

## Victoria Small Area Population Projections

This appendix outlines the process used for producing population and enrolment projections for all Statistical Areas Level 1 (SA1s) in Victoria, from June 2017 to June 2020.

### Projection Method

The method employed for projecting the population down to Statistical Areas Level 2 (SA2) was the cohort-component method, widely accepted as the best way of producing age/sex population projections. It involved applying annual fertility and mortality rates and internal migration and overseas migration by age and sex to the base population to produce a projected population, which then became the base population for projecting the next year and so on. This cycle was repeated until the projection horizon was reached.

The following four-tiered process was taken in projecting the resident population aged 18 years and over for all SA1s in Victoria:

1. State projections. The Victorian population was projected by age and sex.
2. Capital city/rest of state projections. The populations of Melbourne and the rest of Victoria were projected by age and sex (and constrained to 1).
3. Statistical Area Level 2 projections. The population of all of Victoria's SA2s was projected by age and sex (and constrained to 2) and a subset of those over 18 was extracted.
4. Statistical Area Level 1 projections. The SA2 projected population aged 18 and over (in 3) was split into SA1s.

Finally, the SA1 projected population aged 18 and over was combined with enrolment data to produce projected enrolments.

### 1. State Projections

The base population for the Victorian cohort-component projections was preliminary age/sex estimated resident population (ERP) as at 30 June 2016. Assumptions for the projections were based on both short and long-term trends for each component of population change. These fertility, mortality, overseas migration and interstate migration assumptions were based on those used in the latest *Population Projections, Australia, 2012 (base) -2101* (ABS cat. no. 3222.0), but adjusted to reflect more recently available data. All states and territories were independently projected, then constrained to sum to the Australian-level projection.

### 2. Capital City/Rest of State Projections

As per the state/territory level, the capital city and rest of state projections used assumptions updated from the *Population Projections* publication. 30 June 2016 base population was used, with assumptions reflecting historically observed region-specific patterns of fertility, mortality, overseas migration and internal migration. The Victorian population projections acted as control totals.

### **3. Statistical Area Level 2 Projections**

The base population for the SA2 cohort-component projections was also 30 June 2016 SA2 age/sex ERP. The fertility, mortality and migration assumptions were based on SA2-specific levels observed during the past five years, constrained to the assumed capital city/rest of state levels and trends. SA2 age/sex migration profiles were derived from 2011 Census data on place of usual residence one year ago, with migration levels based on recent growth rate and proportion of capital city/rest of state migration.

The ABS regularly collects demographic information down to the SA2 level, which means that SA2 projections (in contrast to smaller areas) are firmly based on a series of known data. At each yearly cycle in this process, the resulting SA2 projections were constrained to sum to the capital city/rest of state projections, helping to produce more reliable SA2 figures.

From the resultant 30 June SA2 projections, the projected population aged 18 and over was derived by sub setting the total population for each SA2.

### **4. Statistical Area Level 1 Projections**

SA1 projected population aged 18 and over was calculated by extrapolation using 2012-2016 SA1 ERP, and then constrained to the projected SA2 populations. Projected population aged 18 at 25 August 2019 was derived by linear interpolation using the projected populations at 30 June 2019 and 30 June 2020.

Following the above four-tiered process the projected enrolments (for SA1s) were calculated using the 4 September 2017 relationship between each SA1's enrolments and its population (see Appendix 3).

The lack of demographic data collected regularly at SA1 level makes it necessary to use the conversion method as outlined above. While the process is quite complex, it should be reiterated that the basic concept of splitting SA2s to SA1 level cannot be expected to give projections as reliable as those for SA2s. However, as the goal is to support the redrawing of federal Electoral Division boundaries which are aggregates of large numbers of SA1s there is a high likelihood that any random errors or inconsistencies will be statistically offset in the aggregation process.

#### **Boundaries**

Previous redistributions have used Census Collection Districts (CCDs) as the base unit, however in 2011 CCDs were superseded by the new SA1 unit.

SA1 and SA2 boundaries are from the *Australian Statistical Geography Standard (ASGS) Volume 1 – Main Structure and Greater Capital City Statistical Areas, July 2011* (ABS Cat. 1270.0.55.001) corresponding to those used for the 2011 Census.

#### **Disclaimer**

It is important to recognise that the projection results in this report reflect the assumptions made about future fertility, mortality and migration trends. While these assumptions are formulated on the basis of an objective assessment of historical demographic trends and their likely future dynamics, there can be no certainty that they will be realised.

The ABS takes responsibility for the method employed, however in accordance with ABS policy regarding small area population projections, the assumptions used are the final responsibility of the client, and the projections are not official ABS population statistics.

The projections may be referred to as "...projections prepared by the ABS according to assumptions reflecting prevailing trends agreed to by the Australian Electoral Commission...".

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