep-Dec 2015 (quarter)

CHB prevalence estimates, PHN boundaries and population data

Population denominator data were sourced from the Australian Bureau of Statistics, which provides Estimated Resident Population (ERP) according to standard geographical statistical areas⁵. ERP for each Primary Health Network was generated using estimates of ERP according to Statistical Area 2 (SA2) geographic boundaries, which were then attributed to PHNs based on concordance files produced by the Department of Health⁶. In the small number of cases where a given SA2 was split between more than one PHN, the SA2 was allocated to the PHN that contained the largest proportion of the population.

Data regarding treatment and care were assigned to PHN boundaries by the Department of Human Services. Some registered addresses were not able to be assigned a PHN of residence, eg PO boxes, which has led to a small number of individuals classified as 'PHN not assigned'. These have not been separately listed in tables however appear in state/territory and national totals. For those states which contain only a single PHN (ACT, NT, and TAS), state and territory totals rather than PHN totals provided were used for consistency when both were available from the source data.

Estimates of the number of people living with CHB were derived using the same method as in previous Hepatitis B Mapping Reports, which applies the prevalence of CHB in both the overall population and

in identified higher-risk groups (those born overseas, Aboriginal and Torres Strait Islander people, people who inject drugs, men who have sex with men), to estimated population in each of these categories. Detailed methodology and sources, including individual seroprevalence estimates and population figures, can be obtained from the paper *The burden of chronic hepatitis B virus infection in Australia, 2011* by MacLachlan *et al* published in 2013⁷.

The original prevalence estimates were derived using data from the Australian Bureau of Statistics Census of Population and Housing, which was last updated in 2011. Estimates of CHB for the years 2013, 2014 and 2015 were generated by applying prevalence data from 2011 to updated ERP according to each SA2, which were then collated into PHNs using the concordance information described above. Source prevalence data were also updated for Aboriginal and Torres Strait Islander people, to reflect the updated published estimate of seroprevalence of 3.9%⁸ (instead of 3.7% as used previously).

Estimate of proportion diagnosed

The proportion of people living with chronic hepatitis B who have been diagnosed was estimated using model-derived estimates of the total number of people who have ever had chronic hepatitis B in Australia as the denominator and the cumulative number of notifications of hepatitis B from 1971 – 2015 as the numerator. Mortality is not included and therefore the proportion derived represents those ever having lived with chronic hepatitis B who have ever been diagnosed. More information on source information and methodology can be found in *The burden of chronic hepatitis B virus infection in Australia, 2011* by MacLachlan *et al* published in 2013⁷.

Notifications data

De-identified, tabulated notifications for unspecified (assumed to be chronic) hepatitis B according to year of diagnosis and state/territory were obtained from the Australian Government Department of Health National Notifiable Diseases Surveillance System (NNDSS)⁹. Notification rates were generated by dividing the total number of notifications by the ERP, sourced from Australian Bureau of Statistics data⁵.

De-identified, line-listed notifications data according to postcode were obtained through a data request to the Australian Government Department of Health for the period 2005–2014, which were categorised according to PHN using concordance files⁶. Rates were generated using ERP according to PHN for each year, as described above. Ethical approval for the obtainment of these data at this high level of geographic specificity was provided by the Melbourne Health Human Research Ethics Committee (LNR/16/MH/23) and approval for release was granted by the Communicable Diseases Network of Australia.

Medicare data

Data regarding viral load testing and antiviral treatment prescribing for people living with CHB were obtained from Medicare data provided by the Australian Government Department of Human Services. For both testing and treatment data, two sources were utilised – publicly available data according to state and territory for 2015, and a data request for information according to PHN, provider type, age/sex, and drug prescribed (for treatment data), for the period 2013–2014.

These sources include all services provided through Australia's national subsidised healthcare system, Medicare. Therefore it is possible that the data presented may underestimate uptake due to services provided outside of Medicare, such as those paid for by individual patients or subsidised by State Government services. However, previous analyses and comparison with other source data demonstrate that the vast majority of testing and treatment services for patients with CHB are provided through Medicare and included in these estimates.

Treatment

Treatment data for CHB represent the number of individuals receiving any drug listed on the Pharmaceutical Benefits Scheme (PBS)¹⁰ for the treatment of CHB: adefovir, entecavir, lamivudine, pegylated interferon alfa-2a, telbivudine, and tenofovir. Treatment uptake was derived by dividing the number of people receiving treatment by the total estimated population living with CHB in a given geographic area.

Treatment numbers according to state and territory for 2015 were derived from data extracted from the Department of Human Services website¹¹, which provides the number of scripts dispensed according to drug. Extrapolation of the number of individual patients prescribed treatment was done by dividing the number of scripts by the average number of scripts per patient required for a full year of treatment. These data were validated using previously provided data regarding the concordance between number of scripts and number of patients prescribed treatment.

Further treatment data at a more specific level were requested directly from the Department of Human Services, which provided the number of patients provided CHB treatment according to year, age, sex, provider type, geographic area (Statistical Area 3, Remoteness Area, and Primary Health Network), and drug, for the period July 1st 2013-December 31st 2014. Due to changes in the reporting systems for the Pharmaceutical Benefits Scheme, these more specific data are only available from July 2013 onwards. The period July-December 2013 is provided as representative of 2013.

All time periods are based on date of service, which represents the date the patient was supplied with their medication by a pharmacy. Age was calculated as of the date of service, which meant a patient could be part of two age categories during a given time period. Provider type was determined using derived major speciality type, which assigns a provider their speciality based on their history of prescribing. Area of residence was determined using the residential address of the patient at the date of service.

Any patients who received a prescription during the period for drugs indicated for HIV infection were removed from the data, to eliminate the possible inclusion of people receiving tenofovir for HIV instead of CHB, as it is used to treat both conditions. Pegylated interferon alfa-2a can also be prescribed for hepatitis C treatment, however only those treated using interferon without ribavirin (as is standard in the treatment of hepatitis B) were included in this dataset. In addition, given that pegylated interferon represented less than 1.5% of all CHB treatment during the period, any inadvertent inclusion of hepatitis C patients will have no discernible effect on the estimates of overall treatment uptake.

The number of patients receiving treatment was suppressed by the Department of Human Services if it was below 6 for the given period, indicated in tables using an asterisk.

Testing and care

The number of people receiving care for CHB was estimated by combining the number of people receiving treatment for a given time period and area with the number of people receiving a hepatitis B viral load test while NOT receiving treatment. Viral load testing is differentiated in Medicare data by the use of different item numbers (69482 for services in individuals not receiving treatment and item 69483 for individuals receiving treatment)¹². The 69482 item is restricted to one test per patient per year, and means that each test represents a single patient.

The proportion in care was determined by dividing the number in care by the estimated number of people living with CHB, and the number not receiving care by subtracting those in care from the total number living with CHB.

As with treatment, these data were derived from two separate sources depending on the time period available. The number of viral load tests for each state and territory in 2015 was derived from data extracted from the Department of Human Services website¹³. Further monitoring data at a more specific level was requested directly from the Department of Human Services, which provided the number of patients tested according to year, age, sex, and geographic area (Statistical Area 3, Remoteness Area, and Primary Health Network) for the period January 1st 2013-December 31st 2014.

The number of individual patients tested was also used to validate the assumption made in the 2015 data that each test represented a single patient and that no patients received the 69482 item more than once, which was verified by the data provided. Provider information was also requested for the testing item, however the majority of tests listed the pathologist as the test provider and therefore did not allow for determination of which type of practitioner ordered the test.

The number of patients receiving treatment was suppressed by the Department of Human Services if it was below 6 for the given period, indicated in tables using an asterisk.

Immunisation data

The Australian Childhood Immunisation Register (ACIR) is a national register that records immunisations given to children up to the age of 7 years. It includes all children registered with Medicare, and coverage is estimated to be 99% of all Australian children.

The immunisation schedule for hepatitis B includes three doses of vaccine at 2, 4 and 6 months as part of the hexavalent vaccine¹⁴. A child who was fully immunised according to the ACIR at 1 year in 2012-13 had received all recommended doses of vaccination for diphtheria, tetanus, pertussis, polio, hepatitis B, *Haemophilus influenzae* type b, and pneumococcal disease before the age of 15 months (the recommended birth dose of hepatitis B is not recorded by ACIR and not included in coverage estimates)⁴. Completeness was not available for individual vaccines for all time periods, which means coverage may underestimate the number of children vaccinated for hepatitis B, however the majority of children receive all vaccines in combination¹⁵.

Due to discrepancies in reporting, immunisation data were not available for concurrent time periods for the state/territory and PHN level. State/territory information for the period 2006-2015 were obtained from Immunise Australia⁴.

PHN data were not available per calendar year, and financial year data are not yet available for the period 2015-2016. For this reason, data regarding uptake according to PHN are presented for the quarter September-December 2015 (September 1st to 31st December 2015, indicated as Q4 2015), obtained from Immunise Australia¹⁶, and for the previous financial years 2013-14 and 2014-15 (July 1st 2013-June 30th 2014 and July 1st 2014-June 30th 2015) obtained from the National Health Performance Authority¹⁷.

National data for the period Sep-Dec 2015 for comparison purposes were obtained from the Australian Government Department of Human Services¹⁵.

ADDITIONAL TABLES

Table 8: CHB prevalence by Primary Health Network, 2015

State/ Territory	Primary Health Network	Total population	People living with CHB	CHB prevalence
NSW	Central & Eastern Sydney	1,524,342	22,032	1.45%
NSW	Northern Sydney	902,959	10,081	1.12%
NSW	Western Sydney	931,760	14,438	1.55%
NSW	Nepean Blue Mountains	364,776	2,664	0.73%
NSW	South Western Sydney	933,832	14,936	1.60%
NSW	South Eastern NSW	603,851	4,293	0.71%
NSW	Western NSW	313,007	2,625	0.84%
NSW	Hunter New England & Central Coast	1,244,217	8,270	0.66%
NSW	North Coast	508,967	3,349	0.66%
NSW	Murrumbidgee	239,994	1,597	0.67%
VIC	North Western Melbourne	1,616,658	21,911	1.36%
VIC	Eastern Melbourne	1,460,790	16,692	1.14%
VIC	South Eastern Melbourne	1,452,048	15,947	1.10%
VIC	Gippsland	266,020	1,510	0.57%
VIC	Murray	583,508	3,577	0.61%
VIC	Grampians & Barwon South West	608,847	3,388	0.56%
QLD	Brisbane North	957,590	7,294	0.76%
QLD	Brisbane South	1,101,386	12,057	1.09%
QLD	Gold Coast	569,951	4,062	0.71%
QLD	Darling Downs & West Moreton	546,258	4,013	0.73%
QLD	Western Queensland	69,981	832	1.19%
QLD	Central Qld, Wide Bay, Sunshine Coast	832,161	5,224	0.63%
QLD	Northern Queensland	701,527	6,642	0.95%
SA	Adelaide	1,210,164	12,031	0.99%
SA	Country SA	488,496	3,058	0.63%
WA	Perth North	1,065,774	10,431	0.98%
WA	Perth South	980,303	9,410	0.96%
WA	Country WA	547,011	5,009	0.92%
TAS	Tasmania	516,586	3,532	0.68%
NT	Northern Territory	244,307	4,315	1.77%
ACT	Australian Capital Territory	390,706	3,948	1.01%
	AUSTRALIA	23,777,777	239,167	1.01%

Data source: Estimation of CHB prevalence based on population-specific prevalence data and ABS population data⁷. Totals may not add up due to inclusion of those without a PHN of residence recorded in source data.

Table 9: CHB notifications by Primary Health Network, 2014

State/ Territory	Primary Health Network	Total population	CHB notifications	Notification rate per 100,000
NSW	Central & Eastern Sydney	1,502,132	786	52.3
NSW	Northern Sydney	887,918	415	46.7
NSW	Western Sydney	910,486	590	64.8
NSW	Nepean Blue Mountains	359,856	22	6.1
NSW	South Western Sydney	915,629	376	41.1
NSW	South Eastern NSW	598,216	53	8.9
NSW	Western NSW	311,789	49	15.7
NSW	Hunter New England & Central Coast	1,234,273	109	8.8
NSW	North Coast	504,891	38	7.5
NSW	Murrumbidgee	238,904	40	16.7
VIC	North Western Melbourne	1,572,404	756	48.1
VIC	Eastern Melbourne	1,441,487	472	32.7
VIC	South Eastern Melbourne	1,424,012	341	23.9
VIC	Gippsland	264,966	16	6.0
VIC	Murray	581,274	52	8.9
VIC	Grampians & Barwon South West	603,696	49	8.1
QLD	Brisbane North	941,980	171	18.2
QLD	Brisbane South	1,087,222	410	37.7
QLD	Gold Coast	560,044	79	14.1
QLD	Darling Downs & West Moreton	539,098	52	9.6
QLD	Western Queensland	70,675	19	26.9
QLD	Central Qld, Wide Bay, Sunshine Coast	823,643	58	7.0
QLD	Northern Queensland	697,263	116	16.6
SA	Adelaide	1,199,325	270	22.5
SA	Country SA	486,225	53	10.9
WA	Perth North	1,053,434	273	25.9
WA	Perth South	961,423	254	26.4
WA	Country WA	544,989	100	18.3
TAS	Tasmania	514,726	55	10.7
NT	Northern Territory	243,368	150	61.6
ACT	Australian Capital Territory	385,346	95	24.7
	AUSTRALIA	23,460,694	6,400	27.3

Data source: National Notifiable Diseases Surveillance System; ABS Estimated Resident Population. Totals may not add up due to inclusion of those without a PHN of residence recorded in source data.

Table 10: CHB notifications by state and territory, 2006-2015

State/Territory	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
ACT	70	56	57	103	92	92	105	107	95	81
NSW	2376	2521	2230	2769	2556	2459	2287	2477	2506	2355
NT	234	235	185	157	157	150	191	325	150	159
QLD	936	932	867	994	1043	778	766	838	908	998
SA	255	315	271	295	262	302	328	286	320	337
TAS	44	32	52	70	49	37	61	55	55	41
VIC	1565	1851	1852	1903	1861	1883	1839	1835	1738	1816
WA	543	568	685	665	743	630	805	941	628	576
AUSTRALIA	6,076	6,023	6,510	6,199	6,956	6,763	6,331	6,382	6,864	6,400

Data source: National Notifiable Diseases Surveillance System; ABS Estimated Resident Population.

Table 11: CHB notification rate per 100,000 by state and territory, 2006-2015

State/Territory	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
ACT	20.9	16.3	16.4	29.0	25.4	25.0	28.0	28.1	24.7	20.7
NSW	35.2	36.9	32.1	39.3	35.8	34.1	31.3	33.4	33.4	30.9
NT	111.9	109.9	84.1	69.5	68.3	64.9	81.0	134.0	61.6	65.1
QLD	23.4	22.7	20.5	23.0	23.7	17.4	16.8	18.0	19.2	20.9
SA	16.4	20.1	17.1	18.3	16.1	18.4	19.8	17.1	19.0	19.8
TAS	9.0	6.5	10.4	13.9	9.6	7.2	11.9	10.7	10.7	7.9
VIC	30.9	35.9	35.2	35.4	34.1	34.0	32.6	32.0	29.8	30.6
WA	26.5	27.0	31.5	29.7	32.4	26.8	33.0	37.4	24.6	22.2
AUSTRALIA	29.5	31.3	29.2	32.1	30.7	28.3	28.1	29.7	27.3	26.8

Data source: National Notifiable Diseases Surveillance System; ABS Estimated Resident Population.

Table 12: CHB notification rate per 100,000 by Primary Health Network, 2005-14

State/ Territory	Primary Health Network	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
NSW	Central & Eastern Sydney	65.1	58.1	60.7	56.0	69.4	62.5	56.8	50.9	52.6	52.3
NSW	Northern Sydney	38.3	40.0	39.0	31.0	41.5	34.8	37.7	38.5	46.9	46.7
NSW	Western Sydney	71.4	74.0	77.4	64.0	82.4	74.0	70.4	67.7	62.7	64.8
NSW	Nepean Blue Mountains	10.2	9.6	6.9	6.2	10.2	13.3	9.8	5.1	5.9	6.1
NSW	South Western Sydney	67.8	49.3	58.3	48.3	51.5	47.9	47.3	39.1	46.2	41.1
NSW	South Eastern NSW	12.1	12.2	11.3	12.3	10.0	11.4	10.1	9.4	8.3	8.9
NSW	Western NSW	12.8	8.8	6.4	9.1	14.0	13.9	14.5	13.0	15.2	15.7
NSW	Hunter New England & Central Coast	11.1	10.9	8.8	9.0	11.1	8.3	7.8	7.1	9.2	8.8
NSW	North Coast	7.5	9.3	10.1	6.2	6.4	7.5	7.7	6.4	6.0	7.5
NSW	Murrumbidgee	12.1	13.8	18.1	11.6	11.1	13.6	12.7	17.7	13.9	16.7
VIC	North Western Melbourne	61.7	54.9	62.0	61.1	59.7	53.0	54.8	51.0	48.7	48.1
VIC	Eastern Melbourne	33.7	29.8	36.4	36.2	38.8	36.2	36.0	36.9	35.6	32.7
VIC	South Eastern Melbourne	28.2	31.8	33.2	29.9	30.8	32.3	32.4	28.2	26.8	23.9
VIC	Gippsland	9.6	5.8	7.7	8.5	9.9	10.9	6.2	5.7	9.1	6.0
VIC	Murray	5.7	6.9	7.1	9.7	9.6	10.4	10.5	12.0	10.2	8.9
VIC	Grampians & Barwon South West	5.6	4.3	10.3	9.3	8.4	8.4	7.0	7.6	8.5	8.1
QLD	Brisbane North	18.1	19.1	17.7	22.6	21.6	22.3	19.1	17.3	15.3	18.2
QLD	Brisbane South	45.8	47.4	45.6	31.3	44.2	45.0	31.3	32.0	36.3	37.7
QLD	Gold Coast	17.2	15.1	14.2	15.4	17.3	16.4	13.4	10.9	11.8	14.1
QLD	Darling Downs & West Moreton	13.5	11.9	9.3	13.0	8.4	12.8	8.4	9.8	8.7	9.6
QLD	Western Queensland	22.6	22.8	27.1	29.6	35.2	32.0	21.6	28.5	24.0	26.9
QLD	Central Qld, Wide Bay, Sunshine Coast	6.9	9.6	8.8	6.3	7.5	7.9	4.9	6.3	7.3	7.0
QLD	Northern Queensland	19.5	19.9	24.3	23.2	23.0	22.8	17.9	12.4	17.3	16.6
SA	Adelaide	19.8	17.9	23.8	19.9	21.2	18.1	20.7	24.4	20.6	22.5
SA	Country SA	13.6	22.7	15.7	9.4	8.7	5.9	8.4	10.6	11.8	10.9
WA	Perth North	23.6	36.0	38.0	38.2	32.9	28.8	26.3	25.4	24.8	25.9
WA	Perth South	13.3	20.5	19.4	29.0	32.8	43.4	29.8	48.2	60.4	26.4
WA	Country WA	17.3	18.3	17.1	21.2	16.3	20.2	21.3	21.3	20.9	18.3
TAS	Tasmania	10.1	6.5	10.4	10.2	13.9	9.6	7.2	11.9	10.7	10.7
NT	Northern Territory	97.1	111.9	109.9	84.1	69.5	68.3	64.9	81.0	134.0	61.6
ACT	Australian Capital Territory	26.6	20.9	16.3	16.4	29.0	25.4	25.0	28.0	28.1	24.7
	AUSTRALIA	30.1	29.5	31.3	29.2	32.1	30.7	28.3	28.1	28.3	27.3

Data source: National Notifiable Diseases Surveillance System; ABS Estimated Resident Population. Totals may not add up due to inclusion of those without a PHN of residence recorded in source data.

Table 13: CHB treatment by state and territory, 2013-2014

	2013			2014		
State/ Territory	People living with CHB	Number receiving treatment	Treatment uptake	People living with CHB	Number receiving treatment	Treatment uptake
ACT	3,823	163	4.3%	3,876	212	5.5%
NSW	81,997	5,956	7.3%	83,319	6,806	9.1%
NT	4,305	98	2.3%	4,296	134	3.1%
QLD	39,057	1,012	2.6%	39,640	1,250	2.6%
SA	14,797	427	2.9%	14,942	543	3.2%
TAS	3,510	31	0.9%	3,514	49	1.4%
VIC	60,244	3,338	5.5%	61,493	3,873	6.6%
WA	24,182	668	2.8%	24,533	836	3.3%
AUSTRALIA	231,980	11,693	5.0%	235,679	13,703	5.8%

Data source: Department of Human Services Medicare statistics.

Table 14: CHB treatment by Primary Health Network, 2014

State/ Territory	Primary Health Network	People living with CHB	Number receiving treatment	Treatment uptake
NSW	Central & Eastern Sydney	21,687	1901	8.8%
NSW	Northern Sydney	9,895	984	9.9%
NSW	Western Sydney	14,122	1,415	10.0%
NSW	Nepean Blue Mountains	2,625	79	3.0%
NSW	South Western Sydney	14,708	2,009	13.7%
NSW	South Eastern NSW	4,252	104	2.4%
NSW	Western NSW	2,618	35	1.3%
NSW	Hunter New England & Central Coast	8,208	166	2.0%
NSW	North Coast	3,321	63	1.9%
NSW	Murrumbidgee	1,589	29	1.8%
VIC	North Western Melbourne	21,291	1,446	6.8%
VIC	Eastern Melbourne	16,455	1,251	7.6%
VIC	South Eastern Melbourne	15,638	997	6.4%
VIC	Gippsland	1,502	31	2.1%
VIC	Murray	3,559	93	2.6%
VIC	Grampians & Barwon South West	3,352	54	1.6%
QLD	Brisbane North	7,174	179	2.5%
QLD	Brisbane South	11,902	648	5.4%
QLD	Gold Coast	3,992	134	3.4%
QLD	Darling Downs & West Moreton	3,955	90	2.3%
QLD	Western Queensland	839	7	0.8%
QLD	Central Qld, Wide Bay, Sunshine Coast	5,176	76	1.5%
QLD	Northern Queensland	6,602	107	1.6%
SA	Adelaide	11,901	505	4.2%
SA	Country SA	3,041	35	1.2%
WA	Perth North	10,320	458	4.4%
WA	Perth South	9,256	328	3.5%
WA	Country WA	5,012	51	1.0%
TAS	Tasmania	3,514	49	1.4%
NT	Northern Territory	4,296	134	3.1%
ACT	Australian Capital Territory	3,876	212	5.5%
	AUSTRALIA	235,679	13,703	5.8%

Data source: Department of Human Services Medicare statistics. Totals may not add up due to inclusion of those without a PHN of residence recorded in source data.

Table 15: CHB treatment by state and territory and provider type, 2013-2014

	2013				2014			
	Specialist		General Practitioner		Specialist		General Practitioner	
State/ Territory	N	%	N	%	N	%	N	%
ACT	142	89.9%	16	10.1%	179	84.4%	33	15.6%
NSW	5540	95.8%	240	4.2%	6509	96.8%	216	3.2%
NT	46	66.7%	23	33.3%	73	68.9%	33	31.1%
QLD	824	84.3%	153	15.7%	1058	81.6%	239	18.4%
SA	343	93.7%	23	6.3%	437	92.8%	34	7.2%
TAS	31	100.0%	*	*	39	84.8%	7	15.2%
VIC	2951	97.5%	77	2.5%	3573	96.7%	123	3.3%
WA	407	94.4%	24	5.6%	521	89.5%	61	10.5%
AUSTRALIA	10284	94.9%	556	5.1%	12389	94.3%	746	5.7%

Data source: Department of Human Services Medicare statistics. Totals may not add up due to patients prescribed treatment by both a general practitioner and a specialist during the time period, and the exclusion of providers not classified with a provider type. *Data suppressed due to low numbers. Note due to availability, 2013 treatment data represent the period July-December 2013.

Table 16: CHB treatment by drug, 2013-2014

	2013		2014	
Drug regimen prescribed	Number receiving treatment	Proportion	Number receiving treatment	Proportion
MONOTHERAPY REGIMENS				
Adefovir	602	4.2%	543	3.3%
Entecavir	6,472	45.4%	7,490	45.5%
Lamivudine	1,566	11.0%	1,595	9.7%
Pegylated Interferon	149	1.0%	192	1.2%
Telbivudine	*	*	7	0.0%
Tenofovir	4,051	28.4%	5,153	31.3%
COMBINATION REGIMENS				
Adefovir/Lamivudine	455	3.2%	459	2.8%
Tenofovir/Lamivudine	682	4.8%	692	4.2%
Entecavir/Tenofovir	230	1.6%	264	1.6%
Entecavir/Adefovir	59	0.4%	60	0.4%

Data source: Department of Human Services Medicare statistics. Totals may not match national data due to patients prescribed multiple drugs or regimens during the time period. *Data suppressed due to low numbers. Note due to availability, 2013 treatment data represent the period July-December 2013.

Table 17: Change in treatment uptake by Primary Health Network, 2013-2014

State/ Territory	Primary Health Network	2013		2014		2013 to 2014	
		Number receiving treatment	Treatment uptake	Number receiving treatment	Treatment uptake	Change in number receiving treatment	Percent change in uptake
NSW	Central & Eastern Sydney	1,640	7.7%	1,901	8.8%	261	13.8%
NSW	Northern Sydney	858	8.8%	984	9.9%	126	12.9%
NSW	Western Sydney	1,235	9.0%	1,415	10.0%	180	11.9%
NSW	Nepean Blue Mountains	70	2.7%	79	3.0%	9	11.2%
NSW	South Western Sydney	1,820	12.6%	2,009	13.7%	189	8.7%
NSW	South Eastern NSW	91	2.2%	104	2.4%	13	13.3%
NSW	Western NSW	26	1.0%	35	1.3%	9	33.6%
NSW	Hunter New England & Central Coast	131	1.6%	166	2.0%	35	25.6%
NSW	North Coast	46	1.4%	63	1.9%	17	36.0%
NSW	Murrumbidgee	23	1.5%	29	1.8%	6	25.2%
VIC	North Western Melbourne	1,236	6.0%	1,446	6.8%	210	13.4%
VIC	Eastern Melbourne	1,078	6.6%	1,251	7.6%	173	14.4%
VIC	South Eastern Melbourne	880	5.7%	997	6.4%	117	11.0%
VIC	Gippsland	30	2.0%	31	2.1%	1	3.0%
VIC	Murray	76	2.1%	93	2.6%	17	21.6%
VIC	Grampians & Barwon South West	40	1.2%	54	1.6%	14	34.0%
QLD	Brisbane North	148	2.1%	179	2.5%	31	18.8%
QLD	Brisbane South	511	4.4%	648	5.4%	137	24.9%
QLD	Gold Coast	111	2.8%	134	3.4%	23	18.8%
QLD	Darling Downs & West Moreton	74	1.9%	90	2.3%	16	19.4%
QLD	Western Queensland	6	0.7%	7	0.8%	1	16.6%
QLD	Central Qld, Wide Bay, Sunshine Coast	66	1.3%	76	1.5%	10	13.5%
QLD	Northern Queensland	88	1.3%	107	1.6%	19	20.3%
SA	Adelaide	398	3.4%	505	4.2%	107	25.5%
SA	Country SA	28	0.9%	35	1.2%	7	24.4%
WA	Perth North	372	3.7%	458	4.4%	86	21.0%
WA	Perth South	262	2.9%	328	3.5%	66	22.7%
WA	Country WA	36	0.7%	51	1.0%	15	41.8%
TAS	Tasmania	31	0.9%	49	1.4%	18	55.5%
NT	Northern Territory	98	2.3%	134	3.1%	36	36.7%
ACT	Australian Capital Territory	163	4.3%	212	5.5%	49	27.9%
	AUSTRALIA	11,693	5.0%	13,703	5.8%	2,010	16.0%

Data source: Department of Human Services Medicare statistics. Totals may not add up due to inclusion of those without a PHN of residence recorded in source data.

Table 18: Number and proportion of people receiving care for CHB by state and territory, 2013-2014

State/ Territory	2013			2014		
	People living with CHB	Number receiving care	Proportion of people in care	People living with CHB	Number receiving care	Proportion of people in care
ACT	3,823	506	13.2%	3,876	568	14.7%
NSW	81,997	14,394	17.6%	83,319	16,743	20.1%
NT	4,305	587	13.6%	4,296	730	17.0%
QLD	39,057	2,552	6.5%	39,640	2,834	7.1%
SA	14,797	650	4.4%	14,942	794	5.3%
TAS	3,510	85	2.4%	3,514	118	3.4%
VIC	60,244	11,189	18.6%	61,493	12,029	19.6%
WA	24,182	1,309	5.4%	24,533	1,505	6.1%
AUSTRALIA	231,980	31,280	13.5%	235,679	35,331	15.0%

Data source: Department of Human Services Medicare statistics.

Table 19: Number and proportion of people receiving care for CHB by Primary Health Network, 2014

State/ Territory	Primary Health Network	People living with CHB	Number receiving care	Proportion of people in care	Number not receiving care
NSW	Central & Eastern Sydney	21,687	4,953	22.8%	16,734
NSW	Northern Sydney	9,895	2,590	26.2%	7,305
NSW	Western Sydney	14,122	3,291	23.3%	10,831
NSW	Nepean Blue Mountains	2,625	184	7.0%	2,441
NSW	South Western Sydney	14,708	4,583	31.2%	10,125
NSW	South Eastern NSW	4,252	276	6.5%	3,976
NSW	Western NSW	2,618	101	3.9%	2,517
NSW	Hunter New England & Central Coast	8,208	447	5.4%	7,761
NSW	North Coast	3,321	173	5.2%	3,148
NSW	Murrumbidgee	1,589	79	5.0%	1,510
VIC	North Western Melbourne	21,291	4,565	21.4%	16,726
VIC	Eastern Melbourne	16,455	3,782	23.0%	12,673
VIC	South Eastern Melbourne	15,638	3,089	19.8%	12,549
VIC	Gippsland	1,502	83	5.5%	1,419
VIC	Murray	3,559	280	7.9%	3,279
VIC	Grampians & Barwon South West	3,352	230	6.9%	3,122
QLD	Brisbane North	7,174	367	5.1%	6,807
QLD	Brisbane South	11,902	1,530	12.9%	10,372
QLD	Gold Coast	3,992	259	6.5%	3,733
QLD	Darling Downs & West Moreton	3,955	208	5.3%	3,747
QLD	Western Queensland	839	15	1.8%	824
QLD	Central Qld, Wide Bay, Sunshine Coast	5,176	155	3.0%	5,021
QLD	Northern Queensland	6,602	284	4.3%	6,318
SA	Adelaide	11,901	739	6.2%	11,162
SA	Country SA	3,041	57	1.9%	2,984
WA	Perth North	10,320	770	7.5%	9,550
WA	Perth South	9,256	594	6.4%	8,662
WA	Country WA	5,012	148	3.0%	4,864
TAS	Tasmania	3,514	118	3.4%	3,396
NT	Northern Territory	4,296	730	17.0%	3,566
ACT	Australian Capital Territory	3,876	568	14.7%	3,308
	AUSTRALIA	235,679	35,331	15.0%	200,348

Data source: Department of Human Services Medicare statistics. Totals may not add up due to inclusion of those without a PHN of residence recorded in source data.

Table 20: Change in uptake of care for CHB by Primary Health Network, 2013-2014

		2013		2014		2013 to 2014	
State/ Territory	Primary Health Network	Number receiving care	Proportion of people in care	Number receiving care	Proportion of people in care	Change in number receiving care	Percent change in proportion
NSW	Central & Eastern Sydney	4,095	19.2%	4,953	22.8%	858	+21.0%
NSW	Northern Sydney	2,174	22.3%	2,590	26.2%	416	+19.1%
NSW	Western Sydney	2,812	20.4%	3,291	23.3%	479	+17.0%
NSW	Nepean Blue Mountains	153	5.9%	184	7.0%	31	+20.3%
NSW	South Western Sydney	4,215	29.1%	4,583	31.2%	368	+8.7%
NSW	South Eastern NSW	236	5.6%	276	6.5%	40	+16.9%
NSW	Western NSW	64	2.5%	101	3.9%	37	+57.8%
NSW	Hunter New England & Central Coast	388	4.8%	447	5.4%	59	+15.2%
NSW	North Coast	144	4.4%	173	5.2%	29	+20.1%
NSW	Murrumbidgee	62	3.9%	79	5.0%	17	+27.4%
VIC	North Western Melbourne	4,212	20.4%	4,565	21.4%	353	+8.4%
VIC	Eastern Melbourne	3,512	21.6%	3,782	23.0%	270	+7.7%
VIC	South Eastern Melbourne	2,950	19.3%	3,089	19.8%	139	+4.7%
VIC	Gippsland	98	6.5%	83	5.5%	-15	-15.3%
VIC	Murray	251	7.1%	280	7.9%	29	+11.6%
VIC	Grampians & Barwon South West	177	5.3%	230	6.9%	53	+29.9%
QLD	Brisbane North	357	5.1%	367	5.1%	10	+2.8%
QLD	Brisbane South	1,355	11.6%	1,530	12.9%	175	+12.9%
QLD	Gold Coast	266	6.8%	259	6.5%	-7	-2.6%
QLD	Darling Downs & West Moreton	177	4.6%	208	5.3%	31	+17.5%
QLD	Western Queensland	12	1.4%	15	1.8%	3	+25.0%
QLD	Central Qld, Wide Bay, Sunshine Coast	148	2.9%	155	3.0%	7	+4.7%
QLD	Northern Queensland	220	3.4%	284	4.3%	64	+29.1%
SA	Adelaide	586	5.0%	739	6.2%	153	+26.1%
SA	Country SA	60	2.0%	57	1.9%	-3	-5.0%
WA	Perth North	681	6.7%	770	7.5%	89	+13.1%
WA	Perth South	511	5.6%	594	6.4%	83	+16.2%
WA	Country WA	124	2.5%	148	3.0%	24	+19.4%
TAS	Tasmania	85	2.4%	118	3.4%	33	+41.7%
NT	Northern Territory	587	13.6%	730	17.0%	141	+25.0%
ACT	Australian Capital Territory	506	13.2%	568	14.7%	62	+11.4%
	AUSTRALIA	31,280	13.5%	35,331	15.0%	4031	+12.9%

Data source: Department of Human Services Medicare statistics. Totals may not add up due to inclusion of those without a PHN of residence recorded in source data. Note due to availability, 2013 treatment data represent the period July-December 2013.

Table 21: Immunisation coverage by Primary Health Network according to time period, 2013/14 to 2015

State/ Territory	Primary Health Network	Proportion fully immunised			Percent change
		Jul 2013 – Jun 2014	Jul 2014 – Jun 2015	Sep – Dec 2015 (Q4)	2014/15 to Sep-Dec 2015
NSW	Central & Eastern Sydney	89.0%	91.3%	92.4%	+1.2%
NSW	Northern Sydney	89.6%	90.8%	92.7%	+2.1%
NSW	Western Sydney	88.9%	88.6%	91.7%	+3.5%
NSW	Nepean Blue Mountains	89.9%	91.0%	93.6%	+2.8%
NSW	South Western Sydney	88.7%	91.0%	92.4%	+1.5%
NSW	South Eastern NSW	91.3%	92.5%	94.5%	+2.2%
NSW	Western NSW	90.8%	92.4%	94.5%	+2.2%
NSW	Hunter New England & Central Coast	91.7%	93.1%	95.0%	+2.0%
NSW	North Coast	86.3%	87.7%	90.0%	+2.6%
NSW	Murrumbidgee	91.7%	93.6%	95.1%	+1.6%
VIC	North Western Melbourne	90.2%	90.7%	92.6%	+2.0%
VIC	Eastern Melbourne	91.0%	91.6%	93.5%	+2.0%
VIC	South Eastern Melbourne	90.6%	90.7%	92.5%	+2.0%
VIC	Gippsland	91.7%	92.3%	94.6%	+2.5%
VIC	Murray	90.9%	91.4%	92.4%	+1.1%
VIC	Grampians & Barwon South West	91.8%	92.5%	94.1%	+1.7%
QLD	Brisbane North	92.5%	92.6%	94.0%	+1.5%
QLD	Brisbane South	91.4%	92.2%	93.0%	+0.9%
QLD	Gold Coast	89.7%	90.6%	92.5%	+2.1%
QLD	Darling Downs & West Moreton	91.9%	92.5%	93.8%	+1.4%
QLD	Western Queensland	91.0%	91.3%	93.4%	+2.3%
QLD	Central Qld, Wide Bay & Sunshine Coast	89.9%	90.8%	91.8%	+1.0%
QLD	Northern Queensland	91.3%	92.0%	92.6%	+0.6%
SA	Adelaide	90.0%	91.0%	93.3%	+2.5%
SA	Country SA	90.4%	91.7%	93.8%	+2.3%
WA	Perth North	90.3%	91.9%	92.7%	+0.9%
WA	Perth South	89.3%	90.7%	92.4%	+1.9%
WA	Country WA	91.1%	91.8%	93.1%	+1.4%
TAS	Tasmania	89.8%	90.7%	93.1%	+2.7%
NT	Northern Territory	90.8%	90.5%	92.7%	+2.4%
ACT	Australian Capital Territory	93.0%	92.9%	95.0%	+2.2%
	AUSTRALIA	90.4%	91.3%	93.0%	+1.8%

Data source: Immunise Australia, Medicare Australia, and National Health Performance Authority Australian Childhood Immunisation Register statistics.

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AUSTRALASIAN SOCIETY FOR HIV, VIRAL HEPATITIS AND SEXUAL HEALTH
MEDICINE AND VICTORIAN INFECTIOUS DISEASES REFERENCE
LABORATORY, THE DOHERTY INSTITUTE



HEPATITIS B MAPPING PROJECT

Appendix/Supplementary Information

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VICTORIAN INFECTIOUS DISEASES REFERENCE LABORATORY, THE DOHERTY INSTITUTE



Table 22: CHB notifications by Primary Health Network, 2005-14

State/ Territory	Primary Health Network	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
NSW	Central & Eastern Sydney	852	769	819	771	973	888	816	741	778	786
NSW	Northern Sydney	301	316	313	252	343	292	320	331	410	415
NSW	Western Sydney	534	563	602	511	675	619	599	588	558	590
NSW	Nepean Blue Mountains	34	32	23	21	35	46	34	18	21	22
NSW	South Western Sydney	544	398	478	403	438	412	412	345	415	376
NSW	South Eastern NSW	66	67	63	69	57	66	59	55	49	53
NSW	Western NSW	38	26	19	27	42	42	44	40	47	49
NSW	Hunter New England & Central Coast	125	123	101	104	130	99	93	86	113	109
NSW	North Coast	35	44	48	30	31	37	38	32	30	38
NSW	Murrumbidgee	28	32	42	27	26	32	30	42	33	40
VIC	North Western Melbourne	749	683	796	809	817	746	789	755	743	756
VIC	Eastern Melbourne	434	387	479	483	526	497	498	517	506	472
VIC	South Eastern Melbourne	337	387	412	381	402	428	435	386	374	341
VIC	Gippsland	23	14	19	21	25	28	16	15	24	16
VIC	Murray	31	38	39	54	54	59	60	69	59	52
VIC	Grampians & Barwon South West	31	24	58	53	48	49	41	45	51	49
QLD	Brisbane North	139	150	143	188	185	195	170	157	142	171
QLD	Brisbane South	418	442	434	305	442	457	323	337	389	410
QLD	Gold Coast	77	70	68	76	88	85	71	59	65	79
QLD	Darling Downs & West Moreton	60	54	43	62	41	64	43	51	46	52
QLD	Western Queensland	15	15	18	20	24	22	15	20	17	19
QLD	Central Qld, Wide Bay, Sunshine Coast	48	68	64	47	57	61	38	50	59	58
QLD	Northern Queensland	114	119	149	146	148	149	119	84	119	116
SA	Adelaide	215	196	263	223	241	209	241	287	244	270
SA	Country SA	62	104	73	44	41	28	40	51	57	53
WA	Perth North	195	304	331	343	305	272	255	255	257	273
WA	Perth South	96	151	148	229	269	365	259	437	568	254
WA	Country WA	80	86	81	103	81	102	110	113	113	100
TAS	Tasmania	49	44	32	52	70	49	37	61	55	55
NT	Northern Territory	200	234	235	185	157	157	150	191	325	150
ACT	Australian Capital Territory	88	70	56	57	103	92	92	105	107	95
	AUSTRALIA	6,076	6,023	6,510	6,199	6,956	6,763	6,331	6,382	6,864	6,400

Data source: National Notifiable Diseases Surveillance System; ABS Estimated Resident Population. Totals may not add up due to inclusion of those without a PHN of residence recorded in source data.

Table 23: CHB treatment by age and sex and state and territory, 2013

Males					
Number receiving treatment and proportion of total					
State/Territory	0-20	21-40	41-60	>60	TOTAL
ACT	*	26	54	20	100
	*	26.0%	54.0%	20.0%	
NSW	19	849	2,149	796	3,813
	0.5%	22.3%	56.4%	20.9%	
NT	0	17	30	10	57
	0.0%	29.8%	52.6%	17.5%	
QLD	9	143	360	156	668
	1.3%	21.4%	53.9%	23.4%	
SA	0	67	154	81	302
	0.0%	22.2%	51.0%	26.8%	
TAS	0	7	15	*	22
	0.0%	31.8%	68.2%	*	
VIC	7	490	1,145	510	2,152
	0.3%	22.8%	53.2%	23.7%	
WA	*	127	227	84	438
	*	29.0%	51.8%	19.2%	
AUSTRALIA	40	1,726	4,134	1,657	7,557
Females					
Number receiving treatment and proportion of total					
State/Territory	0-20	21-40	41-60	>60	TOTAL
ACT	*	12	38	11	61
	*	19.7%	62.3%	18.0%	
NSW	9	504	1,195	503	2,211
	0.4%	22.8%	54.0%	22.7%	
NT	*	10	24	6	40
	*	25.0%	60.0%	15.0%	
QLD	*	104	174	72	350
	*	29.7%	49.7%	20.6%	
SA	*	36	65	29	130
	*	27.7%	50.0%	22.3%	
TAS	0	8	*	*	8
	0.0%	100.0%	*	*	
VIC	0	363	581	280	1,224
	0.0%	29.7%	47.5%	22.9%	
WA	*	68	117	48	233
	*	29.2%	50.2%	20.6%	
AUSTRALIA	19	1,105	2,194	949	4,267

Data source: Department of Human Services Medicare statistics. Totals may not match national data due to patients being included in multiple age categories during a given period. *Data suppressed due to low numbers. Note due to availability, 2013 treatment data represent the period July-December 2013.

Table 24: CHB treatment by age and sex and state and territory, 2014

Males					
Number receiving treatment and proportion of total					
State/Territory	0-20	21-40	41-60	>60	TOTAL
ACT	*	39	68	26	133
	*	29.3%	51.1%	19.5%	
NSW	20	961	2,387	977	4,345
	0.5%	22.1%	54.9%	22.5%	
NT	*	26	43	11	80
	*	32.5%	53.8%	13.8%	
QLD	15	188	437	197	837
	1.8%	22.5%	52.2%	23.5%	
SA	*	82	181	110	373
	*	22.0%	48.5%	29.5%	
TAS	0	11	18	8	37
	0.0%	29.7%	48.6%	21.6%	
VIC	8	579	1,287	627	2501
	0.3%	23.2%	51.5%	25.1%	
WA	*	156	275	115	546
	*	28.6%	50.4%	21.1%	
AUSTRALIA	51	2,042	4,696	2,071	8,860
Females					
Number receiving treatment and proportion of total					
State/Territory	0-20	21-40	41-60	>60	TOTAL
ACT	*	18	50	13	81
	*	22.2%	61.7%	16.0%	
NSW	10	620	1,393	624	2,647
	0.4%	23.4%	52.6%	23.6%	
NT	*	16	33	8	57
	*	28.1%	57.9%	14.0%	
QLD	7	136	219	89	451
	1.0%	30.2%	48.6%	19.7%	
SA	*	58	81	38	177
	*	32.8%	45.8%	21.5%	
TAS	0	9	*	*	9
	0.0%	100.0%	*	*	
VIC	*	431	700	354	1,485
	*	29.0%	47.1%	23.8%	
WA	*	105	137	63	305
	*	34.4%	44.9%	20.7%	
AUSTRALIA	28	1,393	2,613	1,189	5,223

Data source: Department of Human Services Medicare statistics. Totals may not match national data due to patients being included in multiple age categories during a given period. *Data suppressed due to low numbers.

Table 25: Number and proportion of people receiving care for CHB by Primary Health Network, 2013

State/ Territory	Primary Health Network	People living with CHB	Number receiving care	Proportion of people in care	Number not receiving care
NSW	Central & Eastern Sydney	21,284	4,095	19.2%	17,189
NSW	Northern Sydney	9,740	2,174	22.3%	7,566
NSW	Western Sydney	13,795	2,812	20.4%	10,983
NSW	Nepean Blue Mountains	2,587	153	5.9%	2,434
NSW	South Western Sydney	14,480	4,215	29.1%	10,265
NSW	South Eastern NSW	4,213	236	5.6%	3,977
NSW	Western NSW	2,598	64	2.5%	2,534
NSW	Hunter New England & Central Coast	8,136	388	4.8%	7,748
NSW	North Coast	3,298	144	4.4%	3,154
NSW	Murrumbidgee	1,577	62	3.9%	1,515
VIC	North Western Melbourne	20,638	4,212	20.4%	16,426
VIC	Eastern Melbourne	16,225	3,512	21.6%	12,713
VIC	South Eastern Melbourne	15,319	2,950	19.3%	12,369
VIC	Gippsland	1,497	98	6.5%	1,399
VIC	Murray	3,537	251	7.1%	3,286
VIC	Grampians & Barwon South West	3,327	177	5.3%	3,150
QLD	Brisbane North	7,049	357	5.1%	6,692
QLD	Brisbane South	11,724	1,355	11.6%	10,369
QLD	Gold Coast	3,929	266	6.8%	3,663
QLD	Darling Downs & West Moreton	3,883	177	4.6%	3,706
QLD	Western Queensland	839	12	1.4%	827
QLD	Central Qld, Wide Bay, Sunshine Coast	5,102	148	2.9%	4,954
QLD	Northern Queensland	6,531	220	3.4%	6,311
SA	Adelaide	11,771	586	5.0%	11,185
SA	Country SA	3,026	60	2.0%	2,966
WA	Perth North	10,146	681	6.7%	9,465
WA	Perth South	9,075	511	5.6%	8,564
WA	Country WA	5,016	124	2.5%	4,892
TAS	Tasmania	3,510	85	2.4%	3,425
NT	Northern Territory	4,305	587	13.6%	3,718
ACT	Australian Capital Territory	3,823	506	13.2%	3,317
	AUSTRALIA	231,980	31,280	13.5%	200,700

Data source: Department of Human Services Medicare statistics. Totals may not add up due to inclusion of those without a PHN of residence recorded in source data. Note due to availability, 2013 treatment data represent the period July-December 2013.

Table 26: CHB monitoring tests by state and territory, 2013

State/ Territory	People living with CHB	Number receiving viral load test while not on treatment, 2013	Number receiving viral load test while on treatment, 2013
ACT	3,823	343	140
NSW	81,997	8,438	6,082
NT	4,305	489	42
QLD	39,057	1,540	1,530
SA	14,797	223	1,218
TAS	3,510	54	54
VIC	60,244	7,851	4,605
WA	24,182	641	143
AUSTRALIA	231,980	19,587	13,814

Data source: Department of Human Services Medicare statistics.

Table 27: CHB monitoring tests by state and territory, 2014

State/ Territory	People living with CHB	Number receiving viral load test while not on treatment	Number receiving viral load test while on treatment
ACT	3,876	356	174
NSW	83,319	9,937	6,494
NT	4,296	596	130
QLD	39,640	1,584	1,747
SA	14,942	251	1,368
TAS	3,514	69	92
VIC	61,493	8,156	4,829
WA	24,533	669	150
AUSTRALIA	235,679	21,628	14,990

Data source: Department of Human Services Medicare statistics.

Table 28: CHB monitoring tests by Primary Health Network, 2013

State/ Territory	Primary Health Network	People living with CHB	Number receiving viral load test while not on treatment	Number receiving viral load test while on treatment
NSW	Central & Eastern Sydney	21,284	2,455	1,434
NSW	Northern Sydney	9,740	1,316	734
NSW	Western Sydney	13,795	1,577	1,519
NSW	Nepean Blue Mountains	2,587	83	103
NSW	South Western Sydney	14,480	2,395	1,903
NSW	South Eastern NSW	4,213	145	156
NSW	Western NSW	2,598	38	35
NSW	Hunter New England & Central Coast	8,136	257	93
NSW	North Coast	3,298	98	51
NSW	Murrumbidgee	1,577	39	34
VIC	North Western Melbourne	20,638	2,976	1,743
VIC	Eastern Melbourne	16,225	2,434	1,535
VIC	South Eastern Melbourne	15,319	2,070	1,125
VIC	Gippsland	1,497	68	27
VIC	Murray	3,537	175	90
VIC	Grampians & Barwon South West	3,327	137	90
QLD	Brisbane North	7,049	209	227
QLD	Brisbane South	11,724	844	815
QLD	Gold Coast	3,929	155	139
QLD	Darling Downs & West Moreton	3,883	103	100
QLD	Western Queensland	839	6	6
QLD	Central Qld, Wide Bay, Sunshine Coast	5,102	82	97
QLD	Northern Queensland	6,531	132	133
SA	Adelaide	11,771	188	1,113
SA	Country SA	3,026	32	95
WA	Perth North	10,146	309	78
WA	Perth South	9,075	249	62
WA	Country WA	5,016	88	9
TAS	Tasmania	3,510	54	54
NT	Northern Territory	4,305	489	40
ACT	Australian Capital Territory	3,823	336	139
	AUSTRALIA	231,980	19,587	13,814

Data source: Department of Human Services Medicare statistics. Totals may not add up due to inclusion of those without a PHN of residence recorded in source data.

Table 29: CHB monitoring tests by Primary Health Network, 2014

State/ Territory	Primary Health Network	People living with CHB	Number receiving viral load test while not on treatment	Number receiving viral load test while on treatment
NSW	Central & Eastern Sydney	21,687	3,052	1,571
NSW	Northern Sydney	9,895	1,606	779
NSW	Western Sydney	14,122	1,876	1,631
NSW	Nepean Blue Mountains	2,625	105	104
NSW	South Western Sydney	14,708	2,574	2,004
NSW	South Eastern NSW	4,252	172	136
NSW	Western NSW	2,618	66	52
NSW	Hunter New England & Central Coast	8,208	281	103
NSW	North Coast	3,321	110	59
NSW	Murrumbidgee	1,589	50	34
VIC	North Western Melbourne	21,291	3,119	1,789
VIC	Eastern Melbourne	16,455	2,531	1,498
VIC	South Eastern Melbourne	15,638	2,092	1,326
VIC	Gippsland	1,502	52	36
VIC	Murray	3,559	187	90
VIC	Grampians & Barwon South West	3,352	176	90
QLD	Brisbane North	7,174	188	244
QLD	Brisbane South	11,902	882	953
QLD	Gold Coast	3,992	125	135
QLD	Darling Downs & West Moreton	3,955	118	122
QLD	Western Queensland	839	8	12
QLD	Central Qld, Wide Bay, Sunshine Coast	5,176	79	106
QLD	Northern Queensland	6,602	177	164
SA	Adelaide	11,901	234	1,260
SA	Country SA	3,041	22	101
WA	Perth North	10,320	312	76
WA	Perth South	9,256	266	67
WA	Country WA	5,012	97	13
TAS	Tasmania	3,514	69	92
NT	Northern Territory	4,296	596	130
ACT	Australian Capital Territory	3,876	356	174
	AUSTRALIA	235,679	21,628	14,990

Data source: Department of Human Services Medicare statistics. Totals may not add up due to inclusion of those without a PHN of residence recorded in source data.

Table 30: CHB treatment by Primary Health Network, 2013

State/ Territory	Primary Health Network	People living with CHB	Number receiving treatment	Treatment uptake
NSW	Central & Eastern Sydney	21,284	1,640	7.7%
NSW	Northern Sydney	9,740	858	8.8%
NSW	Western Sydney	13,795	1,235	9.0%
NSW	Nepean Blue Mountains	2,587	70	2.7%
NSW	South Western Sydney	14,480	1,820	12.6%
NSW	South Eastern NSW	4,213	91	2.2%
NSW	Western NSW	2,598	26	1.0%
NSW	Hunter New England & Central Coast	8,136	131	1.6%
NSW	North Coast	3,298	46	1.4%
NSW	Murrumbidgee	1,577	23	1.5%
VIC	North Western Melbourne	20,638	1,236	6.0%
VIC	Eastern Melbourne	16,225	1,078	6.6%
VIC	South Eastern Melbourne	15,319	880	5.7%
VIC	Gippsland	1,497	30	2.0%
VIC	Murray	3,537	76	2.1%
VIC	Grampians & Barwon South West	3,327	40	1.2%
QLD	Brisbane North	7,049	148	2.1%
QLD	Brisbane South	11,724	511	4.4%
QLD	Gold Coast	3,929	111	2.8%
QLD	Darling Downs & West Moreton	3,883	74	1.9%
QLD	Western Queensland	839	6	0.7%
QLD	Central Qld, Wide Bay, Sunshine Coast	5,102	66	1.3%
QLD	Northern Queensland	6,531	88	1.3%
SA	Adelaide	11,771	398	3.4%
SA	Country SA	3,026	28	0.9%
WA	Perth North	10,146	372	3.7%
WA	Perth South	9,075	262	2.9%
WA	Country WA	5,016	36	0.7%
TAS	Tasmania	3,510	31	0.9%
NT	Northern Territory	4,305	98	2.3%
ACT	Australian Capital Territory	3,823	163	4.3%
	AUSTRALIA	231,980	11,693	5.0%

Data source: Department of Human Services Medicare statistics. Totals may not add up due to inclusion of those without a PHN of residence recorded in source data. Note due to availability, 2013 treatment data represent the period July-December 2013.

HEPATITIS B MAPPING PROJECT

Supplementary material to the National Hepatitis B Mapping Project Report 2014-15

Estimates of chronic hepatitis B (CHB) prevalence according to Primary Health Network and Statistical Area 3, 2015

AUSTRALASIAN SOCIETY FOR HIV, VIRAL HEPATITIS AND SEXUAL HEALTH MEDICINE
AND VICTORIAN INFECTIOUS DISEASES REFERENCE LABORATORY, THE DOHERTY INSTITUTE



NATIONAL REPORT 2014/15

STATISTICAL AREA 3 ESTIMATES OF CHRONIC HEPATITIS B, 2015

This supplementary information report presents estimates of the prevalence of chronic hepatitis B (CHB) within each Primary Health Network, at the Statistical Area 3 (SA3) geographic designation. It extends on the findings presented in the [Third National Hepatitis B Mapping Report](#) (see report for methodological details and further information on measurement of indicators relating to hepatitis B).

The boundaries used are standardised by the Australian Bureau of Statistics, and represent the most granular available for many data parameters. SA3s (referred to as areas in this report) generally have populations between 30,000 and 130,000 residents, and are often functional areas of regional towns and cities. There are 333 SA3s in Australia.

Each Primary Health Network in Australia contains a number of SA3s, however the boundaries do not concord exactly and a number of SA3s are split between one or more PHNs. In these cases, the SA3 is listed with the PHN which contains the majority of its population. Due to these variations in geographic concordance between SA3s and Primary Health Networks, the SA3 population numbers will not add to PHN population totals. More detailed information about the geographic classifications used is available from the [Australian Bureau of Statistics](#). To look up an SA3 or find out which SA3 an area belongs to, go to [ABS Maps](#).

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FUNDED BY:

The Australian Government Department of Health

Disclaimer: Whilst the Australian Department of Health provides financial assistance to ASHM, the material contained in this resource produced by ASHM should not be taken to represent the views of the Australian Department of Health. The content of this resource is the sole responsibility of ASHM and The Doherty Institute.

We would like to acknowledge the Australian Bureau of Statistics for the provision of the data used in preparing the statistics contained in this report.

New South Wales

Priority areas for CHB in New South Wales

The Primary Health Networks in metropolitan NSW are among the highest prevalence for CHB in the country, particularly South Western Sydney, Western Sydney, and Central and Eastern Sydney, which rank 2nd, 3rd and 4th highest in Australia respectively. In each of these areas there is considerable diversity in prevalence within the PHN.

In **South Western Sydney**, where the average CHB prevalence is 1.6%, the Fairfield area has the most substantial burden, being home to one third of all people living with CHB in the South Western Sydney PHN and having a prevalence of 2.72%. The burden of CHB in South Western Sydney is generally concentrated closer to the metropolitan area, with the areas of Bankstown, Bringelley-Green Valley, and Liverpool having higher prevalence than those areas situated geographically further west.

A similar pattern occurs in **Western Sydney**, where a single area (Auburn, 2.77% prevalence) has a substantially higher burden of CHB than the PHN average of 1.55%. In addition, prevalence of CHB in Western Sydney is generally higher in those areas closer to the metropolitan centre – the areas of Carlingford, Merrylands-Guildford, and Parramatta – than those situated in the northern part of the PHN.

In **Central and Eastern Sydney** PHN, the burden of CHB is highest in Canterbury (2.16%) and Hurstville (2.07%), while also being above average in Strathfield-Burwood-Ashfield, Kogarah-Rockdale, Sydney Inner City, and Botany.

The burden of CHB in **Northern Sydney** is clustered in the areas of Ryde-Hunters Hill (1.71% prevalence, home to one quarter of people with CHB in this PHN), Pennant Hills-Epping (1.51%), and Chatswood-Lane Cove (1.37%).

In most of the non-metropolitan areas of NSW, the prevalence of CHB varied less substantially within PHNs, and no statistical areas within the PHNs of **Nepean Blue Mountains, South Eastern NSW, Murrumbidgee, or North Coast NSW** have a prevalence above the NSW average.

However, in the **Western NSW** PHN, prevalence was 1.44% in the Bourke-Cobar-Coonamble area, higher than the NSW average of 1.06%, and it was also above the PHN average in the Dubbo area (1.00%). In **Hunter-New England PHN**, the prevalence in Moree-Narrabri (1.08%) was nearly double that of other areas within the PHN.

Prevalence of CHB in New South Wales by Statistical Area 3 and Primary Health Network, 2015

Primary Health Network	SA3	Total population	People living with CHB	CHB prevalence
Central & Eastern Sydney		1,524,342	22,032	1.45%
	Botany	465,87	708	1.52%
	Canada Bay	87,023	1,201	1.38%
	Canterbury	138,333	2,991	2.16%
	Cronulla - Miranda - Caringbah	113,649	780	0.69%
	Eastern Suburbs - North	137,648	1,076	0.78%
	Eastern Suburbs - South	145,822	1,961	1.34%
	Hurstville	127,750	2,638	2.07%
	Kogarah - Rockdale	137,976	2,316	1.68%
	Leichhardt	58,758	461	0.78%
	Marrickville - Sydenham - Petersham	55,879	785	1.41%
	Strathfield - Burwood - Ashfield	151,536	3,020	1.99%
	Sutherland - Menai - Heathcote	111,979	730	0.65%
	Sydney Inner City	211,001	3,362	1.59%
Northern Sydney		902,959	10,081	1.12%
	Chatswood - Lane Cove	113,986	1,562	1.37%
	Dural - Wisemans Ferry	5,474	32	0.59%
	Hornsby	83,347	987	1.18%
	Ku-ring-gai	123,165	1,307	1.06%
	Manly	45,365	315	0.69%
	North Sydney - Mosman	101,384	902	0.89%
	Pennant Hills - Epping	47,502	716	1.51%
	Pittwater	64,189	367	0.57%
	Ryde - Hunters Hill	135,897	2,329	1.71%
	Warringah	156,693	1,237	0.79%
Western Sydney		931,760	14,438	1.55%
	Auburn	88,831	2462	2.77%
	Baulkham Hills	149,635	1,719	1.15%
	Blacktown	137,465	1,918	1.40%
	Blacktown - North	90,791	1,055	1.16%
	Carlingford	68,368	1,209	1.77%
	Dural - Wisemans Ferry	27,379	190	0.69%
	Merrylands - Guildford	153,627	2,748	1.79%
	Mount Druitt	113,759	1,767	1.55%
	Parramatta	146,163	2,366	1.62%
	Rouse Hill - McGraths Hill	30,831	260	0.84%
Nepean Blue Mountains		364,776	2,664	0.73%
	Blue Mountains	79,551	466	0.59%
	Hawkesbury	25,308	138	0.55%
	Lithgow - Mudgee	21,400	143	0.67%
	Penrith	139,475	1,049	0.75%
	Richmond - Windsor	37,975	267	0.70%
	St Marys	56,748	575	1.01%
South Western Sydney		933,832	14,936	1.60%
	Bankstown	177,682	3,022	1.70%
	Bringelly - Green Valley	96,669	1,466	1.52%
	Camden	62,270	404	0.65%
	Campbelltown (NSW)	160,313	1,837	1.15%
	Fairfield	191,314	5,204	2.72%

	Liverpool	117,703	1,621	1.38%
	Southern Highlands	48,004	274	0.57%
	Wollondilly	40,518	235	0.58%
South Eastern NSW		603,851	4,293	0.71%
	Dapto - Port Kembla	77,067	578	0.75%
	Goulburn - Yass	72,420	427	0.59%
	Kiama - Shellharbour	91,153	564	0.62%
	Queanbeyan	57,847	412	0.71%
	Shoalhaven	99,956	673	0.67%
	Snowy Mountains	19,949	113	0.56%
	South Coast	71,551	447	0.63%
	Wollongong	131,834	1175	0.89%
Western NSW		313,007	2,625	0.84%
	Bathurst	47,540	314	0.66%
	Bourke - Cobar - Coonamble	26,585	383	1.44%
	Broken Hill and Far West	21,632	185	0.85%
	Dubbo	71,174	710	1.00%
	Lachlan Valley	57,152	430	0.75%
	Lithgow - Mudgee	25,690	157	0.61%
	Lower Murray	12,870	103	0.80%
	Orange	59,347	398	0.67%
Hunter New England & Central Coast		1,244,217	8,270	0.66%
	Armidale	37,711	316	0.84%
	Gosford	173,931	1,081	0.62%
	Great Lakes	31,822	193	0.61%
	Inverell - Tenterfield	39,264	273	0.70%
	Lake Macquarie - East	125,498	742	0.59%
	Lake Macquarie - West	76,431	473	0.62%
	Lower Hunter	89,252	550	0.62%
	Maitland	73,213	439	0.60%
	Moree - Narrabri	27,013	292	1.08%
	Newcastle	169,016	1,229	0.73%
	Port Stephens	73,100	449	0.61%
	Tamworth - Gunnedah	82,824	657	0.79%
	Taree - Gloucester	54,205	355	0.66%
	Upper Hunter	31,749	206	0.65%
	Wyong	159,188	1,015	0.64%
North Coast		508,967	3,349	0.66%
	Clarence Valley	50,613	337	0.67%
	Coffs Harbour	86,409	601	0.70%
	Kempsey - Nambucca	49,336	404	0.82%
	Port Macquarie	78,139	464	0.59%
	Richmond Valley - Coastal	79,531	465	0.59%
	Richmond Valley - Hinterland	72,479	495	0.68%
	Tweed Valley	92,460	582	0.63%
Murrumbidgee		239,994	1,597	0.67%
	<i>Albury – see Murray PHN in Victoria</i>			
	Griffith - Murrumbidgee (West)	49,284	414	0.84%
	Tumut - Tumbarumba	15,030	94	0.62%
	Upper Murray exc. Albury	42,305	226	0.53%
	Wagga Wagga	94,540	644	0.68%

VICTORIA

Priority areas for CHB in Victoria

Within Victoria, the burden of CHB is strongly concentrated in the greater Melbourne area, with clustering of high prevalence within each of the three metropolitan PHNs.

In North Western Melbourne PHN, the prevalence is highest in Brimbank (2.14%), Maribyrnong (2.11%), and Melbourne City (2.10%), which together make up 40% of people living with CHB in this PHN. Prevalence was also higher than average in Darebin North, while the majority of other areas remain similar to the PHN average, and prevalence is notably lower in areas further from metropolitan Melbourne.

In Eastern Melbourne PHN, the burden is clustered among the areas of Monash (1.84%), Whitehorse-West (1.66%), and Manningham-West (1.67%), home to nearly half of those living with CHB. The majority of other areas in this PHN have a prevalence similar to the PHN average (1.14%), prevalence is notably lower in those areas furthest east.

The burden of CHB in **South Eastern Melbourne** PHN is highly concentrated, with the area of Dandenong having a prevalence more than double the PHN average (2.46% vs 1.10%). Prevalence was also slightly higher than average in the adjacent areas of Casey-North and -South (1.20-1.22%), and in Glen Eira (1.13%).

Within non-metropolitan Victorian PHNs the prevalence of CHB was highly consistent, however within the PHN of **Murray** (average prevalence 0.61%) the areas of Shepparton (0.90%) and Murray River-Swan Hill (0.77%) had higher prevalence.

**Prevalence of CHB in Victoria by Statistical Area 3 and Primary Health Network,
2015**

Primary Health Network	SA3	Total population	People living with CHB	CHB prevalence
North Western Melbourne		1,616,658	21,911	1.36%
	Brimbank	190,763	4,078	2.14%
	Brunswick - Coburg	89,523	973	1.09%
	Darebin - North	96,676	1,508	1.56%
	Darebin - South	54,205	545	1.01%
	Essendon	67,752	803	1.18%
	Hobsons Bay	86,360	875	1.01%
	Keilor	60,502	635	1.05%
	Macedon Ranges	29,061	148	0.51%
	Maribyrnong	83,515	1,758	2.11%
	Melbourne City	128,963	2,704	2.10%
	Melton - Bacchus Marsh	150,743	1,425	0.95%
	Moreland - North	76,457	873	1.14%
	Sunbury	39,111	221	0.57%
	Tullamarine - Broadmeadows	156,834	1,622	1.03%
	Wyndham	216,248	2,576	1.19%
	Yarra	89,945	1,167	1.30%
Eastern Melbourne		1,460,790	16,692	1.14%
	Banyule	126,232	1,168	0.92%
	Boroondara	174,787	1995	1.14%
	Knox	155,719	1,525	0.98%
	Manningham - East	26,625	215	0.81%
	Manningham - West	92,930	1,555	1.67%
	Maroondah	111,858	875	0.78%
	Monash	179,431	3,308	1.84%
	Nillumbik - Kinglake	66,526	362	0.54%
	Whitehorse - East	62,232	828	1.33%
	Whitehorse - West	104,077	1,725	1.66%
	Whittlesea - Wallan	210,573	2,312	1.10%
	Yarra Ranges	149,800	824	0.55%
South Eastern Melbourne		1,452,048	15,947	1.10%
	Bayside	101,321	708	0.70%
	Cardinia	91,073	539	0.59%
	Casey - North	132,001	1,608	1.22%
	Casey - South	160,210	1,928	1.20%
	Dandenong	188,317	4,641	2.46%
	Frankston	135,971	924	0.68%
	Glen Eira	154,158	1,736	1.13%
	Kingston	118,899	996	0.84%
	Mornington Peninsula	155,015	843	0.54%
	Port Phillip	107,142	938	0.88%
	Stonnington - East	43,162	438	1.01%
	Stonnington - West	64,779	649	1.00%
Gippsland		266,020	1,510	0.57%
	Baw Baw	31,357	157	0.50%
	Gippsland - East	44,097	259	0.59%
	Gippsland - South West	59,942	312	0.52%
	Latrobe Valley	73,356	466	0.64%
	Wellington	41,863	236	0.56%
Murray		583,508	3,577	0.61%

	Albury (NSW)	61905	366	0.59%
	Bendigo	92,888	499	0.54%
	Campaspe	36,915	197	0.53%
	Heathcote - Castlemaine - Kyneton	45,904	233	0.51%
	Loddon - Elmore	11,127	55	0.49%
	Mildura	53,015	407	0.77%
	Moir	28,820	152	0.53%
	Murray River - Swan Hill	36,380	279	0.77%
	Shepparton	63,169	568	0.90%
	Upper Goulburn Valley	52,310	278	0.53%
	Wangaratta - Benalla	44,350	228	0.51%
	Wodonga - Alpine	68,240	372	0.55%
		608,847	3,388	0.56%
Grampians & Barwon South West	Ballarat	93,784	527	0.56%
	Barwon - West	12,364	58	0.47%
	Bendigo	14,841	87	0.59%
	Creswick - Daylesford - Ballan	27,798	139	0.50%
	Geelong	187,417	1,211	0.65%
	Glenelg - Southern Grampians	26,584	137	0.51%
	Grampians	50,317	256	0.51%
	Maryborough - Pyrenees	24,243	117	0.48%
	Mildura	6,455	38	0.59%
	Surf Coast - Bellarine Peninsula	68,323	338	0.49%
	Upper Goulburn Valley	6,333	34	0.53%
	Warrnambool - Otway Ranges	85,752	437	0.51%

Queensland

Priority areas for CHB in Queensland

The burden of CHB in Queensland is disparately distributed, with areas of increased prevalence both in urban areas of Brisbane and in rural and remote parts of the north of the state.

In **Brisbane South PHN**, the prevalence of CHB is highly clustered in a number of areas in the inner south, most notably in Sunnybank (2.40% prevalence) where it is more than double the PHN average (1.09%). The adjacent areas of Forest Lake-Oxley, Rocklea-Acacia Ridge, Mt Gravatt, Nathan, and Sunnybank-Kingston also have an elevated burden, and these combined areas comprise more than half of all people with CHB in this PHN.

The prevalence of CHB in **Brisbane North PHN** (0.76%) is lower than in Brisbane South, with the only areas of above-average prevalence being those adjacent to Brisbane South (Brisbane Inner, 1.23%, and Sherwood-Indooroopilly, 1.15%).

Within the PHN of **Western Queensland**, the highest prevalence PHN in the state, the more remote Outback North area has much higher prevalence (1.46%) than the other area in the PHN, Outback South (0.93%).

In **Northern Queensland PHN**, the burden of CHB is highest in the Far North area (2.52%), where it is more than double the PHN average of 0.95%, and also concentrated in the areas of Cairns, Innisfail-Cassowary Coast, and Tablelands(East)-Kuranda. CHB prevalence is substantially lower in the more southern parts of the PHN.

The PHNs of **Darling Downs and West Moreton**, and **Central Queensland, Wide Bay, and Sunshine Coast** have a lower prevalence, and levels are generally consistent within these PHNs. One exception is the area of Springfield-Redbank (1.05%), which has a higher prevalence than the average of Darling Downs and West Moreton (0.73%) and is adjacent to the higher-prevalence areas of Brisbane South PHN.

**Prevalence of CHB in Queensland by Primary Health Network and Statistical Area
3, 2015**

Primary Health Network	SA3	Total population	People living with CHB	CHB prevalence
Brisbane North		957,590	7,294	0.76%
	Bald Hills - Everton Park	41,403	326	0.79%
	Chermside	72,394	602	0.83%
	Bribie - Beachmere	33,123	196	0.59%
	Brisbane Inner	67,155	827	1.23%
	Brisbane Inner - North	85,203	704	0.83%
	Brisbane Inner - West	60,116	457	0.76%
	Caboolture	66,930	472	0.70%
	Caboolture Hinterland	13,243	93	0.70%
	Hills District	87,525	494	0.56%
	Kenmore - Brookfield - Moggill	47,680	361	0.76%
	Narangba - Burpengary	63,868	408	0.64%
	North Lakes	67,646	447	0.66%
	Nundah	38,689	352	0.91%
	Redcliffe	59,999	397	0.66%
	Sandgate	59,103	469	0.79%
	Sherwood - Indooroopilly	52,457	603	1.15%
	Strathpine	38,598	266	0.69%
Brisbane South		1,101,386	12,057	1.09%
	Beauresert	13,735	89	0.65%
	Beenleigh	43,172	331	0.77%
	Capalaba	74,263	481	0.65%
	Carindale	51,375	422	0.82%
	Centenary	34,129	371	1.09%
	Cleveland - Stradbroke	84,049	528	0.63%
	Forest Lake - Oxley	73,815	1,392	1.89%
	Brisbane Inner - East	43,185	304	0.70%
	Browns Plains	81,067	781	0.96%
	Holland Park - Yeronga	73,426	731	1.00%
	Jimboomba	41,705	260	0.62%
	Loganlea - Carbrook	60,682	495	0.82%
	Mt Gravatt	72,149	1,057	1.46%
	Nathan	40,062	553	1.38%
	Rocklea - Acacia Ridge	60,595	1,013	1.67%
	Springwood - Kingston	82,055	1,005	1.23%
	Sunnybank	51,049	1,224	2.40%
	Wynnum - Manly	71,484	500	0.70%
Gold Coast		569,951	4,062	0.71%
	Coolangatta	53,262	316	0.59%
	Gold Coast - North	66,196	501	0.76%
	Gold Coast Hinterland	18,755	104	0.55%
	Broadbeach - Burleigh	63,157	415	0.66%
	Mudgeeraba - Tallebudgera	34,053	206	0.61%
	Nerang	68,974	449	0.65%
	Ormeau - Oxenford	115,864	723	0.62%
	Robina	50,584	436	0.86%
	Southport	59,842	590	0.99%
	Surfers Paradise	39,264	323	0.82%
Darling Downs & West Moreton		546,258	4,013	0.73%
	Darling Downs - East	42,730	264	0.62%

	Darling Downs (West) - Maranoa	45,788	333	0.73%
	Granite Belt	40,566	248	0.61%
	Burnett	49,505	367	0.74%
	Ipswich Hinterland	62,149	370	0.60%
	Ipswich Inner	105,415	735	0.70%
	Springfield - Redbank	82,180	859	1.05%
	Toowoomba	152,245	1108	0.73%
Western Queensland		69,,981	832	1.19%
	Outback - North	35,002	509	1.46%
	Outback - South	19,977	185	0.93%
Central Qld, Wide Bay, Sunshine Coast		832,161	5,224	0.63%
	Central Highlands (Qld)	32,455	250	0.77%
	Gladstone - Biloela	82,675	547	0.66%
	Gympie - Cooloola	48,609	285	0.59%
	Buderim	51,841	296	0.57%
	Bundaberg	89,040	563	0.63%
	Caloundra	78,962	445	0.56%
	Hervey Bay	56,834	362	0.64%
	Maroochy	57,408	332	0.58%
	Maryborough	45,208	274	0.61%
	Nambour - Pomona	63,079	359	0.57%
	Noosa	39,957	225	0.56%
	Rockhampton	120,654	898	0.74%
	Central Highlands (Qld)	32,455	250	0.77%
Northern Queensland		701,527	6,642	0.95%
	Charters Towers - Ayr - Ingham	44,241	411	0.93%
	Far North	33,253	838	2.52%
	Bowen Basin - North	37,776	264	0.70%
	Cairns - North	52,791	390	0.74%
	Cairns - South	104,049	1,284	1.23%
	Innisfail - Cassowary Coast	34,820	402	1.15%
	Mackay	123,724	849	0.69%
	Port Douglas - Daintree	11,608	100	0.86%
	Tablelands (East) - Kuranda	40,784	382	0.94%
	Townsville	193,992	1,568	0.81%
	Whitsunday	20,803	129	0.62%

South Australia

Priority areas for CHB in South Australia

The burden of CHB in South Australia is largely concentrated in the **Adelaide PHN**, predominantly in the area of Adelaide City (1.86%), where the prevalence is nearly twice the state average, as well as Port Adelaide (1.47-1.50%) and Salisbury (1.23%). Within non-metropolitan SA, the burden is concentrated in the remote Outback-North and East area, where prevalence (1.23%) is double the average for **Country SA** (0.63%).

Prevalence of CHB in South Australia by Primary Health Network and Statistical Area 3, 2015

Primary Health Network	SA3	Total population	People living with CHB	CHB prevalence
Adelaide		1,210,164	12,031	0.99%
	Adelaide City	23,169	431	1.86%
	Campbelltown (SA)	52,252	599	1.15%
	Charles Sturt	111,195	1265	1.14%
	Burnside	45,034	434	0.96%
	Holdfast Bay	35,643	225	0.63%
	Marion	90,390	800	0.89%
	Mitcham	65,052	498	0.76%
	Norwood - Payneham - St Peters	37,350	398	1.07%
	Onkaparinga	170,093	997	0.59%
	Playford	89,104	769	0.86%
	Port Adelaide - East	68,804	1,034	1.50%
	Port Adelaide - West	60,282	884	1.47%
	Prospect - Walkerville	29,089	288	0.99%
	Salisbury	136,608	1,675	1.23%
	Tea Tree Gully	94,683	654	0.69%
	Unley	39,324	349	0.89%
	West Torrens	62,092	731	1.18%
Country SA		488,496	3,058	0.63%
	Adelaide Hills	72,226	379	0.52%
	Barossa	34,924	169	0.48%
	Eyre Peninsula and South West	58,694	410	0.70%
	Fleurieu - Kangaroo Island	49,929	255	0.51%
	Gawler - Two Wells	34,389	189	0.55%
	Limestone Coast	64,855	384	0.59%
	Lower North	22,632	115	0.51%
	Mid North	27,273	154	0.57%
	Murray and Mallee	68,999	489	0.71%
	Outback - North and East	29,413	378	1.29%
	Yorke Peninsula	25,162	134	0.53%

Western Australia

Priority areas for CHB in Western Australia

The burden of CHB in Western Australia is concentrated in two separate regions – clustered around the north-eastern area of Perth, and in the remote Northern part of the state.

Within the **Perth North PHN**, the higher prevalence areas are Bayswater-Bassendean (1.23%) and Stirling (1.20%). Prevalence was similar to the PHN average (0.98%) in Perth City, Swan, and Wannerro, while being lower in the remaining areas.

Prevalence in **Perth South PHN** is similarly disparate, with concentration of CHB burden in those areas closest to metropolitan Perth – Canning (1.53%), Belmont-Victoria Park (1.36%), Gosnells (1.21%), and South Perth (1.10%), together home to half of those living with CHB in this PHN.

In the PHN of **Country WA**, which comprises all of WA outside the Perth urban area, the prevalence of CHB is highest in those remote areas in the northern part of the state. In the Kimberley area, the prevalence of CHB is 2.39%, more than double the average for the PHN (0.92%). Prevalence is also higher in the adjacent Pilbara region (1.20%), and in Gascoyne (1.30%) and Goldfields (1.09%). Prevalence is lower in those areas in the south-western part of WA.

Prevalence of CHB in Western Australia by Primary Health Network and Statistical Area 3, 2015

Primary Health Network	SA3	Total population	People living with CHB	CHB prevalence
Perth North		1,065,774	10,431	0.98%
	Bayswater - Bassendean	87,326	1,075	1.23%
	Cottesloe - Claremont	72,089	595	0.82%
	Joondalup	167,910	1,177	0.70%
	Kalamunda	60,826	439	0.72%
	Mundaring	44,201	314	0.71%
	Perth City	108,973	1,174	1.08%
	Stirling	208,127	2,496	1.20%
	Swan	127,518	1,269	1.00%
	Wanneroo	188,804	1,893	1.00%
Perth South		980,303	9,410	0.96%
	Armadale	80,287	635	0.79%
	Belmont - Victoria Park	75,366	1,025	1.36%
	Canning	102,182	1,562	1.53%
	Cockburn	105,233	935	0.89%
	Fremantle	38,923	288	0.74%
	Gosnells	125,051	1,519	1.21%
	Kwinana	37,149	317	0.85%
	Mandurah	100,327	615	0.61%
	Melville	109,480	999	0.91%
	Rockingham	128,962	792	0.61%
	Serpentine - Jarrahdale	24,161	136	0.56%
	South Perth	46,298	508	1.10%
Country WA		547,011	5,009	0.92%
	Albany	60,165	428	0.71%
	Augusta - Margaret River - Busselton	50,092	289	0.58%
	Esperance	16,745	105	0.63%
	Gascoyne	9,904	129	1.30%
	Goldfields	43,791	479	1.09%
	Bunbury	107,065	693	0.65%
	Kimberley	38,801	927	2.39%
	Manjimup	22,847	136	0.59%
	Mid West	57,974	523	0.90%
	Pilbara	65,859	787	1.20%
	Wheat Belt - North	56,277	391	0.70%
	Wheat Belt - South	21,546	147	0.68%

Tasmania

Priority areas for CHB in Tasmania

The prevalence of CHB in Tasmania is relatively similar according to area, with limited variation beyond the average for the state (0.68%). The prevalence is highest in the area of Hobart (0.88%), and above average in the adjacent areas of Huon-Bruny Island (0.77%) and Brighton 0.72%), as well as the West Coast area (0.76%).

Prevalence of CHB in Tasmania by Primary Health Network and Statistical Area 3, 2015

Primary Health Network	SA3	Total population	People living with CHB	CHB prevalence
Tasmania		516,586	3,532	0.68%
	Central Highlands (Tas.)	11,757	69	0.58%
	Devonport	45,836	289	0.63%
	Brighton	16,590	119	0.72%
	Burnie - Ulverstone	49,755	334	0.67%
	Hobart - North East	52,385	316	0.60%
	Hobart - North West	52,637	398	0.76%
	Hobart - South and West	32,878	216	0.66%
	Hobart Inner	50,796	445	0.88%
	Huon - Bruny Island	19,296	148	0.77%
	Launceston	83,279	588	0.71%
	Meander Valley - West Tamar	22,808	121	0.53%
	North East	37,787	217	0.57%
	Sorell - Dodges Ferry	15,667	91	0.58%
	South East Coast	6,872	43	0.63%
	West Coast	18,243	139	0.76%

Northern Territory

Priority areas for CHB in Northern Territory

With the exception of Litchfield, all areas of NT have a prevalence higher than the national average of 1%, and it is the location of the three highest prevalence areas in the country – East Arnhem (3.06%), Daly-Tiwi-West Arnhem (3.04%), and Barkly (2.97%). Prevalence is generally higher in the rural and remote parts of the Territory than those closer to Darwin.

Prevalence of CHB in Northern Territory by Primary Health Network and Statistical Area 3, 2015

Primary Health Network	SA3	Total population	People living with CHB	CHB prevalence
Northern Territory		244,307	4,315	1.77%
	Alice Springs	40,951	823	2.01%
	Barkly	6,852	204	2.97%
	Daly - Tiwi - West Arnhem	18,923	575	3.04%
	Darwin City	26,581	299	1.13%
	Darwin Suburbs	57,864	853	1.47%
	East Arnhem	13,982	428	3.06%
	Katherine	21,341	519	2.43%
	Litchfield	23,269	208	0.89%
	Palmerston	34,544	406	1.18%

Australian Capital Territory

Priority areas for CHB in Australian Capital Territory

Prevalence of CHB in ACT is equal to the national average (1.0%), and there is only moderate fluctuation in prevalence according to area within the territory. Areas with the highest prevalence of CHB are situated in the northern area of ACT PHN, with the highest level in Gungahlin (1.27%), North Canberra (1.07%), and Belconnen (1.07%).

Prevalence of CHB in Australian Capital Territory by Primary Health Network and Statistical Area 3, 2015

Primary Health Network	SA3	Total population	People living with CHB	CHB prevalence
Australian Capital Territory		390,706	3,948	1.01%
	Belconnen	96,600	1,036	1.07%
	Cotter - Namadgi	3,707	18	0.48%
	Fyshwick - Pialligo - Hume	1,482	13	0.85%
	Gungahlin	66,756	848	1.27%
	North Canberra	53,361	645	1.21%
	South Canberra	26,169	213	0.81%
	Tuggeranong	85,743	680	0.79%
	Weston Creek	22,462	175	0.78%
	Woden	34,426	321	0.93%

HEPATITIS B MAPPING PROJECT

Supplementary material to the National Hepatitis B Mapping Project Report 2014-15

Estimates of treatment and monitoring according to Primary Health Network and Statistical Area 3, 2014-15

AUSTRALASIAN SOCIETY FOR HIV, VIRAL HEPATITIS AND SEXUAL HEALTH MEDICINE
AND VICTORIAN INFECTIOUS DISEASES REFERENCE LABORATORY, THE DOHERTY INSTITUTE



diagnosis, monitoring and treatment
by Primary Health Network

NATIONAL REPORT 2014/15

STATISTICAL AREA 3 ESTIMATES OF DIAGNOSIS AND CARE, 2014-15

This supplementary information report presents estimates of the uptake of CHB monitoring and treatment within each Primary Health Network at the Statistical Area 3 (SA3) geographic designation. It extends on the findings presented in the [Third National Hepatitis B Mapping Report](#) (see report for methodological details and further information on measurement of indicators relating to hepatitis B).

The boundaries used are standardised by the Australian Bureau of Statistics, and represent the most granular available for many data parameters. SA3s (referred to as areas in this report) generally have populations between 30,000 and 130,000 residents, and are often functional areas of regional towns and cities. There are 333 SA3s in Australia.

Each Primary Health Network in Australia contains a number of SA3s, however the boundaries do not concord exactly and a number of SA3s are split between one or more PHNs. In these cases, the SA3 is listed with the PHN which contains the majority of its population. Due to these variations in geographic concordance between SA3s and Primary Health Networks, the SA3 population numbers will not add to PHN population totals. More detailed information about the geographic classifications used is available from the [Australian Bureau of Statistics](#). To look up an SA3 or find out which SA3 an area belongs to, go to [ABS Maps](#).

The statistics presented here were derived using viral load testing and antiviral treatment prescribing for people living with CHB, obtained from Medicare data provided by the Australian Government Department of Human Services. These sources include all services provided through Medicare, and it is possible that the data presented may underestimate uptake due to services provided outside of Medicare, such as those paid for by individual patients or subsidised by State Government services. However, previous analyses and comparison with other source data demonstrate that the vast majority of testing and treatment services for patients with CHB are provided through Medicare and included in these estimates.

As per our data agreements we have suppressed the publication of any potentially identifiable data, removing any counts where the number of people in an SA3 was less than 6. To prevent re-calculation of suppressed data using PHN totals in cases where only one SA3 was suppressed, the SA3 with the second lowest number of people receiving treatment was also suppressed. Data were suppressed in a total of 108 SA3s, or 33% of the total.

Measures of treatment and monitoring are presented as the proportion of people living with chronic hepatitis B in a given area, based on our previous estimates of prevalence through population-level modelling. The proportions presented are sensitive to variations in the underlying source data according to area, and the number of people who require treatment in a given area may vary according to the demographic distribution and clinical characteristics of its residents.

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FUNDED BY:

The Australian Government Department of Health

Disclaimer: Whilst the Australian Department of Health provides financial assistance to ASHM, the material contained in this resource produced by ASHM should not be taken to represent the views of the Australian Department of Health. The content of this resource is the sole responsibility of ASHM and The Doherty Institute.

We would like to acknowledge the Australian Government Department of Health, The Department of Human Services, and the Australian Bureau of Statistics for the provision of the data used in preparing the statistics contained in this report.

New South Wales

CHB treatment uptake in New South Wales

The uptake of treatment for people living with CHB was highest in NSW in the four metropolitan PHNs – **South Western Sydney, Western Sydney, Northern Sydney, and Central and Eastern Sydney**. However, within each of these PHNs there was considerable variability in uptake according to statistical area, with more urban areas generally having higher uptake than more regional areas.

In **South Western Sydney PHN**, treatment uptake was highest in Fairfield (16.9%), the only statistical area in the country to exceed the 15% National Strategy target. Treatment uptake was also higher than 10% in the Bankstown and Bringelly-Green Valley areas, however was lower than the state average of 9.1% in Liverpool, Camden, and Campbelltown.

In **Western Sydney PHN**, treatment uptake reached the National Strategy target in the statistical area of Carlingford (15.0%), and was also higher than 10% in the Auburn, Merrylands-Guildford, and Baulkham Hills areas. Uptake was below the state average in the remaining statistical areas, being lowest in the Mount Druitt and Dural-Wisemans Ferry areas.

Treatment uptake in **Central and Eastern Sydney PHN** was considerably higher in Hurstville (13.3%) than in other statistical areas, and was above the state average in Strathfield-Burwood-Ashfield, Canterbury, Marrickville-Sydenham-Petersham, and Kogarah-Rockdale, all of which uptake between 8-10%. Uptake was notably lower in Sutherland-Menai-Heathcote, Sydney Inner City, and Eastern Suburbs, where it was approximately half the PHN average.

In **Northern Sydney PHN**, treatment uptake approached the National Strategy target in Pennant Hills-Epping (14.7%), and was higher in Ku-ring-gai, Ryde-Hunters Hill, Chatswood-Lane Cove, and Hornsby than in other statistical areas. Uptake was lowest in Pittwater (3.0%), where it was less than one third the state average.

Within those PHNs in non-metropolitan areas of NSW, there was limited variation in treatment uptake, and of those with sufficient data available for reporting no statistical area reached a level above 3%.

CHB treatment uptake in New South Wales by Statistical Area 3 and Primary Health Network, 2014

Primary Health Network	SA3	People living with CHB	Number receiving treatment	Treatment uptake
Central & Eastern Sydney		21,687	1,901	8.8%
	Botany	708	34	4.8%
	Canada Bay	1201	86	7.2%
	Canterbury	2991	266	8.9%
	Cronulla - Miranda - Caringbah	780	43	5.5%
	Eastern Suburbs - North	1076	47	4.4%
	Eastern Suburbs - South	1961	90	4.6%
	Hurstville	2638	351	13.3%
	Kogarah - Rockdale	2316	189	8.2%
	Leichhardt	461	23	5.0%
	Marrickville - Sydenham - Petersham	785	68	8.7%
	Strathfield - Burwood - Ashfield	3020	283	9.4%
	Sutherland - Menai - Heathcote	730	29	4.0%
	Sydney Inner City	3362	142	4.2%
Northern Sydney		9,895	984	9.9%
	Chatswood - Lane Cove	1562	141	9.0%
	Hornsby	987	88	8.9%
	Ku-ring-gai	1307	161	12.3%
	Manly	315	14	4.4%
	North Sydney - Mosman	902	50	5.5%
	Pennant Hills - Epping	716	105	14.7%
	Pittwater	367	11	3.0%
	Ryde - Hunters Hill	2329	216	9.3%
	Warringah	1237	59	4.8%
Western Sydney		14,122	1,415	10.0%
	Auburn	2462	306	12.4%
	Baulkham Hills	1719	181	10.5%
	Blacktown	1918	123	6.4%
	Blacktown - North	1055	57	5.4%
	Carlingford	1209	182	15.0%
	Dural - Wisemans Ferry	190	8	4.2%
	Merrylands - Guildford	2748	310	11.3%
	Mount Druitt	1767	76	4.3%
	Parramatta	2366	140	5.9%
	Rouse Hill - McGraths Hill	260	17	6.5%
Nepean Blue Mountains		2,625	79	3.0%
	Blue Mountains	466	6	1.3%
	Hawkesbury	138	*	*
	Lithgow - Mudgee	300	*	*
	Penrith	1049	27	2.6%
	Richmond - Windsor	267	*	*
	St Marys	575	26	4.5%
South Western Sydney		14,708	2,009	13.7%
	Bankstown	3022	391	12.9%
	Bringelly - Green Valley	1466	162	11.0%
	Camden	404	15	3.7%
	Campbelltown (NSW)	1837	77	4.2%
	Fairfield	5204	880	16.9%
	Liverpool	1621	125	7.7%

	Southern Highlands	274	*	*
	Wollondilly	235	*	*
South Eastern NSW		4,252	104	2.4%
	Dapto - Port Kembla	578	14	2.4%
	Goulburn - Yass	427	11	2.6%
	Kiama - Shellharbour	564	10	1.8%
	Queanbeyan	412	12	2.9%
	Shoalhaven	673	**	**
	Snowy Mountains	113	*	*
	South Coast	447	10	2.2%
	Wollongong	1175	25	2.1%
Western NSW		2,618	35	1.3%
	Bathurst	314	6	1.9%
	Bourke - Cobar - Coonamble	383	*	*
	Broken Hill and Far West	185	*	*
	Dubbo	710	*	*
	Lachlan Valley	430	*	*
	Lower Murray	103	0	0.0%
	Orange	398	8	2.0%
Hunter New England & Central Coast		8,208	166	2.0%
	Armidale	193	*	*
	Gosford	1081	21	1.9%
	Great Lakes	193	*	*
	Inverell - Tenterfield	273	7	2.6%
	Lake Macquarie - East	742	15	2.0%
	Lake Macquarie - West	292	*	*
	Lower Hunter	292	*	*
	Maitland	439	6	1.4%
	Moree - Narrabri	657	*	*
	Newcastle	1229	24	2.0%
	Port Stephens	449	6	1.3%
	Tamworth - Gunnedah	657	*	*
	Taree - Gloucester	355	6	1.7%
	Upper Hunter	206	*	*
	Wyong	1015	24	2.4%
North Coast		3,321	63	1.9%
	Clarence Valley	337	*	*
	Coffs Harbour	601	18	3.0%
	Kempsey - Nambucca	404	*	*
	Port Macquarie	464	*	*
	Richmond Valley - Coastal	465	*	*
	Richmond Valley - Hinterland	495	7	1.4%
	Tweed Valley	582	8	1.4%
Murrumbidgee		1,589	29	1.8%
	<i>Albury – see Murray PHN in Victoria</i>			
	Griffith - Murrumbidgee (West)	414	7	1.7%
	Tumut - Tumbarumba	94	*	*
	Upper Murray exc. Albury	312	*	*
	Wagga Wagga	644	8	1.2%

Data source: Department of Human Services Medicare statistics. Totals may not add due to inclusion of those without a PHN or SA3 of residence in source data.

* Data suppressed as number receiving treatment <6.

** Data suppressed to prevent derivation of suppressed number using totals.

VICTORIA

CHB treatment uptake in Victoria

Treatment uptake in Victoria varied both between and within PHNs, with the highest levels in the **Eastern Melbourne, North Western Melbourne, and South Eastern Melbourne PHNs**.

In **Eastern Melbourne PHN**, treatment uptake was highest in the cluster of adjacent statistical areas of Manningham East and West (9.8 and 10.9%, respectively) and Whitehorse-East (9.5%). Treatment uptake was similar to the PHN average in the nearby areas of Knox, Boroondara, and Monash, while being lower in Whitehorse-West, Maroondah, and Banyule. Uptake was lowest in the regional areas of Yarra Ranges and Nilumbik-Kinglake, however was similar to the PHN average in Whittlesea-Wallan.

Treatment uptake in **North Western Melbourne PHN** was highest in the statistical area of Brimbank (8.8%) and the adjacent areas of Keilor, Maribyrnong, Tullamarine-Broadmeadows, and Melton-Bacchus Marsh, as well as the inner city area of Yarra. Uptake was lowest in Melbourne City (2.7%) and Moreland-North (3.4%) areas, while in the remaining areas uptake was between 4-6%.

Treatment uptake in **South Eastern Melbourne PHN** was notably higher in the Dandenong statistical area (9.7%) than the remaining parts of the PHN, being nearly double that of the next highest (Kingston, 5.3%) and of the adjacent areas of Casey (North and South) and Frankston. Lower uptake was observed in other areas of the PHN located either closer to and further from metropolitan Melbourne, with the lowest levels observed in Cardinia (1.9%) and Port Philip (2.6%).

Limited variation in treatment uptake was seen among those PHNs located in regional and rural areas of Victoria, with the highest levels observed in the **Murray PHN** areas of Heathcote-Castlemaine-Kyneton (3.9%), Bendigo (3.4%), and Upper Goulburn Valley (3.2%).

CHB treatment uptake in Victoria by Statistical Area 3 and Primary Health Network, 2014

Primary Health Network	SA3	People living with CHB	Number receiving treatment	Treatment uptake
North Western Melbourne		21,291	1,446	6.8%
	Brimbank	4078	357	8.8%
	Brunswick - Coburg	973	41	4.2%
	Darebin - North	1508	82	5.4%
	Darebin - South	545	28	5.1%
	Essendon	803	38	4.7%
	Hobsons Bay	875	48	5.5%
	Keilor	635	39	6.1%
	Macedon Ranges	148	*	*
	Maribyrnong	1758	120	6.8%
	Melbourne City	2704	73	2.7%
	Melton - Bacchus Marsh	1425	83	5.8%
	Moreland - North	873	30	3.4%
	Sunbury	221	**	**
	Tullamarine - Broadmeadows	1622	96	5.9%
	Wyndham	2576	111	4.3%
	Yarra	1167	81	6.9%
Eastern Melbourne		16,455	1,251	7.6%
	Banyule	1168	56	4.8%
	Boroondara	1995	138	6.9%
	Knox	1525	112	7.3%
	Manningham - East	215	21	9.8%
	Manningham - West	1555	169	10.9%
	Maroondah	875	42	4.8%
	Monash	3308	199	6.0%
	Nillumbik - Kinglake	362	12	3.3%
	Whitehorse - East	828	79	9.5%
	Whitehorse - West	1725	95	5.5%
	Whittlesea - Wallan	2312	137	5.9%
	Yarra Ranges	824	18	2.2%
South Eastern Melbourne		15,638	997	6.4%
	Bayside	708	19	2.7%
	Cardinia	539	10	1.9%
	Casey - North	1608	74	4.6%
	Casey - South	1928	92	4.8%
	Dandenong	4641	451	9.7%
	Frankston	924	40	4.3%
	Glen Eira	1736	59	3.4%
	Kingston	996	53	5.3%
	Mornington Peninsula	843	23	2.7%
	Port Phillip	938	24	2.6%
	Stonnington - East	438	12	2.7%
	Stonnington - West	649	23	3.5%
Gippsland		1,502	31	2.1%
	Baw Baw	236	7	3.0%

	Gippsland - East	259	7	2.7%
	Gippsland - South West	312	*	*
	Latrobe Valley	466	9	1.9%
	Wellington	197	*	*
Murray		3,559	93	2.6%
	Albury (NSW)	366	6	1.6%
	Bendigo	499	17	3.4%
	Campaspe	197	*	*
	Heathcote - Castlemaine - Kyneton	233	9	3.9%
	Loddon - Elmore	55	0	0.0%
	Mildura	407	7	1.7%
	Moir	152	*	*
	Murray River - Swan Hill	279	*	*
	Shepparton	568	13	2.3%
	Upper Goulburn Valley	278	9	3.2%
	Wangaratta - Benalla	228	*	*
	Wodonga - Alpine	372	8	2.2%
Grampians & Barwon South West		3,352	54	1.6%
	Ballarat	583	*	*
	Barwon - West	86	*	*
	Creswick - Daylesford - Ballan	139	*	*
	Geelong	1211	19	1.6%
	Glenelg - Southern Grampians	181	*	*
	Grampians	297	*	*
	Maryborough - Pyrenees	117	0	0.0%
	Surf Coast - Bellarine Peninsula	338	*	*
	Upper Goulburn Valley	437	*	*
	Warrnambool - Otway Ranges	437	7	1.6%

Data source: Department of Human Services Medicare statistics. Totals may not add due to inclusion of those without a PHN or SA3 of residence in source data.

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Queensland

CHB treatment uptake in Queensland

Treatment uptake in Queensland was highest in the **Brisbane South PHN** at 5.4%, more than double the state average. Within this PHN, the highest uptake levels observed were in the adjacent statistical areas of Nathan (6.2%), Forest Lake-Oxley (6.8%), and Sunnybank (5.8%). Uptake was generally lowest in the eastern coastal areas of the PHN, being less than 3% in the Cleveland-Stradbroke, Wynnum Manly, and Capalaba statistical areas.

In **Gold Coast PHN** treatment uptake was 3.4%, with limited variation in the level according to statistical area (for those with data available). The highest level of uptake observed was in Surfers Paradise (4.0%) and Broadbeach-Burleigh (3.9%), while lower uptake was seen in Nerang and Coolangatta (both 2.2%).

Treatment uptake was considerably lower in the **Brisbane North PHN** (2.5%) compared to Brisbane South. Within Brisbane North the highest level observed was in the statistical area of Chermside (3.7%), and uptake was higher than the PHN average in its adjacent areas of Strathpine, Sandgate, and Bald Hills-Everton Park. Lower uptake was observed in the metropolitan areas of Brisbane Inner-West and Sherwood-Indooroopilly (both 1.3%), as well as North Lakes (1.4%).

Treatment uptake varied less substantially among Queensland's remaining PHNs, and a considerable proportion of statistical areas had data suppressed due to low numbers. Within the **Darling Downs and West Moreton PHN**, treatment uptake was higher than the PHN average in those areas closer to Brisbane (Springfield-Redbank and Ipswich Inner). Uptake was also higher in the Sunshine Coast Hinterland and Maroochy areas of **Central Qld, Wide Bay, and Sunshine Coast PHN**; and the Cairns South area of the **Northern Queensland PHN**.

CHB treatment uptake in Queensland by Statistical Area 3 and Primary Health Network, 2014

Primary Health Network	SA3	People living with CHB	Number receiving treatment	Treatment uptake
Brisbane North		7,174	179	2.5%
	Bald Hills - Everton Park	326	9	2.8%
	Bribie - Beachmere	196	*	*
	Brisbane Inner	827	17	2.1%
	Brisbane Inner - North	704	17	2.4%
	Brisbane Inner - West	457	6	1.3%
	Caboolture	472	10	2.1%
	Caboolture Hinterland	93	*	*
	Chermside	602	22	3.7%
	Hills District	494	11	2.2%
	Kenmore - Brookfield - Moggill	361	*	*
	Narangba - Burpengary	408	*	*
	North Lakes	447	6	1.3%
	Nundah	352	6	1.7%
	Redcliffe	397	7	1.8%
	Sandgate	469	15	3.2%
	Sherwood - Indooroopilly	603	8	1.3%
	Strathpine	266	9	3.4%
	The Gap - Enoggera	340	7	2.1%
Brisbane South		11,902	648	5.4%
	Beauresert	89	*	*
	Beenleigh	331	14	4.2%
	Brisbane Inner - East	304	*	*
	Browns Plains	781	30	3.8%
	Capalaba	481	14	2.9%
	Carindale	422	19	4.5%
	Centenary	371	20	5.4%
	Cleveland - Stradbroke	528	12	2.3%
	Forest Lake - Oxley	1392	94	6.8%
	Holland Park - Yeronga	731	23	3.1%
	Jimboomba	260	**	**
	Loganlea - Carbrook	495	15	3.0%
	Mt Gravatt	1057	50	4.7%
	Nathan	553	34	6.2%
	Rocklea - Acacia Ridge	1013	50	4.9%
	Springwood - Kingston	1005	29	2.9%
	Sunnybank	1224	71	5.8%
	Wynnum - Manly	500	10	2.0%
Gold Coast		3,992	134	3.4%
	Broadbeach - Burleigh	415	16	3.9%
	Coolangatta	316	7	2.2%
	Gold Coast - North	501	14	2.8%
	Gold Coast Hinterland	104	*	*
	Mudgeeraba - Tallebudgera	206	*	*

	Nerang	449	10	2.2%
	Ormeau - Oxenford	723	17	2.4%
	Robina	436	14	3.2%
	Southport	590	18	3.1%
	Surfers Paradise	323	13	4.0%
Darling Downs & West Moreton		3,955	90	2.3%
	Burnett	367	*	*
	Darling Downs - East	264	*	*
	Darling Downs (West) - Maranoa	333	*	*
	Granite Belt	248	*	*
	Ipswich Hinterland	370	*	*
	Ipswich Inner	735	19	2.6%
	Springfield - Redbank	859	29	3.4%
	Toowoomba	1108	17	1.5%
Western Queensland		839	7	0.8%
	Outback - North	509	*	*
	Outback - South	185	*	*
Central Qld, Wide Bay, Sunshine Coast		5,176	76	1.5%
	Buderim	296	6	2.0%
	Bundaberg	563	6	1.1%
	Caloundra	445	*	*
	Central Highlands (Qld)	250	0	0.0%
	Gladstone - Biloela	547	10	1.8%
	Gympie - Cooloolo	285	*	*
	Hervey Bay	362	*	*
	Maroochy	332	9	2.7%
	Maryborough	274	*	*
	Nambour - Pomona	359	*	*
	Noosa	225	*	*
	Rockhampton	898	9	1.0%
	Sunshine Coast Hinterland	278	9	3.2%
Northern Queensland		6,602	107	1.6%
	Bowen Basin - North	264	*	*
	Cairns - North	390	8	2.0%
	Cairns - South	1284	32	2.5%
	Charters Towers - Ayr - Ingham	411	6	1.5%
	Far North	838	12	1.4%
	Innisfail - Cassowary Coast	402	*	*
	Mackay	849	6	0.7%
	Port Douglas - Daintree	100	*	*
	Tablelands (East) - Kuranda	382	*	*
	Townsville	1568	15	1.0%
	Whitsunday	129	*	*

Data source: Department of Human Services Medicare statistics. Totals may not add due to inclusion of those without a PHN or SA3 of residence in source data.

* Data suppressed as number receiving treatment <6.

** Data suppressed to prevent derivation of suppressed number using totals.

South Australia

CHB treatment uptake in South Australia

Treatment uptake in South Australia was more than three times higher in the **Adelaide PHN** compared to **Country SA**. Within the **Adelaide PHN**, the highest levels of treatment were seen in the areas of Port Adelaide–East (5.2%), Burnside (5.1%), and Charles Sturt (5.0%), and uptake was similar to the PHN average in Prospect-Walkerville and West Torrens. Uptake was lower (<2%) in the statistical areas of Salisbury, Marion, Norwood-Payneham-St Peters, and Adelaide City.

Due to the small population size in **Country SA**, the majority of statistical areas had data suppressed (<6 people on treatment), and variation on uptake cannot be reliably assessed.

CHB treatment uptake in South Australia by Statistical Area 3 and Primary Health Network, 2014

Primary Health Network	SA3	People living with CHB	Number receiving treatment	Treatment uptake
Adelaide		11,901	505	4.2%
	Adelaide City	431	8	1.9%
	Burnside	434	22	5.1%
	Campbelltown (SA)	599	17	2.8%
	Charles Sturt	1,265	63	5.0%
	Holdfast Bay	800	27	3.4%
	Marion	498	7	1.4%
	Mitcham	398	11	2.8%
	Norwood - Payneham - St Peters	997	17	1.7%
	Onkaparinga	769	28	3.6%
	Playford	1,034	27	2.6%
	Port Adelaide - East	884	46	5.2%
	Port Adelaide - West	288	**	**
	Prospect - Walkerville	1,675	73	4.4%
	Salisbury	654	8	1.2%
	Tea Tree Gully	800	27	3.4%
	Unley	349	*	*
	West Torrens	731	30	4.1%
Country SA		3,041	35	1.2%
	Adelaide Hills	379	*	*
	Barossa	169	*	*
	Eyre Peninsula and South West	410	6	1.5%
	Fleurieu - Kangaroo Island	255	*	*
	Gawler - Two Wells	189	*	*
	Limestone Coast	384	*	*
	Lower North	115	*	*
	Mid North	154	*	*
	Murray and Mallee	489	6	1.2%
	Outback - North and East	378	*	*
	Yorke Peninsula	134	0	0.0%

Data source: Department of Human Services Medicare statistics. Totals may not add due to inclusion of those without a PHN or SA3 of residence in source data.

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Western Australia

CHB treatment uptake in Western Australia

Treatment uptake in Western Australia was generally higher in metropolitan areas, with the level in **Perth North** and **Per South PHNs** 3-4 times higher than that in **Country WA**.

Within **Perth North PHN**, treatment uptake was highest in the Swan (4.9%) and Bayswater-Bassendean (4.8%) statistical areas, and similar to the PHN average of 4.4% in Wanneroo, Perth City, and Stirling. Uptake was notably lower (<2.5%) in the areas of Cottesloe-Claremont and Joondalup.

Treatment uptake in **Perth South PHN** was highest in the Melville area (4.7%), and was similar to the PHN average in the adjacent areas of Canning, Cockburn, and South Perth. Uptake was lower in the areas further from the metropolitan area of Perth, such as Kwinana (1.9%) and Rockingham (1.4%).

Due to the small population size in **Country WA**, the majority of statistical areas had data suppressed (<6 people on treatment), and variation in uptake cannot be reliably assessed.

CHB treatment uptake in Western Australia by Statistical Area 3 and Primary Health Network, 2014

Primary Health Network	SA3	People living with CHB	Number receiving treatment	Treatment uptake
Perth North		10,320	458	4.4%
	Bayswater - Bassendean	1075	52	4.8%
	Cottesloe - Claremont	595	13	2.2%
	Joondalup	1177	17	1.4%
	Kalamunda	439	**	**
	Mundaring	314	*	*
	Perth City	1174	46	3.9%
	Stirling	2496	96	3.8%
	Swan	1269	62	4.9%
	Wanneroo	1893	74	3.9%
Perth South		9,256	328	3.5%
	Armadale	635	15	2.4%
	Belmont - Victoria Park	1025	24	2.3%
	Canning	1562	50	3.2%
	Cockburn	935	28	3.0%
	Fremantle	288	7	2.4%
	Gosnells	1519	48	3.2%
	Kwinana	317	6	1.9%
	Mandurah	615	*	*
	Melville	999	47	4.7%
	Rockingham	792	11	1.4%
	Serpentine - Jarrahdale	136	*	*
	South Perth	508	15	3.0%
Country WA		5,012	51	1.0%
	Albany	428	*	*
	Augusta - Margaret River - Busselton	289	*	*
	Bunbury	693	7	1.0%
	Esperance	105	*	*
	Gascoyne	129	*	*
	Goldfields	479	*	*
	Kimberley	927	10	1.1%
	Manjimup	136	*	*
	Mid West	523	*	*
	Pilbara	787	*	*
	Wheat Belt - North	391	*	*
	Wheat Belt - South	147	*	*

Data source: Department of Human Services Medicare statistics. Totals may not add due to inclusion of those without a PHN or SA3 of residence in source data.

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Tasmania

CHB treatment uptake in Tasmania

Due to the small population size in **Tasmania**, the majority of statistical areas had data suppressed (<6 people on treatment), and variation in uptake cannot be reliably assessed.

CHB treatment uptake in Tasmania by Statistical Area 3 and Primary Health Network, 2014

Primary Health Network	SA3	People living with CHB	Number receiving treatment	Treatment uptake
Tasmania		3,514	49	1.4%
	Brighton	119	*	*
	Burnie - Ulverstone	334	*	*
	Central Highlands (Tas.)	69	*	*
	Devonport	289	*	*
	Hobart - North East	316	*	*
	Hobart - North West	398	*	*
	Hobart - South and West	216	*	*
	Hobart Inner	445	9	2.0%
	Huon - Bruny Island	148	*	*
	Launceston	588	8	1.4%
	Meander Valley - West Tamar	121	*	*
	North East	217	0	0.0%
	Sorell - Dodges Ferry	91	*	*
	South East Coast	43	*	*
	West Coast	139	*	*

Data source: Department of Human Services Medicare statistics. Totals may not add due to inclusion of those without a PHN or SA3 of residence in source data.

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Northern Territory

CHB treatment uptake in Northern Territory

Treatment uptake in the Northern Territory PHN varied widely according to statistical area, and was generally higher in the northern region of the territory. Uptake in Darwin City (7.0%) was more than double the PHN average, and it was also comparatively higher in the adjacent Darwin Suburbs area (3.6%), while being similar to the Territory average in Palmerston and East Arnhem. Lower uptake (<2%) was seen in Alice Springs and Katherine.

CHB treatment uptake in Northern Territory by Statistical Area 3 and Primary Health Network, 2014

Primary Health Network	SA3	People living with CHB	Number receiving treatment	Treatment uptake
Northern Territory		4,296	134	3.1%
	Alice Springs	823	14	1.7%
	Barkly	204	*	*
	Daly - Tiwi - West Arnhem	575	*	*
	Darwin City	299	21	7.0%
	Darwin Suburbs	853	31	3.6%
	East Arnhem	428	10	2.3%
	Katherine	519	6	1.2%
	Litchfield	208	*	*
	Palmerston	406	10	2.5%

Data source: Department of Human Services Medicare statistics. Totals may not add due to inclusion of those without a PHN or SA3 of residence in source data.

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Australian Capital Territory

CHB treatment uptake in Australian Capital Territory

Treatment uptake in the **Australian Capital Territory PHN** was highest in the areas of Gungahlin (5.8%) and Tuggeranong (5.4%), while the proportion was lower in the adjacent areas of North and South Canberra and Belconnen.

CHB treatment uptake in Australian Capital Territory by Statistical Area 3 and Primary Health Network, 2014

Primary Health Network	SA3	People living with CHB	Number receiving treatment	Treatment uptake
Australian Capital Territory		3,876	212	5.5%
	Belconnen	1036	34	3.3%
	Cotter - Namadgi	18	*	*
	Fyshwick - Pialligo - Hume	13	*	*
	Gungahlin	848	49	5.8%
	North Canberra	645	21	3.3%
	South Canberra	213	8	3.8%
	Tuggeranong	680	37	5.4%
	Weston Creek	175	*	*
	Woden	321	*	*

Data source: Department of Human Services Medicare statistics. Totals may not add due to inclusion of those without a PHN or SA3 of residence in source data.

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Australian Government

Department of Health

SECOND
National
Hepatitis B
Strategy

2014-2017

Second National Hepatitis B Strategy 2014–2017

ISBN: 978-1-74186-164-8

Online ISBN: 978-1-74186-165-5

Publications approval number: 10716

Copyright Statements:

Paper-based publications

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SECOND
National
Hepatitis B
Strategy

2014-2017

Foreword



Australia has made great progress in addressing blood-borne viruses and sexually transmissible infections over the last three decades. Our continued response to HIV, viral hepatitis and sexually transmissible infections over the life of the new national strategies comes at a time of both unprecedented opportunity and ongoing challenge.

Scientific advances in prevention, testing and treatment are providing us with the knowledge and the means to make dramatic reductions in

new infections and significant improvements in health outcomes. At the same time, these conditions still represent a significant burden of disease in this country, with the number of people affected by blood-borne viruses and sexually transmissible infections remaining too high and, for some conditions, increasing.

Australia's five national strategies set the direction for a coordinated, national response to HIV, hepatitis B, hepatitis C, sexually transmissible infections, and blood-borne viruses and sexually transmissible infections in the Aboriginal and Torres Strait Islander population until 2017. The national strategies are endorsed by all Australian Health Ministers and, for the first time, contain targets which provide a renewed focus for action and a framework for accountability.

Achieving the targets will be challenging and will require the concerted effort of all governments, affected communities, health care providers, the community sector and researchers. Together we need to take action to overcome the barriers that impede our efforts to scale up prevention, testing, management, care and support for people living with and at risk of blood-borne viruses and sexually transmissible infections.

Each national strategy identifies the priority actions that will support achievement of the targets across the areas of prevention; testing; management, care and support; workforce; protection of human rights; and surveillance, research and evaluation.

Implementing the priority actions will see evidence-based and targeted prevention activities remaining fundamental to the national response, and efforts

to increase testing rates and early diagnosis being scaled up. The role of primary care in blood-borne viruses and sexually transmissible infections management, care and support will become increasingly important, and the workforce will need to be supported accordingly. Continuing to build an enabling environment where stigma and discrimination does not prevent people from accessing health and community services will underpin success across all areas. More effective surveillance, monitoring, research and evaluation will continue to inform our national response and measure our progress.

The strong partnership approach that has been a hallmark of Australia's response to blood-borne viruses and sexually transmissible infections to date is required now more than ever. Despite the challenges, and with concerted and collective action, I am confident that Australia is well placed to step up the pace in our response to these conditions. I will be closely monitoring our progress over the coming years.



The Hon Peter Dutton MP

Minister for Health

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1. Introduction

Australia is still in the early stages of establishing a strong response to hepatitis B. This *Second National Hepatitis B Strategy 2014–2017* (the Strategy) looks to build on the achievements of the first strategy, strengthening Australia's hepatitis B response.

Hepatitis B is a potentially life-threatening liver infection caused by the hepatitis B virus (HBV) and transmitted through contact with the blood or some other body fluids of a person living with hepatitis B. While many people clear the virus, in others it can cause chronic liver disease and chronic infection and puts people at high risk of death from cirrhosis of the liver and liver cancer.

Hepatitis B is a significant concern worldwide, with the World Health Organization (WHO) declaring that the world is facing a silent epidemic of viral hepatitis (hepatitis B and C) with up to 500 million people affected [1].

In Australia there is a significant public health burden related to chronic hepatitis B infection. It is currently estimated that over 207 000 people are living with hepatitis B [3]. It is thought that only half (55 per cent) of those living with chronic hepatitis B know they have it, resulting in poor health outcomes and risk of transmission [4].

The burden of disease caused by the hepatitis B virus includes liver cirrhosis, cancer and potential need for transplant. In the last few years liver cancer has been identified as the fastest increasing cause in cancer death of Australians [4], to which chronic hepatitis B infection is a significant contributor. The high proportion of people who have undiagnosed, and hence untreated, hepatitis B will contribute significantly to the rise in these conditions in the future.

Most people living with chronic hepatitis B contracted the infection at birth or in early childhood, when the risk of progression to chronic infection is high. People born overseas in areas endemic for hepatitis B, including the Asia–Pacific region and Africa, together with Aboriginal and Torres Strait Islander people, are estimated to represent approximately two-thirds of those living with chronic hepatitis B in Australia [4].

Australia's principal tool to prevent new hepatitis B infection is our universal infant vaccination program, which started in 2000. The program has been highly successful, with coverage of infant vaccination remaining higher than 90 per cent. New infections among those eligible for childhood and adolescent vaccination have been declining [3]. This program will continue to play an essential role in preventing newly acquired infections in the longer term. Other effective actions are infection-control strategies, maternal hepatitis B screening, and ensuring the safety of the blood supply.

Despite the success of these prevention activities, strategies focusing on improving the diagnosis of people with chronic hepatitis B infection and on active monitoring and management are critical to addressing the increasing burden associated with chronic hepatitis B.

Australia's first *National Hepatitis B Strategy 2010-2013* aimed to reduce the transmission of, and the morbidity and mortality associated with, hepatitis B and to minimise the personal and social impact. This first strategy focused on building partnerships and strengthening community action, preventing transmission, and optimising diagnosis, screening and clinical management.

In partnership with state and territory governments and community organisations, models of care have been developed to assist healthcare professionals to conduct appropriate follow-up tests, assessments, referrals and management. A National Hepatitis B Testing Policy has also been developed, and targeted awareness campaigns have been implemented for some priority populations. Australia has recently been recognised by the WHO as meeting the regional hepatitis B control target of a prevalence of less than 1 per cent among children less than five years of age.

Despite the progress made under the first strategy, we need to do a lot more to address hepatitis B in Australia. Priority actions include reducing the high rate of unidentified chronic infection by improving access to and uptake of testing. We also need to expand monitoring and antiviral therapy to turn around the increasing incidence of poor outcomes, including primary liver cancer and liver failure. This will require finding effective ways to reach out to high-risk populations.

Promoting comprehensive and inclusive activities to link and involve those communities most affected by hepatitis B is also essential to improve health outcomes and reduce avoidable deaths. Continuing education for healthcare professionals will sustainably develop a workforce to deliver services for people living with chronic hepatitis B.

This Strategy aligns with the directions of the Auckland Statement on Viral Hepatitis 2012, which aims to focus attention on viral hepatitis as an urgent health concern that needs immediate action to prevent new infections and stop the rising death toll from cirrhosis and liver cancer.

2. Hepatitis B in Australia

Hepatitis B is a vaccine-preventable disease; however, chronic hepatitis B-associated mortality and morbidity contributes to a high public health burden in Australia. This burden is not evenly distributed among the Australian population; rather, it disproportionately affects often already marginalised populations such as migrant communities with origins in Asia, the Pacific and Africa [5], Aboriginal and Torres Strait Islander people [4], individuals with a history of injecting drug use [6], and other men who have sex with men [7,8]. Of these groups, approximately two-thirds of Australians living with chronic hepatitis B were either born overseas or are Aboriginal and Torres Strait Islander people [4].

Hepatitis B vaccine is included in Australia's National Immunisation Program as part of routine childhood immunisation. Coverage of infant vaccination since 2000 has remained higher than 90 per cent and the incidence of hepatitis B infections among those eligible for childhood and adolescent vaccination has been declining [3]. A catch-up program provided for adolescents aged 10 to 13 years is scheduled to be completed in all states and territories in 2014.

In Aboriginal and Torres Strait Islander children, vaccination coverage at two years of age is similar to non-Indigenous children (94 per cent), but lacks timeliness with only about 85 per cent vaccinated at one year of age compared to 92 per cent of non-Indigenous children. In adults of priority populations, vaccination coverage is anecdotally relatively low; however, systematic estimates are not readily available.

The successful infant, child and adolescent vaccination program in Australia has ensured that prevalence of hepatitis B infection has remained at less than 1 per cent among children under five years of age.

Overall, the number and rate of diagnosis of newly acquired hepatitis B infection has steadily declined over the last five years, from 262 new diagnoses and a rate of 1.2 per 100 000 population in 2008 to 193 new diagnoses and a rate of 0.8 per 100 000 population in 2012 [3]. More than 80 per cent of these occur in those aged over 25 years, and around 70 per cent in those born overseas [3].

However, there are a large number of people living with chronic hepatitis B in Australia, at risk of significant morbidity and mortality. In 2012, it is estimated that approximately 207 000 people were living with hepatitis B infection, an overall prevalence of 1.0 per cent [3]. Nearly half of those assumed to be living with chronic hepatitis B remain undiagnosed [4], and are hence unaware of their infection.

The burden of disease caused by the hepatitis B virus, including liver cirrhosis, cancer and potential need for transplant, continues to rise. By 2010, liver cancer had become the ninth most common cause of cancer death in Australians, increasing faster than any other cause of cancer related mortality [2, 9]. It has been estimated that between 2011 and 2020, annual liver cancer incidence in Australia will increase from 1520 to 2465 cases [10], with a substantial proportion of these cancers being attributable to hepatitis B [11, 12]. Chronic hepatitis B infection was estimated to be the underlying cause of liver disease in 5.6 per cent of liver transplants in 2012 [3].

3. Achievements

Over the last four years, from 2010 to 2013, a number of milestones and achievements have been reached in Australia to reduce the transmission of hepatitis B. These achievements will be built on over the next four years to achieve the goals, objectives and targets of this Strategy.

The hepatitis B mapping project has assisted in the identification and targeting of priority populations. The project developed estimates of chronic hepatitis B prevalence at the local level to help inform awareness and intervention campaigns to suit the particular local needs of people living with chronic hepatitis B infection and those providing services to them [4].

Continued investment occurred in behavioural, clinical, epidemiological and social research to inform policy and priority setting in the hepatitis B response, and improved systems were implemented for the monitoring and surveillance of hepatitis B. For example, social research projects and data collection by professional and community-based organisations during this period enhanced understanding of the epidemiology of hepatitis B and targeting of priority populations.

The development of a National Hepatitis B Testing Policy has provided guidance and enhanced consistency around hepatitis B testing nationally. Access and capability to improve hepatitis B management was supported by two factors: the removal of liver biopsy as a prerequisite for subsidised treatment; and the development of a pilot education curriculum and associated resources for primary care providers. The pilot included the introduction of programs in some states and territories for Section 100 community prescribing for the maintenance and treatment of hepatitis B and provision of patient information on hepatitis B.

During the period 2010–2013, Australia was formally recognised by the WHO as meeting the regional hepatitis B control target of prevalence of less than 1 per cent among children among children less than five years of age.

4. Measuring Progress

4.1 Goals

The goals of the Strategy are to reduce the transmission of, and morbidity and mortality caused by, hepatitis B and to minimise the personal and social impact of Australians living with hepatitis B.

4.2 Objectives

The Strategy aims to achieve the above goal through six combined objectives. These objectives are to:

1. reduce new hepatitis B infections
2. achieve and maintain high levels of hepatitis B vaccination
3. increase the proportion of people with chronic hepatitis B who have been diagnosed
4. increase access to appropriate management and care for people with chronic hepatitis B
5. reduce the burden of disease attributed to chronic hepatitis B
6. eliminate the negative impact of stigma, discrimination, and legal and human rights issues on people's health.

4.3 Targets

Targets are included for the first time in this Strategy. These aspirational targets provide a specific focus for the efforts of all partners in moving towards the achievement of the above objectives and the overall goal. These targets are an initial step, and will be reviewed and updated as necessary. The targets are, by 2017, to:

1. achieve HBV childhood vaccination coverage of 95 per cent
2. increase hepatitis B vaccination coverage of priority populations
3. increase to 80 per cent the proportion of all people living with chronic hepatitis B who are diagnosed
4. increase to 15 per cent the proportion of people living with chronic hepatitis B who are receiving antiviral treatment.

Vaccination remains the key prevention activity for hepatitis B. Achieving a national 95 per cent HBV vaccination coverage in infants at one and two years of age aligns with the *National Immunisation Strategy 2013-2018*, in which the improvement of immunisation coverage is the first strategic priority. While coverage for infants is consistently above 90 per cent, there are significant gains to be had in improved timeliness and coverage in high-risk population groups. Improvements in vaccination among adults at higher risk of infection are important in reducing transmission.

It is estimated that only 55 per cent of people living with chronic hepatitis B are diagnosed [4]. Expert opinion is that increasing the proportion of those diagnosed to 80 per cent would significantly contribute to opportunities to reduce hepatitis B associated morbidity and mortality, and reducing transmission.

While estimates for the proportion of people living with chronic hepatitis B who are on treatment are uncertain, they are very low, ranging from 2.5–5 per cent [13, 14]. Similarly, there is limited information on the proportion of people living with chronic hepatitis B who are eligible for treatment; however, Australian and international estimates range from 10–25 per cent [15, 16, 17]. The target of 15 per cent, which equates to about 31 000 people on treatment, will see significant benefits in achieving the goal.

4.4 Indicators

Indicators will be used to monitor the implementation of the Strategy, report against progress in achieving targets and objectives, and inform changes in the response as required.

There are limitations in the availability and quality of indicators to measure progress against several of the Strategy's objectives and targets. The indicators identified below have an existing national collection mechanism, and can be reported on from the initiation of this Strategy.

Further work on refining and developing indicators is required, and will be progressed during the life of this Strategy. Indicators to report against each of the targets will need to be specifically defined. An important gap to be addressed is the lack of a nationally agreed indicator for measuring progress in reducing the health impact of stigma, discrimination, and legal and human rights in the context of this Strategy. Additionally, work on indicators to measure the burden of disease associated with hepatitis B and vaccination in adult priority groups is essential to assessing progress. Other areas for revision and updating include indicators for the measurement of appropriate treatment and management, and estimates around the undiagnosed proportion of chronic hepatitis B. Further limitations and gaps are discussed in section 7.6, 'Surveillance, Research and Evaluation'.

Objective	Indicator
Reduce hepatitis B infections	Annual rate of notifications of newly acquired hepatitis B
Achieve and maintain high levels of hepatitis B vaccination	Coverage of hepatitis B vaccination at 12 and 24 months
Increase the proportion of people with chronic hepatitis B who have been diagnosed	Estimated proportion of people with chronic hepatitis B who have not been diagnosed
	Annual rate of notifications of unspecified hepatitis B
	Prevalence of hepatitis B in pregnant women, by country of birth and Aboriginal and Torres Strait Islander status
Increase access to appropriate management and care for people with chronic hepatitis B	Proportion of people with chronic hepatitis B dispensed drugs for hepatitis B infection through the Highly Specialised Drugs Program
Reduce burden of disease attributed to chronic hepatitis B	
Eliminate the negative impact of stigma, discrimination, and legal and human rights issues on people's health	

4.5 Implementation and Evaluation

This Strategy sets high-level directions for action over the next four years. Implementation and evaluation of the Strategy will be supported by an 'Implementation and Evaluation Plan' and a 'Surveillance and Monitoring Plan'. These plans will be developed in consultation with state and territory governments and partners and will detail the way in which priority actions will be implemented, including roles and responsibilities, timeframes and lines of accountability, and how the goals, targets and objectives will be monitored.

Australia's world-recognised partnership approach will remain central to our response to blood-borne viruses (BBV) and sexually transmissible infections (STI). Undertaking the actions set out in this Strategy by December 2017 requires Commonwealth and state and territory governments, community organisations, service delivery organisations, professional bodies, and research

institutions to work together. In doing this, we need to ensure that affected individuals and communities remain at the heart of our response and involved in activities as they are proposed, developed and implemented.

This Strategy builds on its predecessor, which guided Australia's response to hepatitis B between 2010 and 2013. It is one of five interrelated national strategies aiming to reduce the transmission and impact of BBV and STI. The other strategies are the:

- *Seventh National HIV Strategy*
- *Fourth National Aboriginal and Torres Strait Islander Blood Borne Viruses and Sexually Transmissible Infections Strategy*
- *Fourth National Hepatitis C Strategy*
- *Third National Sexually Transmissible Infections Strategy.*

The five national strategies share common structural elements, designed to support a coordinated effort in addressing common concerns. Much of the prevention, healthcare and community responses contained in the strategies are intrinsically linked through co-infections, commonalities in risk factors, and shared responsibility for the clinical management of BBV and STI. The strategies support and align with state and territory BBV and STI strategies and provide a framework to guide coordinated action in this area by state and territory governments and other partners until 2017.

Epidemiology, policy context and priority areas for action specific to addressing HIV in the Aboriginal and Torres Strait Islander population are included in more depth in the *Fourth National Aboriginal and Torres Strait Islander Blood Borne Viruses and Sexually Transmissible Infections Strategy*.

5. Guiding Principles Underpinning Australia's Response

The guiding principles informing this Strategy are drawn from Australia's efforts over time to respond to the challenges, threats and impacts of HIV, STI and viral hepatitis.

Human Rights

People with BBV and STI have a right to participate fully in society, without experience of stigma or discrimination. They have the same rights to comprehensive and appropriate information and health care as other members of the community, including the right to the confidential and sensitive handling of personal and medical information.

Access and Equity

Health and community care in Australia should be accessible to all based on need. The multiple dimensions of inequality should be addressed, whether related to geographic location, gender, sexuality, drug use, occupation, socioeconomic status, migration status, language, religion or culture. Special attention needs to be given to working with Aboriginal and Torres Strait Islander people to close the gap between Aboriginal and Torres Strait Islander health status and that of other Australians [34].

Health Promotion

The Ottawa Charter for Health Promotion provides the framework for effective BBV and STI health promotion action. It facilitates the active participation of affected communities and individuals to increase their influence over the determinants of their health, and formulation and application of law and public policy that supports and encourages healthy behaviours and respects human rights.

Prevention

The transmission of hepatitis B is preventable through the appropriate use of combinations of evidence-based approaches. All prevention efforts are underpinned by targeted and culturally appropriate health promotion activities. Vaccination is the most effective means of preventing the transmission of hepatitis B.

Harm Reduction

Harm-reduction approaches underpin effective measures to prevent transmission of HIV and viral hepatitis, including needle and syringe programs and drug treatment programs.

Shared Responsibility

Individuals and communities share responsibility to prevent themselves and others from becoming infected, and to inform efforts that address education and support needs. Governments and civil society organisations have a responsibility to provide the necessary information, resources and supportive environments for prevention.

Commitment to Evidence-based Policy and Programs

The national response to BBV and STI has at its foundation an evidence base built on high-quality research and surveillance, monitoring and evaluation. A strong and constantly refining evidence base is essential to meet new challenges and evaluate current and new interventions and effective social policy.

Partnership

An effective partnership between affected communities, professional and community organisations, government, researchers and health professionals is characterised by consultation, cooperative effort, respectful dialogue, resourcing and action to achieve the goals of the strategies. It includes leadership from the Australian Government, and the full cooperative efforts of all members of the partnership to implement agreed directions.

Meaningful Involvement of Affected Communities

The meaningful participation of people living with BBV and STI and of affected communities in all aspects of the response is essential to the development, implementation, monitoring and evaluation of programs and policies.

6. Priority Populations

Hepatitis B is an issue for the whole of Australian society; however, targeting responses to priority populations is critical to maximising the impact and sustainability of our response. The priority populations for this Strategy reflect Australia's epidemiological data and social context. Individuals may be members of more than one priority population.

Priority populations identified in this Strategy are:

- people from culturally and linguistically diverse backgrounds, particularly people with an Asia-Pacific or Sub-Saharan African background
- Aboriginal and Torres Strait Islander people
- children born to mothers with chronic hepatitis B and children with chronic hepatitis B
- unvaccinated adults at higher risk of infection, including:
 - other men who have sex with men
 - sex workers
 - people who inject drugs
 - partners and other household and intimate contacts of people who have acute or chronic hepatitis B infection
 - people in custodial settings
 - people with HIV or hepatitis C or both.

Further details on the main reasons for priority population status, specific subpopulations of higher prevalence and/or higher risk, and the main barriers and facilitators to effective responses, are included in the Appendix.

7. Priority Areas for Action

Prevention activities are an essential element of the response. Actions will focus on continuing to prevent new cases of acute hepatitis B through vaccination, while minimising the adverse health outcomes for people living with chronic hepatitis B.

An increase in testing in priority populations is crucial to reducing the morbidity and mortality associated with chronic hepatitis B infection. This is important in reducing the extent of undiagnosed infection and linking people to monitoring and treatment programs.

The goal of chronic hepatitis B management is to improve quality of life and survival by preventing the progression of liver disease. All people with chronic hepatitis B require lifelong regular monitoring to ensure appropriate and timely management decisions, including the appropriate initiation of treatment. Primary and community care play the central role in this, requiring a renewed focus on strengthening their capacity to respond.

High quality surveillance, monitoring, research and evaluation will inform our knowledge of hepatitis B and guide the most effective response in the Australian context.

Many people with blood-borne viral infections have experienced stigma and discrimination. More evidence is required regarding the impact of stigma and discrimination in relation to hepatitis B, which should be addressed to enable a nationally coordinated response.

7.1 Prevention

Priority Actions

- Increase hepatitis B vaccination rates in children.
- Increase the uptake of hepatitis B vaccination among priority populations.
- Build knowledge and skills in priority populations, healthcare professionals, policy makers and the general community around hepatitis B transmission risks and the availability of a vaccine.
- Maintain and increase safer sexual and safer injecting practices in priority populations.
- Strengthen monitoring and appropriate care of pregnant women with chronic hepatitis B and children born to these mothers, and support the development of nationally consistent protocols to support best practice.

Nationally funded hepatitis B vaccination for children is implemented under the National Immunisation Program Schedule (the Schedule). The Schedule includes a course of four vaccinations, commencing with a birth dose. Coverage rates for hepatitis B vaccine are good overall; however, challenges remain in the rate of timely vaccination for Aboriginal and Torres Strait Islander children (at one year of age) and in the reporting of the birth dose.

In 2011, the coverage rates for hepatitis B vaccination for Aboriginal and Torres Strait Islander children at one year of age was 85.05 per cent, compared to 91.93 per cent for non-Indigenous children. Coverage rates for both Aboriginal and Torres Strait Islander and non-Indigenous children are above 94 per cent at two years of age.

Although coverage of the three-dose primary vaccination schedule (two, four and six months) is high (over 85 per cent) and assessed via the Australian Childhood Immunisation Register [18], coverage of the birth dose is not systematically reported and information regarding timely receipt of the birth dose (within 24 hours of birth) is limited in Australia. Surveillance and evaluation of birth-dose information across Australia would better inform the coverage rates and indicate whether further work to improve uptake is needed.

The vaccine prevents new infections, which is particularly important in newborns and children as the risk of developing chronic hepatitis B following infection is greater the younger the age at infection. Up to 90 per cent of infants and 30 per cent of children will develop chronic hepatitis B after exposure to infection, compared to 5 per cent in adults [19]. As such, vaccination remains central to prevention efforts for the long-term management of hepatitis B in Australia.

In Australia, systematic testing for, and identification of, hepatitis B during antenatal care is generally done well. Reducing transmission to the newborn could be strengthened through improved maternal care, including improved provision of appropriate information to pregnant women about their own care, appropriate access to management and treatment, and the development and implementation of nationally consistent best practice protocols. Screening of pregnant women for hepatitis B and providing babies born to hepatitis B-positive mothers with post-exposure prophylaxis remains an important element in prevention of transmission of the virus.

Key action areas of the *National Immunisation Strategy 2013-2018* include increasing immunisation coverage for priority populations and ensuring equity of access to immunisation services, including Aboriginal and Torres Strait Islander people. Also, under the National Partnership Agreement on Essential Vaccines, states and territories have agreed to maintain or improve vaccination coverage for Aboriginal and Torres Strait Islander people.

The *Australian Immunisation Handbook* [21] recommends vaccination for the adult priority populations of this Strategy as they are at higher risk of acquiring hepatitis B or are at higher risk of severe disease. It provides guidance as to when pre-vaccination serological testing is indicated which includes the priority populations. Despite this, evidence suggests the uptake of vaccination among priority populations at higher risk of infection remains suboptimal [21, 22, 23, 24, 25, 26].

Unsafe injective practices account for at least 50 per cent of new hepatitis B infections, and approximately 5 per cent of adults living with hepatitis B will go on to develop chronic hepatitis B [19]. The provision and uptake of hepatitis B vaccination among people who inject drugs is strongly correlated to the service models, availability of information, and accessibility of vaccination that they encounter [25]. Needle and syringe services may be ideally positioned to promote and deliver hepatitis B vaccination to this high-risk population.

Factors such as low awareness of transmission risks and the availability of the

vaccine, including confusion between the different hepatitis viruses [27], have been identified as barriers to vaccination. As the burden of hepatitis B can be identified by geographic area and by population group, prevention activities should also be targeted to local health areas where priority populations at higher risk of hepatitis B are located. Better awareness about vaccination would enable effective promotion through education and awareness to priority populations, through integrated safe sex programs, and safe injecting health promotion and education programs.

7.2 Testing

Priority Actions

- Increase testing in priority populations to decrease the undiagnosed proportion of people living with chronic hepatitis B.
- Improve health literacy in priority populations to increase their awareness of chronic hepatitis B and the importance of testing.
- Promote the use of the National Hepatitis B Testing Policy among healthcare professionals who work with priority populations.
- Develop a model of care that supports healthcare professionals who diagnose chronic hepatitis B to conduct appropriate follow-up testing, assessment, management and referral.
- Develop a national protocol for the public health management of hepatitis B.

It is estimated that 45 per cent of people living with chronic hepatitis B have not been diagnosed [4]. Late diagnosis leads to ongoing transmission and poor health outcomes, as opportunities to prevent progression to advanced liver disease and cancer are missed. Improvements in testing in priority populations are needed to identify undiagnosed infection and provide appropriate monitoring and treatment to maximise health outcomes.

Those communities most affected by chronic hepatitis B in Australia often experience multiple barriers to accessing appropriate testing for hepatitis B. These barriers can include highly disrupted lives and limited access to healthcare services in their country of origin, cultural and language differences, and variable levels of education and health literacy [27]. Improving testing rates

among priority populations, particularly given the high rate of infection in people with culturally and linguistically diverse backgrounds, requires specific, targeted culturally appropriate education and awareness initiatives and ongoing testing models appropriate to these diverse populations.

The National Hepatitis B Testing Policy [28] provides evidence-based recommendations for whom to test, how to test, and the interpretation of pathology results. This policy, and other relevant resources, should be promoted among healthcare professionals to ensure nationally consistent testing, pathology reporting and follow-up procedures. Testing strategies and models will need to be reviewed and updated to allow new testing technologies, such as rapid testing, to be included as they become available.

Chronic hepatitis B is a dynamic disease and people require lifelong regular monitoring. Primary healthcare services, particularly those working in high prevalence areas, and community organisations providing support and advice to priority populations will continue to play an increasingly important role in hepatitis B testing and monitoring. Programs to improve testing need to recognise the value of these organisations and services, and work to integrate opportunistic testing into current activities.

Education and appropriate support of the workforce is required to ensure knowledge and competency remains current. The renewed focus in Australia on responding to local health priorities can be harnessed to target clinical education and public health programs to address hepatitis B where the burden is greatest, in areas where there is a higher proportion of residents from priority populations [29].

Increased testing in priority populations will lead to an increase in the identification of people with hepatitis B. The information and support needs of people who are newly diagnosed must be discussed and met to assist them to manage their hepatitis B over their lifetime, in partnership with healthcare providers.

To maximise opportunities for increasing the identification and diagnosis of people living with hepatitis B, and reducing transmission, the public health response should include appropriate testing and vaccinating of household contacts and sexual partners, and the provision of information to reduce the risk of ongoing transmission [30]. A national protocol on the public health response to hepatitis B, which addresses the important role of primary care, is needed to improve national consistency.

7.3 Management, Care and Support

Priority Actions

- Increase the number of people living with chronic hepatitis B infection receiving appropriate management.
- Improve awareness among priority populations of the long-term consequences of chronic hepatitis B and the availability of appropriate management, treatment and community support.
- Work towards improving access to hepatitis B medications, through general practitioner prescribing and community dispensing.
- Examine strategies to encourage the development and implementation of models of care that increase involvement of general practitioners.
- Explore tools to improve continuity of care.

7.3.1 Management

The management of chronic hepatitis B is complex, requiring a spectrum of care ranging through diagnosis, education, support, regular monitoring and (where appropriate) antiviral therapy. Best practice management involves lifelong regular monitoring of all people with chronic infection to enable decisions regarding antiviral treatment and to detect progressive liver disease and complications of infection, including liver cancer.

The delivery of such comprehensive, yet flexible and culturally appropriate, care requires a multidisciplinary team approach. A renewed focus on the central role of primary healthcare and community care in achieving this is essential. In addition to strengthening support for the role of general practitioners, this could include an exploration of alternative arrangements for care, including possible roles for nurse practitioners or integrated primary and tertiary nursing models.

While ongoing management for all people with chronic hepatitis B is needed, treatment is not recommended for all stages of disease. There is limited evidence to inform the percentage of people living with chronic hepatitis B who are eligible for treatment, with estimates range from 10 to 25 per cent [15, 16, 17] (based on cost effectiveness studies into screening, prevention and treatment strategies, mostly identified through cohort or survey data) [6]. Currently, it is

estimated that treatment levels in Australia are 5 per cent or less, and increasing the number of people accessing clinical treatment is an important element of this Strategy.

Supporting the increasingly critical role primary healthcare plays in hepatitis B management will require strategies to improve access to the tools important for management. Difficulties are experienced by the primary healthcare sector in accessing the non-invasive diagnostic tools necessary to assess liver disease severity and thus make decisions regarding appropriate management, including initiation of antiviral therapy. Current arrangements restrict prescribing and dispensing of antiviral therapy to specialist services.

An important element of appropriate management is the six-monthly monitoring for hepatocellular carcinoma in certain individuals and introduction of antiviral therapy when appropriate. There is evidence that a systematic approach to screening and managing chronic hepatitis appropriately is likely to be a cost-effective cancer prevention intervention in the Australian context [31]. To address the increasing burden of liver cancer in Australia, the cost-effectiveness and utility of establishing options for implementation of such an approach should be considered.

Due to significant variations in the geographic distribution of priority populations and existing infrastructure and support in Australia, primary healthcare governance at the local level is essential to deliver appropriately targeted interventions. Improved knowledge about the geographic distribution of these communities, the prevalence of chronic hepatitis B, and other factors (including the incidence of liver cancer and surveillance notifications) will help guide these local interventions [4].

Localised priority setting, through geographical mapping of the burden of disease, will allow individual primary healthcare governance and general practice to identify hepatitis B as a health burden for their community that requires addressing [7]. Additionally, identifying areas where access to appropriate diagnosis, management and treatment is lowest relative to the estimated burden of hepatitis B provides an opportunity to prioritise health interventions and improve local service delivery [7].

7.3.2 Care and Support

People living with chronic hepatitis B infection come from a diverse cross-section of cultural, linguistic and social backgrounds, and often experience a range of complex social and psychological challenges in settings with decreased access to healthcare services.

To be effective, community-based specialist hepatitis and primary healthcare services must be physically accessible and culturally responsive to the specific needs of the priority populations. Communities need resources that incorporate references and experiences that translate relevant complex biomedical information into accessible language. Relationships with local multicultural health workforce and community organisations will strengthen care delivery as well as personal and community-level support for the individual. Better understanding of hepatitis B and treatment availability is also required for some general practitioners and non-hepatology specialists, such as those involved in antenatal care, where maternal treatment can significantly reduce the risk of transmission to the baby.

Improving understanding of hepatitis B and the health services available is essential for people living with chronic hepatitis B to stay healthy and avoid health risks. Given the complexity of chronic hepatitis B, innovative, sustainable and culturally appropriate health promotion activities are required. Access to culturally and linguistically appropriate support and information about hepatitis B and treatment options is required to address low levels of hepatitis B awareness and knowledge in communities most at risk. A person with hepatitis B who has a good understanding of the impact of chronic hepatitis B infection, the purpose of treatment and the clinical process for treatment is more likely to adhere to the recommendations on lifelong monitoring and treatment and respond effectively to clinical advice.

Communities play a pivotal role in ensuring that people with hepatitis B are effectively supported in promoting their health and maintaining compliance with clinical management. It is important that programs supporting these communities impart the knowledge and skills to deliver these activities.

7.4 Workforce

Priority Actions

- Improve knowledge of hepatitis B diagnosis and management among primary healthcare professionals.
- Support healthcare professionals and community organisations to provide for the needs of priority populations, improve health literacy and to deliver appropriate and evidence-based care.
- Provide the primary healthcare workforce with support and mentorship, to ensure successful management and transition to primary care.

Services providing care and support for people with chronic hepatitis B are diverse. For example, the workforce within these sectors is varied, and includes healthcare professionals as well as the community-based workforce, such as community organisations, community workers and peer-education and support workers.

Additionally, some organisations are tailored towards individual priority population groups and the specific needs of a population, such as for people with culturally and linguistically diverse backgrounds. This varied workforce requires access to accurate information about hepatitis B, the skills to promote prevention, and the links to engage with appropriate services in order to ensure the most appropriate provision of care and workforce capacity as possible.

A move towards a primary healthcare focus of management will increase access, reduce the health costs and personal consequences of unmanaged hepatitis B, and increase healthcare integration. Professional education programs must address testing and assessing, monitoring, managing and treating hepatitis B in order to ensure expanding access to care is done safely.

Developing cultural competency across clinical services and community organisations is important to increase engagement with priority populations. Understanding the different needs of each priority population group is important to ensure appropriate and effective service delivery. This requires continued and sustained collaboration with communities most affected by chronic hepatitis B.

Further support for healthcare professionals prescribing hepatitis B antivirals will be essential to scale-up treatment access. Some of the curriculum, resources and oversight were developed under the auspices of the first *National Hepatitis B Strategy 2010–2013*. Supporting prescribing in primary care, such as through mentorship for prescribers, and regulatory changes to Section 100 prescribing and dispensing arrangements, should be explored during the lifetime of this Strategy.

Understanding the characteristics of the local population and the prevalence of hepatitis B at the local level will support the development, targeting and intensity of health promotion programs and shared care service delivery mechanisms. It will support establishing partnerships between key organisations—including Aboriginal community-controlled health services, specific community groups, and other health and community organisations—to take a targeted approach to raise awareness, increase testing and support compliance with management and treatment protocols at the local level.

7.5 Enabling Environment

Priority Actions

- Eliminate stigma and discrimination in community and healthcare settings and empower priority populations.
- Remove institutional, regulatory and systems barriers to equality of care for people infected and affected by hepatitis B in the health sector.
- Develop programs to assess and address hepatitis B-related stigma and discrimination.
- Maintain effective partnerships between governments and organisations representing the interests of people affected by or living with hepatitis B at local, state and territory and national levels.
- Develop health promotion interventions to improve health literacy in people with chronic hepatitis B and their families and communities, to foster culturally sensitive environments in which it is safe to disclose hepatitis B infection and support their clinical and non-clinical needs.

Little is known about the impact of stigma and discrimination on people with hepatitis B. Social exclusion and isolation affect the health status of communities from culturally and linguistically diverse backgrounds. Language differences and cultural beliefs and practices influence health literacy, including access to health services.

Hepatitis B infections disproportionately affect marginalised populations, such as migrant communities with origins in Asia, the Pacific and Africa; Aboriginal and Torres Strait Islander people; individuals with a history of injecting drug use; and other men who have sex with men [5, 21, 22, 23, 24, 25, 26]. Modelling data indicates that a significant number of people living with hepatitis B who were born overseas, and the predominant countries of birth include China, Vietnam, Cambodia, Malaysia and the Philippines.

People from affected communities require protection from multiple forms of discrimination [32], not only those associated with fears of contagion but also a range of other social phobias related to sexuality, drug use, or being a sex worker or person in a custodial setting [33].

All partners in Australia's hepatitis B response have a responsibility to work towards ensuring the response to hepatitis B—and indeed all BBV and STI—is based in human rights. Discrimination, unfair treatment and social burdens increase the negative impact of health status and can reduce access to care.

Programs that address advocacy and empowerment of populations to access prevention, treatment, care and support in the community, education, workplace, healthcare and legal settings should be promoted. Approaches include awareness-raising initiatives, education and training programs, supporting advocacy and empowerment, improving access to effective complaint systems, and promoting research.

Organisations involved in community responses to BBV require support for programs relating to hepatitis B and to further develop and implement community engagement and partnership building.

Communities and people living with hepatitis B need to be equipped with the language and skills to negotiate through the experience of their infection (including understanding the impact of their diagnosis), the clinical management options (including compliance and monitoring and expectations of treatment), and informing their contacts of the implications of the infection.

A priority action area for the first *National Hepatitis B Strategy 2010–2013* was to build partnerships and strengthen community action, recognising the need for collaboration between communities most affected by hepatitis B and all levels of government as well as between community-based organisations and the medical, healthcare, research and scientific communities.

These partnerships have been established, and the challenge for this Strategy is to both maintain effective partnerships to deliver targeted health promotion activities, testing, treatment, care and support to priority populations, particularly those where social exclusion and isolation affect health status and access to effective management.

7.6 Surveillance, Research and Evaluation

Priority Actions

- Strengthen the hepatitis B component of the National BBV & STI Surveillance and Monitoring Plan.
- Improve our understanding of the burden of disease attributable to hepatitis B and the associated risk factors, develop appropriate evidence-based public health responses, and evaluate the impact of these programs on the increasing incidence of morbidity and mortality.
- Provide support to ensure research is undertaken across the relevant diseases and disciplines, including social, behavioural, epidemiological, clinical and basic research to inform the delivery of the Strategy.
- Evaluate health promotion, testing, treatment, care, support and education and awareness campaigns, programs and activities to ensure they are effective.

7.6.1 Surveillance and Monitoring

The quality and coverage of surveillance data for hepatitis B infection requires significant improvement. In 2013, only half of the eight indicators identified in the *National BBV and STI Surveillance and Monitoring Plan 2010-13* to monitor the implementation of the first *Hepatitis B Strategy* were able to be reported on; further, two of these were based on weak data and/or methods. The revised set of indicators for this Strategy contains six indicators which can be nationally reported on, and identifies several significant gaps.

A key issue in the data collection that needs to be addressed is the need to improve data completeness for Aboriginal and Torres Strait Islander status and country of birth for newly acquired and unspecified hepatitis B notifications.

There is currently no ability to monitor and report on the disease-related mortality and morbidity attributed to chronic hepatitis B nationally. The development of a new indicator is critical, given the public health disease burden attributed to hepatitis B. Consideration could be given to indicators that measure the proportion of liver cancer attributed to hepatitis B and the number of deaths attributable to hepatitis B infection.

While antiviral treatment is an important aspect of hepatitis B management, the emphasis is on ensuring appropriate monitoring and care. Further work is needed to develop a measure of the delivery of appropriate comprehensive management. Examples include the proportion of people with chronic hepatitis B who have a recorded management plan and / or received at least an annual hepatitis B virus DNA test.

Support for high quality denominator data is essential to inform progress towards the target of 80 per cent of people living with hepatitis B being diagnosed. There is a need to strengthen data collection on vaccination uptake and record uptake in high-risk adults as well as research and monitoring to determine the most effective strategies for different priority populations.

An important gap, identified across all five strategies, is the ability to monitor the impact of stigma, discrimination, and legal and human rights. Options need to be explored to develop an indicator that informs activities and strategies in a meaningful way.

Behavioural surveillance encompassing risk behaviours, prevention practices, testing and treatment uptake and health services for priority populations is important to inform policy and programs addressing emerging prevention, testing, treatment, care and support needs.

Recent mapping work will allow additional information to be collected to analyse surveillance notifications, liver cancer incidence and antiviral treatment uptake in order to reflect the shifting epidemiology of hepatitis B in Australia and the impact of interventions to address hepatitis B infection at a population level [7].

7.6.2 Research and Evaluation

Research guides the development, implementation and evaluation of policies and programs at all levels of the national response to chronic hepatitis B. Research is needed to investigate the impact of chronic hepatitis B in priority populations and communities.

A culture of continuous improvement needs to underpin program and service development, including strong formative and evaluation research.

Mapping work identifying areas of high hepatitis B prevalence and the proportion of people receiving treatment will also help measure the impact of health promotion programs and interventions at the population level [3]. Recording linkages between notifications of chronic hepatitis B with outcomes—including liver cancer and mortality—would enable a better understanding of the impact of hepatitis B.

Monitoring and evaluating the implementation of the priority actions, and the supporting indicators and Implementation and Evaluation Plan, will ensure we are progressing towards, and remain focused on, reaching the targets outlined in this Strategy.

Systematic evaluation of activities and programs should also focus on aligning outcomes with identified priority actions. The interrelationship between priority actions and associated programs should be monitored and linkages enhanced where appropriate.

A significant number of activities and programs have been undertaken in the first *Hepatitis B Strategy* and by state and territory, peak and community organisations and research centres across all six priority action areas. The opportunities for scaling-up these activities and programs to a national level should be evaluated and explored.

Acknowledgements

The *Second National Hepatitis B Strategy 2014–2017* was developed through a broad and inclusive consultation process with contributions from governments, professional and community organisations, researchers and expert health professionals. Thanks go to all those involved in developing this Strategy.

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Appendix: Priority Populations

Priority Population	Reason for Priority Status	Issues and considerations	Additional Focus
Culturally and linguistically diverse people	<ul style="list-style-type: none"> High prevalence with estimates that the prevalence of hepatitis B in Australia among people from culturally and linguistically diverse backgrounds typically reflects the prevalence of hepatitis B in the countries of origin. 	<ul style="list-style-type: none"> Language, cultural and gender issues. Low health literacy and perception of risk. Limited health-seeking behaviour. Lack of familiarity with health system and services. Previous negative experiences of healthcare. Issues relating to privacy and confidentiality (e.g. use of interpreters). Refugees and asylum seekers may have experienced significant trauma or violence. 	<ul style="list-style-type: none"> Priority subpopulations are migrants from countries with high prevalence, such as Viet Nam (12.5 per cent of the population) and China (12.3 per cent of the population).¹
Aboriginal and Torres Strait Islander people	<ul style="list-style-type: none"> High prevalence of an estimated 3.7 per cent of the Aboriginal and Torres Strait Islander population² compared with the 1.03 per cent³ in the Australian population. 	<ul style="list-style-type: none"> Concerns regarding access and/or acceptance of culturally appropriate services including primary healthcare services for many communities. Language and cultural issues, including family and community relationships. 	<ul style="list-style-type: none"> Prevalence of chronic hepatitis B varies according to place of residence, with 2 per cent in urban populations to 8 per cent in rural populations.

Priority Population	Reason for Priority Status	Issues and considerations	Additional Focus
Children born to mothers with chronic hepatitis B and children with chronic hepatitis B	<ul style="list-style-type: none"> High risk, with only 10 per cent of neonates and infants clearing the hepatitis B virus after infection. 	<ul style="list-style-type: none"> Lack of viral load testing for pregnant women with chronic hepatitis B.^{4, 5} 	
Un-vaccinated adults at higher risk of infection	<ul style="list-style-type: none"> High risk due to increased or potentially increased exposure to the hepatitis B virus. Injecting drug use is the highest reported source of hepatitis B infection. (15.5 per cent of newly acquired infections.)⁶ Includes: <ul style="list-style-type: none"> people who inject drugs other men who have sex with men sex workers household and intimate contacts of people who have chronic hepatitis B infection people in custodial settings people who are immunocompromised, have HIV or hepatitis C or both, or have chronic liver disease. 	<ul style="list-style-type: none"> Criminalisation. Access to treatment is difficult, and exit screening is not as high as entry screening in people in custodial settings. 	<ul style="list-style-type: none"> Solid organ and haematopoietic stem cell transplant recipients.

Notes to the Appendix

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