# Australian Internal Migration (AIM) Database
## Its Development and Utilization


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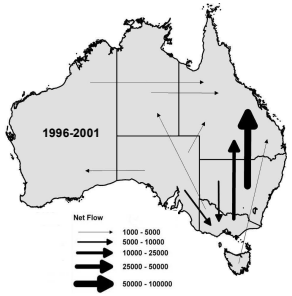
## Background

- Long standing recognition of significance of Australian internal migration (Bell and Hugo, 2000).
- Most studies, however, primarily adopted a cross sectional approach and limited time series comparisons.
- Moreover, relatively little systematic analysis has been undertaken such as international comparisons of internal migration.
- Unavailability of comparable time-series data sets is the main reasons for this.




***Hence, it is essential to construct a geographically consistent time series database in order to understand migration behavior and to track its dynamic changes over time.***

Table 1. International Comparisons of Internal Migration (2001)

| *One-year interval* | | *Five-year interval* | |
|---|---|---|---|
| ***Country*** | ***% Moved*** | ***Country*** | ***% Moved*** |
| United States | 16.3 | New Zealand | 49.4 |
| Australia | 17.5 | United States | 43.0 |
| Canada | 14.3 | Australia | 42.1 |
| United Kingdom | 12.0 | Canada | 41.9 |
| Netherlands | 10.2 | Korea | 31.4 |
| Ireland | 8.8 | Japan | 28.1 |
| Belgium | 5.3 | Puerto Rico | 27.2 |
| Norway | 4.5 | Norway | 23.3 |

*Source:* Brown, D., Bell, M. and Hugo, G (forthcoming) Trends and patterns of internal migration. In: *Australian mobility in the new millennium,* Chapter 2.
*Note:* Migration data were captured in different ways in those countries.

## Objectives

- To develop an internal migration database for Australia which:
  - Overcomes geographical boundary inconsistencies
  - Provides a time-series of internal migration
  - Affords the user to undertake APC (age-period-cohort) analysis
  - Offers the possibility to do cross national comparisons
- To support the systematic analysis of migration through the research grant on "Understanding the dynamics and structure of Internal Migration in Australia"
- To increase the use of migration data from censuses by providing users with the access to the AIM database.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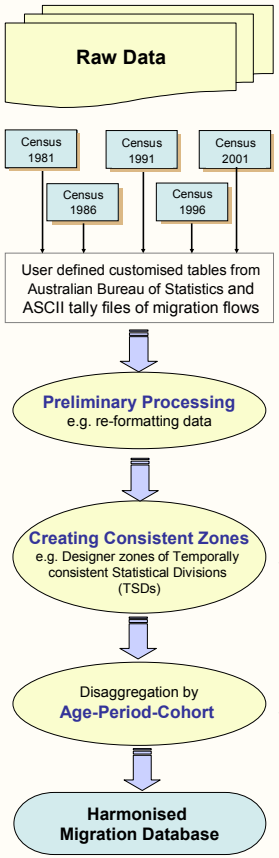
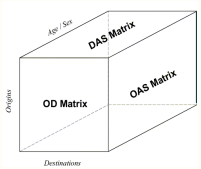
## Construction of Database




Large Interaction Database:
5 x 69 x 69 x 2 x 16 x 20

- 5 sequential census periods: 1976-81, 1981-86, 1986-91, 1991-96, and 1996-2001
- 69 TSD of Origins and Destinations
  → Aggregated to 38 City Regions
  → Aggregated to 8 States/Territories
- 2 sexes (male and female)
- 16 age groups: 0-4, 5-9, 10-14, …75+
- 20 birth cohorts: pre-1906,…,1996-01

### *Step 1. Preliminary Processing*

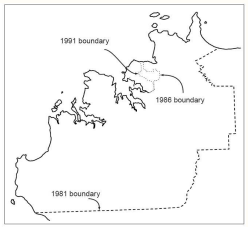



To create a uniform dataset, the framework for database is organized as **SODAPC** (Sex-Origin-Destination-Age-Period-Cohort)

*Age* at time of migration
*Period* of migration
*Birth* cohort membership

Data re-formatting:
1. To define the migration data (e.g. event or transition)
2. To define the population at risk (PAR)
3. To define the migration period: one or five years base

### *Step 2. Response to boundary changes*




Some administrative boundaries in each census period tend to change.

Eg. the changes in boundaries of Darwin (Northern Territory) for Statistical Divisions (SD) in the 1981, 1986 and 1991 censuses.

***Creating the designer zones*** (by applying one of the methods in defining temporally consistent migration regions, Blake *et al.* 2000).

1. Comparing the SLA (the smallest of spatial unit code) and SD (Statistical Divisions) boundaries at each of censuses to identify the boundary changes.
2. Using SD as the lowest spatial level which relatively homogeneous region characterised by identifiable social and economic links between the inhabitants and between the economic units in the region (ABS, 1992).
3. A heuristic procedure was used to search for the nearest set of boundaries at SLA level.
4. Adopted the 1996 SDs as the standard (where possible).

### *Step 3. Finalized database*

| Age group | Age Code |
|---|---|
| 0-4 | 1 |
| 5-9 | 2 |
| 10-14 | 3 |
| 15-19 | 4 |
| 20-24 | 5 |
| 25-29 | 6 |
| 30-34 | 7 |
| 35-39 | 8 |
| 40-44 | 9 |
| 45-49 | 10 |
| 50-54 | 11 |
| 55-59 | 12 |
| 60-64 | 13 |
| 65-69 | 14 |
| 70-74 | 15 |
| 75+ | 16 |

| Period years | Period Code |
|---|---|
| 1976-81 | 1 |
| 1981-86 | 2 |
| 1986-91 | 3 |
| 1991-96 | 4 |
| 1996-01 | 5 |

| Birth cohort years | Cohort code |
|---|---|
| Pre -1906 | 1 |
| Born 1906-11 | 2 |
| Born 1911-16 | 3 |
| Born 1916-21 | 4 |
| Born 1921-26 | 5 |
| Born 1926-31 | 6 |
| Born 1931-36 | 7 |
| Born 1936-41 | 8 |
| Born 1941-46 | 9 |
| Born 1946-51 | 10 |
| Born 1951-56 | 11 |
| Born 1956-61 | 12 |
| Born 1961-66 | 13 |
| Born 1966-71 | 14 |
| Born 1971-76 | 15 |
| Born 1976-81 | 16 |
| Born 1981-86 | 17 |
| Born 1986-91 | 18 |
| Born 1991-96 | 19 |
| Born 1996-01 | 20 |

| Sex | Code |
|---|---|
| Males | 1 |
| Females | 2 |

## Applications

- The AIM Database has been used in wide range of studies, among others are: Brown et al. (2006) *The structure of internal migration;* Bell et al. (2006) The changing structure of internal migration in Australia, and Bell *et al.* (2006) Regional and cohort dimension of Australian internal migration.
- It can be utilised as a testing ground for models and theories of migration e.g. four key dimensions of migration measurements (Bell *et al.* 2002)

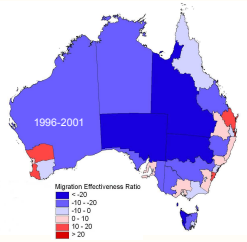
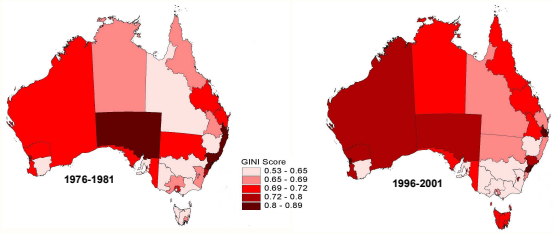



Table 2. Measurements of Internal Migration in Australia's City Regions: 1976-2001

| Dimension/ Measures | 1976-81 | 1981-86 | 1986-91 | 1991-96 | 1996-01 |
|---|---|---|---|---|---|
| **Intensity** | | | | | |
| Crude Migration Probability | 168.89 | 167.30 | 165.21 | 156.38 | 149.04 |
| Gross Migra-production Probability | 11.30 | 11.29 | 11.32 | 10.88 | 10.68 |
| **Connectivity** | | | | | |
| Migration Gini Index | 0.77 | 0.75 | 0.74 | 0.75 | 0.76 |
| **Impact** | | | | | |
| Aggregate Net-migration | 780,480 | 705,014 | 813,942 | 779,218 | 714,046 |
| Aggregate Net-migration Probability | 2.60 | 1.87 | 1.99 | 1.70 | 1.24 |
| Migration Effectiveness Index | 15.37 | 11.20 | 12.02 | 10.87 | 8.34 |

Source: Bell *et al.* (2006)




## Conclusions

- The AIM database is a unique dataset for understanding the dynamics and structure of internal migration in Australia.
- It has allowed comparative analysis with migration in other countries, including UK and New Zealand, to be carried out by resolving the definitional, measurement and geographical inconsistencies among the data sets.
- The database has advantages in the design of the zonal system (consistency across censuses), and in the methods used to decompose inter-regional flows (to differentiate age groups, periods, and birth cohorts).
- The database will be extended in the near future to incorporate the 2006 census data.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