

Queensland Government population projections, 2018 edition: Background research

Introduction

This paper provides information on historical and recent trends in the different components of Queensland's population change — fertility, mortality, net overseas migration (NOM) and net interstate migration (NIM).

The Queensland Government 2018 edition population projections were generated using a multi-regional cohort component model. This methodology, which ages population cohorts over time, incorporates assumptions about the future levels of fertility, mortality, NOM and NIM.

Fertility

Total fertility rate

The total fertility rate (TFR) is a common measure of fertility and represents the number of children a female will bear during her lifetime. The TFR depends on the current age structure of the female population and current age-specific fertility rates; it is derived by summing the age-specific fertility rates.

Another indicator of fertility is the replacement level fertility, which is the TFR required to maintain a stable population, excluding the impact of migration. Replacement level fertility refers to the average number of babies required to be born per female over her reproductive life span for the population to exactly replace itself from one generation to the next. For developed countries including Australia, the replacement TFR is estimated to be 2.1 babies per female¹.

Without migration and unchanged mortality rates, a TFR below replacement level fertility is likely to lead to an eventual population decline. However, net positive overseas migration at the national level, or net positive overseas and interstate migration at the state level, can offset a below-replacement TFR and generate population growth.

Internationally, TFRs in Organisation for Economic Cooperation and Development (OECD) countries have progressively declined, from an average 2.73 children per woman of childbearing age in 1970 to the latest average of 1.68 in 2015. Among the 35 OECD member countries in 2015, only two countries recorded above replacement

levels of fertility — Israel (3.09) and Mexico (2.19)². In contrast, the lowest TFR among the OECD countries in 2015 was recorded in South Korea (1.24).

While there are many reasons for declining fertility rates, they are primarily due to the postponement of family formation and a decline in desired family size, underpinned by higher levels of female education and employment³.

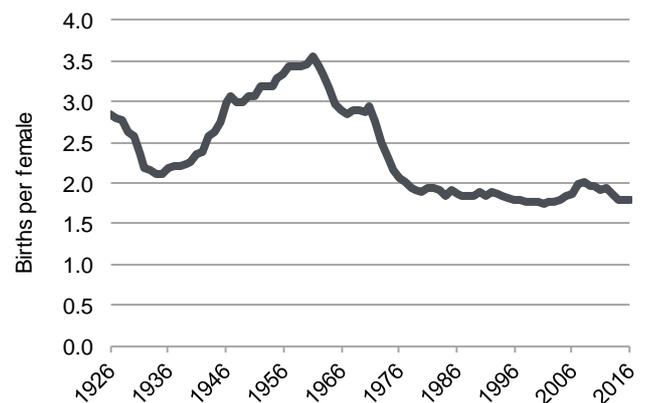
Long term trends

Consistent with long term international trends, Australia's TFR has progressively declined. In 1926, the average woman bore 2.85 children during her lifetime. However, by 2016, this had fallen to just 1.79 children. Over this 90-year period, however, fertility has fluctuated considerably (Figure 1).

Australia's fertility initially fell in the 1930s with the Great Depression, as evident in Figure 1, then peaked at 3.55 babies per female in 1961 at the height of the 'baby boom'.

Subsequently over the following two decades, with broad social change including greater reproductive control and increased female participation in the labour force, the TFR fell sharply to below 2.00 by the late 1970s.

Figure 1 Total fertility rate, Australia



Source: ABS 3105.0.65.001, *Australian historical population statistics*, 2014; ABS 3301.0, *Births, Australia*, 2016

¹ ABS 3301.0, *Births, Australia*, 2016

² OECD (2017), *Fertility rates (indicator)* doi: 10.1787/8272fb01-en (accessed on 26 September 2017)

³ OECD (2016), *OECD Factbook 2015–16: Economic, Environmental and Social Statistics*

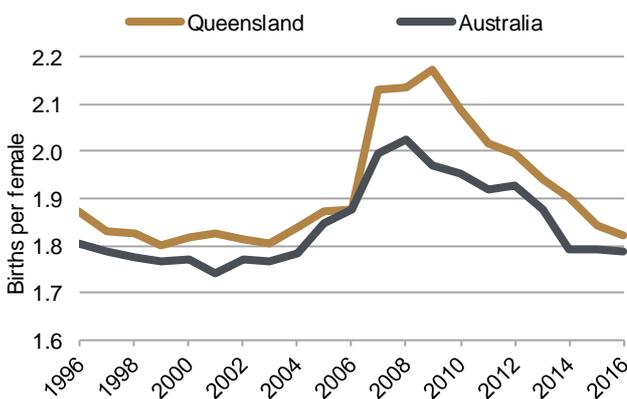
From the 1980s to the early 2000s, Australia's TFR was relatively stable (average of 1.84) and reflected the tendency to delay partnering and childbearing. Then, in 2008, Australia's fertility rate temporarily recovered to 2.02 babies per female, the highest recorded in the 40 years to 2016 (Figure 1).

Despite temporary up-swings in fertility in recent years, Australia's TFR has been below the replacement level of 2.1 babies for the last 40 years and was stable at 1.79 in 2016.

Recent trends

Queensland's broad fertility movements align with national trends over the last 20 years. However, the state's fertility rate has generally been higher than the national rate. Over the 20-year period to 2016, Queensland's TFR has averaged 1.92, compared with Australia's average of 1.85 (Figure 2).

Figure 2 Total fertility rates, Queensland and Australia



Source: ABS 3105.0.65.001, *Australian historical population statistics*, 2014; ABS 3301.0, *Births, Australia*, 2016

In line with a sustained long-term decline in worldwide and national fertility, Queensland's TFR reached a historical low of 1.80 in 1999, the lowest recorded to 2016. Similarly, Australia recorded a record low TFR of 1.74 in 2001, which has yet to be surpassed.

Fertility then recovered temporarily and rose to levels not experienced for more than 30 years in both Queensland⁴ (2.17 in 2009) and Australia (2.02 in 2008).

Subsequently, fertility began to fall again, decreasing to 1.82 in Queensland in 2016 and 1.79 in Australia (Figure 2).

⁴ Some of the increase in Queensland can be attributed to a change in registration administrative practices which coincided with an increase in birth numbers.

⁵ Life expectancy data are based on the occurrence of deaths over a three-year period (latest available 2014–2016) and the estimated

Mortality

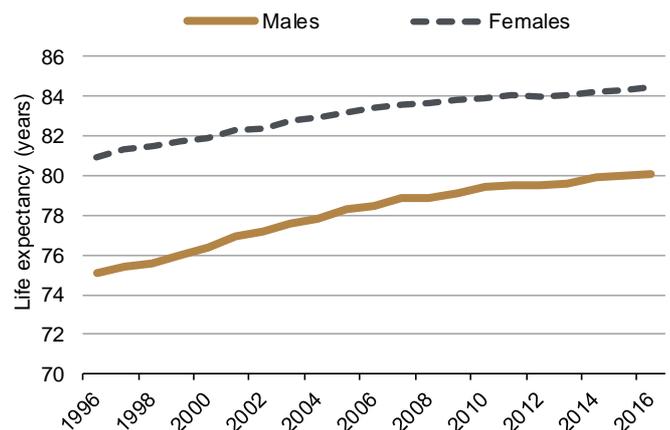
Recent trends in life expectancy

Over time, consistent with national and international trends, life expectancy at birth for both male and female Queenslanders continues to rise (Figure 3) and hit new highs in 2016.

The improvement in life expectancy reflects access to better health care, medical advances, enhanced education and changing lifestyle (such as sun protection and declining smoking rates) and safer working environments.

In 2014–16, life expectancy at birth⁵ for Queensland males reached 80.1 years, up from 75.1 years in 1994–96 (Figure 3). For Queensland females, life expectancy rose to 84.5 years in 2014–16, from 80.9 years in 1994–96. This increase represented average annual improvements of three months for males and marginally over two months for females.

Figure 3 Life expectancy at birth³, Queensland



Source: ABS 3105.0.65.001, *Australian Historical Population Statistics*, 2014; ABS 3302.0.55.001, *Life Tables, States, Territories and Australia*

Net overseas migration

NOM is the net gain or loss of population through immigration to and emigration from Australia, regardless of nationality, citizenship, legal status or visa category.

It is important to note that Australian Bureau of Statistics (ABS) NOM estimates contain a break in series at 30 June 2006. Estimates for 2006–07 onwards use an

resident population at the mid-point of that period (i.e. 30 June 2015). This methodology reduces the impact of year-to-year statistical variations, particularly at younger ages where there are small numbers of deaths, and at very old ages where the population at risk is small.

improved methodology and hence are not directly comparable with NOM data from earlier periods.

The enhanced method is based on a traveller's actual duration of stay or absence using the '12/16' rule, where overseas travellers resident in or absent from Australia for 12 months or more during a 16-month period are taken into account in the estimated resident population.

NOM estimates from the ABS are available for four broad categories: temporary visa holders, permanent visa holders, New Zealand citizens and Australian citizens.

Temporary visa holders come to Australia on a temporary basis for specific purposes and comprise international students, working holiday makers, tourists, business visitors, and those on temporary work visas. There are no annual quotas or restrictions on the number of temporary visas issued by the Australian Government.

Permanent visa holders have been granted a visa under Australia's permanent immigration programme. This programme has two components: the Migration Programme for skilled and family migrants, and the Humanitarian Programme for refugees and others in refugee-like situations. National planning levels for the number of visas granted under each programme are set annually by the Australian Government.

Recent trends

Over the last two decades, Queensland's NOM has shown considerable variation, reflecting changing economic conditions and immigration programs. NOM gains fluctuated from a low of almost 12,500 persons in 1997–98 to a record high of around 59,300 persons in 2008–09 (Figure 4).

Over the 10 years to 2005–06 (prior to the series break, see Figure 4), the net addition to the state's population from NOM was estimated at an average annual 21,900 persons. Subsequently, NOM gains rose significantly and for the 10 years to 2016–17, NOM added 37,000 persons annually on average to Queensland's population.

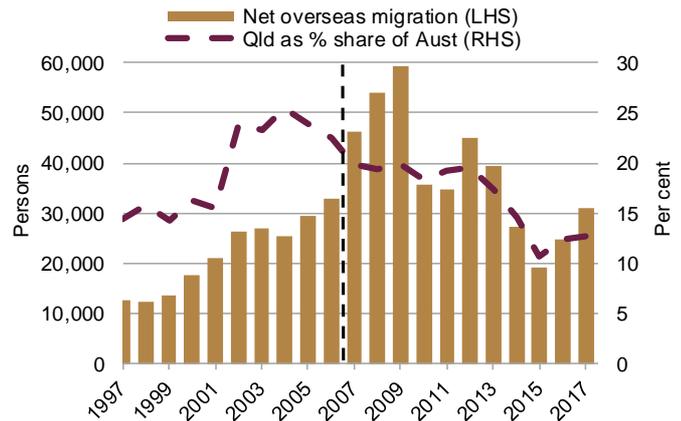
While Queensland's annual NOM gains in most years over the last decade were markedly lower than the 2008–09 peak, there are recent signs of recovery. NOM was at a 3-year high in 2016–17, at 31,100 persons, up from 24,900 persons in the previous year and 19,200 persons in 2014–15. More recent quarterly data for September 2017 recorded NOM at 7,900 persons, slightly higher than the 7,600 persons recorded for the September quarter 2016.

The broad pattern of Queensland's NOM is reflective of national trends. For Australia, over the decade to 2016–17 (Fig. 4), NOM gains were recorded at an annual average of 222,200 persons. Australia's NOM has been trending downwards since it peaked at almost 299,900 persons in 2008–09. In 2016–17, NOM added

approximately 245,400 persons to Australia's population, up from 201,400 in 2015–16.

Queensland's share of NOM in Australia averaged 19.3% per annum between 2007–08 and 2011–12. However, this share has gradually declined from 17.4% in 2012–13 to 10.8% in 2014–15, before increasing slightly to 12.7% in 2016–17.

Figure 4 Net overseas migration, year to 30 June, Queensland



Note: There is a break in the series at 30 June 2006. Source: ABS 3101.0, Australian demographic statistics, Sep 2017

DIBP Forecasts

The former Department of Immigration and Border Protection (DIBP), now the Department of Home Affairs, forecasts NOM for Australia by visa components. The forecasts combine the latest data on permanent and long-term arrivals and departures with past behaviour of migrants across different visa groups to enter and leave the population. Forecasts consider official Australian and world economic growth forecasts, visa grants, and the impact of announced policy decisions.

DIBP forecasts released in September 2016 indicated that NOM for Australia was expected to rise from 177,300 persons in 2014–15 (the lowest level recorded since the break in the NOM series at 30 June 2006) to 188,200 in 2015–16, then gradually increase to reach 246,700 persons at the end of the forecast period in 2019–20 (Table 1).

After the release of the preliminary NOM figure of 177,300, the ABS revised Australia's NOM for 2014–15 upward to 178,600 persons, which remained the lowest level recorded since 2006–07. ABS estimated preliminary NOM for 2016–17 at around 245,400 persons, somewhat higher than the DIBP forecast for 2016–17 of 218,200.

Table 1 Overseas migration, Australia

Year ending 30 June	Arrivals	Departures	Net
Actual	— 000s —		
2011	431.8	251.4	180.4
2012	481.2	251.8	229.4
2013	496.7	269.6	227.1
2014	474.2	287.8	186.4
2015	475.4	298.2	177.3
Forecast			
2016	483.5	295.3	188.2
2017	506.4	288.3	218.2
2018	511.9	286.2	225.7
2019	525.3	293.6	231.7
2020	547.8	301.1	246.7

Source: DIBP, *Outlook for net overseas migration, September 2016*

Net interstate migration

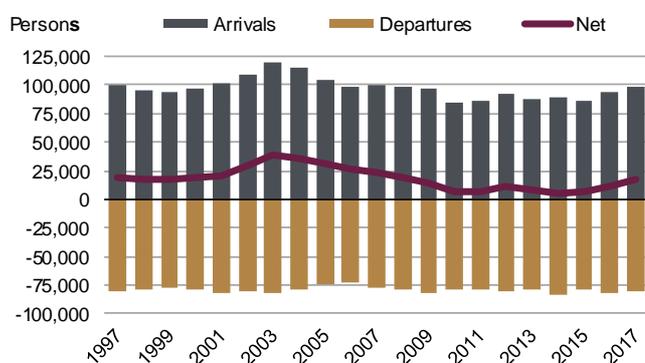
Recent trends

Queensland has consistently recorded gains from net interstate migration (NIM) over the last two decades. Nonetheless, there has been considerable variation, mainly driven by the volatility of arrivals as departures are relatively steady (Figure 5).

Over the 20 years to 2016–17, Queensland's gains from NIM have been the most variable component of Queensland's population change. In the 10 years to 2006–07, the average annual gain from NIM was 25,600 persons. However, NIM has eased over the following decade to 2016–17 with a much lower average annual gain of around 10,800 persons.

NIM reached a historical low in 2013–14, adding fewer than 5,800 persons to Queensland's population. There has been an increase in NIM gains over the last three years with 6,400 persons added in 2014–15, rising further to 11,600 persons in 2015–16 and 17,400 in 2016–17.

Figure 5 Interstate migration, year to 30 June, Queensland

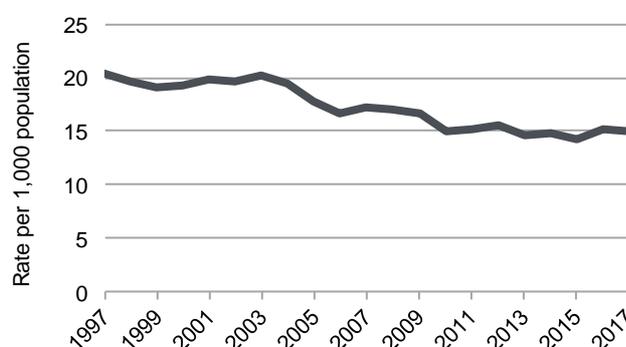


Source: ABS 3101.0, *Australian demographic statistics, Sep 2017*

More recent data suggest that NIM appears to be continuing to increase. Data for the 12 months to September 2017 show Queensland NIM at around 19,300 persons.

Lower gains in Queensland's NIM over the recent decade correspond to a decline in the overall rate of interstate movement within Australia. Figure 6 shows that the crude rate of interstate movement within Australia has declined from 20.2 interstate moves per 1,000 estimated resident population in 2002–03 to 14.2 in 2014–15. More recently, the uptick in Queensland's NIM also reflects the broader national pattern with the crude instate migration rate in 2016–17 increasing to 15.1 moves per 1,000 estimated resident population.

Figure 6 Crude interstate migration rate^(a), year to 30 June, Australia



(a) Total interstate movements per 1,000 estimated resident population.

Source: ABS 3101.0, *Australian demographic statistics, Sep 2017*

Sources

Data used in this paper were sourced from the following publications:

- ABS 3301.0 (released 13 December 2017)
- OECD *Fertility rates indicator* (accessed 26 September 2017)
- ABS 3105.0.65.001 (released 18 September 2014)
- ABS 3302.0.55.001 (various editions)
- ABS 3101.0 (released 22 March 2018)
- DIBP, *Outlook for net overseas migration, September 2016*