

Transitions to residential aged care after hospital for people living with dementia

Web report | Last updated: 18 Oct 2023 | Topic: [Dementia](#) | [Media release](#)

About

In 2017, nearly 79,000 people living with dementia and 630,000 people without dementia aged 65 or older had one or more hospitalisations.

This report focuses on people's first hospitalisation in 2017 and compares transitions to residential aged care or mortality in the 7-days, 3-months and 12-months after discharge for people living with dementia and people without dementia.

For people living with dementia, the report also explores the characteristics that are associated with longer lengths of stay in hospital and transitions to residential aged care within 7-days of discharge. The use of key healthcare services in the 12-months after discharge are also summarised.

This report used the National Integrated Health Services Information (NIHSI) analysis asset, which contains de-identified administrative health (hospitals, Medicare claims and prescriptions), residential aged care, and deaths data from 2010-11 to 2018-19 (NIHSI 2018-19).

Cat. no: DEM 8

Findings from this report:

- 1 in 4 people with dementia who were living in the community moved into aged care after a hospital stay
- People who moved into aged care after their hospital stay spent 20-days longer in hospital than other older people
- People with dementia living in residential aged care were less likely to return to hospital than those in the community
- 2 in 5 people with dementia did not have a chronic disease management plan or review in the year after being discharged

Summary

Dementia is a progressive and usually irreversible condition that is estimated to affect 850,000 Australians by 2058 (AIHW 2023a). People living with dementia tend to be high users of hospital and residential aged care services, particularly as their condition progresses. Understanding how people living with dementia access and transition between hospitals and residential aged care is needed to inform planning for current and future care needs and assess coordination of care. It is also essential to identify points along the care continuum that need improving.

This study is the first large-scale analysis to examine movements between residential aged care and hospital for Australians living with dementia who were aged 65 or older and hospitalised in 2017. Factors that influenced people's length of stay and use of health services in the 12-months after discharge from their first hospitalisation for that year were also examined.

This study included nearly 79,000 people living with dementia and 630,000 people without dementia. At the time of their first hospitalisation, 3 in 5 people living with dementia (62%) and 97% of people without dementia were living in the community, with the remainder living in residential aged care.

1 in 4 people with dementia who were living in the community moved into aged care after a hospital stay.

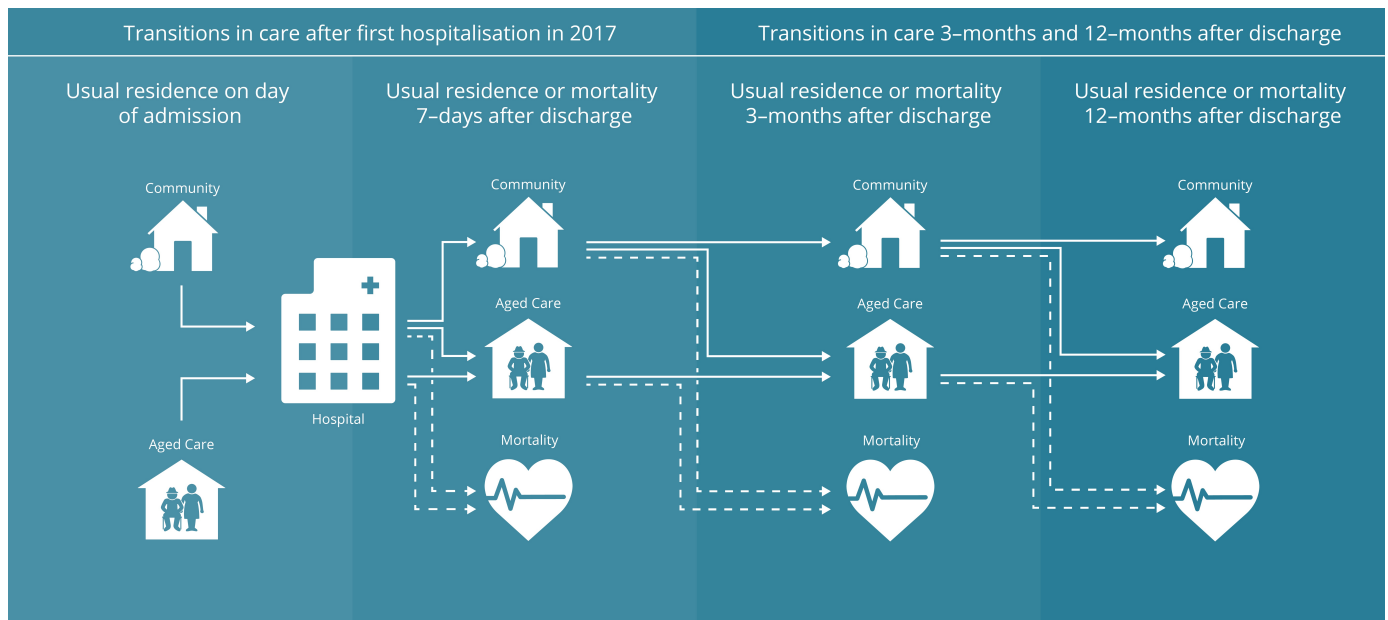
By comparison, 1 in 50 people without dementia who were living in the community moved into residential aged care in the 7-days after being discharged from hospital.

People living with dementia were also more likely to move to residential aged care, and/or to die in the 12-months after a hospitalisation compared with people without dementia who were also hospitalised.

These findings were observed in all age groups (65-74, 75-84 and 85+) for both men and women, indicating that differences in age and sex between people living with dementia and people without dementia are not driving these differences in outcomes.

Greater consideration is needed on the co-ordination of care for people living with dementia, and how care needs will be met during and after hospital visits, particularly for those who are living in the community. Appropriate clinical handover notes to the person's GP or residential aged care facility are also required. This is in line with *Recommendation 66* from the Royal Commission into Aged Care Quality and Safety as well as *Recommendation 54* from the Clinical Practice Guidelines and Principles of Care for People with Dementia (Royal Commission 2021, Guideline Adaptation Committee 2016).

See [Transitions of care and mortality outcomes](#) for more information.



People living with dementia who had potentially preventable complications in hospital were more likely to move into residential aged care

Community-dwellers living with dementia were more likely to experience potentially preventable complications during their hospital stay compared with aged care residents living with dementia. Complications include delirium, urinary tract infections, pneumonia, pressure injuries and in-hospital falls.

Within 7-days of being discharged from hospital, community-dwellers who experienced complications were more likely to transition into residential aged care, or die, compared with people living with dementia who did not experience a complication.

These findings appear to indicate that community-dwellers living with dementia who require hospital care are particularly vulnerable to complications in the hospital environment. This may be because community-dwellers living with dementia typically had longer hospital stays compared with aged care residents living with dementia. Alternatively, while these conditions were reported to arise during people's hospitalisation, we cannot rule out the possibility that these conditions were present prior to the hospitalisation and were first identified during a hospital stay.

See [Conditions reported during hospitalisation](#) for more information.

People living with dementia who experienced a potentially preventable complication spent two to four weeks longer in hospital compared with people who did not develop a complication - resulting in thousands of additional hospital bed-days. People living with dementia who experienced a urinary tract infection, delirium or pneumonia in hospital had nearly 110,000 additional bed-days compared with people who did not experience these conditions.

Work is needed to make hospitals more dementia-friendly and to reduce the occurrence of potentially preventable complications. This will require a multi-disciplinary approach, including improvements to the environment, involvement of families or carers, education and leadership opportunities for staff, and structural changes to ensure the long-term sustainability of programs (Cahill et al. 2018).

See [Effect of conditions reported during hospitalisation and aged-care characteristics on average length of stay](#) for more information.

People who moved into aged care after their hospital stay spent 20-days longer in hospital than other older people

People living with dementia and people without dementia who moved from the community to residential aged care up to 7-days after their hospitalisations had the longest median length of hospital stays (24 days), about 20-days longer than people who returned to their usual residence in the community or in aged care (about 4-days).

See [Median length of stay and effect of specific conditions](#) for more information.

People awaiting entry to residential aged care or who moved to a new facility spent more time in hospital

Among people who moved to residential aged care, people who were reported to be 'eligible and awaiting entry to residential aged care' typically spent 13-days longer in hospital than people who did not receive this flag.

Aged care residents living with dementia and without dementia typically had the shortest lengths of hospital stay (4 days). Most aged care residents were able to return to the facility they lived in before their hospitalisation, but people who moved to a new residential aged care facility typically spent 30-days longer in hospital and had similar lengths of stay in hospital as people who newly transitioned to living in residential aged care.

Aged care residents who need to or want to move to a new residential aged care facility after a hospitalisation appear to face similar barriers to entering a new facility as people who are moving from the community to a residential aged care facility. These results highlight the need to better understand the hospital and aged care interface to improve the flow of people between these two systems.

See [Median length of stay and effect of specific conditions](#) for more information.

Using respite care to enter a new aged care facility reduced time spent in hospital

Among people living with dementia who transitioned to aged care after discharge from hospital, people who entered their new aged care facility as a respite resident spent 11-days less in hospital than people who entered as a permanent resident.

Using residential respite care before entering an aged care facility as a permanent resident is increasingly common (AIHW 2023b). However, many people face barriers to accessing residential respite care. Increasing the number of dementia-specific respite care places, as recommended by Carers Australia, should be considered to improve access to residential respite care by people living with dementia (Carers Australia 2016).

See [Effect of conditions reported during hospitalisation and aged-care characteristics on average length of stay](#) for more information.

People with dementia living in residential aged care were less likely to return to hospital than those in the community

In the 12-months after discharge from hospital, people who returned to live in the community after their first hospitalisation were more likely to have a subsequent emergency department presentation or hospitalisation compared with people who moved to residential aged care or who continued to live in residential aged care after their hospitalisation. These findings indicate that people living with dementia in the community may require additional health and personal support to ensure their needs are being met.

See [Health services used in the year after first hospitalisation for people living with dementia](#) for more information.

2 in 5 people with dementia did not have a chronic disease plan or review in the year after being discharged from hospital

Community-dwellers and aged care residents living with dementia who survived for 12-months after their first hospitalisation had similar rates of accessing GP consultations (95%) and chronic disease management services (around 55%). However, people who transitioned to live in residential aged care after their hospitalisation were more likely to have a medication management review (51%) compared with people who continued to live in aged care (33%) or the community (16%).

Given dementia is a chronic and progressive condition, people living with dementia would benefit from having medication management reviews and chronic disease management services. However, almost half of people living with dementia did not receive these in the 12-months after being discharged from hospital. Improving the provision and regular review of chronic disease management services and medication management reviews by health professionals is needed to ensure these services are appropriately provided to people living with dementia. This may be through greater education of dementia management among GPs and other health professionals as well as structural changes to ensure health professionals who deliver these services have the required tools and are appropriately funded.

See [Health services used in the year after first hospitalisation for people living with dementia](#) for more information.

Community-dwellers were more likely to die in hospital compared with aged care residents

Among people who died in the 12-months after discharge from hospital, most people who were living in the community at the time of their death died in hospital or the emergency department (79%) whereas most people who were aged care residents died in their aged care facility (71%). This was consistent for people living with dementia and people without dementia and for men and women of all age groups studied.

See [Where were people living when they died?](#) for more information.

References

Australian Institute of Health and Welfare (2023a) 'Prevalence of dementia', [Dementia in Australia](#), catalogue number DEM 2, AIHW, Australian Government, accessed 7 July 2023.

Australian Institute of Health and Welfare (2023b) 'Respite use on the way to permanent residential aged care', AIHW, Australian Government, accessed 12 July 2023.

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Guideline Adaptation Committee (2016). *Clinical Practice Guidelines and Principles of Care for People with Dementia*. Sydney. Guideline Adaptation Committee.

Royal Commission into Aged Care Quality and Safety (2021a) *Final report: Care, dignity and respect*, Australian Government, Canberra, viewed 17 March 2021.



Overview of study



Overview of study

Dementia is a collection of symptoms caused by a range of disorders affecting the brain (WHO 2019). It is usually a progressive condition and usually irreversible. People living with dementia will have increasing health and personal care needs over time. Consequently, people living with dementia are high users of health and aged care services and often move between these two systems.

The Royal Commission into Aged Care Quality and Safety (Royal commission 2021) highlighted the need for Australia's health and aged care systems to be better integrated to improve outcomes for older Australians:

- *Recommendation 66* calls for improvements in the quality of transfers between residential aged care facilities and hospitals to ensure resident's health status, medications and advanced care directives are communicated when residents enter and exit hospital.
- *Recommendation 67* calls for structural changes in the way health and aged care data are collected and reported in Australia to allow the interaction between health and aged care systems to be monitored.

Currently, it is not possible to examine the quality of communication between hospitals and residential aged care facilities in existing national data. However, we can examine movements between residential aged care and hospital settings and outcomes for this group using linked data.

A recent report using linked Queensland and Victorian hospital and aged care data showed that on discharge from hospital, 1 in 10 people aged 65 or over required an aged care program with a higher level of support (AIHW 2020). Other studies have shown that Australians living with dementia were more likely to move to residential aged care compared with Australians without dementia (Welberry 2021).

Using linked data to examine transitions from hospital into residential aged care for people living with dementia

With Australia's growing and ageing population, the number of people living with dementia is expected to rise to just under 850,000 people by 2058 (AIHW 2023). Understanding how people living with dementia access and transition between the health and aged care systems, particularly hospitals and residential aged care, is needed to inform planning for current and future care needs and assess coordination of care. It is also essential to identify points along the care continuum that need improving. This study aimed to use linked data to examine transitions of care for people living with dementia following hospitalisation.

Specifically, the study aimed to:

- Examine transitions to residential aged care or mortality among people with dementia within 7 days, 3-months and within 12-months after hospitalisation, and how this compares to people without dementia.
- Explore the reasons that people living with dementia are hospitalised, the factors that may influence their length of stay in hospital and whether they transition to residential aged care.
- Summarise key healthcare services used by people living with dementia in the 12-months following their hospitalisation, and whether this varies by use of residential aged care.

References

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Welberry HJ, Jorn LR, Barbieri S, Hsu B, Brodaty H (2021). [The impact of dementia on aged care service transitions in the last five years of life](#). *Age and Ageing*, 50, 1159-1165.

WHO (World Health Organization) (2019) *Dementia*, WHO, Geneva, viewed 14 January 2022.

Overview of study

Linked data are essential to examining transitions between hospital and residential aged care settings. The study used the National Integrated Health Services Information (NIHSI) analysis asset, a multi-source enduring linked data asset managed under the custodianship of the AIHW (AIHW 2022). This study used the NIHSI 2018-19, which contains de-identified administrative health (hospitals, Medicare claims and prescriptions), residential aged care, and deaths data from 2010-11 to 2018-19 (NIHSI 2018-19). Further detail on the individual data sets included in the linked database and detailed methods can be found in [Technical notes](#).

Study populations

In total, 705,000 people were included in the study.

The study focused on people who had one or more hospitalisations ending in 2017. See [How were hospitalisations defined?](#) for more detail on what was considered a hospitalisation in this study. The year 2017 was chosen because it was the latest year in the data which still allowed for 12-month outcomes to be examined.

People were included in the study if they:

- were aged 65 or over in 2017
- had one or more hospitalisations in 2017
- lived in New South Wales, Victoria, Queensland, South Australia, Tasmania, or Australian Capital Territory from 1 January 2017 until 31 December 2018, or until death. These jurisdictions were selected as complete public hospitals data was available in the linked data.
- had complete key information of interest, such as age and sex.

Identifying people living with dementia

Around 11% of all people included in the study were identified as living with dementia (almost 79,000 people) using dementia diagnosis information available in the linked data. People were identified as living with dementia if they had a record of dementia in the linked data between 1 July 2010 and 31 December 2017.

See [Technical notes](#) for a detailed list of the classification codes for dementia in each individual dataset in the linked data.

Using information from multiple datasets over several years ensures that anyone whose dementia diagnosis was not recorded in one dataset at any point in time (for example, during a hospitalisation), may be recorded in other datasets and/or at another point in time.

Identifying people without dementia

About 89% of people included in the study were identified as not having dementia (almost 627,000 people) using the linked data. It is possible that this group incorrectly included some people living with dementia, particularly those who are in the earlier stages of dementia and have had little interaction with the health and aged care systems and those who do not have a diagnosis.

References

AIHW (2018-19) National Integrated Health Services Information, aihw.gov.au, accessed 29 June 2023

AIHW (2022) *National Integrated Health Service Information Analysis Asset (NIHSI) version 1.0*, METEOR identifier: 766334, viewed 18 July 2023.

Overview of study

How were hospitalisations defined?

In this report, hospitalisations include those where the patient was discharged one or more days after being admitted to hospital (excluding any time spent in emergency departments).

A hospitalisation starts when a person is admitted to hospital and ends when they are discharged from hospital or die in hospital. Adjoining admitted patient episodes of care were combined into a single hospitalisation, ensuring that the entire hospitalisation includes first admission to discharge from the hospital system (or death in hospital).

Episodes of care refer to periods of admitted patient care with one care type, in one ward and in one hospital. If a person receives a new type of care, moves to a different ward in the same hospital or is transferred to another hospital, the episode of care ends and a new episode of care begins. People who receive one care type and do not move between wards or hospitals have one episode of care that encompasses their entire hospitalisation.

Linked data are required to combine distinct episodes of care into hospitalisations. Further information on how hospitalisations were identified using the linked data is in [Technical notes](#).

First hospitalisation

The study focused on transitions of care before and after, and health outcomes after, each person's first hospitalisation ending in 2017. This includes hospital admissions that commenced in 2017 (or earlier) that resulted in discharge or death in 2017. For people who had more than one hospitalisation ending in 2017, the first hospitalisation is the one that occurred earliest in the year.

Usual residence and residential aged care service use

How was usual residence defined?

In this report people were categorised as living in residential aged care if they either lived in a residential aged care facility as a permanent resident or accessed respite care in a residential aged care facility. A very small proportion of people living with dementia (1%) and people without dementia (0.1%) accessed respite care before their hospitalisation and these people typically transitioned to living in residential aged care as a permanent resident without returning to live in the community.

Everyone not categorised as living in residential aged care was categorised as living in the community.

When were transitions in usual residence examined?

People's usual residence was examined at four key periods before or after their first hospitalisation:

- on the day of admission
- within 7-days of discharge
- within 3-months of discharge
- within 12-months of discharge.

Changes in each person's usual residence was examined between admission to hospital and 7-days, 3-months and 12-months after discharge from hospital.

Transitions in care 7-days after discharge for community-dwellers

Within 7-days of discharge from hospital, people who lived in the community on the day they were admitted to hospital were categorised into one of the following transition groups:

- **Community-dwellers** - people who did not live in residential aged care at any time during this period.
- **Transitioned to residential aged care** - people who transitioned to living in residential aged care during this period after hospitalisation.
- **Died (community-dwellers)** - people who died during their first hospitalisation or at any time during this period.

Transitions in care 7-days after discharge for aged care residents

Within 7-days of discharge from hospital, people who lived in residential aged care on the day they were admitted to hospital were categorised into one of the following transition groups:

- **Aged care residents** - people who lived in residential aged care at any time during this period after discharge from hospital.
- **Died (aged care residents)** - people who died during their first hospitalisation or at any time during this period.

A very small number of people moved from residential aged care to live in the community within 7-days after their first hospitalisation. Due to small counts, this group was excluded from all analyses. Note also that it was not possible to examine use of community aged care or transition care programs using the NIHSI 2018-19 data.

12-month outcomes following first hospitalisation

Place of death was reported for people who died in the 12-months after their first hospitalisation. This includes whether the person died while living in the community, in residential aged care, in hospital or in the emergency department.

Use of key hospital and Medicare-subsidised healthcare services in the 12-months after their first hospitalisation were examined for people who survived 12-months from their first hospitalisation. These included:

- Subsequent hospitalisations
- Emergency department presentations
- GP consultations
- Specialist consultations
- Allied health services
- Medication management reviews
- Chronic disease management services
- Geriatrician referred management plans.

Further information on key variables used from each data source is provided in [Technical notes](#).



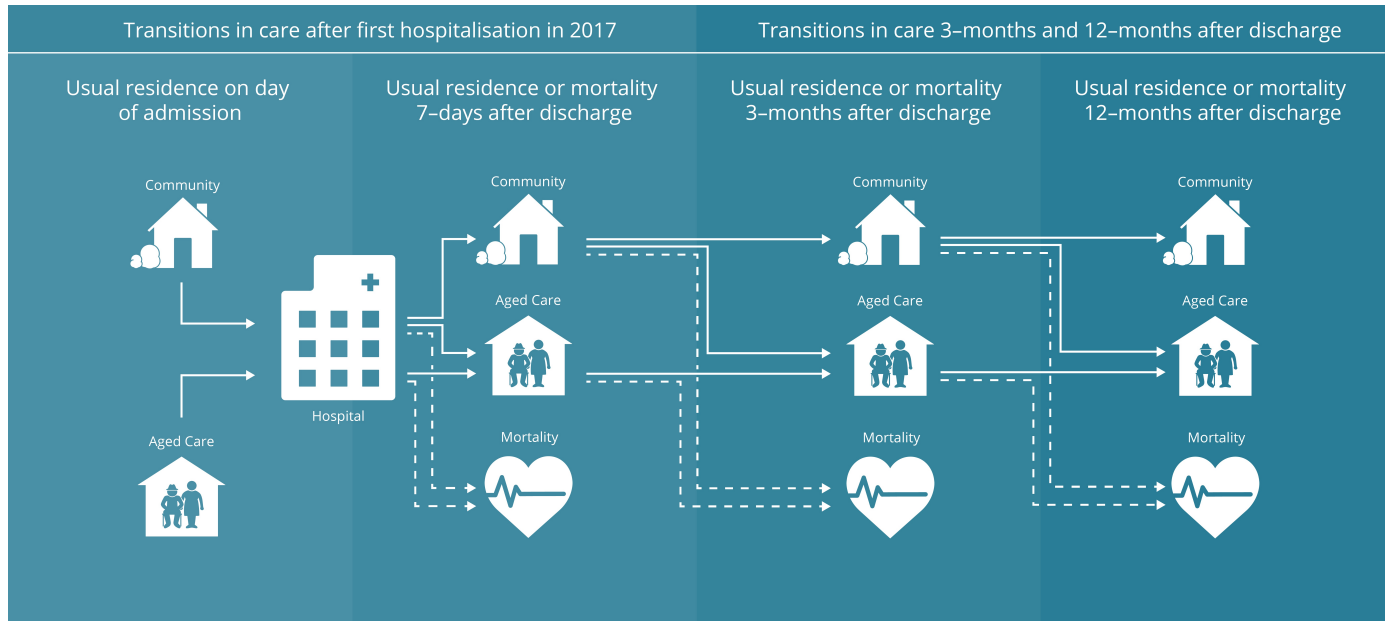


Transitions of care and mortality outcomes



Transitions of care and mortality outcomes

People living with dementia were more likely to be living in residential aged care and to die in the 7-days, 3-months, and 12-months after their first hospitalisation than people without dementia (Figure 1 and Table S1.1).



People living in the community on the day they were admitted to hospital

On the day of admission to their first hospitalisation, 62% of people living with dementia and 97% of people without dementia were living in the community (Figure 1).

Figure 2 shows that among the nearly 49,000 community-dwellers living with dementia:

- Almost 1 in 4 (23%) entered residential aged care for the first time in the 7 days following their first hospitalisation. This includes people entering permanent residential aged care and those accessing respite care. This increased to 33% at 3-months and to 37% at 12-months from discharge.
- 71% continued to live in the community at 7 days after discharge. This decreased to 55% at 3-months and to 35% at 12-months from discharge.
- 5% died during the hospitalisation or within 7 days of discharge. This increased to 12% at 3-months and to 27% at 12-months from discharge.

For the 605,000 people without dementia, only 2% entered residential aged care in the 7-days from discharge and this increased to 4% at 12-months from discharge. Around 3% died during the hospitalisation or within 7 days of discharge and this increased to 11% at 12-months from discharge.

People living in residential aged care on the day they were admitted to hospital

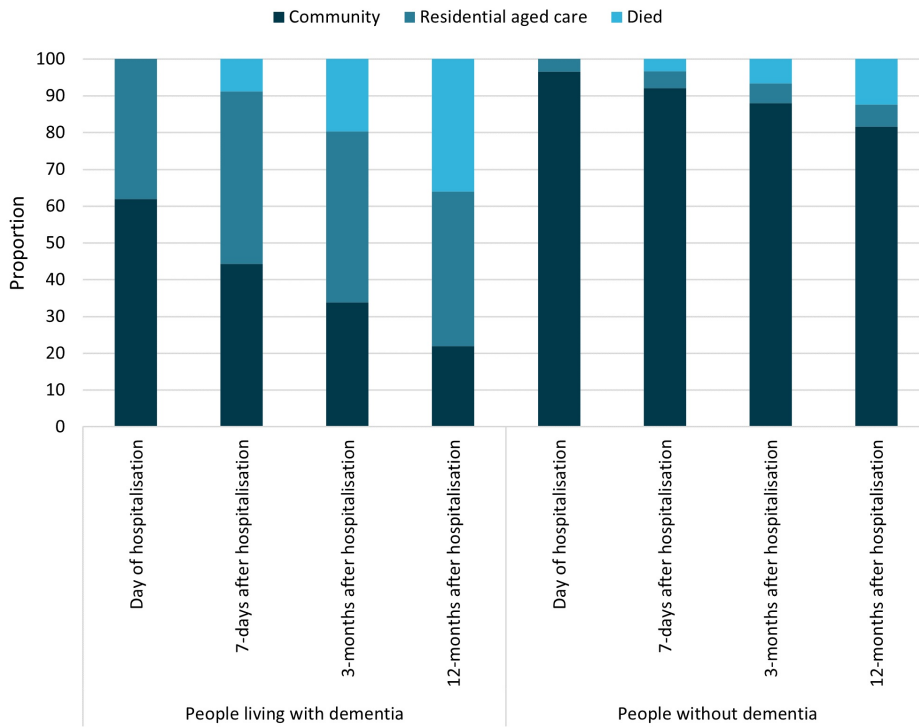
On the day of admission to their first hospitalisation, 38% of people living with dementia and 3% of people without dementia were living in residential aged care (Figure 1).

Figure 2 shows that among the 30,000 people living with dementia who were living in residential aged care prior to their first hospitalisation:

- 14% died within 7-days of discharge
- 31% died within 3-months of discharge
- 50% died within 12-months of discharge.

By comparison, of the nearly 22,000 people without dementia who lived in residential aged care prior to their hospitalisation 11% died during their hospitalisation or within 7-days of discharge, 24% died within 3-months and 41% died within 12-months of discharge.

Figure 1 Usual residence or mortality up to 12-months after first hospitalisation for people living with dementia and people without dementia



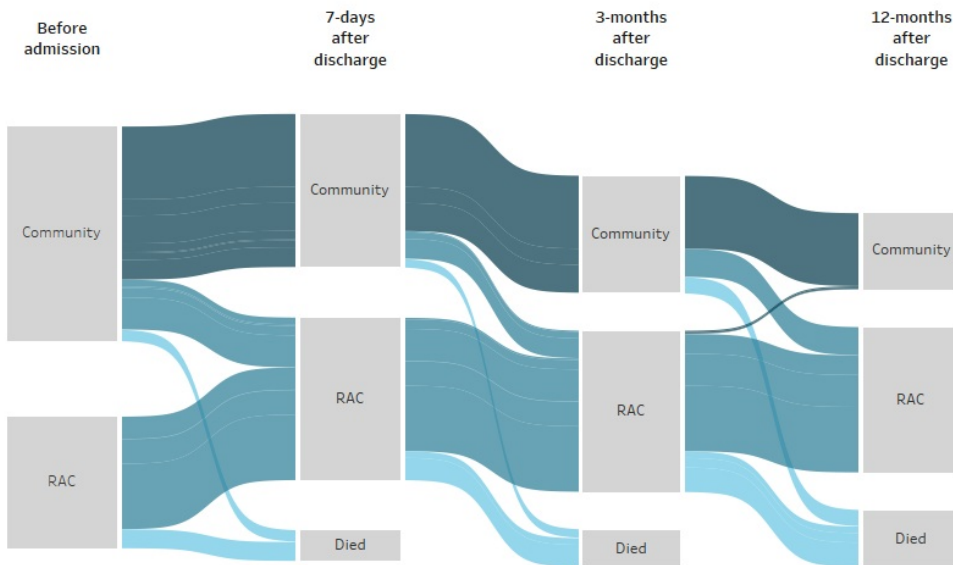
Source: AIHW NIHSI 2018-19, analysis of NIHSI.

Figure 2 Transitions to residential aged care or mortality up to 12-months after first hospitalisation for people living with dementia and people without dementia

The figure is a Sankey chart and shows the flow of people between living in the community, living in residential aged care or dying in the 7-days, 3-months and 12-months after their first hospitalisation in 2017. People living with dementia were much more likely to transition to residential aged care or to die after discharge from hospital compared to people without dementia.

Select an individual item in the list to trace it through the flow:
All

Dementia status
 People living with dementia
 People without dementia



Notes: RAC = residential aged care; deaths within 7-days of discharge include deaths during first hospitalisation in 2017.
 Sankey based on the work of Olivier Catherin and Jeffrey Shaffer. Sankey calculations and data template from Kevin and Ken Flerlage.
 Source: AIHW NIHSI 2018-19, analysis of NIHSI.
<https://www.aihw.gov.au>

Source: AIHW NIHSI 2018-19, analysis of NIHSI.

Transitions of care and mortality outcomes

People living with dementia were older than people without dementia.

- The median age of people living with dementia was 86, and over half of people living with dementia (56%) were aged 85 or older.
- For people without dementia the median age was 76 and 22% were aged 85 or older (Table S1.2).

A higher proportion of people living with dementia were women (56%) compared with people without dementia (50%).

- For both people living with dementia and people without dementia there was a slightly higher proportion of men than women in people aged 65-74, equal proportions of men and women in people aged 75-84 and a higher proportion of women than men in people aged 85 or older (Table S1.2)

Men and women aged 65-74, 75-84 and 85 or older and living with dementia were more likely to transition to residential aged care or to die in the 7-days, 3-months and 12-months after discharge from their hospitalisation compared with people without dementia. This indicates that differences in age and sex between people living with dementia and people without dementia do not explain the observed differences in outcomes.

For people living with dementia and people without dementia, transitions to residential aged care or mortality after discharge were different for men and women aged 65-74 compared with men and women aged 75 or older.

For people aged 65-74:

- A similar proportion of men and women lived in the community before admission to hospital and after discharge
- Men were more likely to die in the 12-months after discharge compared with women

For people aged 75-84 and 85 or older:

- Men were more likely than women to live in the community before admission to hospital and after discharge
- Men were more likely to die in the 12-months after discharge compared with women (Table S1.3)

Figure 3 Change in usual residence or mortality by age and sex 12-months after discharge for people living with dementia and people without dementia

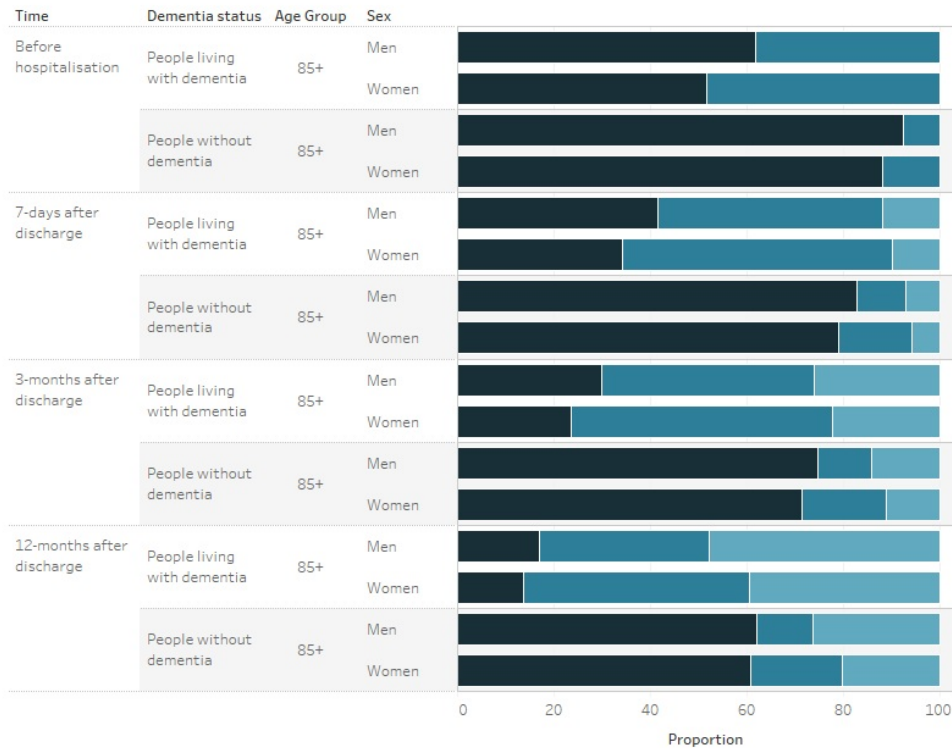
The figure is a bar-chart and shows the proportion of people living with dementia or people without dementia, by sex and age, who were living in the community or living in residential aged care before their first hospitalisation, and the proportion who were living in the community, living in residential aged care or who had died in the 7-days, 3-months and 12-months after discharge. In all age and sex groups, people living with dementia were much more likely to transition to residential aged care or to die after discharge from hospital compared to people without dementia.

Show Dementia status:
 People living with dementia
 People without dementia

Show Sex:
 Men
 Women

Show Age Group:
 65-74
 75-84
 85+
 Total aged 65+

Usual residence or mortality
 Died
 RAC
 Community



Source: AIHW NIHSI 2018-19, analysis of NIHSI.
<https://www.aihw.gov.au>

Source: AIHW NIHSI 2018-19, analysis of NIHSI

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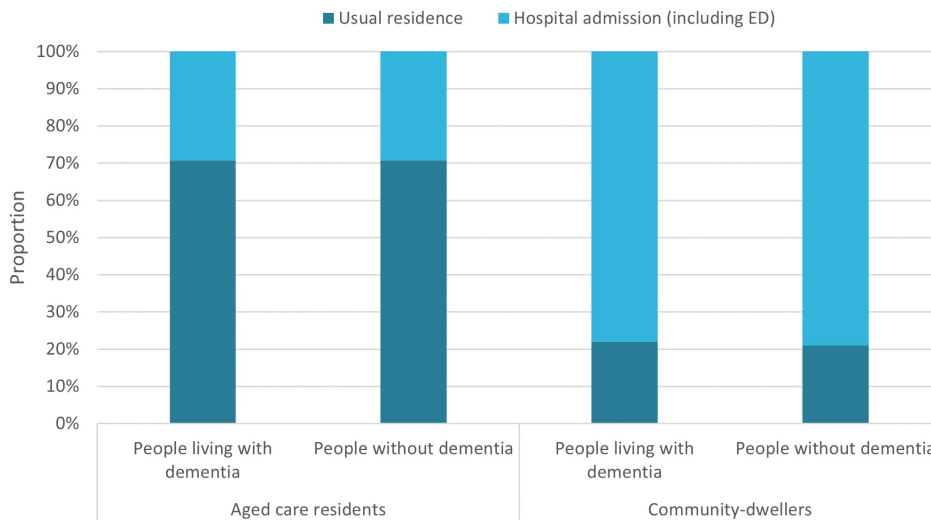


Transitions of care and mortality outcomes

Of the nearly 79,000 people living with dementia who had a hospitalisation in 2017, 36% died in the 12-months following their first hospitalisation. Of these, almost 3 in 4 people (73%) were aged care residents at the time of their death. In contrast, 12% of people without dementia died in the 12-months after their first hospitalisation and less than 1 in 4 people (23%) were aged care residents at the time of their death.

For people living with dementia and people without dementia, people who were aged care residents at the time of their death typically died in their aged care facility (about 71%) and people who were community-dwellers typically died in hospital or the emergency department (about 79%, [Figure 4](#)). These findings were observed in age groups and for men and women (Table S1.4).

Figure 4 Physical place of death for people living with dementia and people without dementia who died during their first hospitalisation or in the 12-months after discharge



Source: AIHW NIHSI 2018-19, analysis of NIHSI.



Clinical characteristics of first hospitalisation for people living with dementia



Clinical characteristics of first hospitalisation for people living with dementia

Understanding the hospital clinical characteristics that commonly lead to people transitioning into residential aged care is important to determine where high-quality transitional care is most needed, and where new policies and interventions should be targeted. As current hospitals are also not typically well-designed for people living with dementia, high-quality transitional care is essential to improve outcomes for people living with dementia.

All clinical characteristics are reported by people's change in usual residence or mortality in the 7-days after discharge from hospital.

First Hospitalisation

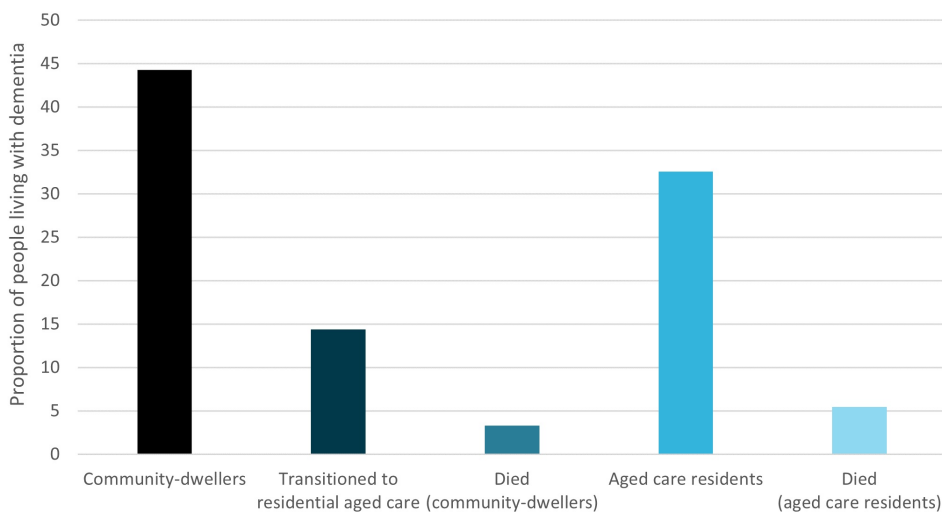
For people aged 65 or older, this study reports on the characteristics of each person's first hospitalisation ending in 2017 and their transitions of care before and after. This includes hospital admissions that started in 2017 (or earlier) that resulted in discharge or death in 2017. For people who had more than one hospitalisation ending in 2017, the first hospitalisation is the one that occurred earliest in the year.

Transitions in aged care use or mortality in the 7-days after discharge from hospital

For people living with dementia, [Figure 5](#) shows that in the 7-days after discharge from hospital:

- 44% of people were community-dwellers
- 46% were aged care residents, including:
 - 14% of people who transitioned into residential aged care
 - 33% of people who were already in residential aged care
- 8% of people died during their first hospitalisation or within 7-days, including:
 - 3% who were community-dwellers
 - 5% who were aged care residents ([Table S1.5](#)).

Figure 5 Change in usual residence or mortality 7-days after discharge from hospital for people living with dementia



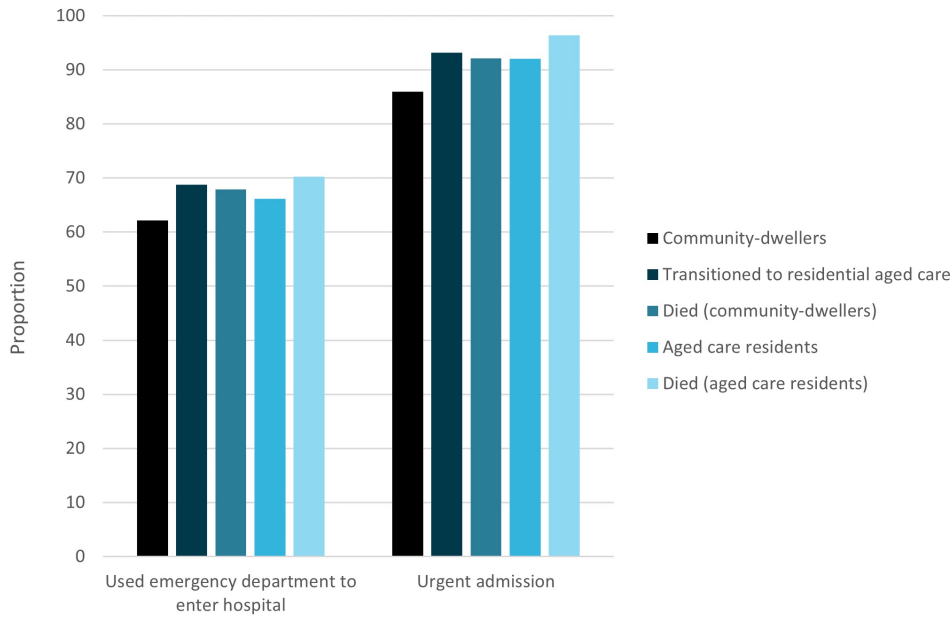
Source: AIHW NIHSI 2018-19, analysis of NIHSI.

Clinical characteristics of first hospitalisation for people living with dementia

Almost two in three people living with dementia (65%) used the emergency department to enter their first hospitalisation, and during their hospitalisation most people were categorised as having an urgent or “emergency” admission (90%), rather than “elective”, meaning treatment could not be delayed by 24 hours due to serious risk of illness or death.

Community-dwellers were less likely to enter the emergency department (62%) or to have an urgent admission (86%) compared with aged care residents, people who then transitioned into residential aged care and people who died during their hospitalisation or within 7-days (for each group, over 66% entered the emergency department and over 92% had an urgent admission) ([Table S1.6](#) and [Table S1.7](#)).

Figure 6 Use of the emergency department to enter hospital and urgency of admission for people living with dementia



Source: AIHW NIHSI 2018-19, analysis of NIHSI.

Clinical characteristics of first hospitalisation for people living with dementia

The number of episodes of care, the clinical complexity of care and type of care reflect the treatment patterns and needs of patients during their hospitalisation. Episodes with major complexity tend to have the highest healthcare costs.

People who transitioned to residential aged care and community-dwellers who died during their hospitalisation (or within 7-days of discharge) had more complex care needs and required more episodes of care compared with community-dwellers, aged care residents who died and aged care residents living with dementia.

Clinical complexity of care

Most people living with dementia (62%) had at least one episode of care classified as “major complexity” (rather than intermediate or minor complexity, [Table S1.8](#)).

The proportion of people who had at least one episode of care classified as major complexity was:

- 85% for people who transitioned to residential aged care,
- 76% for community-dwellers who died,
- 60% for community-dwellers,
- 58% for aged care residents who died,
- 56% for aged care residents had at least one episode of care classified as major complexity.

Clinical complexity of care is recorded for each episode of care for each person and is estimated using the Australian Refined Diagnostic Related Group (AR-DRG). For people that had more than one episode of care, the complexity of the most complex episode of care is reported.

Number of episodes of care

A new episode of care commences each time a person receives a different type of care, moves to a different ward, or moves to a different hospital. People who require more than one episode of care typically have more complex health problems requiring extended hospital care.

Most people living with dementia had one episode of care (73%), 19% had two episodes of care and 8% had three or more episodes of care ([Table S1.9](#)). The proportion of people who had three or more episodes of care was highest for people who then transitioned to residential aged care (26%) and lowest for community-dwellers (7%) and aged care residents (2%).

The high proportion of people who had three or more episodes of care, particularly among people who transitioned to residential aged care, highlights the importance of using linked data to examine the entirety of people’s hospital stays.

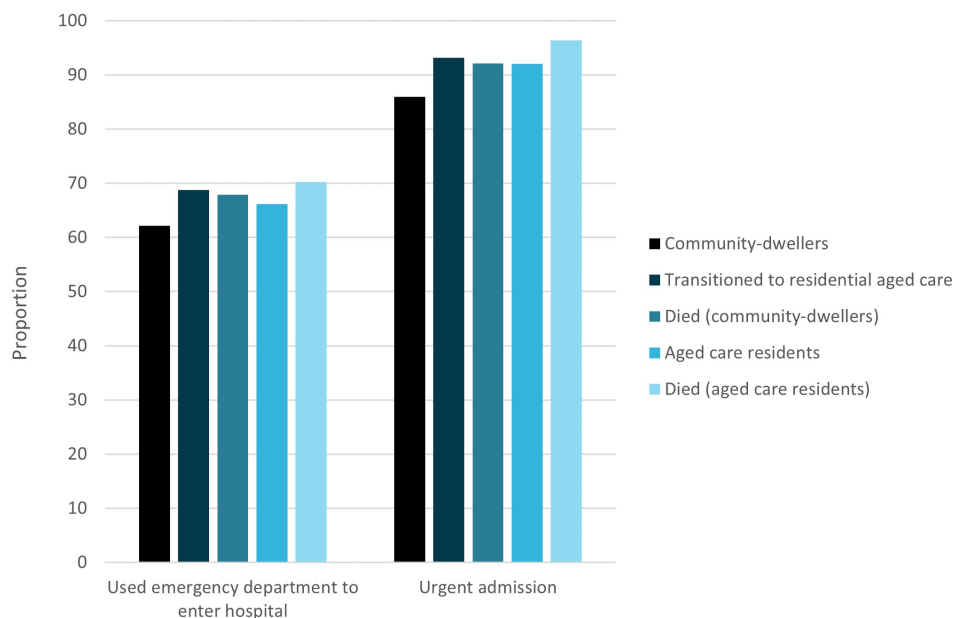
Types of care

Almost all people living with dementia used acute care during their hospitalisation (97%). The other most common types of care used by people living with dementia were geriatric evaluation and management (9%), maintenance care (7%) and rehabilitation care (6%, [Table S1.10](#)).

[Figure 7](#) shows the distinct types of care used by change in usual residence or mortality. Key findings are that:

- People who transitioned to live in residential aged care more frequently accessed maintenance care (35%), geriatric evaluation and management (22%), and rehabilitation care (12%) compared with other people living with dementia.
- Community-dwellers who died were more likely to access palliative care (33%) compared with aged care residents who died (22%).
- Aged care residents were more likely to access acute care (99%) and less likely to access any other care type (<2%) compared with other people living with dementia.

Figure 7 Distinct types of care used by people living with dementia, by change in usual residence or mortality within 7-days of discharge



Note: Rehabilitation care for aged care residents who died has been combined with Psychogeriatric care, Mental health care or Other.
 Source: AIHW NIHSI 2018-19, analysis of NIHSI.

Care type broadly reflects the nature of the clinical service that the person received during their care. Full descriptions of each care type are available (AIHW 2019). For people who had more than one episode of care and used more than one care type, each distinct type of care is reported.

References

AIHW (2019a) [Hospital service-care type](#), code N[N], METEOR identifier: 711010, viewed 06 Jan 2023.



Clinical characteristics of first hospitalisation for people living with dementia

A person's principal diagnosis reflects the specific reason they were admitted to hospital and additional diagnoses reflect conditions that impacted care needs during their admission. On this page, the principal diagnosis is summarised using the principal diagnosis group, which reflects the broad category of disease or health problem that the person needed treatment for.

The proportion of people with a principal or additional diagnosis of dementia is reported, reflecting people who were hospitalised due to their dementia or whose dementia impacted the care they required.

Principal diagnosis group

The most common reason that people living with dementia were hospitalised was for:

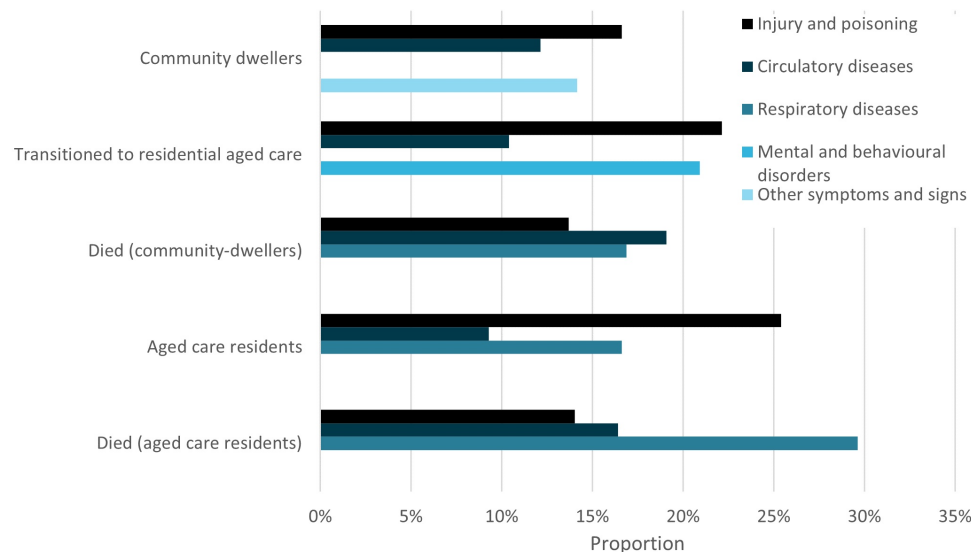
- 20% injury or poisoning (most often due to fracture of subcapital section of femur)
- 13% respiratory diseases (most often due to pneumonia -unspecified)
- 11% circulatory diseases (most often due to congestive heart failure).

Injury or poisoning, respiratory diseases and circulatory diseases were the most common reason for hospitalisation among community-dwellers who died, aged care residents who died and aged care residents, though the most common principal diagnosis varied ([Figure 8](#) and [Table S1.11](#)).

For community-dwellers, the most common reasons for hospitalisation were injury or poisoning, other signs and symptoms (most often due to syncope and collapse) and circulatory diseases.

For people who transitioned to live in residential aged care the most common reasons for hospitalisation were injury or poisoning, mental and behavioural disorders (most often due to delirium superimposed on dementia) and circulatory diseases.

Figure 8 Top principal diagnosis groups for people living with dementia, by change in usual residence or mortality within 7-days of discharge



Source: AIHW NIHSI 2018-19, analysis of NIHSI.

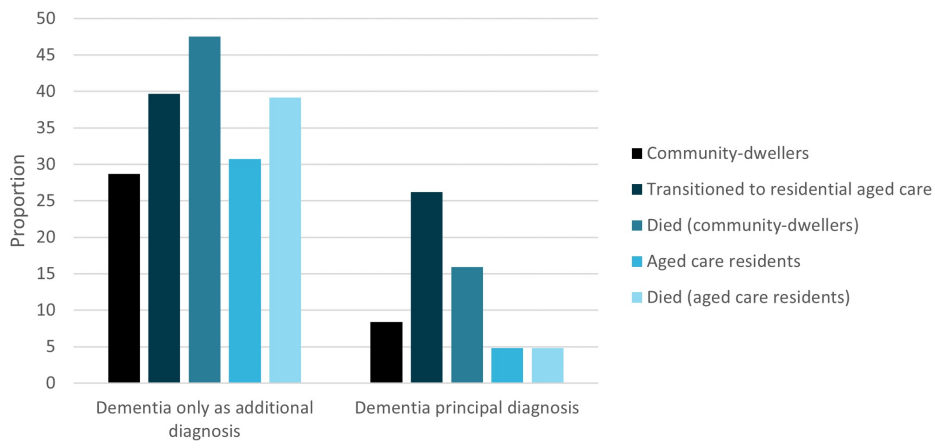
Hospitalised due to or with dementia

Most people living with dementia did not have dementia recorded as a principal or additional diagnosis (58%). Only 10% of people living with dementia were hospitalised due to dementia and 32% had dementia recorded as a condition that affected the care they required during their hospitalisation ([Table S1.12](#)). This shows the importance of linked data for identifying people with dementia.

The proportion of people who were hospitalised due to dementia was highest for people who transitioned to residential aged care (26%) and lowest for aged care residents (5%) and aged care residents who died (5%). This suggests that people who lived in the community prior to their hospitalisation may require additional support in the community to manage their dementia.

The proportion of people whose dementia impacted their care but was not the main reason for admission was highest for community-dwellers who died (48%) and lowest for aged care residents (31%) and community-dwellers (29%).

Figure 9 Proportion of people who were hospitalised due to or with dementia, by change in usual residence or mortality within 7-days of discharge



Source: AIHW NIHSI 2018-19, analysis of NIHSI.

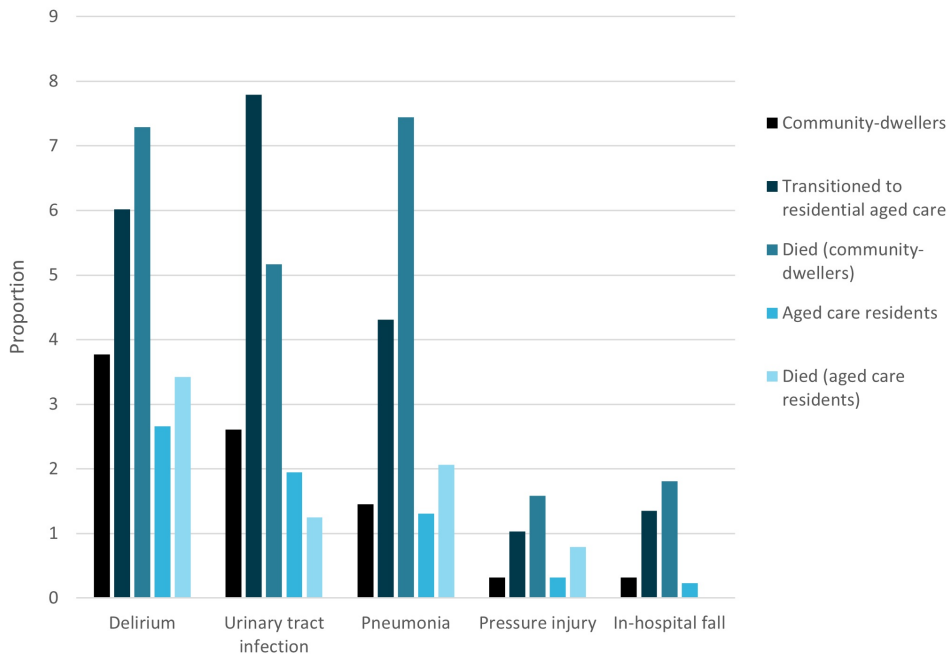
Clinical characteristics of first hospitalisation for people living with dementia

Incidence of delirium, urinary tract infections, pneumonia, pressure injuries and in-hospital falls that were reported to occur during a hospitalisation were explored because they are potentially preventable and relevant to people living with dementia (Australian Commission on Safety and Quality in Health Care 2022). Information on the codes used to derive these conditions is provided in the [Technical notes](#).

Potentially preventable complications were not common, affecting less than 4% of people living with dementia who were hospitalised. Delirium, urinary tract infections and pneumonia were more commonly reported compared with pressure injuries or in-hospital falls.

People who transitioned to residential aged care and community-dwellers who died were more likely to have a potentially preventable complication reported during their hospitalisation compared with community-dwellers, aged care residents and aged care residents who died (Figure 10 and Table S1.13).

Figure 10 Proportion of people living with dementia with a potentially preventable complication reported during their first hospitalisation, by change in usual residence or mortality within 7-days of discharge



Source: AIHW NIHSI 2018-19, analysis of NIHSI.

References

Australian Commission on Safety and Quality in Health Care (2022) *Hospital-acquired complications specifications V3.1 - April 2022* (12th edition).



Clinical characteristics of first hospitalisation for people living with dementia

Aged care residents

1 in 3 people living with dementia (33%) were aged care residents before and after discharge from their first hospitalisation, nearly 26,000 people.

Of these, 615 (2%) moved to a new residential aged care facility within 7-days of discharge from hospital. Most of these people entered their new residential aged care facility as a permanent resident (82%) and 18% entered their new residential aged care facility as a respite user ([Table S1.14](#)).

People who transitioned to residential aged care

Over 11,000 people, 14% of people living with dementia, moved from the community to live in residential aged care within 7-days of their discharge from hospital.

Half of these people entered a new residential aged care facility as a permanent resident (48%) and half (52%) entered their new residential aged care facility as a respite user ([Table S1.15](#)).

Clinical characteristics of first hospitalisation for people living with dementia

This page shows the 12-months transitions of care or mortality and subsequent hospitalisations or emergency department (ED) presentations for people who were hospitalised due to a fall that occurred outside of hospital.

Hospitalisations for falls are of particular interest as people living with dementia are at least twice as likely to have a fall and more likely to have serious injury or death after a fall compared with people without dementia (Lord et al. 2007, Fernando et al. 2017).

How many people were hospitalised due to a fall?

About one in five people living with dementia (22%) and one in ten people without dementia (9%) were hospitalised due to a fall ([Table S.16](#)).

The proportion of people who were hospitalised for a fall by change in usual residence or mortality was highest for:

- people who transitioned to residential aged care (28% for people living with dementia and 26% for people without dementia)
- aged care residents (27% for people with dementia and 17% for people without dementia)

The proportion of people who were hospitalised for a fall by change in usual residence or mortality was lowest for:

- community-dwellers (18% for people living with dementia and 8% for people without dementia)
- people who died during their hospitalisation or within 7-days (about 17% for people living with dementia and 11% for people without dementia, [Table S1.17](#))

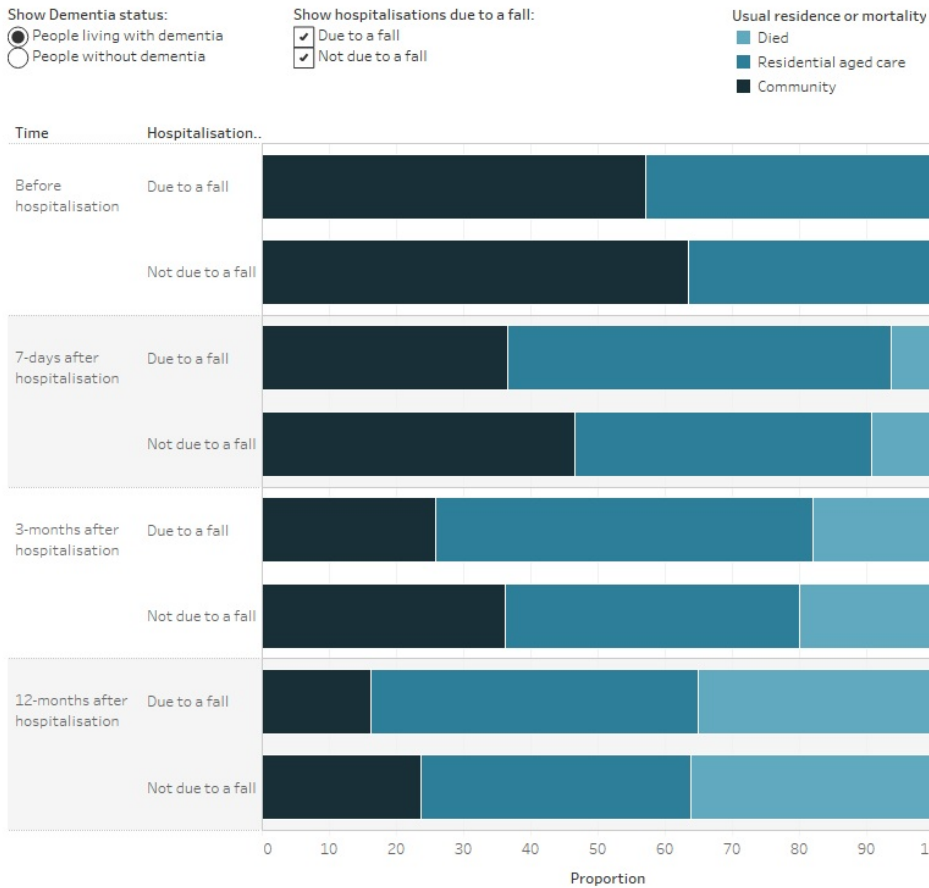
People who were hospitalised due to a fall

[Figure 11](#) shows the usual residence on the day of admission to hospital and usual residence or mortality in the 7-days, 3-months, and 12-months after discharge for people living with dementia and people without dementia whose first hospitalisation was or was not due to a fall ([Table S1.17](#)).

Compared with people whose first hospitalisation was not due to a fall, people whose first hospitalisation was due to a fall were less likely to live in the community and more likely to live in residential aged care both before their hospitalisation and 7-days, 3-months, and 12-months after their first hospitalisation. A similar proportion of people who were hospitalised due to a fall or hospitalised for other reasons died in the 12-months after discharge.

Figure 11 Usual residence or mortality up to 12-months after first hospitalisation for people living with dementia and people without dementia by whether their hospitalisation was due to a fall

The figure is a bar-chart and shows the proportion of people living with dementia or people without dementia, by whether their first hospitalisation was due to a fall, who were living in the community or living in residential aged care before their first hospitalisation, and the proportion who were living in the community, living in residential aged care or who had died in the 7-days, 3-months and 12-months after discharge. Compared with people whose first hospitalisation was not due to a fall, people whose first hospitalisation was due to a fall were less likely to live in the community and more likely to live in residential aged care both before their hospitalisation and 7-days, 3-months, and 12-months after their first hospitalisation.



Source: AIHW NIHSI 2018-19, analysis of NIHSI.
<https://www.aihw.gov.au>

Source: AIHW NIHSI 2018-19, analysis of NIHSI.

Subsequent hospitalisations and ED presentations for people who were hospitalised due to a fall

Among people living with dementia who survived for 12-months after their hospitalisation for a fall:

- 48% of people had an ED presentation, with 10% having three or more emergency department presentations (Table S1.18).
- 58% of people living with dementia had a subsequent hospitalisation, with 18% having three or more subsequent hospitalisations (Table S1.19).

The proportion of people who had 3 or more ED presentations or subsequent hospitalisations varied by people’s change in usual residence in the 7-days after hospitalisation:

- 15% of community-dwellers had 3 or more ED presentations and 23% had three or more subsequent hospitalisations
- 6% of people who transitioned to residential aged care had 3 or more ED presentations and 14% had three or more subsequent hospitalisations
- 4% of aged care residents had 3 or more ED presentations and 14% had three or more subsequent hospitalisations

Clinical characteristics of first hospitalisation for people living with dementia

This page shows the proportion of people who were reported to be eligible and awaiting entry to residential aged care during their first hospitalisation. It also shows the outcomes 12-months after discharge for people who were or were not reported to be eligible and awaiting entry to residential aged care, but these results are restricted to people who moved from living in the community to living in residential aged care within 7-days of discharge from their hospitalisation.

Outcomes for people who are eligible and awaiting entry to residential aged care are of interest because these people are at the interface between the hospital and aged care systems. Some people living with dementia may be turned away from residential aged care facilities if they have complex behaviours, and these people may stay in hospital longer than necessary.

People can receive an additional diagnosis during their hospitalisation that indicates they are ‘eligible and awaiting entry to residential aged care’ if they do not require further clinical care and are waiting in hospital until they can transfer to a residential aged care facility or because there are no appropriate residential aged care facilities in their district.

Eligible and awaiting entry to residential aged care

Less than 1% of people without dementia and 7% of people living with dementia were reported to be eligible and awaiting entry to residential aged care during their first hospitalisation. This varied by people’s change in usual residence or mortality after their hospitalisation ([Table S1.20](#)).

Over 1 in 3 people living with dementia (37%) and 1 in 4 people without dementia (27%) who moved from living in the community to living in residential aged care were most reported to be eligible and awaiting entry to residential aged care during their hospitalisation.

Around 9% of community-dwellers living with dementia and 2% of community-dwellers without dementia who died during their hospitalisation were flagged in their hospital record as being eligible and awaiting entry to residential aged care.

A small number of people who continued to live in the community (2%) were flagged as being eligible and awaiting placement in a residential aged care facility. It is not clear whether these people chose to return to live in the community despite being found eligible for a RAC placement, returned to live in the community while they waited to enter a RAC facility, or used a health or care facility not available in the linked data while they awaited entry to a RAC facility.

A small number of people who continued living in residential aged care (1%) were also reported to be eligible and awaiting entry to residential aged care, and it is likely that these people needed to or wanted to move to a different residential aged care facility after their hospitalisation.

Outcomes 12-months after discharge

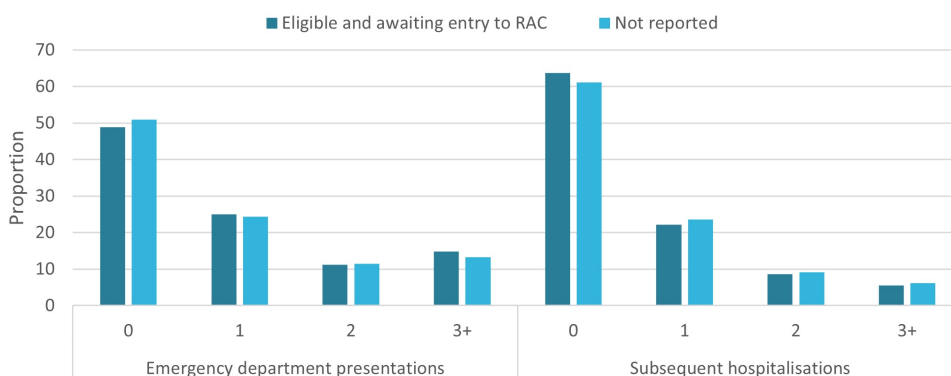
Among people living with dementia who moved from living in the community to living in residential aged care within 7-days of discharge, outcomes 12-months after discharge were similar for people who were reported to be eligible and awaiting entry to residential aged care during their hospitalisation and people who were not.

- About 32% of people died within 12-months of discharge (including 13% who died within 3-months, [Table S1.21](#))

Among people who survived for 12-months after discharge:

- About 50% of people had one or more emergency department presentations ([Table S1.22](#))
- About 38% of people living with dementia had one or more subsequent hospitalisations ([Table S1.23](#))

Figure 12 Number of emergency department presentations and subsequent hospitalisations for people living with dementia who were or were not reported to be eligible and awaiting entry to residential aged care



Note: this is limited to people who transitioned to live in residential aged care within 7-days of discharge from their first hospitalisation and survived for 12-months after discharge

Source: AIHW NIHSI 2018-19, analysis of NIHSI.

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Median length of stay and effect of specific conditions



Median length of stay and effect of specific conditions

Median length of stay and the effect of specific conditions are reported for people living with dementia and people without dementia by their change in usual residence or mortality within 7-days of discharge from hospital.

First Hospitalisation

For people aged 65 or older, this study reports on the characteristics of each person's first hospitalisation ending in 2017 and their transitions of care before and after. This includes hospital admissions that started in 2017 (or earlier) that resulted in discharge or death in 2017. For people who had more than one hospitalisation ending in 2017, the first hospitalisation is the one that occurred earliest in the year.

People who lived in the community prior to first hospitalisation

Nearly 2 in 3 people living with dementia (62%) and 97% of people without dementia lived in the community prior to their first hospitalisation ([Figure 13](#) and [Table S1.5](#)).

Within 7-days of discharge from their first hospitalisation:

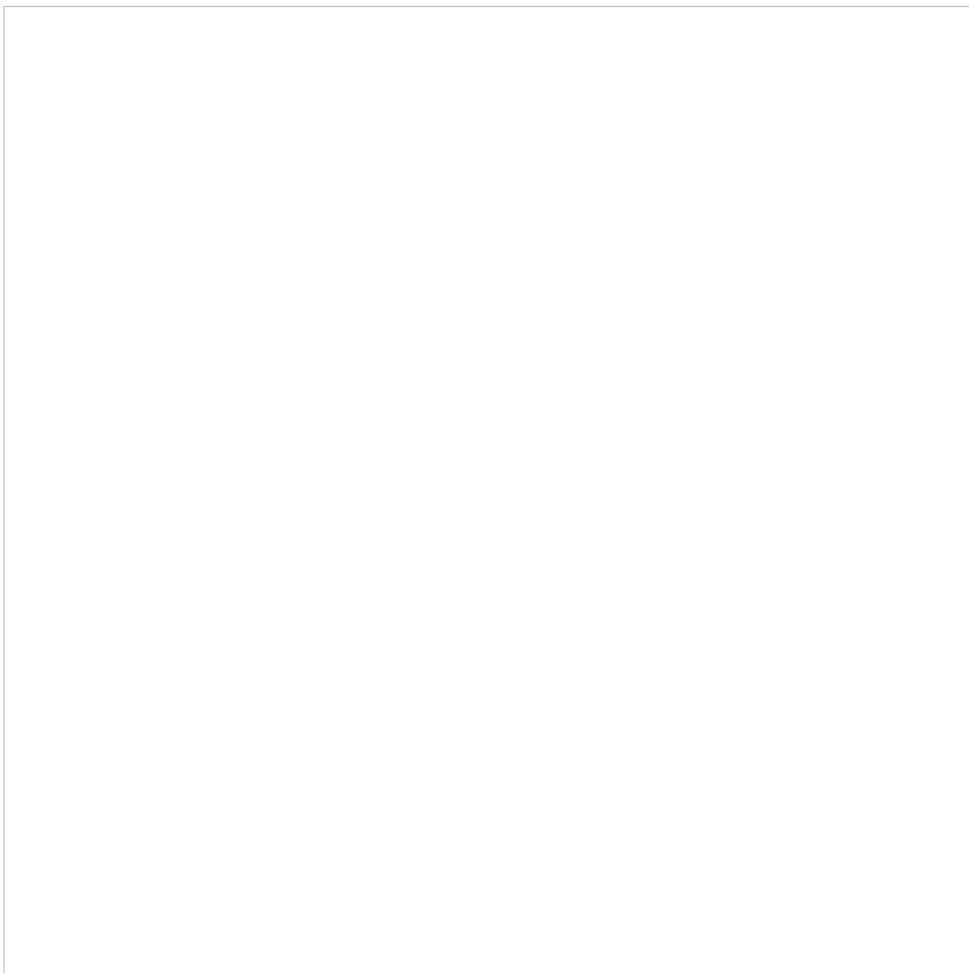
- 71% of people living with dementia and 95% of people without dementia returned to live in the community (community-dwellers)
- 23% of people living with dementia and 2% of people without dementia transitioned to residential aged care
- 5% of people living with dementia and 3% of people without dementia died (during hospitalisation or within 7-days after discharge).

People who lived in residential aged care prior to first hospitalisation

Over 1 in 3 people living with dementia (38%) and 3% of people without dementia lived in residential aged care prior to their first hospitalisation. Within 7-days of discharge from their first hospitalisation:

- 86% of people living with dementia and 89% of people without dementia returned to live in residential aged care (aged care residents)
- 14% of people living with dementia and 11% of people without dementia died (during hospitalisation or within 7-days after discharge).

Figure 13 Change in usual residence or mortality within 7-days of discharge for people living with dementia and people without dementia



Source: AIHW NIHSI 2018-19, analysis of NIHSI.

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Median length of stay and effect of specific conditions

The median length of stay of first hospitalisations was 5-days for people living with dementia and 3-days for people without dementia. However, this varied substantially by whether people were living in the community or in residential aged care before their hospitalisation, and transitions after their hospitalisation (Figure 14 and Table S1.24).

The median length of stay is the value at which 50% of people had a shorter length of stay and 50% had a longer length of stay. The median is interpreted alongside the inter-quartile range (IQR), which shows the 25th percentile (25% have a shorter length of stay than this) and 75th percentile (25% of people have a longer length of stay than this). The IQR indicates how much people's average length of hospital stay tends to vary from the median.

Median length of stay by change in usual residence or mortality

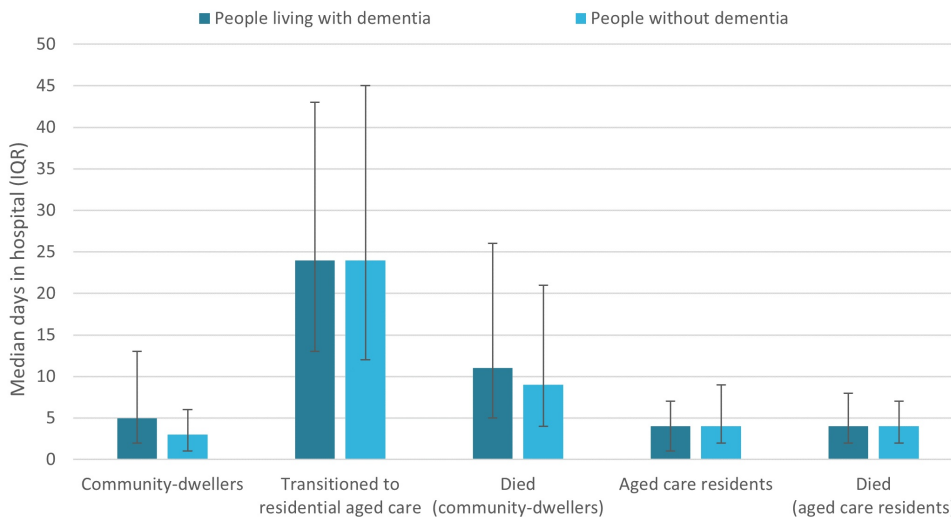
Figure 14 shows that for people living with dementia and people without dementia, the median length of stay was:

- Similar for community-dwellers, aged care residents and aged-care residents who died (between 3 and 5-days),
- Longer for community-dwellers who died (11-days for people living with dementia and 9-days for people without dementia),
- Longest for people who transitioned to residential aged care (24-days).

For people who lived in the community prior to their hospitalisation, these results show that people who were able to return to live in the community were able to spend less time in hospital compared with people who died or needed to transition into residential aged care. This is likely because they had less complex healthcare needs (see [clinical characteristics summary](#)), but unmeasured factors such as availability of carers, whether the person lives alone and whether the person was accessing community aged care are also likely to influence how quickly a person living with dementia is able to return home.

The impact of conditions reported during hospitalisation on median length of stay are explored next.

Figure 14 Median length of first hospitalisation for people living with dementia, by change in usual residence or mortality within 7-days of discharge



Note: Error bars represent the inter-quartile range (IQR), which indicates how much people's average length of stay tends to vary from the median.

Source: AIHW NIHSI 2018-19, analysis of NIHSI.

Median length of stay and effect of specific conditions

Effect of conditions reported during hospitalisation and aged care characteristics on average length of stay

This page compares the impact of various factors on the length of hospitalisation for people living with dementia who survived for at least 7-days after their first hospitalisation. Comparisons are made to people without dementia to determine whether these impacts are typical of all adults aged 65 or older or unique among people living with dementia.

Linear regression models were used to determine the adjusted effect of each factor of interest on average length of stay for people living with dementia and people without dementia. An example of what the “adjusted effect” means is provided below and detailed methods are available in *Technical notes*.

The models were conducted separately for community-dwellers, aged care residents and people who transitioned to aged care. All models included:

- Dementia
- Age
- Sex
- Delirium
- In-hospital falls
- Pressure injuries
- Pneumonia
- Urinary tract infections

For people who transitioned to residential aged care, the model also included:

- Eligible and awaiting entry to residential aged care
- Use of respite residential aged care after discharge

For aged care residents, the model also included:

- Whether the person moved to a different aged care facility after discharge

What does the “adjusted effect” mean?

In this report, the adjusted effect is the effect on average length of stay associated with one factor, accounting for differences in all other factors included in the model.

For example, the adjusted effect of delirium on length of stay provides an estimation of the difference in average length of stay between those with delirium and those without delirium when all other factors included in the model are at the same level between groups.

Impact of living with dementia

The impact of living with dementia on length of stay varied depending on people’s change in usual residence after hospitalisation, age group, and for aged care residents whether they had a potentially preventable condition.

Compared with people without dementia, the average length of stay for people living with dementia was:

- 3 to 6-days longer for community-dwellers at different age groups
- 1 to 6-days shorter for people at different age groups who transitioned to residential aged care
- Similar for people who were aged care residents who did not have a potentially preventable condition and 2-6 days shorter for people who did have a potentially preventable condition.

Impact of age and sex

For community-dwellers and aged care residents age and sex had very little impact on length of stay, and average length of stay was similar for men and women and for people aged 65-74, 74-84 and 85 or older.

For people who transitioned to residential aged care, average length of stay was 2-days shorter for women than men and older adults had shorter lengths of stay than younger adults.

Impact of potentially preventable conditions

People living with dementia and people without dementia who experienced a potentially preventable complication during their hospitalisation had longer lengths of stay than people who did not.

For people who transitioned to live in residential aged care, experiencing a potentially preventable complication had a similar impact on length of stay for people living with dementia and people without dementia. The impact on length of stay ranged from:

- 13-days longer in hospital for people who developed delirium to
- 25-days longer in hospital for people who developed a pressure injury.

For community-dwellers the impact of pneumonia on length of stay was different for people living with dementia (26-days longer in hospital) and people without dementia (22-days longer in hospital). All other potentially preventable complications had a similar impact on length of stay for community-dwellers living with dementia and community-dwellers without dementia. The impact on length of stay ranged from:

- 17-days longer in hospital for people who developed delirium, to
- 31-days longer in hospital for people who developed a pressure injury

For aged care residents, the impact of experiencing an in-hospital fall was the same for people living with dementia and people without dementia, who spent 18-days longer in hospital. For all other complications, people living with dementia had smaller increases in length of stay than people without dementia. The impact on length of stay was:

- 6-days longer in hospital for people living with dementia and 8-days longer for people without dementia who developed delirium
- 8-days longer for aged care residents living with dementia and 11-days longer for aged care residents without dementia who contracted pneumonia
- 11-days longer for aged care residents living with dementia and 14-days longer for aged care residents without dementia who developed a urinary tract infection
- 8-days longer for aged care residents living with dementia and 15-days longer for aged care residents without dementia who developed a pressure injury

Impact of being eligible and awaiting entry to residential aged care or using respite residential aged care

For people living with dementia or without dementia who transitioned to living in residential aged care:

- People who were reported to be eligible and awaiting entry to residential aged care spent 13-days on average longer in hospital.
- People who entered a residential aged care facility as a respite user (rather than as a permanent resident) spent 11-days on average shorter in hospital.

Impact of moving to a new residential aged care facility

For people living with dementia or without dementia who were aged care residents:

- People who moved to a new residential aged care facility after discharge from hospital spent 30-days on average longer in hospital compared with people who returned to their original aged care facility.

Aged care residents who moved to a new residential aged care facility had similar lengths of stay as people who transitioned to living in residential aged care. These results indicate that aged care residents who need to or want to move to a new residential aged care facility after a hospitalisation may face similar barriers to entering a new facility as people who are moving to a residential aged care facility from the community after a hospitalisation.

Median length of stay and effect of specific conditions

Effect of conditions reported during hospitalisation and aged care characteristics on potentially avoidable bed-days

Multiplying the average increase in length of stay with the number of people who experienced each factor provides an estimate of the number of hospital bed-days that could potentially be avoided if nobody had experienced that factor, or if that factor was not associated with any increase in length of stay. This information is intended to be used to determine where efforts to reduce unnecessary bed-days would be best employed.

[Figure 15](#) shows that for people living with dementia, the potentially preventable complications associated with the greatest number of additional bed-days were:

- urinary tract infections (over 23,000 bed-days for community-dwellers and nearly 21,000 bed-days for people who transitioned to residential aged care)
- delirium (nearly 22,000 bed-days for community-dwellers and nearly 9,000 bed-days for people who transitioned to residential aged care)

For people living with dementia who transitioned to residential aged care:

- people who entered residential aged care as a permanent resident collectively spent over 60,000 additional days in hospital compared with people who transitioned to aged care as a respite user
- people who were reported to be eligible and awaiting entry to residential aged during their hospitalisation collectively spent over 53,000 additional days in hospital compared with people who were not reported to be eligible and awaiting entry to residential aged care during their hospitalisation

For existing aged care residents living with dementia:

- people who needed or wanted to move to a new aged care facility collectively spent over 16,000 additional days in hospital compared with people who returned to their previous aged care facility

The number of potentially avoidable bed-days for people living with dementia and people without dementia is available in [Table S1.25](#).

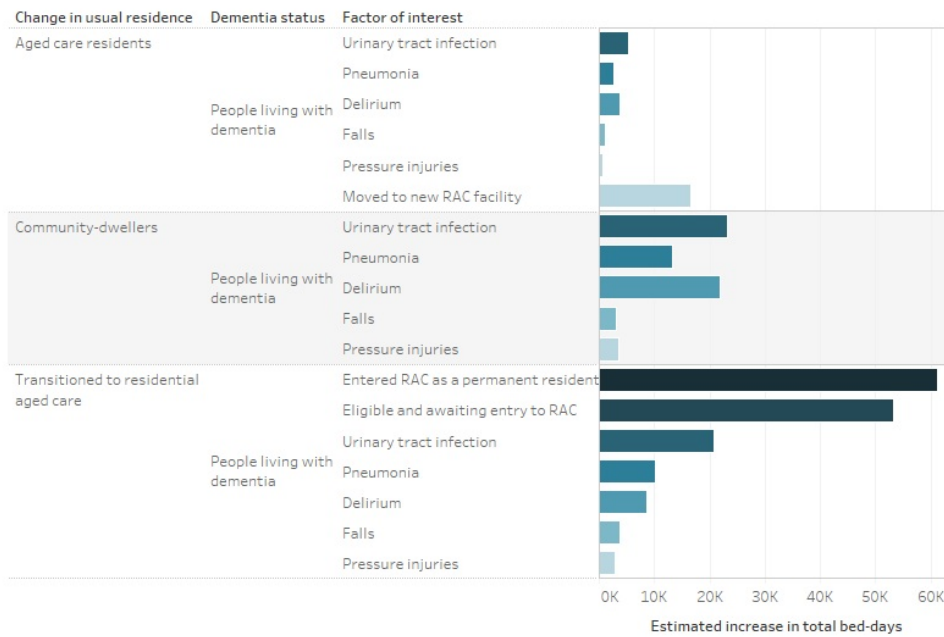
Figure 15 Estimated impact of potentially preventable complications reported during hospitalisation on potentially avoidable bed-days for people living with dementia and people without dementia

This figure is a bar chart and shows the estimated number of potentially-avoidable bed-days for people living with dementia and people without dementia who were aged care residents, community-dwellers or who transitioned to residential aged care within 7-days of discharge from their first hospitalisation in 2017. The largest number of potentially-avoidable bed-days was for people who transitioned to residential aged care and entered the facility as a permanent resident compared to entering as a respite resident (over 60,000 days).

Show Dementia status:
 People living with dementia
 People without dementia

Show factors of interest:
 Delirium
 Eligible and awaiting entry to RAC
 Entered RAC as a permanent resident
 Falls
 Moved to new RAC facility
 Pneumonia
 Pressure injuries
 Urinary tract infection

Selected factors of interest
 Entered RAC as a permanent resident
 Eligible and awaiting entry to RAC
 Urinary tract infection
 Pneumonia
 Delirium
 Falls
 Pressure injuries
 Moved to new RAC facility



Source: AIHW NIHSI 2018-19, analysis of NIHSI.
<https://www.aihw.gov.au>

Note, potentially preventable bed-days for each potentially preventable complication are calculated based on the effect of those complications adjusted for the confounding effect of age, sex, incidence of other potentially preventable complications and aged care characteristics.

RAC: residential aged care

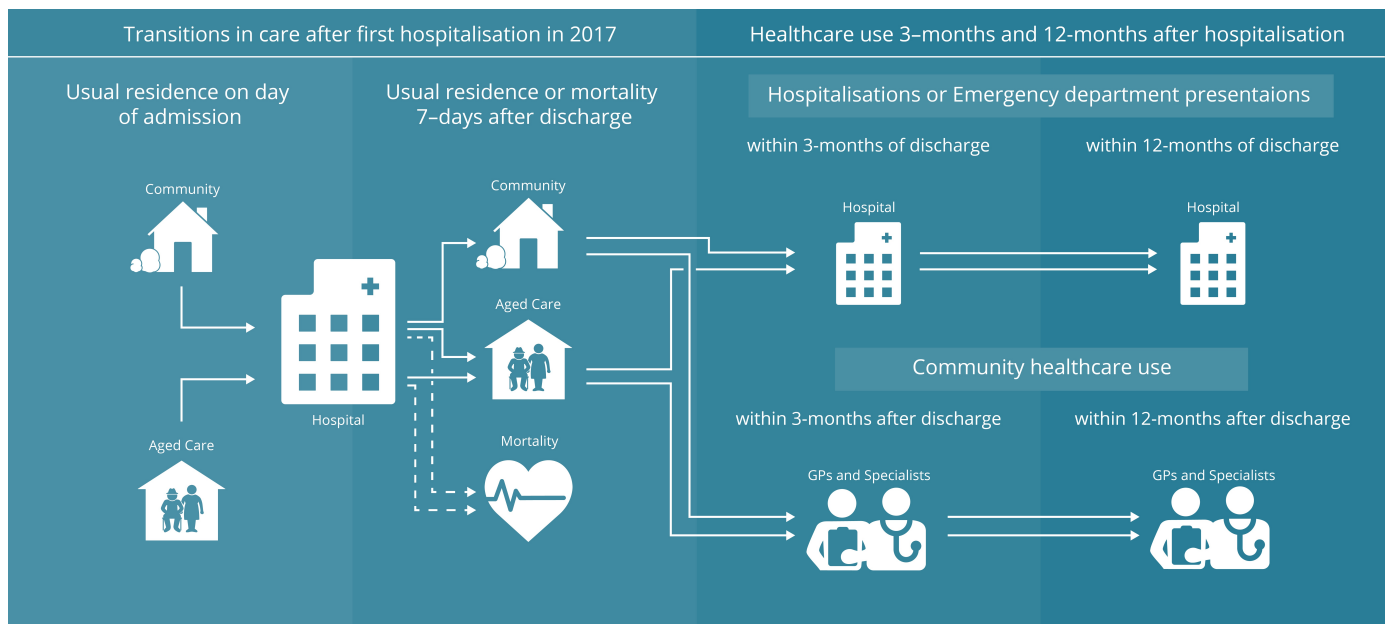
Source: AIHW NIHSI 2018-19, analysis of NIHSI.

Health services used in the year after first hospitalisation for people living with dementia

This page presents the use of key healthcare services by people living with dementia in the 12-months after discharge from their first hospitalisation in 2017. This includes hospital admissions, emergency department presentations and select Medicare-subsidised services.

These services are important in the treatment and management of dementia (and other co-morbidities) and are often recommended after a significant change in a person's health status - as may occur after a hospitalisation. Understanding use of these health services in the year after first hospitalisation and how this differs by people's usual residence can help to identify people who may be underserved.

Findings are presented by change in usual residence within 7-days of discharge from hospital, and therefore reflect where people were living after their first hospitalisation. To ensure a fair comparison between groups, results are limited to people who survived for at least 12-months after discharge from hospital: community-dwellers, people who transitioned into residential aged care and aged care users.

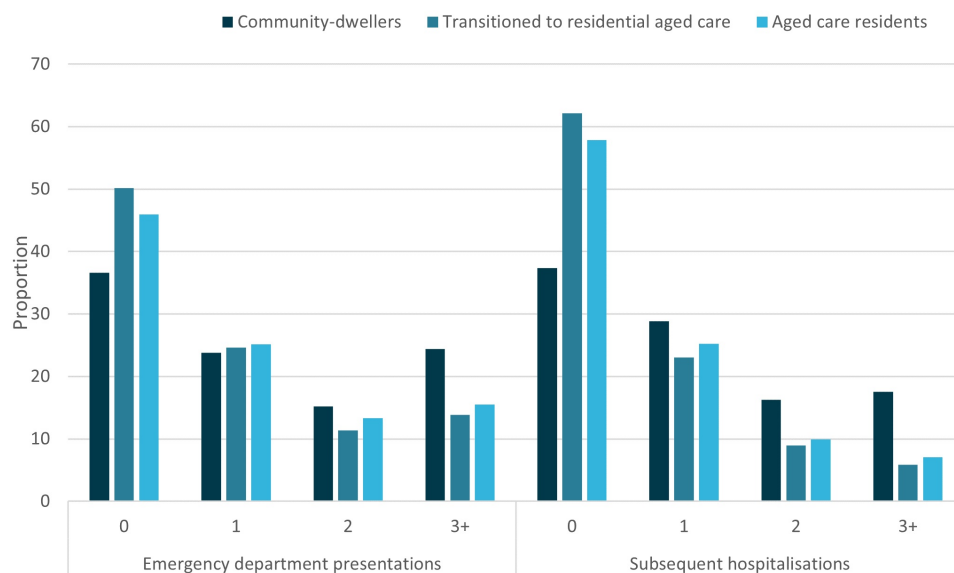


Hospitalisations and emergency department presentations

Community-dwellers were more likely to have an emergency department (ED) presentation (63%) or subsequent hospitalisation (62%) in the 12-months after discharge compared with people who were living in residential aged care (54% and 42%, respectively) and people who transitioned into residential aged care after their first hospitalisation (50% and 38%, respectively).

Community-dwellers were also more likely to have three or more ED presentations or subsequent hospitalisations compared with aged care users and people who transitioned to residential aged care after their first hospitalisation ([Figure 16](#) and [Tables S1.26](#) and [S1.27](#)).

Figure 16 Number of emergency department presentations and subsequent hospitalisations in the 12-months after discharge for people living with dementia, by change in usual residence in the 7-days after discharge



Note, this was limited to people living with dementia who survived for 12-months after discharge from their hospitalisation

Source: AIHW NIHSI 2018-19, analysis of NIHSI.

Community-based healthcare services

Figure 17 shows that in the 12-months after discharge from hospital:

- almost all people living with dementia had one or more GP consultations (94%)
- over half had a specialist consultation (56%) or received a chronic disease management service (57%)
- less than half had an allied health service (41%)
- less than 1 in 3 had a medication management review (27%)
- less than 1 in 7 people living with dementia received a geriatrician referred management plan (13%).

GP consultations

Of the 94% of people living with dementia who had one or more Medicare-subsidised GP consultations in the 12-months after discharge from their first hospitalisation, most people (96%) saw a GP in the 3-months after their first hospitalisation (Table S1.28).

The median number of GP consultations in the 12-months after discharge was:

- 17 for community-dwellers
- About 27 for aged care residents and people who transitioned to residential aged care after their first hospitalisation (Table S1.29).

Specialist consultations

Over half (56%) of people living with dementia had a Medicare-subsidised specialist consultation in the 12-months after discharge from hospital (Table S1.28).

The proportion of people who had one or more specialist consultations in the 12-months after discharge was:

- 66% for community-dwellers
- 46% for people who transitioned to live in residential aged care
- 42% for aged care residents

Among those who had one or more specialist consultations, about 60% had this consultation in the 3 to 12-months after discharge from their first hospitalisation.

Chronic disease management services

Over half (57%) of people living with dementia had a Medicare-subsidised chronic disease management service in the 12-months after discharge from hospital (Table S1.28). The proportion of people who had one or more chronic disease management services in the 12-months after discharge was:

- 58% for community-dwellers
- 58% for people who transitioned to live in residential aged care
- 53% for aged care residents

Among those who received a chronic disease management service, people who transitioned into residential aged care were more likely to receive a chronic disease management service in the 3-months after discharge from hospital (56%) than people who remained living in residential aged care (49%) or remained living in the community (45%).

Chronic disease management services include the preparation and review of GP management plans, team care arrangements and multidisciplinary care plans. People with chronic or terminal conditions can access chronic disease management services from their GP (sometimes in collaboration with other health or care professionals), to help ensure they receive structured and coordinated care that will help them to achieve their current health goals.

GP management plans with regular review are a recommended strategy to monitor the progress of each person living with dementia to ensure their goals are being met (Pond 2012). These plans should be regularly reviewed, either every six months, or as clinically necessary up to once every three months.

Geriatrician referred plans

Less than 1 in 7 people living with dementia (13%) had a Medicare-subsidised geriatrician referred plan in the 12-months after discharge from their first hospitalisation. By change in usual residence for people living with dementia, this was:

- 14% for community-dwellers
- 14% for people who transitioned into residential aged care
- 10% for aged care residents.

About 40% of people who had a geriatrician referred plan received this in the 3 to 12-months after discharge from their first hospitalisation (Table S1.28).

People aged 65 and over with complex health issues or who are at risk of poor health outcomes can be referred by their GP for a comprehensive assessment and management plan (geriatrician referred plan) by a consultant physician or specialist in geriatric medicine. The assessment includes a medication review, advance care planning and a review of the person's physical, social, and emotional health.

Medication management reviews

Only 27% of people living with dementia had a Medicare-subsidised medication management review in the 12-months after discharge from their first hospitalisation. Among people who had a medication management review, the majority (76%) received this in the 3 to 12-months after discharge from their first hospitalisation (Table S1.28).

The proportion of people who had a medication management review varied by change in usual residence after discharge:

- 51% for people who transitioned into residential aged care
- 33% for aged care residents
- 16% for community-dwellers

People can access medication reviews once every 12-months, or after a significant change in the person's condition or prescribed medications. As examining prescription medications was out of scope of the current report it is unclear what proportion of people living with dementia take medications and would require a medication management review.

Medication management reviews are conducted by GPs (in collaboration with community pharmacists or specialists) and involve reviewing the number and type of medicines that a person has been prescribed. This allows the risks and benefits of each medication, and potential interactions between medications, to be considered.

Allied health care services

Aged care residents were slightly more likely to have one or more Medicare-subsidised allied health care services in the 12-months after discharge from hospital (44%) compared with community-dwellers (40%) or people who transitioned into residential aged care after their first hospitalisation (38%).

Among people who received an allied health care service, aged care residents were also more likely to receive this service in the 3-months after discharge from hospital (65%) compared with people who remained living in the community (58%) or who transitioned into residential aged care after their first hospitalisation (42%) (Table S1.28).

Figure 17 Proportion of people living with dementia who accessed a Medicare-subsidised healthcare service in the 12-months after discharge

This figure is a bar chart and shows the proportion of people living with dementia who were aged care residents, community-dwellers or who transitioned to residential aged care in the 7-days after discharge from their first hospitalisation in 2017 and accessed Medicare-subsidised community-based healthcare services in the 12-months after discharge. Most people had one or more GP consultations (over 94%) and very few people had a geriatrician-referred management plan (less than 15%).

Show factors of interest:

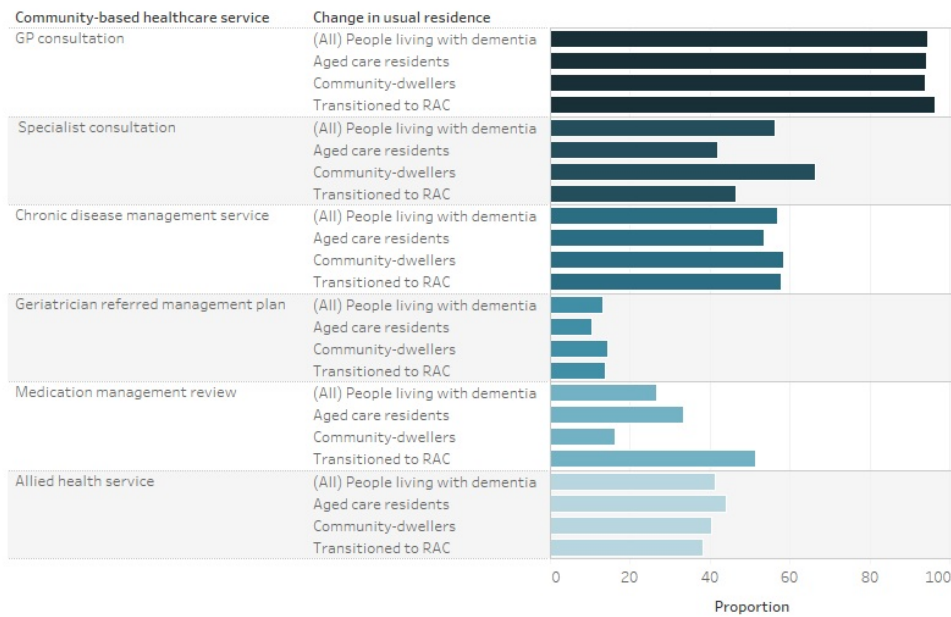
- Specialist consultation
- Allied health service
- Chronic disease management service
- Geriatrician referred management plan
- GP consultation
- Medication management review

Show usual residence:

- (All) People living with dementia
- Aged care residents
- Community-dwellers
- Transitioned to RAC

Selected factors of interest

- GP consultation
- Specialist consultation
- Chronic disease management service
- Geriatrician referred management plan
- Medication management review
- Allied health service



Note: Change in usual residence reflects transitions within 7-days of discharge from hospital.
 Source: AIHW NIHSI 2018-19, analysis of NIHSI.
<https://www.aihw.gov.au>

Note, this was limited to people living with dementia who survived for 12-months after discharge from their hospitalisation
 Source: AIHW NIHSI 2018-19, analysis of NIHSI.

References

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Value of these findings and future directions

Benefits of this study

This is the first study in Australia to use population-level linked data to examine transitions between hospital and residential aged care for people living with dementia and how this compared with people without dementia. As the data include all public hospitalisations and government-funded residential aged care admissions within most jurisdictions, results are representative of most Australians aged 65 or older who were hospitalised.

Using linked health, residential aged care and mortality data from multiple jurisdictions is a key strength of this study. It allowed for nearly seven years of clinical information to be used to identify whether people had a previous diagnosis of dementia, and almost 79,000 people living with dementia and almost 627,000 people without dementia aged 65 or older who were hospitalised in 2017 were identified. Using linked data also allowed for people's transitions in care or mortality in the 7-days, 3-months and 12-months after discharge from their first hospitalisation to be examined. For the first time, this allowed the key clinical characteristics and use of health services 12-months after first hospitalisation to be examined by use of residential aged care before and after hospitalisation and by dementia status.

Specific findings, such as the substantial increase in length of stay associated with individuals awaiting entry to aged care (including where individuals already in aged care are changing facilities) and decrease in length of stay for people who used respite care to transition to residential aged care indicate a need for further investigation into the sources of delay and how these transitions may be streamlined to reduce hospital stay length. This is especially pertinent for people living with dementia given they were much more likely to transition to aged care (or move to a new aged care facility) compared with people without dementia. It is also particularly important to ensure hospital stays for people living with dementia are only as long as clinically necessary because the hospital environment can exacerbate the behavioural and psychological symptoms of dementia (Dementia Australia 2019).

There may be opportunities for earlier identification of people in hospital who are more likely to require aged care, such as people who are hospitalised due to dementia and people hospitalised due to a fall, so that processes to improve access to residential aged care and reduce the length of stay associated with delays can be implemented.

Community-dwellers living with dementia had longer lengths of stay compared with people without dementia and were more likely to present to the emergency department and have subsequent hospitalisations in the 12-months after discharge compared with aged care residents. These findings point to a greater need for comprehensive community-based dementia support services to allow people to leave hospital sooner in a clinically safe manner, and to support them to live in the community.

While almost everyone living with dementia had one or more GP consultations in the 3-months and 12-months after discharge, uptake of chronic disease management services and medication management reviews that are provided by GPs (in coordination with other health professionals) was relatively low. These findings may indicate missed opportunities to improve the coordination of care for people living with dementia.

Limitations and future directions

Future work to expand the linked data to include additional states and territories, private hospitalisations, community-based aged care services, eligibility assessments for aged care, and dementia-specific support services would provide richer information on transitions of care for people living with dementia. Incorporating information on community-based aged care programs into the linked data, particularly programs like transition care that provide short-term restorative care after a hospitalisation, is essential to understanding the hospital and aged care interface. Incorporating data from dementia-specific behavioural support services would also allow for transitions of care for people experiencing behaviours and psychological symptoms of dementia (BPSD) who received support to be examined. People experiencing BPSD are of particular interest because they typically have complex care needs, often have longer hospital stays and are more likely to transition to live in residential aged care (AIHW 2023a).

Future work to expand the linked data to incorporate richer sociodemographic information is also needed. This would allow the hospital and aged care interface for priority population groups such as First Nations people and people from culturally and linguistically diverse background to be examined. These groups face unique challenges to accessing health and aged care services, such as language barriers, accessing culturally safe health and aged care services, and health literacy.

A previous AIHW report recommended incorporating supplementary codes for chronic conditions into the linked hospitals data (AIHW 2023b). This change will be implemented into later versions of NISHI and is likely to improve the identification of people living with dementia. It will be important for the current report to be updated, particularly as more contemporary hospitals and aged care data becomes available.

To develop and implement targeted strategies that improve transitions between hospital and residential aged care for people living with dementia, future research that can better understand the factors that influence these transitions is also needed. For aged care facilities, factors such as their facilities and resources, including availability of staff trained in dementia care, may determine whether they are able to accommodate people living with dementia. For people living with dementia these factors may include: the role of the person's carer and

living situation, their socioeconomic status, whether they live in regional or remote areas, whether available residential aged care facilities are acceptable to the person and their family or carer, their dementia type and stage, and the types of community-based health and personal care services they are receiving.

Outcomes from recommendations relating to improving the hospital and aged care interface provided by the Royal Commission Into Aged Care Quality and Safety (Royal Commission) is another area of future research. Recommendation 66 of the Royal Commission called for improved transitions between residential aged care and hospital, whereby staff of aged care services should provide paramedics with current information on residents' health status when an ambulance is called, and Australian State and Territory Governments should implement changes to hospital discharge protocols that improve the clinical handover to aged care services. Expansions to the My Aged Care portal from April 2023 now allow discharge planning staff at select hospitals to access a summary of people's My Aged Care portal. This allows them to view people's current aged care services and their latest aged care assessment and to upload hospital discharge summaries. Whether this initiative improves clinical handover from hospitals to aged care services should be examined as data become available. The impact of the COVID-19 pandemic on transitions between hospital and aged care, and whether the impact differed for people living with dementia compared with people without dementia, should also be examined as the data become available. Understanding the quality of transitions between hospital and aged care will require quantitative data at the service-level about the frequency of transitions alongside qualitative data about whether the communication provided in the care transition was sufficient to understand the person's needs.

References

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Australian Institute of Health and Welfare (2023b) [Supplementary codes for chronic conditions: evaluation report for population health monitoring](#), catalogue number PHC 11, AIHW, Australian Government.

Dementia Australia (2019). [Hospital Care for People Living with Dementia](#).

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Technical notes



Technical notes

The study focused on transitions of care before and after each person's first hospitalisation ending in 2017. This includes hospital admissions that commenced in 2017 (or earlier) that resulted in discharge or death in 2017. For people who had more than one hospitalisation ending in 2017, the first hospitalisation is the one that occurred earliest in the year. People who had been hospitalised prior to 2017 were eligible for the study.

The year 2017 was chosen because it was the latest year in the data which still allowed for 12-month outcomes to be examined.

In total, 705,000 people (including nearly 79,000 people living with dementia) were included in the study.

People were included in the study if they:

- were aged 65 or over in 2017
- had one or more hospitalisations in 2017
- lived in New South Wales, Victoria, Queensland, South Australia, Tasmania, or Australian Capital Territory from 1 January 2017 until 31 December 2018, or until death. These jurisdictions were selected as complete public hospitals data was available in the linked data. People were classified as living in these jurisdictions where all of their events in the linked data during this period were in these jurisdictions.
- had complete key information of interest, such as age and sex.

People's usual residence on the day of their admission to hospital and within 7-days, 3-months and 12-months of discharge was determined using the Residential Aged Care activity data (see Data Sources). Within each period of interest:

- People with a record in the National Death Index were categorised as having died.
 - People with a record in the Residential Aged Care Activity data were categorised as living in aged care.
 - People who did not have a death record and did not have any residential aged care activity were categorised as living in the community.
-

Technical notes

National Integrated Health Services Information Analysis Asset

The National Integrated Health Services Information (NIHSI) analysis asset 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. 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 NSW, Vic, Qld, SA, Tas and the ACT. The NIHSI includes various national Commonwealth government datasets, including the Pharmaceutical Benefits Scheme, Repatriation Pharmaceutical Benefits Scheme data, Medicare Benefits Schedule data, Residential Aged Care Services data, and the National Death Index data. The NIHSI version 1.0 analysed for this report contains data from 2010 until 2018-19.

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 first and last name(s); day, month and year of birth; and sex. The Medicare Consumer Directory and the National Death Index were first linked to create the AIHW linkage spine which was used to create the NIHSI.

Pharmaceutical Benefits Scheme

The Pharmaceutical Benefits Scheme (PBS) contains claims for Australian Government subsidised medicines. 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.

The version of the PBS included in NIHSI 2018-19 includes Repatriation Pharmaceutical Benefits Scheme data, covers all jurisdictions, and spans the period 2010-11 to 2018-19.

This analysis uses PBS data from June 2010 to December 2017 to identify people who were dispensed dementia-specific medication ([Table 1](#)).

Admitted Patient Care

The Admitted Patient Care (APC) is part of the National Hospital Morbidity Database. APC data contains episode-level records from admitted patient morbidity data collection systems in Australian hospitals. The version of the APC included in NIHSI 2018-19 includes public hospital data for 6 states/territories: NSW, Vic, Qld, SA, Tas and the ACT for the years 2010-11 to 2018-19, and select private hospital data for: Vic (2010-11 to 2016-17), Qld (2010-11 to 2018-19) and the ACT (2010-11 to 2018-19).

It is important to note that the version of the APC included in NIHSI 2018-19 does not include the supplementary codes for chronic conditions. Supplementary codes for chronic conditions provide information about chronic conditions where it may not be appropriate to include this information as an additional diagnosis. They were introduced into the APC data in 2015 and have been found to improve the identification of people living with dementia (AIHW 2023).

Diagnostic information in APC data can be recorded as a principal diagnosis or additional diagnosis. These are coded using the International Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification (ICD-10-AM).

This analysis uses APC data from June 2010 to December 2017 to identify people who were hospitalised with a principal or additional diagnosis of dementia ([Table 2](#)), and data from June 2016 to December 2018 to understand people's hospital use and the characteristics of their first hospitalisation.

National Non-Admitted Patient Emergency Department Care

The National Non-Admitted Patient Emergency Department Care Database (ED) is part of the National Hospital Morbidity Database. The ED data contains information on non-admitted emergency department activity in public hospitals and is available in NIHSI 2018-19 for all jurisdictions except WA and NT for the years 2010-11 to 2018-19, although diagnostic information is only available for 2013-14 to 2018-19.

Diagnostic information for emergency department presentations can be recorded in the principal or additional diagnosis. Diagnostic information in the ED data is not consistently recorded and is reported using several classification systems. The following were used from 2013-14 to 2018-19:

- Systematised Nomenclature of Medicine—Clinical Terms—Australian version, Emergency Department Reference Set (SNOMED CT-AU EDRS)
- International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM).
- ICD-10-AM.

This analysis uses ED data from June 2013 to December 2017 to identify people who were had an ED presentation with a principal or additional diagnosis of dementia ([Table 3](#)). Data from June 2016 to December 2018 is used to combine discrete hospital episodes into hospital stays and to understand people's hospital use during their first hospitalisation and 12-months afterwards.

Aged Care Funding Instrument

The Aged Care Funding Instrument (ACFI) is a resource allocation tool that was used in government-funded residential aged care facilities from March 2008 to September 2022 to assess the care needs of each resident and determine the funding of each facility. After admission to residential aged care, the ACFI was used to categorise residents core care needs in each funding domain and included two sections for previously diagnosed health conditions that most affect the person's care needs. Information on mental or behavioural conditions was used to identify whether people had dementia in this analysis ([Table 4](#)).

The version of the ACFI included in NIHSI 2018-19 includes data for all jurisdictions for the years 2010-11 to 2018-19. This analysis uses ACFI data from June 2010 to December 2017 to identify people had dementia listed as a mental or behavioural condition.

National Death Index

The NDI contains records of all deaths occurring in Australia since 1980. The underlying cause of death and all other associated causes of death are recorded. These are coded using the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10).

The version of the NDI in NIHSI 2018-19 contains data on fact of death for all jurisdictions from July 2010 to June 2019, and information on cause of death from July 2010 to late 2018 (with complete cause of death information from July 2010 to June 2017).

This analysis uses NDI data from 2017 to identify people who had dementia listed as an underlying or associated cause of death ([Table 5](#)) and NDI data from 2017 and 2018 to report whether people died after their hospitalisation.

Residential Aged Care activity

The Residential Aged Care activity data (RAC activity data) contains episode-level records from all government-subsidised residential aged care services, including permanent residential aged care and respite residential aged care. The version of the RAC activity data included in NIHSI 2018-19 includes data for all jurisdictions for the years 2010-11 to 2018-19. This analysis uses RAC activity data from 2016 to 2018 to understand whether people lived in residential aged care as a permanent resident or accessed residential respite care before and after their hospitalisation.

Medicare Benefits Scheme claims data

The Medicare Benefits Scheme claims data (MBS) contains MBS claims data for Medicare services subsidised by the Australian Government. The version of the MBS data included in NIHSI 2018-19 includes data for all jurisdictions for the years 2010-11 to 2018-19. This analysis uses MBS data from 2017 and 2018 to understand people's use of Medicare-subsidised healthcare services after their hospitalisation.

Demographic data

Information on a person's sex and age in years is based on information held in the MBS or PBS. Where date of birth or sex information is not available from the MBS or PBS data, it is obtained from the RAC, NDI or APC data.

People who did not have age or sex information in the linked data were excluded from analysis.

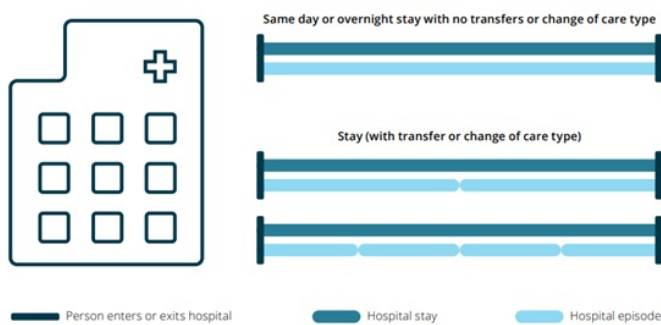
Technical notes

Creating hospital stays, and examining transitions between overnight hospitalisations and residential aged care

Hospital data are episodic in nature, meaning that, while from a person's perspective they may have had one hospital stay with some moves between hospitals or wards, from a data collection perspective the patient had several adjoining individual episodes of care with an admission date and discharge date for each. A hospital episode can be:

- a total hospital stay—from admission into hospital to discharge from hospital or death
- a portion of a hospital stay beginning and/or ending in a change of care type (for example, from acute care to rehabilitation). Episodes ending with a change in care type in the same hospital are reported as ending in a statistical discharge.
- a portion of a hospital stay beginning and/or ending in a transfer from/to another hospital (Figure 18).

Figure 18 Conceptual diagram of relationships between hospital episodes and hospital stays



Hospital episodes are useful for measuring activity in the system—and some of the information recorded on admission mode, care type or episode end status can give an indication as to whether the episode of care was, for example, transfer from another ward or hospital—but does not readily capture a full hospital stay.

Therefore, to capture a person's experience in hospital more accurately, this analysis used a set of rules to combine a person's individual hospital episodes into hospital stays. At the broad level, hospitalisations are defined here as the period from admission into the hospital system to discharge from it (or death in hospital). Individual hospital episodes were brought together to identify the start and end dates for periods in hospital; that is, distinct hospital stays. To quantify movement between hospital and residential aged care (RAC), these dates were then be compared against RAC dates to identify whether people lived in RAC before and/or after their hospital stay.

Emergency department (ED) data were used to combine hospital episodes for people who transferred between hospitals via the ED during their stay. ED presentations prior to admission were also reported, but any time spent in the ED prior to admission did not count toward the person's total length of hospital stay.

Defining transitions

A person can have a hospital stay that lasts for one or more days. This analysis defines a transition as a situation where a person physically moves from one place to another (e.g., from RAC to a hospital) and stays there for at least one night. Therefore, same-day hospital stays were excluded from the analysis. This definition of a transition is consistent from previous work in this area (Aaltonen et al. 2011; Sivananthan et al. 2016).

References

Aaltonen et al. 2011. The impact of dementia on care transitions during the last two years of life. *Age and Ageing* 41:52-57.

Sivananthan et al. 2016. Diagnosis and disruption: population-level analysis identifying points of care at which transitions are highest for people with dementia and factors that contribute to them. *Journal of the American Geriatrics Society* 64(3):569-577

Technical notes

Around 11% of all people included in the study were identified as living with dementia (almost 79,000 people) using dementia diagnosis information available in the linked data. People were identified as living with dementia if they had a record of one or more of the following:

- supplied a dementia-specific medication through the PBS between 1 July 2010 and 31 December 2017 ([Table 1](#))
- hospital admission between 1 July 2010 and 31 December 2017 with a principal or additional diagnosis of dementia ([Table 2](#))
- emergency department presentation between 1 July 2013 and 31 December 2017 with a principal or additional diagnosis of dementia ([Table 3](#))
- Aged Care Funding Instrument assessment between 1 July 2010 and 31 December 2017 with a medical diagnosis of dementia ([Table 4](#))
- died during 2017 and had dementia recorded as an underlying or associated cause of death ([Table 5](#)).

Over half of the study cohort (54%) had a record identifying them as having dementia in more than one data source. People who were identified as having dementia in only one data source were typically identified in the APC data (23%) or ACFI data (13%).

Table 1 Codes to identify Alzheimer's disease in PBS data

Drug name	ATC code
Donepezil	N06DA02
Rivastigmine	N06DA03
Galantamine	N06DA04
Memantine	N06DX01

Table 2 Codes to identify dementia in APC data

Dementia type	ICD-10-AM code
Alzheimer's disease	F00.0, F00.1, F00.2, F00.9, G30.0, G30.1, G30.8, G30.9
Vascular dementia	F01.0, F01.1, F01.2, F01.3, F01.8, F01.9
Fronto-temporal dementia	F02.0 and G31.0 ^(a)
Dementia in Creutzfeldt-Jakob disease	F02.1 and A81.0 ^(a)
Dementia in Huntington's disease	F02.2 and G10 ^(a)
Dementia in Parkinson's disease	F02.3 and G20 ^(a)
Dementia in human immunodeficiency virus (HIV) disease	F02.4 and B22 ^(a)
Lewy Body dementia	F02.8 and G31.3 ^(b)
Dementia in other diseases (remainder)	F02.8 and not G31.3
Dementia due to effect of substances	F10.7, F13.7, F18.7
Unspecified dementia	F03 <i>and not</i> F00.0, F00.1, F00.2, F00.9, G30.0, G30.1, G30.8, G30.9, F01.0, F01.1, F01.2, F01.3, F01.8, F01.9, F02.0, F02.1, F02.2, F02.3, F02.4, F02.8, F10.7, F13.7, F18.7

Delirium superimposed on dementia	F05.1 <i>and not</i> F00.0, F00.1, F00.2, F00.9, G30.0, G30.1, G30.8, G30.9, F01.0, F01.1, F01.2, F01.3, F01.8, F01.9, F02.0, F02.1, F02.2, F02.3, F02.4, F02.8, F03, F10.7, F13.7, F18.7
Other degenerative diseases of nervous system, not elsewhere classified ^(c)	G31 <i>and</i> F00.0, F00.1, F00.2, F00.9, G30.0, G30.1, G30.8, G30.9, F01.0, F01.1, F01.2, F01.3, F01.8, F01.9, F02.0, F02.1, F02.2, F02.3, F02.4, F02.8, F03, F05.1, F10.7, F13.7, F18.7

- Indicates that the dementia type is valid regardless of whether the hospitalisation also includes this code.
- Indicates that the dementia type is only valid when the hospitalisation also includes this code.
- AIHW were advised by the AIHW Dementia Expert Advisory Group to include hospitalisations with a principal diagnosis of G31 *Other degenerative diseases of nervous system, not elsewhere classified* and an additional diagnosis of dementia as a hospitalisation with a principal diagnosis of dementia. This was done previously for the AIHW Dementia in Australia 2012 report.

Table 3 Codes to identify dementia in ED data by classification system

Classification type	Dementia type	Code
SNOMED CT-AU EDRS	Unspecified dementia	52448006, 12348006, 15662003
	Dementia in Alzheimer's disease	26929004
	Delirium superimposed on dementia	191461002
ICD-9-CM	Senile dementia, uncomplicated	290.0
	Presenile dementia	290.1
	Presenile dementia, uncomplicated	290.10
	Presenile dementia, with delirium	290.11
	Presenile dementia, with delusion	290.12
	Presenile dementia, with depression	290.13
	Senile dementia with delusion or depression	290.2
	Senile dementia, with delusion	290.20
	Senile dementia, with depression	290.21
	Senile dementia with delirium	290.3
	Vascular dementia	290.4
	Vascular dementia, uncomplicated	290.40
	Vascular dementia, with delirium	290.41
	Vascular dementia, with delusion	290.42
	Vascular dementia, with depression	290.43
	Other specified senile psychotic conditions	290.8
	Unspecified senile psychotic condition	290.9
	Alcohol-induced persisting dementia	291.2
	Dementia in conditions classified elsewhere	294.1
	Dementia in conditions classified elsewhere, without behavioural disturbance	294.10

	Dementia in conditions classified elsewhere, with behavioural disturbance	294.11
	Dementia, unspecified	294.2
	Dementia, unspecified, without behavioural disturbance	294.20
	Dementia, unspecified, with behavioural disturbance	294.21
	Alzheimer's disease	331.0
ICD-10-AM	Dementia in Alzheimer's disease	F00.0, F00.1, F00.2, F00.9, G30.0, G30.1, G30.8, G30.9
	Vascular dementia	F01.0, F01.1, F01.2, F01.3, F01.8, F01.9
	Fronto-temporal dementia	F02.0 <i>and</i> G31.0 ^(a)
	Dementia in Creutzfeldt-Jakob disease	F02.1 <i>and</i> A81.0 ^(a)
	Dementia in Huntington's disease	F02.2 <i>and</i> G10 ^(a)
	Dementia in Parkinson's disease	F02.3 <i>and</i> G20 ^(a)
	Dementia in human immunodeficiency virus (HIV) disease	F02.4 <i>and</i> B22 ^(a)
	Lewy Body dementia	F02.8 <i>and</i> G31.3 ^(b)
	Dementia in other diseases (remainder)	F02.8 <i>and not</i> G31.3
	Dementia due to effect of substances	F10.7, F13.7, F18.7
	Unspecified dementia	F03 <i>and not</i> F00.0, F00.1, F00.2, F00.9, G30.0, G30.1, G30.8, G30.9, F01.0, F01.1, F01.2, F01.3, F01.8, F01.9, F02.0, F02.1, F02.2, F02.3, F02.4, F02.8, F10.7, F13.7, F18.7
	Delirium superimposed on dementia	F05.1 <i>and not</i> F00.0, F00.1, F00.2, F00.9, G30.0, G30.1, G30.8, G30.9, F01.0, F01.1, F01.2, F01.3, F01.8, F01.9, F02.0, F02.1, F02.2, F02.3, F02.4, F02.8, F03, F10.7, F13.7, F18.7

	Other degenerative diseases of nervous system, not elsewhere classified ^(c)	G31 (including G31.0, G31.1, G31.2, G31.3, G31.8, G31.81, G31.88, G31.9) and F00, F00.0, F00.1, F00.2, F00.9, G30, G30.0, G30.1, G30.8, G30.9, F01, F01.0, F01.1, F01.2, F01.3, F01.8, F01.9, F02, F02.0, F02.1, F02.2, F02.3, F02.4, F02.8, F03, F05.1, F10.7, F13.7 (including F13.70, F13.71, F13.79), F18.7, U79.1
	Any dementia	U79.1

- Indicates that the dementia type is valid regardless of whether the hospitalisation also includes this code.
- Indicates that the dementia type is only valid when the hospitalisation also includes this code.
- AIHW were advised by the AIHW Dementia Expert Advisory Group to include hospitalisations with a principal diagnosis of G31 *Other degenerative diseases of nervous system, not elsewhere classified* and an additional diagnosis of dementia as a hospitalisation with a principal diagnosis of dementia. This was done previously for the AIHW Dementia in Australia 2012 report.

Table 4 Codes to identify dementia in ACFI data

Dementia type	Description	ACFI code
Dementia in Alzheimer's disease	Includes Dementia in Alzheimer's disease: younger-onset, late-onset, atypical, mixed type and unspecified	0500
Vascular dementia	Includes Vascular dementia: acute onset, multi-infarct dementia, subcortical vascular dementia, mixed cortical and subcortical vascular dementia, other vascular dementia, and vascular dementia unspecified	0510
Dementia in other diseases	Includes dementia in: Pick's disease, Creutzfeldt-Jakob disease, Huntington's disease, Parkinson disease, HIV and other specified disease classified elsewhere	0520
Other dementia	Includes: Lewy body, Alcoholic dementia, and Unspecified dementia	0530

Table 5 Codes to identify dementia in NDI data

Dementia type	ICD-10 diagnosis codes: Underlying causes of deaths (UCODs)	ICD-10 diagnosis codes: Associated causes of deaths (ACODs)
Alzheimer's disease	G30.0, G30.1, G30.8, G30.9	F00.0, F00.1, F00.2, F00.9, G30.0, G30.1, G30.8, G30.9
Vascular dementia	F01.0, F01.1, F01.2, F01.3, F01.8, F01.9	F01.0, F01.1, F01.2, F01.3, F01.8, F01.9
Fronto-temporal dementia	G31.0	G31.0
Lewy body dementia	G31.8	G31.8
Dementia in Creutzfeldt-Jakob disease	N/A	UCOD of A81.0 and ACOD of F03 (Unspecified dementia)
Dementia in Huntington's disease	N/A	UCOD of G10 and ACOD of F03 (Unspecified dementia)
Dementia in Parkinson's disease	N/A	UCOD of G20 and ACOD of F03 (Unspecified dementia)
Dementia in human immunodeficiency virus (HIV) disease	N/A	UCOD of B20 and ACOD of F03 (Unspecified dementia)
Dementia due to effect of substances	F10.7, F13.7, F18.7	F10.7, F13.7, F18.7

Unspecified dementia	F03 and no other dementias as ACODs: G30.0, G30.1, G30.8, G30.9, G31.0, G31.8, F00, F01, F10.7, F13.7, F18.7, F05.1	F03 and no UCOD of: A81.0, G10, G20, B20 and no other dementias as a UCOD: G30.0, G30.1, G30.8, G30.9, G31.0, G31.8, F01, F10.7, F13.7, F18.7 and no other dementias as ACODs: G30.0, G30.1, G30.8, G30.9, G31.0, G31.8, F00, F01, F10.7, F13.7, F18.7, F05.1
Delirium superimposed on dementia	N/A	F05.1

Note: According to ICD-10 coding rules, the codes of F00 Dementia in Alzheimer's disease and F05.1 delirium superimposed on dementia cannot be assigned as an underlying cause of death but can be used to capture additional causes of death.



Technical notes

Variables not included here were reported using variables available in the APC data.

Place of death

Place of death is reported using information from the RAC dataset to determine whether the person lived in residential aged care at the time of their death, and information from the APC and ED datasets to determine whether the person attended the ED on the day of their death or was in hospital on the day of their death.

Urgency of admission

Urgency of admission to hospital relates to whether a hospitalisation can be delayed by 24 hours or not, in the opinion of the treating clinician (AIHW 2018). Emergency admissions should occur within 24 hours due to risk of serious illness or death, whereas elective admissions can be delayed by 24 hours or more. A very small number of people in the study had a hospitalisation with no urgency status assigned, typically meaning they had a change in care type or a planned readmission. For the purposes of this report, they have been reported together with people with an 'elective' urgency of admission.

Clinical complexity of care

Clinical complexity of care is recorded for each episode of care for each person and is estimated using the Australian Refined Diagnostic Related Group (AR-DRG). Episodes with major complexity tend to have higher healthcare costs compared with episodes of care with intermediate or minor complexity. For people that had more than one episode of care, the complexity of the most complex episode of care is reported.

Care type

Care type broadly reflects the nature of the clinical service that the person received during their care, and is here categorised as acute care, geriatric evaluation and management, maintenance care, palliative care, rehabilitation care, psychogeriatric care, mental health care, or other. Full descriptions of each care type are available (AIHW 2019). For people who had more than one episode of care and used more than one care type, each distinct type of care is reported.

Use of respite care after hospitalisation

For people who used RAC before and after their hospitalisation, information on (randomised) facility ID and respite care use in the RAC activity data was used to determine whether the person changed to a different RAC facility, and if so whether they used residential respite care to change to a different RAC facility.

For people who moved from living in the community to living in RAC after their hospitalisation, information on residential respite care use in the RAC activity data was used to determine whether the person entered residential aged care using respite residential aged care.

ED prior to admission

People who had an ED episode in the ED data that started before their first hospitalisation and ended on or after the first day of their first hospitalisation were characterised as using ED prior to their admission.

Length of stay

Length of stay is calculated as the difference in days between the admission date of the first episode of care and the separation date of the final episode of care.

Principal diagnosis

A person's principal diagnosis is the specific reason that they were hospitalised and is recorded using the ICD-10-AM 3-character diagnosis codes.

In this report the principal diagnosis of people's first episode of care is summarised into one of 22 broad categories of diseases or health problems which corresponds to the ICD-10-AM chapters (AIHW 2020, [Table 6](#)). These are reported alongside the most common principal diagnosis in each group.

Table 6 ICD-10-AM chapters and report classification

ICD-10-AM Chapter number	Chapter descriptor	3-character code	Report classification
1	Certain infectious and parasitic diseases	A00-B99	Infections
2	Neoplasms	C00-D49	Cancers

3	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	D50-D89	Blood-related diseases
4	Endocrine, nutritional and metabolic diseases	E00-E89	Diabetes and thyroid diseases
5	Mental and behavioural disorders	F00-F99	Mental and behavioural disorders
6	Diseases of the nervous system	G00-G99	Nervous system diseases
7	Diseases of the eye and adnexa	H00-H59	Eye diseases
8	Diseases of the ear and mastoid process	H60-H99	Ear diseases
9	Diseases of the circulatory system	I00-I99	Circulatory diseases
10	Diseases of the respiratory system	J00-J99	Respiratory diseases
11	Diseases of the digestive system	K00-K99	Digestive diseases
12	Diseases of the skin and subcutaneous tissue	L00-L99	Skin diseases
13	Diseases of the musculoskeletal system and connective tissue	M00-M99	Musculoskeletal diseases
14	Diseases of the genitourinary system	N00-N99	Genitourinary diseases
15	Pregnancy, childbirth and the puerperium	O00-O99	N.A.
16	Certain conditions originating in the perinatal period	P00-P99	N.A.
17	Congenital malformations, deformations and chromosomal abnormalities	Q00-Q99	Congenital abnormalities
18	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	R00-R99	Other symptoms and signs
19	Injury, poisoning and certain other consequences of external causes	S00-T98	Injury and poisoning
20	External causes of morbidity and mortality	U50-U73, U90, V00-Y98	N.A.
21	Factors influencing health status and contact with health services	Z00-Z99	Dialysis and other health services
22	Codes for special purposes	U04-U49, U78-U88	N.A.

Diagnoses of interest

Dementia as a principal or additional diagnosis during hospitalisation was reported where the person had any of the codes present in [Table 2](#) during their first hospitalisation.

Potentially preventable complications were selected from the Australian Commission on Safety and Quality in Health Care’s list of hospital-acquired complications (Australian Commission on Safety and Quality in Health Care 2022). Complications most relevant to people living with dementia were selected in consultation with the AIHW’s Dementia Expert Advisory Group, these included: delirium, in-hospital falls, pneumonia, pressure injuries and urinary tract infections.

People who were reported to be ‘eligible and awaiting entry to residential aged care’ during their hospitalisation were of interest because these people are at the interface between the hospital and aged care systems.

People who were hospitalised due to a fall that occurred outside of hospital were also of interest because people living with dementia are known to be at higher risk of falls and to be more likely to have a serious injury or to die after a fall compared with people without dementia.

Table 7 Codes to identify diagnoses of interest in APC data

Diagnosis of interest	ICD-10-AM code	Other required codes
Eligible and waiting for residential aged care	Principal or additional diagnosis of either of the following: Z75.1, Z75.41	
Delirium	Additional diagnosis of any of the following: F050, F051, F058, F059, R410	Condition onset flag indicates this condition occurred during the episode of admitted care
In-hospital falls resulting in fracture or other intracranial injury	Additional diagnosis of any of the following: S0600, S0601, S0602, S0603, S0604, S0605, S061, S0620, S0621, S0622, S0623, S0628, S0630, S0631, S0632, S0633, S0634, S0638, S064, S065, S066, S068, S069, S7200, S7201, S7202, S7203, S7204, S7205, S7208, S7210, S7211, S722, S020, S021, S022, S023, S024, S025, S0260, S0261, S0262, S0263, S0264, S0265, S0266, S0267, S0268, S0269, S027, S028, S029, S070, S071, S078, S079, S120, S121, S1221, S1222, S1223, S1224, S1225, S127, S128, S129, S197, S2200, S2201, S2202, S2203, S2204, S2205, S2206, S221, S222, S2231, S2232, S2240, S2241, S2242, S2243, S2244, S225, S228, S229, S280, S29.7, S3200, S3201, S3202, S3203, S3204, S3205, S321, S322, S323, S324, S325, S327, S3281, S3282, S3283, S3289, S397, S4200, S4201, S4202, S4203, S4209, S4210, S4211, S4212, S4213, S4214, S4219, S4220, S4221, S4222, S4223, S4224, S4229, S423, S4240, S4241, S4242, S4243, S4244, S4245, S4249, S427, S428, S429, S497, S5200, S5201, S5202, S5209, S5210, S5211, S5212, S5219, S5220, S5221, S5230, S5231, S524, S5250, S5251, S5252, S5253, S5259, S526, S527, S528, S529, S597, S620, S6210, S6211, S6212, S6213, S6214, S6215, S6216, S6217, S6219, S6220, S6221, S6222, S6223, S6224, S6230, S6231, S6232, S6233, S6234, S624, S6250, S6251, S6252, S6260, S6261, S6262, S6263, S627, S628, S697, S723, S7240, S7241, S7242, S7243, S7244, S727, S728, S729, S797, S820, S8211, S8218, S8221, S8228, S8231, S8238, S8240, S8241, S8242, S8249, S825, S826, S827, S8281, S8282, S8288, S829, S897, S920, S921, S9220, S9221, S9222, S9223, S9228, S923, S924, S925, S927, S929, S997	Condition onset flag indicates this condition occurred during the episode of admitted care, and an external cause code of: W01x, W03, W04, W05, W061, W062, W063, W064, W066, W068, W069, W07x, W08x, W10x, W130, W131, W132, W135, W138, W139, W18x, W19

Hospitalisations due to a fall outside of hospital		External cause code: W00-W19 Condition onset flag indicates this condition did not occur during the episode of admitted care
Pneumonia	Additional diagnosis of any of the following: J100, J110, J120, J121, J122, J123, J128, J129, J13, J14, J150, J151, J152, J153, J154, J155, J156, J157, J158, J159, J160, J168, J170, J171, J172, J173, J178, J180, J181, J182, J188, J189, J22	Condition onset flag indicates this condition occurred during the episode of admitted care
Pressure injury	Additional diagnosis of any of the following: L8920, L8921, L8922, L8923, L8924, L8925, L8926, L8927, L8928, L8929, L8930, L8931, L8932, L8933, L8934, L8935, L8936, L8937, L8938, L8939, L8990, L8991, L8992, L8993, L8994, L8995, L8996, L8997, L8998, L8999, L8940, L8941, L8942, L8943, L8944, L8945, L8946, L8947, L8948, L8949, L8950, L8951, L8952, L8953, L8954, L8955, L8956, L8957, L8958, L8959	Condition onset flag indicates this condition occurred during the episode of admitted care
Urinary tract infection	Additional diagnosis of any of the following: N390, N300, O862, T835	Condition onset flag indicates this condition occurred during the episode of admitted care

Medicare-subsidised services

MBS group code, MBS item number or Registered specialty codes in the MBS data were used to determine people's use of Medicare-subsidised services in the 3-months and 12-months after discharge from their first hospitalisation.

Table 8 Codes to report use of Medicare Benefits Scheme services

	MBS group code, MBS item number or Registered specialty codes
GP consultation^(a)	<i>Group:</i> A/101, M/102, B/103
Specialist consultation^(b)	<i>Registered specialty code:</i> 0002, 0082, 0004, 0084, 0005, 0026, 0085, 0009, 0089, 0016, 0096, 0017, 0049, 0097, 0804, 0031, 0032, 0411, 0038, 0052, 0401, 0054, 0406, 0056, 0099, 0409, 0001, 0008, 0014, 0042, 0043, 0081, 0088, 0094
Allied health service	<i>Group:</i> M03, M06, M07, M09, M11, M15
Medication management review	<i>MBS Item:</i> 900, 903
Chronic disease plan	<i>Group:</i> A15
Geriatrician referred plan	<i>MBS Item:</i> 141, 142, 143, 144, 145, 146, 147

a. MBS item numbers for attendances in a residential care facility are also included in broad type of service group A/101 or B/103,

b. includes general medicine, cardiology, haematology, neurology, geriatric medicine, medical oncology (including radiation oncology and gynaecological oncology), general surgery, urology, dermatology, ophthalmology, psychiatry and other specialties.

Technical notes

Linear regression models

Linear regression models, fit with a gamma distribution, were used to examine predictors of length of first overnight hospitalisation ending in 2017 (first hospitalisation) for people with and without dementia, focusing on the role of potentially preventable complications of interest to the dementia cohort.

Regressions were performed separately depending on people's use of residential aged care before and after their first hospitalisation:

- continued to live in the community (community-dwellers),
- moved from the community to live in residential aged care (transitioned to residential aged care),
- continued to live in residential aged care (aged care residents).

The outcome of our regression model was a continuous variable: length of hospital stay (days)

The predictors of the regression model were all categorical variables:

- dementia status (people living with or without dementia),
- age (65-74, 75-84, 85+)
- sex (male or female)
- delirium (reported during hospitalisation or not)
- in-hospital fall (reported during hospitalisation or not)
- pneumonia (reported during hospitalisation or not)
- pressure injury (reported during hospitalisation or not)
- urinary tract infection (UTI, reported during hospitalisation or not)

For people who transitioned to residential aged care, the model also included:

- Eligible and awaiting entry to residential aged care (reported during hospitalisation or not)
- Use of respite residential aged care after discharge (used within 7-days of discharge or not)

For aged care residents, the model also included:

- Whether the person moved to a different aged care facility after discharge (or returned to their previous facility)
- Note: a sensitivity analysis was conducted and removing aged care residents who were accessing respite care in a residential aged care facility prior to their hospitalisation (rather than as a permanent resident) had no effect on the results.

Interactions between dementia status and each predictor were also tested. Where significant these tests show that the impact of having this predictor on length of stay is different for people living with dementia compared with people without dementia.

Estimating additional bed-days in hospital attributable to each predictor

The estimated number of additional days spent in hospital (bed-days) for people with potentially preventable factors was calculated separately for people living with dementia and people without dementia. Using predictors included in the linear regression models, the estimated number of additional bed-days was calculated by:

1. Using the adjusted effect associated with predictors of interest to estimate the adjusted additional length of stay for those exposed to a risk factor comparing to those unexposed to the risk factor.
2. Multiplying the estimated additional length of stay by the number of people exposed to the risk factor of interest to estimate the total additional bed-days attributable to this risk factor.

References

Australian Commission on Safety and Quality in Health Care (2022) Hospital-acquired complications specifications V3.1 - April 2022 (12th edition). <https://www.safetyandquality.gov.au/publications-and-resources/resource-library/hospital-acquired-complications-hacs-list-specifications-version-31-12th-edn>

Australian Institute of Health and Welfare (2018) [Episode of admitted patient care-admission urgency status](#), code N, METEOR identifier: 686084, viewed 19 Jan 2023.

Australian Institute of Health and Welfare (2019) [Hospital service-care type](#), code N[N], METEOR identifier: 711010, viewed 06 Jan 2023.

Australian Institute of Health and Welfare (2023a) Supplementary codes for chronic conditions: evaluation report for population health monitoring, catalogue number PHC 11, AIHW, Australian Government.

Australian Institute of Health and Welfare (2023b) [Admitted patient care 2021-22: Why did people receive care?](#) viewed 12 July 2023, AIHW, Australian Government.



Glossary

Key term	Definition
Additional diagnosis	The diagnosis of a condition or recording of a complaint that requires provision of care. In this report, additional diagnoses are from episodes of admitted patient care (hospitalisation) and either coexists with the principal diagnosis or arises during the episode of care. Multiple diagnoses may be recorded.
Admission	An admission to hospital. The term hospitalisation is used to describe an episode of hospital care that starts with the formal admission process and ends with the formal separation process.
Acute care	Care provided to patients admitted to hospital that is intended to cure illness, alleviate symptoms of illness or manage childbirth.
Allied health	A range of services provided by university qualified health practitioners with specialised expertise in preventing, diagnosing and treating a range of conditions and illnesses. The practitioners have autonomy of practice, a defined scope of practice, a regulatory mechanism and a national organisation with clearly defined entrance criteria. Examples include psychologists, optometrists and physiotherapists. The current report includes Medicare -subsidised allied health services.
Alzheimer's disease	A degenerative brain disease caused by nerve cell death resulting in shrinkage of the brain. A common form of dementia.
Anatomical Therapeutic Chemical (ATC) classification	Anatomical Therapeutic Chemical (ATC) codes are used to classify medicines. The ATC classification of medicines is recommended by the World Health Organization, and is the Australian standard for presenting and comparing drug usage data. The ATC classification groups medicines according to the body organ or system on which they act, and their therapeutic and chemical characteristics. More information on the ATC classification system can be found at structure and principles .
Associated cause(s) of death	A cause(s) listed on the medical certificate of cause of death, other than the underlying cause of death. They include the immediate cause, any intervening causes, and conditions that contributed to the death but were not related to the disease or condition causing death. See also cause(s) of death .
Australian Refined Diagnosis Related Groups (AR-DRGs)	An Australian system of diagnosis related groups (DRGs). DRGs provide a clinically meaningful way of relating the number and type of patients treated in a hospital (that is, its casemix) to the resources required by the hospital. Each AR-DRG represents a class of patients with similar clinical conditions requiring similar hospital services.
Average length of stay	The average number of bed days for admitted patient episodes (referred to as hospitalisations in this report). Patients who have an admission and a separation on the same date are allocated a length of stay of 1 day.
Behaviours and psychological symptoms of dementia (BPSD)	Refer to a range of non-cognitive symptoms common among people with dementia. These include - agitation, anxiety, apathy, depression, hallucinations or delusions, insomnia, risky behaviour, resistive behaviour, verbal aggression and wandering.
Bed days	The total number of days for patients who were admitted for an episode of care and who separated during a specified reference period. A patient who is admitted and separated on the same day is allocated one bed day.
Carer	Carer refers to people who provide any informal assistance (help or supervision) to people with disability or older people. People who provide formal assistance (on a regular paid basis, usually associated with an organisation) are not considered to be a carer for the purpose of this report.

Care type	<p>The care type defines the overall nature of a clinical service provided to an admitted patient during an episode of care (admitted care), or the type of service provided by the hospital for boarders or posthumous organ procurement (care other than admitted care).</p> <p>Admitted patient care consists of the following categories: acute care, rehabilitation care, palliative care, geriatric evaluation and management, psychogeriatric care, maintenance care, newborn care, mental health care and other admitted patient care - where the principal clinical intent does not meet the criteria for any of the other care types.</p> <p>Care other than admitted care includes: posthumous organ procurement and hospital boarder.</p>
Cause(s) of death	All diseases, morbid conditions or injuries that either resulted in or contributed to death - and the circumstances of the accident or violence that produced any such injuries - that are entered on the medical certificate of cause of death. Causes of death are commonly reported by the underlying cause of death or associated cause(s) of death .
Cholinesterase inhibitor	A class of anti-dementia medication that prevents the breakdown of acetylcholine, an important component in cognitive pathways in the brain. Levels of acetylcholine decrease in people with Alzheimer disease and some other dementias. By increasing the availability of acetylcholine in the brain these medications are thought to improve or stabilise cognitive function in people with dementia. Examples of these medications include Donepezil , Galantamine and Rivastigamine .
Community-based aged care	Support services that assist older people to continue to live independently at home. This may include healthcare and nursing services, home modifications and assistance with daily activities. Due to data limitations this report does not report on any community-based aged care services.
Community-based health care	Also known as primary health care . These are services delivered in many community settings, such as general practices, community health centres, Aboriginal health services and allied health practices (for example, physiotherapy, dietetic and chiropractic practices) and come under numerous funding arrangements. This report includes use of specific community-based healthcare services that were subsidised through Medicare .
Comorbidities/ co-existing health conditions	Defined in relation to an index disease/condition, a comorbidity or co-existing health condition includes any additional disease that is experienced by a person while they have the index disease (in this instance, dementia).
Culturally and linguistically diverse (CALD)	There are a number of ways to define culturally and linguistically diverse people. Generally, people who were born overseas, have a parent born overseas and/or who speak a variety of languages are considered to be in the CALD population. In this report, information on people with dementia from CALD backgrounds is presented for available measures (i.e. people who were born in non-English speaking countries) rather than as a group (i.e. people from CALD backgrounds).
Data linkage/linked data	Bringing together (linking) information from two or more data sources believed to relate to the same entity, such as the same individual or the same institution. The resulting data set is called linked data. This report uses NIHSI data, which brings together information from hospitals, aged care, Medicare, prescription medication and mortality datasets
Dementia	A term used to describe a group of similar conditions characterised by the gradual impairment of brain function. It is commonly associated with memory loss, but can affect speech, cognition (thought), behaviour and mobility. An individual's personality may also change, and health and functional ability decline as the condition progresses. Dementia is a fatal condition.
Dementia-specific medications	Prescription medications specifically used to treat the symptoms of dementia. There are 4 dementia-specific medications - Donepezil , Galantamine , Rivastigmine and Memantine - currently subsidised under the Pharmaceutical Benefits Scheme and Repatriation Pharmaceutical Benefits Scheme. These medications can be prescribed to patients with a confirmed diagnosis of Alzheimer's disease made by (or in consultation with) a specialist or consultant physician under specific clinical criteria. In order to continue treatment, patients must demonstrate a clinically meaningful response to the treatment. This may include improvements in the patients' quality of life, cognitive function and/ or behavioural symptoms.
Discharge	See separation .

Donepezil	A dementia-specific medication approved in Australia for the treatment of mild to moderate Alzheimer's disease . It is an acetylcholinesterase inhibitor and works by blocking the actions of the enzyme acetylcholinesterase, which destroys acetylcholine - a major neurotransmitter for memory. The use of this medicine may lead to increased communication between nerve cells and slow dementia progression
Episode of care	The period of admitted patient care between a formal or statistical admission and a formal or statistical separation, characterised by only one care type (see care type and separation).
First hospitalisation	This report includes hospital admissions that resulted in discharge or death in 2017. For people who had more than one hospitalisation ending in 2017, the first hospitalisation is the one that occurred earliest in the year.
First Nations people	A person of Aboriginal and/or Torres Strait Islander descent who identifies as an Aboriginal and/or Torres Strait Islander.
Frontotemporal dementia	A type of dementia caused by progressive damage to the frontal and/or temporal lobes of the brain. Frontotemporal dementia is more commonly seen in people with younger onset dementia .
Galantamine	A dementia-specific medication approved in Australia for the treatment of mild to moderate Alzheimer's disease . It is an acetylcholinesterase inhibitor and works by blocking the actions of the enzyme acetylcholinesterase, which destroys acetylcholine - a major neurotransmitter for memory. The use of this medicine may lead to increased communication between nerve cells and slow dementia progression.
Hospitalisation	A person-centred approach to hospitalisation data that is used in linked data analysis. Adjoining hospital episodes of care are combined into a single hospitalisation. The hospitalisation represents a person's time in hospital, regardless of any changes to care type or hospital facility.
Impairment	Any loss or abnormality of psychological, physiological or anatomical structure or function.
International Classification of Diseases (ICD) and Related Health Problems	The World Health Organization's internationally accepted classification of death and disease. The Tenth Revision (ICD-10) is currently in use. The ICD-10-AM is the Australian Modification of the ICD-10; it is used for diagnoses and procedures recorded for patients admitted to hospitals.
Lewy body dementia/ dementia with Lewy bodies	A type of dementia caused by the degeneration and death of nerve cells in the brain due to the presence of abnormal spherical structures, called Lewy bodies, which develop inside nerve cells.
Mean/average	The expected value of a particular variable if you were to select an observation at random from a population. Calculated by adding together the values of a variable across the total population and dividing the result by the number of observations in the population.
Median	The midpoint of a list of observations that have been ranked from the smallest to the largest.
Medicare	A national, government-funded scheme that subsidises the cost of personal medical services for all Australians and aims to help them afford medical care. The Medicare Benefits Schedule (MBS) is the listing of the Medicare services subsidised by the Australian Government. The schedule is part of the wider Medicare Benefits Scheme (Medicare).
Mixed dementia	Multiple types of dementia affecting the same person. Mixed dementia is common in the population. The most common combination is Alzheimer's disease and vascular dementia.
Memantine	A dementia-specific medication approved in Australia for the treatment of moderately severe to severe Alzheimer's disease. It works by blocking the neurotransmitter glutamate, which causes damage to brain cells and is present in high levels in people with Alzheimer's disease.
Modifiable risk factors	Risk factors that can be modified or reduced (such as tobacco smoking).
Mortality	Number or proportion of people who died during a given time period. This report includes mortality during people's first hospitalisation or within 7-days of discharge, within 3-months of discharge or within 12-months of discharge.

N-methyl-D-aspartate (NMDA) receptor antagonist	A type of anti-dementia medication that blocks the functioning of NMDA receptors and reduces the levels of glutamate in the brain, thereby preventing the movement of excess calcium in the brain. Increased levels of glutamate in the brain may contribute to the symptoms and progression of Alzheimer disease and other dementias. NMDA receptor antagonists are thought to improve or stabilise cognitive function in people with Alzheimer disease, with improvements seen in the function of daily activities, thinking and behaviour. Memantine is an example of an NMDA receptor antagonist.
National Hospital Morbidity Database (NHMD)	A compilation of episode-level records from admitted patient morbidity data collection systems in Australian hospitals. The data supplied are based on the National minimum data set (NMDS) for Admitted patient care and include the Admitted Patient Care and The National Non-Admitted Patient Emergency Department Care Databases.
National Integrated Health Services Information (NIHSI)	The 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. The NIHSI is the only enduring linked data asset that includes linked hospital data. For more information refer to the <i>Technical note</i> .
Non-Indigenous	People who have not indicated that they are of Aboriginal or Torres Strait Islander descent.
Non-modifiable risk factors	Risk factors that cannot be modified or reduced (such as aging or genetics).
Palliative care	Care in which the clinical intent or treatment goal is primarily quality of life for a patient with an active, progressive disease with little or no prospect of cure.
Patient days	Total patient days is the total number of days for all patients who were admitted for an episode of care and who separated during a specified reference period. A patient who is admitted and separated on the same day is allocated 1 patient day.
Patient-centred care	An approach to health care which places the patient at the centre of the care model, with an emphasis on collaboration between the patient and health-care providers when making decisions about their health and treatment approaches.
Pharmaceutical Benefits Scheme (PBS)	A scheme through which the Australian Government subsidises the cost of a wide range of prescription medicines. Most prescriptions for General Schedule medicines (Section 85) are dispensed through community pharmacies, but the PBS is also available through eligible public hospitals to patients on discharge, and day patients. Several drugs are also distributed under alternative arrangements where these are considered more appropriate (Section 100).
Prescription	An authorisation issued by a medical profession for a patient to be issued a particular medication. For dementia-specific medications , typically a prescription (script) authorises a person to receive one month's supply of medication.
primary health care	See community-based health care .
Principal diagnosis	The principal diagnosis is the diagnosis considered to be chiefly responsible for occasioning an episode of patient care (hospitalisation).
procedure	A clinical intervention that is surgical in nature, carries a procedural risk, carries an anaesthetic risk, and requires specialist training and/or special facilities or equipment available only in the acute-care setting.
Rate	One number (numerator) divided by another number (denominator). The numerator is commonly the number of events in a specified time. The denominator is the population 'at risk' of the event. Rates (crude, age-specific and age-standardised) are generally multiplied by a number such as 100,000 to create whole numbers. In some instances, for example with prescription volumes or expenditure amounts in magnitude, a multiplier of 100 is used to aid comprehension.
Remoteness	Remoteness is classified according to the Australian Statistical Geography Standard 2016 Remoteness Areas structure, usually based on location of current residence. Data on the location of usual residence may be collected differently across data sources. ABS correspondences are used to assign data from one type of geographic region to another, for example, Statistical Area Level 2 (SA2) to Remoteness Areas.

Repatriation Pharmaceutical Benefits Scheme (RPBS)	A scheme through which the Australian Government subsidises the cost of a wide range of prescription medicines for veteran (DVA) health care card holders. Like the Pharmaceutical Benefits Scheme (PBS) most prescriptions for General Schedule medicines (Section 85) are dispensed through community pharmacies, but the PBS is also available through eligible public hospitals to patients on discharge, and day patients. Several drugs are also distributed under alternative arrangements where these are considered more appropriate (Section 100).
Residential aged care	A program that provides personal and/or nursing care to people in a residential aged care facility. As part of the service, people are also provided with meals and accommodation, including cleaning services, furniture and equipment.
Respite care	An alternative care arrangement for dependent people living in the community, giving people - or their carers - a short break from their usual care arrangements. Friends, family or the community may also provide informal respite. This report includes respite care where it is offered through a residential aged care facility.
Respiratory condition	A condition affecting the airways and characterised by symptoms such as wheezing, shortness of breath, chest tightness and cough. Conditions include asthma and chronic obstructive pulmonary disease (COPD) - which includes emphysema and chronic bronchitis.
Risk factor	Any factor that represents a greater risk of a health condition or health event. This report explored risk factors that may increase length of stay in hospital.
Rivastigmine	A dementia-specific medication approved in Australia for the treatment of mild to moderate Alzheimer's disease . It is an acetylcholinesterase inhibitor and works by blocking the actions of the enzyme acetylcholinesterase, which destroys acetylcholine - a major neurotransmitter for memory. The use of this medicine may lead to increased communication between nerve cells and slow dementia progression.
Separation	A separation is the formal process where a hospital records the completion of an episode of treatment and/or care for an admitted patient - in this report, described by the term hospitalisation .
Statistical discharge	A statistical discharge is a mode of separation assigned to patients for whom the intent of care changed during their stay in hospital (for example, from acute care to palliative care).
Underlying cause of death	The disease or injury that initiated the train of events leading directly to death, or the circumstances of the accident or violence that produced the fatal injury. See also cause(s) of death and associated cause(s) of death .
Vascular dementia	A form of dementia mainly caused by haemodynamic (blood flow to the brain) disorders (e.g. strokes), thromboembolism (small blood clots that block small blood vessels in the brain), small blood vessel disease in the brain and bleeding into or around the brain.



Data





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