# Insights from the Australian Census Longitudinal Dataset:
## Housing tenure transition in Australia

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# Introduction

# Outline

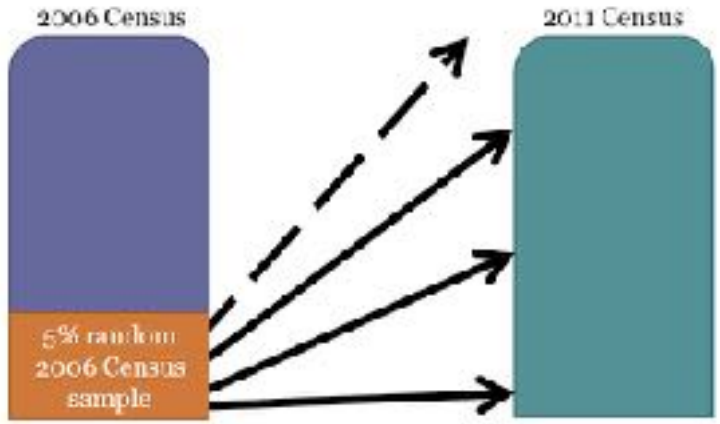
1. What is the ACLD?
2. ACLD vs HILDA
3. Housing tenure transitions
4. Modelling data from the ACLD
5. Concluding remarks

# What is the ACLD?

# The ACLD

- Random 5% sample of the Australian population
- Linked across 2006 and 2011 censuses
- 800,759 records (adjusted for births, deaths, and migration)

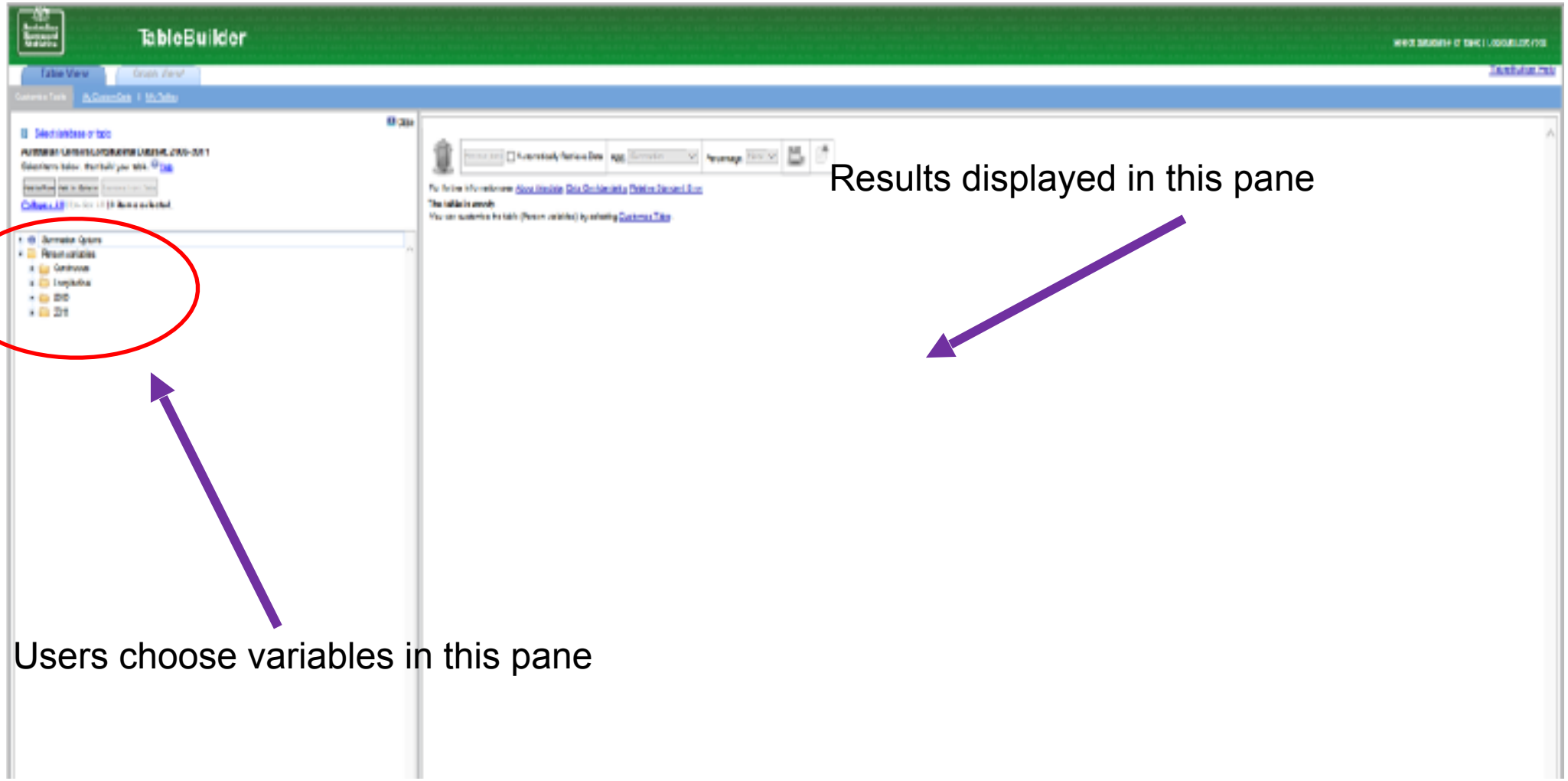
- Includes variables such as:
  - Age, gender, marital status
  - LGAs, ASGS areas, SEIFA
  - Culture and language
  - Education
  - Workforce
  - Family items



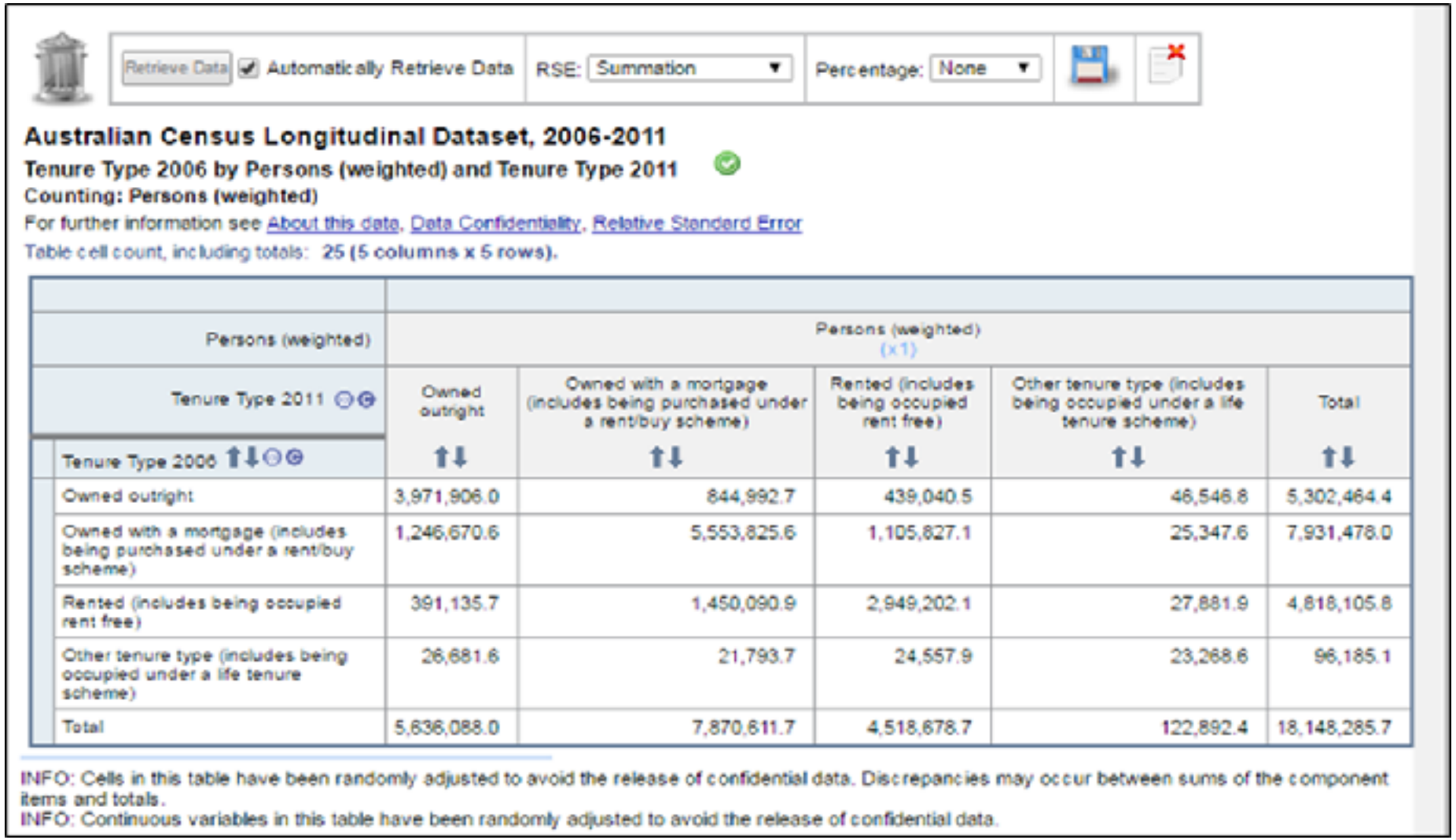
# Accessing the ACLD

- ABS Tablebuilder
  - Users have access to tabulated data
  - Users can design large complex tables
  - Download data to workstation
  - Perform analysis on desktop
- ABS Microdata
  - Users has access to confidential unit-record data
  - DataLab on-site at all ABS offices
  - Outputs are vetted by ABS staff

# ABS Tablebuilder



# What can you do with TableBuilder



Retrieve Data | Automatically Retrieve Data | RSE: Summation | Percentage: None

**Australian Census Longitudinal Dataset, 2006-2011**

**Tenure Type 2006 by Persons (weighted) and Tenure Type 2011**

**Counting: Persons (weighted)**

For further information see About this data, Data Confidentiality, Relative Standard Error

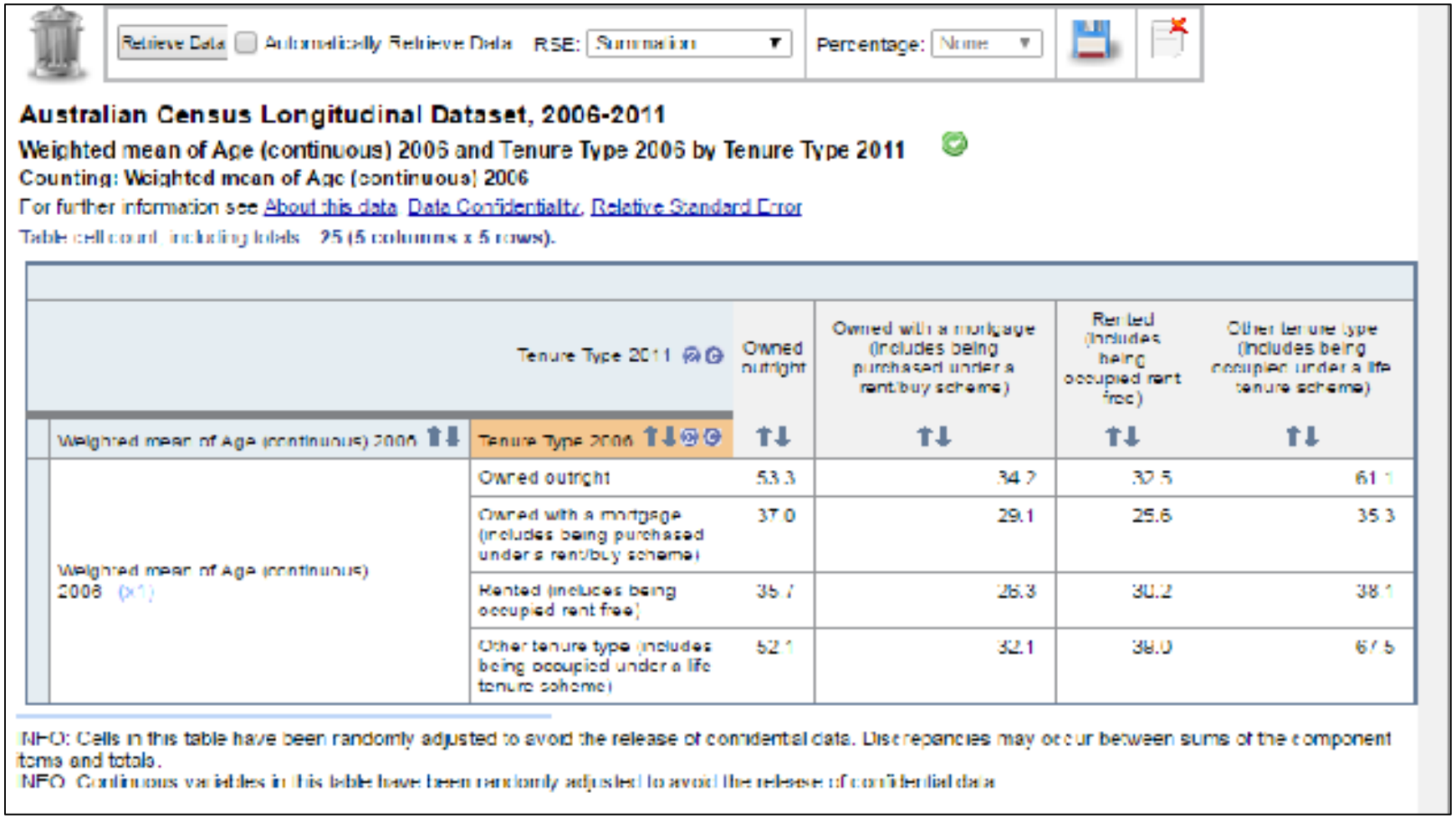
Table cell count, including totals: **25 (5 columns x 5 rows).**

| Persons (weighted) | Persons (weighted) (x1) | | | | |
|---|---|---|---|---|---|
| Tenure Type 2011 / Tenure Type 2006 | Owned outright | Owned with a mortgage (includes being purchased under a rent/buy scheme) | Rented (includes being occupied rent free) | Other tenure type (includes being occupied under a life tenure scheme) | Total |
| Owned outright | 3,971,906.0 | 844,992.7 | 439,040.5 | 46,546.8 | 5,302,464.4 |
| Owned with a mortgage (includes being purchased under a rent/buy scheme) | 1,246,670.6 | 5,553,825.6 | 1,105,827.1 | 25,347.6 | 7,931,478.0 |
| Rented (includes being occupied rent free) | 391,135.7 | 1,450,090.9 | 2,949,202.1 | 27,881.9 | 4,818,105.8 |
| Other tenure type (includes being occupied under a life tenure scheme) | 26,681.6 | 21,793.7 | 24,557.9 | 23,268.6 | 96,185.1 |
| Total | 5,636,088.0 | 7,870,611.7 | 4,518,678.7 | 122,892.4 | 18,148,285.7 |

INFO: Cells in this table have been randomly adjusted to avoid the release of confidential data. Discrepancies may occur between sums of the component items and totals.
INFO: Continuous variables in this table have been randomly adjusted to avoid the release of confidential data.

- ➢ Row %
- ➢ Column %
- ➢ Total %

# Continuous data



Retrieve Data | Automatically Retrieve Data | RSE: Summation | Percentage: None

**Australian Census Longitudinal Dataset, 2006-2011**

**Weighted mean of Age (continuous) 2006 and Tenure Type 2006 by Tenure Type 2011**

**Counting: Weighted mean of Age (continuous) 2006**

For further information see About this data, Data Confidentiality, Relative Standard Error

Table cell count including totals 25 (5 columns x 5 rows).

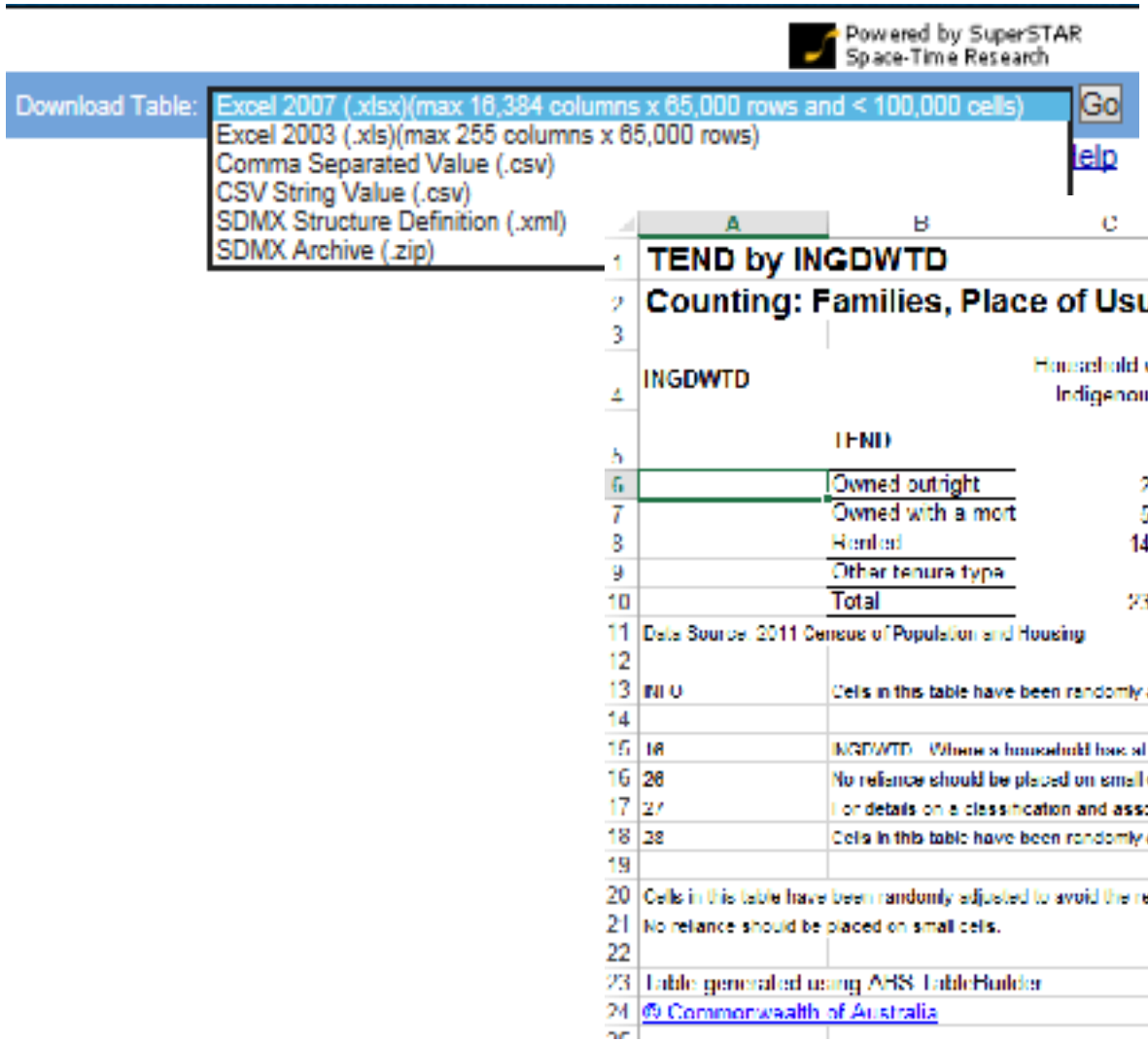
| | Tenure Type 2011 | Owned outright | Owned with a mortgage (includes being purchased under a rent/buy scheme) | Rented (includes being occupied rent free) | Other tenure type (includes being occupied under a life tenure scheme) |
|---|---|---|---|---|---|
| Weighted mean of Age (continuous) 2006 | Tenure Type 2006 | | | | |
| Weighted mean of Age (continuous) 2006 (x1) | Owned outright | 53.3 | 34.7 | 37.5 | 61.1 |
| | Owned with a mortgage (includes being purchased under a rent/buy scheme) | 37.0 | 29.1 | 25.6 | 35.3 |
| | Rented (includes being occupied rent free) | 35.7 | 26.3 | 30.2 | 38.1 |
| | Other tenure type (includes being occupied under a life tenure scheme) | 52.1 | 32.1 | 38.0 | 67.5 |

NFO: Cells in this table have been randomly adjusted to avoid the release of confidential data. Discrepancies may occur between sums of the component items and totals.

NFO: Continuous variables in this table have been randomly adjusted to avoid the release of confidential data

- Mean, median, sum
- Quantiles
- ranges

# Export data from TableBuilder



# ACLD versus Census

- **Use the Census datasets** if you are interested in point in time estimates such as the unemployment rate in 2006 or how many individuals owned their home outright in 2011.

Census datasets => whole population
ACLD => in both the 2006 and 2011 Censuses.

- **Use the ACLD** when you are interested in estimates of transitions between 2006 and 2011.

Census datasets => not linked
ACLD => linked, allows examining transitions between 2006 and 2011.

# How does the ACLD compare to HILDA?

# Indigenous Population

- HILDA ≈ 2% Indigenous ≈ 200 people
- ACLD ≈ 2.25% Indigenous ≈ 22,000 people

# Comparison with HILDA – Indigenous Persons 2006

| | Level | ACLD | HILDA | Difference |
|---|---|---|---|---|
| **Age** | 21 to 30 | 33% (1,619) | 39% (49) | 6% |
| | 31 to 40 | 32% (1,567) | 27% (34) | 5% |
| | 41 to 60 | 36% (1,766) | 34% (42) | 2% |
| **Gender** | Male | 41% (2,036) | 34% (43) | 7% |
| | Female | 59% (2,917) | 66% (82) | 7% |
| **Tenure** | Rent | 72% (3,584) | 77% (96) | 5% |
| | Owned | 28% (1,368) | 23% (29) | 5% |
| **Marital** | Married | 32% (1,590) | 28% (35) | 4% |
| | Never Married | 54% (2,654) | 50% (63) | 4% |
| | Other | 14% (700) | 22% (27) | 8% |

# Comparison with HILDA – Indigenous Persons 2006

| | Level | ACLD | HILDA | Difference % |
|---|---|---|---|---|
| **Family type** | Couple | 56% (2,796) | 46% (58) | 8% |
| | One parent | 25% (1,251) | 34% (42) | 9% |
| | Other | 18% (911) | 20% (25) | 2% |
| **Labour status** | Employed | 57% (2,803) | 54% (68) | 3% |
| | Unemployed | 8% (390) | 12% (15) | 4% |
| | Other | 36% (1,764) | 34% (42) | 2% |
| **Geography** | Major city | 34% (1,676) | 42% (53) | 8% |
| | Regional | 42% (2,081) | 50% (63) | 8% |
| | Remote | 24% (1,215) | 8% (9) | 16% |

# Comparison with HILDA

- Pros of ACLD
  - 800,000 records in ACLD
  - Likely better coverage of hard to reach persons
  - Tenure transition at individual level (not family level)
  - Results available weighted to Australian population

- Cons
  - Count data or summaries (mean, median) if using Tablebuilder

# So why would you use longitudinal ACLD?

- Transitions over 5 year periods
- Large sample of population
- Captures disadvantaged sub-groups
- Next wave will include 3 time points

# Housing tenure transitions

# Housing tenure transitions (def)

# Short Introduction to Australian Housing Research

- Housing transitions are a result of adapting housing needs to changes occurred by life-cycle events (Rossi, 1955)
- Households ascend three separate but related ladders:
- employment, life stage & housing ladder => “career” (Kendig, 1984)
- Housing careers uniform, “upwards”, aim: homeownership
- “housing pathways” better explains the  diversity and discontinuity of housing pathways in Australia (Beer &Faulkner 2009)
- Previous generations pathway clearly defined:

  marry - child – home ownership

# Short Introduction to Australian Housing Research

Social research has shown: relationship formation and birth of a child primary trigger to enter home ownership

⇒Less predictable (lifestyle choices)

> “union formation”: social expectation to marry has declined

> 1/3 Australian women are expected to be childless in the future

> age of parent at birth of first child has been pushed back

> divorce increasingly associated with tenure transitions

> more time spent in further education
=> delayed entry into labour force

# Short Introduction to Australian Housing Research



Importance of understanding housing pathways:

=> Age pension in Australia set to lower rates

compared to other countries, assuming

lower outright home ownership

# Previous results using HILDA

~40% stable housing tenure over 10 waves of HILDA

~42% of housing pathways can be explained as married couple with children to transition from renting to owning

➢ positive association of a birth event after entering home ownership

➢ entering home ownership without children was found to have the strongest association with a significant increase in housing affordability measures.

# Modelling with the ACLD

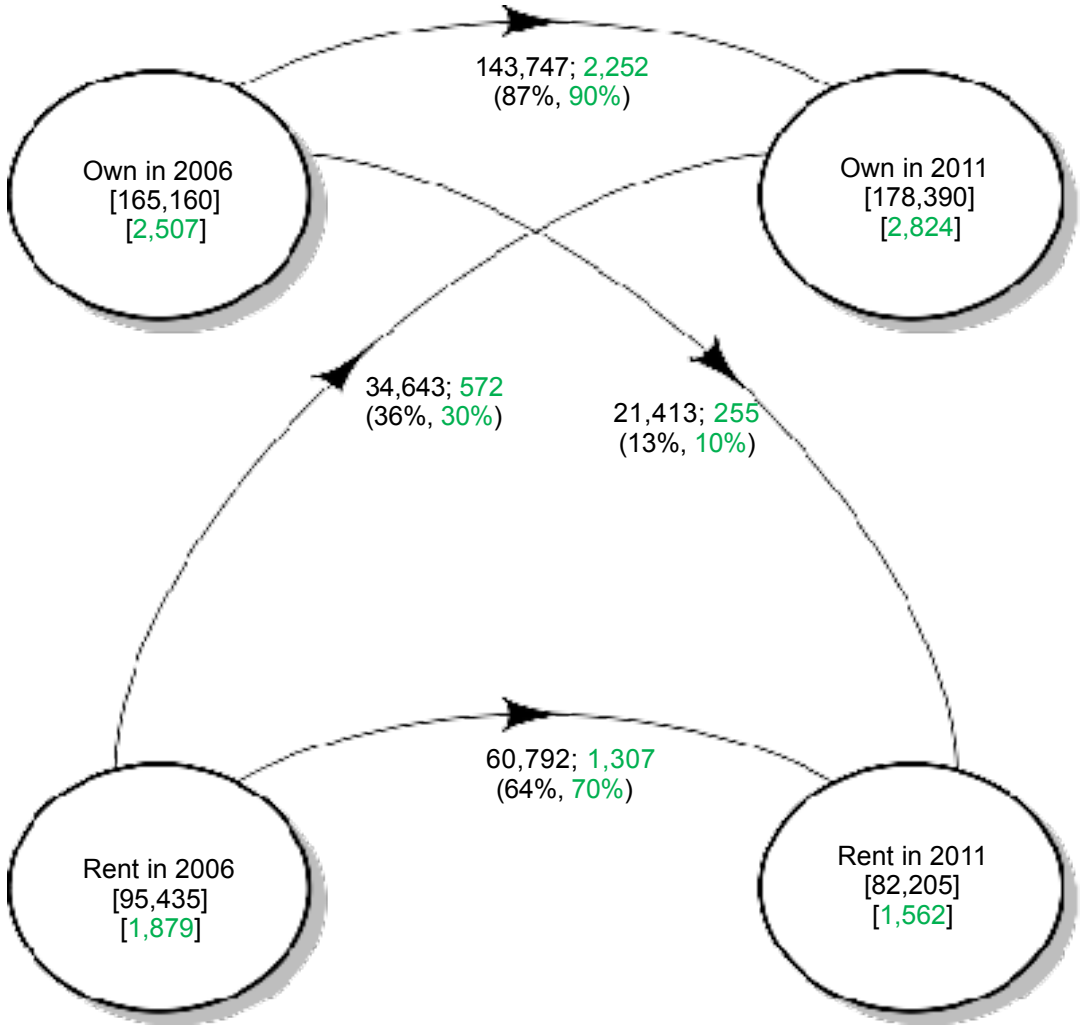
# Housing transitions – ACLD analytical sample

- Non-Indigenous
- 21 – 60 year olds (as at 2006)
- Do not own home outright (in 2006 or 2011, and tenure was available)
- Final sample ~ 260,600 records

| | |
|---|---|
| • 979,664 in ACLD sample (no adjustment for birth/death/missing links) | (979,644) |
| • Of ACLD sample; 96% non-indigenous persons | (942,253) |
| • Of non-indigenous; 55% aged between 21-60 | (520,277) |
| • Of 21-60 year olds; 72% did not own home outright in 2006 | (372,776) |
| • Of these; 70% did not own home outright in 2011 | (**260,580**) |

# Housing transitions – analytical sample

- Primary outcome is tenure transition
  - 55.2% (51.4%)* always owners
  - 13.3% (13.0%) new owners
  - 8.2% (5.8%) no longer owners
  - 23.3% (29.8%) always non-owners




*HILDA data

# Modelling data from Tablebuilder

- Chi-squared test of association
- Generalised linear modelling for count data (log-linear or Poisson model)
  - Can quantify the strength, direction of relationship between categorical variables
  - Does not rely on unit-record information
  - Can use information criteria (e.g. AIC) for model selection
  - Test different hypotheses based on absence or presence of interaction terms

- Some tests for assumptions of Poisson regression
  - Perform linear model assumption checking
  - A test for overdispersion, e.g. variance ≠ mean should be performed (Cameron & Trivedi, 1990)

# Modelling Housing Tenure Transitions

- Ideally we could download a table with cross sections of our analytical sample including important determinants such as:
  - Age group and sex
  - Tenure transition (2006 to 2011)
  - Family composition transition
  - Children transition
  - Marital status transition
  - Geographical transition
  - Labour status transition
- However, such a large table is difficult to access
  - Too much identifying information, very low cell counts
  - Potential disclosure risk
- How do we proceed?

# Modelling Housing Tenure Transitions

- Create several tables that share a common set of variables plus **one extra**
- Each table includes cross-table of
  - Sex, age group, and housing tenure transition
- Plus one of the following variables:
  - Family composition transition
  - Children transition (young children)
  - Marital status transition (registered)
  - Geographical transition (remoteness)
  - Labour force status transition
- We can model each table with a Poisson regression
- Use model selection to decide which table best represents the data

# Results – age, sex, housing tenure transition

| Variable | Level | Estimate (S.E.) | Exp( estimate ) |
|---|---|---|---|
| Constant | | 9.565*** (0.008) | - |
| Sex (ref: Female) | Male | -0.184*** (0.012) | 0.83 |
| Age (ref: 21 to 30) | 31 to 40 | 0.629*** (0.010) | 1.88 |
| | 41 to 60 | 0.858*** (0.010) | 2.36 |
| Tenure (ref: Own to own) | Own to rent | -1.286*** (0.018) | 0.28 |
| | Rent to own | -0.598*** (0.014) | 0.55 |
| | Rent to rent | -0.241*** (0.013) | 0.79 |
| Sex × Age | Male × 31 to 40 | 0.037** (0.015) | 1.04 |
| | Male × 41 to 60 | 0.197*** (0.015) | 1.22 |
| Sex × Tenure | Male × Own to rent | 0.157*** (0.026) | 1.17 |
| | Male × Rent to own | 0.051** (0.021) | 1.05 |
| | Male × Rent to rent | 0.017 (0.019) | 1.02 |

*p<0.1; **p<0.05; ***p<0.01

# Results – age, sex, housing tenure transition

| Variable | Level | Estimate (S.E.) | Exp( estimate ) |
|---|---|---|---|
| Age × Tenure | 31 to 40 × Own to rent | -0.730*** (0.025) | 0.48 |
| | 41 to 60 × Own to rent | -1.045*** (0.026) | 0.35 |
| | 31 to 40 × Rent to own | -0.917*** (0.020) | 0.40 |
| | 41 to 60 × Rent to own | -1.510*** (0.022) | 0.22 |
| | 31 to 40 × Rent to rent | -0.823*** (0.017) | 0.44 |
| | 41 to 60 × Rent to rent | -0.767*** (0.016) | 0.46 |
| Sex × Age × Tenure | Male × 31 to 40 × Own to rent | -0.121*** (0.037) | 0.89 |
| | Male × 41 to 60 × Own to rent | -0.074** (0.036) | 0.93 |
| | Male × 31 to 40 × Rent to own | 0.064** (0.029) | 1.07 |
| | Male × 41 to 60 × Rent to own | -0.022 (0.031) | 0.98 |
| | Male × 31 to 40 × Rent to rent | -0.041 (0.026) | 0.96 |
| | Male × 41 to 60 × Rent to rent | -0.158*** (0.024) | 0.85 |

*p<0.1; **p<0.05; ***p<0.01

# Comparison of best models

- Model selection using the AIC was used to compare each table

- **Geographical transition** best explained the data
  - Measured by remoteness status transitions between city, regional or remote
  - Better than using family composition, young children, marital status, and labour status

- However, models that incorporated more variables are likely to be better
  - We are not yet able to access these

# Concluding remarks

# Conclusions

# HILDA equivalent– analytical sample

- Non-Indigenous
- 21 – 60 year olds (as at 2006)
- Do not own home outright (in 2006 or 2011, and tenure was available)
- Final sample 4,386 records

- 10,425 responding person in 2006 and 2011 (10,425)
- Of 06/11 responding person sample; 98% non-Indigenous persons (10,207)
- Of non-Indigenous; 70% aged between 21-60 (7,149)
- Of 21-60 year olds; 81% tenure available in 2006 and 2011 (5,788)
- Of 06/11 tenure: 84% did not own home outright in 2006 (4,865)
- Of these; 90% did not own home outright in 2011 (**4,386**)