Queensland Government population projections, 2018 edition: Methodology and assumptions

Methodology

The Queensland Government produces projections of the total population by age and sex. The 2018 edition uses a 2016 base population, with time horizons to 2066 for Queensland and 2041 for sub-state areas. Data are released for the following geographic boundaries:

- the State of Queensland
- statistical areas level 4 (SA4)
- statistical areas level 2 (SA2)
- local government areas (LGA).

The geographical boundaries are sourced from the 2016 Australian Statistical Geography Standard published by the Australian Bureau of Statistics (ABS)[1].

These projections represent usual resident populations only and exclude visitors and temporary residents.

Caveats

Population projections should not be interpreted as precise point estimate forecasts or predictions. Rather, the projections reflect the outcomes of applying a set of assumptions about the future to a base population.

While past and current trends provide background to the possible demographic outlook for Queensland and SA4s, there is uncertainty around how these trends will evolve over a 50–year projection horizon for Queensland and a 25–year projection horizon at the SA4 level. For example, these population projections do not attempt to directly measure any future changes in economic, social and political conditions that may influence future population growth and distribution. As a result, the accuracy of these projections is dependent on the extent to which assumptions about future fertility, mortality and migration trends hold true. To account for this uncertainty, a range of possible outcomes rather than a single projection series provides a more realistic view of the possible future size, distribution and age structure of the population of Queensland and SA4s. As a consequence, three projection series (low, medium, high) have been produced.

Population change at the SA2 and LGA levels is more likely to be a function of available land supply and constraints, and consequent dwelling construction, than pure demographic factors alone. The spatial and temporal distribution of land supply arises from planning schemes and policies and is therefore subject to change and review. The rate at which the available land supply is used is contingent upon economic conditions and decisions made by the business community.

Users should exercise caution in the interpretation and use of population projections, particularly sub–state level projections where there is a much greater degree of uncertainty involved in generating projections.

State and statistical area level 4

Population projections for Queensland and SA4s have been developed using a multi–regional cohort component model. The cohort-component model ages population cohorts over time to the next age group, accounting for births, deaths and inward and outward migration. The model calculates births by applying assumed fertility rates to the population of women of child-bearing age. Deaths are derived by applying age–specific death rates to the population, and these rates are calculated by fitting a mortality surface to assumed life expectancies at birth. A summary of the Queensland-level assumptions is provided on page 3.

Projections for SA4s have been prepared using regionally-specific assumptions, with projected births, deaths, and overseas and interstate migration for SA4s scaled to the Queensland level. Projected intrastate migration, aggregated across all SA4s, is scaled to zero at the Queensland level. Different fertility rates and life expectancies are used for each SA4, accounting for historical differentials between each SA4 and Queensland.

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[1] ABS 1270.0 Australian Statistical Geography Standard (ASGS): Volumes 1 and 3, 2016
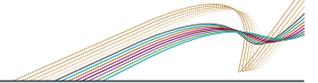
A range of data sources and information were used to inform intrastate, interstate and overseas migration shares and their respective age profiles:

- 2006, 2011 and 2016 Census of Population and Housing data published by the ABS

- Regional Internal Migration Estimates (RIME) prepared by the ABS[2]

- immigration and emigration estimates in the paper 'Methods for Estimating Sub-State International Migration: The Case of Australia'[3]

- information provided by local government councils.

The cohort component model was used to generate projections for the Greater Brisbane Greater Capital City Statistical Area (GCCSA) rather than for each individual SA4 within this area (Brisbane-East, Brisbane-North, Brisbane-South, Brisbane-West, Brisbane Inner City, Ipswich, Logan-Beaudesert, Moreton Bay-North, Moreton Bay-South). This approach was taken as future population change in a number of these SA4s is expected to be principally driven by land supply availability and constraints rather than demographic factors alone.

For the remaining SA4s in Queensland, shares (and/or levels) for each of the three components of migration (overseas, interstate and intrastate) were estimated for each region, based on the relevant data sources. Regionally–specific migration profiles were then applied to determine the sex and age pattern of each migration flow (overseas, interstate and intrastate). Migration profiles were estimated based on averaging data from the 2011 and 2016 Censuses. The profiles mapped migration propensities by sex and single year of age, and determined the pattern and distribution of inflows and outflows of overseas, interstate and intrastate migration for each region.

Statistical area level 2

Projections for SA2s have been developed using two different approaches based on urban and non-urban categories.

SA2s have been classified as 'urban' where land supply availability and constraints are expected to impact on future population change and where these data are available. Projections for these SA2s have been developed using a housing-unit model. This model uses land supply capacities to allocate detached and attached dwellings to population based on:

- vacant lots
- assumptions about the likely location and timing of infill
- recent land subdivision and dwelling construction activity
- areas of greenfield land and their expected dwelling density and development timing.

SA2s classified as 'non-urban' have been projected using an averaging model based on two trend models:

- a constant share of the state's projected population
- a variable share of the state's projected population growth.

SA2 projections are modelled to sum to the SA4 level projections.

Local government area

Projections for LGAs have not been modelled separately. Instead, these have been derived by concording data from small area projections.

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[2] ABS 3412.0 *Migration Australia,* various editions including unpublished data

[3] Tom Wilson, Northern Institute, Charles Darwin University, Australia

Assumptions

Summary table of assumptions – Queensland[a]

Series	Fertility (total fertility rate[b])	Mortality (life expectancy at birth)	Interstate migration	Overseas migration
Low	Queensland total fertility rate decreasing to 1.60 by 2021–22, then remaining constant.	Slowing rate of improvement in life expectancy at birth in Queensland: • from 0.12 to 0.05 years per annum for females, to reach 88.7 years • from 0.15 to 0.08 years per annum for males, to reach 85.9 years by 2065–66.	Net interstate migration decreasing to 14,000 persons per annum by 2021–22, then remaining constant.	Net overseas migration for Australia decreasing to 200,000 persons per annum by 2026–27, then remaining constant. Queensland's annual share increasing to 16.0% by 2026–27, then remaining constant.
Medium	Queensland total fertility rate decreasing to 1.80 by 2021–22, then remaining constant.	Average of low and high series life expectancy at birth. Life expectancy is projected to reach 91.6 years for females and 89.1 years for males by 2065–66.	Net interstate migration to reach 19,000 persons per annum by 2021–22, then remaining constant.	Net overseas migration for Australia increasing to 250,000 persons per annum by 2026–27, then remaining constant. Queensland's annual share increasing to 18.0% by 2026–27, then remaining constant.
High	Queensland total fertility rate increasing to 2.00 by 2021–22, then remaining constant.	Constant rate of improvement in life expectancy at birth in Queensland: • 0.20 years per annum for females • 0.24 years per annum for males. Life expectancy is projected to reach 94.5 years for females and 92.2 years for males by 2065–66.	Net interstate migration increasing to 24,000 persons per annum by 2021–22, then remaining constant.	Net overseas migration for Australia increasing to 300,000 persons per annum by 2026–27, then remaining constant. Queensland's annual share increasing to 20.0% by 2026–27, then remaining constant.

(a) Projections for SA4s have been prepared using regionally-specific assumptions. However, projected births, deaths, and overseas and interstate migration for SA4s are scaled to the Queensland level, with projected intrastate migration scaled to zero by definition.
(b) The number of children a woman would bear during her lifetime if she experienced current age–specific fertility rates at each age of her reproductive life.