

# HEPATITIS B MAPPING PROJECT

Estimates of chronic hepatitis B diagnosis,  
monitoring and treatment by Medicare Local



NATIONAL REPORT 2012/13

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monitoring and treatment by Medicare Local

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AUSTRALASIAN SOCIETY FOR HIV MEDICINE AND VICTORIAN INFECTIOUS DISEASES REFERENCE LABORATORY, THE DOHERTY INSTITUTE



***Hepatitis B Mapping Project: Estimates of chronic hepatitis B diagnosis, monitoring and treatment by Medicare Local, 2012/13 – National Report***

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# EXECUTIVE SUMMARY

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## DIAGNOSIS

**All people living with chronic hepatitis B (CHB) need to be diagnosed, in order to facilitate effective care and prevention of adverse outcomes.**

**NATIONAL HEPATITIS B STRATEGY 2014-2017 TARGET: 80%**

*In 2013, 57% of people living with CHB had been diagnosed(1).*

- Based on notifiable disease surveillance data, almost 100,000 Australians have been diagnosed with CHB in the last fifteen years.
- The rate of CHB notification has remained steady at a national level in recent years, with around 6,000-7,000 people newly diagnosed each year.
- The rate of CHB notification varies significantly according to state and territory, being highest in the NT and lowest in Tasmania. Rates in NSW, VIC and ACT are higher than in SA, WA or QLD.
- More than half (53%) of all notifications were in people residing in just 10 Medicare Locals located in New South Wales, Victoria and Queensland: Inner West Sydney, South Eastern Sydney, South Western Sydney, Western Sydney, Inner East Melbourne, Inner North West Melbourne, Macedon Ranges and North Western Melbourne, South Eastern Melbourne, Greater Metro South Brisbane, and Metro North Brisbane.

## MONITORING

**All people living with CHB should receive a yearly HBV viral load test to monitor their infection and assess the need for treatment, if not currently receiving therapy.**

*In 2013, 9% of people living with CHB received an annual viral load test.*

- 19,000 HBV viral load tests were provided through the Medicare Benefits Schedule (MBS) in 2013.
- The number of viral load tests provided has been increasing by around 2,500-3,000 tests per year, however this is less than half the number of people newly diagnosed with CHB each year.
- The rate of viral load testing varies according to state and territory, being highest in the NT, and higher in VIC, NSW, and ACT than in QLD, SA, WA or TAS.
- Even in those Medicare Locals with the highest testing rates, the number of tests was less than one quarter of the number of people living with CHB in that Medicare Local.
- Two thirds of all viral load tests were provided to the residents of just 10 Medicare Locals located in New South Wales, Victoria and Queensland: Inner West Sydney, Northern Sydney, South Eastern Sydney, South Western Sydney, Western Sydney, Inner East Melbourne, Macedon Ranges and North Western Melbourne, Northern Melbourne, South Eastern Melbourne, and Greater Metro South Brisbane.

# TREATMENT

**It is estimated at least 15% of Australians living with CHB should be receiving antiviral treatment to prevent adverse outcomes.**

## **NATIONAL HEPATITIS B STRATEGY 2014-2017 TARGET: 15%**

*In 2013, 5% of people living with CHB were receiving treatment\*.*

- 11,527 people were receiving antiviral treatment through the Pharmaceutical Benefits Scheme (PBS) for CHB in 2013, representing 5.3% of the total estimated to be living with CHB as of 2011.
- An additional 21,000 people need to be initiated on CHB therapy in order to meet the National Strategy target.
- Treatment uptake was highest in NSW (7.6%); VIC (5.8%) and ACT (4.6%) were similar to the national average; and WA (3.0%), SA (2.9%), QLD (2.6%), NT (2.4%) and TAS (1.1%) were lower than the national average.
- Two-thirds of all prescriptions for CHB treatment were provided in just 10 Medicare Locals: Inner West Sydney, Northern Sydney, South Eastern Sydney, South Western Sydney, Western Sydney, Inner East Melbourne, Macedon Ranges and North Western Melbourne, Northern Melbourne, South Eastern Melbourne, and Greater Metro South Brisbane\*

\*Only counts medication supplied through a PBS script..

# ACCESS TO CARE

**All Australians living with CHB should be receiving ongoing care, incorporating either yearly off-treatment monitoring (including a viral load test) or antiviral treatment.**

*In 2013, 14% of people living with CHB were receiving ongoing care for their condition (treatment or off-treatment monitoring).*

- 30,700 people received either antiviral treatment (11,500 people) or a yearly viral load test (19,200 people) in 2013, representing 14.0% of the total population estimated to be living with CHB in 2011.
- Uptake of care was highest in VIC (19.0%), NSW (18.5%), and NT (16.0%); similar to the national average in ACT (13.7%); and considerably lower than the national average in QLD (6.9%), WA (5.8%), SA (4.4%) and TAS (2.7%).
- Due to the geographic clustering of people living with CHB, many Medicare Locals with relatively high uptake of care also have the highest number of people currently not receiving guideline-based care.

# IMMUNISATION

**All infants are recommended to complete the hepatitis B immunisation schedule before 1 year of age, in accordance with the National Immunisation Program.**

**NATIONAL HEPATITIS B STRATEGY 2014-2017 TARGET: 95%**

*In 2012-13, 91.2% of infants received vaccination according to the recommended schedule.*

- This proportion decreased from 2011-12, when 91.8% of children were fully vaccinated.
- The proportion of children fully immunised varied according to state and territory, with rates highest in the ACT; above the national average in TAS, QLD, VIC and NT; similar to the national average in SA; and lowest in NSW and WA.
- The three Medicare Locals with the lowest immunisation coverage (North Coast NSW, Far West NSW, and Eastern Sydney), and the two Medicare Locals with the highest numbers of unvaccinated children (Western Sydney and South Western Sydney), were all located in NSW.

# HEPATOCELLULAR CARCINOMA

**Mortality from hepatocellular carcinoma (HCC) due to CHB is increasing in Australia, however appropriate management including antiviral therapy can prevent many of these deaths.**

*Some areas of Australia have a disproportionate burden of HCC relative to state and national averages.*

- In NSW, Medicare Locals with the highest HCC incidence were Inner West Sydney, South Western Sydney, and Southern NSW.
- In VIC, the Medicare Locals of Inner North West Melbourne, Inner East Melbourne, and Northern Melbourne had the highest HCC incidence.
- In QLD, the Medicare Locals with the highest incidence of HCC were Far North Queensland, West Moreton-Oxley, Greater Metro South Brisbane, and Central and North West Queensland.
- In WA, Perth Central & East Metro, Fremantle, and Goldfields-Midwest had the highest rates of HCC.
- In South Australia, the highest HCC incidence rate was observed in the Central Adelaide and Hills Medicare Local.

# DEATHS DUE TO HEPATITIS B

**Without access to appropriate care, around 15-25% of people living with CHB will die from their condition, and deaths due to hepatitis B in Australia are increasing.**

- In 2014, an estimated 396 Australians died due to hepatitis B (plausible range 304-644 deaths).

### Heat map key:

#### BURDEN OF CHRONIC HEPATITIS B



Higher

Lower

#### TREATMENT AND MONITORING UPTAKE



Lower

Higher

Figure 1: Heat Map of CHB burden and access to care, in order of CHB prevalence

STATE	MEDICARE LOCAL	PREVALENCE RANK	NOTIFICATIONS RANK	VIRAL LOAD TESTING RANK	TREATMENT UPTAKE RANK
NT	NORTHERN TERRITORY	1	1	5	31
NSW	INNER WEST SYDNEY	2	2	6	5
NSW	SOUTH WESTERN SYDNEY	3	3	3	1
NSW	WESTERN SYDNEY	4	5	8	3
WA	KIMBERLEY-PILBARA	5	4	-	59
VIC	SOUTH EASTERN MELBOURNE	6	9	2	7
VIC	INNER EAST MELBOURNE	7	10	4	6
VIC	MACEDON RANGES & NORTH WEST MELB.	8	7	1	8
NSW	NORTHERN SYDNEY	9	12	7	2
VIC	INNER NORTH WEST MELBOURNE	10	11	12	14
NSW	SOUTH EASTERN SYDNEY	11	13	9	4
NSW	EASTERN SYDNEY	12	8	13	13
QLD	CENTRAL AND NORTH WEST QLD	13	29	-	-
WA	BENTLEY ARMADALE	14	20	20	25
QLD	FAR NORTH QUEENSLAND	15	14	21	36
VIC	SOUTH WESTERN MELBOURNE	16	15	10	11
NSW	FAR WEST NSW	17	6	-	-
VIC	NORTHERN MELBOURNE	18	16	11	9
SA	CENTRAL ADELAIDE AND HILLS	19	17	34	17
QLD	GREATER METRO SOUTH BRISBANE	20	19	19	21
SA	NORTHERN ADELAIDE	21	24	36	23
WA	PERTH NORTH METRO	22	23	23	22
VIC	BAYSIDE	23	21	18	18
QLD	WEST MORETON-OXLEY	24	27	17	15
ACT	AUSTRALIAN CAPITAL TERRITORY	25	28	15	16
WA	PERTH CENTRAL EAST METRO	26	26	27	20
WA	GOLDFIELDS-MIDWEST	27	22	-	56
NSW	SYDNEY NORTH SHORE AND BEACHES	28	18	16	10
WA	FREMANTLE	29	32	24	19
VIC	LOWER MURRAY	30	30	-	34
NSW	NEW ENGLAND	31	35	-	50
VIC	EASTERN MELBOURNE	32	31	14	12
NSW	WESTERN NSW	33	44	-	54
QLD	METRO NORTH BRISBANE	34	25	32	33
QLD	TOWNSVILLE-MACKAY	35	38	37	45
NSW	ILLAWARRA-SHOALHAVEN	36	36	30	26
QLD	GOLD COAST	37	34	29	29
NSW	NEPEAN-BLUE MOUNTAINS	38	33	33	27
QLD	CENTRAL QUEENSLAND	39	51	-	55

STATE	MEDICARE LOCAL	PREVALENCE RANK	NOTIFICATIONS RANK	VIRAL LOAD TESTING RANK	TREATMENT UPTAKE RANK
QLD	DARLING DOWNS-SOUTH WEST QUEENSLAND	40	41	-	52
NSW	MURRUMBIDGEE	41	37	-	43
VIC	GOULBURN VALLEY	42	45	-	39
SA	SOUTHERN ADELAIDE-FLEURIEU	43	43	-	35
TAS	TOTAL TASMANIA	44	48	39	49
WA	PERTH SOUTH COASTAL	45	53	-	41
WA	SOUTH WEST WA	46	56	-	51
SA	COUNTRY NORTH SA	47	49	-	57
NSW	NORTH COAST NSW	48	47	35	47
NSW	SOUTHERN NSW	49	40	-	28
NSW	HUNTER	50	46	-	42
SA	COUNTRY SOUTH SA	51	55	-	53
QLD	WIDE BAY	52	58	-	48
NSW	CENTRAL COAST NSW	53	39	28	32
VIC	FRANKSTON-MORNINGTON PENINSULA	54	42	22	24
VIC	BARWON	55	50	26	44
QLD	SUNSHINE COAST	56	57	38	38
VIC	GIPPSLAND	57	54	31	37
VIC	LODDON - MALLEE - MURRAY	58	52	25	30
VIC	HUME	59	59	-	40
VIC	GRAMPIANS	60	60	-	58
VIC	GREAT SOUTH COAST	61	61	-	46

Figure 2: Heat Map of CHB burden and access to care, in order of State and Territory

STATE	MEDICARE LOCAL	PREVALENCE (%)	NOTIFICATION RATE	VIRAL LOAD TESTING RATE	TREATMENT UPTAKE (%)
ACT	AUSTRALIAN CAPITAL TERRITORY	1.01%	20.5	92.7	4.6%
NSW	CENTRAL COAST NSW	0.66%	11	28.8	2.3%
	EASTERN SYDNEY	1.25%	54.6	103.2	5.2%
	FAR WEST NSW	1.12%	66.4	-	-
	HUNTER	0.67%	8.8	-	1.4%
	ILLAWARRA-SHOALHAVEN	0.77%	14	26.6	3.0%
	INNER WEST SYDNEY	1.67%	87.7	226.4	8.3%
	MURRUMBIDGEE	0.72%	12.8	-	1.4%
	NEPEAN-BLUE MOUNTAINS	0.76%	16.1	21.1	2.8%
	NEW ENGLAND	0.82%	14.3	-	1.0%
	NORTH COAST NSW	0.68%	8.7	18.8	1.2%
	NORTHERN SYDNEY	1.35%	46.5	216.4	10.7%
	SOUTH EASTERN SYDNEY	1.30%	45.3	187.6	9.8%
	SOUTH WESTERN SYDNEY	1.61%	83.7	283.2	13.0%
	SOUTHERN NSW	0.67%	10.4	-	2.5%
	SYDNEY NORTH SHORE AND BEACHES	0.94%	29	85.3	6.0%
	WESTERN NSW	0.80%	9.7	-	0.8%
	WESTERN SYDNEY	1.56%	67.1	188.2	10.1%



STATE	MEDICARE LOCAL	PREVALENCE (%)	NOTIFICATION RATE	VIRAL LOAD TESTING RATE	TREATMENT UPTAKE (%)
NT	NORTHERN TERRITORY	1.68%	90.1	233.1	2.4%
QLD	CENTRAL AND NORTH WEST QLD	1.24%	18.8	-	-
	CENTRAL QUEENSLAND	0.75%	8.2	-	0.8%
	DARLING DOWNS-SOUTH WEST QUEENSLAND	0.73%	10.4	-	0.9%
	FAR NORTH QUEENSLAND	1.20%	38.7	38	1.8%
	GOLD COAST	0.76%	15.8	28.4	2.5%
	GREATER METRO SOUTH BRISBANE	1.06%	27.6	73.3	4.2%
	METRO NORTH BRISBANE	0.79%	24.1	24.4	2.3%
	SUNSHINE COAST	0.61%	6.7	13	1.6%
	TOWNSVILLE-MACKAY	0.79%	12	14.6	1.3%
	WEST MORETON-OXLEY	1.01%	22.8	83.5	4.7%
	WIDE BAY	0.66%	6.5	-	1.1%
SA	CENTRAL ADELAIDE AND HILLS	1.09%	29.3	19.9	4.3%
	COUNTRY NORTH SA	0.68%	8.4	-	0.7%
	COUNTRY SOUTH SA	0.67%	7.3	-	0.9%
	NORTHERN ADELAIDE	1.04%	25	17.5	3.8%
	SOUTHERN ADELAIDE-FLEURIEU	0.71%	9.9	-	1.9%
TAS	TOTAL TASMANIA	0.71%	8.5	11.9	1.1%
VIC	BARWON	0.63%	8.4	30.6	1.4%
	BAYSIDE	1.01%	26.2	74.5	4.3%
	EASTERN MELBOURNE	0.81%	17.3	94.3	5.4%
	FRANKSTON-MORNINGTON PENINSULA	0.65%	10.3	36.2	3.8%
	GIPPSLAND	0.60%	7.7	25	1.8%
	GOULBURN VALLEY	0.71%	9.3	-	1.6%
	GRAMPIANS	0.56%	5.2	-	0.7%
	GREAT SOUTH COAST	0.54%	3.8	-	1.3%
	HUME	0.58%	5.8	-	1.6%
	INNER EAST MELBOURNE	1.51%	52.9	249.2	8.3%
	INNER NORTH WEST MELBOURNE	1.34%	51.2	138.2	5.1%
	LODDON - MALLEE - MURRAY	0.58%	8.2	31.9	2.5%
	LOWER MURRAY	0.86%	18.1	-	2.3%
	MACEDON RANGES & NORTH WEST MELB.	1.48%	64.2	333.1	8.1%
	NORTHERN MELBOURNE	1.10%	34	155.4	6.2%
	SOUTH EASTERN MELBOURNE	1.54%	53.3	285	8.3%
	SOUTH WESTERN MELBOURNE	1.14%	37.9	160.9	5.5%
WA	BENTLEY ARMADALE	1.21%	26.9	38.9	3.3%
	FREMANTLE	0.92%	16.7	32	4.3%
	GOLDFIELDS-MIDWEST	0.96%	26	-	0.8%
	KIMBERLEY-PILBARA	1.56%	67.7	-	0.6%
	PERTH CENTRAL EAST METRO	0.99%	23.6	29.6	4.3%
	PERTH NORTH METRO	1.02%	25.3	34.3	4.1%
	PERTH SOUTH COASTAL	0.70%	7.8	-	1.5%
	SOUTH WEST WA	0.69%	7.0	-	1.0%

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# INTRODUCTION

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## MEASURING PROGRESS TOWARDS IMPROVED ACCESS TO DIAGNOSIS, TREATMENT AND CARE FOR PEOPLE LIVING WITH CHRONIC HEPATITIS B

The burden of hepatitis B in Australia is substantial, with an estimated 218,000 people living with chronic hepatitis B (CHB) in 2011(2). It is estimated that without appropriate management and treatment, up to a quarter of people living with CHB will develop advanced liver disease and/or liver cancer(3); however, there is now considerable evidence that appropriate monitoring and treatment profoundly reduces this risk (4). Interventions necessarily rely on individuals being offered testing, made aware of their infection, and linked to appropriate health care, however, there are gaps in the knowledge of both affected communities and the health workforce that impede the delivery of appropriate care(5).

Australia's Second National Hepatitis B Strategy sets a target of 15% of people living with CHB receiving antiviral therapy. Achievement of this target would represent a large increase in the current estimated uptake. In order to accurately assess progress towards achieving this target, it is necessary to report on the proportion of people estimated to be living with CHB receiving treatment by local area, state/territory, and nationally, which is the goal of this report.

Uptake of treatment is not in itself the objective of the National Strategy, but a means to achieving a significant and sustained reduction in mortality attributable to advanced liver disease and liver cancer. By including data on the local incidence of liver cancer, of which hepatitis B is a significant contributor, areas with the greatest burden of the adverse outcomes of CHB can be targeted for more urgent interventions across the spectrum of care.

This report builds on the findings of the First National Report of the ASHM/VIDRL Hepatitis B Mapping Project – available at [ashm.org.au/hepatitis-b/mapping](http://ashm.org.au/hepatitis-b/mapping) - which presented estimates of the number of people living with CHB, derived using modeled estimates of prevalence in Australia's priority populations(6). For the first time, the initial report highlighted areas of the country to be prioritised for programmatic responses to address the increasing burden of adverse health outcomes attributable to hepatitis B. The second national report utilises national datasets to indicate the current level of diagnosis, monitoring and treatment, as well as vaccination and outcomes of infection, providing a benchmark against which progress in achieving these priorities can be assessed at the national, jurisdictional, and local levels. The indicators applied to demonstrate this are prevalence, treatment uptake and two new indicators: notifications and annual viral load tests.

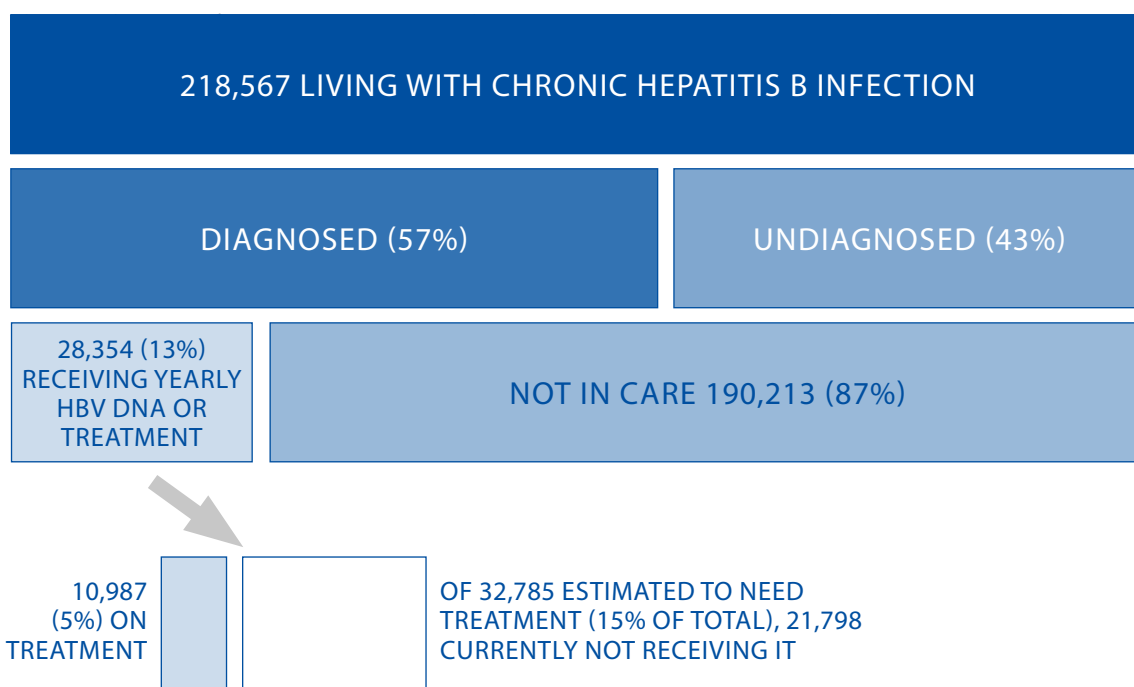
Having an inflated estimate of the number of people living with chronic hepatitis B will result in erroneously low estimated proportions of people having been diagnosed and receiving monitoring and treatment. For example, it is likely that the estimated number of people living with chronic hepatitis B in Tasmania is disproportionately high. This relates to differences in population structure relative to other jurisdictions, including countries of birth, and proportion of Aboriginal and Torres Strait Islander people in the population. Discussions regarding the development of more accurate estimates in partnership with the Tasmanian Department of Health and Human Services are underway.

Notifications of unspecified hepatitis B (in this report assumed to be CHB) are a function of access to testing for people living with CHB. They can also be used to derive the number of people living with undiagnosed CHB in a given area, with a higher notification rate representing a greater number of people who have tested positive relative to the total population.

The number of annual viral load tests conducted is indicative of the level of clinical engagement of the population living with CHB who are not on treatment. Current recommendations are that all people living with CHB have a HBV viral load assay (HBV DNA test) at least annually(7), and this frequency of testing is funded by the Medicare Benefits Schedule for all people living with CHB. For those on treatment, who are eligible for up to four tests per year, a different item number is used. Thus the annual HBV viral load item can be used as a surrogate indicator of a person living with CHB who is not receiving antiviral therapy, receiving guideline based care.

## THE CASCADE OF CARE FOR CHRONIC HEPATITIS B

Considering all of the above indicators at a national level - including prevalence estimates, notifications, viral load testing, and treatment uptake, combined with mathematical modelling - allows for an estimation of the gaps in CHB diagnosis and care delivery in Australia; this is referred to as a cascade of care. This research has identified that of all people living with CHB in Australia, only 57% have been diagnosed; 13% are receiving adequate guideline based care; and 5.3% of all people living with CHB are receiving antiviral therapy(1).



Medicare Local, allowing identification of the priority areas for improving access to HBV monitoring and treatment. The notifications data presented here also indicate areas where the rate of diagnosis of CHB is lower than would be expected in a high prevalence area, a potential indicator of low diagnosis.

## FUTURE DIRECTIONS FOR THE MEDICARE LOCAL MAPPING PROJECT

In 2014, the transition from Medicare Locals to Public Health Networks (PHNs) was announced by the Australian Government Department of Health. As the data presented here were sourced and collected during the period 2013-2014, they relate solely to Medicare Local geographic boundaries and, in the case of notifications data, Local Government Area divisions. In future iterations of the Medicare Locals Mapping Project, and with the finalisation of the boundaries of the newly established PHNs, the data presented here will be obtained at the level of these new divisions. Due to the larger size of the PHNs (approximately 30 compared to 61 Medicare Locals), data will be sought by smaller geographic areas, such as Local Government Area or Statistical Area, in order to provide the most useful indicators for a given local region.

# DIAGNOSIS

Successful notification of CHB is reliant on a series of events including an individual attending a health service, being offered screening, testing positive, and having their positive test result provided to the relevant health department. The number of notifications in a given area is therefore dependent on an environment that enables the successful completion of each of these steps. The areas that have been identified with high notification rates will generally represent areas of high prevalence of chronic hepatitis B, and can be targeted as areas where a large number of people are known to be living with diagnosed CHB infection. Those areas with an estimated higher prevalence (identified in the First National hepatitis B mapping report) are generally reflected among those with higher notification rates. An area with estimated high prevalence but low notifications may represent an area where proportionally more people are living with undiagnosed chronic hepatitis B infection.

The notification rates represent the number of CHB diagnoses that have been reported to their respective jurisdictional departments of health, organised according to area of residence. These notifications are generally classified as 'unspecified' cases for surveillance purposes, but are hereafter referred to as chronic. Although data according to state and territory were available for 2013 and have been included here, the average notification rate used was for the period 1998-2012, to maintain consistency with the period available according to LGA and Medicare Local.

## CHB NOTIFICATIONS ACCORDING TO STATE AND TERRITORY

**Table 1: Number of notifications for chronic hepatitis B in Australia according to state and territory and year, 1998-2013 (2005-2013 in NT)**

YEAR	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	AUSTRALIA
1998	82	2,861	-	843	529	28	1,928	187	6,458
1999	65	3,512	-	788	246	26	1,777	374	6,788
2000	48	3,552	-	852	262	35	1,695	751	7,195
2001	54	4,065	-	731	298	19	1,767	599	7,533
2002	82	3,247	-	717	258	30	1,743	363	6,440
2003	57	2,659	-	733	218	54	1,599	389	5,709
2004	50	2,742	-	742	289	42	1,492	386	5,743
2005	88	2,575	200	885	355	49	1,659	373	6,184
2006	71	2,386	236	943	312	44	1,567	544	6,103
2007	55	2,531	235	939	489	32	1,856	569	6,706
2008	57	2,250	185	866	434	52	1,852	686	6,382
2009	101	2,777	157	1,001	440	70	1,919	665	7,130
2010	92	2,569	158	1,057	407	49	1,889	743	6,964
2011	93	2,474	163	828	422	37	1,917	630	6,564
2012	104	2,291	193	820	391	61	1,855	808	6,523
<b>TOTAL, 1998-2012</b>	<b>1,099</b>	<b>42,491</b>	<b>1,527</b>	<b>12,745</b>	<b>5,350</b>	<b>628</b>	<b>26,515</b>	<b>8,067</b>	<b>98,422</b>
<b>2013</b>	<b>107</b>	<b>2,499</b>	<b>326</b>	<b>902</b>	<b>286</b>	<b>35</b>	<b>1,844</b>	<b>944</b>	<b>6,943</b>

(Data source: National Notifiable Diseases Surveillance System. 2013 data extracted January 2015.)

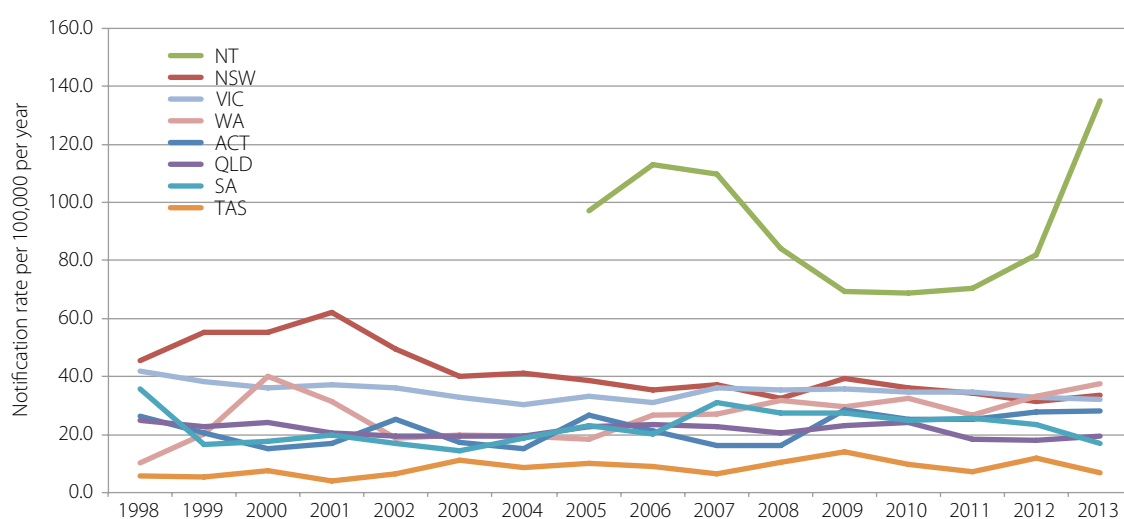
Table 2: Rate of notifications for chronic hepatitis B in Australia according to state and territory and year, 1998-2013 (2005-2013 in NT)

YEAR	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	AUSTRALIA
1998	26.3	45.4	-	24.8	35.7	5.9	41.8	10.2	34.7
1999	20.7	55.1	-	22.8	16.5	5.5	38.2	20.2	36.1
2000	15.1	55.1	-	24.3	17.5	7.4	36.0	40.0	37.8
2001	16.8	62.2	-	20.5	19.8	4.0	37.1	31.4	39.1
2002	25.3	49.3	-	19.6	17.1	6.3	36.2	18.8	33.0
2003	17.4	40.2	-	19.6	14.3	11.3	32.8	19.9	28.9
2004	15.2	41.2	-	19.4	18.9	8.7	30.3	19.5	28.8
2005	26.6	38.5	97.1	22.6	23.1	10.1	33.3	18.5	30.6
2006	21.2	35.4	112.9	23.5	20.1	9.0	31.0	26.5	29.8
2007	16.1	37.0	109.9	22.8	31.1	6.5	36.0	27.0	32.2
2008	16.4	32.4	84.1	20.5	27.3	10.4	35.2	31.6	30.0
2009	28.5	39.4	69.5	23.1	27.3	13.9	35.7	29.7	32.9
2010	25.4	36.0	68.8	24.0	25.0	9.6	34.6	32.4	31.6
2011	25.3	34.3	70.5	18.5	25.7	7.2	34.6	26.8	29.4
2012	27.7	31.4	81.8	18.0	23.6	11.9	32.9	33.1	28.7
<b>AVERAGE RATE, 1998-2012</b>	<b>21.7</b>	<b>41.9</b>	<b>48.2</b>	<b>21.5</b>	<b>22.9</b>	<b>8.6</b>	<b>35.0</b>	<b>26.0</b>	<b>32.1</b>
<b>2013</b>	<b>28.0</b>	<b>33.7</b>	<b>135.2</b>	<b>19.4</b>	<b>17.1</b>	<b>6.8</b>	<b>32.1</b>	<b>37.5</b>	<b>30.0</b>

(Data source: National Notifiable Diseases Surveillance System. 2013 data extracted January 2015. Population figures from Australian Bureau of Statistics Estimated Resident Population by state/territory and year.)

## TRENDS IN CHB DIAGNOSIS ACCORDING TO STATE AND TERRITORY, 1998-2013

Figure 3: Rate of notifications for chronic hepatitis B in Australia according to state and territory and year, 1998-2013



(Data source: National Notifiable Diseases Surveillance System. Population figures from Australian Bureau of Statistics Estimated Resident Population by state/territory and year.)

Between 1998 and 2013 more than 100,000 notifications of CHB were reported to the National Notifiable Diseases Surveillance System (NNDSS) in Australia. The number of people notified at a national level during this period has remained relatively stable at between 5,700 and 7,100 notifications per year, a rate of between 28 and 39 per 100,000 people per year. The rate of notification varied substantially between jurisdictions, with the highest consistently occurring in the Northern Territory, at more than triple the national rate. Other states with a higher than average notification rate during the period were New South Wales and Victoria; this correlates with the findings presented in the First National Mapping Report, which identified the Northern Territory, New South Wales, and Victoria as having the highest prevalence of people living with CHB of Australia's states and territories.

Trends over time also differ according to state and territory. In the Northern Territory, initially high rates after notifications commenced in 2005 subsequently declined, but have risen again since 2010, and reached their highest year on record in 2013. Western Australia experienced a large peak in notifications in 2000, and rates appear to be gradually increasing since 2005, being higher in 2013 than in any year since 2000. Notification rates in New South Wales peaked in 2001 and have been slowly declining since, however a small increase was seen in 2013 compared to 2012. Rates in the Australian Capital Territory have fluctuated more widely, reflecting the low population in this jurisdiction; however, remained at a similar level in 2013 as they were in 1998. Queensland, South Australia, Tasmania and Victoria have all experienced relatively stable notification rates over the fifteen-year period.

## CHB DIAGNOSIS ACCORDING TO MEDICARE LOCAL, 1998-2012

### AUSTRALIAN CAPITAL TERRITORY

In the Australian Capital Territory, 1,099 notifications were reported between 1998-2012, with an average rate of 21.7 per 100,000 people per year.

*The Australian Capital Territory comprises a single Medicare Local and is not separated into LGAs.*

### NEW SOUTH WALES

The average rate of notifications in New South Wales from 1998-2012 was 41.6 per 100,000 persons, and the total number of notifications reported over the period was 42,491. Of the State's 18 Medicare Locals, seven had notification rates above the state average, and three Medicare Locals alone accounted for 60% of all notifications: South Western Sydney, Western Sydney, and Inner West Sydney. The notification rate in both South Western Sydney (83.7) and Inner West Sydney (87.7) was twice the New South Wales average, while in Western Sydney (67.1) the rate was 60% above the state average. Other Medicare Locals with higher notification rates during the period included Far West NSW (66.4), Eastern Sydney (54.6), Northern Sydney (46.5), and South Eastern Sydney (45.3). All of these Medicare Locals with a high rate of notifications were identified as having a high prevalence of CHB by census-based methods in the First National Mapping Report.

### NORTHERN TERRITORY

1,527 notifications were reported in the Northern Territory between 1998-2013, with an average rate of 90.4 per 100,000 people per year. This notification rate was the highest in Australia, at nearly three times the national average.

*Northern Territory comprises a single Medicare Local and data by LGA were not provided for this jurisdiction.*



## QUEENSLAND

12,745 notifications were reported in Queensland between 1998 and 2012, with an average rate of 21.5 per 100,000 people per year. Nearly half (45.5%) were residents of the LGA of Brisbane, which is split between three metropolitan Medicare Locals and is home to one quarter of the state's population. Of Queensland's eleven Medicare Locals, four had a notification rate above the state average of 21.6 per 100,000 per year: the three metropolitan Brisbane Medicare Locals (Greater Metro South, 27.6; Metro North, 24.1; and West Moreton-Oxley, 22.8), and Far North Queensland (38.7). The Medicare Local with the highest notification rate of any in the state was Far North Queensland, where it was nearly twice the state average. The notification rate was particularly high in the LGAs that incorporate the Torres Strait Islands; more than 14 times the state average in Torres Strait Island (284.9) and Torres (272.0), and more than nine times average in Northern Peninsula Area (182.6). The Far North Queensland and Greater Metro South Brisbane Medicare Locals were estimated to have high prevalence in the First National Report; however the one other Medicare Local with an estimated higher prevalence, Central and North West Queensland, had a notification rate similar to the state average, potentially indicating a lower level of diagnosis.

## SOUTH AUSTRALIA

5,350 notifications were reported in South Australia between 1998-2012, with an average rate of 22.3 per 100,000 people per year. Two of South Australia's five Medicare Locals had notification rates above the state average - the metropolitan Adelaide areas of Central Adelaide & Hills (29.3) and Northern Adelaide (25.0), which were also identified as having a higher prevalence in the First National Report. Within these Medicare Locals the LGAs of Adelaide (54.3), Port Adelaide-Enfield (47.3), and Charles Sturt (39.1) had notably higher rates, being around double the state average. It is noteworthy that two remote LGAs in Country North SA, while not in a high burden Medicare Local, had very high rates of CHB notifications: Anangu Pitjantjatjara (124.3) and Coober Pedy (133.8), with rates more than 5 times the state average. Although these LGAs were identified as having higher CHB prevalence in the First National Report, the relatively very high rate of notifications may be indicative of an underestimation of actual prevalence, high testing rates, or a combination of these factors.

## TASMANIA

Tasmania consists of a single Medicare Local, and the average number of notifications was 8.6 per 100,000 people per year, with a total of 35 notifications during the period. The LGAs in Tasmania with notification rates higher than the state average were Hobart, where the notification rate was approximately triple the state average (26.3), and Glenorchy (16.4), where the rate was double the state average. These two LGAs combined comprise nearly half of all notifications in Tasmania during the time period.

## VICTORIA

26,515 notifications were reported in Victoria between 1998-2012, with an average rate of 35.0 per 100,000 people per year. Of Victoria's 17 Medicare Locals, five had above average rates of CHB notification, all of which are located in metropolitan Melbourne and have been identified as having a high prevalence(6): Inner East Melbourne (52.9), Inner North West Melbourne (51.2), Macedon Ranges & North Western Melbourne (64.2), South Eastern Melbourne (53.5), and South Western Melbourne (37.9). These five Medicare Locals combined represent two thirds of all notifications in Victoria during this period. Within these Medicare Locals, LGAs with particularly high notification rates (more than triple the state average) included Maribyrnong (105.1) and Brimbank (94.9) in Macedon Ranges & North Western Melbourne; and Greater Dandenong (131.4) in the South Eastern Melbourne Medicare Local.

## WESTERN AUSTRALIA

8,067 notifications were reported in Western Australia between 1998-2012, with an average rate of 26.0 per 100,000 people per year. The highest notification rate in Western Australia occurred in the Kimberley-Pilbara Medicare Local (67.7), where rates were more than double the state's average. This high notification rate was driven by a number of LGAs in this area with very high notification rates, most notably Derby-West Kimberley (156.4, nearly six times the state average), and Port Hedland (142.2), and Halls Creek (128.8). The other Medicare Local with a notification rate above the state average was Bentley-Armadale (26.9) in metropolitan Perth. The Goldfields-Midwest Medicare Local had average notification rates overall, however it includes the LGAs of Mullewa (131.5) and Ngaanyatjaraku (151.7), which have notification rates 5 to 6 times higher than the Western Australian average.

# MONITORING

HBV viral load testing was made available on the Medicare Benefits Schedule (MBS) in July 2008, and since the beginning of 2009 just over 70,000 services have been provided. In this analysis, this MBS item is used as a surrogate for guideline-based monitoring of people living with CHB who are not receiving treatment, as viral load monitoring is recommended at least annually. As some individuals will be receiving antiviral therapy, their monitoring viral load tests will be covered by a different MBS item not included here; for this reason, the combined indicator of access to care (incorporating people either in monitoring or treatment) is covered in a section below.

## CHB MONITORING ACCORDING TO STATE AND TERRITORY

**Table 3: Number of viral load tests conducted in people living with CHB and not receiving treatment (funded for one service per person per year), according to state and territory, 2008-2013**

Year#	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	AUSTRALIA
2009	49	5,270	3	1,001	94	17	2,782	48	9,264
2010	67	5,260	59	993	82	33	4,954	285	11,733
2011	184	7,024	65	1,128	115	46	5,598	319	14,479
2012	265	7,782	336	1,412	141	47	6,856	528	17,367
2013	345	8,378	492	1,527	222	55	7,454	614	19,087
<b>Total</b>	<b>910</b>	<b>33,714</b>	<b>955</b>	<b>6,061</b>	<b>654</b>	<b>198</b>	<b>27,644</b>	<b>1,794</b>	<b>71,930</b>

(Data source: Department of Human Services service utilisation data for MBS item no 69482.)

#Note data use different time period and methodology to Tables 10 and 11.

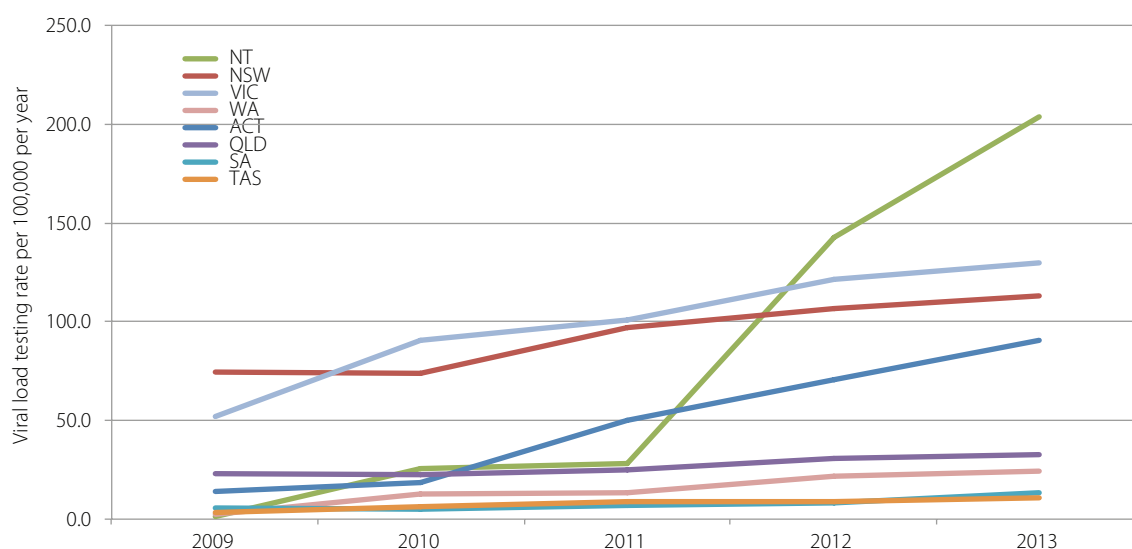
**Table 4: Rate of viral load tests conducted per 100,000 people per year, in people living with CHB and not receiving treatment (funded for one service per person per year), according to state and territory, 2008-2013**

Year#	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	AUSTRALIA
2009	13.8	74.7	1.3	23.1	5.8	3.4	51.8	2.1	42.7
2010	18.5	73.6	25.7	22.5	5.0	6.5	90.7	12.4	53.3
2011	50.0	97.3	28.1	25.2	7.0	9.0	101.1	13.6	64.8
2012	70.6	106.5	142.4	30.9	8.5	9.2	121.7	21.7	76.4
2013	90.4	113.1	204.0	32.8	13.3	10.7	129.9	24.4	82.5

(Data source: Department of Human Services service utilisation data for MBS item no 69482. Population figures from Australian Bureau of Statistics Census 2011.)

#Note data use different time period and methodology to Tables 10 and 11.

**Figure 4: Rate of viral load testing according to state and territory and year, 2009-2013**



(Data source: Department of Human Services service utilisation data for MBS item no 69482. Population figures from Australian Bureau of Statistics Census 2011.)

In 2013, just over 19,000 individuals living with CHB received a test for HBV viral load through Medicare. This represents less than one tenth of the total number estimated to be living with CHB in 2011. Even taking account of the number of people receiving antiviral therapy whose viral load testing is not included in these data, the vast majority of people living with CHB did not receive a viral load test to monitor their infection in accordance with guidelines, and were therefore not evaluated as to their potential need for treatment.

The number of people being tested has increased steadily over time, with between 1,500 and 3,000 additional tests being conducted each year between 2009 and 2013. This increase represents less than half the number newly diagnosed, with 6,000-7,000 new notifications recorded each year, all of whom should have received a viral load test to assess the stage of their infection.

As with notifications, the trends in testing over time vary substantially across jurisdictions. The most substantial increase has occurred in the Northern Territory, with the rate of annual viral load tests rebated by the MBS per 100,000 people quadrupling between 2011 and 2012, and doubling again in 2013, so that the Northern Territory had the highest rates of viral load testing (per total population) in Australia. The rate of testing has risen, in all jurisdictions, however rates were substantially higher in 2013 in Victoria, New South Wales, and the Australian Capital Territory than in Queensland, Western Australia, South Australia and Tasmania.

## AUSTRALIAN CAPITAL TERRITORY

The rate of viral load testing in the Australian Capital Territory in 2013 was very similar to the national average, at 90.4 per 100,000 people per year. The total number of people receiving a viral load test in the Australian Capital Territory represents less than 10% of the total number estimated to be living with CHB.

## NEW SOUTH WALES

The rate of viral load testing in New South Wales in 2013 was 113.1 per 100,000 people, however, this varied considerably according to Medicare Local, with rural and regional Medicare Locals generally having much lower rates than those in metropolitan Sydney. Those Medicare Locals with the highest viral load testing rates included Inner West Sydney, South Western Sydney, and Western Sydney. These three Medicare Locals together comprised more than 60% of the total number of tests conducted in

the state in 2013. The Eastern Sydney and Sydney North Shore Medicare Locals had testing rates below the state average, and those Medicare Locals in rural and regional areas (Central Coast, Illawarra-Shoalhaven, Hunter, Nepean-Blue Mountains, and North Coast NSW) all had similarly low rates, at between 15-30 tests per 100,000 people in 2013.

Despite areas with higher testing, overall less than 20% of people estimated to be living with CHB in NSW were receiving regular monitoring in any Medicare Local.

## NORTHERN TERRITORY

The rate of viral load testing in the Northern Territory was the highest of any jurisdiction in 2013, at 204.0 tests per 100,000 people. When compared to the number of people estimated to be living with CHB in the Northern Territory however, this represents less than 15% of those estimated to be affected who were receiving regular monitoring.

## QUEENSLAND

The viral load testing rate in Queensland in 2013 was 32.8 per 100,000 per year. The rate of testing was highest in the metropolitan Brisbane Medicare Locals of Greater Metro South Brisbane and West Moreton-Oxley, which together comprised around 60% of all tests performed in the state in 2013. Testing rates were also slightly above average in the Far North Queensland Medicare Local.

Even in those Brisbane Medicare Locals where testing rates were more than double the Queensland state average, the number of people tested represents less than 10% of the number estimated to be living with CHB.

## SOUTH AUSTRALIA

In 2013 in South Australia, the population rate of viral load testing was 13.3 per 100,00 per year. Two Medicare Locals, Central Adelaide and Hills and Northern Adelaide, made up three quarters of all CHB viral load testing performed in South Australia in 2013. The remaining three of the state's five Medicare Locals have viral load testing numbers below the threshold for data suppression (for details, see Methodological Notes, page 33), limiting comparison of rates within the state, although these numbers have been included in the state total.

Overall, with an estimated 14,400 South Australians living with CHB, the number of tests performed represents less than 2% of all those who require regular monitoring.

## TASMANIA

The rate of viral load testing in Tasmania in 2013 was the lowest of any state and territory in Australia, at 10.7 tests per 100,000 people. When compared to the approximately 3,500 Tasmanians living with CHB, this represents only 2.5% of affected people receiving monitoring.

## VICTORIA

The overall rate of viral load testing in Victoria was 129.9 per 100,000 people per year in 2013. The rate varied considerably according to Medicare Local, with the highest rates (around double the state average) observed in the Macedon Ranges & North Western Melbourne, South Eastern Melbourne, and Inner East Melbourne Medicare Locals. These three Medicare Locals had testing rates considerably higher than other metropolitan Medicare Locals, where viral load testing rates were similar to the state average (Northern Melbourne, South Western Melbourne, and Inner North West Melbourne). The rate of testing was similar within the rural and regional Victorian Medicare Locals where data are available, with rates varying from 25-35 tests per 100,000 people.

Even in those Victorian Medicare Locals with the highest rates of testing, the number of individuals receiving monitoring represents less than 25% of the total number of people estimated to be living with CHB.

## WESTERN AUSTRALIA

The overall rate of viral load testing in Western Australia in 2013 was 24.4 tests per 100,000 people per year. There was little geographic variation in testing rates within those Western Australian Medicare Locals which had data available, with between 29 and 38 tests per 100,000 being performed in 2013 in Bentley-Armadale, Fremantle, Perth Central & East Metro, and Perth North Metro (see Methodological Notes, page 33, for more detail on data suppression). These four Medicare Locals comprised around 85% of all viral load tests conducted in Western Australia in 2013.

The 612 individuals tested in Western Australia represent less than 3% of the estimated 22,000 people living with CHB in the state in 2011. Even in those Medicare Locals with slightly higher rates of testing, the proportion of the number living with CHB was still less than 5%.

# TREATMENT

Treatment for CHB has been available through the Pharmaceutical Benefits Scheme (PBS) since 1998, and is demonstrably effective in preventing outcomes such as cirrhosis, liver failure and death in people living with CHB in a variety of settings. As treatment is only required for people with CHB in particular phases of infection (based on the amount of virus and liver damage they have), only a minority of people in the population living with CHB will need treatment. The most conservative estimate is that 15% of people living with CHB should be accessing treatment at any given time, and this is reflected in the National Hepatitis B Strategy 2014-2017 treatment target. Because of the influence of factors such as age, sex, ethnicity and general health on the need for treatment, some geographic areas may have a demographic structure where a greater proportion of people with CHB than 15% require treatment; however, it is considered a minimal baseline for adequate access.

Treatment uptake is estimated here as the proportion of people living with CHB (as of 2011) who were prescribed a drug used to treat CHB during 2013, including direct acting antivirals (tenofovir, entecavir, adefovir, lamivudine, and telbivudine) and immunomodulatory agents (pegylated interferon). Although some of the drugs examined have multiple indications, this analysis excludes those people being prescribed antivirals for HIV infection.

As the number of people receiving antiviral treatment for CHB needs to increase rapidly to meet the national strategy target for uptake, examining trends in treatment numbers over time is a key aspect of this analysis. However, due to previous inconsistencies in reporting methodologies, the availability of robust data is limited to the most recent time period. The estimates of treatment uptake according to year, presented in Table 6, are derived from expenditure reports, and rely on assumptions regarding drug prescribing patterns. They also utilise the calendar year time period, rather than the June-November periodic estimates provided by Department of Human Services (presented in Tables 5 and 12).

## CHB TREATMENT UPTAKE ACCORDING TO STATE AND TERRITORY

**Table 5: Treatment uptake by State and Territory, 2013**

State or Territory	Population, 2011	Number of people living with CHB, 2011	Number receiving antiviral treatment, 2013	Proportion living with CHB receiving antiviral therapy (%)
AUSTRALIAN CAPITAL TERRITORY	357,219	3,603	164	4.6%
NEW SOUTH WALES	6,917,655	77,076	5,871	7.6%
NORTHERN TERRITORY	211,943	3,556	86	2.4%
QUEENSLAND	4,332,737	37,427	985	2.6%
SOUTH AUSTRALIA	1,596,570	14,442	416	2.9%
TASMANIA	495,352	3,513	38	1.1%
VICTORIA	5,354,042	56,836	3,303	5.8%
WESTERN AUSTRALIA	2,239,170	22,055	664	3.0%
<b>AUSTRALIA</b>	<b>21,507,719</b>	<b>218,567</b>	<b>11,527</b>	<b>5.3%</b>

(Data source: Department of Human Services.)

Totals may not add up due to inclusion of those without a State or Territory of residence.

Around 11,000 Australians received treatment for CHB in 2013, representing 5.3% of the total living with CHB in 2011, or one third of the number who require treatment to reach the national strategy target aimed at reducing adverse outcomes for those affected by CHB. Treatment uptake was highest in New

South Wales (7.6%) and Victoria (5.8%), and similar to the national average of 5.3% in the Australian Capital Territory (4.6%). The remaining states with lower treatment uptake all had levels of around 2-3%, with the exception of Tasmania, where treatment uptake was the lowest of any state or territory (1.1%). However, these treatment uptake figures are based on estimates of CHB prevalence, and any underestimation of the true burden would overestimate treatment uptake, or vice versa.

**Table 6: CHB treatment uptake over time by state and territory, 2011-2013**

State or Territory	HSD expenditure summary data		
	2011	2012	2013
AUSTRALIAN CAPITAL TERRITORY	132	152	166
NEW SOUTH WALES	4,895	5,844	5,491
NORTHERN TERRITORY	72	72	62
QUEENSLAND	804	941	1,022
SOUTH AUSTRALIA	365	419	506
TASMANIA	29	31	38
VICTORIA	2,813	2,979	3,192
WESTERN AUSTRALIA	528	549	594
<b>AUSTRALIA</b>	<b>9,638</b>	<b>10,987</b>	<b>11,071</b>

(Data source: Department of Human Services HSD Program Expenditure Reports. Note different time periods and data sources used to Table 5 above.) Totals may not add up due to inclusion of those without a State or Territory of residence.

The number of people receiving antiviral therapy in Australia has increased in recent years, however a larger increase occurred between 2011 and 2012 than in 2013. This difference was largely driven by what appeared to be a decline in the treatment numbers for NSW in 2013 compared to 2012. The only other state or territory in which a decline occurred was the Northern Territory, however the smaller population of the territory means that the change had a limited effect on national numbers.

Although treatment uptake has increased over time, the current rate of increase is insufficient to achieve a three-fold increase by 2017, in line with the national target and given the increasing population.

## CHB TREATMENT ACCORDING TO MEDICARE LOCAL

### AUSTRALIAN CAPITAL TERRITORY

Treatment uptake in the Australian Capital Territory in 2013 was similar to the national average, with 4.6% of people living with CHB estimated to be accessing treatment in 2013. In order to reach the national strategy target for treatment access of 15%, the number of people receiving antiviral therapy in the Australian Capital Territory would need to triple.

### NEW SOUTH WALES

Treatment uptake in New South Wales in 2013 was the highest of any state or territory in Australia, reaching 5,871 individuals living with CHB of the estimated 77,000 affected (7.6% uptake). The number of people receiving treatment in New South Wales would need to double in order to meet the National Strategy target of 15% of people living with CHB receiving treatment.

Those Medicare Locals with the highest treatment uptake are all located in metropolitan Sydney, with uptake greatest in South Western Sydney (13.0%), Northern Sydney (10.7%), Western Sydney (10.1%), South Eastern Sydney (9.8%) and Inner West Sydney (8.3%). These five Medicare Locals combined represent around 85% of all people with CHB receiving treatment in NSW, while representing 60% of those affected, demonstrating that treatment access is highly focused in metropolitan areas.



## NORTHERN TERRITORY

The proportion of people living with CHB in the Northern Territory who were accessing treatment in 2013 was among the lowest of all states and territories, at 2.4% - around half the national average figure for treatment uptake (5.3%). In order to meet the national strategy target of 15%, the number of people accessing therapy in the Northern Territory would need to increase six-fold from its current level.

## QUEENSLAND

Approximately 1,000 people living with CHB in Queensland received antiviral treatment in 2013, representing 2.6% of the 37,400 total affected in the state. The number of people receiving treatment would need to increase six-fold in order to meet the national target of 15% uptake. Two Medicare Locals have treatment uptake higher than the state average (West Moreton Oxley, 4.7%, and Greater Metro South Brisbane, 4.2%) however in both cases the number of people receiving treatment still needs to triple.

Of particular concern are also those Medicare Locals with very low treatment uptake but high prevalence of CHB, notably Far North Queensland (uptake 1.8%).

## SOUTH AUSTRALIA

Treatment uptake in South Australia in 2013 was 2.9%, with 416 people living with CHB accessing antiviral treatment of the 14,400 total affected. This proportion would need to increase five-fold to meet the national strategy target of 15%.

Uptake was higher in the two metropolitan South Australia Medicare Locals (4.3% in Central Adelaide and Hills, 3.8% in Northern Adelaide) while remaining below 2% in the three rural/regional Medicare Locals. Even in those Medicare Locals with the highest level of treatment uptake, the number of people accessing therapy would need to more than triple to meet the 15% threshold.

## TASMANIA

Treatment uptake in Tasmania in 2013 was 1.1%, with 38 people accessing antiviral treatment of the 3,500 estimated to be living with CHB. In order to reach the national strategy target for treatment access of 15%, the number of people receiving antiviral therapy in Tasmania would need to increase more than ten-fold.

## VICTORIA

Of the 56,700 Victorians living with CHB, around 3,300 were accessing antiviral treatment in 2013, representing uptake of 5.8%. In order to reach the national target of 15% treatment uptake, the number of people receiving antiviral treatment in Victoria would need to more than double.

Treatment uptake was highest in the Inner East Melbourne (8.3%) and South Eastern Melbourne (8.3%) Medicare Locals; and above average in the Macedon Ranges and North Western Melbourne (8.1%) and Northern Melbourne (6.2%) Medicare Locals. Higher prevalence Medicare Locals in Melbourne where treatment uptake was lower than the state average was the Inner North West Melbourne (uptake 5.1%) and South Western Melbourne (uptake 5.4%) Medicare Locals.

## WESTERN AUSTRALIA

Of Western Australia's estimated 22,000 people living with CHB, 664 were accessing antiviral treatment in 2013, representing a treatment uptake proportion of 3.0%. This proportion would need to increase fivefold in order to reach the national strategy target of 15% treatment uptake.

In Western Australia, four of the state's Medicare Locals had treatment uptake higher than the state average: uptake was 4.3% in both Fremantle and Perth Central and East Metro Medicare Locals, 4.1% in Perth North Metro and 3.3% in Bentley Armadale. Of particular note is the Kimberley-Pilbara Medicare Local, which had the lowest treatment uptake in the state (0.6%), but has been estimated to be the state's highest prevalence Medicare Local (1.56% of the population are estimated to be affected).

# ENGAGEMENT IN CARE

The indicators discussed above of uptake of viral load testing and treatment discussed above provide insight into the provision of adequate and guideline-based care to people living with CHB. Due to their relatedness, however, a composite indicator is required in order to identify the number and proportion of people who are **not** receiving care – being either treatment, or a yearly viral load test indicating that they are being monitored regularly.

Identifying priority areas for improving access to care requires not only identifying where uptake is low, but also where large numbers of people lack appropriate monitoring and treatment. Due to the high population density of many CHB prevalent areas, even areas with a relatively high proportion of people in care may have a large number of people lacking access.

## PROPORTION IN CARE BY STATE AND TERRITORY

**Table 7: Number and proportion of people receiving guideline-based care for CHB, 2013**

State or Territory	Population, 2011	Number of people living with CHB, 2011	Number receiving care, 2013	Proportion of people in care (%)	Number still requiring care, 2013
ACT	357,219	3,603	493	13.7%	3,110
NSW	6,917,655	77,076	14,237	18.5%	62,839
NT	211,943	3,556	568	16.0%	2,988
QLD	4,332,737	37,427	2580	6.9%	34,847
SA	1,596,570	14,442	630	4.4%	13,812
TAS	495,352	3,513	95	2.7%	3,418
VIC	5,354,042	56,836	10,819	19.0%	46,017
WA	2,239,170	22,055	1278	5.8%	20,777
<b>AUSTRALIA</b>	<b>21,507,719</b>	<b>218,567</b>	<b>30,700</b>	<b>14.0%</b>	<b>187,808</b>

(Data source: Department of Human Services.)

Totals may not add up due to inclusion of those without a State or Territory of residence.

At a national level in 2013, just over 30,000 people living with CHB were accessing either regular monitoring or antiviral treatment for CHB, representing less than one in six of the total affected and leaving approximately 187,000 people not receiving guideline-based care. Although treatment and monitoring uptake was highest in New South Wales and Victoria, the large populations of these states means that they also contain the majority of people who are not accessing appropriate care, representing 58% of the national total. Proportionally, access to care was highest in Victoria and lowest in Tasmania.

There was also a disparity between access to treatment and access to monitoring in some states; although the treatment uptake was low in the Northern Territory, for example, the high rate of viral load testing means the total proportion of people in care was the third highest nationally. While NSW had a higher proportion of people accessing treatment, a slightly greater proportion of Victorians received guideline-based care (19.0% compared to 18.5%) due to the higher rate of viral load testing. Similarly, while South Australia had higher treatment uptake than Queensland (2.9% and 2.6%, respectively) when viral load testing is taken into account, the proportion of people in care in Queensland was greater (6.9% compared to 4.4%). These differences may be due to relative access to regular monitoring, or may reflect differences in clinical practices between jurisdictions.

Another reason for relatively low viral load monitoring relative to treatment uptake may be jurisdictional differences in practices for billing viral load testing to the MBS. If a large proportion of care for people with CHB occurs in a public hospital which (unlike many hospitals) does not submit HBV viral load testing for reimbursement by the MBS, these tests would not appear in the MBS data used for this analysis.

## PROPORTION IN CARE BY MEDICARE LOCAL

### AUSTRALIAN CAPITAL TERRITORY

In the ACT in 2013, around 500 individuals accessed either antiviral therapy or viral load testing for CHB, representing 13.7% of the total affected, a similar proportion to the national average of people in care (14%). A remaining 3,110 individuals did not receive regular guideline-based care.

### NEW SOUTH WALES

Approximately 15,000 people living with CHB in New South Wales received guideline based monitoring or antiviral therapy in 2013, representing 18.5% of the total estimated to be living with CHB in the state. Due to the large population, New South Wales had the highest number of Australians who are not receiving care for their CHB, at nearly 63,000 people.

Those Medicare Locals with higher proportions of people accessing care reflect those identified as having higher than average treatment uptake, namely South Western Sydney (30.8%), Northern Sydney (26.6%), South Eastern Sydney (24.4%), Inner West Sydney (22.2%), and Western Sydney (21.8%). Of note, the Medicare Local of South Western Sydney had the highest level of access to care in Australia. Even with this high level of service provision, more than two-thirds of people living with CHB in this Medicare Local did not access monitoring or therapy in 2013.

Despite higher uptake, the large population in inner metropolitan Sydney led to a concentration of people who did not have access to care in urban Medicare Locals. The Medicare Locals of Northern Sydney, Sydney North Shore and Beaches and Western Sydney all had more than 7,000 people living with CHB who did not access care in 2013, 42% of the total in the state.

### NORTHERN TERRITORY

In 2013, approximately 570 people living with CHB in the Northern Territory received either regular monitoring or antiviral therapy, leaving 3,000 individuals not accessing care. Although treatment uptake data indicate that access to antiviral therapy for CHB in the Northern Territory was relatively low, the high rate of viral load testing means that overall access to care in the Northern Territory was above the national average, at 16%. This indicates that the particular barriers in accessing treatment are distinct from those in accessing regular monitoring, potentially reflecting the challenges in a jurisdiction with a substantial burden of CHB amongst rural and remote residents. This may be exacerbated when treatment is confined to specialist medical practitioners, even in the presence of established outreach programs.

### QUEENSLAND

Around 2,500 people living with CHB in Queensland accessed either antiviral therapy or viral load testing in 2013, representing 6.9% of the total estimated to be living with CHB and leaving nearly 35,000 people who did not access care.

The highest level of uptake of care was in the West Moreton-Oxley Medicare Local (12.8%), followed by the higher prevalence area of Greater Metro South Brisbane (11.0%). The Far North Queensland

Medicare Local, despite having above-average CHB prevalence, had a level of uptake of care less than the state average. Access to care in the other higher prevalence Medicare Local in Queensland, Central and North West, was not able to be estimated due to suppression of data given low numbers of viral load tests and prescriptions of antiviral treatment.

## **SOUTH AUSTRALIA**

In South Australia in 2013, 630 people received either antiviral therapy or viral load testing, representing 4.4% of the total 14,400 estimated to be affected. This results in South Australia having the second-lowest uptake of care for any state or territory in the country. This was largely driven by a lower rate of viral load testing than in other states with a similar prevalence.

The proportion of people in care was highest in the two Medicare Locals with increased prevalence in South Australia - Central Adelaide and Hills (5.7%), and Northern Adelaide (5.0%). However, even in these areas with higher coverage than the state average, more than 90% of people living with CHB in these areas did not access care in 2013. Their higher populations also led to them making up the bulk of South Australians with CHB who did not have access, representing nearly 70% of those not in care in 2013.

## **TASMANIA**

Approximately 100 people living with CHB in Tasmania received either antiviral treatment or regular monitoring, meaning that the proportion of people in care was the lowest of all states and territories, at less than 3%. This meant an estimated 3,400 Tasmanians living with CHB did not have access to care in 2013.

## **VICTORIA**

Nearly 11,000 Victorians living with CHB received either antiviral treatment or viral load testing in 2013, making the proportion of people in care in Victoria in 2013 the highest of any state and territory, at 19%. Even with access to care at this level, more than 80% of Victorians living with CHB did not receive guideline-based care for their condition in 2013.

Those Medicare Locals with a higher proportion of people in care included Macedon Ranges and North Western Melbourne (30.7%), South Eastern Melbourne (26.4%), Inner East Melbourne (24.4%), Northern Melbourne (20.4%), and South Western Melbourne (19.6%). Even in those areas that have the highest uptake of care in the state, two-thirds to three-quarters of people living with CHB did not access guideline-based care in 2013. The Inner North West Melbourne Medicare Local was the only high prevalence urban Medicare Local in Australia where the proportion of people in care was below its state's average in 2013.

## **WESTERN AUSTRALIA**

Approximately 1,300 Western Australian residents received a viral load test or antiviral therapy in 2013, representing 5.8% of the 22,000 estimated to be living with CHB, while a remaining 20,000 people did not have access to care.

Those areas with a higher proportion of people receiving care for CHB were the Fremantle (7.4%), Perth Central & East Metro (7.3%), Perth North Metro (7.0%) and Bentley-Armadale (6.5%) Medicare Locals. Of note is the remote Kimberley-Pilbara Medicare Local, which is estimated to have the highest prevalence of CHB in Western Australia, however, uptake of care was the lowest in the state (1.3%).

# IMMUNISATION

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Although the majority of people living with chronic hepatitis B in Australia were born overseas, immunisation is still a key public health strategy to prevent acquisition of hepatitis B in this country. The National Immunisation Program Schedule includes four doses of hepatitis B vaccine, one at birth and three doses to be delivered at 2, 4 and 6 months of age, generally in a hexavalent combination vaccine which includes the other scheduled vaccines for infants(8). Infant immunisation prevents mother to child transmission, and a completed course provides lifelong protection against hepatitis B(8). Immunisation in infancy is particularly important given the risk of progression to chronic infection is highest early in life. Improving the coverage of hepatitis B vaccine among children is a priority action of Australia's National Hepatitis B Strategy 2014-2017 (5) and National Immunisation Strategy 2013-2018 (9).

The Australian Childhood Immunisation Register (ACIR) collects information on the immunisation status of all children registered with Medicare until the age of seven, and is considered to be a nearly complete population register(10). Reporting of childhood immunisations to the ACIR is required by all registered providers of vaccinations. Children who have completed the vaccination schedule for one year olds have received a complete course of the vaccinations required by the age of fifteen months, including 3 doses of hepatitis B vaccination (8) (the birth dose is not recorded in the ACIR).

## IMMUNISATION COVERAGE ACCORDING TO STATE AND TERRITORY

In Australia in 2012-13, 300,229 children registered with the ACIR reached the age of 1 year, and 91.2% of these children were fully immunised. Of the 26,256 children not fully immunised at one year, 3,125 had a conscientious objection recorded, representing 11.9% of those not immunised or 1.0% of all children on the ACIR.

The proportion of children fully immunised in 2012-13 varied according to state and territory, with rates highest in the Australian Capital Territory (93.0%) and lowest in Western Australia (90.1%). Given the large population of New South Wales, this state was also home to the greatest number of unimmunised children (8,900). The state with the highest proportion of conscientious objectors was Western Australia, with 1.4% of children registered compared to the national average of 1.0%.

## IMMUNISATION COVERAGE ACCORDING TO MEDICARE LOCAL

The proportion of children fully immunised according to Medicare Local varied from the lowest in North Coast NSW Medicare Local (86.1%) to the highest in Great South Coast Medicare Local (94.5%).

Nine Medicare Locals had vaccination uptake of below 90% in 2012-13. These were located in New South Wales (North Coast NSW, Far West NSW, Eastern Sydney), Western Australia (Bentley-Armadale, Kimberley-Pilbara, Goldfields-Midwest, Perth South Coastal) South Australia (Central Adelaide and Hills) and Queensland (Sunshine Coast).

Four Medicare Locals had coverage greater than 93%, of which three were located in Victoria (Great South Coast, Hume, and Barwon) and one in New South Wales (Hunter). No Medicare Local had immunisation completeness at or above the national strategy target of 95%.

As the number of registered children varies considerably according to Medicare Local, some Medicare Locals with relatively high coverage still have high numbers of unvaccinated children. Both Western Sydney and South Western Sydney had immunisation coverage of 90.3%, but had the highest numbers of unvaccinated children in Australia (1,353 and 1,295, respectively). Nearly one thousand unvaccinated children were living in Greater Metro South Brisbane (coverage 92.4%).

Areas with a high prevalence of CHB are also of particular concern when immunisation coverage is low. Of the Medicare Locals where coverage was below 90%, those with CHB prevalence above the national average of 1.02% were Eastern Sydney Medicare Local (88.3% coverage, 1.25% prevalence); Far West NSW Medicare Local (86.9% coverage, 1.12% prevalence); Central Adelaide and Hills Medicare Local (89.6% coverage, 1.09% prevalence); and Kimberley-Pilbara Medicare Local (89.2% coverage, 1.56% prevalence).

# HEPATOCELLULAR CARCINOMA

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Prevention of hepatocellular carcinoma, or primary liver cancer, is a key aim of engagement of people living with CHB in care and improving access to treatment. CHB is a major cause of liver cancer, which is the fastest increasing cause of cancer death in Australians (11), and survival for those diagnosed remains amongst the lowest for all cancers (12-14).

Cancer registry data do not routinely record causes of liver cancer. Geographic analysis comparing CHB prevalence or notifications with liver cancer incidence represents correlation and cannot infer causation. However, identifying those areas with a higher incidence of HCC can help target prevention efforts to reduce this burden, given that most cases of HCC are preventable. Evaluating trends in the incidence of HCC, with particular emphasis on changes over time, can help demonstrate the impact of public health and clinical programs responding to the burden of HCC.

As these data are collated from individual state and territory cancer registries, the time periods available for analysis vary, and the diagnostic criteria for HCC can differ between jurisdictions, meaning that rates are only comparable between Medicare Locals in a given state or territory and are not comparable between jurisdictions. As age standardised rates were not available for this analysis, data regarding the age distribution in different Medicare Locals must be taken into account in interpreting higher rates, as the risk of HCC increases considerably with age and this may result in higher rates in areas with particular demographic profiles. These demographic data are presented in Table 16.

## HCC INCIDENCE ACCORDING TO MEDICARE LOCAL

### AUSTRALIAN CAPITAL TERRITORY

Between 1999-2009 there were 92 individuals diagnosed with HCC in the Australian Capital Territory, a rate of 2.3 per 100,000 people per year.

### NEW SOUTH WALES

During the period 1999-2008, 2,380 individuals in New South Wales were diagnosed with HCC, a rate of 3.4 cases per 100,000 per year. The highest rate of HCC incidence, 4.9 per 100,000 per year, was observed in three Medicare Locals - Inner West Sydney, South Western Sydney, and Southern NSW. Higher than average incidence was also observed in Eastern Sydney (4.6 per 100,000 per year); Central Coast NSW (4.4); South Eastern Sydney (3.7); and Northern Sydney (3.5). All Medicare Locals with higher than average HCC incidence are areas with above average CHB prevalence, except for Central Coast NSW and Southern NSW, however, in both these areas a greater than average proportion of the population was aged over 50.

## NORTHERN TERRITORY

During the period 1999-2011, there were 122 individuals diagnosed with HCC in the Northern Territory, a rate of 4.4 per 100,000 people per year.

## QUEENSLAND

Between 1999-2010, 1,262 individuals in Queensland were diagnosed with HCC, a rate of 2.4 per 100,000 per year. Four of Queensland's Medicare Locals had higher than average incidence during the period: Far North Queensland (3.3 cases per 100,000 per year); West Moreton-Oxley (2.9); Greater Metro South Brisbane (2.6); and Central and North West Queensland (2.5). These Medicare Locals also represent Queensland's four highest CHB prevalence Medicare Locals.

## SOUTH AUSTRALIA

There were 647 HCC cases diagnosed in South Australia between 1999-2010, a rate of 3.4 per 100,000 per year. The Central Adelaide and Hills Medicare Local had the highest incidence rate at 4.3 cases per 100,000 per year, while the remaining Medicare Locals showed limited variation, ranging from 2.6 cases per 100,000 per year (Country North SA) to 3.4 cases per 100,000 per year (Southern Adelaide-Fleurieu). Central Adelaide and Hills and Northern Adelaide, South Australia's two higher prevalence Medicare Locals, have similar estimated numbers of people living with CHB, however, the population in Central Adelaide and Hills is older overall.

## TASMANIA

HCC incidence data for Tasmania were not available for this analysis.

## VICTORIA

Between 1999-2012, 1,583 Victorians were diagnosed with HCC, equivalent to a rate of 2.1 per 100,000 people per year. Those Medicare Locals with the highest rates were Inner North West Melbourne (3.4 per 100,000 people per year); Inner East Melbourne (2.5); Northern Melbourne (2.5); Lower Murray (2.4); Macedon Ranges and North Western Melbourne (2.4); and Gippsland (2.3). All the urban Medicare Locals with higher than average HCC incidence were identified as being higher CHB prevalence areas in the First National Report.

## WESTERN AUSTRALIA

During the period 1999-2012, 957 individuals were diagnosed with HCC in Western Australia, a rate of 3.1 cases per 100,000 per year. Those Medicare Locals with higher than average rates of HCC were Perth Central and East Metro (3.9 cases per 100,000 per year); Fremantle (3.8); and Goldfields-Midwest (3.3), all of which have a CHB prevalence estimated to be similar to the state of Western Australia overall.



# ATTRIBUTABLE MORTALITY

Without access to effective care, it has been estimated that 15-25% of people living with CHB will die due to consequences of their infection, including HCC (see above) and liver failure(3). As population-level data regarding the adverse outcomes of infection in people living with CHB are not available, the most useful estimations come from modelling of the expected mortality in people with CHB based on the natural history of the disease.

**Table 8: Model-derived estimates of mortality attributable to CHB, 2010-2013**

Year	Number of deaths attributable to chronic hepatitis B infection	Plausible range for estimate
2010	335	259-544
2011	382	294-621
2012	383	295-624
2013	389	300-624
2014	395	304-614

These estimates indicate the steadily increasing burden of mortality attributable to CHB, which reflects findings from registry data that the number of deaths from HCC continues to increase. In 2014, it was estimated that nearly 400 Australians died due to CHB infection.

# APPENDIX:

## METHODOLOGICAL NOTES

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### POPULATION AND DENOMINATOR DATA

Due to differences in availability, two different sources were used for population denominator data throughout this report. All Medicare Local-based analyses used population and prevalence estimates based on the 2011 Census of Population and Housing, which provides detailed information about population sizes according to detailed geographic and demographic parameters.

Although the Census collects highly detailed information, it is only conducted every five years, limiting the utility of these data in assessing trends over time in the context of a changing population size. In analyses that involved assessing trends over time, population figures used were based on the Estimated Resident Population (ERP) figures produced by the Australian Bureau of Statistics and available quarterly. These estimates are usually higher than the Census estimate of a given year, as they do not count individuals and therefore do not have a proportion of non-responders, as is the case for the Census. The source of population denominator data is clearly marked in Tables whenever ERP data are used in place of the Census. The ERP figure for June of a given year was always used as representative of a given year. Rates may not exactly correspond to data in tables due to rounding of numerators after calculation.

### MEDICARE LOCAL BOUNDARIES

Medicare Local boundaries were determined from LGA data for a number of data sources, using boundaries as defined at June 2012. Details of LGA and Medicare Local concordance are available at: <http://www.medicarelocals.gov.au/internet/medicarelocals/publishing.nsf/Content/digital-boundaries>.

The Medicare data provided for treatment uptake and viral load testing were categorised using 2011 boundary and concordance files, resulting in the Hunter Medicare Local being listed as two separate Medicare Locals, as was the case before the boundary reassignment in 2012. For this reason, Hunter Urban and Hunter Rural are listed separately in the viral load data tables, but are combined in the notifications data tables. Hunter Urban as listed in Tables contains the LGAs of Lake Macquarie, Maitland, Newcastle, and Port Stephens.

In those cases where a LGA was split between multiple Medicare Locals, the number of notifications was divided equally between the constituent Medicare Locals proportionally according to Medicare Locals boundary documents. The population of each Medicare Local in those cases where LGAs were split was determined by assigning the population according to Statistical Local Area (SLA) as defined in Medicare Local boundary documents, as outlined in the previous Hepatitis B Medicare Local Mapping Report. The discrepancy between the two methodologies is due to the availability of more specific SLA information from the Australian Bureau of Statistics Census data, while SLA information was not available from the NNDSS. Because of this, there may be slight discrepancies in the rate in the same LGA between two Medicare Locals. Those LGAs that have been split between multiple Medicare Locals and are listed in Tables under both Medicare Locals they are a part of, and indicated in italics.

Three Medicare Locals cross state boundaries (Lower Murray, Loddon-Mallee-Murray, and Hume); in all cases this involves New South Wales LGAs being included in Victoria Medicare Locals. These LGAs are listed under the Victorian Medicare Local they are a part of, indicated with an asterisk; however, in calculating state totals only LGAs that are part of that state have been included, regardless of their constituent Medicare Local. State totals also included those populations defined in the Census as No

Usual Address or Unincorporated Areas. Due to these factors, Medicare Local figures shown in tables may not add to State and Territory totals.

Age distribution data according to Medicare Local are based on Census demographics applied to the Estimated Resident Population for June 2011. These data were made available at the Medicare Local level by the Public Health Informational Data Unit; further information on their development can be found at <http://www.adelaide.edu.au/phidu/help-info/>.

## NOTIFICATIONS DATA

De-identified, summarised notifications for unspecified (chronic) hepatitis B according to LGA and year were obtained at a national level from the Commonwealth Department of Health National Notifiable Diseases Surveillance System (NNDSS), at a state and territory level through publicly available datasets (from <http://www9.health.gov.au/cda/source/cda-index.cfm>) and at an LGA level through specific data requests. Additional notifiable disease surveillance data were also provided by New South Wales Health and the Department of Health Victoria. Notifications by LGA were provided for the period 1998-2012, except for those from the Northern Territory, where unspecified hepatitis B became notifiable in 2005. Publicly available 2013 data from the NNDSS have been included at a state and territory level. Average notification rates were calculated using the average (mean) ERP for the period 1998-2013, based on June figures used for individual yearly rates.

Notifications were provided to NNDSS by each state and territory classified by postcode, and then categorised into LGAs; as many postcodes are split between multiple LGAs, the number of notifications recorded in a given LGA is often not a round number. These LGA data were then additionally classified according to Medicare Local for the purpose of this report (see 'Medicare Local boundaries' section for details.)

Notifications were not provided according to LGA for the Northern Territory and are presented as a summary for the state. Due to some notifications not including residential postcode, LGA and Medicare Local totals will not add to state and territory and national totals in tables.

Due to lack of reliability and interpretability of low numbers, and in keeping with agreements made with the relevant data custodians, numbers have been suppressed and no rate or proportion has been calculated when the number of people indicated was below 5. These numbers have been included in Medicare Local totals.

## MEDICARE DATA

Due to the timing of data request completion, the six month periods used are from December-May and June-November. The yearly totals included represent the total from December the previous year to November of that year, however, are listed as whole years for simplicity. The number of Medicare items claimed for any service during the Dec-May period is generally lower than the Jun-Nov period, due to its inclusion of the December/January holidays and the effect of this on service utilisation and claims processing.

Due to the lack of Census information available in yearly increments, the rate of viral load tests per year and the notification rate per year were derived using the Australian Bureau of Statistics figures for estimated resident population (ERP) in the midpoint (June) of each year. As viral load testing was only included in the MBS as of July 2008, the yearly rate for 2008 has been excluded from the figures.

### TESTING

The number of items claimed and the number of individual patients provided services for annual HBV DNA viral load testing (item number 69482) was provided by Department of Human Services according to

Medicare Local, in six month time periods (Dec-May and Jun-Nov) for the period December 2011 to November 2013 through a data request.

Numbers according to State and Territory for the period 2009-2013, used to assess trends over the time period that the test has been available on Medicare, were available from the Department of Human Services online reporting system ([https://www.medicareaustralia.gov.au/statistics/mbs\\_item.shtml](https://www.medicareaustralia.gov.au/statistics/mbs_item.shtml)). Although this provides data regarding total services, not patient numbers as in the specific data provided by Medicare, the high concordance between the figures provides reassurance that almost all individuals are receiving only one test of this type per year and the number of services is representative of the number of patients tested.

The number of tests according to Medicare Local was suppressed by Medicare if it was below 20 for the given period, indicated in Tables as “-”.

## TREATMENT

Treatment data presented in this report were derived using two different methods, based on the availability of data: derivation of the number of people receiving treatment based on the publicly available reporting published by the Australian Government Department of Human Services, which provides all Commonwealth-funded scripts for HBV prescriptions; and through the acquisition of aggregated patient-level data from Australian Government Department of Human Services. In both cases, treatment data for CHB represent the number of individuals receiving any drug indicated for the treatment of CHB: adefovir, entecavir, lamivudine, pegylated interferon alfa-2a, telbivudine, and tenofovir.

In the case of the Medicare data request, patient-level estimates were provided, allowing removal of those receiving tenofovir for the treatment of HIV and to avoid double counting of people receiving combination therapy. Pegylated interferon alfa-2a prescribed for hepatitis C treatment could not be removed from the data, however these data only include those treated using interferon without ribavirin (as is standard in the treatment of hepatitis C). In addition, given that pegylated interferon represented less than 1.5% of all HBV 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 Medicare if it was below 20 for the given period. In cases where the number of patients was suppressed but the number of scripts was available, the number of patients was estimated using the ratio of scripts per patient (3.04 scripts per patient per six-month period). Figures derived using this method are indicated in the table in italics.

Due to changes in the reporting system for the patient-level data collected by Department of Human Services, estimates of treatment uptake using this method were only available for the period Jun-Nov 2013. Historical estimates of treatment uptake, in order to assess trends in prescribing over time, were derived from HSD expenditure reporting by state and territory, cross-referenced with patient-level PBS data requested directly from Medicare and further verified with supply information from pharmaceutical companies. Estimates of the number of individual patients receiving therapy are extrapolated based on the cost per script, which assumes that each patient received a full year of therapy.

## NUMBER IN CARE

The aggregate number in care indicator was derived by combining the number of people receiving antiviral therapy and the number receiving a yearly viral load test, using the Medicare item number specific to those not on treatment, as described in the methods above. As the viral load data were missing for approximately one third of all Medicare Locals due to cell suppression, those with a value of <20 were assumed to have 10 patients tested during the time period, this representing the average number of tests performed in the Medicare Locals which has suppression applied. Although the true number could be between 1 and 19, sensitivity analysis demonstrated that this variation would have minimal impact on these estimates of uptake of care or relative ranking of individual Medicare Locals.

The proportion of people in care was derived using the estimated number of people living with CHB in a given Medicare Local as of the 2011 Census, and the number not in care taken as the difference between the number of people with CHB and the number of people receiving a viral load test or antiviral treatment. Note that viral load testing while receiving antiviral treatment is performed using a different item number, avoiding double counting of individuals on treatment.

## 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 vaccine. Although the full schedule for hepatitis B includes a dose at birth, this is not registered with the ACIR and therefore not able to be included in coverage estimates. A child who was fully immunised according to the ACIR at one year in 2012-13 had received their third vaccination for diphtheria, tetanus, whooping cough, polio, hepatitis B and *Haemophilus influenzae* type b, before the age of 15 months. As these vaccines are nearly always delivered in a single-dose hexavalent formula, immunisation completeness was not available for individual vaccines by Medicare Local; however, a child who was fully immunised at one year received the full course of hepatitis B immunisation. These data may underestimate or overestimate the true proportion of children vaccinated if the vaccines are delivered outside the hexavalent formulation, for example if a specific vaccine is excluded; however these variations are very uncommon.

ACIR data according to Medicare Local are collated and reported by the National Health Performance Authority on an annual basis. The data reported are for the financial year 2012-13 (July 2012 to June 2013) with comparisons for the year 2011-12 (July 2011 to June 2012). Further information regarding immunisation data collection is available at: <http://www.nhpa.gov.au/internet/nhpa/publishing.nsf/Content/Report-Download-Immunisation-rates-for-children-in-2012-13>.

## CANCER DATA

Hepatocellular carcinoma incidence data were obtained from each state and territory cancer registry (data from Tasmania were unavailable at the time of publication). Diagnoses requested included all cases coded as ICD-10 C22.0 and/or with morphology in the ICDO-3 range 8170/3 to 8180/3, which includes all hepatocellular carcinoma variants.

These diagnoses may not include suspected cases of hepatocellular carcinoma diagnosed through non-histological methods, such as imaging, and thus could underestimate the true incidence of hepatocellular carcinoma. Due to differing standards in jurisdictional registries, access to diagnostic technologies and interpretation of coding, hepatocellular carcinoma incidence cannot be compared between states or collated into a national estimate.

Cases that occurred in a New South Wales LGA that is assigned to a Victorian Medicare Local were not included in the totals for these Victorian Medicare Locals due to these potential coding differences. Due to data suppression by the New South Wales Cancer Institute for those LGAs with fewer than five cases during the period, some Medicare Locals are missing substantial data about how many cases of HCC occurred in their catchment. Numbers and rates have been suppressed in cases where more than half of the constituent LGAs in a given Medicare Local had data suppressed. These Medicare Locals are indicated in the table.

Incidence rates were calculated using ABS Census data for 2011 according to Medicare Local.

## ATTRIBUTABLE MORTALITY DATA

Estimates of the number of deaths due to chronic hepatitis B were derived from a deterministic compartmental mathematical model of hepatitis B virus infection in the Australian population from 1951-2050. The model was parameterised using a wide range of data sources including the Australian Bureau of Statistics, existing mathematical models, surveillance notifications, epidemiological research and clinical studies. Important factors such as migration, attributable and all-cause mortality, the ageing of the population, the variable natural history of chronic hepatitis B infection and the impact of vaccination were all incorporated. Model construction included sensitivity analyses around critical parameters such as the force of infection (Fol) and migration estimates. Both static and dynamic Fol models were created, the latter using novel techniques for deriving the Fol over time. Model outcomes have been validated using a range of external data, particularly national and Victorian serosurvey results. These were not used to parameterise the model to allow independent comparison with modelled outcomes. The plausible range around estimated attributable deaths derived by adopting low and high mortality estimates directly in the model. These deaths do not include those in people living with CHB who died attributable to causes other than their hepatitis B.

## CHB NOTIFICATIONS ACCORDING TO MEDICARE LOCAL AND LOCAL GOVERNMENT AREA

**Table 9: Number and rate of unspecified (chronic) hepatitis B notifications according to Medicare Local and Local Government Area, 1998-2012 (2005-2012 in Northern Territory)**

Medicare Local (ML) and Local Government Areas (LGAs)	2011 Population	Number of chronic hepatitis B notifications	Notification rate per 100,000 per year, 1998-2012#
AUSTRALIAN CAPITAL TERRITORY			
AUSTRALIAN CAPITAL TERRITORY	357,219	1,099	20.5
NEW SOUTH WALES			
<b>CENTRAL COAST NSW</b>	<b>312,187</b>	<b>516.7</b>	<b>11.0</b>
Gosford	162,441	284.9	11.7
Wyong	149,746	231.8	10.3
<b>EASTERN SYDNEY</b>	<b>355,597</b>	<b>2,909.9</b>	<b>54.6</b>
Botany Bay	39,353	337.3	57.1
Randwick	128,987	1023.3	52.9
<i>Sydney</i>	<i>71,613</i>	<i>1118.5</i>	<i>104.1</i>
Waverley	63,485	247.5	26.0
Woollahra	52,159	183.3	23.4
<b>FAR WEST NSW</b>	<b>36,308</b>	<b>361.6</b>	<b>66.4</b>
Bourke	2,866	58.9	137.1
Brewarrina	1,766	75.8	286.0
Broken Hill	18,519	80.1	28.9
Central Darling	1,991	35.1	117.6
Cobar	4,713	-	-
Walgett	6,453	109.4	113.0
<b>HUNTER</b>	<b>667,076</b>	<b>885.1</b>	<b>8.8</b>
Cessnock	50,840	61.5	8.1

Medicare Local (ML) and Local Government Areas (LGAs)	2011 Population	Number of chronic hepatitis B notifications	Notification rate per 100,000 per year, 1998-2012#
Dungog	8,316	-	-
Gloucester	4,879	-	-
Great Lakes	34,431	22.7	4.4
Greater Taree	46,541	42.7	6.1
Lake Macquarie	189,007	224.8	7.9
Maitland	67,479	51.0	5.0
Muswellbrook	15,793	53.0	22.4
Newcastle	148,536	340.5	15.3
Port Stephens	64,808	60.2	6.2
Singleton	22,695	12.8	3.8
Upper Hunter Shire	13,751	9.0	4.4
<b>ILLAWARRA-SHOALHAVEN</b>	<b>368,820</b>	<b>772</b>	<b>14.0</b>
Kiama	19,984	13.0	4.3
Shellharbour	63,604	82.7	8.7
Shoalhaven	92,811	115.0	8.3
Wollongong	192,421	561.3	19.4
<b>INNER WEST SYDNEY</b>	<b>548,631</b>	<b>7,221</b>	<b>87.7</b>
Ashfield	41,213	675.7	109.3
Burwood	32,425	542.8	111.6
Canada Bay	75,761	435.7	38.3
Canterbury	137,454	2,343.9	113.7
Leichhardt	52,197	196.6	25.1
Marrickville	76,500	1,010.9	88.1
Strathfield	35,188	550.4	104.3
<i>Sydney</i>	<i>97,893</i>	<i>1,464.7</i>	<i>99.7</i>
<b>MURRUMBIDGEE</b>	<b>178,985</b>	<b>343</b>	<b>12.8</b>
Bland	5,862	5.3	6.0
Boorowa	2,399	-	-
Carrathool	2,584	-	-
Coolamon	4,100	-	-
Cootamundra	7,336	-	-
Griffith	24,364	120.7	33.0
Gundagai	3,663	-	-
Harden	3,585	-	-
Hay	2,958	-	-
<i>Jerilderie</i>	<i>274</i>	<i>-</i>	<i>-</i>
Junee	5,878	16.0	18.2
<i>Lachlan</i>	<i>1,787</i>	<i>-</i>	<i>-</i>
Leeton	11,038	8.3	5.0
Lockhart	2,995	-	-
Murrumbidgee	2,261	-	-
Narrandera	5,900	6.2	7.0
Temora	5,776	5.2	6.0
Tumbarumba	3,357	18.4	36.5
Tumut Shire	10,935	-	-

Medicare Local (ML) and Local Government Areas (LGAs)	2011 Population	Number of chronic hepatitis B notifications	Notification rate per 100,000 per year, 1998-2012#
<i>Urana</i>	239	-	-
Wagga Wagga	59,459	122.2	13.7
Young	12,235	6.2	3.4
<b>NEPEAN-BLUE MOUNTAINS</b>	<b>336,923</b>	<b>813</b>	<b>16.1</b>
Blue Mountains	75,942	115.0	10.1
Hawkesbury	62,353	131.0	14.0
Lithgow	20,162	27.0	8.9
Penrith	178,466	539.8	20.2
<b>NEW ENGLAND</b>	<b>175,766</b>	<b>376</b>	<b>14.3</b>
Armidale Dumaresq	24,105	63.9	17.7
Glen Innes Severn	8,655	15.6	12.0
Gunnedah	12,065	9.0	5.0
Guyra	4,397	5.0	7.6
Gwydir	4,964	-	-
Inverell	16,077	14.8	6.2
Liverpool Plains	7,480	5.9	5.3
Moree Plains	13,428	140.8	69.9
Narrabri	12,925	14.8	7.6
Tamworth Regional	56,291	87.2	10.3
<i>Tenterfield</i>	6,326	6.9	7.6
Uralla	6,032	-	-
Walcha	3,021	-	-
<b>NORTH COAST NSW</b>	<b>478,169</b>	<b>621.7</b>	<b>8.7</b>
Ballina	39,272	41.1	7.0
Bellingen	12,515	11.0	5.9
Byron	29,207	48.1	11.0
Clarence Valley	49,666	50.3	6.7
Coffs Harbour	68,415	131.5	12.8
Kempsey	28,134	48.4	11.5
Kyogle	9,227	8.8	6.4
Lismore	42,764	87.9	13.7
Nambucca	18,645	17.4	6.2
Port Macquarie-Hastings	72,698	57.8	5.3
Richmond Valley	22,038	23.3	7.1
<i>Tenterfield</i>	483	-	-
Tweed	85,105	95.4	7.5
<b>NORTHERN SYDNEY</b>	<b>380,766</b>	<b>2,658.4</b>	<b>46.5</b>
Hornsby	156,850	953.5	40.5
Hunters Hill	13,216	45.3	22.9
<i>Ku-ring-gai</i>	107,660	567.0	35.1
Ryde	103,040	1,092.6	70.7
<b>SOUTH EASTERN SYDNEY</b>	<b>442,863</b>	<b>3,006.8</b>	<b>45.3</b>
Hurstville	78,855	1,056.1	89.3
Kogarah	55,805	632.0	75.5
Rockdale	97,340	882.2	60.4



Medicare Local (ML) and Local Government Areas (LGAs)	2011 Population	Number of chronic hepatitis B notifications	Notification rate per 100,000 per year, 1998-2012#
Sutherland Shire	210,863	436.6	13.8
<b>SOUTH WESTERN SYDNEY</b>	<b>840,610</b>	<b>10,552.5</b>	<b>83.7</b>
Bankstown	182,352	2,655.9	97.1
Camden	56,720	88.2	10.4
Campbelltown	145,970	774.1	35.4
Fairfield	187,768	5,222.7	185.4
Liverpool	180,142	1,704.1	63.1
Wingecarribee	44,397	38.2	5.7
Wollondilly	43,261	69.3	10.7
<b>SOUTHERN NSW</b>	<b>189,416</b>	<b>294.5</b>	<b>10.4</b>
Bega Valley	31,950	31.2	6.5
Bombala	2,407	-	-
Cooma-Monaro	9,773	5.9	4.0
Eurobodalla	35,739	37.6	7.0
Goulburn Mulwaree	27,481	59.3	14.4
Palerang	14,351	16.3	7.6
Queanbeyan	37,994	120.0	21.0
Snowy River	7,509	-	-
Upper Lachlan Shire	7,192	8.6	8.0
Yass Valley	15,020	14.2	6.3
<b>SYDNEY NORTH SHORE AND BEACHES</b>	<b>427,889</b>	<b>1,859.8</b>	<b>29.0</b>
<i>Ku-ring-gai</i>	<i>1,639</i>	<i>8.6</i>	<i>35.1</i>
Lane Cove	31,510	165.6	35.0
Manly	39,748	131.2	22.0
Mosman	27,452	79.1	19.2
North Sydney	62,290	344.9	36.9
Pittwater	57,154	63.4	7.4
Warringah	140,740	442.4	21.0
Willoughby	67,356	624.5	61.8
<b>WESTERN NSW</b>	<b>245,534</b>	<b>358.3</b>	<b>9.7</b>
Bathurst Regional	38,517	51.9	9.0
Blayney	6,985	-	-
Bogan	2,900	-	-
Cabonne	12,823	11.3	5.9
Coonamble	4,032	9.4	15.5
Cowra	12,146	17.3	9.5
Dubbo	38,808	84.0	14.4
Forbes	9,169	7.5	5.4
Gilgandra	4,368	24.2	36.9
<i>Lachlan</i>	<i>4,689</i>	<i>10.8</i>	<i>15.4</i>
Mid-Western Regional	22,320	19.2	5.7
Narromine	6,584	8.3	8.4
Oberon	5,041	7.0	9.3
Orange	38,056	59.8	10.5
Parkes	14,592	7.7	3.5

Medicare Local (ML) and Local Government Areas (LGAs)	2011 Population	Number of chronic hepatitis B notifications	Notification rate per 100,000 per year, 1998-2012#
Warren	2,758	-	-
Warrumbungle Shire	9,588	-	-
Weddin	3,665	-	-
Wellington	8,493	24.6	19.3
<b>WESTERN SYDNEY</b>	<b>810,727</b>	<b>8,156.4</b>	<b>67.1</b>
Auburn	73,738	2,192.0	198.2
Blacktown	301,099	1,888.8	41.8
Holroyd	99,161	1,045.2	70.3
Parramatta	166,858	2,133.9	85.3
The Hills Shire	169,871	896.6	35.2
<b>NEW SOUTH WALES TOTAL</b>	<b>6,917,655</b>	<b>42,491</b>	<b>40.9</b>
<b>NORTHERN TERRITORY</b>			
<b>NORTHERN TERRITORY</b>	<b>211,943</b>	<b>1,527</b>	<b>90.1#</b>
<b>QUEENSLAND</b>			
<b>CENTRAL AND NORTH WEST QLD</b>	<b>42,556</b>	<b>120.3</b>	<b>18.8</b>
Barcaldine	3,214	-	-
Barcoo	352	-	-
Blackall Tambo	2,199	-	-
Boulia	479	-	-
Burke	512	-	-
Carpentaria	2,053	-	-
Cloncurry	3,228	7.2	14.8
Diamantina	282	-	-
Doomadgee	1,289	-	-
Longreach	4,187	5.0	8.0
McKinlay	1,048	-	-
Mornington	1,140	7.9	46.0
Mount Isa	21,238	87.6	27.5
Winton	1,335	-	-
<b>CENTRAL QUEENSLAND</b>	<b>204,864</b>	<b>252.4</b>	<b>8.2</b>
<i>Banana</i>	<i>13,514</i>	<i>19.1</i>	<i>9.4</i>
Central Highlands	28,715	33.2	0.2
<i>Gladstone</i>	<i>52,355</i>	<i>53.9</i>	<i>6.9</i>
Rockhampton	109,337	145.7	8.9
Woorabinda	943	-	-
<b>DARLING DOWNS-SOUTH WEST QUEENSLAND</b>	<b>286,125</b>	<b>448.5</b>	<b>10.4</b>
Balonne	4,718	18.2	25.7
<i>Banana</i>	<i>940</i>	<i>-</i>	<i>-</i>
Bulloo	405	-	-
Cherbourg	1,223	-	-
Goondiwindi	10,627	13.3	8.4
Maranoa	13,074	21.0	10.7
Murweh	4,616	8.0	11.6
Paroo	1,857	9.0	32.3
Quilpie	973	-	-

Medicare Local (ML) and Local Government Areas (LGAs)	2011 Population	Number of chronic hepatitis B notifications	Notification rate per 100,000 per year, 1998-2012#
South Burnett	31,029	24.8	5.3
Southern Downs	33,883	38.5	7.6
Toowoomba	151,189	282.8	12.5
Western Downs	31,591	27.6	5.8
<b>FAR NORTH QUEENSLAND</b>	<b>252,456</b>	<b>1,466</b>	<b>38.7</b>
Aurukun	1,295	8.0	41.0
Cairns	156,171	730.6	31.2
<i>Cassowary Coast</i>	<i>25,810</i>	<i>90.6</i>	<i>23.4</i>
Cook	4,153	16.0	25.7
Croydon	314	-	-
Etheridge	893	6.3	46.8
Hope Vale	985	-	-
Kowanyama	1,030	7.8	50.3
Lockhart River	482	-	-
Mapoon	264	-	-
Napranum	857	6.7	52.5
Northern Peninsula Area	2,298	62.9	182.6
Pormpuraaw	662	-	-
Tablelands	43,728	164.6	25.1
Torres	3,259	133.4	272.9
Torres Strait Island	4,250	181.6	284.9
Weipa	3,332	22.2	44.4
Wujal Wujal	267	-	-
Yarrabah	2,406	18.2	50.3
<b>GOLD COAST</b>	<b>507,537</b>	<b>1,201.2</b>	<b>15.8</b>
Gold Coast	494,504	1,199.6	16.2
Scenic Rim	13,033	-	-
<b>GREATER METRO SOUTH BRISBANE</b>	<b>879,977</b>	<b>3,640.2</b>	<b>27.6</b>
Brisbane	450,735	2,495.0	36.9
Logan	278,052	955.2	22.9
Redland	138,668	188.4	9.1
<i>Scenic Rim</i>	<i>12,522</i>	<i>-</i>	<i>-</i>
<b>METRO NORTH BRISBANE</b>	<b>855,073</b>	<b>3,088.4</b>	<b>24.1</b>
<i>Brisbane</i>	<i>472,931</i>	<i>2,634.3</i>	<i>37.1</i>
Moreton Bay	378,047	449.7	7.9
<i>Somerset</i>	<i>4,095</i>	<i>-</i>	<i>-</i>
<b>SUNSHINE COAST</b>	<b>352,658</b>	<b>352.1</b>	<b>6.7</b>
Gympie	45,748	35.6	5.2
Sunshine Coast	306,910	316.5	6.9
<b>TOWNSVILLE-MACKAY</b>	<b>389,185</b>	<b>702.0</b>	<b>12.0</b>
Burdekin	17,361	19.0	7.3
<i>Cassowary Coast</i>	<i>1,857</i>	<i>6.6</i>	<i>23.7</i>
Charters Towers	12,169	19.7	10.8
Flinders	1,791	-	-
Hinchinbrook	11,568	20.8	12.0

Medicare Local (ML) and Local Government Areas (LGAs)	2011 Population	Number of chronic hepatitis B notifications	Notification rate per 100,000 per year, 1998-2012#
Isaac	22,587	16.2	4.8
Mackay	112,797	106.8	6.3
Palm Island	2,340	10.9	31.2
Richmond	827	-	-
Townsville	174,461	457.0	17.5
Whitsunday	31,427	43.0	9.1
<b>WEST MORETON-OXLEY</b>	<b>348,487</b>	<b>1,189.7</b>	<b>22.8</b>
<i>Brisbane</i>	<i>118,179</i>	<i>673.1</i>	<i>38.0</i>
Ipswich	166,904	428.3	17.1
Lockyer Valley	34,956	67.9	13.0
<i>Scenic Rim</i>	<i>10,902</i>	<i>-</i>	<i>-</i>
<i>Somerset</i>	<i>17,546</i>	<i>19.0</i>	<i>7.2</i>
<b>WIDE BAY</b>	<b>200,803</b>	<b>195.4</b>	<b>6.5</b>
Bundaberg	89,813	97.4	7.2
Fraser Coast	95,311	87.4	6.1
<i>Gladstone</i>	<i>5,537</i>	<i>6.1</i>	<i>7.3</i>
North Burnett	10,142	-	-
<b>TOTAL QUEENSLAND</b>	<b>4,332,737</b>	<b>12,745</b>	<b>19.6</b>
<b>SOUTH AUSTRALIA</b>			
<b>CENTRAL ADELAIDE AND HILLS</b>	<b>493,517</b>	<b>2,170.6</b>	<b>29.3</b>
Adelaide	19,639	160.0	54.3
Adelaide Hills	38,628	32.4	5.6
Burnside	42,193	137.2	21.7
Campbelltown	48,163	174.2	24.1
Charles Sturt	104,985	616.5	39.1
Mount Barker	29,766	14.8	3.3
Norwood Payneham St Peters	34,886	113.0	21.6
<i>Port Adelaide Enfield</i>	<i>56,500</i>	<i>401.1</i>	<i>47.3</i>
Prospect	19,955	66.6	22.3
Unley	36,839	123.5	22.3
Walkerville	7,001	20.2	19.3
West Torrens	54,962	311.0	37.7
<b>COUNTRY NORTH SA</b>	<b>189,509</b>	<b>239.5</b>	<b>8.4</b>
Anangu Pitjantjatjara	2,439	45.5	124.3
Barossa	22,167	12.9	3.9
Barunga West	2,456	-	-
Ceduna	3,480	24.1	46.2
Clare and Gilbert Valleys	8,750	-	-
Cleve	1,733	-	-
Coober Pedy	1,694	34.0	133.8
Copper Coast	12,947	7.9	4.0
Elliston	1,047	-	-
Flinders Ranges	1,700	5.0	19.6
Franklin Harbour	1,271	-	-
Goyder	4,163	-	-

Medicare Local (ML) and Local Government Areas (LGAs)	2011 Population	Number of chronic hepatitis B notifications	Notification rate per 100,000 per year, 1998-2012#
Kimba	1,089	-	-
Light	13,783	-	-
Lower Eyre Peninsula	4,915	-	-
Maralinga Tjarutja	75	-	-
Mount Remarkable	2,873	-	-
Northern Areas	4,504	-	-
Orroroo/Carrieton	873	-	-
Peterborough	1,731	-	-
Port Augusta	13,986	36.7	17.5
Port Lincoln	14,086	10.1	4.8
Port Pirie City and Districts	17,332	16.8	6.4
Roxby Downs	4,702	7.0	9.9
Streaky Bay	2,101	-	-
Tumby Bay	2,587	-	-
Wakefield	6,660	-	-
Whyalla	22,089	14.9	4.5
Wudinna	1,252	-	-
Yorke Peninsula	11,024	6.1	3.7
<b>COUNTRY SOUTH SA</b>	<b>130,720</b>	<b>140.7</b>	<b>7.3</b>
Berri and Barmera	10,582	12.2	7.7
Grant	7,855	5.9	5.0
Karoonda East Murray	1,032	-	-
Kingston	2,278	-	-
Loxton Waikerie	11,287	12.0	7.1
Mid Murray	8,136	-	-
Mount Gambier	25,249	32.0	8.4
Murray Bridge	19,742	27.8	9.4
Naracoorte and Lucindale	8,115	18.5	15.2
Renmark Paringa	9,244	14.7	10.6
Robe	1,399	-	-
Southern Mallee	2,101	-	-
Tatiara	6,553	-	-
The Coorong	5,523	-	-
Wattle Range	11,624	6.1	3.5
<b>NORTHERN ADELAIDE</b>	<b>388,894</b>	<b>1,455.7</b>	<b>25.0</b>
Gawler	20,537	-	-
Mallala	8,346	5.0	4.0
Playford	79,118	208.0	17.5
<i>Port Adelaide Enfield</i>	<i>56,316</i>	<i>393.1</i>	<i>46.5</i>
Salisbury	129,109	695.9	35.9
Tea Tree Gully	95,468	149.1	10.4
<b>SOUTHERN ADELAIDE-FLEURIEU</b>	<b>386,422</b>	<b>575.7</b>	<b>9.9</b>
Alexandrina	23,699	11.4	3.2
Holdfast Bay	34,604	69.1	13.3
Kangaroo Island	4,415	5.0	7.6

Medicare Local (ML) and Local Government Areas (LGAs)	2011 Population	Number of chronic hepatitis B notifications	Notification rate per 100,000 per year, 1998-2012#
Marion	82,992	208.3	16.7
Mitcham	62,899	129.8	13.8
Onkaparinga	159,576	140.4	5.9
Victor Harbor	13,841	7.7	3.7
Yankalilla	4,396	-	-
<b>TOTAL SOUTH AUSTRALIA</b>	<b>1,596,570</b>	<b>5,350</b>	<b>22.3</b>
<b>TASMANIA</b>			
Break O'Day	6,194	-	-
Brighton	15,460	11.9	5.1
Burnie	19,331	16.7	5.7
Central Coast	21,352	8.5	2.7
Central Highlands	2,259	-	-
Circular Head	7,977	-	-
Clarence	51,854	67.7	8.7
Derwent Valley	9,706	-	-
Devonport	24,618	15.4	4.2
Dorset	6,827	-	-
Flinders	775	-	-
George Town	6,636	-	-
Glamorgan/Spring Bay	4,191	-	-
Glenorchy	44,657	109.7	16.4
Hobart	48,705	192.1	26.3
Huon Valley	15,138	11.0	4.9
Kentish	6,085	-	-
King Island	1,564	-	-
Kingborough	33,890	34.8	6.9
Latrobe	9,833	6.3	4.3
Launceston	64,195	83.9	8.7
Meander Valley	18,889	12.7	4.5
Northern Midlands	12,228	-	-
Sorell	13,197	-	-
Southern Midlands	6,046	-	-
Tasman	2,355	-	-
Waratah/Wynyard	13,708	6.7	3.3
West Coast	4,680	-	-
West Tamar	21,817	13.7	4.2
<b>TOTAL TASMANIA</b>	<b>495,352</b>	<b>628</b>	<b>8.5</b>
<b>VICTORIA</b>			
<b>BARWON</b>	<b>270,938</b>	<b>341.8</b>	<b>8.4</b>
Colac-Otway	20,347	12.6	4.1
Golden Plains	10,849	6.5	4.0
Greater Geelong	210,875	305.0	9.6
Queenscliffe	2,999	-	-
Surf Coast	25,868	15.4	4.0
<b>BAYSIDE</b>	<b>556,048</b>	<b>2,187.4</b>	<b>26.2</b>

Medicare Local (ML) and Local Government Areas (LGAs)	2011 Population	Number of chronic hepatitis B notifications	Notification rate per 100,000 per year, 1998-2012#
Bayside	91,813	150.1	10.9
Glen Eira	131,013	456.1	23.2
Kingston	142,425	747.7	35.0
<i>Melbourne</i>	<i>6,284</i>	<i>72.8</i>	<i>77.3</i>
Port Phillip	91,369	367.1	26.8
Stonnington	93,144	393.5	28.2
<b>EASTERN MELBOURNE</b>	<b>397,679</b>	<b>1,030.7</b>	<b>17.3</b>
Knox	149,300	562.0	25.1
Maroondah	103,840	316.9	20.3
Yarra Ranges	144,539	151.8	7.0
<b>FRANKSTON-MORNINGTON PENINSULA</b>	<b>271,063</b>	<b>420.6</b>	<b>10.3</b>
Frankston	126,456	269.3	14.2
Mornington Peninsula	144,607	151.3	7.0
<b>GIPPSLAND</b>	<b>255,720</b>	<b>294.3</b>	<b>7.7</b>
Bass Coast	29,616	35.3	8.0
Baw Baw	42,863	32.1	5.0
East Gippsland	42,193	34.0	5.4
Latrobe	72,395	119.2	11.0
South Gippsland	27,210	20.0	4.9
Wellington	41,443	53.7	8.6
<b>GOULBURN VALLEY</b>	<b>145,753</b>	<b>203.7</b>	<b>9.3</b>
Greater Shepparton	60,448	135.1	14.9
Mitchell	34,637	36.4	7.0
Moir	28,124	18.4	4.4
Murrindindi	13,057	8.8	4.5
Strathbogie	9,487	5.0	3.5
<b>GRAMPIANS</b>	<b>204,447</b>	<b>160.1</b>	<b>5.2</b>
Ararat	11,183	-	-
Ballarat	93,501	93.5	6.7
Central Goldfields	12,495	-	-
<i>Golden Plains</i>	<i>7,917</i>	<i>5.2</i>	<i>4.3</i>
Hepburn	14,368	15.4	7.2
Hindmarsh	5,797	6.4	7.4
Horsham	19,279	9.2	3.2
<i>Moorabool</i>	<i>10,056</i>	<i>7.5</i>	<i>5.0</i>
Northern Grampians	11,844	8.8	5.0
Pyrenees	6,668	-	-
West Wimmera	4,250	-	-
Yarriambiack	7,089	5.0	4.7
<b>GREAT SOUTH COAST</b>	<b>100,298</b>	<b>57.4</b>	<b>3.8</b>
Corangamite	16,376	8.5	3.4
Glenelg	19,576	11.8	4.0
Moyne	15,955	-	-
Southern Grampians	16,362	5.8	2.4
Warrnambool	32,029	28.0	5.8

Medicare Local (ML) and Local Government Areas (LGAs)	2011 Population	Number of chronic hepatitis B notifications	Notification rate per 100,000 per year, 1998-2012#
<b>HUME</b>	<b>195,662</b>	<b>170.9</b>	<b>5.8</b>
Albury*	47,809	64.4	9.0
Alpine	11,879	12.1	6.8
Benalla	13,649	6.0	2.9
Berrigan*	8,066	5.9	4.9
Corowa Shire*	11,001	-	-
Greater Hume Shire*	9,817	10.0	6.8
Indigo	15,182	16.5	7.2
<i>Jerilderie*</i>	<i>1,221</i>	-	-
Mansfield	7,892	-	-
Towong	5,889	-	-
<i>Urana*</i>	<i>920</i>	-	-
Wangaratta	26,816	11.0	2.7
Wodonga	35,520	35.0	6.6
<b>INNER EAST MELBOURNE</b>	<b>591,099</b>	<b>4,691</b>	<b>52.9</b>
Boroondara	159,184	919.0	38.5
Manningham	111,301	925.1	55.4
Monash	169,281	1,594.1	62.8
Whitehorse	151,333	1,252.6	55.2
<b>INNER NORTH WEST MELBOURNE</b>	<b>416,110</b>	<b>3,195.1</b>	<b>51.2</b>
<i>Melbourne</i>	<i>87,335</i>	<i>1,014.0</i>	<i>77.4</i>
Moonee Valley	107,442	628.1	39.0
Moreland	147,244	722.9	32.7
Yarra	74,089	830.0	74.7
<b>LODDON - MALLEE - MURRAY</b>	<b>213,085</b>	<b>262.6</b>	<b>8.2</b>
<i>Buloke</i>	<i>5,521</i>	-	-
Campaspe	36,364	19.9	3.7
Conargo*	1,540	-	-
Deniliquin*	7,121	-	-
Gannawarra	10,368	-	-
Greater Bendigo	100,619	121.0	8.0
Loddon	7,460	5.5	4.9
Mount Alexander	17,592	14.6	5.5
Murray*	6,957	7.6	7.3
<i>Swan Hill</i>	<i>15,581</i>	<i>77.6</i>	<i>33.2</i>
Wakool*	3,962	5.8	9.8
<b>LOWER MURRAY</b>	<b>65,612</b>	<b>178.4</b>	<b>18.1</b>
Balranald*	2,282	-	-
<i>Buloke</i>	<i>867</i>	-	-
Mildura	50,981	130.3	17.0
<i>Swan Hill</i>	<i>4,872</i>	<i>25.7</i>	<i>35.2</i>
Wentworth*	6,610	21.7	21.9
<b>MACEDON RANGES &amp; NORTH WEST MELB.</b>	<b>458,714</b>	<b>4,418.6</b>	<b>64.2</b>
Brimbank	182,733	2,600.0	94.9
<i>Hume</i>	<i>35,162</i>	<i>164.6</i>	<i>31.1</i>



Medicare Local (ML) and Local Government Areas (LGAs)	2011 Population	Number of chronic hepatitis B notifications	Notification rate per 100,000 per year, 1998-2012#
Macedon Ranges	41,859	36.7	5.9
Maribyrnong	71,633	1,128.9	105.1
Melton	109,258	475.4	29.0
Moorabool	18,069	13.0	4.8
<b>NORTHERN MELBOURNE</b>	<b>602,401</b>	<b>3,075.3</b>	<b>34.0</b>
Banyule	118,305	431.7	24.3
Darebin	136,471	1,054.7	51.5
Hume	132,399	608.1	30.6
Nillumbik	60,346	74.0	8.2
Whittlesea	154,880	906.8	39.0
<b>SOUTH EASTERN MELBOURNE</b>	<b>462,162</b>	<b>3,692.4</b>	<b>53.3</b>
Cardinia	74,178	71.4	6.4
Casey	252,380	947.3	25.0
Greater Dandenong	135,604	2,673.6	131.4
<b>SOUTH WESTERN MELBOURNE</b>	<b>245,440</b>	<b>1,396.4</b>	<b>37.9</b>
Hobsons Bay	83,861	543.2	43.2
Wyndham	161,579	853.2	35.2
<b>TOTAL VICTORIA</b>	<b>5,354,052</b>	<b>26,515</b>	<b>33.0</b>
<b>WESTERN AUSTRALIA</b>			
<b>BENTLEY ARMADALE</b>	<b>380,516</b>	<b>1,537.6</b>	<b>26.9</b>
Armadale	62,295	90.0	9.6
Belmont	35,206	170.0	32.2
Canning	85,513	488.4	38.1
Gosnells	106,586	393.2	24.6
Serpentine-Jarrahdale	17,745	10.0	3.8
South Perth	40,738	185.8	30.4
Victoria Park	32,433	200.2	41.1
<b>FREMANTLE</b>	<b>218,903</b>	<b>547.9</b>	<b>16.7</b>
Cockburn	89,687	169.3	12.6
East Fremantle	6,932	7.0	6.7
Fremantle	26,583	81.6	20.5
Melville	95,701	290.0	20.2
<b>GOLDFIELDS-MIDWEST</b>	<b>120,354</b>	<b>470.2</b>	<b>26.0</b>
Carnamah	546	-	-
Carnarvon	5,785	36.8	42.4
Chapman Valley	1,171	-	-
Coolgardie	4,000	10.3	17.2
Coorow	1,064	-	-
Cue	271	-	-
Dundas	1,143	6.0	35.0
Esperance	13,477	9.9	4.9
Exmouth	2,393	-	-
Geraldton-Greenough	36,449	76.3	14.0
Irwin	3,568	-	-
Kalgoorlie/Boulder	31,109	213.7	45.8

Medicare Local (ML) and Local Government Areas (LGAs)	2011 Population	Number of chronic hepatitis B notifications	Notification rate per 100,000 per year, 1998-2012#
Laverton	1,225	7.4	40.2
Leonora	2,512	8.6	22.7
Meekatharra	1,377	10.2	49.2
Menzies	384	-	-
Mingenew	478	-	-
Morawa	890	-	-
Mount Magnet	642	-	-
Mullewa	712	14.0	131.5
Murchison	115	-	-
Ngaanyatjarraku	1,435	32.6	151.7
Northampton	3,191	-	-
Perenjori	903	-	-
Ravensthorpe	2,126	-	-
Sandstone	104	-	-
Shark Bay	857	-	-
Three Springs	614	-	-
Upper Gascoyne	251	-	-
Wiluna	1,160	26.0	149.4
Yalgoo	402	-	-
<b>KIMBERLEY-PILBARA</b>	<b>94,689</b>	<b>961.2</b>	<b>67.7</b>
Ashburton	10,001	11.9	7.9
Broome	14,998	171.0	76.0
Derby-West Kimberley	8,434	197.9	156.4
East Pilbara	11,949	50.6	28.2
Halls Creek	3,561	68.8	128.8
Port Hedland	15,046	321.0	142.2
Roebourne	22,899	75.0	21.8
Wyndham-East Kimberley	7,801	65.0	55.5
<b>PERTH CENTRAL EAST METRO</b>	<b>429,375</b>	<b>1,521.4</b>	<b>23.6</b>
Bassendean	14,405	47.1	21.8
Bayswater	61,266	362.4	39.4
Cambridge	24,965	60.6	16.2
Claremont	9,280	11.8	8.5
Cottesloe	7,605	-	-
Kalamunda	53,570	86.4	10.8
Mosman Park	8,600	23.0	17.8
Mundaring	36,532	61.4	11.2
Nedlands	20,534	59.4	19.3
Peppermint Grove	1,526	-	-
Perth	16,716	122.7	48.9
<i>Stirling</i>	<i>16,787</i>	<i>95.5</i>	<i>37.9</i>
Subiaco	17,575	52.2	19.8
Swan	108,464	331.1	20.4
Vincent	31,550	204.6	43.2
<b>PERTH NORTH METRO</b>	<b>483,398</b>	<b>1,831.6</b>	<b>25.3</b>

Medicare Local (ML) and Local Government Areas (LGAs)	2011 Population	Number of chronic hepatitis B notifications	Notification rate per 100,000 per year, 1998-2012#
Joondalup	152,407	232.9	10.2
<i>Stirling</i>	<i>178,912</i>	<i>1,002.7</i>	<i>37.4</i>
Wanneroo	152,079	596.0	26.1
<b>PERTH SOUTH COASTAL</b>	<b>220,974</b>	<b>258.0</b>	<b>7.8</b>
Kwinana	29,229	67.0	15.3
Mandurah	69,905	64.8	6.2
Murray	14,150	8.2	3.9
Rockingham	104,108	115.0	7.4
Waroon	3,582	-	-
<b>SOUTH WEST WA</b>	<b>283,241</b>	<b>295.6</b>	<b>7.0</b>
Albany	33,651	50.0	9.9
Augusta-Margaret River	11,761	15.0	8.5
Beverley	1,567	-	-
Boddington	2,228	-	-
Boyup Brook	1,589	-	-
Bridgetown-Greenbushes	4,318	-	-
Brookton	931	-	-
Broomehill-Tambellup	1,139	-	-
Bruce Rock	975	-	-
Bunbury	31,351	51.2	10.9
Busselton	30,330	22.0	4.8
Capel	14,637	10.3	4.7
Chittering	4,427	-	-
Collie	9,126	-	-
Corrigin	1,063	-	-
Cranbrook	1,080	-	-
Cuballing	871	-	-
Cunderdin	1,314	-	-
Dalwallinu	1,265	-	-
Dandaragan	3,186	-	-
Dardanup	12,404	9.2	4.9
Denmark	5,193	-	-
Donnybrook-Balingup	5,322	-	-
Dowerin	675	-	-
Dumbleyung	604	-	-
Gingin	4,688	-	-
Gnowangerup	1,270	-	-
Goomalling	985	-	-
Harvey	23,238	24.3	7.0
Jerramungup	1,051	-	-
Katanning	4,184	18.0	28.6
Kellerberrin	1,180	-	-
Kent	510	-	-
Kojonup	1,981	-	-
Kondinin	1,045	-	-

Medicare Local (ML) and Local Government Areas (LGAs)	2011 Population	Number of chronic hepatitis B notifications	Notification rate per 100,000 per year, 1998-2012#
Koorda	434	-	-
Kulin	826	-	-
Lake Grace	1,360	-	-
Manjimup	9,182	8.0	5.8
Merredin	3,282	7.0	14.2
Moora	2,476	6.0	16.2
Mount Marshall	488	-	-
Mukinbudin	489	-	-
Nannup	1,261	-	-
Narembeen	811	-	-
Narrogin (Shire)	874	-	-
Narrogin (Town)	4,220	-	-
Northam	10,558	8.8	5.6
Nungarin	230	-	-
Pingelly	1,163	-	-
Plantagenet	4,882	6.8	9.2
Quairading	1,043	-	-
Tammin	403	-	-
Toodyay	4,387	-	-
Trayning	347	-	-
Victoria Plains	896	-	-
Wagin	1,847	-	-
Wandering	437	-	-
West Arthur	868	-	-
Westonia	275	-	-
Wickepin	749	-	-
Williams	912	-	-
Wongan-Ballidu	1,431	-	-
Woodanilling	417	-	-
Wyalkatchem	523	-	-
Yilgarn	1,635	-	-
York	3,396	-	-
<b>TOTAL WESTERN AUSTRALIA</b>	<b>2,239,170</b>	<b>8,067</b>	<b>24.0</b>
<b>TOTAL AUSTRALIA</b>	<b>21,507,719</b>	<b>98,422</b>	<b>30.5</b>

(Data source: National Notifiable Diseases Surveillance System. Population figures from Australian Bureau of Statistics Census 2011.)

- Denotes data suppressed due to low numbers (<5 notifications).

\* Denotes New South Wales LGAs included in Victorian Medicare Locals.

# 2005-2012 for the Northern Territory.

Note that Notifications were classified by postcode, and then categorised into LGAs. As a number of postcodes are split between multiple LGAs, the number of notifications recorded in a given LGA are often not round numbers.

Totals may not add up due to inclusion of those without an LGA, Medicare Local, or State or Territory of residence.

# CHB VIRAL LOAD TESTING ACCORDING TO MEDICARE LOCAL

Table 10: Number and rate of viral load tests conducted in people living with CHB and not receiving treatment (funded for one service per person per year), according to Medicare Local, 2013; and estimated number of people living with CHB, 2011

	Population, 2011	People living with CHB, 2011	Viral load tests, 2013	Viral load test rate per 100,000, 2013
<b>AUSTRALIAN CAPITAL TERRITORY</b>				
<b>Australian Capital Territory</b>	<b>357,219</b>	<b>3,603</b>	<b>331</b>	<b>92.7</b>
<b>NEW SOUTH WALES</b>				
Central Coast NSW	312,187	2,069	90	28.8
Eastern Sydney	355,597	4,434	367	103.2
Far West NSW	36,308	408	-	-
Hunter Rural^	197,246	1,295	-	-
Hunter Urban^	469,830	3,149	97	20.6
Illawarra-Shoalhaven	368,820	2,853	98	26.6
Inner West Sydney	548,631	9,172	1,242	226.4
Murrumbidgee	178,985	1,293	-	-
Nepean-Blue Mountains	336,923	2,552	71	21.1
New England	175,766	1,450	-	-
North Coast NSW	478,169	3,265	90	18.8
Northern Sydney	380,766	5,129	824	216.4
South Eastern Sydney	442,863	5,746	831	187.6
South Western Sydney	840,610	13,513	2,381	283.2
Southern NSW	189,416	1,271	-	-
Sydney North Shore And Beaches	427,889	4,031	365	85.3
Western NSW	245,534	1,956	-	-
Western Sydney	810,727	12,644	1,526	188.2
<b>NEW SOUTH WALES</b>	<b>6,917,655</b>	<b>77,076</b>	<b>8,349</b>	<b>120.7</b>
<b>NORTHERN TERRITORY</b>				
<b>Northern Territory</b>	<b>211,943</b>	<b>3,556</b>	<b>494</b>	<b>233.1</b>
<b>QUEENSLAND</b>				
Central and North West Queensland	42,556	528	-	-
Central Queensland	204,864	1,542	-	-
Darling Downs-South West Queensland	286,125	2,092	-	-
Far North Queensland	252,456	3,042	96	38.0
Gold Coast	507,537	3,873	144	28.4
Greater Metro South Brisbane	879,977	9,327	645	73.3
Metro North Brisbane	855,073	6,770	209	24.4
Sunshine Coast	352,658	2,165	46	13.0
Townsville-Mackay	389,185	3,076	57	14.6
West Moreton-Oxley	348,487	3,529	291	83.5
Wide Bay	200,803	1,335	-	-
<b>QUEENSLAND</b>	<b>4,332,737</b>	<b>37,427</b>	<b>1,585</b>	<b>36.5</b>

	Population, 2011	People living with CHB, 2011	Viral load tests, 2013	Viral load test rate per 100,000, 2013
<b>SOUTH AUSTRALIA</b>				
Central Adelaide and Hills	493,517	5,388	98	19.9
Country North SA	189,509	1,294	-	-
Country South SA	130,720	870	-	-
Northern Adelaide	388,894	4,036	68	17.5
Southern Adelaide-Fleurieu	386,422	2,753	-	-
<b>SOUTH AUSTRALIA</b>	<b>1,596,570</b>	<b>14,442</b>	<b>218</b>	<b>13.7</b>
<b>TASMANIA</b>				
<b>Tasmania</b>	<b>495,352</b>	<b>3,513</b>	<b>59</b>	<b>11.9</b>
<b>VICTORIA</b>				
Barwon	270,938	1,704	83	30.6
Bayside	556,048	5,634	414	74.5
Eastern Melbourne	397,679	3,205	375	94.3
Frankston-Mornington Peninsula	271,063	1,762	98	36.2
Gippsland	255,720	1,544	64	25.0
Goulburn Valley	145,753	1,039	-	-
Grampians	204,447	1,148	-	-
Great South Coast	100,298	541	-	-
Hume	195,662	1,129	-	-
Inner East Melbourne	591,099	8,946	1,473	249.2
Inner North West Melbourne	416,110	5,582	575	138.2
Loddon-Mallee-Murray	213,085	1,231	68	31.9
Lower Murray	65,612	563	-	-
Macedon Ranges & North Western Melbourne	458,714	6,767	1,528	333.1
Northern Melbourne	602,401	6,616	936	155.4
South Eastern Melbourne	462,162	7,122	1,317	285.0
South Western Melbourne	245,440	2,787	395	160.9
<b>VICTORIA</b>	<b>5,354,042</b>	<b>56,836</b>	<b>7,527</b>	<b>140.6</b>
<b>WESTERN AUSTRALIA</b>				
Bentley-Armadale	380,516	4,615	148	38.9
Fremantle	218,903	2,010	70	32.0
Goldfields-Midwest	120,354	1,161	-	-
Kimberley-Pilbara	94,689	1,476	-	-
Perth Central & East Metro	429,375	4,262	127	29.6
Perth North Metro	483,398	4,954	166	34.3
Perth South Coastal	220,974	1,544	-	-
South West WA	283,241	1,960	-	-
<b>WESTERN AUSTRALIA</b>	<b>2,239,170</b>	<b>22,055</b>	<b>612</b>	<b>27.3</b>
<b>AUSTRALIA</b>	<b>21,507,719</b>	<b>218,567</b>	<b>19,175</b>	<b>89.2</b>

(Data source: Department of Human Services service utilisation data for MBS item no 69482. Population figures from Australian Bureau of Statistics Census 2011.)

- Denotes data suppressed due to low numbers (<20 patients receiving a test).

^2011 Medicare Local boundaries used in data extraction, prior to merging of Hunter Urban and Hunter Rural Medicare Locals. For a list of the LGAs included in Hunter Urban, see Methodological Notes (page 32).

Totals may not add up due to inclusion of those without a Medicare Local or State or Territory of residence.

Table 11: Number of viral load tests performed per six-month period by state and territory, Jun 2011-Nov 2013

Medicare Local Name	Time Period				
	Jun2011 - Nov2011	Dec2011 - May2012	Jun2012 - Nov2012	Dec2012 - May2013	Jun2013 - Nov2013
<b>AUSTRALIAN CAPITAL TERRITORY</b>					
<b>Australian Capital Territory</b>	<b>91</b>	<b>99</b>	<b>155</b>	<b>155</b>	<b>174</b>
<b>NEW SOUTH WALES</b>					
Central Coast NSW	35	28	36	35	55
Eastern Sydney	208	142	163	180	187
Far West NSW	0	-	-	-	-
Hunter Rural^	-	-	-	-	-
Hunter Urban^	33	27	28	38	59
Illawarra - Shoalhaven	60	45	47	59	39
Inner West Sydney	580	513	519	571	671
Murrumbidgee	-	-	-	-	-
Nepean - Blue Mountains	35	26	24	34	37
New England	-	-	-	-	-
North Coast NSW	32	26	44	34	56
Northern Sydney	361	390	409	401	422
South Eastern Sydney	371	332	379	394	437
South Western Sydney	1,169	1,104	1,173	1,180	1,201
Southern NSW	-	-	21	-	24
Sydney North Shore and Beaches	199	178	209	177	188
Western NSW	-	-	-	-	23
Western Sydney	585	668	730	723	803
<b>NEW SOUTH WALES</b>	<b>3,905</b>	<b>3,633</b>	<b>3,945</b>	<b>3,949</b>	<b>4,370</b>
<b>NORTHERN TERRITORY</b>					
<b>Northern Territory</b>	<b>31</b>	<b>110</b>	<b>168</b>	<b>217</b>	<b>265</b>
<b>QUEENSLAND</b>					
Central and North West Queensland	0	-	-	-	0
Central Queensland	-	-	-	-	-
Darling Downs - South West Queensland	-	-	-	20	-
Far North Queensland	41	27	35	49	47
Gold Coast	41	68	50	76	68
Greater Metro South Brisbane	260	254	294	323	322
Metro North Brisbane	74	88	94	116	93
Sunshine Coast	-	-	-	21	25
Townsville - Mackay	-	-	-	31	26
West Moreton - Oxley	134	130	140	169	122
Wide Bay	-	-	-	-	-
<b>QUEENSLAND</b>	<b>603</b>	<b>621</b>	<b>691</b>	<b>838</b>	<b>747</b>
<b>SOUTH AUSTRALIA</b>					
Central Adelaide and Hills	30	25	42	32	66
Country North SA	-	-	-	-	-
Country South SA	-	-	-	-	-
Northern Adelaide	-	-	23	24	44

Medicare Local Name	Time Period				
	Jun2011 - Nov2011	Dec2011 - May2012	Jun2012 - Nov2012	Dec2012 - May2013	Jun2013 - Nov2013
Southern Adelaide - Fleurieu	-	-	-	-	-
<b>SOUTH AUSTRALIA</b>	<b>69</b>	<b>58</b>	<b>79</b>	<b>84</b>	<b>134</b>
<b>TASMANIA</b>					
<b>Tasmania</b>	<b>25</b>	<b>21</b>	<b>24</b>	<b>24</b>	<b>33</b>
<b>VICTORIA</b>					
Barwon	28	31	29	43	40
Bayside	185	202	211	211	202
Eastern Melbourne	159	141	171	180	194
Frankston - Mornington Peninsula	39	40	39	61	37
Gippsland	21	26	21	22	42
Goulburn Valley	20	-	-	20	-
Grampians	-	-	-	20	-
Great South Coast	-	-	-	-	-
Hume	-	-	-	-	23
Inner East Melbourne	618	639	685	684	788
Inner North West Melbourne	221	224	296	268	307
Loddon - Mallee - Murray	25	29	25	29	39
Lower Murray	-	-	-	-	-
Macedon Ranges & North Western Melb.	529	621	749	711	817
Northern Melbourne	273	295	369	402	534
South Eastern Melbourne	726	691	632	708	608
South Western Melbourne	144	200	184	195	200
<b>VICTORIA</b>	<b>3,045</b>	<b>3,201</b>	<b>3,474</b>	<b>3,611</b>	<b>3,916</b>
<b>WESTERN AUSTRALIA</b>					
Bentley - Armadale	43	52	73	58	90
Fremantle	-	24	-	33	37
Goldfields - Midwest	-	-	-	-	-
Kimberley - Pilbara	-	-	-	-	-
Perth Central and East Metro	50	60	73	50	77
Perth North Metro	47	71	67	62	103
Perth South Coastal	-	-	-	-	-
South West WA	-	-	-	-	-
<b>WESTERN AUSTRALIA</b>	<b>180</b>	<b>238</b>	<b>270</b>	<b>244</b>	<b>368</b>
<b>AUSTRALIA TOTAL</b>	<b>7,951</b>	<b>7,985</b>	<b>8,812</b>	<b>9,161</b>	<b>10,014</b>

(Data source: Department of Human Services. Number of patients receiving MBS item 69482.)

- Denotes data suppressed due to low numbers (<20 patients receiving a test).

^2011 Medicare Local boundaries used in data extraction, prior to merging of Hunter Urban and Hunter Rural Medicare Locals. For a list of the LGAs included in Hunter Urban, see Methodological Notes (page 32).

Totals may not add up due to inclusion of those without a Medicare Local or State or Territory of residence.



Table 12: Uptake of antiviral treatment for chronic hepatitis B in Australia according to Medicare Local, 2013

	Population, 2011	People living with CHB, 2011	Number receiving antiviral treatment, 2013	Proportion of people with CHB receiving treatment, 2013 (%)
AUSTRALIAN CAPITAL TERRITORY				
<b>Australian Capital Territory</b>	<b>357,219</b>	<b>3,603</b>	<b>164</b>	<b>4.6%</b>
NEW SOUTH WALES				
Central Coast NSW	312,187	2,069	48	2.3%
Eastern Sydney	355,597	4,434	233	5.2%
Far West NSW	36,308	408	-	-
<i>Hunter Rural</i>	<i>197,246</i>	<i>1,295</i>	<i>12</i>	<i>0.9%</i>
Hunter Urban	469,830	3,149	51	1.6%
Illawarra-Shoalhaven	368,820	2,853	56	3.0%
Inner West Sydney	548,631	9,172	792	8.3%
<i>Murrumbidgee</i>	<i>178,985</i>	<i>1,293</i>	<i>18</i>	<i>1.4%</i>
Nepean-Blue Mountains	336,923	2,552	64	2.8%
<i>New England</i>	<i>175,766</i>	<i>1,450</i>	<i>15</i>	<i>1.0%</i>
North Coast NSW	478,169	3,265	39	1.2%
Northern Sydney	380,766	5,129	542	10.7%
South Eastern Sydney	442,863	5,746	571	9.8%
South Western Sydney	840,610	13,513	1,775	13.0%
Southern NSW	189,416	1,271	32	2.5%
Sydney North Shore And Beaches	427,889	4,031	251	6.0%
<i>Western NSW</i>	<i>245,534</i>	<i>1,956</i>	<i>16</i>	<i>0.8%</i>
Western Sydney	810,727	12,644	1,227	10.1%
<b>NEW SOUTH WALES</b>	<b>6,917,655</b>	<b>77,076</b>	<b>5,871</b>	<b>7.6%</b>
NORTHERN TERRITORY				
<b>Northern Territory</b>	<b>211,943</b>	<b>3,556</b>	<b>86</b>	<b>2.4%</b>
QUEENSLAND				
Central and North West Queensland	42,556	528	-	-
<i>Central Queensland</i>	<i>204,864</i>	<i>1,542</i>	<i>12</i>	<i>0.8%</i>
Darling Downs-South West Queensland	286,125	2,092	21	0.9%
Far North Queensland	252,456	3,042	52	1.8%
Gold Coast	507,537	3,873	97	2.5%
Greater Metro South Brisbane	879,977	9,327	378	4.2%
Metro North Brisbane	855,073	6,770	156	2.3%
Sunshine Coast	352,658	2,165	36	1.6%
Townsville-Mackay	389,185	3,076	35	1.3%
West Moreton-Oxley	348,487	3,529	160	4.7%
<i>Wide Bay</i>	<i>200,803</i>	<i>1,335</i>	<i>15</i>	<i>1.1%</i>
<b>QUEENSLAND</b>	<b>4,332,737</b>	<b>37,427</b>	<b>985</b>	<b>2.6%</b>
SOUTH AUSTRALIA				
Central Adelaide and Hills	493,517	5,388	211	4.3%
<i>Country North SA</i>	<i>189,509</i>	<i>1,294</i>	<i>9</i>	<i>0.7%</i>
<i>Country South SA</i>	<i>130,720</i>	<i>870</i>	<i>8</i>	<i>0.9%</i>

	Population, 2011	People living with CHB, 2011	Number receiving antiviral treatment, 2013	Proportion of people with CHB receiving treatment, 2013 (%)
Northern Adelaide	388,894	4,036	135	3.8%
Southern Adelaide-Fleurieu	386,422	2,753	54	1.9%
<b>SOUTH AUSTRALIA</b>	<b>1,596,570</b>	<b>14,442</b>	<b>416</b>	<b>2.9%</b>
<b>TASMANIA</b>				
<b>Tasmania</b>	<b>495,352</b>	<b>3,513</b>	<b>38</b>	<b>1.1%</b>
<b>VICTORIA</b>				
Barwon	270,938	1,704	23	1.4%
Bayside	556,048	5,634	231	4.3%
Eastern Melbourne	397,679	3,205	170	5.4%
Frankston-Mornington Peninsula	271,063	1,762	60	3.8%
Gippsland	255,720	1,544	30	1.8%
Goulburn Valley	145,753	1,039	20	1.6%
<i>Grampians</i>	<i>204,447</i>	<i>1,148</i>	<i>8</i>	<i>0.7%</i>
<i>Great South Coast</i>	<i>100,298</i>	<i>541</i>	<i>7</i>	<i>1.3%</i>
<i>Hume</i>	<i>195,662</i>	<i>1,129</i>	<i>18</i>	<i>1.6%</i>
Inner East Melbourne	591,099	8,946	709	8.3%
Inner North West Melbourne	416,110	5,582	280	5.1%
Loddon-Mallee-Murray	213,085	1,231	30	2.5%
<i>Lower Murray</i>	<i>65,612</i>	<i>563</i>	<i>13</i>	<i>2.3%</i>
Macedon Ranges & North Western Melb.	458,714	6,767	550	8.1%
Northern Melbourne	602,401	6,616	411	6.2%
South Eastern Melbourne	462,162	7,122	566	8.3%
South Western Melbourne	245,440	2,787	152	5.5%
<b>VICTORIA</b>	<b>5,354,042</b>	<b>56,836</b>	<b>3,303</b>	<b>5.8%</b>
<b>WESTERN AUSTRALIA</b>				
Bentley-Armadale	380,516	4,615	153	3.3%
Fremantle	218,903	2,010	79	4.3%
<i>Goldfields-Midwest</i>	<i>120,354</i>	<i>1,161</i>	<i>10</i>	<i>0.8%</i>
<i>Kimberley-Pilbara</i>	<i>94,689</i>	<i>1,476</i>	<i>9</i>	<i>0.6%</i>
Perth Central & East Metro	429,375	4,262	182	4.3%
Perth North Metro	483,398	4,954	180	4.1%
Perth South Coastal	220,974	1,544	25	1.5%
<i>South West WA</i>	<i>283,241</i>	<i>1,960</i>	<i>19</i>	<i>1.0%</i>
<b>WESTERN AUSTRALIA</b>	<b>2,239,170</b>	<b>22,055</b>	<b>664</b>	<b>3.0%</b>
<b>AUSTRALIA</b>	<b>21,507,719</b>	<b>218,567</b>	<b>11,527</b>	<b>5.3%</b>

(Data source: Department of Human Services.)

- Denotes data suppressed due to low numbers (<20 individuals receiving treatment).

*Italics* denote data derived from number of scripts rather than number of patients, due to low numbers. See Methodological Notes (page 34) for detail.

^2011 Medicare Local boundaries used in data extraction, prior to merging of Hunter Urban and Hunter Rural Medicare Locals. For a list of the LGAs included in Hunter Urban, see Methodological Notes (page 32).

Totals may not add up due to inclusion of those without a Medicare Local or State or Territory of residence.

**Table 13: Proportion of people in care (received antiviral treatment or a yearly viral load test) by Medicare Local, 2013**

	Population, 2011	People living with CHB, 2011	Number in care, 2013	Proportion in care, 2013 (%)	Number not receiving care, 2013
<b>AUSTRALIAN CAPITAL TERRITORY</b>					
<b>Australian Capital Territory</b>	<b>357,219</b>	<b>3,603</b>	<b>493</b>	<b>13.7%</b>	<b>3110</b>
<b>NEW SOUTH WALES</b>					
Central Coast NSW	312,187	2,069	138	6.7%	1,931
Eastern Sydney	355,597	4,434	600	13.5%	3,834
Far West NSW	36,308	408	-	-	-
<i>Hunter Rural</i> <sup>^</sup>	<i>197,246</i>	<i>1,295</i>	<i>22</i>	<i>1.7%</i>	<i>1723</i>
<i>Hunter Urban</i> <sup>^</sup>	<i>469,830</i>	<i>3,149</i>	<i>148</i>	<i>4.7%</i>	<i>2981</i>
Illawarra-Shoalhaven	368,820	2,853	154	5.4%	1,265
Inner West Sydney	548,631	9,172	2,034	22.2%	2,417
<i>Murrumbidgee</i>	<i>178,985</i>	<i>1,293</i>	<i>28</i>	<i>2.1%</i>	<i>1,425</i>
Nepean-Blue Mountains	336,923	2,552	135	5.3%	3,136
<i>New England</i>	<i>175,766</i>	<i>1,450</i>	<i>25</i>	<i>1.7%</i>	<i>3,764</i>
North Coast NSW	478,169	3,265	129	4.0%	4,344
Northern Sydney	380,766	5,129	1,365	26.6%	9,357
South Eastern Sydney	442,863	5,746	1,402	24.4%	1,229
South Western Sydney	840,610	13,513	4,156	30.8%	3,415
<i>Southern NSW</i>	<i>189,416</i>	<i>1,271</i>	<i>42</i>	<i>3.3%</i>	<i>1,930</i>
Sydney North Shore And Beaches	427,889	4,031	616	15.3%	9,891
<i>Western NSW</i>	<i>245,534</i>	<i>1,956</i>	<i>26</i>	<i>1.4%</i>	<i>2,699</i>
Western Sydney	810,727	12,644	2,753	21.8%	7,138
<b>NEW SOUTH WALES</b>	<b>6,917,655</b>	<b>77,076</b>	<b>14,237</b>	<b>18.5%</b>	<b>62,839</b>
<b>NORTHERN TERRITORY</b>					
<b>Northern Territory</b>	<b>211,943</b>	<b>3,556</b>	<b>568</b>	<b>16.0%</b>	<b>2,988</b>
<b>QUEENSLAND</b>					
Central and North West Queensland	42,556	528	-	-	-
<i>Central Queensland</i>	<i>204,864</i>	<i>1,542</i>	<i>22</i>	<i>1.4%</i>	<i>1,520</i>
<i>Darling Downs-South West Queensland</i>	<i>286,125</i>	<i>2,092</i>	<i>29</i>	<i>1.4%</i>	<i>2,063</i>
Far North Queensland	252,456	3,042	148	4.9%	2,894
Gold Coast	507,537	3,873	241	6.2%	3,632
Greater Metro South Brisbane	879,977	9,327	1,023	11.0%	8,304
Metro North Brisbane	855,073	6,770	365	5.4%	6,405
Sunshine Coast	352,658	2,165	82	3.8%	2,083
Townsville-Mackay	389,185	3,076	92	3.0%	2,984
West Moreton-Oxley	348,487	3,529	451	12.8%	3,078
<i>Wide Bay</i>	<i>200,803</i>	<i>1,335</i>	<i>25</i>	<i>1.9%</i>	<i>1,310</i>
<b>QUEENSLAND</b>	<b>4,332,737</b>	<b>37,427</b>	<b>2,580</b>	<b>6.9%</b>	<b>34,847</b>
<b>SOUTH AUSTRALIA</b>					
Central Adelaide and Hills	493,517	5,388	309	5.7%	5,079
<i>Country North SA</i>	<i>189,509</i>	<i>1,294</i>	<i>19</i>	<i>1.4%</i>	<i>1,275</i>
<i>Country South SA</i>	<i>130,720</i>	<i>870</i>	<i>18</i>	<i>2.0%</i>	<i>864</i>

	Population, 2011	People living with CHB, 2011	Number in care, 2013	Proportion in care, 2013 (%)	Number not receiving care, 2013
Northern Adelaide	388,894	4,036	203	5.0%	3,833
<i>Southern Adelaide-Fleurieu</i>	386,422	2,753	64	2.3%	2,689
<b>SOUTH AUSTRALIA</b>	<b>1,596,570</b>	<b>14,442</b>	<b>630</b>	<b>4.4%</b>	<b>13,812</b>
<b>TASMANIA</b>					
<b>Tasmania</b>	<b>495,352</b>	<b>3,513</b>	<b>95</b>	<b>2.7%</b>	<b>3,418</b>
<b>VICTORIA</b>					
Barwon	270,938	1,704	106	6.2%	1,598
Bayside	556,048	5,634	644	11.4%	4,990
Eastern Melbourne	397,679	3,205	544	17.0%	2,661
Frankston-Mornington Peninsula	271,063	1,762	158	9.0%	1,604
Gippsland	255,720	1,544	94	6.1%	1,450
<i>Goulburn Valley</i>	<i>145,753</i>	<i>1,039</i>	27	2.6%	<i>1,012</i>
<i>Grampians</i>	<i>204,447</i>	<i>1,148</i>	18	1.6%	<i>1,130</i>
<i>Great South Coast</i>	<i>100,298</i>	<i>541</i>	17	3.2%	<i>524</i>
<i>Hume</i>	<i>195,662</i>	<i>1,129</i>	28	2.5%	<i>1,101</i>
Inner East Melbourne	591,099	8,946	2,181	24.4%	6,765
Inner North West Melbourne	416,110	5,582	855	15.3%	4,727
Loddon-Mallee-Murray	213,085	1,231	98	8.0%	1,133
<i>Lower Murray</i>	<i>65,612</i>	<i>563</i>	23	4.1%	<i>540</i>
Macedon Ranges & North Western Melb.	458,714	6,767	2,078	30.7%	4,689
Northern Melbourne	602,401	6,616	1,347	20.4%	5,269
South Eastern Melbourne	462,162	7,122	1,882	26.4%	5,240
South Western Melbourne	245,440	2,787	547	19.6%	2,240
<b>VICTORIA</b>	<b>5,354,042</b>	<b>56,836</b>	<b>10,819</b>	<b>19.0%</b>	<b>46,017</b>
<b>WESTERN AUSTRALIA</b>					
Bentley-Armadale	380,516	4,615	301	6.5%	4,314
Fremantle	218,903	2,010	149	7.4%	1,861
<i>Goldfields-Midwest</i>	<i>120,354</i>	<i>1,161</i>	20	1.7%	<i>1,141</i>
<i>Kimberley-Pilbara</i>	<i>94,689</i>	<i>1,476</i>	19	1.3%	<i>1,457</i>
Perth Central & East Metro	429,375	4,262	309	7.3%	3,953
Perth North Metro	483,398	4,954	345	7.0%	4,609
<i>Perth South Coastal</i>	<i>220,974</i>	<i>1,544</i>	33	2.1%	<i>1,511</i>
<i>South West WA</i>	<i>283,241</i>	<i>1,960</i>	29	1.5%	<i>1,931</i>
<b>WESTERN AUSTRALIA</b>	<b>2,239,170</b>	<b>22,055</b>	<b>1,278</b>	<b>5.8%</b>	<b>20,777</b>
<b>AUSTRALIA</b>	<b>21,507,719</b>	<b>218,567</b>	<b>30,700</b>	<b>14.0%</b>	<b>187,867</b>

(Data source: Department of Human Services.)

- Denotes data suppressed due to low numbers (<20 individuals receiving treatment).

Italics denote data imputed from average number of tests per Medicare Local in cases where suppression applied. See Methodological Notes (page 33) for detail.

^2011 Medicare Local boundaries used in data extraction, prior to merging of Hunter Urban and Hunter Rural Medicare Locals. For a list of the LGAs included in Hunter Urban, see Methodological Notes (page 32).

Totals may not add up due to inclusion of those without a Medicare Local or State or Territory of residence.

**Table 14: Hepatitis B immunisation status of children in Australia at 1 year of age, by Medicare Local, 2012-13**

Medicare Local Name	Number of registered children	Number fully immunised	Proportion fully immunised (%)	Proportion with objection (%)	Number of non-immunised children
<b>AUSTRALIAN CAPITAL TERRITORY</b>					
<b>Australian Capital Territory</b>	<b>5,336</b>	<b>4,962</b>	<b>93.0%</b>	<b>0.56%</b>	<b>374</b>
<b>NEW SOUTH WALES</b>					
Central Coast NSW	4,051	3,767	93.0%	0.94%	284
Eastern Sydney	4,493	3,966	88.3%	0.73%	527
Far West NSW	533	463	86.9%	-	70
Hunter	9,032	8,441	93.5%	0.81%	591
Illawarra - Shoalhaven	4,592	4,206	91.6%	0.91%	386
Inner West Sydney	8,256	7,473	90.5%	0.80%	783
Murrumbidgee	2,453	2,257	92.0%	0.65%	196
Nepean - Blue Mountains	4,900	4,494	91.7%	0.73%	406
New England	2,558	2,352	91.9%	1.06%	206
North Coast NSW	5,641	4,857	86.1%	3.12%	784
Northern Sydney	4,381	3,983	90.9%	0.68%	398
South Eastern Sydney	6,277	5,751	91.6%	0.70%	526
South Western Sydney	13,399	12,104	90.3%	0.34%	1,295
Sydney North Shore and Beaches	6,066	5,469	90.2%	1.19%	597
Southern NSW	2,205	2,022	91.7%	1.32%	183
Western NSW	3,570	3,251	91.1%	0.34%	319
Western Sydney	13,963	12,610	90.3%	0.36%	1,353
<b>NEW SOUTH WALES</b>	<b>96370</b>	<b>87,466</b>	<b>90.8%</b>	<b>0.82%</b>	<b>8,904</b>
<b>NORTHERN TERRITORY</b>					
<b>Northern Territory</b>	<b>3,832</b>	<b>3,503</b>	<b>91.4%</b>	<b>0.68%</b>	<b>329</b>
<b>QUEENSLAND</b>					
Central and North West Queensland	777	715	92.0%	-	62
Central Queensland	3,338	3,098	92.8%	0.48%	240
Darling Downs - South West Queensland	4,229	3,908	92.4%	1.35%	321
Far North Queensland	3,970	3,574	90.0%	1.81%	396
Gold Coast	6,819	6,187	90.7%	1.88%	632
Greater Metro South Brisbane	13,112	12,113	92.4%	1.21%	999
Metro North Brisbane	11,758	10,918	92.9%	1.12%	840
Sunshine Coast	4,080	3,657	89.6%	3.09%	423
Townsville - Mackay	5,979	5,547	92.8%	0.64%	432
West Moreton - Oxley	5,764	5,290	91.8%	0.95%	474
Wide Bay	2,351	2,154	91.6%	1.45%	197
<b>QUEENSLAND</b>	<b>62,177</b>	<b>57,161</b>	<b>91.9%</b>	<b>1.31%</b>	<b>5,016</b>
<b>SOUTH AUSTRALIA</b>					
Central Adelaide and Hills	5,422	4,859	89.6%	1.86%	563
Country North SA	2,508	2,294	91.5%	1.04%	214
Country South SA	1,546	1,438	93.0%	0.97%	108

Medicare Local Name	Number of registered children	Number fully immunised	Proportion fully immunised (%)	Proportion with objection (%)	Number of non-immunised children
Northern Adelaide	5,896	5,427	92.0%	0.86%	469
Southern Adelaide - Fleurieu	4,549	4,158	91.4%	1.38%	391
<b>SOUTH AUSTRALIA</b>	<b>19921</b>	<b>18,176</b>	<b>91.2%</b>	<b>1.29%</b>	<b>1,745</b>
<b>TASMANIA</b>					
<b>Tasmania</b>	<b>6,084</b>	<b>5,607</b>	<b>92.2%</b>	<b>1.18%</b>	<b>477</b>
<b>VICTORIA</b>					
Barwon	3,494	3,257	93.2%	0.74%	237
Bayside	6,780	6,183	91.2%	1.24%	597
Eastern Melbourne	5,188	4,725	91.1%	1.66%	463
Frankston - Mornington Peninsula	3,574	3,267	91.4%	1.09%	307
Gippsland	3,102	2,883	92.9%	1.00%	219
Goulburn Valley	1,954	1,807	92.5%	0.92%	147
Grampians	2,484	2,305	92.8%	1.25%	179
Great South Coast	1,241	1,173	94.5%	1.37%	68
Hume	2,280	2,141	93.9%	0.61%	139
Inner East Melbourne	6,332	5,817	91.9%	0.99%	515
Inner North West Melbourne	5,170	4,717	91.2%	0.79%	453
Loddon - Mallee - Murray	2,602	2,359	90.7%	1.11%	243
Lower Murray	871	784	90.0%	1.26%	87
Macedon Ranges & North Western Melb.	7,363	6,738	91.5%	0.56%	625
Northern Melbourne	9,297	8,542	91.9%	0.89%	755
South Eastern Melbourne	7,734	7,032	90.9%	0.62%	702
South Western Melbourne	4,974	4,481	90.1%	0.66%	493
<b>VICTORIA</b>	<b>74,440</b>	<b>68,211</b>	<b>91.6%</b>	<b>0.93%</b>	<b>6,229</b>
<b>WESTERN AUSTRALIA</b>					
Bentley - Armadale	5,811	5,146	88.6%	1.41%	665
Fremantle	2,897	2,623	90.5%	1.73%	274
Goldfields - Midwest	1,796	1,603	89.3%	0.89%	193
Kimberley - Pilbara	1,579	1,409	89.2%	1.33%	170
Perth Central and East Metro	5,405	4,869	90.1%	1.48%	536
Perth North Metro	7,295	6,671	91.4%	1.07%	624
Perth South Coastal	3,564	3,186	89.4%	0.95%	378
South West WA	3,722	3,380	90.8%	2.10%	342
<b>WESTERN AUSTRALIA</b>	<b>32,069</b>	<b>28,887</b>	<b>90.1%</b>	<b>1.37%</b>	<b>3,182</b>
<b>AUSTRALIA TOTAL</b>	<b>300,229</b>	<b>273,973</b>	<b>91.3%</b>	<b>1.03%</b>	<b>26,256</b>

(Data source: National Health Performance Authority.)

- Denotes data suppressed due to low numbers (<5 individuals).

Totals may not add up due to inclusion of those without a Medicare Local or State or Territory of residence.

**Table 15: Hepatocellular carcinoma incidence by Medicare Local, 1999-2012 (time period varies according to jurisdiction)**

	Population, 2011	Time period of data available	Number of HCC cases	Incidence rate per 100,000 per year
<b>AUSTRALIAN CAPITAL TERRITORY</b>				
<b>Australian Capital Territory</b>	<b>357,219</b>	<b>1999-2009</b>	<b>92</b>	<b>2.3</b>
<b>NEW SOUTH WALES</b>				
Central Coast NSW	312,187	1999-2008	138	4.4
Eastern Sydney	355,597	1999-2008	162	4.6
Far West NSW	36,308	1999-2008	-	-
Hunter	667,076	1999-2008	172	2.6
Illawarra-Shoalhaven	368,820	1999-2008	114	3.1
Inner West Sydney	548,631	1999-2008	271	4.9
Murrumbidgee	178,985	1999-2008	-	-
Nepean-Blue Mountains	336,923	1999-2008	61	1.8
New England	175,766	1999-2008	-	-
North Coast NSW	478,169	1999-2008	158	3.3
Northern Sydney	380,766	1999-2008	134	3.5
South Eastern Sydney	442,863	1999-2008	163	3.7
South Western Sydney	840,610	1999-2008	416	4.9
Southern NSW	189,416	1999-2008	92	4.9
Sydney North Shore And Beaches	427,889	1999-2008	136	3.2
Western NSW	245,534	1999-2008	-	-
Western Sydney	810,727	1999-2008	250	3.1
<b>NEW SOUTH WALES</b>	<b>6,917,655</b>	<b>1999-2008</b>	<b>2,380<sup>^</sup></b>	<b>3.4</b>
<b>NORTHERN TERRITORY</b>				
<b>Northern Territory</b>	<b>211,943</b>	<b>1999-2011</b>	<b>122</b>	<b>4.4</b>
<b>QUEENSLAND</b>				
Central and North West Queensland	42,556	1999-2010	13	2.5
Central Queensland	204,864	1999-2010	41	1.7
Darling Downs-South West Queensland	286,125	1999-2010	64	1.9
Far North Queensland	252,456	1999-2010	100	3.3
Gold Coast	507,537	1999-2010	142	2.3
Greater Metro South Brisbane	879,977	1999-2010	274	2.6
Metro North Brisbane	855,073	1999-2010	224	2.2
Sunshine Coast	352,658	1999-2010	96	2.3
Townsville-Mackay	389,185	1999-2010	109	2.3
West Moreton-Oxley	348,487	1999-2010	122	2.9
Wide Bay	200,803	1999-2010	55	2.3
<b>QUEENSLAND</b>	<b>4,332,737</b>	<b>1999-2010</b>	<b>1,262<sup>#</sup></b>	<b>2.4</b>
<b>SOUTH AUSTRALIA</b>				
Central Adelaide and Hills	493,517	1999-2010	253	4.3
Country North SA	189,509	1999-2010	58	2.6
Country South SA	130,720	1999-2010	46	2.9

	Population, 2011	Time period of data available	Number of HCC cases	Incidence rate per 100,000 per year
Northern Adelaide	388,894	1999-2010	131	2.8
Southern Adelaide-Fleurieu	386,422	1999-2010	159	3.4
<b>SOUTH AUSTRALIA</b>	<b>1,596,570</b>	<b>1999-2010</b>	<b>647</b>	<b>3.4</b>
<b>TASMANIA</b>				
<b>Tasmania</b>	<b>495,352</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>
<b>VICTORIA</b>				
Barwon	270,938	1999-2012	66	1.7
Bayside	556,048	1999-2012	161	2.1
Eastern Melbourne	397,679	1999-2012	78	1.4
Frankston-Mornington Peninsula	271,063	1999-2012	68	1.8
Gippsland	255,720	1999-2012	84	2.3
Goulburn Valley	145,753	1999-2012	32	1.6
Grampians	204,447	1999-2012	45	1.6
Great South Coast	100,298	1999-2012	22	1.6
Hume	195,662	1999-2012	26	0.9
Inner East Melbourne	591,099	1999-2012	203	2.5
Inner North West Melbourne	416,110	1999-2012	200	3.4
Loddon-Mallee-Murray	213,085	1999-2012	36	1.2
Lower Murray	65,612	1999-2012	22	2.4
Macedon Ranges & North Western Melb.	458,714	1999-2012	151	2.4
Northern Melbourne	602,401	1999-2012	207	2.5
South Eastern Melbourne	462,162	1999-2012	121	1.9
South Western Melbourne	245,440	1999-2012	61	1.8
<b>VICTORIA</b>	<b>5,354,042</b>	<b>1999-2012</b>	<b>1,583</b>	<b>2.1</b>
<b>WESTERN AUSTRALIA</b>				
Bentley-Armadale	380,516	1999-2012	160	3.0
Fremantle	218,903	1999-2012	116	3.8
Goldfields-Midwest	120,354	1999-2012	55	3.3
Kimberley-Pilbara	94,689	1999-2012	33	2.5
Perth Central & East Metro	429,375	1999-2012	235	3.9
Perth North Metro	483,398	1999-2012	205	3.0
Perth South Coastal	220,974	1999-2012	76	2.5
South West WA	283,241	1999-2012	77	1.9
<b>WESTERN AUSTRALIA</b>	<b>2,239,170</b>	<b>1999-2012</b>	<b>957</b>	<b>3.1</b>

(Data source: State and Territory Cancer Registries.)

#Queensland total includes 22 cases with unknown Medicare Local

^New South Wales total includes 115 cases which were not assigned to a Medicare Local due to data suppression at the Local Government Area level; and 21 cases which were in LGAs assigned to Victorian Medicare Locals. Cases from different states were not combined due to case definition differences between state-based registries.

- Denotes data suppressed due to low numbers (more than half of LGAs within the Medicare Local had data suppressed).

- Medicare Local with a high number of LGAs (>50%) suppressed due to low numbers.

Data not available from the Tasmanian Cancer Registry at time of reporting.



Table 16: Age distribution of Medicare Local residents, 2013

Medicare Local Name	Population, 2011	Proportion aged 50 and over (%)	Proportion aged 65 and over (%)
AUSTRALIAN CAPITAL TERRITORY			
<b>Australian Capital Territory</b>	<b>357,219</b>	<b>27.8%</b>	<b>10.5%</b>
Central Coast NSW	312,187	37.6%	18.7%
Eastern Sydney	355,597	27.8%	12.4%
Far West NSW	36,308	36.6%	16.1%
Hunter	667,076	36.5%	17.1%
Illawarra - Shoalhaven	368,820	36.8%	17.6%
Inner West Sydney	548,631	27.5%	11.7%
Murrumbidgee	178,985	34.7%	15.9%
Nepean - Blue Mountains	336,923	31.0%	11.6%
New England	175,766	36.6%	16.8%
North Coast NSW	478,169	42.2%	20.0%
Northern Sydney	380,766	33.8%	15.2%
South Eastern Sydney	442,863	32.8%	14.7%
South Western Sydney	840,610	29.1%	11.5%
Southern NSW	189,416	38.8%	17.0%
Sydney North Shore and Beaches	427,889	31.9%	14.4%
Western NSW	245,534	35.3%	16.3%
Western Sydney	810,727	26.8%	10.4%
<b>NEW SOUTH WALES</b>	<b>6,917,655</b>	<b>32.8%</b>	<b>14.5%</b>
NORTHERN TERRITORY			
<b>Northern Territory</b>	<b>231,331</b>	<b>21.7%</b>	<b>5.5%</b>
QUEENSLAND			
Central and North West Queensland	42,556	24.4%	8.3%
Central Queensland	204,864	29.0%	11.1%
Darling Downs - South West Queensland	286,125	34.3%	15.4%
Far North Queensland	252,456	30.2%	11.3%
Gold Coast	507,537	32.6%	14.3%
Greater Metro South Brisbane	879,977	28.3%	11.2%
Metro North Brisbane	855,073	29.4%	12.4%
Sunshine Coast	352,658	38.7%	17.9%
Townsville - Mackay	389,185	28.4%	10.6%
West Moreton - Oxley	348,487	27.8%	10.9%
Wide Bay	200,803	41.7%	20.0%
<b>QUEENSLAND</b>	<b>4,332,737</b>	<b>31.0%</b>	<b>12.9%</b>
SOUTH AUSTRALIA			
Central Adelaide and Hills	493,517	35.6%	16.6%
Country North SA	189,509	37.4%	16.7%
Country South SA	130,720	37.5%	16.7%
Northern Adelaide	388,894	30.8%	13.2%

Medicare Local Name	Population, 2011	Proportion aged 50 and over (%)	Proportion aged 65 and over (%)
Southern Adelaide - Fleurieu	386,422	37.5%	17.0%
<b>SOUTH AUSTRALIA</b>	<b>1,596,570</b>	<b>35.3%</b>	<b>15.9%</b>
<b>TASMANIA</b>			
<b>Tasmania</b>	<b>495,352</b>	<b>36.8%</b>	<b>16.1%</b>
<b>VICTORIA</b>			
Barwon	270,938	35.7%	16.4%
Bayside	556,048	31.9%	14.5%
Eastern Melbourne	397,679	32.5%	13.0%
Frankston - Mornington Peninsula	271,063	36.6%	17.6%
Gippsland	255,720	39.6%	18.2%
Goulburn Valley	145,753	36.0%	16.1%
Grampians	204,447	37.8%	17.3%
Great South Coast	100,298	37.6%	17.2%
Hume	195,662	38.0%	17.2%
Inner East Melbourne	591,099	34.6%	16.7%
Inner North West Melbourne	416,110	26.6%	12.3%
Loddon - Mallee - Murray	213,085	38.6%	18.1%
Lower Murray	65,612	35.4%	15.7%
Macedon Ranges & North Western Melb.	458,714	27.1%	10.1%
Northern Melbourne	602,401	28.7%	11.9%
South Eastern Melbourne	462,162	26.8%	10.6%
South Western Melbourne	245,440	24.5%	9.2%
<b>VICTORIA</b>	<b>5,534,042</b>	<b>31.9%</b>	<b>14.0%</b>
<b>WESTERN AUSTRALIA</b>			
Bentley - Armadale	380,516	28.6%	11.4%
Fremantle	218,903	32.5%	13.5%
Goldfields - Midwest	120,354	28.0%	10.0%
Kimberley - Pilbara	94,689	18.1%	3.1%
Perth Central and East Metro	429,375	30.8%	12.6%
Perth North Metro	483,398	29.0%	11.5%
Perth South Coastal	220,974	31.6%	14.4%
South West WA	283,241	35.4%	14.6%
<b>WESTERN AUSTRALIA</b>	<b>2,239,170</b>	<b>30.2%</b>	<b>12.1%</b>
<b>AUSTRALIA TOTAL</b>	<b>21,507,719</b>	<b>32.0%</b>	<b>13.8%</b>

(Data source: Public Health Information Data Unit.)

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