

Supplement to the
Viral Hepatitis Mapping Project: Hepatitis B; National Report 2021
Changes to prevalence estimates and additional data

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Background to hepatitis B estimates and changes

- Estimates of hepatitis B in Australia are produced as part of the Surveillance for Hepatitis B Indicators Project, and have been the basis for measurement of Australia's progress toward National Strategy Targets since 2016. They are reported in the [National Surveillance for Hepatitis B Indicators Report](#), published annually. The national and state and territory data are also used as the basis for hepatitis B estimates in the [Viral Hepatitis Mapping Project National Report](#).
- The project is conducted with the guidance of the WHO Collaborating Centre for Viral Hepatitis Research Advisory Group, which contains representatives from government, community organisations, workforce development, people with lived experience of chronic hepatitis B (CHB), epidemiological and modelling research bodies, and people with clinical experience of CHB.
- The number of people living with CHB in Australia and in each state and territory is estimated using a mathematical modelling approach, which accounts for various factors including diversity in prevalence and impact of overseas migration, incorporating detailed disease phase dynamics, and examining the impact of vaccination and antiviral treatment on mortality attributable to CHB at a population level.
- The number of people living with CHB is then also estimated in each Primary Health Network (PHN) and Statistical Area 3 (SA3), using a model which accounts for the variation in the distribution and demographics of the Aboriginal and Torres Strait Islander and overseas-born populations according to region.
- Over time, the estimated number of people living with CHB has been subject to incremental changes as these models and methods have been updated. As these estimates are used as the denominators for CHB treatment and care uptake, changes are consequently reflected in these indicators as well.
- Key changes made for the current report are detailed in this document. All changes presented are comparisons between the current 2021 estimates and what the estimates *would have been in 2021* without the methodological changes. This is done in order to control for simple population changes over time that are not related to these updates, and allow for more robust comparison of changes. All estimates use population data from the 2021 Australian Census of Population and Housing.
- For full methodological information, definitions, and data source information, see the [Viral Hepatitis Mapping Project: Hepatitis B; National Report 2021](#).

Table of key changes incorporated in the *Viral Hepatitis Mapping Project: Hepatitis B; National Report 2021*

Data component	Change	Impact	Section
Estimated number of people living with CHB in Australia	Mathematical model reviewed and inputs revised, including prevalence by country of birth. For more detail, see the relevant explanatory document .	Reduction in the total number of people estimated to be living with CHB in Australia and in prevalence, with variation by state and territory.	People living with CHB by state and territory
Estimates of CHB among men who have sex with men	Reduced prevalence of CHB among men who have sex with men to reflect the impact of immunisation in younger cohorts.	Reduction in the estimated number of men who have sex with men who have CHB and consequently the proportion of the total this population represents.	People living with CHB by priority population
Estimates of CHB among people who inject drugs	Reduced prevalence of CHB among people who inject drugs to reflect the impact of immunisation in younger cohorts. Reduced total number of people who inject drugs to reflect estimates from the latest National Drug Strategy Household Survey.	Reduction in the estimated number of people who inject drugs who have CHB and consequently the proportion of the total they represent.	People living with CHB by priority population
Estimates of CHB among those born overseas	Adjustment of prevalence by country of birth to better reflect current evidence, including the impact of vaccination.	Impacts varied by country of birth.	People living with CHB by priority population CHB prevalence by country of birth
Estimates of CHB by PHN and SA3	Adjustment of prevalence in each area to reflect the age structure of the overseas-born population, as age is strongly associated with prevalence. Reduction of prevalence in Australian-born people living in non-metropolitan areas to reflect lower likelihood of having an overseas-born parent.	CHB prevalence generally reduced in areas with younger migrants and increased in areas with older migrants. Estimated CHB prevalence reduced in many non-metropolitan regions where Australian-born non-Indigenous people made up the majority of people with CHB (see National Viral Hepatitis Mapping Report 2021: Hepatitis B , Figure A.7).	CHB prevalence and number of people living with CHB by PHN
Estimates of CHB among Aboriginal and Torres Strait Islander people	Reduction of CHB prevalence in Aboriginal and Torres Strait Islander populations in remote and very remote Queensland, to align with local clinical evidence.	Reduction in the estimated number of people with CHB and prevalence in Aboriginal and Torres Strait Islander people, and therefore the proportion of the total this population represents. Reduction in the estimated number of people with CHB and prevalence in Northern Queensland and Western Queensland PHNs.	People living with CHB by priority population CHB prevalence and number of people living with CHB by PHN

CHB, chronic hepatitis B. PHN, Primary Health Network. SA3, Statistical Area 3.

Data before and after key changes incorporated for the *Viral Hepatitis Mapping Project: Hepatitis B; National Report 2021*

People living with CHB, by state and territory

Changes to these estimates largely related to reduction in prevalence estimates for those born overseas, so the largest reductions were seen in states and territories where this proportion is larger (ACT, NSW, Vic., WA and SA). In states and territories where Australian-born people (including Aboriginal and Torres Strait Islander people) make up a larger proportion of the number living with CHB, there was no reduction (Tas.) or a smaller reduction (NT and Qld).

Table 1: Comparison of estimates of the number of people estimated to be living with CHB and population prevalence in 2021, by state and territory, before and after the incorporation of model revisions

State/territory	Previous estimate, people living with CHB	Previous estimate, prevalence	New estimate, people living with CHB	New estimate, prevalence	Percent change in prevalence
ACT	3,212	0.71%	2,840	0.63%	-11.3%
NSW	79,805	0.99%	72,058	0.89%	-10.1%
NT	4,615	1.85%	4,325	1.73%	-6.5%
Qld	34,367	0.65%	31,665	0.60%	-7.7%
SA	11,560	0.64%	10,181	0.57%	-10.9%
Tas.	1,544	0.27%	1,566	0.27%	-
Vic.	64,344	0.98%	56,837	0.87%	-11.2%
WA	23,773	0.86%	20,912	0.76%	-11.6%
AUSTRALIA	223,220	0.87%	200,385	0.78%	-10.3%

CHB, chronic hepatitis B.

People living with CHB, by priority population

The prevalence of CHB has been reduced in both people who inject drugs and men who have sex with men to account for the impact of immunisation. For people who inject drugs, there has also been a reduction in population size, due to ongoing decreases in the proportion of young people who have a history of injecting drug use.¹

The prevalence of CHB was reduced in Aboriginal and Torres Strait Islander people in rural Queensland² based on newly available clinical data, which led to reduced overall prevalence for this group.

The reduction in the number of people living with CHB in these three groups has resulted in an increase in the proportion represented by Australian-born non-Indigenous people outside of these priority populations.

Changes by region of birth are affected by changes applied to individual countries, and these are discussed further below. Overall, there was a small increase in the proportion of people living with CHB estimated to be born overseas.

In the 2020 Report, those with country of birth not stated were included as a separate group; in the revised version and in this comparison, they are excluded from calculations.

Table 2: Proportion of people living with CHB in Australia in 2021, by priority population, before and after the incorporation of methodological revisions

Population group	Previous estimate, proportion of the total with CHB	New estimate, proportion of the total with CHB	Percent change
People born in Australia (total)	33.2%	30.0%	-9.7%
People who inject drugs	5.8%	3.1%	-46.9%
Men who have sex with men	4.6%	4.1%	-10.2%
Aboriginal and/or Torres Strait Islander people	7.5%	6.7%	-11.1%
Australian-born non-Indigenous people outside priority populations	15.3%	16.1%	+5.3%
People born overseas (total)	66.8%	70.0%	+4.8%
People born in North East Asia	24.3%	23.0%	-5.4%
People born in South East Asia	20.2%	22.5%	+11.1%
People born in Sub-Saharan Africa	3.6%	4.3%	+19.0%
People born in Southern and Eastern Europe	5.0%	5.9%	+16.9%
People born in North Africa and the Middle East	2.5%	3.4%	+38.6%
People born in Oceania (excluding Australia)	4.6%	4.6%	-0.9%
People born in the Americas	0.9%	1.0%	+17.5%
People born in Southern and Central Asia	2.1%	3.1%	+46.0%
People born in North West Europe	3.5%	2.3%	-34.0%

CHB, chronic hepatitis B.

CHB prevalence, by country of birth

Estimates of CHB prevalence now take account of the variations in prevalence that have occurred over time in most regions. This had varying impacts according to country of birth, depending on the demographics and migration dynamics of the country.

These variations also lead to different prevalence estimates in each PHN depending on the demographics of the migrant population. Examples this variation by PHN for the top two countries of birth for people with CHB (China and Vietnam) are shown in Table 6.

For a number of countries, CHB prevalence had previously been underestimated, as data had been drawn from studies in younger people that likely did not reflect Australia's migrant populations.

These countries included Malaysia, Greece, Türkiye, Mauritius, Singapore, Lebanon and Papua New Guinea.

For other countries, CHB prevalence in migrants had previously been overestimated, as the ongoing impact of immunisation in those who subsequently migrate to Australia has led to reduced overall prevalence. These countries included China, Vietnam, Taiwan, South Korea and Myanmar.

For some countries, newly available data suggested prevalence had previously been overestimated for all time periods. These countries include New Zealand, England and Poland.

Table 3: Estimated prevalence of CHB and number of people living with CHB according to country of birth in 2021, before and after revision of prevalence estimates (top 40 countries)

Country of birth	Previous estimate, CHB prevalence	New estimate, CHB prevalence	Percent change in CHB prevalence
China	7.3%	6.7%	-8.0%
Vietnam	9.2%	8.0%	-13.4%
Philippines	2.9%	2.7%	-4.7%
New Zealand	1.1%	0.9%	-15.8%
Malaysia	1.8%	2.4%	+29.4%
Greece	0.7%	4.0%	+485.6%
Thailand	4.3%	4.3%	+0.3%
Cambodia	8.9%	8.2%	-7.2%
Italy	2.3%	1.9%	-16.1%
Hong Kong (SAR of China)	3.4%	3.1%	-6.9%
Taiwan	9.7%	5.8%	-39.8%
England	0.5%	0.3%	-39.3%
South Korea	2.9%	2.4%	-16.9%
India	0.4%	0.4%	-3.4%
Myanmar	6.1%	5.1%	-15.9%
Indonesia	2.0%	2.2%	+13.6%
Turkey	2.4%	3.4%	+44.0%
Mauritius	1.6%	4.9%	+215.8%
Singapore	1.7%	2.0%	+14.3%
Samoa	3.4%	4.2%	+23.9%
Afghanistan	1.7%	1.7%	-
Lebanon	0.7%	1.2%	+65.8%
Kenya	4.7%	5.0%	+7.2%
Somalia	13.4%	12.7%	-5.5%
Nigeria	8.9%	8.5%	-4.8%
Tonga	9.3%	8.6%	-8.1%
Papua New Guinea	2.1%	3.4%	+60.7%
Sudan	5.8%	5.7%	-2.6%
Nepal	0.7%	0.7%	-4.8%
Laos	6.0%	7.9%	+30.2%
Malta	2.3%	2.2%	-5.1%
Syria	2.4%	2.5%	+6.0%
Iraq	0.5%	0.8%	+38.7%
Ethiopia	5.5%	5.2%	-4.8%
Colombia	2.1%	2.0%	-4.8%
Pakistan	0.7%	0.7%	+5.1%
Poland	2.3%	1.4%	-38.2%
Bhutan	5.3%	5.1%	-4.8%
Ghana	8.3%	11.2%	+35.5%
Russia	2.5%	2.5%	+1.1%

CHB, chronic hepatitis B. SAR, Special Administrative Region. Proportional changes greater than + or -30% are highlighted, with red text indicating a decrease, and green text indicating an increase.

CHB prevalence and number of people living with CHB, by PHN

Changes in prevalence varied substantially by PHN, and as a range of methodological changes impact these estimates, the reasons for change vary by region. However, some common reasons for patterns in variation are discussed below.

The reductions in CHB prevalence in predominantly non-metropolitan PHNs are largely due to the adjustment applied which reduced CHB prevalence in non-Indigenous Australian-born people living in rural regions, as they make up the most common group living with CHB in these regions (see [Viral Hepatitis Mapping National Report 2021: Hepatitis B](#), Figure A.7). This reduction was pronounced in **Country SA, Country WA, Gippsland, North Coast NSW, Murray, South Eastern NSW, and Western Victoria**.

The variation in the change in prevalence among metropolitan PHNs often reflected the underlying distribution of the population by age and country of birth. For example, CHB prevalence reduced more substantially in **Central and Eastern Sydney** and in **North Western Melbourne** than other parts of Sydney and Melbourne, as the migrant population in these areas is disproportionately younger.

Changes in **Northern Queensland** and **Western Queensland** PHNs reflect the adjustment of CHB prevalence in Aboriginal and Torres Strait Islander people to reflect local clinical evidence. Despite the changes, PHNs which had estimated CHB prevalence below average in previous estimates remained below average, and those with estimated prevalence above average remained above average. The only exception to this was **Western Queensland**, which went from above to below the national average.

Table 4: Estimated number of people living with CHB and population prevalence in 2021, by PHN, before and after methodological changes

PHN	Previous estimate, people living with CHB	Previous estimate, prevalence	New estimate, people living with CHB	New estimate, prevalence	Percent change
Adelaide	9,439	0.73%	8,615	0.66%	-8.7%
Australian Capital Territory	3,212	0.71%	2,840	0.63%	-11.6%
Brisbane North	7,115	0.61%	6,971	0.59%	-2.0%
Brisbane South	10,190	0.88%	10,363	0.90%	+1.7%
Central and Eastern Sydney	22,930	1.46%	18,933	1.20%	-17.4%
Central Qld, Wide Bay, Sunshine Coast	3,918	0.44%	3,156	0.35%	-19.4%
Country SA	2,121	0.43%	1,566	0.32%	-26.2%
Country WA	5,595	1.07%	4,119	0.79%	-26.4%
Darling Downs and West Moreton	3,388	0.53%	3,187	0.50%	-5.9%
Eastern Melbourne	18,185	1.15%	17,452	1.11%	-4.0%
Gippsland	1,356	0.46%	960	0.33%	-29.2%
Gold Coast	4,015	0.61%	3,522	0.54%	-12.3%
Hunter New England and Central Coast	6,849	0.52%	5,476	0.42%	-20.0%
Murray	3,159	0.50%	2,401	0.38%	-24.0%
Murrumbidgee	1,164	0.49%	985	0.42%	-15.3%
Nepean Blue Mountains	2,206	0.58%	2,160	0.57%	-2.1%
North Coast	2,836	0.53%	2,029	0.38%	-28.4%
North Western Melbourne	23,442	1.29%	19,648	1.08%	-16.2%
Northern Queensland	5,292	0.76%	4,168	0.60%	-21.2%
Northern Sydney	10,837	1.17%	10,486	1.14%	-3.2%
Northern Territory	4,615	1.85%	4,325	1.73%	-6.3%
Perth North	9,488	0.82%	8,708	0.75%	-8.2%
Perth South	8,690	0.80%	8,086	0.75%	-7.0%
South Eastern Melbourne	14,967	0.96%	14,011	0.90%	-6.4%
South Eastern NSW	3,792	0.60%	2,603	0.41%	-31.4%
South Western Sydney	13,719	1.34%	13,535	1.32%	-1.3%
Tasmania	1,544	0.27%	1,566	0.27%	+1.4%
Western NSW	2,397	0.72%	1,699	0.51%	-29.1%
Western Queensland	448	0.99%	298	0.66%	-33.6%
Western Sydney	14,239	1.25%	14,153	1.24%	-0.6%
Western Victoria	3,236	0.48%	2,366	0.35%	-26.9%
AUSTRALIA	223,220	0.87%	200,835	0.78%	-10.0%

CHB, chronic hepatitis B. PHN, Primary Health Network.

Treatment uptake by PHN

Changes to prevalence estimates impact treatment uptake estimates, as CHB prevalence is used as the denominator to measure uptake. The numerator - the number of people who were dispensed drugs for the treatment of hepatitis B through the PBS – is kept constant for these comparisons. Despite the changes to uptake estimates, PHNs which had estimated treatment uptake below average remained below average, and those with estimated prevalence above average remained above average. In general, changes led to reduced disparities in treatment uptake between non-metropolitan and metropolitan PHNs.

Changes to uptake estimates had limited impact on estimated progress towards national strategy targets; those PHNs which had already reached (**South Western Sydney**) or were close to reaching (**Western Sydney**) the national strategy target had only very minor changes to prevalence estimates and therefore to treatment uptake.

Table 5: Estimated CHB treatment uptake in 2021, before and after methodological changes

PHN	Previous estimate, treatment uptake	New estimate, treatment uptake	Percent change
Adelaide	10.9%	12.0%	9.6%
Australian Capital Territory	13.9%	15.7%	13.1%
Brisbane North	7.9%	8.0%	2.1%
Brisbane South	13.8%	13.6%	-1.7%
Central and Eastern Sydney	13.0%	15.7%	21.1%
Central Queensland, Wide Bay, Sunshine Coast	6.3%	7.9%	24.1%
Country SA	3.8%	5.1%	35.5%
Country WA	2.4%	3.3%	35.8%
Darling Downs and West Moreton	6.6%	7.0%	6.3%
Eastern Melbourne	13.3%	13.8%	4.2%
Gippsland	5.8%	8.2%	41.2%
Gold Coast	7.3%	8.4%	14.0%
Hunter New England and Central Coast	4.8%	6.0%	25.1%
Murray	6.5%	8.6%	31.6%
Murrumbidgee	3.8%	4.5%	18.1%
Nepean Blue Mountains	8.9%	9.1%	2.1%
North Coast	4.9%	6.9%	39.7%
North Western Melbourne	12.1%	14.4%	19.3%
Northern Queensland	5.5%	7.0%	27.0%
Northern Sydney	15.4%	15.9%	3.4%
Northern Territory	10.2%	10.8%	6.7%
Perth North	8.5%	9.2%	9.0%
Perth South	8.0%	8.6%	7.5%
South Eastern Melbourne	12.2%	13.1%	6.8%
South Eastern NSW	5.9%	8.5%	45.7%
South Western Sydney	20.2%	20.4%	1.4%
Tasmania	9.2%	9.1%	-1.4%
Western NSW	3.7%	5.2%	41.1%
Western Queensland	0.9%	1.3%	50.6%
Western Sydney	17.2%	17.4%	0.6%
Western Victoria	5.9%	8.0%	36.8%
AUSTRALIA	11.4%	12.7%	11.1%

CHB, chronic hepatitis B. PHN, Primary Health Network.

Data for specific populations used in the *Viral Hepatitis Mapping Project: Hepatitis B; National Report 2021*

CHB prevalence among people born in China and Vietnam, by PHN

Areas with higher prevalence of CHB are those with a higher population of older, less recently arrived migrants, who are more likely to have CHB than those who are younger and more recently arrived.

As shown in Table 4, areas with higher prevalence for those born in China, Vietnam or both are often located in metropolitan regions where these migrants more commonly live and have settled historically (e.g. **South Western Sydney, Western Sydney, Eastern Melbourne, North Western Melbourne, Northern Sydney**).

Table 6: Estimated prevalence of CHB among people born in China and Vietnam, by PHN, showing variability due to distribution of age and year of migration by area

PHN	CHB prevalence among people born in China in this PHN	CHB prevalence among people born in Vietnam in this PHN
Adelaide	5.4%	7.3%
Australian Capital Territory	5.4%	7.0%
Brisbane North	5.1%	6.5%
Brisbane South	6.1%	7.4%
Central and Eastern Sydney	6.3%	7.3%
Central Queensland, Wide Bay, Sunshine Coast	5.6%	6.0%
Country SA	4.7%	5.4%
Country WA	4.8%	6.1%
Darling Downs and West Moreton	5.6%	7.1%
Eastern Melbourne	6.2%	7.5%
Gippsland	5.7%	6.1%
Gold Coast	6.0%	6.4%
Hunter New England and Central Coast	6.3%	5.9%
Murray	5.1%	6.3%
Murrumbidgee	5.2%	5.5%
Nepean Blue Mountains	6.8%	6.2%
North Coast	5.7%	5.2%
North Western Melbourne	5.4%	7.5%
Northern Queensland	5.9%	5.9%
Northern Sydney	6.6%	6.9%
Northern Territory	5.2%	6.3%
Perth North	6.0%	7.4%
Perth South	6.2%	6.6%
South Eastern Melbourne	6.1%	7.5%
South Eastern NSW	5.8%	6.6%
South Western Sydney	7.2%	7.6%
Tasmania	4.5%	5.4%
Western NSW	6.3%	5.8%
Western Queensland	4.3%	6.0%
Western Sydney	6.7%	7.9%
Western Victoria	5.5%	6.0%
AUSTRALIA	6.2%	7.4%

CHB, chronic hepatitis B. PHN, Primary Health Network.

CHB prevalence among Aboriginal and Torres Strait Islander people, by remoteness area and state/territory

The prevalence of CHB among Aboriginal and Torres Strait Islander people is known to vary according to remoteness, and this has been incorporated into estimates since the 2017 Mapping Report.

The current estimate of CHB prevalence in Aboriginal and Torres Strait Islander people Remote and Very Remote regions of Queensland reflects recent clinical evidence, and has been decreased since the previous report (see Table 2).

Further review and evidence gathering regarding the prevalence of CHB among Aboriginal and Torres Strait Islander people across Australia is ongoing, and further refinements are likely to be incorporated into future Mapping Reports.

Table 7: Estimated prevalence of CHB among Aboriginal and Torres Strait Islander people, by remoteness area and state/territory

State/territory	Major cities	Inner regional	Outer regional	Remote	Very remote
ACT	0.7%	0.7%	n.a.	n.a.	n.a.
NSW	0.8%	1.7%	2.7%	4.1%	5.3%
NT	n.a.	n.a.	2.2%	5.1%	5.2%
Qld	1.5%	1.0%	2.8%	2.0%	2.0%
SA	1.7%	1.4%	2.0%	2.0%	2.0%
Tas.	n.a.	0.7%	0.7%	0.7%	0.7%
Vic.	0.8%	0.8%	0.9%	0.9%	n.a.
WA	1.2%	2.0%	4.9%	7.2%	8.0%

ABS, Australian Bureau of Statistics. CHB, chronic hepatitis B. n.a., not applicable (no regions with this level of remoteness exist in the jurisdiction).

Notes: Remoteness category based on designations by the ABS.³

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