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Title:
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Date:
2025-09

Citation:
Temple, J., Grossman, I., Wilson, T., Cavuoto, M., Adair, T., Williams, R. & Anstey, K. J. (2025). Estimating and projecting the population living with dementia at the local area scale in Australia. Journal of Population Research, 42 (3), https://doi.org/10.1007/s12546-025-09389-8.

Persistent Link:
https://hdl.handle.net/11343/357137

Journal of Population Research (2025) 42:37
https://doi.org/10.1007/s12546-025-09389-8

ORIGINAL RESEARCH

# Estimating and projecting the population living with dementia at the local area scale in Australia

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Accepted: 1 July 2025


## Abstract

As Australia's population ages, the number of people living with dementia will grow considerably. Understanding local changes in the number of people living with dementia will facilitate suitable planning, costing, and service delivery for health and aged care services. To inform this task, this study presents estimates and projections from 2021 to 2036 of Australians living with dementia at the state and territory level, and at the finer regional SA3 level. Estimates and projections were prepared for 3 scenarios: where dementia prevalence rates by age, sex, and SA3 area (1) remain fixed (Constant Prevalence), (2) decrease exponentially by 1% per year (Decreasing Prevalence), or (3) increase exponentially by 1% per year (Increasing Prevalence). Regardless of the dementia prevalence scenario, there is projected to be strong growth of the number of people living with dementia between 2021 and 36 due to large growth in the older population. Even in the best-case, Decreasing Prevalence scenario, the number of persons living with dementia is projected to increase from 388,441 in 2021 to approximately 554,000 by 2036—a 42.8% rise. This increase is regionally heterogeneous, albeit correlated with numerical ageing. In all scenarios, by 2036, many SA3 areas will have fewer than 20 working-age persons for each person living with dementia, presenting challenges for the provision of dementia care. These results highlight the need for urgent local level policy and planning decisions to support dementia prevention, diagnosis, and prepare healthcare systems to support the care and quality of life of persons living with dementia.

**Keywords** Population projections · Dementia · Local area · SA3 scale

Extended author information available on the last page of the article

Published online: 24 July 2025

## Introduction

Recent projections indicate significant numerical and structural ageing of the Australian population at the national and sub national level (Wilson and Temple, 2022). From 2021 to 2041, the number of Australians aged 65 + and 85 + years is expected to increase by 54% and 140%, respectively (Wilson and Temple, 2022). The growth and ageing of the population will be accompanied by growth in the number of people living with dementia. In 2021 it was estimated that between 386,200 and 472,000 people in Australia were living with one or more forms of dementia, which include Alzheimer's disease, vascular dementia, dementia with Lewy bodies, and frontotemporal dementia (Australian Institute of Health and Welfare, 2021).

Quantifying the future population of people living with dementia is a difficult task, given considerable data limitations. Indeed, less than 40% of OECD countries had national prevalence rates of dementia (Royal Commission into Aged Care Quality and Safety, 2019). Unfortunately, Australia also does not have national dementia prevalence rates; Australian Institute of Health and Welfare (AIHW) estimates rely on international dementia prevalence data, alongside early onset dementia rate estimates informed by a study of early onset dementia in Eastern Sydney (Australian Institute of Health and Welfare, 2024a).The AIHW has acknowledged that dementia prevalence data "remain elusive," and Australia lacks a national dementia monitoring system, making small-area prevalence estimates particularly challenging (Australian Institute of Health and Welfare, 2024a). In contrast, Australia has a well-established demographic data system, with reliable population estimates and projections at national and sub-national levels which are routinely used to support policy and planning (Australian Bureau of Statistics, 2023, 2024a, b). Given the uncertainties in dementia prevalence data, this study takes an alternative approach, leveraging demographic models based on well-documented migration, fertility, and mortality trends to provide a more reliable projection of the future population living with dementia.

Reliable dementia prevalence data at a smaller area level has been largely unavailable. Consequently, most Australian studies of population projections of dementia have been at a national level (Australian Institute of Health and Welfare, 2023). However, it is important to ascertain accurate population prevalence rates at a finer level of disaggregation such as sub-geographical areas to adequately plan for future workforce and service provision needs (Australian Bureau of Statistics, 2021b). Although small area estimates of dementia in Australia are limited, existing studies highlight the important role of spatial characteristics and geography in explaining dementia prevalence. For example, Haque et al. (2023) calculated the distribution and comparison of dementia prevalence across Australian cities and rural-urban areas, and the association between geographic remoteness and dementia, using microdata from the Survey of Disability, Ageing, and Carers (SDAC) conducted by the ABS in 2015 and 2018. They found significant regional disparity in frequency and an overall upward trend in dementia diagnosis. Specifically, reported dementia prevalence was higher in major cities than in outer regional and remote areas. The authors suggested that the higher number of persons living with dementia in major cities likely reflects the higher absolute number of older persons living there. When they adjusted for age and sex, the higher dementia prevalence in major cities remained in the 2018 data but

not in the 2015 data. The authors suggested that other factors may influence higher dementia prevalence in major cities, such as higher diagnosis rates or environmental risk factors increasing actual prevalence, relative to living in outer regional and rural locations (Haque et al., 2023). Australian studies examining dementia risk within local areas at the Statistical Area Level 1 (SA1) level have found higher likelihood of dementia diagnosis or estimated dementia risk in areas with higher air pollution, lower public open space, higher social fragmentation (Bagheri et al., 2021); and higher cumulative burden of dementia risk factors in those living in areas of lower socio-economic status; longer distances to parkland; and higher crime rates (Cavuoto et al., 2024; Pase et al., 2022). Some work on sub-state dementia prevalence has also been completed by the Australian Government, however their estimates of dementia prevalence are calculated by applying national age and sex specific prevalence rates onto the sub-state estimated resident populations (Australian Institute of Health and Welfare, 2023). Geographically detailed dementia prevalence estimates and projections are scarce, limiting the ability of the government and aged care services sector to provide adequate care to persons living with dementia.

In this study, we utilise Australian Government sub-state estimated resident populations, national dementia prevalence estimates, alongside new Census data and a detailed sub national population projections model, to estimate and project the number of people living with dementia to 2036. Our aim is to model the important role of spatially heterogenous numerical ageing as a driver of the futures of the number of people living with dementia according to national and local areas across Australia to allow better planning for future needs.

## Data and methods

### Dementia prevalence estimates

The prevalence of dementia in 2021 by SA3 area, age and sex had to be estimated because no directly collected reliable data currently exists. There are 359 SA3 areas, and they typically have between 30,000 and 130,000 persons (Australian Bureau of Statistics, 2021d). The Australian Bureau of Statistics publishes the Australian Statistical Geography Standard (ASGS), which organises Australia's geography from the smallest Mesh Blocks through to the national level. Within this main structure, SA3 areas are sub-state units formed by grouping smaller regions with similar socio-economic or geographic characteristics. These characteristics make SA3s well-suited for local-level analysis, policy planning, and resource allocation. For our detailed spatial analysis, we use these SA3 regions, we also aggregated these data to provide analyses at both the Greater Capital City Statistical Area (GCCSA) and state/territory levels. We used national estimates of dementia in Australia for 2021 published by the Australian Institute of Health and Welfare (2023) with local area variations estimated on the basis of the 2021 Census data. The data used are for all forms of dementia. Among these, Alzheimer's disease is the most common subtype, followed by vascular dementia (Department of Health, State Government of Victoria, 2024). It should be noted that the available data on persons living with dementia and their specific

subtypes are imperfect. For example, mortality records indicate that, where dementia is recorded as a cause of death, there were 5,600 deaths attributed to Alzheimer's disease, 1,900 to vascular dementia, and 9,600 to unspecified dementia (Australian Institute of Health and Welfare, 2024c).

For the first time in 2021, the census collected information on long-term health conditions, asking "Has the person been told by a doctor or nurse that they have any of these long-term health conditions?" with one of the tick box options being "Dementia (including Alzheimer's)" (Australian Bureau of Statistics, 2021c). Dementia prevalence rates calculated from census data are much lower than those published by AIHW (Australian Institute of Health and Welfare, 2023), which is a common limitation of self-reported data (McGrath et al., 2021). Given this limitation in the census data, SA3 area dementia prevalence rates for 2021 by sex and five-year age group were estimated by scaling national AIHW prevalence rates using ratios of SA3 to national prevalence rates calculated from the census data. Because of small numbers reporting dementia at younger and middle adult ages, we based the scaling on the oldest ages only. AIHW rates were therefore multiplied by the ratio of SA3 census-based rates averaged over ages 75–79, 80–84, and 85+years to national census-based prevalence rates averaged over the same age groups. Thus:

$$dem^{i}_{s,a} = dem^{Aus,AIHW}_{s,a} \frac{dem^{i,census}_{s,75+}}{dem^{Aus,census}_{s,75+}} \quad (1)$$

where.

$dem$ is the dementia prevalence rate

$i$ refers to any SA3 area

$s$ is sex

$a$ is age group.

$Aus$ is Australia.

This approach generated smooth 2021 dementia prevalence rate age profiles at the SA3 scale, with noisy local patterns removed through the use of scaled national AIHW rate age schedules. For a few SA3 areas, where the total number of persons living with dementia reported in the 2021 Census was under 50, the rates were unreliable, and we borrowed national prevalence rates instead. However, it is important to note that while we have created plausible rates of dementia prevalence by SA3 area, they remain *estimates* and are unavoidably approximate. They are based on several assumptions, including that (i) national AIHW rates are reliable; (ii) all SA3 areas experience the same increase in dementia prevalence with increasing age as recorded at the national scale; and (iii) the 2021 Census-based rates give a reliable indication of local to national prevalence ratios.

## Projection methods

Projections of the number of people living with dementia were produced in two stages. First, population projections by age and sex were calculated for each SA3

area, and second, projected dementia prevalence rates were applied to those population numbers.

Population projections for SA3 areas from 2021 to 2036 were prepared using the synthetic migration cohort-component model, a new local area projection model (Wilson, 2022). The advantage of the model is its low data input requirements whilst retaining the key features of a directional (inwards and outwards) migration cohort-component model. The model outputs population projections by sex and five-year age group up to age 85 + years in five-year intervals. Recent application of the model to local authority populations in Australia and the UK has produced good quality population projections (Rees and Wilson, 2023; Wilson and Grossman, 2022).

For any SA3 area, the projected population five years ahead was calculated from the cohort population accounting equation:

$$\begin{aligned} P^{i}_{s,a+5}\left(t+5\right) = & P^{i}_{s,a}\left(t\right) - D^{i}_{s,a\rightarrow \mathrm{a+5}}\left(t,t+5\right) \\ & - O^{i}_{s,a\rightarrow \mathrm{a+5}}\left(t,t+5\right) + I^{i}_{s,a\rightarrow \mathrm{a+5}}\left(t,t+5\right) \end{aligned} \tag{2}$$

where.

$P$ represents population
$i$ an SA3 area
$s$ sex
$a$ age group
$t$ a point in time
$D$ deaths
$O$ outward migration
$I$ inward migration.

To keep the model as simple as possible, no distinction was made between internal and international migration. Both internal and international inflows of population were combined into inward migration; similarly, both internal and international outflows were combined into outward migration.

Deaths and outward migration were calculated as the product of occurrence/exposure rates and populations-at-risk. To simplify the modelling process and avoid the need for a 'rest of the world' origin region for inward migration, inward migration was projected directly as flows. Once initial SA3 area age-sex projections were calculated, they were constrained through the iterative proportional fitting of births, deaths, and migration flows to two sets of independent constraints: (i) national population projections by age and sex; and (ii) SA3 area total population projections. This ensures that the local area projections are consistent with any national projections while also taking into account locally-specific growth trajectories due to new housing developments or employment growth. Total population constraining was achieved by proportionally adjusting inward and outward migration for each area so that age-sex projections sum to the required total population.

Births were projected in the standard way for a cohort-component model. First, age-specific fertility rates were multiplied by female populations to obtain the projected number of births by age group of mother:

$$B_a^i\,(t,t+5)\;=\;b_a^i\,(t,t+5)\;\;\frac{5}{2}\left[P_{f,a}^i\,(t)+\;P_{f,a}^i\,(t+5)\right] \tag{3}$$

where.

$B$ refers to births

$b$ the fertility rate

$f$ the female population.

Projected births were then summed over female childbearing age groups (15–19 to 45–49 years) and divided into male and female babies. These newly-born infants are projected to age 0–4 years at time t+5 using Eq. 2 above but with births replacing the start-of-interval population at time t.

The projection equations were then repeated for each five-year interval of the projection horizon. The projected population of one interval becomes the starting population of the next interval.

Projections of dementia were then calculated as the product of SA3 area age-sex population projections and projected age-, sex-, and area-specific dementia prevalence rates:

$$DEM_{s,a}^i\,(t+5)\;=\;dem_{s,a}^i(t+5)\;\;P_{s,a}^i\,(t+5) \tag{4}$$

Where.

$DEM_{s,a}^i\,(t+5)$ is the projected number of people living with dementia in SA3 area *i* for sex *s* and age group *a* at time *t* + *5*;

$dem_{s,a}^i\,(t+5)$ is the projected dementia prevalence rate for SA3 area *i* for sex *s* and age group *a* at time *t* + *5*;

$P_{s,a}^i\,(t+5)$ is the projected population in SA3 area *i* for sex *s* and age group *a* at time *t* + *5*.

This equation multiplies the age-, sex-, and area-specific dementia prevalence rate by the corresponding projected population, giving us estimates of the number of people living with dementia over the projection period.

### Input data and projection assumptions

The SA3 area population projections were constrained to a national population projection with a long-run Total Fertility Rate of 1.60, just below recent rates, life expectancy at birth continuing long-run increases, and long-run Net Overseas Migration set at 225,000 per annum. These projections involve very minor updates to those published recently by the ARC Centre of Excellence in Population Ageing Research (Wilson and Temple, 2022).

Total population constraints for SA3 areas were based on anticipated residential development by making use of the projected geographical distribution of population from recent State and Territory Government population projections. A characteristic of the synthetic migration model is that all SA3 area fertility, mortality, and migration assumptions are indirectly estimated, without the need for additional input data. For local area population projections, the future of migration is the most important

demographic process shaping population size and age structure. Inward and outward migration age profiles were indirectly estimated for the 2016-21 intercensal period, and migration assumptions in the projections were formulated indirectly through the independent total population constraints for each area.

Three scenarios of future dementia prevalence were created, the **Constant Prevalence** scenario assumes that prevalence rates by age, sex and SA3 area remain fixed over time. This is a conservative assumption which reflects the limited time series and mixed data quality on dementia in Australia. However, some international studies have suggested a decline in dementia prevalence, although with considerable variations by country and generally wide confidence intervals around measures of prevalence decline (Farina et al., 2022; Harrison et al., 2020; Morovatdar et al., 2022; Roehr et al., 2018; Wu et al., 2017). We therefore include a **Decreasing Prevalence** scenario in which prevalence rates decline exponentially by 1% per year. In addition, we created an **Increasing Prevalence** scenario in which prevalence rates increase exponentially by 1% per year.

International studies have shown that dementia prevalence trends vary. For example, Harrison et al. (2019) reported that among 348,311 older Australians accessing long-term care, the age- and sex-standardised prevalence declined from 50.0% in 2008 to 46.6% in 2014 (an annual exponential decline of about 1.2%), while among 188,846 persons accessing home care, prevalence declined from 25.9% in 2005 to 20.9% in 2014 (roughly a 2.4% annual exponential decrease). Chen et al. (2023) found that in England and Wales the age- and sex-standardised dementia incidence declined from 10.7 per 1000 person-years in 2002 to 8.6 per 1000 person-years in 2010 (an annual exponential decrease of about 2.7%) and then increased to 11.3 per 1000 person-years between 2010 and 2019 (an annual exponential increase of roughly 3.1%), giving an overall annualised exponential change of about 0.32% from 2002 to 2019. Ohara et al. (2017) tracked the age-standardised prevalence of dementia in a Japanese community from 1985 to 2012 and found an increase from 6.8% in 1985 to 11.3% in 2012 (an average annual exponential increase of about 1.9%). However, the annual exponential changes between adjacent surveys varied, with rates ranging from a decline of about 5.4% (1985 to 1992) to an increase of about 6.8% (1998 to 2005); these figures are based on a single community with a small sample size. Given that studies focusing on high-risk groups or smaller populations report larger annual changes over shorter time periods, while broader population trends are generally more stable over the long term, we opted for a conservative annual adjustment of 1% for both the Decreasing and Increasing Prevalence scenarios. Importantly, regardless of the prevalence pathway, our results show that demographic factors—especially population ageing and cohort flow—are the dominant drivers of the projected growth in the number of people living with dementia.

### Projections of the number of persons living with dementia to the size of the service population

Persons with dementia often require support from professional carers and health providers, who are generally within the working age population (15–64 years age group). We define persons in this age group as the service population. This age group

is considered to comprise the bulk of the working age population, who are the primary providers of professional care and services. We considered the projected ratio of the number of persons living with dementia to the projected service population (the D-S ratio) in SA3 areas under the three scenarios (Decreasing Prevalence, Constant Prevalence, and Increasing Prevalence). We also analysed how the projected SA3 level dementia and population statistics vary when SA3s are aggregated to their GCCSAs(Australian Bureau of Statistics, 2021a) to investigate potential regional differences in dementia care needs and available service populations.

## Future populations living with dementia

### Overview of national estimates and projections

Figure 1 shows the projected number of Australians living with dementia by each of the prevalence scenarios (constant, increasing, decreasing). The number of people of all ages living with dementia in Australia is projected to rise from 388,000 in 2021 to 643,000 by 2036 according to the Constant scenario, an increase of 255,000 (or growth of 65.6%). This is a substantial projected increase over a relatively short period, even taking into account overall projected population growth of 21.8%. The share of the population living with dementia will increase due to population ageing and the age profile of prevalence rates. An increase in the proportion of the population in the older age groups, where prevalence rates are highest, will result in a greater share of the total population living with dementia. In the Increasing Prevalence scenario, the population living with dementia increases to 747,000 by 2036 (growth of 92.5%), while the Decreasing Prevalence scenario shows more modest growth to 554,000 (growth of 42.8%). This shows that regardless of the prevalence scenario applied, the number of people living with dementia in Australia is projected to increase between 2021 and 2036.

To set a finer focus on state and territory areas, Table 1 shows the projected growth in Australians living with dementia for the period 2021 to 2036, applying a constant prevalence scenario. It demonstrates an increase in all states and territories with the greatest percentage change occurring in the Northern Territory (100.9%) and Western Australia (85.3%). However, the largest numerical change occurs in New South Wales (71,892), Queensland (61,115) and Victoria, respectively (58,071).

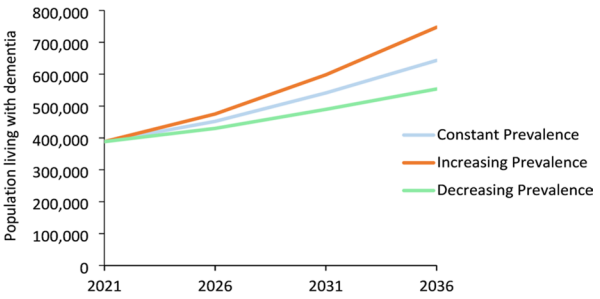


**Fig. 1** Projected growth in the population of all ages living with dementia in Australia by prevalence scenario, 2021-36. Source: Authors' calculations

**Table 1** Projected growth in the population of all ages living with dementia by state and territory, constant prevalence scenario, 2021-36

| State/Territory | 2021 | 2026 | 2031 | 2036 | % change | Change |
|---|---|---|---|---|---|---|
| NSW | 127,069 | 144,700 | 170,019 | 198,871 | 56.5 | 71,802 |
| Vic | 94,852 | 108,871 | 129,202 | 152,923 | 61.2 | 58,071 |
| Qld | 76,830 | 92,617 | 113,966 | 137,945 | 79.5 | 61,115 |
| SA | 35,538 | 40,475 | 47,593 | 55,621 | 56.5 | 20,083 |
| WA | 37,902 | 46,103 | 57,215 | 70,219 | 85.3 | 32,317 |
| Tas | 8,882 | 10,257 | 12,090 | 14,056 | 58.3 | 5,174 |
| NT | 1,838 | 2,346 | 2,981 | 3,693 | 100.9 | 1,855 |
| ACT | 5,462 | 6,505 | 7,973 | 9,633 | 76.4 | 4,172 |
| OT | 69 | 92 | 122 | 157 | 126.8 | 88 |
| Australia | 388,441 | 451,968 | 541,161 | 643,119 | 65.6 | 254,678 |

Source: Authors' calculations

When focusing on the finer SA3 area regions, based on applying a constant prevalence scenario to SA3 Estimated Resident Populations, the projected increase in the numbers of people living with dementia, 2021-36 (Fig. 2) is prominent in remote SA3 areas in Western Australia, the Northern Territory, and Tasmania, these areas are often geographically large which may present particular challenges in the provision of dementia care. All capital cities demonstrate significant projected growth, which can be expected due to the concentration of population living there.

Projected increase in the numbers of people living with dementia by SA3 area in selected capital city regions, is shown in Fig. 3. This includes the period between 2021 and 2036 with the application of a constant prevalence scenario. The selected capital cities are Sydney, South East Queensland, and Melbourne, which show an increase of at least 98.3% occurring in the outer suburbs. This possibly reflects the fact that younger people predominantly live in the inner-city areas to enable a closer work and/or study commute, compared with older people more likely to be retired.

Figure 4 shows the relationship between growth in the population aged 65 + years and the population living with dementia by SA3 area 2021-36 (constant prevalence scenario). The prevalence of dementia rises rapidly with increasing age. Among the population aged 65 + years, the number of people living with dementia is projected to increase by 69.7% between 2021 and 2036 (from 360,000 to 612,000).

## Projected distributions of the ratios of persons living with dementia to service populations

A higher D-S ratio suggest that the pool of service-aged adults is smaller for each person living with dementia. Investigating these projected D-S ratios supports the identification of regions which may experience shortages of service-aged workers able to provide care and support. Figure 5 presents histograms of the D-S ratios across scenarios and years. These histograms are shown for Decreasing Prevalence, Constant Prevalence, and Increasing Prevalence scenarios for the years 2021, 2026, 2031, and 2036. The data for 2021 is the same across all scenarios as it serves as the jump off year. In 2021, most SA3s had D-S ratios of less than 0.03, meaning that for every 1000 individuals in the service population, there were 30 persons living with

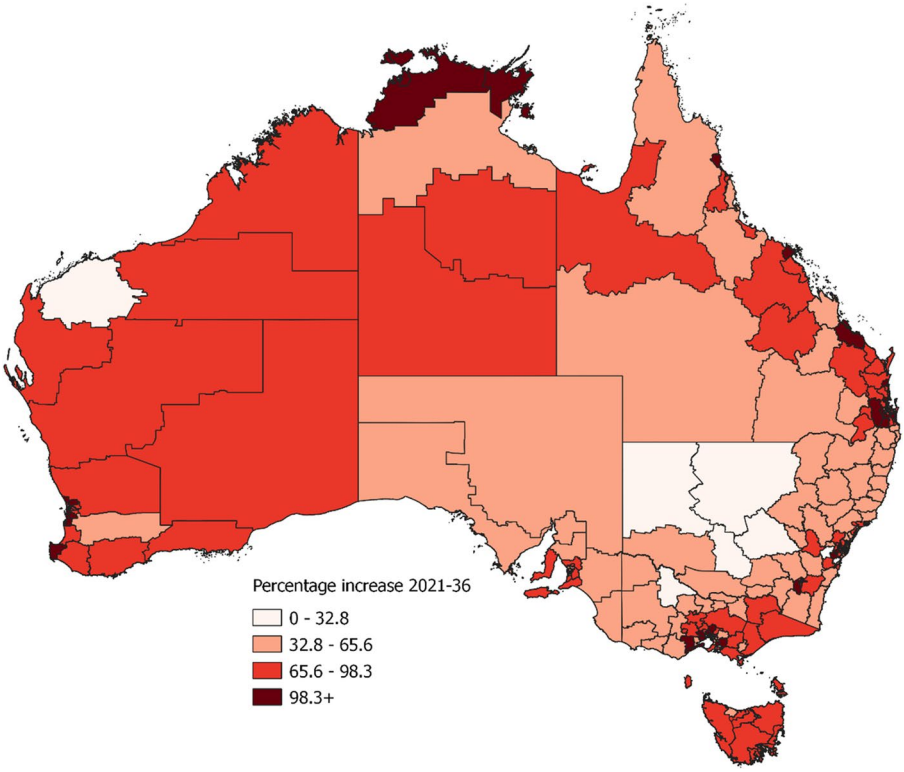


**Fig. 2** Projected increase in the numbers of people of all ages living with dementia by SA3 area, 2021-36 (constant prevalence scenario).
Source: Authors' calculations

dementia or less. In 2021, the mean D-S, ratio across SA3 areas, was 0.024, with a range from 0.003 in West Pilbara, Western Australia (65 persons living with dementia and a service population of 22,408), to 0.082 in Great Lakes, NSW (1,389 persons living with dementia and a service population of 17,025). D-S ratios greater than 0.05 were outliers in 2021, only four SA3 areas had a service population of 20 or fewer for each person living with dementia. By 2036 this outlier D-S ratio is common: in the Decreasing Prevalence scenario 22 of the 334 SA3s were projected to have D-S ratios > 0.05, whilst in the Increasing Prevalence scenario 100 of the 334 SA3 areas were projected to have such ratios.

To identify the GCCSAs which may be most affected by these increases, we aggregated population and dementia statistics to the GCCSA areas for 2021, the jump off year (Table 2). A summary of projected population and dementia statistics by GCCSA region for 2036 is provided in Table 3 whilst Table 4 presents the change in population and dementia statistics from 2021 to 2036. Even under the Constant Prevalence scenario, the mean projected D-S ratio of South Australian SA3 areas in 2036 is 0.055, indicating fewer than 20 service-aged personnel for each person living with dementia. In percentage terms Greater Darwin has substantial increases in the number of persons living with dementia, even in the Decreasing Prevalence

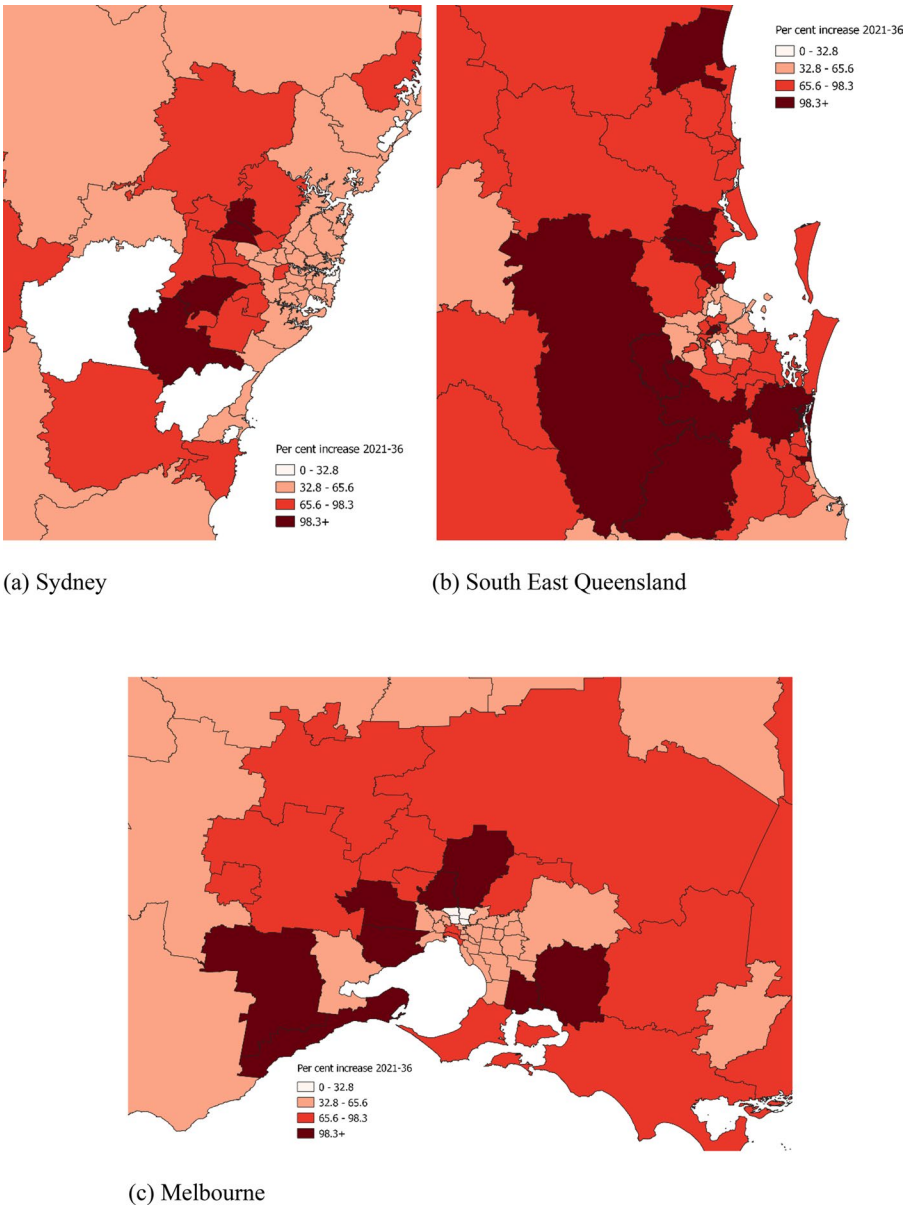


**Fig. 3** Projected increase in the numbers of people of all ages living with dementia by SA3 area in selected capital city regions, 2021-36 (constant prevalence scenario).
Source: Authors' calculations

scenario, the number of persons living with dementia increases from 1261 to 2305, an 83% increase which presents many challenges for the local health care systems. The results also indicate that care requirements may be high in areas outside of capital cities, particularly in NSW, QLD, and SA.

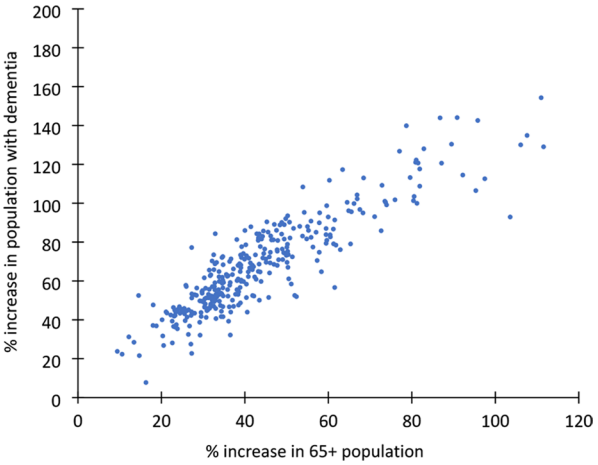


**Fig. 4** Relationship between growth in the population aged 65 + years and the population living with dementia by SA3 area 2021-36 (constant prevalence scenario).
Source: Authors' calculations

## Discussion

This study shows that there is substantial regional heterogeneity in projected population ageing, dementia prevalence, and in the size of the service population from which professional care and medical staff may be drawn from 2021 to 2036. We have presented three scenarios of future dementia prevalence: Decreasing Prevalence, Constant Prevalence and Increasing Prevalence. Our findings indicate that, even in a Decreasing Prevalence scenario, the number of people living with dementia will increase significantly in Australia and across its regions. This increase in prevalence is accompanied by substantial regional variation in the number of serviced aged workers for each person living with dementia.

### The number of persons living with dementia will increase regardless of prevalence scenario

It is unknown how the prevalence of dementia will change into the future. There is literature to support a decrease in dementia prevalence. For example, Morovatdar et al. (2022) used the Global Burden of Disease Study 2017 to estimate the global age-standardised prevalence rate of dementia and found that between 1990 and 2017 it decreased by 4% globally, 5% in OECD countries and 18% in Canada. Our Decreasing Prevalence scenario, compounded over a similar 27-year period, would represent a 24% decrease in dementia prevalence. However, even in the Decreasing Prevalence scenario, where the age-specific prevalence rates are declining, the absolute number of persons living with dementia increases from 388,000 persons in 2021 to 554,000 persons in 2036. This increase is driven by the rapid ageing of the population, which enlarges the pool of individuals at risk, and is accompanied by an increase in the number of SA3 areas with D-S ratios > 0.05 increases from 4 to 22. Similarly, Morovatdar et al. (2022) found that even with decreases in the age-standardised dementia prevalence, between 1990 and 2017, the number of persons living with dementia increased by: 119% globally, 93% in OECD countries and 90% in Canada. Despite their recent decline in dementia prevalence, the Canadian Centre for Economic Analysis (2022)

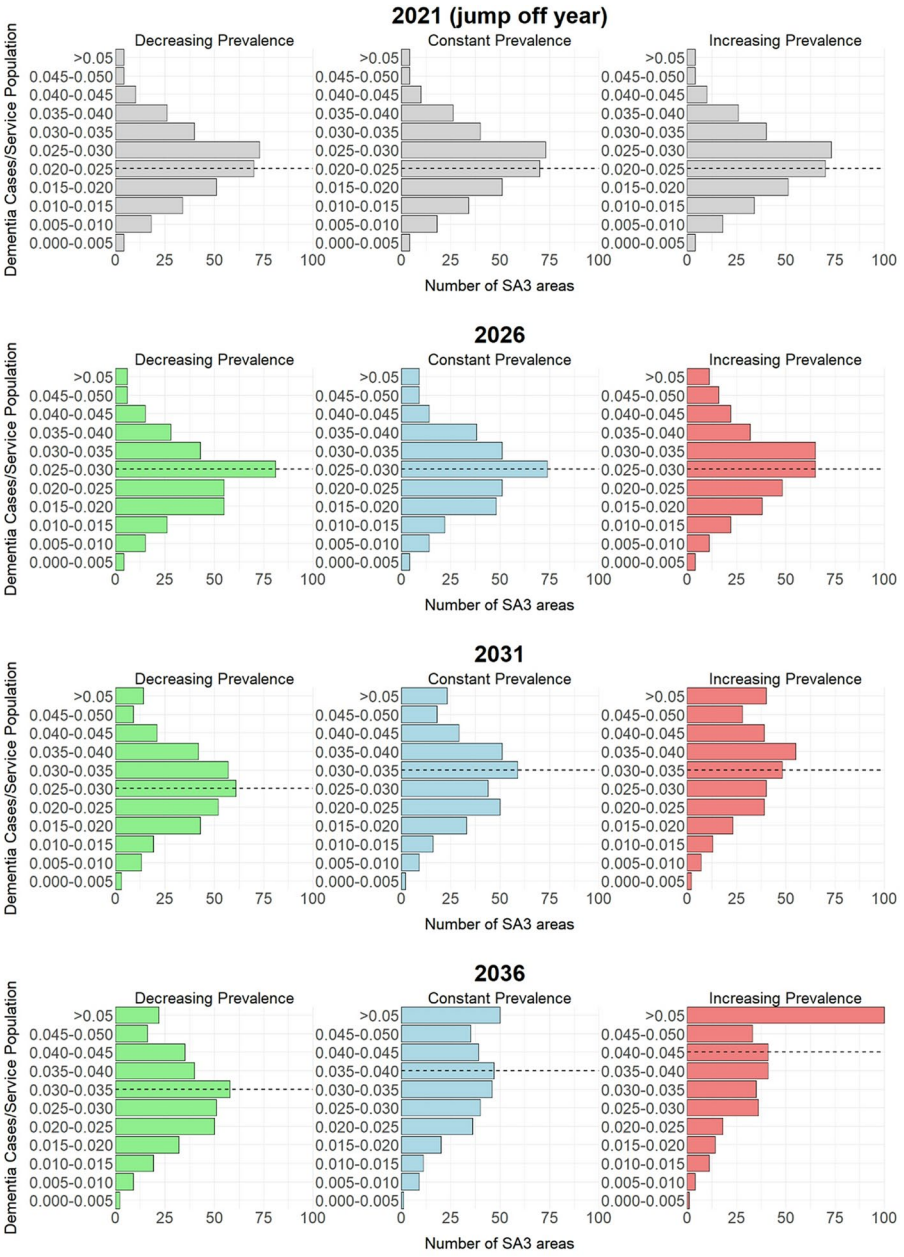


**Fig. 5** Histograms of the ratios of persons of all ages living with dementia to the service population across scenarios and years. Notes. The dashed line represents the mean persons living with dementia to service population ratio. It is centred within the relevant bin rather than at the exact location.
Source: Authors' calculations

**Table 2** Summary of population and dementia statistics by GCCSA region for 2021

| Year | GCCSA NAME | no. SA3s | total pop. | pop. <15 | service pop. | pop. 65+ | dementia pop. | mean ratio | ratios>0.05 |
|---|---|---|---|---|---|---|---|---|---|
| 2021 | ACT | 10 | 452,508 | 83,504 | 308,608 | 60,396 | 5462 | 0.018 | 0 |
| 2021 | Greater Adelaide | 19 | 1,401,872 | 243,016 | 903,365 | 255,491 | 27,572 | 0.032 | 1 |
| 2021 | Greater Brisbane | 39 | 2,567,714 | 497,126 | 1,700,142 | 370,446 | 33,864 | 0.022 | 1 |
| 2021 | Greater Darwin | 4 | 147,971 | 29,907 | 103,576 | 14,488 | 1261 | 0.012 | 0 |
| 2021 | Greater Hobart | 6 | 250,717 | 42,726 | 162,001 | 45,990 | 4199 | 0.024 | 0 |
| 2021 | Greater Melbourne | 40 | 4,975,319 | 911,578 | 3,333,528 | 730,213 | 69,477 | 0.023 | 0 |
| 2021 | Greater Perth | 21 | 2,191,838 | 419,547 | 1,434,447 | 337,844 | 30,617 | 0.021 | 0 |
| 2021 | Greater Sydney | 46 | 5,261,801 | 977,136 | 3,503,529 | 781,136 | 73,421 | 0.021 | 0 |
| 2021 | Other Territories | 1 | 4850 | 840 | 3091 | 919 | 69 | 0.022 | 0 |
| 2021 | Rest of NSW | 43 | 2,835,261 | 516,553 | 1,706,171 | 612,537 | 53,648 | 0.032 | 1 |
| 2021 | Rest of NT | 5 | 100,180 | 22,802 | 70,306 | 7072 | 577 | 0.007 | 0 |
| 2021 | Rest of Qld | 43 | 2,648,100 | 491,911 | 1,662,119 | 494,070 | 42,966 | 0.026 | 0 |
| 2021 | Rest of SA | 9 | 400,729 | 68,273 | 235,509 | 96,947 | 7966 | 0.034 | 1 |
| 2021 | Rest of Tas. | 9 | 316,522 | 53,045 | 193,484 | 69,993 | 4683 | 0.023 | 0 |
| 2021 | Rest of Vic. | 26 | 1,572,503 | 280,628 | 949,274 | 342,601 | 25,375 | 0.027 | 0 |
| 2021 | Rest of WA | 13 | 557,527 | 110,290 | 353,161 | 94,076 | 7285 | 0.019 | 0 |

*Notes.* Dementia and population statistics at the SA3 level have been aggregated to their respective Greater Capital City Statistical Areas (GCCSA). No. SA3s - the number of Statistical Area Level 3 (SA3) regions within each GCCSA. Total pop. - the combined population of all ages and sexes within each GCCSA. Pop. <15 - the total number of residents under 15 years of age. Service pop. - the total number of residents aged 15 to 64 years within each GCCSA. Pop. 65+ - the total number of residents aged 65 years and over within each GCCSA. Dementia pop. - the estimated total number of persons of all ages living with dementia within each GCCSA. Mean ratio - the average ratio of persons living with dementia to the service population (aged 15–64) across the SA3 regions, within each GCCSA. Ratios>0.05 - the number of SA3 regions within each GCCSA where the ratio of persons living with dementia to the service population is greater than 0.05

projected heterogenous growth in the number of persons living with dementia to the year 2050; faster ageing provinces such as Alberta were projected to have an over 270% increase in the number of persons living with dementia, whilst other provinces were projected to have growth of no less than 70%. However, there is no certainty that the Decreasing scenario will prevail. For example, Chen et al. (2023) found that whilst the age and sex standardised incidence of dementia decreased in England and Wales between 2002 and 2010 (from 10.7 to 8.6 per 1000 person years), there was an increase from 8.6 to 11.3 per 1000 person-years from 2010 to 2019, with the authors suggesting that increases in rates of obesity and type 2 diabetes amongst several potential contributing factors. Whilst it is hoped that novel therapies and technologies may support the treatment and care of dementia, the projections presented in this article are for 2036. Expecting structural changes in the medical and healthcare systems in that time frame to meet the increase in dementia care demands may be too

**Table 3** Projected population and dementia statistics by GCCSA region for 2036

| Scenario | GCCSA NAME | no. SA3s | total pop. | pop. <15 | service pop. | pop. 65+ | dementia pop. | mean ratio | ratios > 0.05 |
|---|---|---|---|---|---|---|---|---|---|
| Decreasing | ACT | 10 | 577,570 | 95,469 | 392,216 | 89,884 | 8292 | 0.024 | 0 |
| Decreasing | Greater Adelaide | 19 | 1,591,646 | 253,013 | 991,125 | 347,508 | 36,708 | 0.039 | 2 |
| Decreasing | Greater Brisbane | 39 | 3,272,465 | 583,425 | 2,118,842 | 570,197 | 51,996 | 0.029 | 3 |
| Decreasing | Greater Darwin | 4 | 178,990 | 33,647 | 122,181 | 23,162 | 2305 | 0.018 | 0 |
| Decreasing | Greater Hobart | 6 | 280,020 | 44,340 | 176,132 | 59,548 | 5552 | 0.031 | 0 |
| Decreasing | Greater Melbourne | 40 | 6,286,149 | 1,067,040 | 4,183,787 | 1,035,322 | 94,868 | 0.026 | 2 |
| Decreasing | Greater Perth | 21 | 2,810,235 | 492,512 | 1,777,570 | 540,153 | 48,605 | 0.029 | 0 |
| Decreasing | Greater Sydney | 46 | 6,344,014 | 1,082,134 | 4,158,817 | 1,103,064 | 100,190 | 0.026 | 1 |
| Decreasing | Other Territories | 1 | 6576 | 1073 | 3877 | 1627 | 135 | 0.035 | 0 |
| Decreasing | Rest of NSW | 43 | 3,259,372 | 558,852 | 1,889,470 | 811,050 | 70,980 | 0.039 | 6 |
| Decreasing | Rest of NT | 5 | 104,558 | 21,496 | 72,464 | 10,597 | 873 | 0.011 | 0 |
| Decreasing | Rest of Qld | 43 | 3,235,566 | 539,748 | 1,946,487 | 749,331 | 66,735 | 0.034 | 3 |
| Decreasing | Rest of SA | 9 | 439,705 | 68,025 | 238,900 | 132,779 | 11,166 | 0.047 | 4 |
| Decreasing | Rest of Tas. | 9 | 329,826 | 49,988 | 187,278 | 92,560 | 6546 | 0.035 | 1 |
| Decreasing | Rest of Vic. | 26 | 1,913,318 | 316,917 | 1,103,241 | 493,161 | 36,754 | 0.034 | 0 |
| Decreasing | Rest of WA | 13 | 650,648 | 114,389 | 388,259 | 148,001 | 11,833 | 0.028 | 0 |
| Constant | ACT | 10 | 577,570 | 95,469 | 392,216 | 89,884 | 9633 | 0.028 | 1 |
| Constant | Greater Adelaide | 19 | 1,591,646 | 253,013 | 991,125 | 347,508 | 42,648 | 0.045 | 4 |
| Constant | Greater Brisbane | 39 | 3,272,465 | 583,425 | 2,118,842 | 570,197 | 60,410 | 0.033 | 5 |
| Constant | Greater Darwin | 4 | 178,990 | 33,647 | 122,181 | 23,162 | 2679 | 0.021 | 0 |
| Constant | Greater Hobart | 6 | 280,020 | 44,340 | 176,132 | 59,548 | 6450 | 0.036 | 0 |
| Constant | Greater Melbourne | 40 | 6,286,149 | 1,067,040 | 4,183,787 | 1,035,322 | 110,221 | 0.030 | 4 |

**Table 3** (continued)

| Scenario | GCCSA NAME | no. SA3s | total pop. | pop. <15 | service pop. | pop. 65+ | dementia pop. | mean ratio | ratios > 0.05 |
|---|---|---|---|---|---|---|---|---|---|
| Constant | Greater Perth | 21 | 2,810,235 | 492,512 | 1,777,570 | 540,153 | 56,471 | 0.034 | 2 |
| Constant | Greater Sydney | 46 | 6,344,014 | 1,082,134 | 4,158,817 | 1,103,064 | 116,404 | 0.030 | 3 |
| Constant | Other Territories | 1 | 6576 | 1073 | 3877 | 1627 | 157 | 0.040 | 0 |
| Constant | Rest of NSW | 43 | 3,259,372 | 558,852 | 1,889,470 | 811,050 | 82,466 | 0.045 | 12 |
| Constant | Rest of NT | 5 | 104,558 | 21,496 | 72,464 | 10,597 | 1014 | 0.012 | 0 |
| Constant | Rest of Qld | 43 | 3,235,566 | 539,748 | 1,946,487 | 749,331 | 77,535 | 0.040 | 11 |
| Constant | Rest of SA | 9 | 439,705 | 68,025 | 238,900 | 132,779 | 12,973 | 0.055 | 5 |
| Constant | Rest of Tas. | 9 | 329,826 | 49,988 | 187,278 | 92,560 | 7606 | 0.041 | 1 |
| Constant | Rest of Vic. | 26 | 1,913,318 | 316,917 | 1,103,241 | 493,161 | 42,703 | 0.040 | 1 |
| Constant | Rest of WA | 13 | 650,648 | 114,389 | 388,259 | 148,001 | 13,748 | 0.033 | 1 |
| Increasing | ACT | 10 | 577,570 | 95,469 | 392,216 | 89,884 | 11,193 | 0.033 | 2 |
| Increasing | Greater Adelaide | 19 | 1,591,646 | 253,013 | 991,125 | 347,508 | 49,550 | 0.052 | 12 |
| Increasing | Greater Brisbane | 39 | 3,272,465 | 583,425 | 2,118,842 | 570,197 | 70,187 | 0.039 | 7 |
| Increasing | Greater Darwin | 4 | 178,990 | 33,647 | 122,181 | 23,162 | 3112 | 0.025 | 0 |
| Increasing | Greater Hobart | 6 | 280,020 | 44,340 | 176,132 | 59,548 | 7494 | 0.041 | 1 |
| Increasing | Greater Melbourne | 40 | 6,286,149 | 1,067,040 | 4,183,787 | 1,035,322 | 128,058 | 0.035 | 7 |
| Increasing | Greater Perth | 21 | 2,810,235 | 492,512 | 1,777,570 | 540,153 | 65,610 | 0.039 | 5 |
| Increasing | Greater Sydney | 46 | 6,344,014 | 1,082,134 | 4,158,817 | 1,103,064 | 135,243 | 0.035 | 6 |
| Increasing | Other Territories | 1 | 6576 | 1073 | 3877 | 1627 | 182 | 0.047 | 0 |
| Increasing | Rest of NSW | 43 | 3,259,372 | 558,852 | 1,889,470 | 811,050 | 95,812 | 0.052 | 20 |
| Increasing | Rest of NT | 5 | 104,558 | 21,496 | 72,464 | 10,597 | 1179 | 0.014 | 0 |
| Increasing | Rest of Qld | 43 | 3,235,566 | 539,748 | 1,946,487 | 749,331 | 90,083 | 0.046 | 17 |
| Increasing | Rest of SA | 9 | 439,705 | 68,025 | 238,900 | 132,779 | 15,072 | 0.064 | 7 |

**Table 3** (continued)

| Scenario | GCCSA NAME | no. SA3s | total pop. | pop. <15 | service pop. | pop. 65+ | dementia pop. | mean ratio | ratios>0.05 |
|---|---|---|---|---|---|---|---|---|---|
| Increasing | Rest of Tas. | 9 | 329,826 | 49,988 | 187,278 | 92,560 | 8837 | 0.048 | 4 |
| Increasing | Rest of Vic. | 26 | 1,913,318 | 316,917 | 1,103,241 | 493,161 | 49,613 | 0.046 | 7 |
| Increasing | Rest of WA | 13 | 650,648 | 114,389 | 388,259 | 148,001 | 15,973 | 0.038 | 5 |

Notes. See Table 2 notes for definitions

optimistic. Therefore, urgent action is required now to mitigate substantive regional differences in dementia prevention, timely diagnosis, care and quality of life.

### Regional heterogeneity in the number of persons living with dementia

These findings emphasise that the next decade will see a rapid increase in the number of persons living with dementia and in dementia care needs, and that this increase is highly heterogeneous between regions. In addition to predictions based on demographic changes detailed in this study, evidence suggests that dementia risk also varies according to locality. In Australia and internationally, higher dementia risk is associated with lower neighbourhood-level socio-economic status (Livingston et al., 2024). This is likely associated with unequal distribution of potentially modifiable risk factors for dementia. Livingston et al. (2024) identified 14 risk factors and estimated that they contributed to 45% of the population living with dementia. These risk factors were associated with different stages of the life course: less education in early life; hearing loss, high LDL cholesterol, depression, traumatic brain injury, physical inactivity, diabetes, smoking, hypertension, obesity and excessive alcohol in midlife; and social isolation, air pollution, and visual loss in later life (Livingston et al., 2024). In Australia, the prevalence of dementia risk factors such as smoking, excessive alcohol consumption coronary heart disease, type 2 diabetes increase with increasing remoteness (Australian Institute of Health and Welfare, 2022). The prevalence of obesity, insufficient physical activity, uncontrolled high blood pressure, smoking, diabetes, and heart disease, also modifiable dementia risk factors, are significantly higher in individuals living in lower socioeconomic areas (Australian Institute of Health and Welfare, 2024b). Evidence also suggests that increased risk of dementia diagnosis and dementia risk factors are associated with specific neighbourhood characteristics themselves, for example higher air pollution, rates of crime, and reduced access to greenspace (Bagheri et al., 2021; Cavuoto et al., 2024). These are among some features of the neighbourhood environment that may associate with risk dementia through direct (e.g., neurotoxic effects of air pollution) and indirect effects on health (e.g., limited healthy lifestyle behaviours such as exercise and socialising in areas with limited access to parkland and higher crime). Blanket national – or even state – strategies will not be sufficient to support prevention, timely diagnosis and care of persons with dementia. Urgent action is required to identify vulnerable regions and design targeted policy interventions. These may include (i) dementia prevention programs designed to meet the needs of local areas and their specific

**Table 4** Change in population and dementia statistics by GCCSA region, 2021 to 2036

| Scenario | GCCSA NAME | total pop. | pop.<15 | service pop. | pop. 65+ | dementia pop. | mean ratio | ratios > 0.05 |
|---|---|---|---|---|---|---|---|---|
| Decreasing | ACT | 28% | 14% | 27% | 49% | 52% | 33% | +0 |
| Decreasing | Greater Adelaide | 14% | 4% | 10% | 36% | 33% | 22% | +1 |
| Decreasing | Greater Brisbane | 27% | 17% | 25% | 54% | 54% | 32% | +2 |
| Decreasing | Greater Darwin | 21% | 13% | 18% | 60% | 83% | 50% | +0 |
| Decreasing | Greater Hobart | 12% | 4% | 9% | 29% | 32% | 29% | +0 |
| Decreasing | Greater Melbourne | 26% | 17% | 26% | 42% | 37% | 13% | +2 |
| Decreasing | Greater Perth | 28% | 17% | 24% | 60% | 59% | 38% | +0 |
| Decreasing | Greater Sydney | 21% | 11% | 19% | 41% | 36% | 24% | +1 |
| Decreasing | Other Territories | 36% | 28% | 25% | 77% | 96% | 59% | +0 |
| Decreasing | Rest of NSW | 15% | 8% | 11% | 32% | 32% | 22% | +5 |
| Decreasing | Rest of NT | 4% | -6% | 3% | 50% | 51% | 57% | +0 |
| Decreasing | Rest of Qld | 22% | 10% | 17% | 52% | 55% | 31% | +3 |
| Decreasing | Rest of SA | 10% | 0% | 1% | 37% | 40% | 38% | +3 |
| Decreasing | Rest of Tas. | 4% | -6% | -3% | 32% | 40% | 52% | +1 |
| Decreasing | Rest of Vic. | 22% | 13% | 16% | 44% | 45% | 26% | +0 |
| Decreasing | Rest of WA | 17% | 4% | 10% | 57% | 62% | 47% | +0 |
| Constant | ACT | 28% | 14% | 27% | 49% | 76% | 56% | +1 |
| Constant | Greater Adelaide | 14% | 4% | 10% | 36% | 55% | 41% | +3 |
| Constant | Greater Brisbane | 27% | 17% | 25% | 54% | 78% | 50% | +4 |
| Constant | Greater Darwin | 21% | 13% | 18% | 60% | 112% | 75% | +0 |
| Constant | Greater Hobart | 12% | 4% | 9% | 29% | 54% | 50% | +0 |
| Constant | Greater Melbourne | 26% | 17% | 26% | 42% | 59% | 30% | +4 |
| Constant | Greater Perth | 28% | 17% | 24% | 60% | 84% | 62% | +2 |
| Constant | Greater Sydney | 21% | 11% | 19% | 41% | 59% | 43% | +3 |
| Constant | Other Territories | 36% | 28% | 25% | 77% | 128% | 82% | +0 |
| Constant | Rest of NSW | 15% | 8% | 11% | 32% | 54% | 41% | +11 |
| Constant | Rest of NT | 4% | -6% | 3% | 50% | 76% | 71% | +0 |
| Constant | Rest of Qld | 22% | 10% | 17% | 52% | 80% | 54% | +11 |
| Constant | Rest of SA | 10% | 0% | 1% | 37% | 63% | 62% | +4 |
| Constant | Rest of Tas. | 4% | -6% | -3% | 32% | 62% | 78% | +1 |
| Constant | Rest of Vic. | 22% | 13% | 16% | 44% | 68% | 48% | +1 |
| Constant | Rest of WA | 17% | 4% | 10% | 57% | 89% | 74% | +1 |
| Increasing | ACT | 28% | 14% | 27% | 49% | 105% | 83% | +2 |
| Increasing | Greater Adelaide | 14% | 4% | 10% | 36% | 80% | 63% | +11 |
| Increasing | Greater Brisbane | 27% | 17% | 25% | 54% | 107% | 77% | +6 |
| Increasing | Greater Darwin | 21% | 13% | 18% | 60% | 147% | 108% | +0 |
| Increasing | Greater Hobart | 12% | 4% | 9% | 29% | 78% | 71% | +1 |
| Increasing | Greater Melbourne | 26% | 17% | 26% | 42% | 84% | 52% | +7 |
| Increasing | Greater Perth | 28% | 17% | 24% | 60% | 114% | 86% | +5 |
| Increasing | Greater Sydney | 21% | 11% | 19% | 41% | 84% | 67% | +6 |
| Increasing | Other Territories | 36% | 28% | 25% | 77% | 164% | 114% | +0 |
| Increasing | Rest of NSW | 15% | 8% | 11% | 32% | 79% | 63% | +19 |
| Increasing | Rest of NT | 4% | -6% | 3% | 50% | 104% | 100% | +0 |
| Increasing | Rest of Qld | 22% | 10% | 17% | 52% | 110% | 77% | +17 |
| Increasing | Rest of SA | 10% | 0% | 1% | 37% | 89% | 88% | +6 |

**Table 4** (continued)

| Scenario | GCCSA NAME | total pop. | pop.<15 | service pop. | pop. 65+ | dementia pop. | mean ratio | ratios>0.05 |
|---|---|---|---|---|---|---|---|---|
| Increasing | Rest of Tas. | 4% | -6% | -3% | 32% | 89% | 109% | +4 |
| Increasing | Rest of Vic. | 22% | 13% | 16% | 44% | 96% | 70% | +7 |
| Increasing | Rest of WA | 17% | 4% | 10% | 57% | 119% | 100% | +5 |

Notes. See Table 2 notes for definitions. Data is presented as percentage increase from 2021, except for the "ratios>0.05" variable which gives the numeric change in the number of SA3 areas with the ratio of persons living with dementia to the service population ratios greater than 0.05

dementia risk factors; and (ii) policy addressing general workforce and dementia workforce capabilities in areas predicted to have problematic ratios of persons living with dementia to service populations.

## Regional heterogeneity in potential dementia care workforce shortfalls

The geographically detailed projections of dementia prevalence indicated that many areas are projected to have fewer than 20 service-aged persons for each person living with dementia. This is particularly true SA3s in Greater Brisbane and Melbourne as well as in New South Wales and Queensland, outside of their greater capital city areas. A ratio that is an outlier today, is common in just over a decade – even in the best-case scenario. Across all scenarios, by 2036, the projected increase in the number of persons living with dementia occurs alongside a rise in the number of SA3 areas with fewer than 20 persons of working age for each person living with dementia. In 2021, there were 4 such areas. If the prevalence of dementia remains constant into the future as in the Constant Prevalence Scenario, the number of such areas will increase to 50. In the Decreasing Prevalence Scenario there would be 22 such areas, and in the Increasing Prevalence Scenario there would be 100 such areas. These projections are driven by levels of numerical and structural ageing. Given that the participation rate, as of April 2024, is 67% (Australian Bureau of Statistics, 2024c), there may only be 13 employed persons – across industries – for each person living with dementia in many SA3 areas.

The aged care sector is already facing significant challenges. The healthcare and social support sectors have more job vacancies than any other industry and an additional 30,000 to 35,000 direct aged care workers are required each year. Aged care providers commonly report an inability to meet today's demand for services for older Australians, and some projections suggests a shortage of 110,000 full-time equivalent workers by 2030 (Swerissen, 2024). Increasing available dementia care services is difficult. In 2023 the healthcare and social assistance workforce made up almost 16% of the Australian workforce, in 1984 it was 8% (Swerissen, 2024). Dementia care accounts for a large share of the significant and growing aged care expenses. It is also an industry that is reliant on migrant workers, who comprise an estimated 40% of the aged care workforce, many of whom being temporary visa holders (Kagan, 2024). Swerissen (2024) suggests that skilled migration may only address around 10% of the workforce gap. The future aged care workforce may be more dependent on older workers. The traditional old-age dependency ratio—the ratio of persons 65

years and older to persons aged 20 to 64 years—in Australia is around 0.26. Skirbekk et al. (2022) developed a health-adjusted dependency ratio, which takes into account ageing-related health, and found that in Australia this measure is approximately 0.11, indicating that many older Australians remain healthy and may choose to work or provide informal care.

In 2020-21, $23.6 billion was spent on aged care of which $3.7 billion was directly for dementia-related services; the total public cost was up from $12.5 billion in 2012–2013 (AIHW, ). With the projected growing workforce shortages, and associated escalating costs, it is imperative that policy makers and aged care providers have access to geographically detailed projections about the prevalence of dementia. These projections are necessary for efficient and proactive planning, enabling resources to be directed to areas of greatest need and enhancing the effectiveness of dementia care.

## Limitations and future research directions

The projections presented in this paper are based on several assumptions. However, current Australian dementia prevalence data are known to be limited (Australian Institute of Health and Welfare, 2024a) and the census-derived estimates of dementia are discordant with the AIHW national prevalence estimates (Australian Institute of Health and Welfare, 2024a). A limitation of using Census data is item non-response to the long-term health conditions question. Nationally, approximately 2 million people did not state whether they had any long-term health conditions (Australian Bureau of Statistics, 2021e). Furthermore, research suggests that the rate of undetected dementia in the community is significant (Lang et al., 2017). While this missingness varies across regions, detailed investigation of local patterns is beyond the scope of this study. To address these data limitations, we have scaled national AIHW dementia prevalence estimates rather than relying solely on self-reported Census figures, ensuring a more robust estimation approach. At present, this is the best available data for estimating dementia prevalence at the local level. However, our projections rely on several key, strong assumptions regarding demographic trends and dementia prevalence rates, and are subject to potential misclassification bias in the prevalence data. While our demographic data are robust, the reliance on self-reported and externally sourced prevalence estimates may introduce bias that could affect our projections. Reliable and comprehensive national data remain a long-term goal, with improvements anticipated only after the implementation of the National Dementia Data Improvement Plan 2023–2033 (Australian Government Department of Health and Aged Care, 2024). Our analysis indicates that population ageing is a primary driver of the growing population of persons living with dementia. Even if age-standardised prevalence rates decline, the rapid increase of the ageing, at-risk population will still lead to a substantial increase in the absolute number of people living with dementia, this demographic trend underscores the urgent need for targeted policy interventions and strategic resource planning.

One of the assumptions that this paper relies on is that the increase in dementia prevalence with age is uniform across all SA3 areas. While risk factors such as social isolation, untreated vision loss, and high LDL cholesterol (Livingston et al., 2024)

are known to affect dementia prevalence, comprehensive local-level data on these factors are not available. To incorporate some regional heterogeneity, we reweighted national AIHW prevalence rates using SA3-specific Census ratios at the jump-off year (2021). This approach provides a transparent and robust baseline for forecasting dementia prevalence. We did not incorporate more complex migration data, or ethnicity-specific risk factors—such as differences in dementia prevalence among Culturally and Linguistically Diverse Communities communities— and did not differentiate between internal and international migration flows, due to current data limitations. However, forecasting research suggests that simple, evidence-based models often outperform more complex ones (Green and Armstrong, 2015). Future work should update these projections as more detailed local risk data become available, including that the national AIHW rates are reliable and that the 2021 Census-based rates give a reliable indication of local to national prevalence ratios.

In response to the lack of reliable dementia prevalence data, the AIHW has implemented the 'National Dementia Data Improvement Plan 2023–2033,' which aims to improve data quality (Australian Government Department of Health and Aged Care, 2024). As improved dementia prevalence data become available it will be important to update the projections of persons living with dementia. Such data could include the type of dementia, for which the causes of and treatment for can differ, and for which detailed projections are required. Additionally, it will be important for future work to include additional demographic and socioeconomic details in projections of dementia prevalence. In particular, future work should focus on geographically detailed projections of dementia prevalence in Culturally and Linguistically Diverse Communities, with the prevalence of dementia differing between different ethnic groups (Babulal et al., 2019). Future research should also address dementia in Aboriginal and Torres Strait Islander communities. Temple et al. (2022) report on national demographic drivers of dementia in Aboriginal and Torres Strait Islander communities, and more geographically detailed work is currently in progress. The AIHW has recognised the need for such data to enable the provision of culturally appropriate care (Australian Institute of Health and Welfare, 2020).

As we have discussed in this research paper, it is unknown how dementia prevalence will change into the future. Our discussion on the future prevalence of dementia has been based on the literature. However, it is important to consider that events such as the recent COVID-19 Pandemic may influence the future prevalence of dementia, causing it to be different to that described in the literature. Previous studies have suggested a significant association between infectious disease requiring hospitalisation, with an increased risk of dementias (Sipilä et al., 2021; Tate et al., 2014). It is not yet known how COVID − 19 will impact future dementia prevalence, however some early research suggests that it may exacerbate dementia symptoms (Dubey et al., 2023) and that patients who survived COVID − 19 infection, particularly if they were hospitalised, have a higher incidence of dementia after infection with COVID-19 (Shan et al., 2024; Taquet et al., 2021). COVID-19 is one of several factors, including the development of novel medications, and changes in government policies targeting the risk factors associated with dementia (Livingston et al., 2024), which may influence future prevalence scenarios. This underscores the need to update dementia projections with the latest data in order to be able to support the planning and provi-

sion of dementia-care services, particularly given the existing and growing shortfalls in the size of the aged-care services sector.

## Conclusions

Population ageing and increases in dementia care needs are often only considered at national or state levels, however there are significant differences in ageing in small areas which present challenges for health care systems. This study has presented projections of people living with dementia in Australia from 2021 to 2036 at the SA3 level for three scenarios: Decreasing Prevalence, Constant Prevalence and Increasing Prevalence. Even in the best-case Decreasing Prevalence scenario there are substantial increases in the number of persons living with Dementia and this increase is regionally heterogeneous. Furthermore, the projections suggest that by 2036 many SA3 areas will have fewer than 20 service-aged persons for each person living with dementia, presenting challenges in providing care for persons living with dementia. Our small-area analysis highlights that a single, uniform solution cannot address dementia care needs. Effective strategies must be urgently tailored to the diverse demographic realities and service constraints of each region. Future research is required to support more detailed scenario planning and policy development to support targeted interventions to support local dementia care needs.

**Acknowledgements** This work was supported by the Australian Research Council Centre of Excellence in Population Ageing Research (Project CE1101029) and the Australian Research Council's Discovery Projects funding scheme (Project DP200101480).

**Funding** Open Access funding enabled and organized by CAUL and its Member Institutions

## Declarations

**Conflict of interest** The authors declare that they have no competing interests.

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