

Geographical variation in health service use by people living with dementia

Web report | Last updated: 30 Nov 2023 | Topic: [Dementia](#)

About

Where people with dementia live affects their use of health care services. This report presents data at 4 geographical levels: remoteness area, socioeconomic area, Statistical Area level 4 (SA4) region and state/ territory. Users can explore general practitioner, specialist and allied health attendances, medicines dispensed, emergency department visits, hospital stays and residential respite care use among people living with dementia in the community and in permanent residential aged care in 2019.

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Findings from this report:

- [Dementia-specific medication was less likely to be dispensed to people living in remote or lower socioeconomic areas](#)
 - [Specialist attendance rates were lower among people living with dementia in remote or lower socioeconomic areas](#)
 - [GP chronic disease management plans were most common among people in the lowest socioeconomic areas of major cities](#)
 - [Residential respite care was mostly used in the lead up to permanent care. Rates were lowest for people in remote areas](#)
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Summary

Dementia is an umbrella term for a group of conditions that cause progressive and irreversible impairment to brain function. In 2022, an estimated 401,300 Australians were living with dementia (see [Dementia in Australia](#)). Dementia is a leading cause of death and burden of disease in Australia, but there is variability in access to appropriate dementia care across Australia (Royal Commission 2021).

Examining geographical variation is a common tool for looking at how people living in different areas are affected by a condition such as dementia, and whether there are any regional differences that could be improved at the community or national level.

This study used linked data in the National Integrated Health Services Information (NIHSI) to explore geographical variation in health service and residential respite care use among people living with dementia in the community and in permanent residential aged care in 2019 (AIHW NIHSI 2020-21).

- The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the linked data.
- Health and aged care services examined include general practitioner (GP), specialist, nursing and allied health attendances, medicines dispensed through the Pharmaceutical Benefits Scheme (PBS) and Repatriation PBS (RPBS), emergency department (ED) visits, hospital stays, and residential respite care.

Information is presented at 4 geographical levels:

- [remoteness area](#)
- [socioeconomic area](#)
- [Statistical Area level 4 \(SA4\) region](#)
- state/territory.

Data are also presented for socioeconomic areas within *Major cities* and *Outside major cities*.

Findings

Specialist attendances

[Specialist attendances were lower among people living in the lowest socioeconomic areas, and regional and remote areas](#)

Dementia-specific medication

[Dementia-specific medication was less likely to be dispensed to people living in the lowest socioeconomic areas, and regional and remote areas](#)

GP chronic disease management plans

[GP chronic disease management plans were more common among people living in the lowest socioeconomic areas of Major cities](#)

ED visits and hospital stays

[People living with dementia in the lowest socioeconomic areas had higher rates of emergency department \(ED\) visits and hospital stays](#)

Hospital care in remote areas

[Half of people living with dementia in the community in remote areas had a hospital stay](#)

Residential respite care

[Residential respite care was mostly used in the year before entry to permanent residential aged care](#)

Antipsychotic use

[Antipsychotics were dispensed to 1 in 3 people living with dementia in residential aged care](#)

Specialist attendances were lower among people living in the lowest socioeconomic areas, and regional and remote areas

In Australia, a person will usually first see a GP about dementia symptoms, and then be referred to a specialist to confirm a diagnosis and assess if they are eligible for treatment with dementia-specific medication. Access to specialists is affected by many factors, including availability, location, cost and cultural safety (AIHW 2020b; AIHW 2023b; Nolan-Isles et al. 2021).

The percentage of people living with dementia in the community who had one or more specialist attendances in 2019:

- decreased with increasing remoteness:
 - from 68% of people in *Major cities* to 62% of people in *Inner regional* areas and 45% in *Remote and very remote* areas
- decreased with increasing disadvantage:
 - from 73% of people living in the highest socioeconomic areas to 61% of people in the lowest socioeconomic areas.

At the SA4 level, specialist attendances ranged from 40% to 84% of people.

Of those who saw a specialist, people in the lowest socioeconomic areas and regional and remote areas had **fewer specialist attendances per person**, with rates decreasing from 4.8 attendances per person living in the highest socioeconomic areas of *Major cities* to 2.5 per person in *Remote and very remote* areas.

People living in *Remote and very remote* areas were also less likely to have a type of dementia (such as Alzheimer's disease or vascular dementia) recorded in the linked data. This may be related to misclassification of dementia type in the administrative data but may also suggest poorer access to diagnostic facilities that allow more specialised management (Waller et al. 2021).

People living with dementia in residential aged care were less likely to have a specialist attendance than people living in the community (this is a common pattern for all people living in aged care (AIHW 2020a; Royal Commission 2021)), but the overall patterns of attendance by remoteness and socioeconomic area were similar.

Dementia-specific medication was less likely to be dispensed to people living in the lowest socioeconomic areas, and regional and remote areas

While there is currently no known cure for dementia, there are 4 medications - donepezil, galantamine, rivastigmine and memantine - that may assist in managing dementia symptoms and slowing dementia progression (see [Dementia-specific medications](#)). In Australia, these medications are subsidised under the PBS and RPBS for people with a specialist-confirmed diagnosis of Alzheimer's disease (DUSC 2016). These medications are not subsidised for treating people with other types of dementia.

The percentage of people living with dementia in the community who were dispensed dementia-specific medications at least once in 2019:

- decreased with increasing remoteness
 - from 39% of people living with dementia living in *Major cities* to 23% of people in *Remote and very remote* areas
- decreased with increasing disadvantage
 - from 44% of people in the highest socioeconomic areas to 32% of people in the lowest socioeconomic areas
 - a similar pattern was observed within *Major cities* and *Outside major cities*.

At the SA4 level, dementia-specific medication dispensing ranged from 18% to 56% of people.

Women were more likely than men to have dementia-specific medication dispensed at most geographies.

People living with dementia in residential aged care were less likely to be dispensed dementia-specific medication than people living in the community, but the overall patterns of dispensing by remoteness and socioeconomic area were similar.

The observed variation in dispensing of dementia-specific medications may reflect broader issues, including that people in the lowest socioeconomic areas and regional and remote areas often have:

- reduced access to medical specialists who primarily diagnose the type of dementia and initially prescribe these medications
- symptoms for a longer period of time before seeking healthcare advice and/or receiving a diagnosis (Bryant et al. 2021; Greenway-Crombie et al. 2012). This delayed diagnosis may occur after the early stages of dementia, when the medications are most beneficial.

Strategies to improve access to dementia treatment should remain a priority, particularly as the use of current therapies may have additional clinical benefits (Xu et al. 2021). Variation in access to treatment will become more important to address as newer, more expensive, therapies are developed (Mintun et al. 2021; van Dyck et al. 2023).

GP chronic disease management plans were more common among people living in the lowest socioeconomic areas of Major cities

GP chronic disease management attendances (also referred to as "CDM plans") are provided by a patient's usual medical practitioner to help coordinate care (Services Australia 2023).

The percentage of people living with dementia in the community who had a CDM plan in 2019:

- increased with increasing disadvantage in *Major cities*:
 - from 44% of people living in the highest socioeconomic areas to 53% of people in the lowest socioeconomic areas.

This may be related to patient factors, such as higher rates of comorbidities which require more time for appropriate management (for example, diabetes, respiratory or cardiovascular conditions), as well as health system factors such as using CDM plans to enable access to Medicare-subsidised allied health care.

Conversely, the percentage of people who had a CDM plan decreased with increasing remoteness:

- from 51% in *Major cities* and 53% in *Inner regional* areas to 43% in *Remote and very remote* areas

which may relate to the reduced availability of GPs and other health care professionals in more remote areas of Australia (AIHW 2023b), and the associated use of locum doctors who are less likely to have an ongoing relationship with patients.

At the SA4 level, the percentage of people who had a CDM plan ranged from 32% to 68%.

People living with dementia in residential aged care had similar overall patterns of CDM attendances by remoteness and socioeconomic area as people living in the community.

People living with dementia in the lowest socioeconomic areas had higher rates of emergency department (ED) visits and hospital stays

A hospital stay can be challenging for people living with dementia, as the environment may exacerbate symptoms of dementia, and there is a greater risk of adverse events and preventable complications (Fogg et al. 2018).

People living in disadvantaged areas often have higher rates of hospitalisation (AIHW 2022). In 2019, people living with dementia in the lowest socioeconomic areas had:

- higher rates of ED visits and public hospital stays when living in the community, both within *Major cities* and *Outside major cities*
- higher rates of ED visits and public hospital stays when living in residential aged care within *Major cities*

compared with people living in the highest socioeconomic areas.

Half of people living with dementia in the community in remote areas had a hospital stay

People living with dementia in the community in *Remote and very remote* areas were:

- less likely to have an ED visit (28% of people) in 2019, but
- more likely to have a hospital stay (49%)

than people living in *Major cities* (41% and 37%, respectively).

Factors contributing to this variation may include different hospital admitting rights (where GPs in rural and remote areas can admit people directly to hospital instead of admission through the ED), and the use of hospitals for respite care if no other facilities are available, or to enable monitoring of a patient who would otherwise have to travel long distances between hospital and their home.

Residential respite care was mostly used in the year before entry to permanent residential aged care

Residential respite care can provide a person with dementia and their carers with a break from their usual care arrangements, or it can be used during emergencies, or by people trying out or waiting for a permanent residential aged care placement (AIHW 2023a).

Previous studies have shown that people living with dementia often use residential respite care as part of a transition to permanent residential aged care (AIHW 2023a, 2023c). In this study, 70% of people living with dementia used residential respite care in the 12 months before entry to permanent residential aged care. At the SA4 level, the use of residential respite care in the 12 months before entry to permanent care ranged from 40% to 94% of people.

Respite care is most effective when accessed early and regularly, however, early uptake is generally low (Carers NSW 2021; Neville et al. 2015; Royal Commission 2021). An average of 5.4% of people who did not enter permanent care in the subsequent 12 months used residential respite care in 2019. Rates were lowest among people living in *Remote and very remote* areas (3.3%) and highest in *Inner regional* areas (6.2%). Although people may have used other forms of respite care (which could not be analysed in this study), these findings suggest that residential respite care is mostly used in the lead up to entry to permanent care.

Antipsychotics were dispensed to 1 in 3 people living with dementia in residential aged care

Inappropriate prescribing of antipsychotics is a major problem among people living in residential aged care and a key issue raised in the Royal Commission into Aged Care Quality and Safety (Royal Commission 2021). Antipsychotics should only be prescribed to people living with dementia if the use of non-pharmacological treatments has been unsuccessful (Dementia Australia 2020; Guideline Adaptation Committee 2016).

Among people living with dementia in residential aged care in 2019:

- 33% were dispensed antipsychotics at least once
- 23% were dispensed antipsychotics 4 times or more.

There were no clear patterns of variation by remoteness or socioeconomic area for people living in residential aged care, but at the SA4 level:

- 25% to 41% of people were dispensed antipsychotics at least once
- 16% to 29% of people were dispensed antipsychotics 4 times or more.

Men living in residential aged care were more likely than women to be dispensed antipsychotics.

It should be noted that these 2019 data do not reflect changes made to the PBS in 2020 for prescribing of the antipsychotic, risperidone, for managing changed behaviours (see Box 8.2 under [Dispensing of antipsychotics to people with dementia](#)).

References

- AIHW (Australian Institute of Health and Welfare) (2020a) 'Chapter 7: Changes in people's health service use around the time of entering permanent residential aged care'. *Australia's health 2020: data insights*, AIHW, Australian Government, accessed 27 June 2023. doi:10.25816/5f05371c539f3.
- AIHW (2020b) *Coordination of health care: experiences of barriers to accessing health services among patients aged 45 and over*, AIHW, Australian Government, accessed 27 June 2023.
- AIHW NIHSI (2020-21) *National Integrated Health Services Information*, aihw.gov.au, accessed 26 July 2023.
- AIHW (2022) *Australia's hospitals at a glance*, AIHW, Australian Government, accessed 14 September 2023.
- AIHW (2023a) *Respite use on the way to permanent residential aged care*, AIHW, Australian Government, accessed 28 June 2023.
- AIHW (2023b) *Rural and remote health*, AIHW, Australian Government, accessed 12 September 2023.
- AIHW (2023c) *Transitions to residential aged care after hospital for people living with dementia*, AIHW, Australian Government, accessed 18 October 2023.
- Bryant J, Noble N, Freund M, Rumbel J, Eades S, Sanson-Fisher R, Lowe M, Walsh J, Piterman L, Koch S, Meyer C, Todd E (2021) [How can dementia diagnosis and care for Aboriginal and Torres Strait Islander people be improved? Perspectives of healthcare providers providing care in Aboriginal community controlled health services](#), *BMC Health Services Research*, 21:699.
- Carers NSW (2021) *Repositioning respite in consumer directed service systems*, accessed 6 September 2023.
- Dementia Australia (2020) *Drugs used to relieve behavioural and psychological symptoms of dementia*, Help sheets Dementia Q&A 04, accessed 27 June 2023.
- DUSC (Drug Utilisation Sub-Committee) (2016). *Medicines for Alzheimer disease*. Public release document, February 2016 DUSC Meeting.
- Fogg, C, Griffiths, P, Meredith, P, Bridges, J. [Hospital outcomes of older people with cognitive impairment: An integrative review](#). *International Journal of Geriatric Psychiatry*. 2018; 33: 1177-1197.
- Greenway-Crombie A, Snow P, Disler P, Davis S, Pond D (2012) 'Influence of rurality on diagnosing dementia in Australian general practice', *Australian Journal of Primary Health* 18(3):178-184, doi:10.1071/PY12008.
- Guideline Adaptation Committee (2016) *Clinical Practice Guidelines and Principles of Care for People with Dementia*, Sydney: Guideline Adaptation Committee.
- Mintun M, Lo A, Evans C, Wessels A, Ardayfio P, Andersen S, et al. (2021) [Donanemab in Early Alzheimer's Disease](#), *New England Journal of Medicine*, 384:1691-1704, doi:10.1056/NEJMoa2100708.
- Neville C, Beattie E, Fielding E, MacAndrew M (2015) [Literature review: use of respite by carers of people with dementia](#), *Health & Social Care in the Community*, 23(1):51-53.
- Nolan-Isles D, Macniven R, Hunter K, Gwynn J, Lincoln M, Moir R, Dimitropoulos Y, Taylor D, Agius T, Finlayson H, Martin R, Ward K, Tobin S, Gwynne K (2021) [Enablers and Barriers to Accessing Healthcare Services for Aboriginal People in New South Wales, Australia](#), *International Journal of Environmental Research and Public Health*, 18(6):3014, doi: 10.3390/ijerph18063014.
- Royal Commission into Aged Care Quality and Safety (2021) *Final report: Care, dignity and respect*, Australian Government, accessed 27 June 2023.
- Services Australia (2023) *Chronic disease GP Management Plans and Team Care Arrangements*, Australian Government, accessed 18 July 2023.
- van Dyck C, Swanson C, Aisen P, Bateman R, Chen C, Gee M, et al. (2023) [Lecanemab in Early Alzheimer's Disease](#), *New England Journal of Medicine*, 388:9-21, doi:10.1056/NEJMoa2212948.
- Waller M, Buckley R, Masters C, Nona F, Eades S, Dobson A (2021) Deaths with Dementia in Indigenous and Non-Indigenous Australians: A Nationwide Study, *Journal of Alzheimer's Disease*, 81(4):1589-1599.
- Xu H, Garcia-Ptacek S, Jönsson L, Wimo A, Nordström P, Eriksdotter M (2021) [Long-term Effects of Cholinesterase Inhibitors on Cognitive Decline and Mortality](#), *Neurology*, 96(17): e2220-e2230



Background information



Background information

In this report, regions of residence were based on where a person lived in 2019, or where they died in 2020-2021. In the linked data, there is no address information for residential aged care facilities. Deaths data from 2020-2021 were used as the first source of address because they are considered the most accurate, particularly for people who moved to access residential aged care (Royal Commission 2020) and may not have updated their address in Medicare. As such, it should be noted that a person's region of residence when they died may not be the same as where they previously lived. If a person had not died, their address was taken from hospital or Medicare/PBS service data in 2019.

Users can explore charts at 4 levels of geography based on region of residence (not where they received services):

- remoteness areas
 - based on the 2016 Remoteness Area Structure within the Australian Statistical Geography Standard (ASGS), including *Major cities of Australia*, *Inner regional Australia*, *Outer regional Australia*, and *Remote and very remote Australia* (aggregated to ensure data confidentiality and quality)
- socioeconomic areas
 - based on the 2016 Socio-Economic Indexes for Areas (SEIFA) Index of Relative Socio-economic Disadvantage (IRSD) quintiles
 - the majority (71%) of people in the dementia study cohort lived in *Major cities*, which are socioeconomically diverse. For this reason, data are also presented for socioeconomic areas within *Major cities* and *Outside major cities*
- Statistical Area Level 4 (SA4) regions
 - SA4 regions represent labour markets, with populations between 100,000 people (in regional areas) and 500,000 people (in capital cities).
- state/territory
 - data are only presented for states/territories with hospital data in the NIHSI: New South Wales (NSW), Victoria, Queensland, South Australia, Tasmania and the Australian Capital Territory (ACT)

See the [Technical guide](#) for more information.

References

Royal Commission into Aged Care Quality and Safety (2020) *Research Paper 16 - How far do people move to access aged care?* Australian Government, accessed 9 October 2023.

Background information

The exact number of people living with dementia in Australia is currently not known. However, the AIHW has estimated that 401,300 Australians were living with dementia in 2022 (AIHW 2023a). Although it is not possible to identify everyone with dementia in currently available data sources, linked data can bring together information from a range of sources to improve our ability to understand service use among people living with dementia.

The National Integrated Health Services Information (NIHSI) is a multi-source, enduring linked data asset that contains de-identified health care, residential aged care and mortality data from 2010-11 to 2020-21 (AIHW NIHSI 2020-21).

In this study, the **dementia study cohort** refers to **158,730 people aged 30 and over** who were living in Australia in 2019 and had a dementia record in the linked data.

A person was identified as having dementia if they had at least one of the following in the NIHSI:

- a dementia-specific medication dispensed through the Pharmaceutical Benefits Scheme (PBS)/Repatriation PBS between 2010-11 and 2018
- a diagnosis of dementia in an emergency department (ED) presentation or public hospital admission (including a supplementary chronic condition code) between 2010-11 and 2018
- a record of dementia in an Aged Care Funding Instrument (ACFI) assessment between 2010-11 and 2018, and/or
- dementia recorded as an underlying or additional cause of death between January 2020 and December 2021.

Find out more about how the dementia study cohort was created in the [Technical guide](#).

See Box 1.1 for a discussion on how the study cohort differs from the total population of people living with dementia.

Box 1.1. The dementia study cohort is a subset of people living with dementia

The dementia study cohort comprises 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI. This cohort is a subset of people living with dementia and does not account for all people living with dementia in Australia.

The exact number of people living with dementia in Australia (the ‘prevalence’) is currently not known and estimates vary widely (Dobson et al. 2023). The AIHW [dementia prevalence estimates](#) are derived from a variety of data sources of varying quality, including small-scale Australian and international epidemiological studies. It is not currently known how dementia prevalence rates vary between geographic areas in Australia.

The **dementia study cohort** only includes people with a record of dementia in one of the administrative data sets in the NIHSI (such as data on medications dispensed, public hospital admissions, residential aged care assessments and causes of death). Hospital data are an important source of dementia information, so to ensure comparability of findings across regions, people from states/territories without hospital data in the linked data (Western Australia and the Northern Territory) were excluded from the cohort. Similarly, as private hospital admissions data were incomplete, the cohort only included people with a public hospital admission for dementia. See the [Technical guide](#) for more details on the data available in the NIHSI.

Most administrative data sources for dementia relate to later stages of disease, such as hospital stays, residential aged care and death. Older people with comorbidities are therefore more likely to be identified in the study cohort, while younger people and people in the early to moderate stages of dementia are less likely to be identified. People living in rural and remote areas are also less likely to be identified in the linked data, as they often access specialised aged care services (AIHW 2023b) for which data are not available in the NIHSI (such as the Multi-Purpose Services Program and the [National Aboriginal and Torres Strait Islander Flexible Aged Care Program](#)). It should also be noted that dementia is often underreported on death records (AIHW 2023a; Xu et al. 2022).

References

AIHW (Australian Institute of Health and Welfare) NIHSI (2020-21) [National Integrated Health Services Information](#), aihw.gov.au, accessed 26 July 2023.

AIHW (2023a) [Dementia in Australia](#), AIHW, Australian Government, accessed 28 June 2023.

AIHW (2023b) [Providers, services and places in aged care](#), AIHW, Australian Government, accessed 26 July 2023.

Dobson AJ, Flicker L, Almeida OP, Waller M, Anstey K (2023) [Different estimates of the prevalence of dementia in Australia, 2021](#), *Medical Journal of Australia*, 218: 320-321.

Xu Z, Hockey R, McElwee P, Waller M, Dobson A (2022) [Accuracy of death certifications of diabetes, dementia and cancer in Australia: a population-based cohort study](#) *BMC Public Health*, 22:902.





Methods: Services analysed in this report



Methods: Services analysed in this report

The Medicare Benefits Schedule (MBS) data collection contains claims data for Medicare services subsidised by the Australian Government. This report includes information on Medicare-subsidised services provided by the following community-based health professionals:

- General practitioner (GP) attendances:
 - GP chronic disease management attendances (also referred to as “CDM plans”, includes preparation and review of GP management plans, team care arrangements and multidisciplinary care plans)
 - Medication management review attendances
 - Nursing and/or Aboriginal health worker attendances (includes nurse practitioners)
- Specialist attendances:
 - Geriatricians (includes Geriatrician Referred Patient Assessment and Management Plan attendances, which accounted for 42% of geriatrician attendances for people living in the community and 52% of geriatrician attendances for people living in residential aged care)
 - Psychiatrists
 - Neurologists
 - General Physicians
- Allied health care attendances:
 - Podiatrists
 - Optometrists

More information on each service provider can be found in the [Technical guide](#).

It should be noted that these data only include services receiving a Medicare rebate. People may also access services outside of the Medicare system.

These data combine face-to-face and telehealth attendances. New MBS items for telehealth were introduced in March 2020 during the COVID-19 pandemic. The analysis year for this study, 2019, is before these changes, and the number of telehealth attendances was not large enough to report separately.

Dementia diagnostic information is not available in the MBS, so it was not possible to distinguish between dementia-specific services and services for the management of other health issues.

For a discussion about interpretation of variation in MBS services, see [Using non-hospital Medicare services data](#).

Methods: Services analysed in this report

The Pharmaceutical Benefits Scheme (PBS) data collection contains data for prescriptions dispensed under the PBS and Repatriation PBS (RPBS).

Variation in the dispensing of medication can suggest that some people may be missing out on an effective treatment, while others are being exposed to avoidable harms and unnecessary costs (ACSQHC 2023). This report examined the dispensing patterns of medications that are particularly relevant to people living with dementia, including:

- rates of polypharmacy (when people are using 5 or more distinct medications at the same time)
- rates of hyper-polypharmacy (when people are using 10 or more distinct medications at the same time)

and dispensing of:

- dementia-specific medications (see [Dementia-specific medications](#))
- other psychotropic medications
 - antipsychotics (see [Dispensing of antipsychotics to people with dementia](#))
 - antidepressants
 - benzodiazepines
 - opioids.
- medications for common comorbidities such as heart disease and diabetes
 - [cardiovascular disease medication](#): includes medications that are used to manage coronary heart disease, stroke and chronic heart failure, as well as medications used to manage risk factors like high blood pressure and high blood cholesterol
 - Glucose regulating medication: includes insulins and oral medications.

Information is presented on:

- people dispensed one or more prescriptions, as an indicator of prescribing behaviour
- people dispensed 4 or more prescriptions, as an indicator of regular medication use.

For example, in order to continue receiving dementia-specific medication, patients must be able to tolerate the treatment and demonstrate a clinically meaningful response. It is therefore not surprising that a lower percentage of people were dispensed the medications 4 or more times (see figures 2.2, 3.2, 4.3, 5.2).

It is important to note that information on medication intake and adherence to medication plans is not available. The data presented here relate only to prescriptions dispensed. In addition, the PBS and RPBS do not contain data on dispensing of privately prescribed medications (prescriptions that are not eligible for subsidy under the PBS or RPBS), dispensing to public hospital in-patients and over-the-counter medications.

More information on the analysis of medication dispensing patterns can be found in the [Technical guide](#).

References

ACSQHC (Australian Commission on Safety and Quality in Health Care) (2023) [Medicines dispensing](#), ACSQHC, Australian Government, accessed 22 August 2023.

Methods: Services analysed in this report

This report presents information on Emergency Department presentations (referred to as ED visits) among people living with dementia, from the National Non-Admitted Patient Emergency Department Care Database:

- total ED visits
- ED visits for *Nervous system diseases* and other common conditions (*Injury, Respiratory diseases* and *Circulatory diseases*).

People living in regional and remote areas were more likely to have a lower urgency triage category than people in *Major cities*.

This report also presents information on admitted patient care stays (referred to as hospital stays) among people living with dementia, from the National Hospital Morbidity Database:

- total hospital stays
- hospital stays for *Dementia and delirium* and other common conditions (*Injury, Respiratory diseases* and *Circulatory diseases*) (AIHW 2023).

A person can have more than one ‘episode’ during a single stay in hospital, such as an acute episode followed by a rehabilitation episode. For this analysis, concurrent episodes for the same person were combined into a single hospital stay - see the [Technical guide](#) for more information.

Only public hospital data were included in this analysis: some of the observed variation may be due to the availability and use of private hospitals.

References

AIHW (2023) [Transitions to residential aged care after hospital for people living with dementia](#), AIHW, Australian Government, accessed 18 October 2023.



Methods: Services analysed in this report

The Australian Government subsidises community-based and residential respite care with the aim of providing a person and their carer with a break from their usual care arrangements, or during emergencies. It is also becoming common to use residential respite care on the way to permanent residential aged care (PRAC) (AIHW 2023).

This report explores the use of residential respite care among 2 groups of people living with dementia:

- “Community 2019” group: people living in the community in 2019, who **did not enter** permanent residential aged care in 2019 or 2020
- “Subsequent PRAC” group: people living in the community for all or some of 2019, who **did enter** permanent residential aged care later in 2019 or in 2020.

Residential respite care stays were analysed for the year 2019 for the “Community 2019” group, and for the 12 months before entering permanent care for the “Subsequent PRAC” group.

It should be noted that the linked data do not include community-based respite care services, or specialised residential aged care programs that are common in regional and remote areas, such as the Multi-Purpose Services Program and the National Aboriginal and Torres Strait Islander Flexible Aged Care Program.

References

AIHW (2023) *Respite use on the way to permanent residential aged care*, AIHW, Australian Government, accessed 28 June 2023.



Methods: Services analysed in this report

Percentage of people who used a service

'Percentage' is the proportion of people in the dementia cohort with at least one service recorded in the linked data in 2019. This is also referred to as a rate of service use.

Rate ratios

Rate ratios are a method for comparing service use between regions. Rates for people living in *Major cities* were used as the reference population to compare with other remoteness areas. Rates for people living in the highest socioeconomic areas were used as the reference population to compare with other socioeconomic areas ('*Quintile 5 - highest*' for the total cohort, '*Major cities - quintile 5 - highest*' for analysis within and *Outside Major cities*).

- A rate ratio of 1 indicates that the rate for the region is the same as the rate in the reference population.
- A rate ratio greater than 1 indicates that the rate for the region is higher than the rate in the reference population.
- A rate ratio less than 1 indicates that the rate for the region is lower than the rate in the reference population.

Age-standardised rates

Age-standardised rates were calculated where possible, to enhance the comparability between populations that may have different age structures. This is particularly important when comparing rates between men and women living in residential aged care, because women are more likely to be older (see Figure 1.1). Rates were age-standardised to the Australian Estimated Resident Population 2001, using the direct method (AIHW 2011), with age groups modified for the dementia study cohort: 30-69, 70-74, 75-79, 80-84, 85-89, 90 and over.

Average number of services per person

The average number of services per person was calculated for:

- people in the dementia study cohort who used the service at least once in 2019, referred to in the figures as "Mean (service users)"
- all people in the dementia study cohort, regardless of whether they used the service in 2019, referred to in the figures as "Mean (cohort)".

These measures reflect different aspects of access to services. For example, for people living in residential aged care in 2019, the average number of Medicare-subsided allied health attendances per person in the cohort decreased with increasing remoteness, from 2.5 in *Major cities* to 1.2 in *Remote and very remote* areas (see Figure 2.3). However, among people who used the service, there was little difference in the average number of attendances: 3.3 in *Major cities* and 3.2 in *Remote and very remote* areas. This suggests that while overall access was lower in *Remote and very remote* areas, the number of visits provided to people who used the service was similar to that in *Major cities*.

References

AIHW (Australian Institute of Health and Welfare) (2011) *Principles on the use of direct age-standardisation in administrative data collections: for measuring the gap between Indigenous and non-Indigenous Australians*, AIHW, Australian Government, accessed 15 August 2023.



The dementia study cohort



The dementia study cohort

The dementia study cohort comprises 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the linked data.

The use of health services changes after a person enters permanent residential aged care. For example, general practitioner attendances increase, and specialist attendances decrease (AIHW 2020, 2022, 2023). To partly account for these changes, the dementia study cohort was split into 2 study groups:

- **People living in the community:** includes 69,390 people (44% of the cohort) who were living in the community for all of 2019. This may include people who used residential respite care, people who were living in other supported accommodation, and people who were living in residential aged care facilities not included in the linked data (see [Box 1.1](#)).
- **People living in residential aged care:** includes 89,340 people (56% of the cohort) who were living in permanent residential aged care for all or part of 2019.

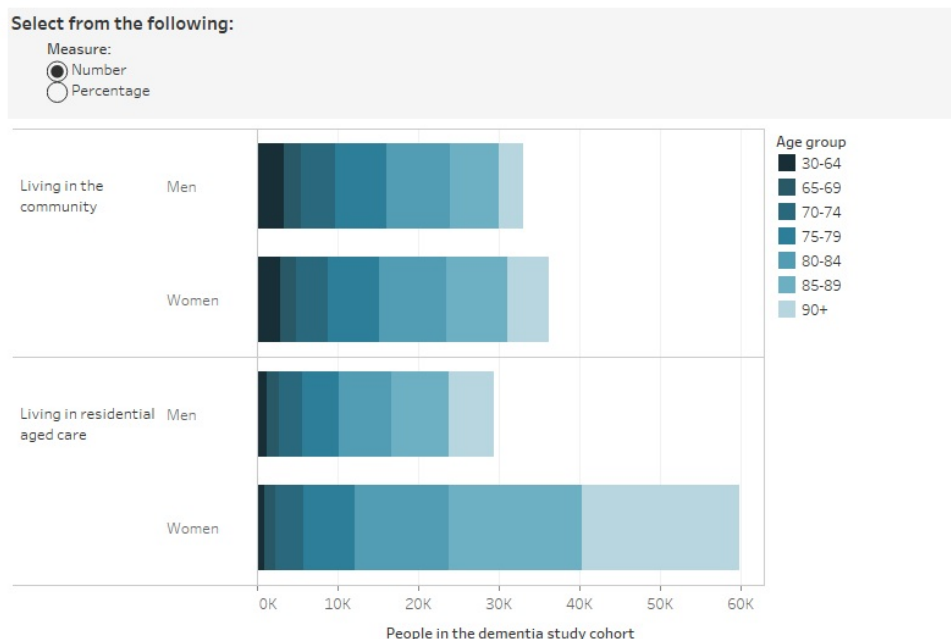
Differences in the number, age and sex profiles of people living in the community and in residential aged care (see Figure 1.1) should be borne in mind when exploring the results in this report, and direct comparisons are not recommended.

- There were a similar number of men and women living with dementia in the community, however, the number of women living in residential aged care was double that of men (partly because women have a longer life expectancy than men, so are more likely to need care at older ages)
- People living in residential aged care were older (55% were aged 85 and over) than those living in the community (32% were aged 85 and over).
- Women were more likely than men to be aged 85 and over, both in residential aged care (60% and 43%, respectively) and in the community (35% and 28%, respectively).

To account for some of the differences due to age, age-standardised rates are reported where possible.

Figure 1.1: Number and percentage of people in the dementia study cohort, by place of residence, sex and age group, 2019

Figure 1.1 is an interactive bar chart showing the number and percentage of people in the dementia study cohort by age group and sex. There were about 33,100 men and 36,300 women living in the community who had a dementia record in the linked data. The age profile of men and women was similar, although a slightly higher proportion of men were aged 30-64 (9.9% compared with 7.8%), and higher proportion of women were aged 90 or over (14% compared with 9.2%). There were twice as many women (59,900) as men (29,400) living with dementia in residential aged care. One third (33%) of women were aged 90 or over, compared with 19% of men.



Source: AIHW analysis of NIHSI 2020-21
<https://www.aihw.gov.au>

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI. Western Australia and the Northern Territory were excluded from all analyses because their hospital data were not available for construction of the cohort.

2. A small number of SA2s with no SEIFA IRSD ranking were excluded from age group analysis because they could not be assigned to a Remoteness Area/IRSD group. As a result, totals for the cohort, remoteness and socioeconomic areas do not sum to the totals for States/territories and SA4 regions.

Data tables: [Number and percentage of people in the dementia study cohort](#)

References

Australian Institute of Health and Welfare (AIHW) (2020) *Australia's health 2020: data insights - Chapter 7: Changes in people's health service use around the time of entering permanent residential aged care*, AIHW, Australian Government, accessed 27 June 2023. doi:10.25816/5f05371c539f3.

AIHW (2022) *Younger onset dementia: new insights using linked data*, AIHW, Australian Government, accessed 22 February 2023. doi:10.25816/cc5a-tm25

AIHW (2023) *Dementia in Australia*, AIHW, Australian Government, accessed 28 June 2023.

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The dementia study cohort

There are many types of dementia caused by a range of conditions impacting brain function. The most common types of dementia include Alzheimer's disease, vascular dementia, dementia with Lewy bodies and frontotemporal dementia. It is common to have multiple types of dementia at once, known as 'mixed dementia' (see [Understanding dementia](#) for more information).

These are the 4 types of dementia shown in Figure 1.2: *Alzheimer's disease*, *Vascular dementia*, *Dementia in other diseases* and *Other dementia not elsewhere classified (NEC) or not otherwise specified* (includes records of *Unspecified dementia* from other datasets).

However, caution should be taken when interpreting statistics by dementia type as coding for dementia type is inconsistent across the individual datasets in the linked data. Dementia types may also be misclassified in administrative data, or simply attributed to *Unspecified dementia* (Crowther et al. 2017; Waller et al. 2021). Further, due to complexities in diagnosing dementia and the possibility of a person having 'mixed dementia', multiple types of dementia may be recorded in a single administrative record as well as across records. Therefore, the number of dementia types will exceed the number of people living with dementia and the percentage of dementia types will sum to more than 100%.

People living in the community

- *Alzheimer's disease* was the most common type of dementia recorded for people in the study cohort living in the community (59% of people), followed by *Other dementia NEC (Unspecified dementia)* (16% of people) and *Dementia in other diseases* (15% of people).

People living in residential aged care

- *Alzheimer's disease* was the most common type of dementia recorded for people in the study cohort living in residential aged care (77% of people), followed by *Dementia in other diseases* (24% of people) and *Vascular dementia* (20% of people). The hospital diagnosis of *Delirium superimposed on dementia* was the largest contributor to *Dementia in other diseases*.

For both groups

- women were more likely than men to have a record of *Alzheimer's disease*
- men were more likely than women to have a record of *Vascular dementia* or *Dementia in other diseases*
- the percentage of people with a record of *Other dementia NEC (Unspecified dementia)* or with no dementia type recorded:
 - increased with increasing socioeconomic disadvantage
 - increased with increasing remoteness.

This may suggest poorer access to diagnostic methods that allow more specialised treatment and management.

Figure 1.2: Percentage of people with a type of dementia recorded in the linked data, by region of residence, place of residence and sex, 2010-2021

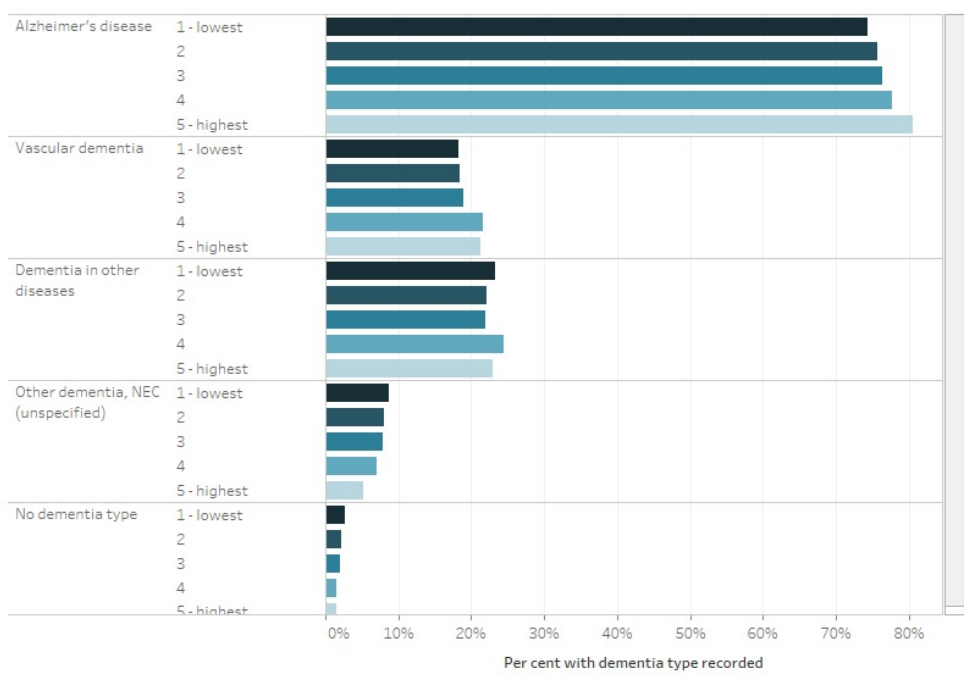
Figure 1.2 is an interactive bar chart showing that Alzheimer's disease was the most common type of dementia recorded in the linked data. The percentage of people with an Alzheimer's disease record decreased with increasing remoteness and socioeconomic disadvantage, while the percentage with a record of Other dementia NEC (Unspecified dementia) or with no dementia type recorded increased. This variation was more pronounced for people living in the community than for those living in residential aged care.

Select from the following:

Place of residence:
 Living in the community
 Living in residential aged care

Sex:
 Men
 Women
 Persons

Region type:
 Total dementia cohort
 Remoteness area
 Socioeconomic area - Total
 Socioeconomic area - Major cities
 Socioeconomic area - Outside major cities



Source: AIHW analysis of NIHSI 2020-21
<https://www.aihw.gov.au>

Notes

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI. Western Australia and the Northern Territory were excluded from all analyses because their hospital data were not available for construction of the cohort.
2. Dementia types were grouped under the 4 broad headings used in ACFI assessments: *Alzheimer's disease*, *Vascular dementia*, *Dementia in other diseases* and *Other dementia not elsewhere classified (NEC) or not otherwise specified* (includes records of *Unspecified dementia* from other datasets).
3. Dementia in other diseases includes: *Frontotemporal dementia*, *Lewy Body dementia*, *Delirium superimposed on dementia*, *Dementia due to effect of substances*, *Dementia in Creutzfeldt-Jakob disease*, *Dementia in Huntington's disease*, *Dementia in human immunodeficiency virus (HIV) disease*, *Dementia in other diseases*.
4. A dementia type of Alzheimer's disease can be inferred through the dispensing of dementia-specific medications, which are currently only subsidised by the PBS/RPBS for people diagnosed with Alzheimer's disease. This may inflate the percentage of people assigned a dementia type of Alzheimer's disease, particularly those living in the community who are less likely to have a hospital, ACFI or death record.
5. A record of a specific type of dementia took precedence over a record of *Unspecified dementia* or *Other dementia NEC*. If a person did not have a specific type of dementia identified in any record, they were assigned as having *No dementia type*.
6. The bar is blank if a value could not be published due to data quality or confidentiality concerns.

Data table: Percentage of people with a type of dementia recorded

References

Crowther G, Bennett M and Holmes J (2017) *How well are the diagnosis and symptoms of dementia recorded in older patients admitted to hospital?* Age and Ageing, 46:1, doi:

Waller M, Buckley R, Masters C, Nona F, Eades S, Dobson A (2021) *Deaths with Dementia in Indigenous and Non-Indigenous Australians: A Nationwide Study.* Journal of Alzheimer's Disease, 81(4) 1589-1599.

Variation by remoteness area

Rural and remote Australians face unique challenges due to their geographic location and often have poorer health outcomes than people living in metropolitan areas (AIHW 2018, 2023). Health and aged care service availability, location, cost and cultural safety have an impact on whether people living with dementia can access the care they need in a timely manner (AIHW 2020; AIHW 2023; Nolan-Isles et al. 2021).

Compared with people in metropolitan areas, people living in rural and remote areas often have:

- reduced access to specialists (AIHW 2022) who primarily diagnose the type of dementia and initially prescribe dementia-specific and other medications
- reduced access to GPs (AIHW 2022), with the associated use of locum doctors who are less likely to have an ongoing relationship with patients
- reduced access to diagnostic services such as MRIs (NHSD 2023)
- symptoms of dementia for a longer period of time before seeking healthcare advice and/or receiving a diagnosis (Bryant et al. 2021; Greenway-Crombie et al. 2012). This delayed diagnosis may occur after the early stages of dementia, when dementia-specific medications are most beneficial
- higher rates of cardiovascular disease, diabetes and other risk factors for dementia (AIHW 2021)
- different hospital admitting rights and a broader use of hospital services (such as for respite care).

This page presents a summary of geographical variation in the use of health services and residential respite care among people living with dementia by **remoteness area**.

As health service use changes after a person enters permanent residential aged care, results are shown by whether people living with dementia were **living in the community** or **living in permanent residential aged care**.

See the [Technical guide](#) for more information on the study cohorts, geographies and services examined.

Very Remote and *Remote* areas of Australia have the highest proportion of Aboriginal and Torres Strait Islander (First Nations) people (41% and 15%, respectively (ABS 2021), however, the number of First Nations people identified in the dementia study cohort was too small to allow separate analysis. For further information, see [Understanding dementia among First Nations people](#).

References

ABS (Australian Bureau of Statistics) (2021), *Census of Population and Housing - Counts of Aboriginal and Torres Strait Islander Australians*, ABS Website, accessed 24 August 2023.

AIHW (Australian Institute of Health and Welfare) (2018) *Survey of Health Care: selected findings for rural and remote Australians*, AIHW, Australian Government, accessed 25 May 2023.

AIHW (2020) *Coordination of health care: experiences of barriers to accessing health services among patients aged 45 and over*, AIHW, Australian Government, accessed 27 June 2023.

AIHW (2021) *Geographical variation in disease: diabetes, cardiovascular and chronic kidney disease*, AIHW, Australian Government, accessed 17 August 2023.

AIHW (2022) *Health workforce*, AIHW, Australian Government, accessed 25 May 2023.

AIHW (2023) *Rural and remote health*, AIHW, Australian Government, accessed 12 September 2023.

Bryant J, Noble N, Freund M, Rumbel J, Eades S, Sanson-Fisher R, Lowe M, Walsh J, Piterman L, Koch S, Meyer C, Todd E (2021) 'How can dementia diagnosis and care for Aboriginal and Torres Strait Islander people be improved? Perspectives of healthcare providers providing care in Aboriginal community controlled health services', *BMC Health Services Research*, 21:699,

Greenway-Crombie A, Snow P, Disler P, Davis S, Pond D (2012) 'Influence of rurality on diagnosing dementia in Australian general practice', *Australian Journal of Primary Health* 18(3):178-184, doi:10.1071/PY12008.

NHSD (National Health Services Directory) (2023), *Healthdirect Australia*, Australian Government, accessed 17 August 2023.

Nolan-Isles D, Macniven R, Hunter K, Gwynn J, Lincoln M, Moir R, Dimitropoulos Y, Taylor D, Agius T, Finlayson H, Martin R, Ward K, Tobin S, Gwynne K (2021) 'Enablers and Barriers to Accessing Healthcare Services for Aboriginal People in New South Wales, Australia', *International Journal of Environmental Research and Public Health*, 18(6):3014, doi: 10.3390/ijerph18063014.

Variation by remoteness area

Most people (70%) in the dementia study cohort lived in *Major cities*, with 21% in *Inner regional* areas, 8.0% in *Outer regional* areas and 0.7% in *Remote and very remote* areas (Table S1.1).

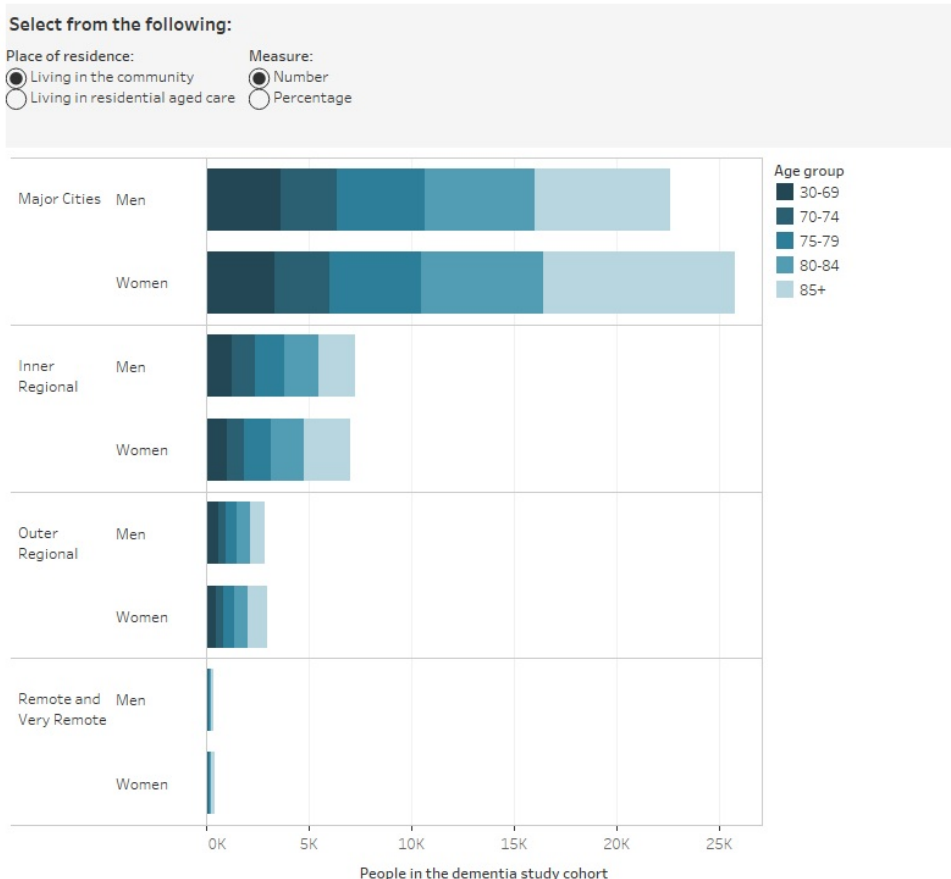
The number of people living with dementia in residential aged care in *Outer regional* and *Remote and very remote* areas was low (Figure 2.1), likely because most residential aged care services are located in metropolitan areas and people often move to access them (Royal Commission 2020), and the flexible aged care services available in more rural areas are not captured in the linked data (see Box 1.1) (AIHW 2023a).

The percentage of people aged 85 and over living in residential aged care was also lower in *Remote and very remote* areas (47% compared with 56% in *Major cities*) (Figure 2.1). This may be due to a shorter life expectancy in rural and remote areas (AIHW 2023b), as well as issues relating to the identification of people living with dementia in the linked data (see Box 1.1).

There were similar numbers of men and women living with dementia in the community outside of *Major cities*, and up to twice as many women as men living in residential aged care in all remoteness areas.

Figure 2.1: Number and percentage of people in the dementia study cohort, by place of residence, remoteness area, sex and age group, 2019

Figure 2.1 is an interactive bar chart showing the number and percentage of people in the dementia study cohort by remoteness area, age group and sex. Among people living in the community, most lived in *Major cities* (96,900 people), followed by *Inner regional* areas (14,300 people), *Outer regional* areas (5,800 people) and *Remote and very remote* areas (760 people). Among people living in residential aged care, most lived in *Major cities* (126,100 people), followed by *Inner regional* areas (19,000 people), *Outer regional* areas (6,900 people) and *Remote and very remote* areas (330 people). Women had an older age profile than men in all remoteness areas.



Source: AIHW analysis of NIHSI 2020-21
<https://www.aihw.gov.au>

Notes

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI. Western Australia and the Northern Territory were excluded from all analyses because their hospital data were not available for construction of the dementia cohort.

2. The geographies in this report are based on where a person lived, not where they received services. Remoteness areas are based on the 2016 Remoteness Area Structure within the ASGS.

3. A small number of SA2s with no SEIFA IRSD ranking were excluded from age group analysis because they could not be assigned to a Remoteness Area/IRSD group. As a result, totals for the cohort, remoteness and socioeconomic areas do not sum to the totals for States/territories and SA4 regions.

Data tables: Number and percentage of people in the dementia study cohort

References

AIHW (Australian Institute of Health and Welfare) (2023a) *Providers, services and places in aged care*, AIHW, Australian Government, accessed 26 July 2023.

AIHW (2023b) *Rural and remote health*, AIHW, Australian Government, accessed 12 September 2023.

Royal Commission into Aged Care Quality and Safety (2020) *Research Paper 16 - How far do people move to access aged care?* Australian Government, accessed 9 October 2023.

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Variation by remoteness area

Figure 2.2 is an interactive chart exploring the use of health services by remoteness area, with rates (the percentage of people in the dementia study cohort with at least one service), rate ratios (where rates for people living in *Major cities* were used as a reference point to compare with other remoteness areas) and age-standardised rates.

People living in the community

People living with dementia in the community in *Remote and very remote* areas of Australia had lower rates of:

- specialist attendances
- dispensing of dementia-specific medications
- emergency department visits
- allied health attendances - podiatry

but higher rates of:

- medication management review attendances
- hospital stays

than people living in *Major cities*.

The dispensing of opioids tended to be higher in regional and remote areas, especially for women. People living in regional and remote areas also had higher rates of nursing and/or Aboriginal health worker attendances.

There was a *similar* rate of service use across remoteness areas for GP attendances and the dispensing of antipsychotics, benzodiazepines and glucose regulating medications.

People living in *Inner regional* areas tended to have *similar* rates of health service use as people in *Major cities*, with the exception of lower rates of specialist attendances and the dispensing of dementia-specific medications.

Rates were highest in *Inner regional* areas and decreased with increasing remoteness for:

- GP chronic disease management attendances
- allied health attendances - total and optometry
- polypharmacy and the dispensing of antidepressants.

People living in residential aged care

There was a *similar* rate of service use across remoteness areas for GP attendances and the dispensing of antidepressants and antipsychotics.

People living with dementia in residential aged care in *Inner regional*, *Outer regional* and *Remote and very remote* areas of Australia had lower rates of:

- specialist attendances
- GP chronic disease management attendances
- nursing and/or Aboriginal health worker attendances
- allied health attendances
- polypharmacy and hyper-polypharmacy
- medication management review attendances
- dispensing of dementia-specific medication
- dispensing of benzodiazepines
- emergency department visits
- hospital stays (although *Outer regional* rates were similar to *Major cities*)

than people living in *Major cities*.

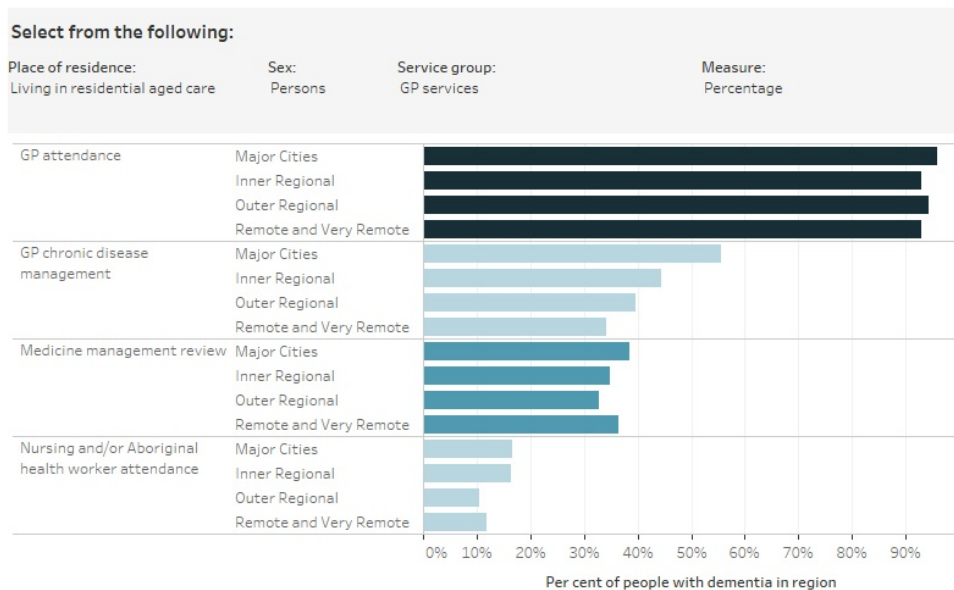
People living in *Remote and very remote* areas also had lower rates of dispensing of cardiovascular and glucose regulating medications, whereas rates for these services in *Inner and outer regional* areas were similar to *Major cities*.

Rates of opioid dispensing were highest in *Inner regional* areas and decreased with increasing remoteness.

People living with dementia who had a GP chronic disease management (CDM) plan were more likely to have a Medicare-subsidised allied health care attendance than people without a CDM plan, at all remoteness areas. For example, among people living in the community in *Inner regional* areas, 81% of those with a CDM plan in 2019 also had an allied health attendance, compared with 42% of those without a CDM plan (Table S2.13).

Figure 2.2: Health service use among people in the dementia cohort, by place of residence, remoteness area and sex, 2019

Figure 2.2 is an interactive bar chart showing variation in the use of a range of health services by remoteness area for people in the dementia study cohort living in the community or living in residential aged care. Health services groups shown are GP services, specialist services, allied health services, ED visits, hospital stays, polypharmacy and medications dispensed (1 or more, 4 or more). Measures of use are percentage of people who used the service, age-standardised rates and rate ratios.



Source: AIHW analysis of NIHSI 2020-21
<https://www.aihw.gov.au>

Notes

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI. Western Australia and the Northern Territory were excluded from all analyses because their hospital data were not available for construction of the cohort.
2. The geographies in this report are based on where a person lived, not where they received services. Remoteness areas are based on the 2016 Remoteness Area Structure within the ASGS.
3. 'Percentage' is the proportion of people in the dementia cohort with at least one service recorded in the NIHSI in 2019.
4. Rate ratios are a method for comparing rates between regions. The rates for people living with dementia in *Major cities* were used as the reference population to compare with other remoteness areas. A rate ratio of 1 indicates that the rate for the region is the same as the rate in the reference population. A rate ratio greater than 1 indicates that the rate for the region is higher than the rate in the reference population. A rate ratio less than 1 indicates that the rate for the region is lower than the rate in the reference population.
5. Age-standardised rates were calculated where population and service counts allowed.
6. Only public hospital data were included in this analysis: some of the observed variation may be due to the availability and use of private hospitals.
7. The bar is blank if a value could not be published due to data quality or confidentiality concerns.

Data tables: [Health service use among people in the dementia cohort](#)

Variation by remoteness area

The number of times a person uses a health service is influenced by many factors, including patient health needs, the available supply of services and potential barriers such as cost.

Figure 2.3 is an interactive chart where the average number of services per person was calculated for:

- people in the dementia study cohort who used the service at least once (referred to in the figures as “service users”)
- all people in the dementia study cohort, regardless of whether they used the service (referred to in the figures as “cohort”).

The following discussion relates to **people who used a service at least once**.

People living in the community

People living with dementia in the community in *Inner regional* areas tended to have *similar or slightly lower* rates of health service use than people in *Major cities*, except for specialist attendances, where the average number of attendances was *lower*.

Of people who used the health service at least once, those living in *Remote and very remote* areas of Australia *had a lower average number of*:

- specialist attendances and allied health attendances (total and podiatry)

but a higher average number of:

- emergency department visits and hospital stays

than people living in *Major cities*.

There was a *similar* average number of services per person across remoteness areas for:

- GP attendances
- GP chronic disease management attendances
- nursing and/or Aboriginal health worker attendances.

People living in residential aged care

Of people living with dementia in residential aged care who used the health service at least once, those living in *Inner regional*, *Outer regional* and *Remote and very remote* areas of Australia *had a lower average number of*:

- GP attendances
- specialist attendances
- nursing and/or Aboriginal health worker attendances

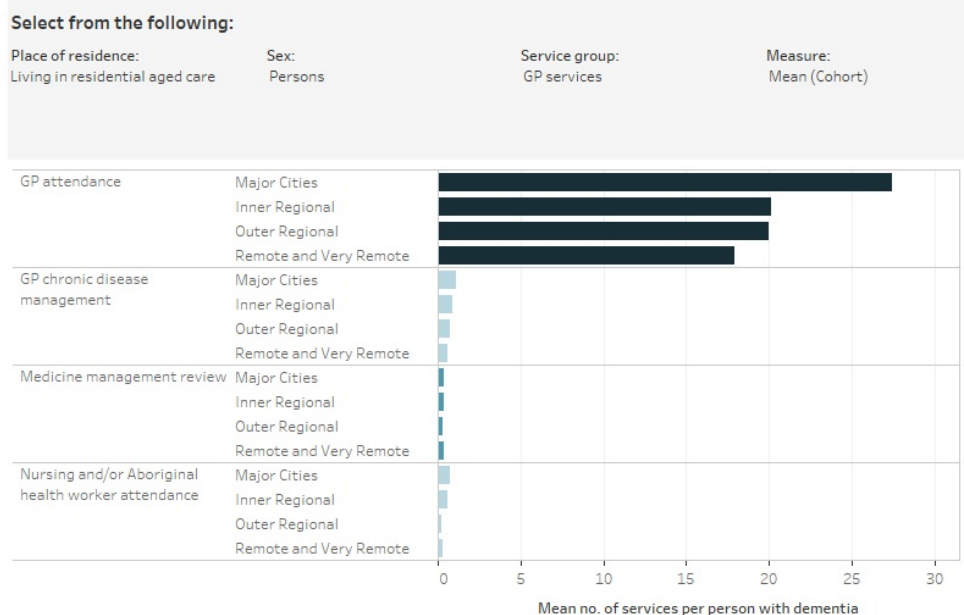
than people living in *Major cities*.

There was a *similar* average number of services per person across remoteness areas for:

- GP chronic disease management attendances
- allied health attendances
- emergency department visits
- hospital stays.

Figure 2.3: Average number of services per person, by place of residence, remoteness area and sex, 2019

Figure 2.3 is an interactive bar chart showing variation in the average number of services per person by remoteness area for people in the dementia study cohort living in the community or living in residential aged care. Health services groups shown are GP services, specialist services, allied health services, ED visits and hospital stays. The average number of services were calculated for people who used the service at least once in 2019 and all people in the dementia study cohort, regardless of whether they used the service in 2019 (as an indication of overall access in an area).



Source: AIHW analysis of NIHSI 2020-21
<https://www.aihw.gov.au>

Notes

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI. Western Australia and the Northern Territory were excluded from all analyses because their hospital data were not available for construction of the cohort.
2. The geographies in this report are based on where a person lived, not where they received services. Remoteness areas are based on the 2016 Remoteness Area Structure within the ASGS.
3. “Mean (Service users)” is the mean number of attendances per person for people in the dementia cohort who used the service at least once in 2019.
4. “Mean (cohort)” is the mean number of attendances per person for all people in the dementia cohort, regardless of whether they used the service in 2019.
5. Only public hospital data were included in this analysis: some of the observed variation may be due to the availability and use of private hospitals.
6. The bar is blank if a value could not be published due to data quality or confidentiality concerns.

Data tables: [Average number of services per person, by place of residence, remoteness area and sex](#)

Variation by remoteness area

This report explores the use of residential respite care among 2 groups of people living with dementia (see Methods section):

- “Community 2019” group: people living in the community in 2019, who **did not enter** permanent residential aged care in 2019 or 2020
- “Subsequent PRAC” group: people living in the community for all or some of 2019, who **did enter** permanent residential aged care later in 2019 or in 2020.

The use of residential respite care by people who **did not enter** permanent care in the subsequent 12 months was low overall (an average 5.4% of people). The highest rates were among people living in *Inner regional* areas (6.2%) and the lowest rates were in *Remote and very remote* areas (3.3%).

The use of residential respite care was more common for people who **did enter** permanent care in the subsequent 12 months (an average of 70% of people). There was no clear pattern of variation by remoteness area, with rates ranging from 66% in *Remote and very remote* areas to 72% in *Outer regional* areas.

For both groups, people who used residential respite care had an average of 1.5 stays per person (see [Table S5.1](#) for details).

Figure 2.4: Residential respite care use among people in the dementia cohort, by place of residence, remoteness area and sex, 2019-2020

Figure 2.4 is an interactive bar chart showing variation in the use of residential respite care by remoteness area for people in the dementia study cohort who entered permanent residential aged care in the subsequent 12 months and those who did not. Measures of use are percentage of people with at least one stay, age-standardised rates, rate ratios and the average number of stays per person with at least one stay.



Source: AIHW analysis of NIHSI 2020-21
<https://www.aihw.gov.au>

Notes

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI. Western Australia and the Northern Territory were excluded from all analyses because their hospital data were not available for construction of the cohort.
2. The geographies in this report are based on where a person lived, not where they received services. Remoteness areas are based on the 2016 Remoteness Area Structure within the ASGS.
3. PRAC = permanent residential aged care
4. ‘Percentage’ is the proportion of people in the dementia cohort with at least one service recorded in the NIHSI in 2019.
5. Rate ratios are a method for comparing rates between regions. The rates for people living with dementia in *Major cities* were used as the reference population to compare with other remoteness areas. A rate ratio of 1 indicates that the rate for the region is the same as the rate in the reference population. A rate ratio greater than 1 indicates that the rate for the region is higher than the rate in the reference population. A rate ratio less than 1 indicates that the rate for the region is lower than the rate in the reference population.
6. Age-standardised rates were calculated where population and service counts allowed.
7. “Mean (service users)” is the mean number of attendances per person for people in the dementia cohort who used the service at least once in 2019.
8. The bar is blank if a value could not be published due to data quality or confidentiality concerns.

Data tables: [Residential respite care use among people in the dementia cohort](#)

Variation by socioeconomic area

Generally, people in lower socioeconomic groups are at greater risk of poor health, have higher rates of illness, disability and death, and live shorter lives than people from higher socioeconomic groups (see [Health across socioeconomic groups](#)). This ‘wealth-health gradient’ becomes more pronounced as people age (McMaughan et al. 2020), and lower neighbourhood-level socioeconomic status has been shown to be associated with poorer cognition and higher dementia risk (Pase et al. 2022).

People in lower socioeconomic groups often have:

- higher rates of modifiable risk factors for dementia (Livingstone et al. 2020) (see also [Dementia burden due to risk factors](#))
- higher rates of cardiovascular disease, diabetes and other comorbidities (AIHW 2022) that can lead to deterioration in health and the need for hospitalisation
- symptoms of dementia for a longer period of time before seeking healthcare advice and/or receiving a diagnosis (Bryant et al. 2021; Greenway-Crombie et al. 2012). This delayed diagnosis may occur after the early stages of dementia, when dementia-specific medications are most beneficial
- lower access to health services due to cost, transport or other factors such as low health literacy (AIHW 2020).

This page presents a summary of geographical variation in the use of health services and residential respite care among people living with dementia by **socioeconomic area**, based on the 2016 Socio-Economic Indexes for Areas (SEIFA) Index of Relative Socio-economic Disadvantage (IRSD) quintiles.

To examine the effect of socioeconomic disadvantage in metropolitan and rural areas, data are presented for the total dementia study cohort, and for socioeconomic areas within *Major cities* and *Outside major cities* (which is an aggregate of *Inner regional*, *Outer regional*, *Remote and Very remote Australia*).

As health service use changes after a person enters permanent residential aged care, results are shown by whether people living with dementia were **living in the community** or **living in permanent residential aged care**.

See the [Technical guide](#) for more information on the study cohorts, geographies and services examined.

References

AIHW (Australian Institute of Health and Welfare) (2020) [Coordination of health care: experiences of barriers to accessing health services among patients aged 45 and over](#), AIHW, Australian Government, accessed 27 June 2023.

AIHW (2022) [Health across socioeconomic groups](#), AIHW, Australian Government, accessed 17 August 2023

Bryant J, Noble N, Freund M, Rumbel J, Eades S, Sanson-Fisher R, Lowe M, Walsh J, Piterman L, Koch S, Meyer C, Todd E (2021) ‘[How can dementia diagnosis and care for Aboriginal and Torres Strait Islander people be improved? Perspectives of healthcare providers providing care in Aboriginal community controlled health services](#)’, *BMC Health Services Research*, 21:699.

Greenway-Crombie A, Snow P, Disler P, Davis S, Pond D (2012) ‘[Influence of rurality on diagnosing dementia in Australian general practice](#)’, *Australian Journal of Primary Health* 18(3):178-184, doi:10.1071/PY12008.

Livingston G, Huntley J, Sommerlad A, Ames D, Ballard C, Banerjee S et al. (2020) [Dementia prevention, intervention, and care: 2020 report of the Lancet commission](#), doi: 10.1016/S0140-6736(20)30367-6.

McMaughan D, Oloruntoba O, Smith M (2020) ‘[Socioeconomic Status and Access to Healthcare: Interrelated Drivers for Healthy Aging](#)’, *Frontiers in Public Health*, volume 8, doi: 10.3389/fpubh.2020.00231.

Pase M, Rowsthorn E, Cavuoto M, Lavale A, Yassi N, Maruff P, Buckley R, Lim Y (2022) ‘[Association of neighborhood-level socioeconomic measures with cognition and dementia risk in Australian adults](#)’, *JAMA Network Open*, 5(3):e224071, doi:10.1001/jamanetworkopen.2022.4071.

Variation by socioeconomic area

Within *Major cities*, people living in the highest socioeconomic areas were most likely to be identified in the dementia study cohort (Figure 3.1). This is influenced by the higher rates of dispensing of dementia-specific medications to people in these areas.

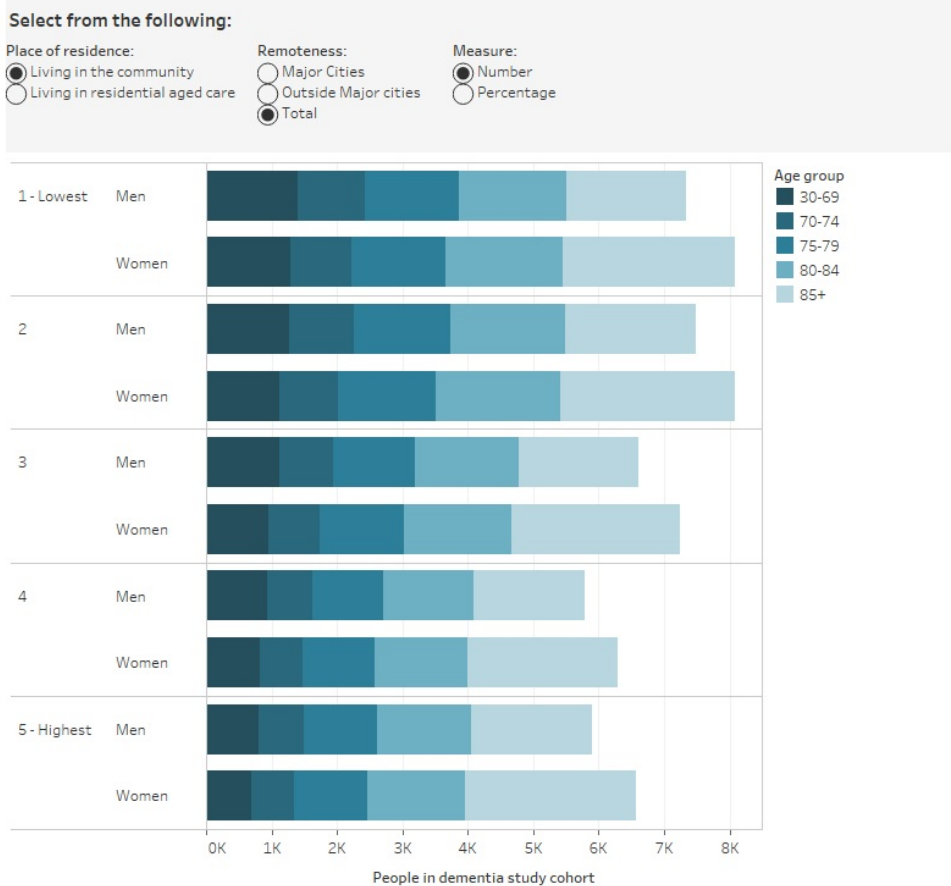
Outside major cities, people living in the lower socioeconomic areas (quintiles 1 and 2) were most likely to be identified in the dementia study cohort. This is partly because the SEIFA index defines relative advantage and disadvantage in terms of people's access to material and social resources and their ability to participate in society, so that fewer areas in regional and remote Australia have high IRSD scores (ABS 2018). This should be kept in mind when interpreting the data.

People living with dementia in the highest socioeconomic areas were more likely to be aged over 85 than people living in the lowest socioeconomic areas.

It should be noted that the socioeconomic area of a person's residential aged care facility may not be the same as the socioeconomic area/s they previously lived in.

Figure 3.1: Number and percentage of people in the dementia study cohort, by place of residence, socioeconomic area (Total, within Major cities and Outside major cities), sex and age group, 2019

Figure 3.1 is an interactive bar chart showing the number and percentage of people in the dementia study cohort by socioeconomic area (total, within Major cities and Outside major cities), age group and sex. Among people in the dementia study cohort living in Major cities, more people lived in the highest socioeconomic areas (11,800 people in the community and 15,700 in residential aged care) than the lowest socioeconomic areas (8,300 people in the community and 9,300 in residential aged care). Conversely, among people living Outside major cities, more people lived in the lowest socioeconomic areas (7,200 people in the community and 8,900 in residential aged care) than the highest socioeconomic areas (650 people in the community and 850 in residential aged care). People in the highest socioeconomic areas had an older age profile than people in lower socioeconomic areas, and women had an older age profile than men in all socioeconomic areas.



Source: AIHW analysis of NIHSI 2020-21
<https://www.aihw.gov.au>

Notes

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI. Western Australia and the Northern Territory were excluded from all analyses because their hospital data were not available for construction of the cohort.
2. The geographies in this report are based on where a person lived, not where they received services.
3. Socioeconomic areas are based on 2016 SEIFA IRSD quintiles. People living in the 20% of areas with the greatest overall level of disadvantage are described as living in the lowest socioeconomic areas (quintile 1); people living in the 20% of areas with the least overall level of disadvantage are described as living in the highest socioeconomic areas (quintile 5).
4. Remoteness areas are based on the 2016 Remoteness Area Structure within the ASGS. *Outside major cities* includes *Inner regional*, *Outer regional*, *Remote* and *Very remote Australia*.
5. A small number of SA2s with no SEIFA IRSD ranking were excluded from age group analysis because they could not be assigned to a Remoteness Area/IRSD group. As a result, totals for the cohort, remoteness and socioeconomic areas do not sum to the totals for states/territories and SA4 regions.

Data tables: [Number and percentage of people in the dementia study cohort](#)

References

ABS (Australian Bureau of Statistics) (2018) *Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), Australia, 2016*, Cat no 2033.0.55.001, Accessed 5 July 2023.

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Variation by socioeconomic area

Figure 3.2 is an interactive chart exploring the use of health services by socioeconomic area, with rates (the percentage of people with at least one service), rate ratios (where rates for people living with dementia living in the highest socioeconomic areas were used as a reference point to compare with other socioeconomic areas) and age-standardised rates.

Common patterns of variation by socioeconomic area

Overall, people living with dementia in the lowest socioeconomic areas had *lower rates of* dispensing of dementia-specific medication *but higher rates of*:

- polypharmacy and hyper-polypharmacy
- emergency department visits and hospital stays
- dispensing of glucose regulating medications and opioids
- dispensing of antipsychotics (in the community)

than people living in the highest socioeconomic areas.

There was a *similar* rate of service use across socioeconomic areas for:

- GP attendances
- dispensing of antidepressants and benzodiazepines
- medication management review attendances.

Different patterns of variation within and outside Major cities

Access to health services also depends on a person's circumstance, for example, people living in the lowest socioeconomic areas are more likely to access bulk-billed Medicare services (where the doctor accepts the Medicare rebate as the full payment for the service, and the patient pays nothing) (AIHW 2020), while financial barriers to accessing services can be compounded if a person lives in a rural area with fewer health service providers (Figure 2.2).

People living with dementia in the lowest socioeconomic areas had:

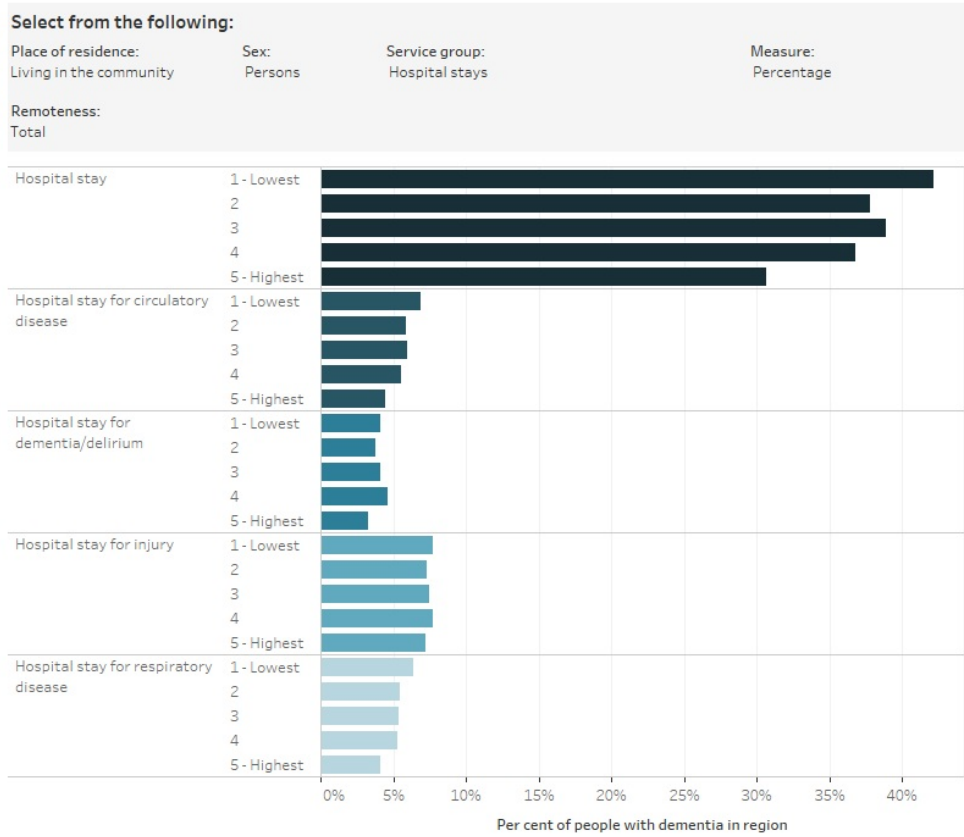
- *lower rates of specialist attendances* when living in the community in *Major cities*, but there were *similar rates* of attendances across socioeconomic areas for people living in residential aged care
- *lower rates of specialist attendances Outside major cities* both in the community and residential aged care
- *higher rates of GP chronic disease management (CDM)* and Medicare-subsidised allied health *podiatry* attendances when living in the community in *Major cities* (and to a lesser extent in residential aged care)
- *lower rates of CDM and Medicare-subsidised allied health optometry* attendances in residential aged care *Outside major cities*, but *similar rates* in the community

compared with people living in the highest socioeconomic areas.

People living with dementia who had a CDM plan were more likely to have a Medicare-subsidised allied health care attendance than people without a CDM plan, across all socioeconomic areas. For example, among people living in the community in the lowest socioeconomic areas, 81% of those with a CDM plan in 2019 also had an allied health attendance, compared with 38% of those without a CDM plan ([Table S2.13](#)).

Figure 3.2: Health service use among people in the dementia cohort, by place of residence, socioeconomic area (Total, within Major cities and Outside major cities) and sex, 2019

Figure 3.2 is an interactive bar chart showing variation in the use of a range of health services by socioeconomic area (total, within Major cities and Outside major cities) for people in the dementia study cohort living in the community or living in residential aged care. Health services groups shown are GP services, specialist services, allied health services, ED visits, hospital stays, polypharmacy and medications dispensed (1 or more, 4 or more). Measures of use are percentage of people who used the service, age-standardised rates and rate ratios.



Source: AIHW analysis of NIHSI 2020-21
<https://www.aihw.gov.au>

Notes

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI. Western Australia and the Northern Territory were excluded from all analyses because their hospital data were not available for construction of the cohort.
2. The geographies in this report are based on where a person lived, not where they received services.
3. 'Percentage' is the proportion of people in the dementia cohort with at least one service recorded in the NIHSI in 2019.
4. Rate ratios are a method for comparing rates between regions. The rates for people living with dementia living in the highest socioeconomic areas were used as the reference population to compare with other socioeconomic areas ('*Quintile 5 - highest*' for the total cohort, '*Major cities - quintile 5 - highest*' for analysis within and '*Outside Major cities*'). A rate ratio of 1 indicates that the rate for the region is the same as the rate in the reference population. A rate ratio greater than 1 indicates that the rate for the region is higher than the rate in the reference population. A rate ratio less than 1 indicates that the rate for the region is lower than the rate in the reference population.
5. Age-standardised rates were calculated where population and service counts allowed.
6. Only public hospital data were included in this analysis: some of the observed variation may be due to the availability and use of private hospitals.
7. The bar is blank if a value could not be published due to data quality or confidentiality concerns.

Data tables: [Health service use among people in the dementia cohort by place of residence, socioeconomic area and sex](#)

References

AIHW (Australian Institute of Health and Welfare) (2020) *Coordination of health care: experiences of barriers to accessing health services among patients aged 45 and over*, AIHW, Australian Government, accessed 27 June 2023.

Variation by socioeconomic area

The number of times a person uses a health service is influenced by many factors, including patient health needs, the available supply of services and potential barriers such as cost.

Figure 3.3 is an interactive chart where the average number of services per person was calculated for:

- people in the dementia study cohort who used the service at least once (referred to in the figures as “service users”)
- all people in the dementia study cohort, regardless of whether they used the service (referred to in the figures as “cohort”).

The following discussion relates to **people who used a service at least once**.

Common patterns of variation by socioeconomic area

Of the people living with dementia who used a health service at least once, those living in the community in the lowest socioeconomic areas had a *lower average number of specialist attendances* than people living in the highest socioeconomic areas, both within and outside *Major cities*.

People living in residential aged care had a *similar average number of specialist attendances* across socioeconomic areas, although the average number of attendances *Outside major cities* was lower than that for *Major cities* (see also Figure 2.3).

Different patterns of variation within and outside Major cities

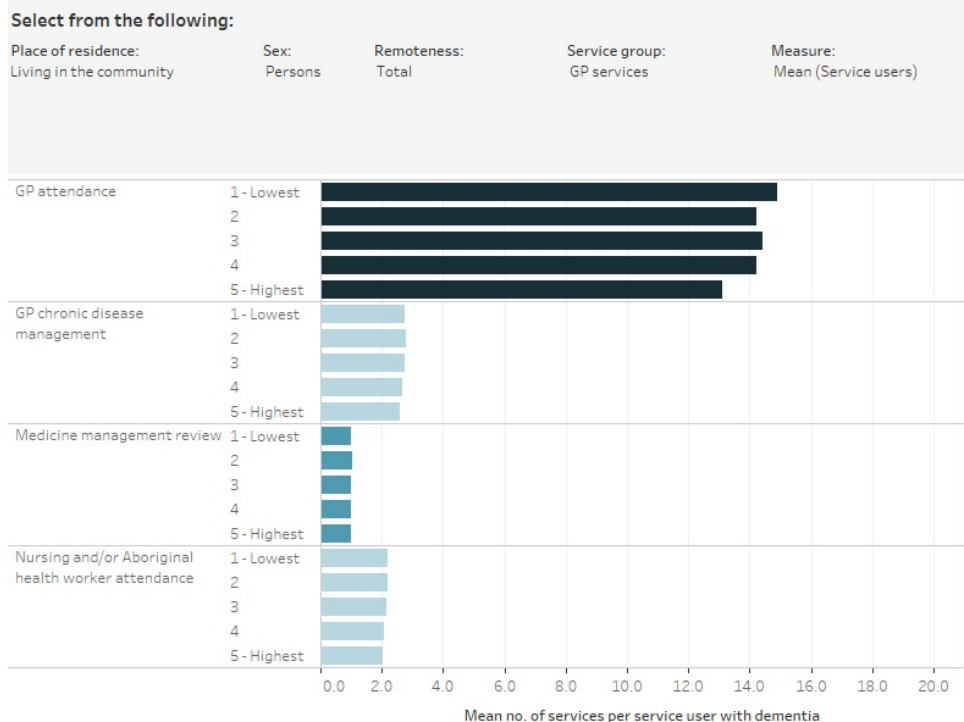
Of the people living with dementia who used a health service at least once, those living in the lowest socioeconomic areas had:

- a *higher average number of GP attendances* per person in *Major cities*, both in the community and in residential aged care
- a *lower average number of GP attendances* per person in residential aged care *Outside major cities*, but a *similar average number* per person in the community

compared with people living in the highest socioeconomic areas.

Figure 3.3: Average number of services per person, by place of residence, socioeconomic area (Total, within Major cities and Outside major cities) and sex, 2019

Figure 3.3 is an interactive bar chart showing variation in the average number of services per person by socioeconomic area (total, within *Major cities* and *Outside major cities*) for people in the dementia study cohort living in the community or living in residential aged care. Health services groups shown are GP services, specialist services, allied health services, ED visits and hospital stays. The average number of services were calculated for people who used the service at least once in 2019 and all people in the dementia study cohort, regardless of whether they used the service in 2019 (as an indication of overall access in an area).



Source: AIHW analysis of NIHSI 2020-21
<https://www.aihw.gov.au>

Notes

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI. Western Australia and the Northern Territory were excluded from all analyses because their hospital data were not available for construction of the cohort.
2. The geographies in this report are based on where a person lived, not where they received services.
3. “Mean (Service users)” is the mean number of attendances per person for people in the dementia cohort who used the service at least once in 2019.
4. “Mean (cohort)” is the mean number of attendances per person for all people in the dementia cohort, regardless of whether they used the service in 2019.
5. Only public hospital data were included in this analysis: some of the observed variation may be due to the availability and use of private hospitals.
6. The bar is blank if a value could not be published due to data quality or confidentiality concerns.

Data tables: [Average number of services per person, by place of residence, socioeconomic area](#)

Variation by socioeconomic area

This report explores the use of residential respite care among 2 groups of people living with dementia (see Methods section):

- “Community 2019” group: people living in the community in 2019, who **did not enter** permanent residential aged care in 2019 or 2020.
- “Subsequent PRAC” group: people living in the community for all or some of 2019, who **did enter** permanent residential aged care later in 2019 or in 2020.

The use of residential respite care by people who **did not enter** permanent care in the subsequent 12 months was low overall (an average 5.4% of people). Within *Major cities*, after adjusting for differences in age, people in the highest socioeconomic areas had significantly higher rates of residential respite care use (3.6 per 100 people with a dementia record) than those in the lowest socioeconomic areas (1.9 per 100 people with a dementia record).

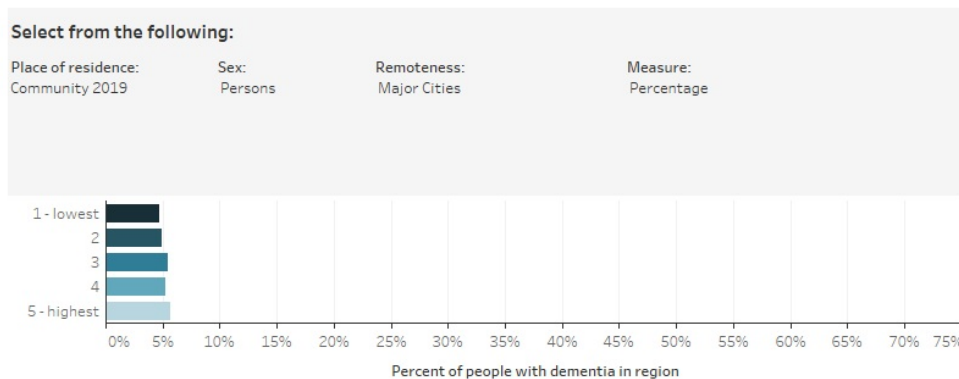
The use of residential respite care was more common for people who **did enter** permanent care in the subsequent 12 months.

- Within *Major cities*, rates were highest in the highest socioeconomic areas (75%) but were similar across other socioeconomic areas (between 69%-71%).
- *Outside major cities*, rates were highest in the lower socioeconomic areas (between 68%-72%) and lowest in the highest socioeconomic areas (62%). Overall, use of residential respite care was lower than within *Major cities*.

For both groups, people who used residential respite care had an average of 1.5 stays per person (see [Table S5.1](#) for details).

Figure 3.4: Residential respite care use among people in the dementia cohort, by place of residence, socioeconomic area (Total, within Major cities and Outside major cities) and sex, 2019-2020

Figure 3.4 is an interactive bar chart showing variation in the use of residential respite care by socioeconomic area (total, within Major cities and Outside major cities) for people in the dementia study cohort who entered permanent residential aged care in the subsequent 12 months and those who did not. Measures of use are percentage of people with at least one stay, age-standardised rates, rate ratios and the average number of stays per person with at least one stay.



Source: AIHW analysis of NIHSI 2020-21
<https://www.aihw.gov.au>

Notes

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI. Western Australia and the Northern Territory were excluded from all analyses because their hospital data were not available for construction of the cohort.
2. The geographies in this report are based on where a person lived, not where they received services.
3. PRAC = permanent residential aged care
4. 'Percentage' is the proportion of people in the dementia cohort with at least one service recorded in the NIHSI in 2019.
5. Rate ratios are a method for comparing rates between regions. The rates for people living with dementia in the highest socioeconomic areas were used as the reference population to compare with other socioeconomic areas ('*Quintile 5 - highest*' for the total cohort, '*Major cities - quintile 5 - highest*' for analysis within and '*Outside Major cities*'). A rate ratio of 1 indicates that the rate for the region is the same as the rate in the reference population. A rate ratio greater than 1 indicates that the rate for the region is higher than the rate in the reference population. A rate ratio less than 1 indicates that the rate for the region is lower than the rate in the reference population.
6. Age-standardised rates were calculated where population and service counts allowed.
7. "Mean (service users)" is the mean number of attendances per person for people in the dementia cohort who used the service at least once in 2019.
8. The bar is blank if a value could not be published due to data quality or confidentiality concerns.

Data tables: [Residential respite care use among people in the dementia cohort](#)



Variation by SA4 region

This section presents a summary of geographical variation in the use of health services and residential respite care among people living with dementia by **Statistical Area Level 4 (SA4)** region. SA4 regions represent labour markets, with populations between 100,000 people (in regional areas) and 500,000 people (in capital cities). SA4s are named for the areas they represent, for example, a centre within a capital city (such as *Sydney - Blacktown*), a large regional city (such as *Bendigo*), or a collection of regional areas (such as *Darling Downs - Maranoa*).

As health service use changes after a person enters permanent residential aged care, results are shown by whether people living with dementia were **living in the community** or **living in permanent residential aged care**.

See the [Technical guide](#) for more information on the dementia study cohorts, geographies and services examined.

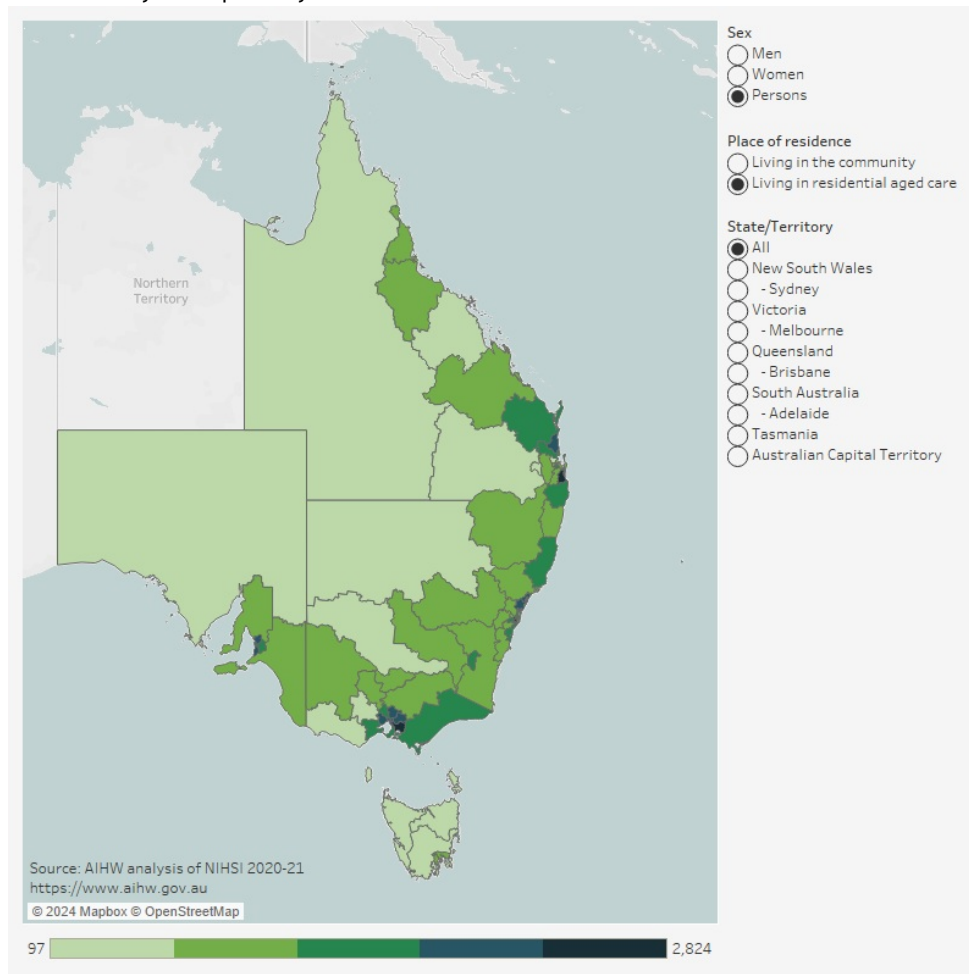
The number of people identified with dementia in the linked data is shown in a map of SA4 regions (Figure 4.1) and interactive maps exploring variation in the use of health services and residential respite care services by SA4 regions are shown in figures 4.2-4.5.

Variation by SA4 region

Figure 4.1 is an interactive map showing the number of people in the dementia study cohort by SA4 region and sex for people living in the community or living in residential aged care.

Figure 4.1: Number of people in the dementia study cohort, by place of residence, SA4 region of residence and sex, 2019

Figure 4.1 is an interactive map showing the number of people in the dementia study cohort by SA4 region and sex for people living in the community or living in residential aged care. The number of people living in the community with a dementia record ranged from 126 in *South East Tasmania* to 2,314 in *Sydney - Inner South West*. The number of people living in residential aged care with a dementia record ranged from 97 in *South East Tasmania* to 2,824 in *Melbourne - South East*. There are 5 colour gradients. SA4s can be selected by state/territory and capital city.



Notes

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI.
2. The geographies in this report are based on where a person lived, not where they received services. Data are only presented for states/territories with hospital data in the NIHSI.

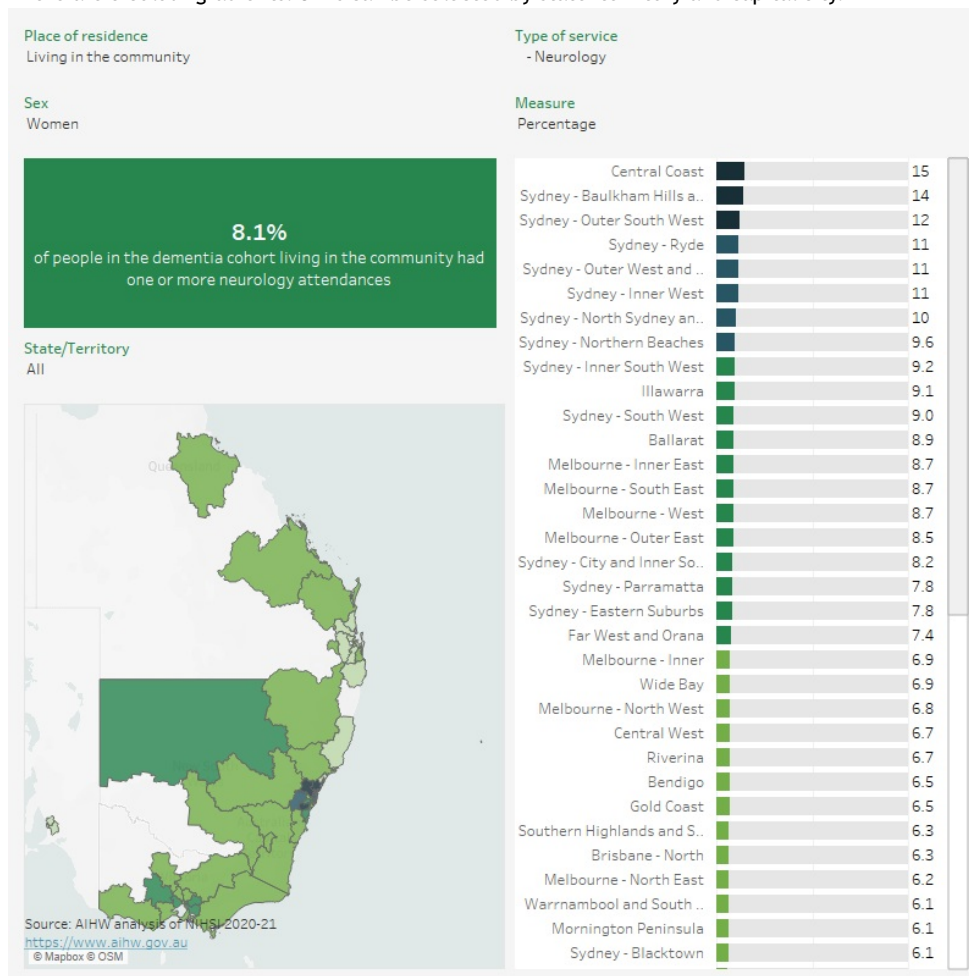
Data tables: [Number of people in the dementia study cohort, by place of residence, SA4 region of residence, sex and age group](#)

Variation by SA4 region

Figure 4.2 is an interactive map and bar chart showing variation in the use of Medicare-subsidised services by SA4 region and sex for people in the dementia study cohort living in the community or living in residential aged care.

Figure 4.2: GP-related, specialist and allied health care attendances among people in the dementia cohort, by place of residence, SA4 region of residence and sex, 2019

Figure 4.2 is an interactive map and bar chart showing variation in the use of Medicare-subsidised services by SA4 region and sex for people in the dementia study cohort living in the community or living in residential aged care. Types of service shown are total GP, GP chronic disease management, nursing and/or Aboriginal health worker, specialist (total, geriatric medicine, general medicine, neurology and psychiatry), and allied health (total, optometry and podiatry) attendances. Measures of use are percentage of people who used the service, the average number of attendances per person who used the service and the average number of attendances per person in the cohort. There are 5 colour gradients. SA4s can be selected by state/territory and capital city.



Notes

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI.
2. The geographies in this report are based on where a person lived, not where they received services. Data are only presented for states/territories with hospital data in the NIHSI.
3. 'Percentage' is the proportion of people in the dementia cohort with at least one service recorded in the NIHSI in 2019.
4. "Mean (Service users)" is the mean number of attendances per person for people in the dementia cohort who used the service at least once in 2019.
5. "Mean (cohort)" is the mean number of attendances per person for all people in the dementia cohort, regardless of whether they used the service in 2019.
6. Age-standardised rates were calculated where population and service counts allowed (see Data tables S2.1- S2.12).
7. A region is blank if a value could not be published due to data quality or confidentiality concerns.

Data tables: [GP-related, specialist and allied health care attendances among people in the dementia cohort, by place of residence, SA4 region of residence and sex](#)

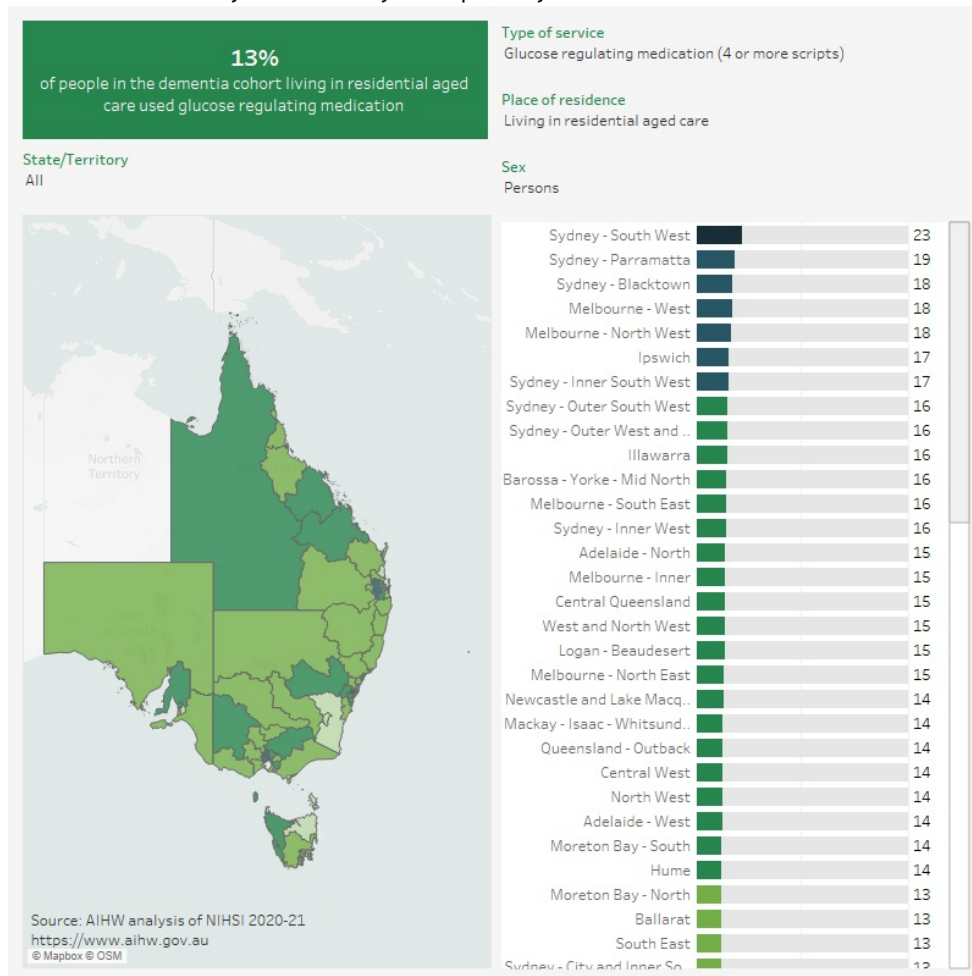


Variation by SA4 region

Figure 4.3 is an interactive map and bar chart showing variation in the dispensing of selected medications by SA4 region and sex for people in the dementia study cohort living in the community or living in residential aged care.

Figure 4.3: Percentage of people in the dementia cohort with polypharmacy or a medication management review, and dispensing of selected medications, by place of residence, SA4 region of residence and sex, 2019

Figure 4.3 is an interactive map and bar chart showing variation in the dispensing of selected medications by SA4 region and sex for people in the dementia study cohort living in the community or living in residential aged care. Data shown are the percentage of people with polypharmacy, hyper-polypharmacy, and people who were dispensed selected medications 4 or more times: dementia-specific, antidepressants, antipsychotics, benzodiazepines, opioids, cardiovascular and glucose regulating medications. There are 5 colour gradients. SA4s can be selected by state/territory and capital city.



Notes

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI.
2. The geographies in this report are based on where a person lived, not where they received services. Data are only presented for states/territories with hospital data in the NIHSI.
3. Data are shown for people who were dispensed selected medications 4 or more times. Data on people who were dispensed selected medications 1 or more times are in Data tables S3.1-S3.3.
4. 'Percentage' is the proportion of people in the dementia cohort with at least one service recorded in the NIHSI in 2019.
5. Age-standardised rates were calculated where population and service counts allowed (see Data tables S3.1 - S3.3).
6. A region is blank if a value could not be published due to data quality or confidentiality concerns.

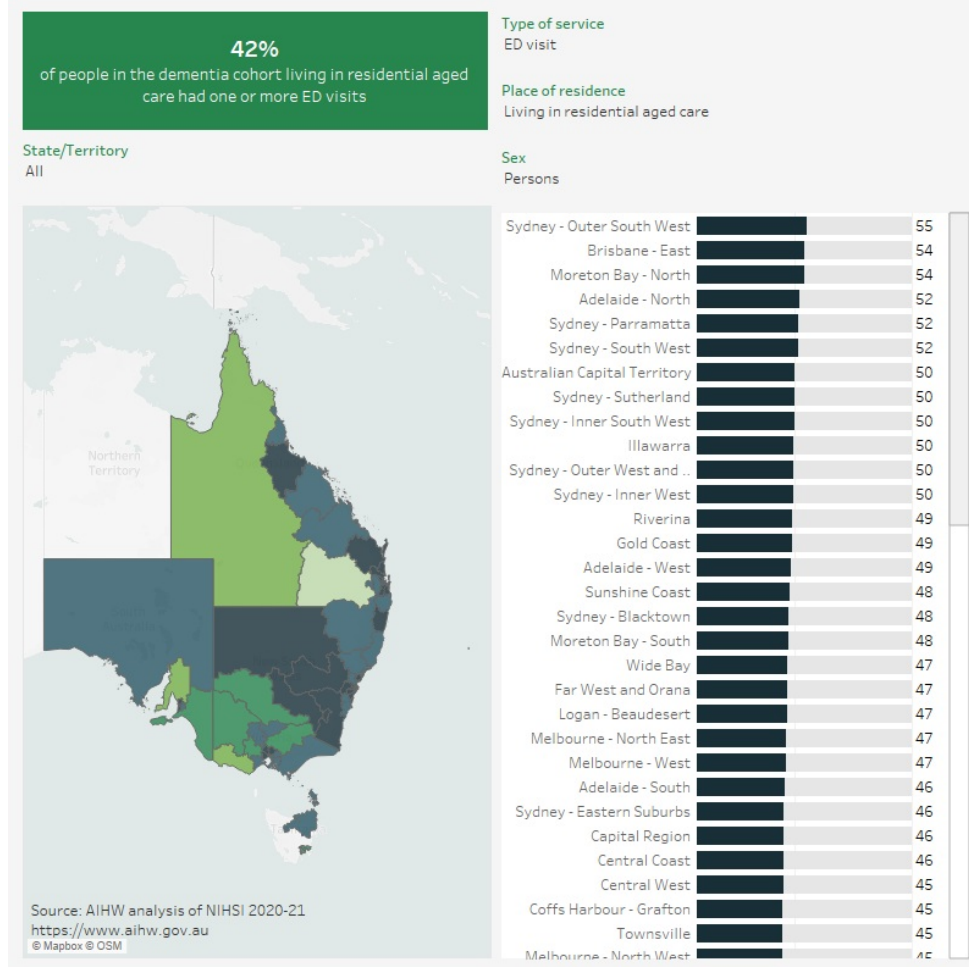
Data tables: [Prescriptions dispensed to people in the dementia cohort](#)

Variation by SA4 region

Figure 4.4 is an interactive map and bar chart showing variation in ED visits and hospital stays by SA4 region and sex for people in the dementia study cohort living in the community or living in residential aged care.

Figure 4.4: Total ED visits and public hospital stays by people in the dementia cohort, by place of residence, SA4 region of residence and sex, 2019

Figure 4.4 is an interactive map and bar chart showing variation in ED visits and hospital stays by SA4 region and sex for people in the dementia study cohort living in the community or living in residential aged care. Data shown are the percentage of people with at least one ED visit or at least one hospital stay. There are 5 colour gradients. SA4s can be selected by state/territory and capital city.



Notes

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI.
2. The geographies in this report are based on where a person lived, not where they received services. Data are only presented for states/territories with hospital data in the NIHSI.
3. 'Percentage' is the proportion of people in the dementia cohort with at least one service recorded in the NIHSI in 2019.
4. Age-standardised rates were calculated where population and service counts allowed (see Data tables S4.1-S4.10).
5. A region is blank if a value could not be published due to data quality or confidentiality concerns.
6. Only public hospital data were included in this analysis: some of the observed variation may be due to the availability and use of private hospitals.

Data tables: [Total ED visits and public hospital stays by people in the dementia cohort, by place of residence, SA4 region of residence and sex](#)

Variation by SA4 region

This report explores the use of residential respite care among 2 groups of people living with dementia (see Methods section):

- “Community 2019” group: people living in the community in 2019, who **did not enter** permanent residential aged care in 2019 or 2020
- “Subsequent PRAC” group: people living in the community for all or some of 2019, who **did enter** permanent residential aged care later in 2019 or in 2020.

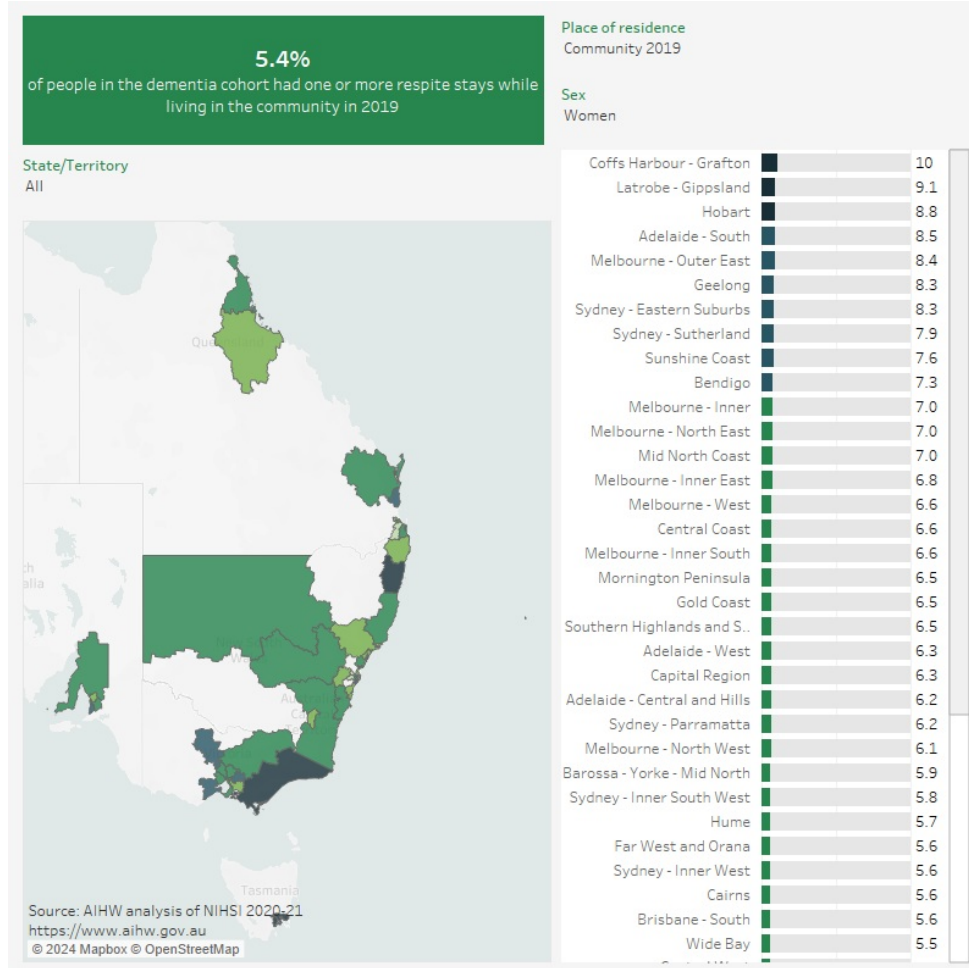
The use of residential respite care by people who **did not enter** permanent care in the subsequent 12 months was low overall (an average 5.4% of people).

The use of residential respite care was more common for people who **did enter** permanent care in the subsequent 12 months (an average 70% of people).

For both groups, people who used residential respite care had an average of 1.5 stays per person (see [Table S5.1](#) for details).

Figure 4.5: Percentage of people in the dementia cohort with at least one residential respite care stay, by place of residence, SA4 region of residence and sex, 2019-2020

Figure 4.5 is an interactive map and bar chart showing variation in the use of residential respite care by SA4 region and sex for people in the dementia study cohort who entered permanent residential aged care in the subsequent 12 months and those who did not. The measure of use is percentage of people with at least one stay. There are 5 colour gradients. SA4s can be selected by state/territory and capital city.



Notes

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI.
2. The geographies in this report are based on where a person lived, not where they received services. Data are only presented for states/territories with hospital data in the NIHSI.
3. PRAC = permanent residential aged care.
4. ‘Percentage’ is the proportion of people in the dementia cohort with at least one service recorded in the NIHSI in 2019.
5. Age-standardised rates were calculated where population and service counts allowed (see Data table S5.1).
6. A region is blank if a value could not be published due to data quality or confidentiality concerns.





Variation by state/territory

This section presents a summary of geographical variation in the use of health services and residential respite care among people living with dementia by **state and territory**.

Data are only presented for states/territories with hospital data in the NIHSI linked data: New South Wales (NSW), Victoria, Queensland, South Australia, Tasmania and the Australian Capital Territory (ACT).

As health service use changes after a person enters permanent residential aged care, results are shown by whether people living with dementia were **living in the community** or **living in permanent residential aged care**.

See the [Technical guide](#) for more information on the study cohorts, geographies and services examined.

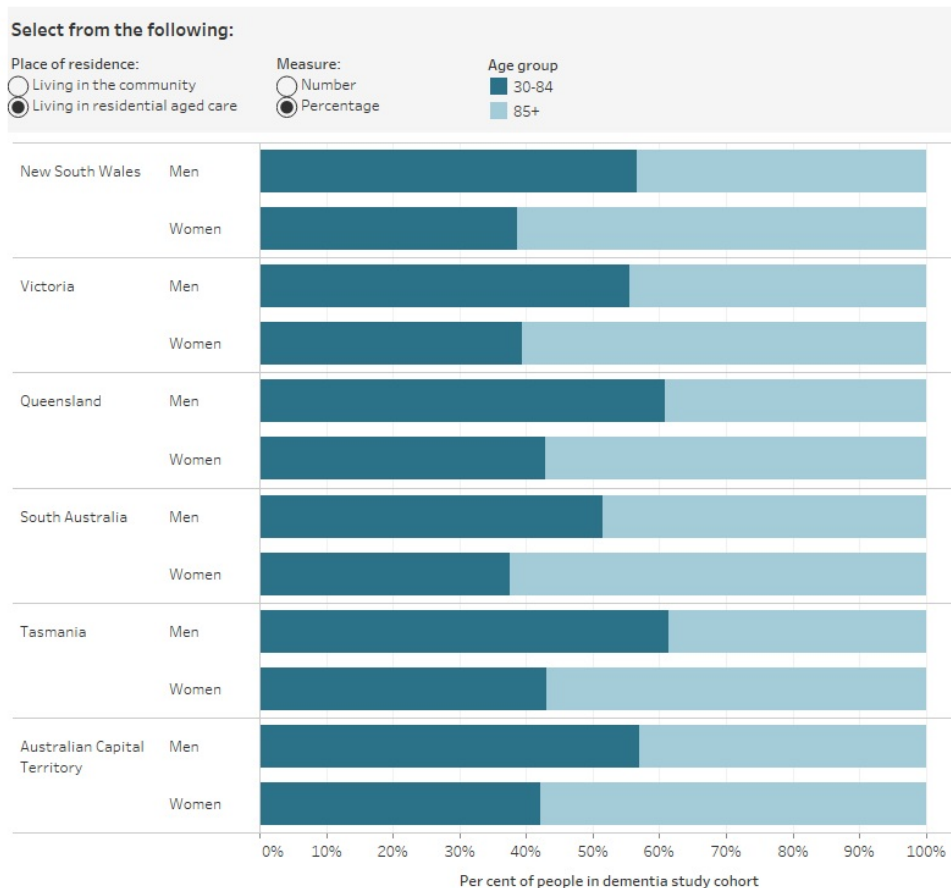
Variation by state/territory

Nearly 2 in 5 (38%) of the dementia study cohort lived in NSW, with 26% living in Victoria, 22% in Queensland, 10% in South Australia, 2.4% in Tasmania and 1.5% in the ACT (Table S5.1). These proportions are similar to the estimated proportions of people living with dementia in each state/territory in 2021 (excluding Western Australia and the Northern Territory) (see [How does dementia prevalence vary by geographic area?](#)).

- The proportion of people aged over 85 living in the community ranged from 28% in Queensland and Tasmania to 33% in NSW, Victoria and South Australia.
- The proportion of people aged over 85 living in residential aged care ranged from 51% in Queensland and Tasmania to 58% in South Australia.

Figure 5.1: Number and percentage of people in the dementia study cohort, by place of residence, state/territory of residence, sex and age group, 2019

Figure 5.1 is an interactive bar chart showing the number and percentage of people in the dementia study cohort by state/territory, age group and sex. Among people living in the community, most lived in NSW (27,000 people), followed by Victoria (17,400 people), Queensland (15,800 people), South Australia (6,500 people), Tasmania (1,700 people) and the ACT (1,100 people). Among people living in residential aged care, most lived in NSW (33,700 people), followed by Victoria (24,200 people), Queensland (19,100 people), South Australia (8,900 people), Tasmania (2,100 people) and the ACT (1,200 people). Women had an older age profile than men in all states/territories.



Source: AIHW analysis of NIHSI 2020-21
<https://www.aihw.gov.au>

Notes

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI.
2. The geographies in this report are based on where a person lived, not where they received services. Data are only presented for states/territories with hospital data in the NIHSI.

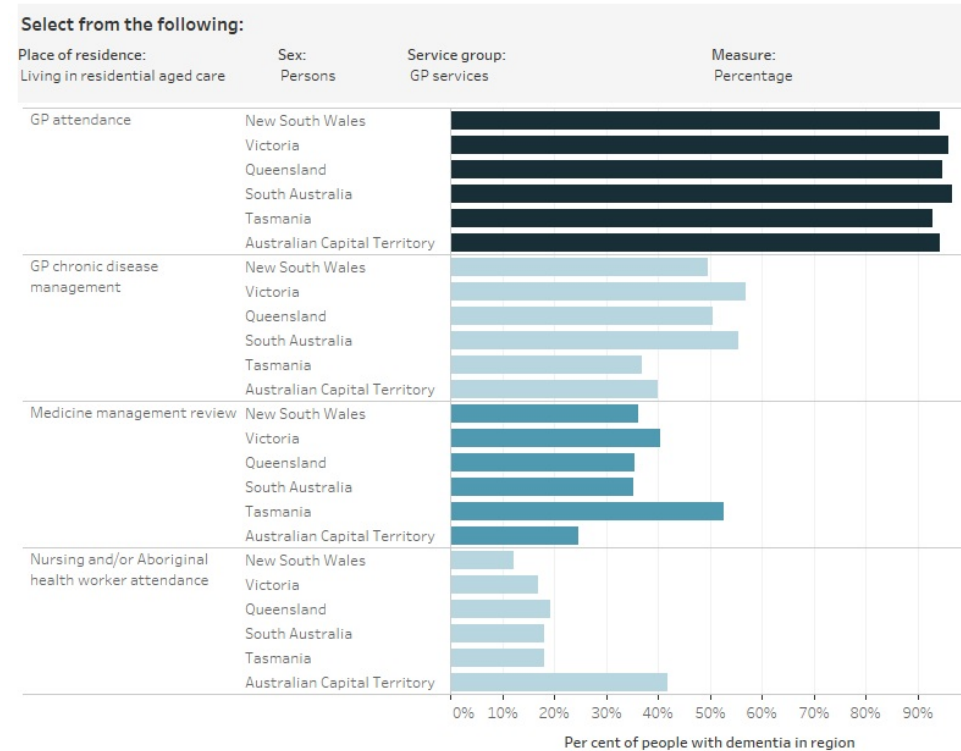
Data tables: [Percentage of people in the dementia cohort](#)

Variation by state/territory

Figure 5.2 is an interactive chart exploring the use of health services by state/territory, with rates (the percentage of people with at least one service) and age-standardised rates.

Figure 5.2: Health service use among people in the dementia cohort, by place of residence, state/territory of residence and sex, 2019

Figure 5.2 is an interactive bar chart showing variation in the use of a range of health services by state/territory for people in the dementia study cohort living in the community or living in residential aged care. Health services groups shown are GP services, specialist services, allied health services, ED visits, hospital stays, polypharmacy and medications dispensed (1 or more, 4 or more). Measures of use are percentage of people with at least one service and age-standardised rates.



Source: AIHW analysis of NIHSI 2020-21
<https://www.aihw.gov.au>

Notes

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI.
2. The geographies in this report are based on where a person lived, not where they received services. Data are only presented for states/territories with hospital data in the NIHSI.
3. 'Percentage' is the proportion of people in the dementia cohort with at least one service recorded in the NIHSI in 2019.
4. Age-standardised rates were calculated where population and service counts allowed.
5. Only public hospital data were included in this analysis: some of the observed variation may be due to the availability and use of private hospitals.
6. The bar is blank if a value could not be published due to data quality or confidentiality concerns.

Data tables: [Health service use among people in the dementia cohort](#)

Variation by state/territory

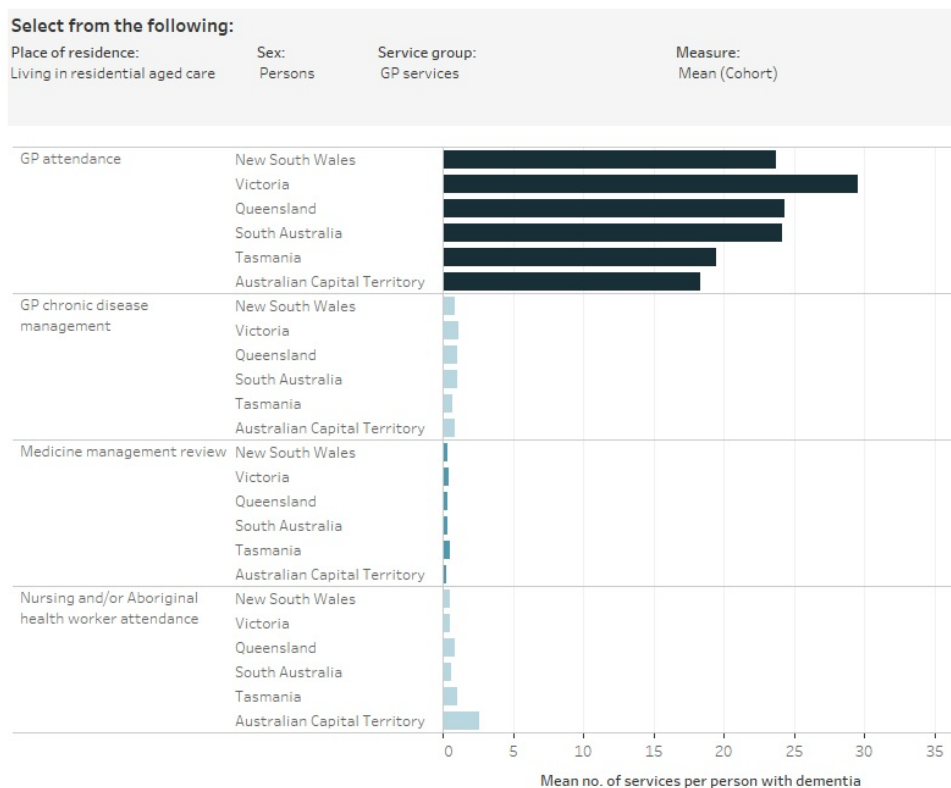
The number of times a person uses a health service is influenced by many factors, including patient health needs, the available supply of services and potential barriers such as cost.

Figure 5.3 is an interactive chart where the average number of services per person was calculated for:

- people in the dementia study cohort who used the service at least once (referred to in the figures as “service users”)
- all people in the dementia study cohort, regardless of whether they used the service (referred to in the figures as “cohort”).

Figure 5.3: Average number of services per person, by place of residence, state/territory of residence and sex, 2019

Figure 5.3 is an interactive bar chart showing variation in the average number of services per person by state/territory for people in the dementia study cohort living in the community or living in residential aged care. Health services groups shown are GP services, specialist services, allied health services, ED visits and hospital stays. The average number of services were calculated for people who used the service at least once in 2019 and all people in the dementia study cohort, regardless of whether they used the service in 2019 (as an indication of overall access in an area).



Source: AIHW analysis of NISHI 2020-21
<https://www.aihw.gov.au>

Notes

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI.
2. The geographies in this report are based on where a person lived, not where they received services. Data are only presented for states/territories with hospital data in the NIHSI.
3. “Mean (Service users)” is the mean number of attendances per person for people in the dementia cohort who used the service at least once in 2019.
4. “Mean (cohort)” is the mean number of attendances per person for all people in the dementia cohort, regardless of whether they used the service in 2019.
5. Only public hospital data were included in this analysis: some of the observed variation may be due to the availability and use of private hospitals.
6. The bar is blank if a value could not be published due to data quality or confidentiality concerns.

Data tables: [Average number of services per person, by place of residence, state/territory of residence and sex](#)



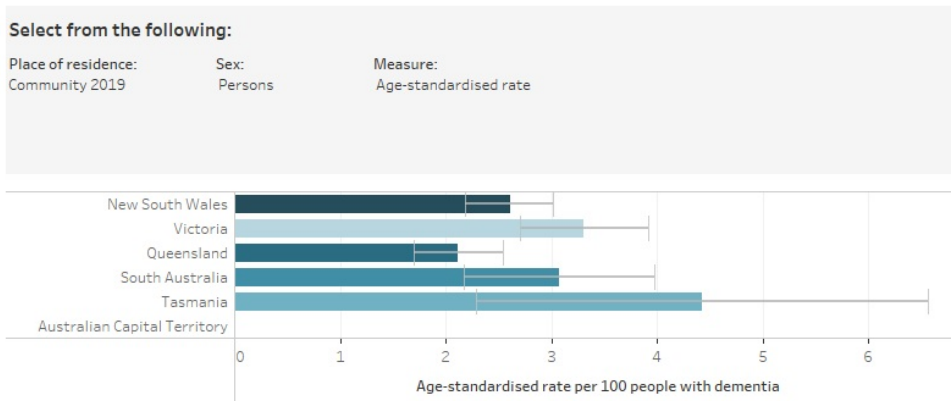
Variation by state/territory

This report explores the use of residential respite care among 2 groups of people living with dementia (see Methods section):

- “Community 2019” group: people living in the community in 2019, who **did not enter** permanent residential aged care in 2019 or 2020
- “Subsequent PRAC” group: people living in the community for all or some of 2019, who **did enter** permanent residential aged care later in 2019 or in 2020.

Figure 5.4: Residential respite care use among people in the dementia cohort, by place of residence, state/territory of residence and sex, 2019-2020

Figure 5.4 is an interactive bar chart showing variation in the use of residential respite care by state/territory for people in the dementia study cohort who entered permanent residential aged care in the subsequent 12 months and those who did not. Measures of use are percentage of people with at least one stay, age-standardised rates and the average number of stays per person with at least one stay.



Source: AIHW analysis of NIHSI 2020-21
<https://www.aihw.gov.au>

Notes

1. The dementia study cohort refers to 158,730 people aged 30 and over who were living in Australia in 2019 and had a dementia record in the NIHSI.
2. The geographies in this report are based on where a person lived, not where they received services. Data are only presented for states/territories with hospital data in the NIHSI.
3. PRAC = permanent residential aged care.
4. ‘Percentage’ is the proportion of people in the dementia cohort with at least one service recorded in the NIHSI in 2019.
5. “Mean (Service users)” is the mean number of attendances per person for people in the dementia cohort who used the service at least once in 2019.
6. Age-standardised rates were calculated where population and service counts allowed (see Data table S5.1).
7. A region is blank if a value could not be published due to data quality or confidentiality concerns.

Data tables: [Residential respite care use among people in the dementia cohort](#)

Variation by sex

Women are disproportionately affected by dementia, as reflected by a greater prevalence in all age groups, a higher burden of disease due to dementia and a higher proportion of deaths from dementia among women than men (see [Population health impacts of dementia](#)) (WHO 2022).

In this study, there were a similar number of men and women living with dementia in the community, however, the number of women living in residential aged care was double that of men (Figure 1.1), partly because women have a longer life expectancy than men, so are more likely to need care at older ages. To account for variation between men and women due to different age profiles, the following comments are based on **age-standardised rates** of service use.

Men and women had similar patterns of geographical variation in health service use. Overall, after adjusting for differences in age, *women were more likely than men* to be dispensed:

- dementia-specific medications
- antidepressants
- opioids.

After adjusting for differences in age, *men were more likely than women* to have:

- polypharmacy
- glucose regulating and cardiovascular medications dispensed
- antipsychotics dispensed (in the community)
- an emergency department visit
- a hospital stay.

The age-standardised rates of use of other services were similar for men and women.

References

WHO (World Health Organization) (2022) [A blueprint for dementia research](#), WHO, accessed 27 June 2023.



Technical guide

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Technical guide

The National Integrated Health Services Information (NIHSI) is a person-focused, de-identified analytical asset that allows for a range of research and analysis on many aspects of population health through access to standardised integrated health administrative datasets (AIHW NIHSI 2020-21). The NIHSI is the only enduring linked data asset that includes linked hospital data including admitted patient care services, emergency department services and outpatient services in public hospitals for New South Wales (NSW), Victoria, Queensland, South Australia, Tasmania and the Australian Capital Territory (ACT).

The NIHSI includes various national Commonwealth government datasets, including the Pharmaceutical Benefits Scheme (PBS) and Repatriation PBS (RPBS), Medicare Benefits Schedule, National Non-Admitted Patient Emergency Department Care Database (NNAPEDC), National Hospital Morbidity Database (NHMD), Residential Aged Care Services data and National Death Index (NDI) data. The NIHSI contains data from 2010 until 2020-21.

Data linkage for the NIHSI was undertaken using probabilistic linkage. This linkage procedure involves creating record pairs by combining records from one data set with records from another data set based on similarities in characteristics such as last and first name(s); day, month and year of birth; and sex. The Medicare Consumer Directory and the NDI were first linked to create the NIHSI linkage spine.

In this study, a person was identified as having dementia if they were aged 30 or over and had at least one of the following in the NIHSI between 1 July 2010 and 31 December 2018:

- a dementia-specific medication dispensed through the PBS / RPBS,
- a principal or additional diagnosis of dementia in an emergency department (ED) presentation or public hospital admission,
- a supplementary chronic code of dementia in a public hospital admission,
- a record of dementia in an Aged Care Funding Instrument (ACFI) assessment, and/or
- dementia recorded as an underlying or additional cause of death between January 2020 and December 2021.

The study cohort was also restricted to people who were:

- alive until 31 December 2019
- recorded in the NIHSI as using a health service in 2019, or having a death record January 2020 - December 2021
- not missing age, sex and/or geography information.

Tables 1-4 summarise the codes used in each dataset to identify dementia and the classification system used in each dataset. For more details, see the [Data sources section of Dementia in Australia](#) (AIHW 2023).

Table 1: List of health condition codes used to identify dementia in the ACFI dataset

Source	Dementia-specific codes
Aged Care Assessment Program (ACAP) health condition code	0500, 0510, 0520, 0530

Table 2: List of diagnosis codes used to identify dementia in the NHMD and NNAPEDC datasets

Source	Dementia-specific codes
Admitted patient ICD-10-AM diagnosis codes	F00, F01, F02, F03, F05.1, F10.7, F13.7, F18.7, G30
Admitted patient chronic condition supplementary code	U791
Emergency department ICD-10-AM diagnosis codes	F00, F01, F02, F03, F05.1, F10.7, F13.7, F18.7, G30
Emergency department ICD-9-CM diagnosis codes	290.0, 290.1, 290.10, 290.11, 290.12, 290.13, 290.2, 290.20, 290.21, 290.3, 290.4, 290.40, 290.41, 290.42, 290.43, 290.8, 290.9, 291.2, 294.1, 294.10, 294.11, 294.2, 294.20, 294.21, 331.0
Emergency department SNOMED CT-AU EDRS diagnosis codes	52448006, 12348006, 15662003, 26929004, 191461002

Note: ICD-10 refers to the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision*. ICD-10-AM refers to ICD-10, Australian Modification; ICD-9-CM refers to the ICD, Ninth Revision, Clinical Modification; SNOMED CT-AU EDRS refers to the Systematized Nomenclature of Medicine - Clinical Terms - Australian version (Emergency Department Reference Set).

Table 3: List of diagnosis codes used to identify dementia in the National Death Index dataset

Source	Dementia-specific codes
--------	-------------------------

ICD-10 Underlying or associated cause of death codes

F00, F01, F02, F03, F05.1, F10.7, F13.7, F18.7, G30, G31.0, G31.8

Table 4: List of codes used to identify dementia in the Pharmaceutical Benefits Scheme dataset

Source	Classification and dementia-specific codes
Classification and dementia-specific codes	N06DA02 (donepezil), N06DA03 (rivastigmine), N06DA04 (galantamine) N06DX01 (memantine)

References

AIHW (Australian Institute of Health and Welfare) NIHSI (2020-21) *National Integrated Health Services Information*, AIHW, Australian Government, accessed 26 July 2023.

AIHW (2023) *Dementia in Australia*, AIHW, Australian Government, accessed 11 April 2023.

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In the linked data, dementia type may be recorded in a hospital admission, an ACFI assessment of care needs at entry to permanent residential aged care, a death record, or inferred through the dispensing of dementia-specific medications (currently only subsidised under the PBS and RPBS for people diagnosed with Alzheimer’s disease). Dementia types were mapped to the 4 broad categories used in the ACFI assessment, as summarised in Table 5.

Table 5: Sources of information on type of dementia in the NIHSI, mapped to ACFI categories

ACFI category	Description
Dementia in Alzheimer’s disease	Dementia in Alzheimer’s disease (includes early onset <65 years, late onset 65+ years, atypical or mixed type, unspecified)
Vascular dementia	Vascular dementia (includes acute onset, multi-infarct, subcortical, mixed cortical & subcortical, other vascular, unspecified)
Dementia in other diseases	The ACFI category includes dementia in Pick’s disease (frontotemporal dementia), Creutzfeldt-Jakob disease, Huntington’s disease, Parkinson’s disease, HIV and other diseases, and dementia with Lewy bodies. Records of ‘Delirium superimposed on dementia’ and ‘Dementia due to psychoactive substance use’ from other datasets were also included in this category.
Other dementia not elsewhere classified (NEC) or not otherwise specified	The ACFI category includes alcoholic, presenile & senile, unspecified dementia. Records of ‘Unspecified dementia’ from other datasets were included in this category.

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Age and sex

The cohort included people aged 30 and over. Younger people were out of scope for this study because the number of people aged under 30 living with dementia (including childhood dementias) would be too small to analyse by smaller geographies, and people are likely to use different services.

Age at the first service event in 2019 was calculated from the "age at event zero" variable in the NIHSI patient demography file (95% of the cohort had a service event in January 2019).

Sex was derived in the following order of priority: from the NIHSI patient demography file, or the last service event in 2019, or the latest service event in the NIHSI.

Geographical region of residence

This report presents information on people living with dementia based on where they lived, not where they received services. People are likely to have used services outside of their region of residence.

To ensure comparability across regions, data were only analysed for people living in states/territories with hospital data in the NIHSI 2020-21: NSW, Victoria, Queensland, South Australia, Tasmania and the ACT. Similarly, people who only had a dementia record in a private hospital service were excluded because private hospital data were not consistently available for all states/territories.

The smallest geography in the NIHSI is Statistical Area level 2 (SA2) (ABS 2016). Region of residence was based on a person's latest recorded SA2 region or postcode in the NIHSI, either in the analysis year of 2019 or, if they had died, their death record in January 2020-December 2021.

People living with dementia may need to change their residence to be nearer to family and carers, or to receive health and/or aged care services. The SA2 regions and postcodes of residential aged care facilities were not available in the NIHSI, so residence was taken from other sources. It is known that people often do not update their address in the Medicare system (used for PBS and MBS data), so these sources were considered less accurate than deaths or hospitals data.

When a person had records in more than one dataset, the latest recorded SA2 region or postcode was taken using the following order of priority:

- National Death Index (for those in the cohort that died between January 2020 and December 2021)
- Hospital data (NHMD and NNAPEDC) (2019)
- Pharmaceutical Benefits Scheme (2019)
- Medicare Benefits Schedule (2019)
- Postcodes were only used if there was no record of SA2 region. Postcodes were allocated to the SA2 region where the largest percentage of the population lived.

Data are presented at four levels of geography:

State/territory

Data are only presented for people living in NSW, Victoria, Queensland, South Australia, Tasmania and the ACT. Western Australia and the Northern Territory were excluded because their hospital data were not available in the NIHSI. SA2s with state code 'Other territories' (Christmas Island, Cocos (Keeling) Islands, Jervis Bay and Norfolk Island) were excluded from analysis due to small counts and privacy concerns.

Statistical Area Level 4 (SA4) regions

SA4 regions are 76 geographic areas covering Australia, with boundaries defined by the ABS (2016). This geography was chosen as the smallest area that had adequate counts of people living with dementia for data analysis. Data were not able to be released from the NIHSI at both SA4 and Primary Health Network level due to data confidentiality concerns with small areas where their boundaries do not align.

Remoteness areas

Based on the 2016 Remoteness Area Structure within the Australian Statistical Geography Standard (ABS 2018a). The 5 Remoteness Areas are based on a measure of relative access to services: *Major Cities*, *Inner Regional*, *Outer Regional*, *Remote* and *Very Remote Australia*. In this report, results for *Remote* and *Very remote Australia* were aggregated to ensure confidentiality and quality.

Remoteness areas do not necessarily correspond with SA2 boundaries and one SA2 can cover several remoteness areas. In this report, SA2s were allocated to the remoteness area where the largest percentage of the population lived, using the population distribution as of 30 June 2016.

Socioeconomic areas

Based on the 2016 Socio-Economic Indexes for Areas (SEIFA) Index of Relative Socio-economic Disadvantage (IRSD) (ABS 2018b). The IRSD ranks statistical areas from the most disadvantaged area (lowest quintile) to the least disadvantaged area (highest quintile), based on the relative socioeconomic conditions at an area or 'neighbourhood' level, not at an individual level. People were assigned an IRSD quintile based on the SA2 of their residential address. The small number of people living in an SA2 with no corresponding SEIFA score were excluded from the socioeconomic area analyses.

Remoteness areas and socioeconomic quintiles combined

The majority (71%) of people in the dementia study cohort lived in *Major cities*, which are socioeconomically diverse. Furthermore, socioeconomic effects can be compounded by access issues for people living in rural and remote areas. For this reason, data are also presented for IRSD quintiles within *Major cities* and *Outside major cities (Inner Regional, Outer Regional, Remote and Very Remote Australia)*.

References

ABS (Australian Bureau of Statistics) (2016) *Australian Statistical Geography Standard (ASGS): Volume 1—Main structure and greater capital city statistical areas, July 2016*, ABS, Australian Government, accessed 30 September 2022.

ABS (2018a) *Australian Statistical Geography Standard: Volume 5 - Remoteness Structure, July 2016*, ABS, Australian Government, accessed 30 September 2022.

ABS (2018b) *Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), Australia, 2016*, ABS, Australian Government, accessed 30 September 2022.



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The Medicare Benefits Schedule (MBS) data collection contains claims data for Medicare services subsidised by the Australian Government. MBS events were grouped according to the MBS codes in Table 6.

Table 6: Medicare service codes and descriptions

Terminology used in this study	MBS code
GP attendance (total)	BTOS: 0101, 0102, 0103
GP chronic disease management	BTOS: 0102; Subgroup: A15.1, A40.13, A40.14 or items: 229 - 233, 93469, 93475
GP medication management review	BTOS: 0102; Items: 245, 249, 900, 903
Specialist attendance (total)	BTOS: 0200
General medicine specialist attendance	BTOS: 0200; Key registered speciality: 2, 82
Geriatrician specialist attendance	BTOS: 0200; Key registered speciality: 16, 96
Neurologist specialist attendance	BTOS: 0200; Key registered speciality: 9, 89
Psychiatrist specialist attendance	BTOS: 0200; Key registered speciality: 56, 99, 409
Nursing and/or Aboriginal health worker attendance	BTOS: 0110 and MBS group M14 and MBS subgroup M18.05 and M18.10.
Allied health attendance (total)	BTOS: 0150, 0900
Allied health - Optometry	BTOS: 0900
Allied health - Podiatry	Items 10962, 81340, 93509, 93532, 93554, 93587

Notes:

1. BTOS = Broad Type of Service.
2. Telehealth, MBS group M18 and A40, were introduced in March 2020 and June 2021 respectively.

- A **general practitioner (GP)** is likely the first point of contact for health care and is important in the coordination of care of patients and referral to other health care services.
- **GP chronic disease management (CDM)** attendances are those relating to the preparation, coordination and review of a GP Management Plan or Team Care Arrangements, or the contribution to a Multidisciplinary Care Plan for patients with a chronic or terminal medical condition, to help ensure they receive structured and coordinated care that will help them to achieve their current health goals.
- **Nursing and/or Aboriginal health worker** attendances are provided in collaboration with, or under the supervision of, medical practitioners. This includes services provided by Practice Nurses, Nurse Practitioners, Aboriginal health workers, and Aboriginal or Torres Strait Islander health practitioners.
 - It should be noted that these data only include services receiving a Medicare rebate. Nursing and Aboriginal health worker services funded through the Workforce Incentive Program Practice Stream are not included.

- A **specialist attendance** is a Medicare subsidised referred patient/doctor encounters involving medical practitioners who have been recognised as specialists or consultant physicians for Medicare benefits purposes. Data are presented for the following specialist attendances:
 - **Geriatric medicine** specialists (or geriatricians) care for people over the age of 65. Most geriatricians have expertise in dealing with people who have multiple conditions. People with younger onset dementia may also see a geriatrician (AIHW 2022). These data include Geriatrician Referred Patient Assessment and Management Plan attendances, which accounted for 42% of geriatrician attendances for people living in the community and 52% of geriatrician attendances for people living in residential aged care.
 - **Psychiatrists** are medical doctors who have completed specialised training in how to diagnose, treat and prevent mental, emotional and behavioural disorders. A person with dementia may see a neuropsychiatrist, a psychiatrist who specialises in the interface between psychiatry, neurology and general medicine.
 - **Neurologists** diagnose and treat conditions of the brain, spinal cord and nerves. This can include muscle diseases and disorders that affect thinking and behaviour.
 - **General Physicians** provide a range of non-surgical health care to adult patients.
- The **allied health** sector represents a range of services provided by health practitioners who are generally university qualified and with specialised expertise in preventing, diagnosing and treating a range of conditions and illnesses. Data are presented for the following allied health care attendances:
 - **Podiatrists** help people in the care of their lower limbs including the foot and ankle and may also be involved in supporting older people to reduce their risk of falling.
 - **Optometrists** are experts in eye health, trained to prescribe spectacles and contact lenses and treat a range of eye conditions such as dry eye, allergies and infections.
- **Medication management reviews** are undertaken by GPs in collaboration with community pharmacists and specialists as well as in discussion with the patient and their carer. They aim to help people to get the most benefit from their medicines and minimise their risk of medicines-related harm.

References

AIHW (2022) *Younger onset dementia - new insights using linked data*, AIHW, Australian Government, accessed 1 December 2022.

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The Pharmaceutical Benefits Scheme (PBS) data collection contains data for prescriptions dispensed under the PBS and Repatriation PBS (RPBS). PBS item claims are mapped to the Anatomical Therapeutic Classification (ATC) index, a classification system that is recommended by the World Health Organization as the international standard for presenting and comparing drug usage data. The ATC groups medicines according to the body organ or system on which they act, as well as their therapeutic and chemical characteristics. Item codes for selected medications analysed in this report are shown in Table 7.

Table 7: PBS codes for selected medications of interest

Selected medication	ATC code
Dementia specific medications	N06D
Antidepressants	N06A
Antipsychotics	N05A
Benzodiazepines	N05BA, N05CD, N05CF
Opioids	N02A, R05DA04
Cardiovascular medications	B01, C
Diabetes (glucose regulating) medications	A10

This report examined rates of polypharmacy (when people are regularly using 5 or more distinct medications at the same time) and rates of hyper-polypharmacy (when people are regularly using 10 or more distinct medications at the same time). People were considered 'regular users' of a medication if 4 or more prescriptions were dispensed for a medicine of interest in 2019 (AIHW 2023). Polypharmacy medication counts excluded the following ATC codes: J01, D02, D04, D06, D07, D08, V04, V06, V07, D01A, D11A, G01A, D05A, D10A, D11A.

References

AIHW (2023) *Number of people dispensed five or more medicines per 100,000 people aged 75 years and over, 2019*, AIHW, Australian Government, accessed 6 April 2023.

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The NIHSI contains de-identified records from 2010-11 to 2020-21 for emergency department and admitted patient care:

- National Hospital Morbidity Database (NHMD) - public hospital admitted patient separations in 6 participating states/territories (NSW, Victoria, South Australia, Queensland, Tasmania and the ACT) and separations for private hospitals (where available) for Victoria (2010-11 to 2016-17), the ACT (2010-11 to 2018-19) and Queensland (2010-11 to 2020-21). Supplementary codes for chronic conditions are available from 2015-16 to 2020-21.
- National Non-Admitted Patient Emergency Department Care Database (NNAPEDC) - emergency department (ED) presentations in the 6 participating states/territories as above.

Since private hospital separations were not available for all states/territories, the analysis of hospital services only included public hospital episodes.

Treatment of admitted patient and emergency department data

Hospital data are episodic in nature, meaning that, while from the person's perspective they may have had one hospital stay with some moves between hospitals, wards or wings, from a data collection perspective the patient had several adjoining individual episodes of care with an admission date and separation date for each (referred to here as 'hospital episodes'). This is useful for measuring activity in the system but does not readily capture a full hospital stay.

To represent hospital care from the patient's perspective, the analyses were based on a set of rules to combine individual hospital episodes into distinct hospital stays. Episodes belonging to the same person were identified using the unique person identifier obtained through the data linkage process. This information, along with data on episode start and end dates and modes of admission and discharge, allowed hospital episodes for an individual to be combined into one hospital stay, from first admission to final discharge.

The steps used to combine hospital episodes into hospital stays are outlined in more detail in a previous report, [Younger onset dementia - New insights using linked data: Technical document](#) (AIHW 2022).

Reasons for ED presentation

There are known gaps in the completeness of ED data relating to dementia (AIHW 2020). The major diagnostic block category was the most complete field available for exploring the reasons for ED presentation. The principal and additional diagnosis codes for dementia were also analysed (see Table 1), but counts were small and are only presented for some of the larger geographies. The report simplified the reasons for ED presentation into plain English terms (Table 8).

Table 8: Urgency related group major diagnostic block codes used to report reasons for ED presentation

Two-character diagnoses	Urgency related major diagnostic block classification	Terminology in this study
2A	Injury, multiple sites	Injury
2B	Injury, single site, major	Injury
2Ba	Injury, single site, minor	Injury
3A	Circulatory system illness	Circulatory diseases
3B	Respiratory system illness	Respiratory diseases
3E	Neurological system illness	Nervous system disease

Note: For complete list of urgency related group major diagnostic block codes see <https://meteor.aihw.gov.au/content/684509>

Principal diagnoses

The International Classification of Diseases (ICD) is the World Health Organization's internationally accepted classification of diseases and related health conditions. The 10th revision, Australian modification (ICD-10-AM) is used in this analysis. The principal diagnosis is the condition or cause that, after study, was established as the reason for the person needing care. Diagnoses are captured slightly differently between various hospitals or hospital systems (using various editions of ICD-10-AM, ICD-9-Clinical Modification and SNOMED CT-AU), but these can be mapped to the ICD-10-AM.

The principal diagnoses reported here use the ICD-10-AM diagnosis codes. Each code identifies particular conditions, symptoms, abnormal findings or causes, and the chapters in ICD-10-AM group these into broad categories. The report simplified the most common reasons into plain English terms that each correspond to a chapter, except *Dementia or delirium* which is reported as a separate category from *Mental and behavioural disorders* and *Nervous system diseases* (Table 9).

Table 9: ICD-10-AM codes used to report principal diagnoses for hospital stays

Chapter	Disease classification	ICD diagnosis codes within range	Report terminology
6	Diseases of the nervous system (excluding dementia or delirium)	G00-G99 (excluding G30, G31)	Nervous system diseases
6	Dementia or delirium	F00, F01, F02, F03, F05, F107, F137, F187, G30, G31 and R41	Dementia/delirium
9	Diseases of the circulatory system	I00-I99	Circulatory diseases
10	Diseases of the respiratory system	J00-J99	Respiratory diseases
19	Injury, poisoning and certain other consequences of external causes	S00-T99	Injury

Note: Analysis of total hospital stays excluded dialysis (ICD-10-AM 'Z49'). Further information is available at: [Episode of care—principal diagnosis, code \(ICD-10-AM 10th edn\) ANN\[.N\[N\]\]; \(aihw.gov.au\)](#).

References

AIHW (Australian Institute of Health and Welfare) (2020) *Dementia data gaps and opportunities*, AIHW, Australian Government, accessed 30 August 2023.

AIHW (2022) *Younger onset dementia - new insights using linked data*, AIHW, Australian Government, accessed 1 December 2022.

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Glossary

See [Dementia Glossary](#)





Notes

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Data quality statement

See [National Integrated Health Service Information](#)





Data

