

Future population growth and ageing

Changes in the size, composition and distribution of the population are partly a product of prevailing social and economic conditions. Likewise, the structure and size of the population contribute to the shaping of the economy, society and the broader environment.

The future growth, distribution and age structure of the population are key factors underpinning many analyses of long-term policy issues in Australia. Some of these issues relate to service provision, such as health and aged care. Other policy issues include the population aspects of economic development and environmental sustainability (including climate change and water security).

While we cannot know with any certainty what Australia's future holds in terms of migration, fertility and life expectancy, we can model or project population growth and population change using a range of assumptions. This article illustrates various scenarios.

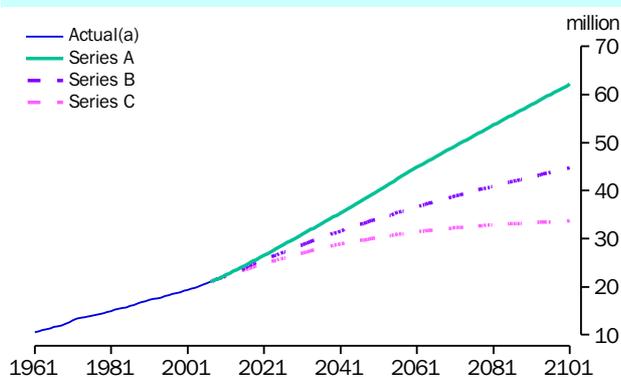
Australia's population is projected to grow from 21 million in 2006 to between 31 and 43 million in 2056

Population growth

From around 21 million people in 2006, Australia's population is projected to grow to between 30.9 million (Series C) and 42.5 million (Series A) million people in 2056, and to reach between 33.7 million (Series C) and 62.2 million (Series A) in 2101.

The Series B projection, in which fertility is assumed steady at 1.8 babies per woman, net overseas migration is 180,000 people per year and life expectancy at birth reaches 85 years for

Actual and projected population, 1961–2101



Source: [Australian Historical Population Statistics](#) (ABS cat. no. 3105.0.65.001), [Population Projections, Australia, 2006 to 2101](#) (ABS cat. no. 3222.0)

Population projections

This article is based on ABS population projections. These projections span the period 2008 to 2101 for Australia and 2008 to 2056 for the states, territories and regions. The base population for the projections is the estimated resident population at 30 June 2007.

Population projections are not predictions or forecasts. They simply show what would happen to Australia's population if a particular set of assumptions about future levels of fertility, mortality, net overseas migration and, for states and territories, net internal migration, were to hold for the next 50 to 100 years. The assumptions are based on demographic trends, current debate, and possible future scenarios arising from research in Australia and elsewhere.

For simplicity, most analysis presented in this article is limited to three main series which cover three sets of possible future population growth outcomes; high (Series A), medium (Series B) and low (Series C). However, there are a total of 72 series available for use.

Population projection assumptions

	Total fertility rate(a)	Net overseas migration (b)	Life expectancy at birth, males(c)	Life expectancy at birth, females(c)
Babies per woman	'000	Years	Years	
Series A	2.0	220.0	93.9	96.1
Series B	1.8	180.0	85.0	88.0
Series C	1.6	140.0	85.0	88.0

(a) From 2021

(b) From 2010–11 in Series A and C, from 2007–08 in Series B

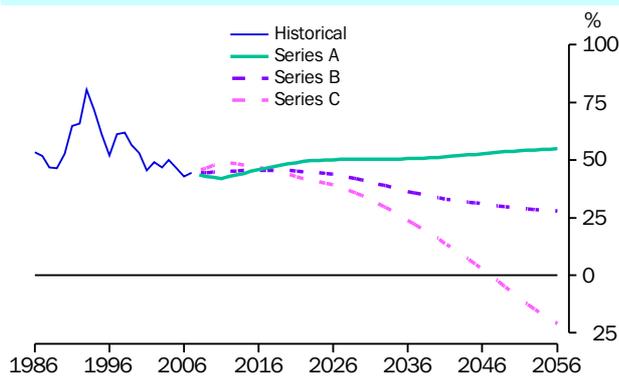
(c) From 2056

Source: [Population Projections, Australia, 2006 to 2101](#) (ABS cat. no. 3222.0)

boys and 88 for girls, most closely reflects actual recent levels of the components of population change of the main series. Series B projects the population to reach 35.5 million by 2056 and 44.7 million by 2101. This is equivalent to an average growth rate of 1.4% per year from 2007 to 2026, slowing to 0.9% per year from 2027 to 2056, and 0.5% per year for the rest of the century. This compares with an average population growth rate from 1997 to 2007 of 1.3% per year.

Under the Series B assumptions, there will be more births than deaths until the year 2101. However, even at the beginning of next century, population growth would remain clearly positive due to the level of net overseas migration.

Proportion of population growth from natural increase, 1986–2056



Source: *Australian Historical Population Statistics* (ABS cat. no. 3105.0.65.001), *Population Projections, Australia, 2006 to 2101* (ABS cat. no. 3222.0)

Under the high assumption (Series A), where fertility increases to 2.0 babies per woman, net overseas migration is 220,000 per year and life expectancy at birth reaches 94 years for boys and 96 years for girls, the strong population growth is driven more or less equally by natural increase and migration. By 2056, 55% of the population growth would come from natural increase (the excess of births over deaths) with the remaining 45% coming from net overseas migration.

The low assumption (Series C) has fertility falling to 1.6 babies per woman, net overseas migration at 140,000 per year and life expectancy at birth increasing to 85 years for boys and 88 years for girls. While population growth would continue throughout this century under these assumptions, the growth would be slow and from 2048 would be driven entirely by net overseas migration as natural increase becomes negative.

Population structure and ageing

In addition to the future size of the population, the most profound change that is projected to occur is the ageing of the population. Population ageing is characterised by an upwards shift in the age structure, so the proportion of younger people declines as the proportion of older people increases. The relative increase in the proportion of older people in the population will be accompanied by a sharply increasing number of older people. These changes are important factors weighing on the future provision of income support, health and aged care services as well as having implications for economic growth.¹

The ageing of the population (already evident in Australia's population structure) is set to continue under all the projection series. The reasons further population ageing is inevitable are to do with the particular shape of the current population structure; the tendency for people to live to older ages; and the fact that fertility and migration can only play a marginal role in limiting the extent of ageing.

Population growth and ageing definitions

In this article the term *older people* refers to those aged 65 years or over, while *working-age* refers to people aged 15 to 64 years.

The *old age dependency ratio* is a measure used to compare the size of the older population to the working age population. It is calculated as the number of people aged 65 years and over (that is, 'old age dependants') divided by the number of people aged 15–64 years, multiplied by 100. While the ratio may oversimplify the implication of dependency – for example, many young adults are dependent on their parents during tertiary study, many people aged 15–64 years are not part of the workforce, many people retire before 65 years of age, while people aged 65 years or over may be self-funded retirees or may continue to work – it provides another measure of the structure of the population.

In 2007, 14.5 million people were aged less than 50 years. Even without increases in life expectancy, 60% (or 8.7 million) of these people will still be alive half a century later (in 2057), but be aged 50 to 99 years. Taking account of the increases in life expectancy assumed in Series B and C, 72% of people aged less than 50 years in 2007 would still be alive in 2056, and 83% would remain alive if life expectancy increased to the levels in Series A.

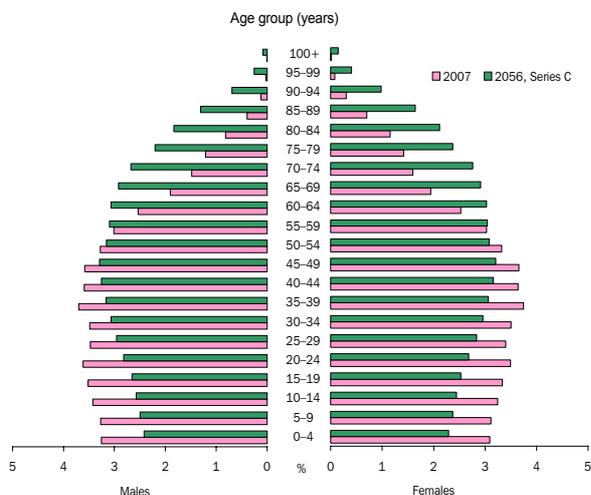
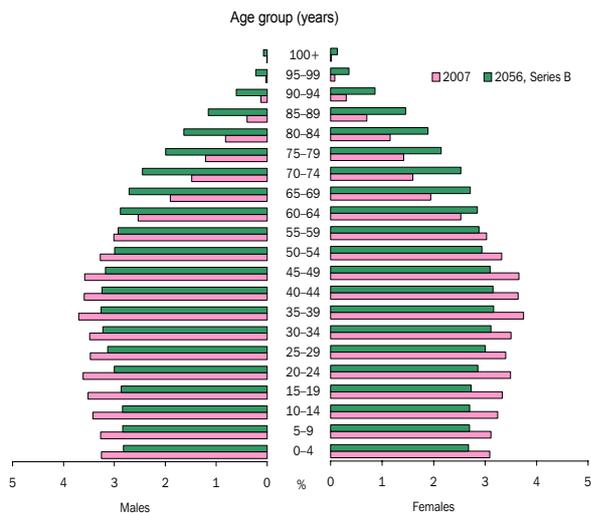
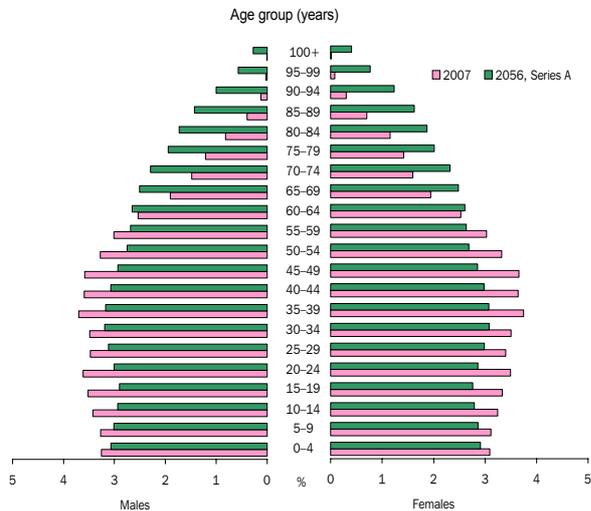
In contrast to the 2007 population age pyramid which shows a relatively wide base and middle with a sharply narrowing top, the 2056 age pyramids each show a relative narrowing of the younger age population and a broadening at the older ages. Series A, B, and C each have significantly greater proportions of people aged 65 years and over ranging from 23% (Series B) to 24% (Series A) in 2056, compared with 13% in 2007. The proportion aged 85 years and over is projected to increase from 1.6% in 2007 to between 4.9% (Series B) and 7.3% (Series A). This is accompanied by the proportion of people aged 15–64 years (sometimes called the working-age population) declining from 67% in 2007 to between 58% (Series A) and 60% (Series B) in 2056. As a consequence, the old age dependency ratio (the ratio of people aged 65 years and over to the working age population) will approximately double from 20% in 2007 to between 38% and 42% (Series B and A respectively). Put another way, for each older person in 2007, there were five working-age people, while in 2056 there will be less than three working-age people for every older person.

...pace of ageing

Far from occurring evenly, the rate at which the populations aged 65 years and over and 85 years and over will grow is projected to accelerate in the short and medium term before declining. This reflects the entry of early baby boomers (born from 1946) into these age groups. In 2007, there were 2.4 million people aged 65–84 years. According to Series B

projection, the number of people this age will grow by an average 2.7% per year to 2011, then accelerate to grow by an average 3.5% per year over the next 11 years to 4.0 million in 2022. Although the rate of growth slows considerably after this period, this age group is still projected to grow to 6.4 million by 2056.

Projected population age and sex structure



Source: [Population Projections, Australia, 2006 to 2101](#) (ABS cat. no. 3222.0)

The number of people aged 85 years and over is also projected to increase rapidly, going from 344,000 in 2007 to 1.7 million in 2056. The fastest growth in this age group occurs as the early baby boomers enter in the early 2030s.

Such increases in the population aged 85 years and over will be associated with large increases in the number of deaths each year. Deaths are projected to more than double between 2007 and 2056 (from 137,000 in 2007 to 321,000), with the most rapid increase in deaths coming between 2027 and 2037.

Could population ageing be prevented?

Examination of the projections from each of the major series (A, B and C) shows that within these assumptions, population ageing is unavoidable and only the extent of ageing remains uncertain. However, the projections model can also be used to explore the less likely 'what ifs?' of fertility and net overseas migration to demonstrate the levels necessary to markedly reduce the extent of ageing that is projected in each of the main series.

...with higher fertility?

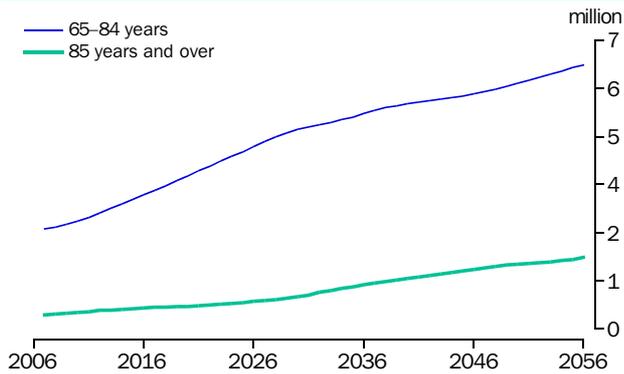
Assuming migration and life expectancy were both held to the medium assumptions in Series B, we can use a range of higher fertility assumptions to see what effect they would have on the age structure of Australia's population.

Increases in Australian fertility to the levels seen in the 1960s or early 1970s, while very effective in growing the population, would be limited in offsetting the increasing old age dependency ratio.

Assuming the total fertility rate increased to, and remained at, 3.0 babies per woman throughout the projection period, there would be 29 older people for every 100 working age people in 2056. While this is lower than the Series B projection of an old age dependency ratio of 38%, it is considerably more than the 2007 level of 20%.

Not surprisingly, high levels of fertility would be very effective in increasing the proportion of children in the population. For example, with a total fertility rate of 3.0 babies per woman, 26% of people would be aged less than 15 years in 2056 compared with 17% in Series B and 19% in 2007. The high birth rate would also increase population growth and lead to Australia having around 49 million people in 2056, 13 million more than the Series B projection.

Projected aged populations: 2007^(a)–2056, Series B



(a) Data for 2007 is estimated, all other years are projections

Source: *Population Projections, Australia, 2006 to 2101* (ABS cat. no. 3222.0)

...with higher net overseas migration?

Keeping the fertility and life expectancy at the Series B level, big increases in migration can dilute the ageing effect in the population structure by adding large numbers of people who have a younger age profile than the population which they are joining. However, to be effective, the level of migration would produce an inordinately large population. For example, with a net addition of 400,000 migrants per year (almost twice the 2007–08 record level), the old age dependency ratio would be 31%, compared with 38% in Series B and 20% in 2007. The population would grow to 51 million in 2056, an extra 15 million on the Series B projection.

If annual net overseas migration increased to 1 million migrants (almost five times the 2007–08 level), the old age dependency ratio in 2056

would be 24% – closer to the 2007 level of 20%. The result of this would be a population of 91 million people in 2056.

States and territories

State and territory population projections differ widely in their rates of growth, age structure and size. This is a reflection of different fertility, mortality, net overseas migration levels, and most variably, the level of internal migration.

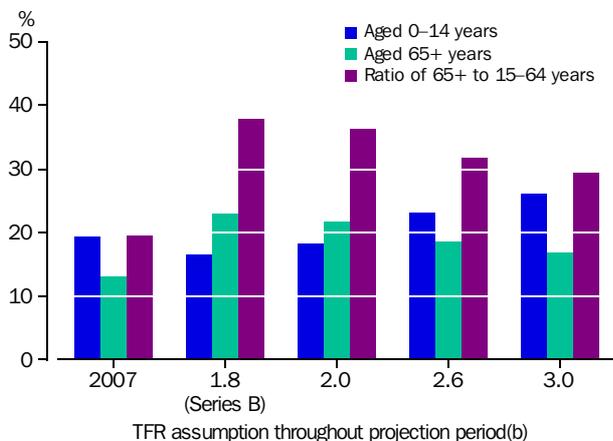
Under Series B projections (based on a medium level of interstate migration flows), all states and territories would continue population growth throughout the projection period except Tasmania, which levels out in around 2040.

New South Wales maintains the largest share of the population throughout the projection period. However, while the number of people living in New South Wales is projected to increase by 3.3 million to 10.2 million, this increase is matched by Victoria's increase (3.3 million) and exceeded by Queensland's (4.6 million). Queensland is projected to more than double its 2007 population of 4.2 million to 8.7 million by 2056, overtaking Victoria as the second most populous state in 2050. Western Australia is also projected to double its population between 2007 and 2056 (from 2.1 to 4.3 million).

The rapid population growth in Queensland and Western Australia reflects the relatively high rates of migration to these states. Under the medium assumption, total migration (i.e. net overseas migration and net internal migration) is projected to contribute around two-thirds of the population growth for both of these states. Just over half (55%) of the Queensland

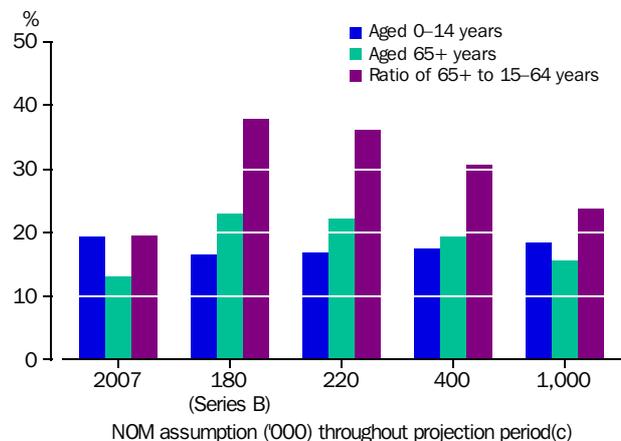
Selected indicators of 2007 and 2056 age structure from a range of increased fertility and migration scenarios^(a)

FERTILITY INCREASES



TFR assumption throughout projection period(b)

NET OVERSEAS MIGRATION INCREASES



NOM assumption (000) throughout projection period(c)

(a) Using selected total fertility rate (TFR) and net overseas migration (NOM) assumptions and keeping all other assumptions to the Series B assumptions

(b) TFR is assumed to move incrementally toward the target level, reaching it by 2021, then remaining constant

(c) Net overseas migration is assumed to move incrementally toward the target level, reaching it by 2011, then remaining constant

Source: ABS Population Projections

migration is overseas migration, while 91% of Western Australia's is projected to come from overseas migrants.

In contrast to these high growth states, the remaining states and the Northern Territory have their growth held back by negative internal migration.

...capital city growth

Over the past decade, Australia's capital city population has grown slightly faster than the non-capital city population, and this is set to continue under Series B assumptions. As a consequence, the proportion of the population living in the capital cities is projected to increase from 64% in 2007 to 67% in 2056.

Despite an assumed net loss of 34,000 people per year through internal migration (in Series B), Sydney is projected to remain Australia's largest city, growing an average 1.0% per year, to 7.0 million by 2056. Most of this growth will come from net overseas migration.

With smaller internal migration losses than Sydney, Melbourne is projected to grow by an average 1.2% per year to 6.8 million in 2056. Brisbane and Perth are projected to grow the most rapidly (averaging 1.6% per year each) to 4.0 million and 3.4 million respectively, with positive internal migration for Brisbane and neutral internal migration for Perth.

...ageing in and out of the capital cities

Projected age structures within and between states differ widely under the influence of differential rates of migration and natural increase. In 2056, the proportion of children aged 0–14 years in the population is projected to be similar across most jurisdictions at 16%–18%. The exception is the Northern Territory, where higher fertility leads to a projected rate of 20% in Darwin

State and territory assumptions

Population projections have been produced for the states and territories that fit within the national projections, in that each component of population change (births, deaths, net overseas migration) sums across the jurisdictions to the Australia level for each of the projection series. For each Australia level assumption, the states and territories each have their own different level (based on the recent differentials across the states and territories) which average to the Australia level. For example, the assumed fertility differential has the Northern Territory with a fertility rate 19% higher than Australia overall while New South Wales is assumed to be 4% lower than nationally.

An additional component of population change for the states and territories is net interstate migration. Interstate migration is inherently volatile because movement between states is unrestricted and economic and lifestyle factors can be strong drivers of population mobility. Using the long term trend of net interstate migration, three assumptions have been made: large, medium and small. Series B uses the medium internal migration assumption.

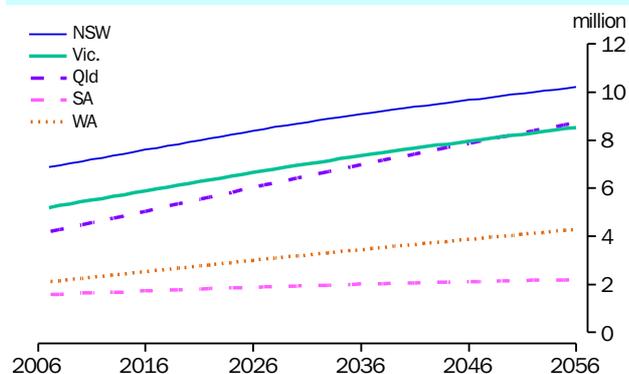
Finally, within states there are differences in the growth of the capital city and balance of state. The projections for 'part of state' are based on the population growth differentials for the capital city/balance of state trends within each state and the Northern Territory.

Source: [Population Projections, Australia, 2006 to 2101](#) (ABS cat. no. 3222.0)

and 24% in the balance of the Northern Territory.

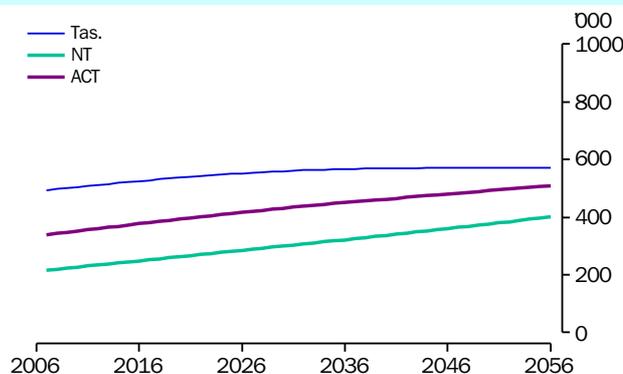
When compared with capital cities, the non-capital city areas typically have significantly higher projected proportions of people aged 65 years and over, as many older people retire to regional coastal areas. This is also reflected in the old age dependency ratio. In the non-capital city areas of New South Wales, Victoria, South Australia and Tasmania, it is projected that by 2056 there will be less than two people of working age for every person aged 65 years and over. In contrast, capital cities such as Sydney, Melbourne, Brisbane and Perth are projected to have considerably younger populations with around three people of working age for every one aged 65 years and

Projected population: states and territories, 2007^(a)–2056, Series B

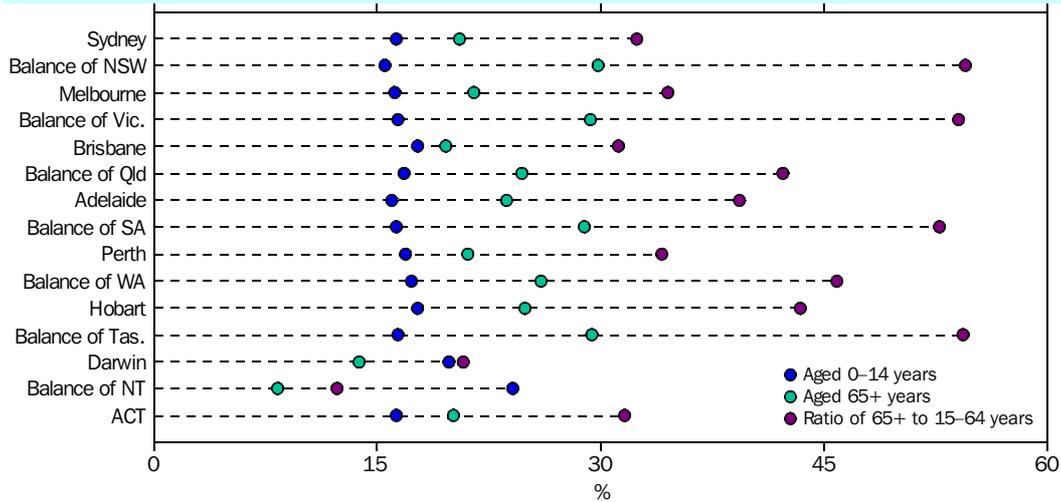


(a) Data for 2007 is estimated, all other years are projections

Source: [Population Projections, Australia, 2006 to 2101](#) (ABS cat. no 3222.0)



Indicators of age structure: capital cities and state balances, Series B — 2056



Source: [Population Projections, Australia, 2006 to 2101](#) (ABS cat. no. 3222.0)

over. Darwin is projected to remain the youngest city with nearly five people of working age for every older person.

Conclusion

The growth, size and age structure of the population are interlinked with social, economic and environmental conditions. Therefore long-term planning and policy-making can be used to both influence and respond to demographic outcomes. For example, as Australia's population continues to age, there may be an increasing desire by governments to attract migrants to contribute to the labour force. At the same time, there will be a need to plan for infrastructure to accommodate the changing size, composition and distribution of the population.

Endnotes

- 1 Productivity Commission 2005, Economic Implications of an Ageing Australia, Research Report, Canberra, available at <http://www.pc.gov.au/>