Challenges in measuring subnational mobility

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Disclaimer

- The opinions, findings, recommendations, and conclusions expressed are those of the author, not Stats NZ.
So, where are we?
There’s a lot of space, but not many people
Some definitions

Mobility

- People move – either short term or for longer periods (including permanently)
- Longer term moves may be referred to as migration
- Populations of interest include people moving across boundaries and within boundaries, as well as people who are not moving at all
Some definitions

Migration

• International migration usually defined as a move of 12 months or more duration – across a border
• Internal migration defined generally as a move from one self-identified usual address to another
Some definitions

Subnational

- Between defined areas within a country – may be at any scale
- But can be extended to any polity with open borders
So, this includes

Mobility, migration and a subnational dimension

• International exchange of people
• Intra-national exchange of people
• The relationship between these flows and with the non-mobile population
Migration is volatile in New Zealand

The measurement problem

- Over 13 million border movements
  - 6,631,129 arrivals
  - 6,570,631 departures
- And, at the moment
  - less than 2 percent of arrivals are PLT
  - less than 1 percent of departures are PLT
Permanent and long-term migration
Year ended November 2017

Arrivals of non-NZ citizens: 99,400 ↓ 0.1%
Departures of non-NZ citizens: 27,800 ↑ 1.3%
Arrivals of NZ citizens: 32,100 ↓ 0.1%
Departures of NZ citizens: 33,400 ↓ 0.4%

Net migration of non-NZ citizens: 71,700
Net migration of NZ citizens: -1,300
Total net migration: 70,400

Note: Totals may not sum due to rounding.
Percentage changes are indicative of the November 2017 year compared with the October 2017 year.
Source: Stats NZ
Permanent & Long-Term Arrivals and Departures: 1978-2016

Thousands of people

140
120
100
80
60
40
20
0
-20
-40
-60

International Forum on Migration Statistics
Internal flows (2013 Census)

Almost half the population changed address

- Of those with specified address 5 years ago in 2013 Census
- 46 percent were at the same address
- 31 percent moved within the same regional council area
- 8 percent changed their regional council
- 7 percent were overseas and 8 percent had not been born
Internal flows (2013 Census)

But there are some limitations…

• 9 percent of population did not give an address able to be coded at region level
• people who had moved may have moved several times
• excludes people who were not counted by the census or had left NZ
Internal flows (2013 Census)

For those counted in the Census, we know

• how many are counted as usually living in the region
• the gains and losses for the region
• the gains as at census date due to inflows from overseas and births
• we do not have a direct measure of mobility for those gone overseas or died
Flows of people relative to 5 years ago

Nonmovers 46% + Movers within region 31% = Overseas inflow 8% + Overseas outflow ? + From other regions 8% + Deaths ?
National level Population outcomes
(2013 Census)
More measurement challenges

**Internal mobility**

- Census valuable source for location at points in time
- Linked Census good for flow histories at census time nodes
- Misses intermediate moves and limited granularity
- Administrative source can add some information
More measurement challenges

International mobility

- Very good information on
  - total arrivals at the national level (but limited information on address in New Zealand)
  - total departures at the national level (but only intended destinations)
    - But only as long as there are departure cards
Internal flows (2013 Census)

Intentions data for international travelers

- Subject to change of intentions and on-shore transitions of status
- In future, alternative data sources will be needed (more on this below)
Comparing traveller intentions and outcomes

Migrant arrivals and departures
By 12/16-month rule and PLT measures
2001–15

Source: Stats NZ
Measurement of international mobility

- Traveller intentions collected historically by cards
- Intentions and outcomes often differ
- In the future, a longitudinal approach to derive outcomes
  - statistical resident status defined as living in NZ for 12 months or more in a 16 month period
  - independent of passenger card information
- Harmonised with Australia
Measurement of internal migration

Current approach for residential migration in estimation

- computation of stocks and transitions using admin sources, such as tax, primary health enrolments, electoral enrolments
- preferential use of source by age
- coverage estimated in base year only adjustments of student, prison and military populations
- requires manual intervention and reliant expert judgement
Measurement of internal migration

Improvements identified

- transparent and consistent use of administrative sources
- provide estimates of internal migration flows
- evaluation of principles of measurement required
- recognition that estimation is only one use of internal migration data
Future potential

An internal 12/16 approach

• Subnationally, mobility is a change of geography
• Not logical to define internal and international flows on a different basis
• A 12/16 month approach to all people enables definition of temporary mobility
Measurement of internal migration

An internal 12/16 approach – some other benefits

• People may have multiple usual addresses, regularly commute, move frequently
• Service populations are often required but currently poorly measured
• Provides longitudinal mobility at the individual level
• Enables estimation at a range of geographic and temporal scales
• Enables real-time estimation and improved projection bases
Links between internal and international mobility

• Immigrants relocate after settlement
  • where to and from and outcomes matter
• Partnering between migrants and locally born
• Changing social and economic characteristics
• Returning migrants may return to a different area than they left
  • mobility of NZ born and overseas born differs in reasons and consequences
What do we need to know, and how can we measure it?

Some content requirements

• Individual demographic variables
  • date of birth, sex, country of birth, addresses time stamped, ethnicities time stamped, Maori descent, date of death,

• Family
  • partnering/childbearing, linked relationships between people and children/parents

• Households
And that might mean a different kind of census

Census Transformation?

• New Zealand has had a 5-yearly survey-based census since 1851 and the next census March 2018
• Census transformation and Next Census programs
• Range of options under consideration
• Work so far implies significant gains in efficiency and robustness in population estimation, gaps still require solutions
Statistical person register (SPR)

A “population spine”

- Official Statistics
  - in production systems
- Research purposes
  - Stats NZ access to microdata
  - External access to microdata
........ estimating populations

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15-16 January 2018

International Forum on Migration Statistics
And different population measures

Demographic accounts

• Where the SPR has individual record data, demographic accounts will aggregate cell-count data
• Bayesian statistical framework
• Limited range of key demographic measures
• But, a powerful tool for longer time series, with build-in uncertainty measures, and able to exploit many sources
Where are we now?

- Reasonably well placed for international migration data
- Less well placed with internal migration
- Data environment changing – potentially dramatically
And we would like to be…

- Able to observe population mobility – in detail, at defined parameters, at local levels, at any time
- Future solutions are being investigated – perhaps combining:
  - Statistical person register,
  - Periodic survey-based census
  - Demographic accounts for aggregation and small area population estimation
Next Steps?

• Wider discussion on requirements, theory and methods
• Integrate across the Official Statistical System for timeliness and accuracy
• Develop a prototype person register and demographic accounts system
• Productionise – including automation for routine production, but retaining flexibility and scope for research