



National Population Estimates (2018-base)

Table of Contents

| | |
|---|---|
| National Population Estimates (2018-base) | 3 |
| National Population Estimates (2018-base) | 3 |
| Methodology | 3 |
| Related Materials | 5 |
| Publication | 5 |
| Variables | 5 |

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The estimated resident population at 30 June 2018 is the 2018 Census usually resident count updated for:

- residents missed or counted more than once by the census (net census undercount),
- residents temporarily overseas on census night,
- births, deaths, and net migration between census night and 30 June 2018,
- reconciliation with demographic estimates at ages 0–14 years.

Quarterly national population estimates from September 2018 onwards were derived by updating the estimated resident population at 30 June 2018 for births, deaths, and net migration during the following period.

Methodology

They are also widely used in analysing changes in the demographic, economic and social structure of New Zealand, eg in the calculation of mortality rates, participation rates in education, per capita consumption of goods within New Zealand, electoral enrolment rates, and crime rates, etc.

The estimated resident population is produced using the component methodology and 'date of event' method.

Date of event method means that demographic events (births, deaths and migration) used in producing population estimates are classified by their date of occurrence.

For demographic accounting, each demographic event is classified by the year and quarter of birth of the person to whom the demographic event applies.

The estimated resident population uses census data (census usually resident population count) as a starting point.

Consequently, estimates of the resident population based on one census cover one intercensal period (and slightly beyond) until more recent census data becomes available. When the more recent census data becomes available, this is incorporated into the new base for the next 5-year period, etc.

After each Census of Population and Dwellings, Statistics New Zealand routinely revises all its national and sub national population estimates, using data from the latest two censuses.

National population estimates are produced quarterly.

To produce population estimates for the current quarter (i.e. the quarter under consideration, or the reference quarter), previous estimates (or the base population) are updated using births, deaths and external migration data for the current quarter.

Birth and death registrations are captured by the Department of Internal Affairs. Statistics New Zealand receives this vitals data each month.

Live births to women resident in New Zealand are classified by the sex of the child and by the year and quarter of birth.

Deaths of New Zealand residents are classified by the sex, and by the year and quarter of death of the deceased.

To meet production timetables the numbers of births and deaths that occurred in the most recent quarter are estimated. Estimation for births and deaths is necessary as not all births and deaths that occur in a quarter are registered by the end of the quarter. Migration data is defined by the outcomes-based measure using linked travel histories and a rule for determining a change in resident status.

The formula used for estimating the national resident population is:

Population (current quarter) = population (previous quarter) + births - deaths + net migration (difference between international migrant arrivals and departures).

Base population

The estimated resident population at 30 June 2018 forms the base population for deriving postcensal population estimates. We derived the estimated resident population of New Zealand at 30 June 2018 (4,900,600) from the 2018 Census usually resident population count at 6 March 2018 (4,799,655), with adjustments for:

- residents missed or counted more than once by the census (net census undercount) (+124,900)
- residents temporarily overseas on census night (+77,200)
- natural increase (births less deaths) between census night and 30 June 2018 (+8,000)
- net migration between census night and 30 June 2018 (+7,300)
- reconciliation with demographic estimates at ages 0–14 years (-16,600).

We derive quarterly national population estimates from September 2018 onwards by updating the estimated resident population at 30 June 2018 for births, deaths, and net migration during the following period.

Accuracy of data

Official national population estimates give the best available measure of how many people usually live in New Zealand. We produce national population estimates using a component methodology, where a base population is updated for the components of population change (births, deaths, and international migration).

All population estimates have some uncertainty around them. Generally, the uncertainty associated with population estimates increases as the estimates move further away from the base (starting point). Uncertainty also increases as population estimates are disaggregated (e.g. by age or subnationally).

The uncertainty is the net combined effect of:

- uncertainty in the census-based estimates of the population at 30 June of the current or previous census year, including uncertainty in the census counts (e.g. from respondent errors or census processing) and uncertainty in the adjustments (e.g. for net census undercount and residents temporarily overseas)
- uncertainty in the estimates of any of the components of population change (births, deaths, and migration) since the previous census.

It is not possible to verify the ongoing accuracy of current national population estimates, as no other independent or authoritative measure of the resident population exists. It is possible to derive retrospective measures of accuracy following the periodic Census of Population and Dwellings.

Following the 2018 Census, we revised national population estimates at 30 June 2018 up by 60,000 (1.2 percent relative to the revised estimate).

International migration estimates

International migration statistics are based on the outcomes-based migration measure. The measure uses linked travel histories and a rule for determining a change in resident status. This rule is independent of the individual's legal residence status and also independent of the information stated on arrival and departure passenger cards.

This rule takes into account where a traveller started, and whether they spend more than 12 of the next 16 months in, or out, of New Zealand following a border crossing.

The outcomes-based migration measure requires observing travellers for up to 16 months after their initial border crossing, so we must use a model to provide timely estimates of migration. These provisional estimates are updated on a monthly basis. This is because the proportion of border crossings that can be classified with certainty increases with time.

All arrivals and departures are processed so they can be allocated to one of three passenger types:

- overseas visitors,
- New Zealand-resident travellers,
- long-term migrants.

The net number of long-term migrations provides the estimate of international migration used in deriving the national population estimates.

Provisional and final estimates

Provisional estimates are published approximately six weeks after the reference date.

These are updated each quarter until all contributing migration estimates are final. This means that each quarterly estimate is revised 6 times, so the time series is consistent with the most up-to-date estimates of international migration.

The births and deaths components are revised once, four months after the reference date, to account for delayed registrations of births and deaths.

Birth and death estimates

There is some uncertainty associated with birth and death data. Birth and death registrations are used to estimate the number of births and deaths that occurred during each quarter. Not all births and deaths that occur in a quarter are registered by the end of the quarter, and this delay in registration is taken into account when estimating birth and death occurrences in the current quarter.

Birth estimates

The provisional estimation for births at the reference quarter is taken as those births that were registered either in the reference quarter or in the subsequent quarter, and that occurred in the reference quarter.

The final estimates are produced a quarter later after provisional estimates, when an extra quarter of birth registration data for the reference quarter are available.

Births that are registered after 2 years will be adjusted for in both provisional and final birth estimates. The final estimation for births that occurred in a quarter is less accurate, as births are not registered as closely to their occurrence as are deaths (around 5 percent of births are not registered either in the quarter of occurrence or in the subsequent quarter).

The final estimation for quarterly births has a 95 percent confidence interval of ± 500 (or about 3.5 percent, based on an average of 14,000 births per quarter).

Starting from June 2016, we began constraining provisional estimation of births to the number of birth notifications received by the DIA, to protect against volatility.

Death estimates

The estimate of deaths that occurred in the reference quarter is taken as those deaths that were registered either in the reference quarter or in the subsequent quarter, and that occurred in the reference quarter.

The provisional estimation for quarterly deaths has a 95 percent confidence interval of ± 250 (or about 3.5 percent, based on an average of 7,000 deaths per quarter).

This final estimation for deaths is very accurate as very few deaths are registered later than one quarter after their occurrence (about 1 death in a 1,000 is not).

Population clock

Statistics NZ's online population clock gives a real-time approximation of the estimated resident population of New Zealand. The population clock uses the latest quarterly estimated resident population, and estimates of the expected number of births, deaths, and net migration for the coming quarter. The settings for each component (births, deaths, and net migration) are determined in advance of each quarter, based on recent trends, and will not necessarily reflect actual population change. The quarterly settings are converted into a 'per minute' figure, making allowance for the number of days per quarter.

Rounding

All figures in this release were rounded independently. Estimates of the total population, natural increase, net migration, and broad age groups are rounded to the nearest 100. National population estimates of five-year age groups are rounded to the nearest 10. All derived figures in this release use data of greater precision than that published.

Related Materials

Publication

- [Estimated resident population 2018: Data sources and methods](#)

Variables