Stats NZ
Tatauranga Aotearoa

Session 7: Methods for producing Tongan population estimates

Kim Dunstan & Cat Anderson

Basic population equation

$$P_{t+1} = P_t + \underbrace{B - D}_{\text{Natural increase}} + \underbrace{I - O}_{\text{Net migration}}$$

P_{t+1}	Population at end of time period
P_t	Population at start of time period (base population)
B	Births during time period
D	Deaths during time period
I	In-migration (arrivals) during time period
O	Out-migration (departures) during time period

Exercise 1

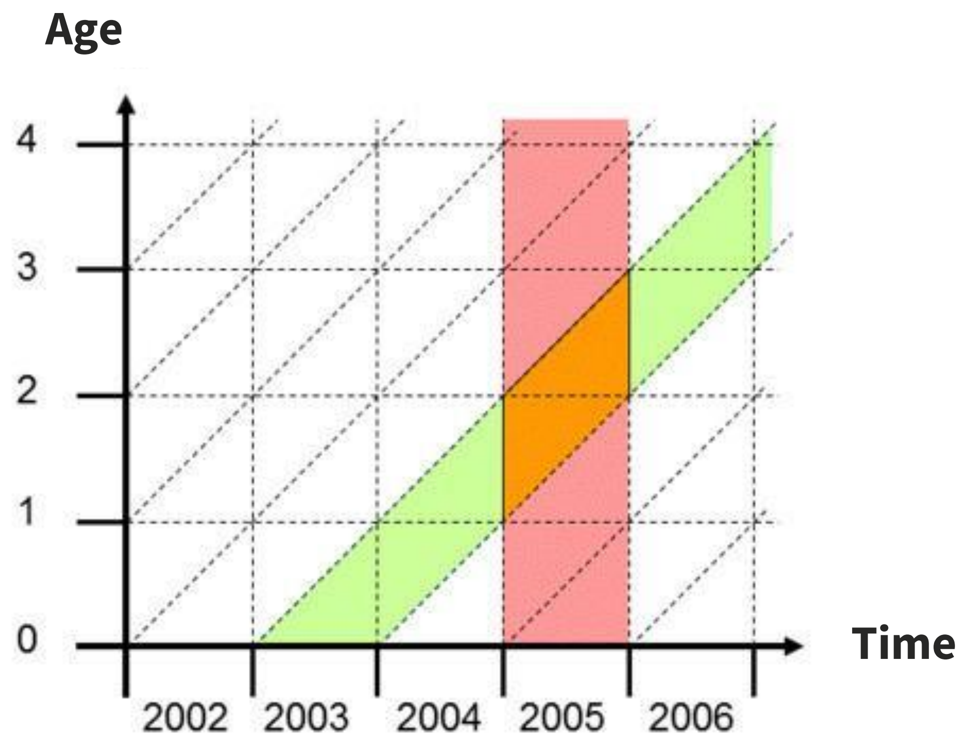
Annual estimates from 30 June 2016 to 30 June 2021
Total population only

Exercise 2

6-monthly estimates from 30 June 2016 to 30 June 2021

Total population only

Lexis Diagram



Exercise 3

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Annual estimates from 30 June 2016 to 30 June 2021
Total population by 5-year age groups
(0-4, 5-9, … 80-84, 85+ years)

Exercise 4

Annual estimates from 30 June 2016 to 30 June 2021
Total population by sex (male, female) by single-year of age
(0, 1, 2, … 84, 85+ years)

‘As at’ and ‘mean’ population estimates

- Basic calculations produce estimates ‘as at’ a given date
- Suitable as denominator for stock populations:
  - Population shares at a date
  - Population change between two dates
- Where the numerator is ‘flow’ data – over a period of time – a more appropriate denominator is a ‘mean’ population
- This is simply the weighted average of ‘as at’ populations
  - Mean pop YE Jun 2017 = ½.‘30 June 2016’ + ½.‘30 June 2017’
  - Mean pop YE Jun 2017 = ¼.‘30 Jun 2016’ + ½.‘30 Sep 2016’ + ½.‘31 Dec 2017’ + ½.‘31 Mar 2017’ + ¼.‘30 Jun 2017’
- Suitable as denominator for flow populations:
  - GDP per capita
  - Birth and death rates
- The ‘as at’ population in the middle of the year ≈ ‘mean’ population over the year