

Cross-sectional Representativeness in Longitudinal Surveys: Income Distribution Trends in HILDA

Bruce Bradbury¹ and Maximilian Longmuir^{1,2}

1 Social Policy Research Centre, UNSW Sydney

2 Stone Center/CUNY Graduate Center

HILDA Survey Conference 2026

Income trends from HILDA and SIH: Median Income

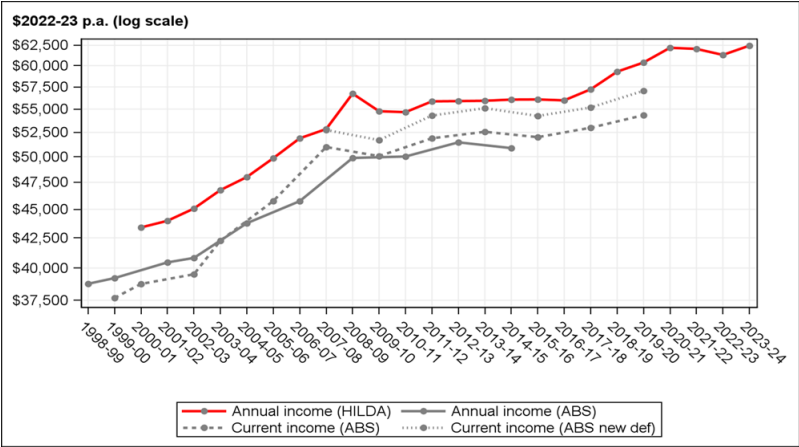


Figure 1. Note: Compiled by the authors. Based on HILDA Release 24 and ABS SIH survey. Median of equivalised disposable household income.

Income trends from HILDA and SIH: Gini Index

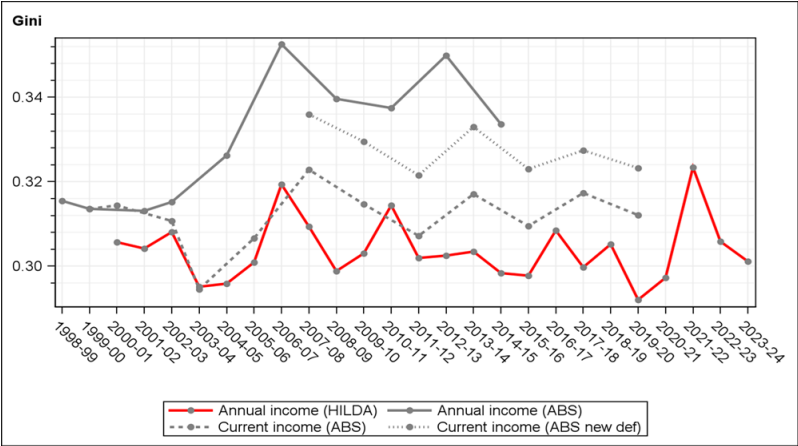


Figure 2. Note: Compiled by the authors. Based on HILDA Release 24 and ABS SIH survey. Gini of equivalised disposable household income.

Why panel composition matters

- **Attrition:** members of the original sample can die, move out of scope or miss later waves (Lynn et al., 2011; Watson and Nesa, 2025).
- **Following rules:** new partners, children and other co-residents enter the observed cross-section (Watson, 2022).
- **Refreshment samples:** HILDA added a general top-up in wave 11 and migrant top-ups in waves 23 and 24 (Summerfield et al., 2025; Watson and Wooden, 2013).
- **Weighting:** official cross-sectional weights calibrate demographic, household and labour-force margins. Income is not a direct benchmark (Watson and Wooden, 2012).

Research question

Does the cross-sectional representativeness of the income distribution in HILDA deteriorate after wave 1?

- **External evidence:** HILDA could be compared with repeated cross-sectional surveys, especially the SIH, or with administrative income data.
- **Limit for assessing trends:** SIH methods have changed over time (Wilkins, 2014), while administrative household-income series have not yet been evaluated for time-series comparability.

Three empirical diagnostics

We take HILDA wave 1 as the reference point.

1. **Origin-decile shares:** follow the wave 1 cohort (OSMs), then include later entrants (TSMs and OPMs) who can be linked to wave 1.
2. **Wave 11 top-up:** compare the newly drawn top-up with the continuing main sample.
3. **Reweighting:** include income-origin deciles and test whether this changes trends in median income or the Gini.

Population and income measure

- The unit of analysis is the **enumerated person**, including children and adults who were not interviewed (Summerfield et al., 2025).
- The outcome is **regular disposable household income**, equivalised with the modified OECD scale.
- Each wave 1 person receives a fixed **within-age income-origin decile**; later waves track that baseline position.
→ A 10% share per decile in every later wave is our diagnostic benchmark...

Population and income measure

- The unit of analysis is the **enumerated person**, including children and adults who were not interviewed (Summerfield et al., 2025).
- The outcome is **regular disposable household income**, equivalised with the modified OECD scale.
- Each wave 1 person receives a fixed **within-age income-origin decile**; later waves track that baseline position.
→ A 10% share per decile in every later wave is our diagnostic benchmark...

... but imperfect, among others:

- Mortality can differ across baseline income deciles.
- People can move outside the target population, for example into residential aged care.

Original wave 1 cohort

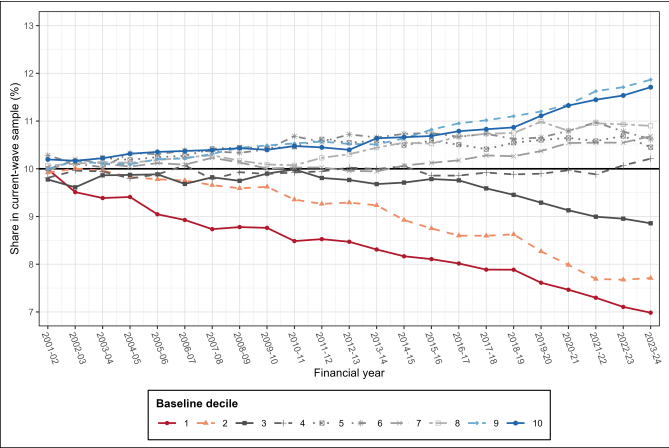


Figure 3. Note: compiled by the authors. Based on HILDA 24. Unweighted original wave-1 cohort; later entrants excluded. Horizontal line = 10%.

Origin deciles within baseline age groups

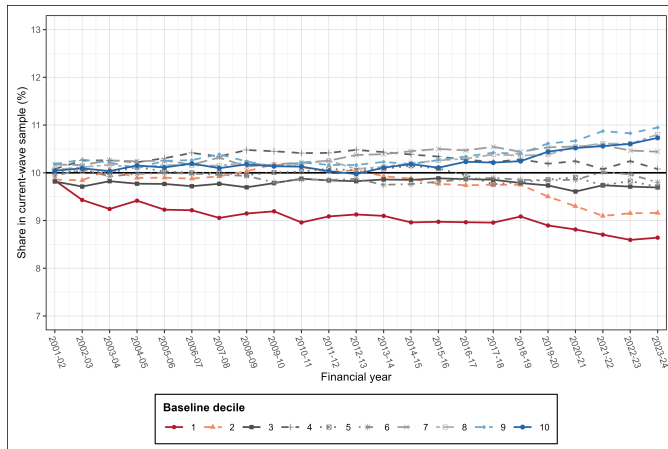


Figure 4. Note: Compiled by the authors. Based on HILDA 24. Unweighted original wave-1 cohort; later entrants excluded. Income deciles defined within wave-1 age groups: 0–14, 15–24, 25–34, 35–44, 45–54, 55–64, 65–74, and 75+ years. Horizontal line = 10%.

Linking later entrants to wave 1

- Every eligible later entrant (TSM and OPM) inherits the origin decile of one wave 1 *anchor* person.
- Anchor priority is **partner**, then **parent**, then an anchored **household member**.
- Once assigned, the anchor stays fixed in later waves.
- The wave 11 general top-up and waves 23-24 migrant top-ups cannot be assigned wave 1 anchors and are excluded from this test.

Origin shares after including linked entrants (unweighted)

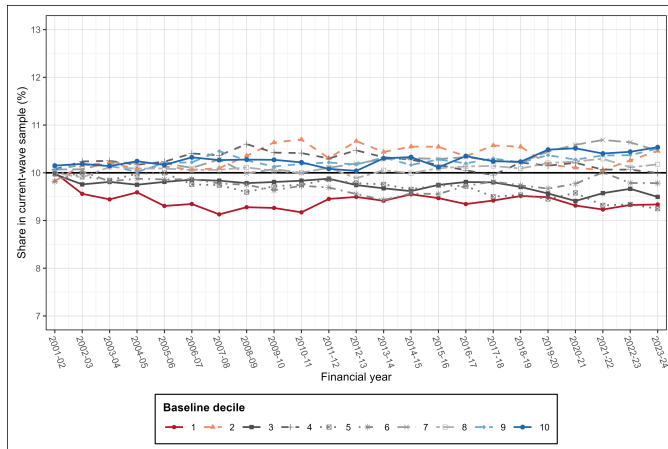


Figure 5. Note: Compiled by the authors. Based on HILDA 24. Unweighted wave-1-linked sample; income deciles defined within wave-1 age groups. TSMs and OPMs inherit their wave-1 anchor's decile; top-up samples excluded. Horizontal line = 10%.

Origin shares after including linked entrants (weighted)

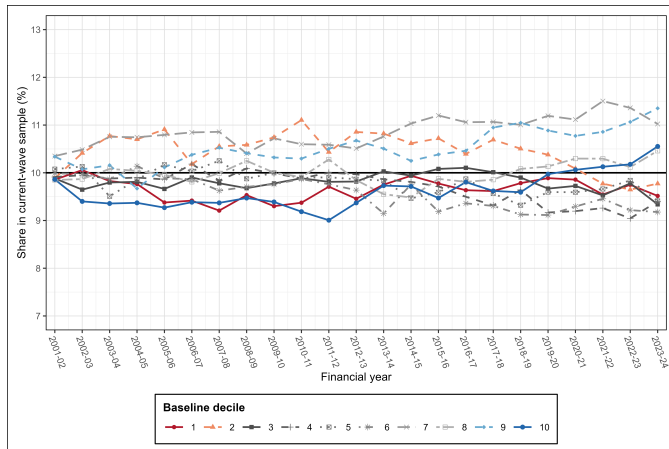


Figure 6. Note: Compiled by the authors. Based on HILDA 24. Wave-1-linked sample weighted using enumerated-person weights excluding the wave-11 top-up; income deciles defined within wave-1 age groups. TSMs and OPMs included; top-up samples excluded. Horizontal line = 10%.

Wave 11 top-up comparison: weighted

Group	Mean	P50	P90/P10	Gini	Top 10	Top 1	Pov50%
Non-top-up population	47,535	41,221	4.000	0.305	23.39	4.81	11.24
Standard error	(2,402)	(2,262)	(0.604)	(0.019)	(1.27)	(0.80)	(3.41)
Top-up / non-top-up	93.7	94.5	110.9	105.3	104.0	91.5	111.7
Standard error	(5.8)	(6.4)	(17.3)	(7.5)	(8.0)	(16.9)	(39.1)
Excluding recent migrants	94.5	94.9	108.6	104.4	103.4	93.0	110.8
Standard error	(5.9)	(5.5)	(15.4)	(7.5)	(6.1)	(17.5)	(27.7)

Table 1 Note: Based on HILDA 24. Non-top-up values are levels; top-up values are ratios in percent. Standard errors are in parentheses. Poverty line defined as 50% of median income.

Key comparisons: The top-up has lower mean (**93.7%**) and median (**94.5%**) income. Its P90/P10 (**110.9%**) and poverty ratio (**111.7%**) are higher, but imprecisely estimated.

Alternative weights as a sensitivity test

1. Start from HILDA's published main-sample enumerated-person weight (Watson and Wooden, 2012; Watson, 2012).
2. Preserve the geography, sex, age, state and labour-force calibration totals.
3. Require each wave 1 within-age income-origin decile to represent 10% of the linked sample.
4. Compare median income and the Gini under the published and alternative weights.

Median income under alternative weights

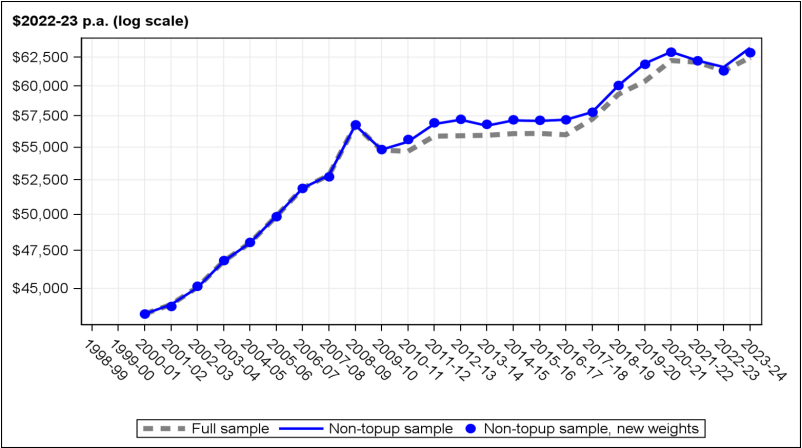


Figure 7. Note: Compiled by the authors. Based on HILDA 24. Median equivalised regular disposable household income in 2022–23 Australian dollars.

Gini under alternative weights

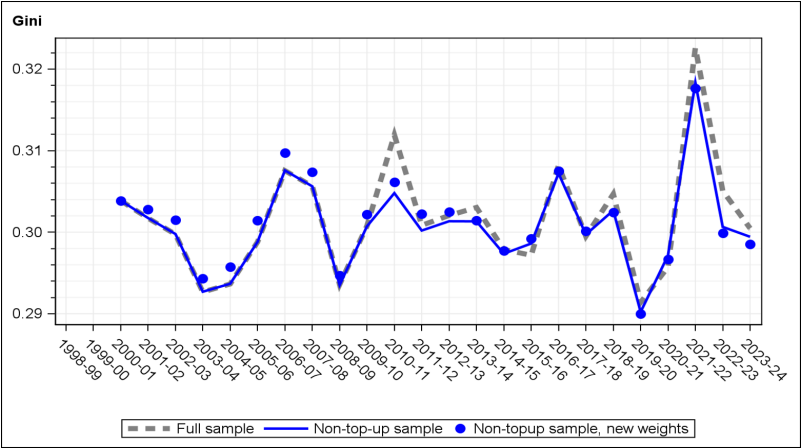


Figure 8. Note: Compiled by the authors. Based on HILDA 24. Gini coefficient of equivalised regular disposable household income.

Conclusions and qualifications

- The unweighted wave 1 cohort alone shows a potential drift across baseline income deciles.
- Much of that drift disappears after accounting for baseline age and entrants generated by HILDA's following rules.
- Reweighting to balance wave 1 income deciles has negligible impact on median income and trends.
- The diagnostics take wave 1 population as given and several biases causing attrition are not accounted for.

Subject to these qualifications, HILDA remains a strong basis for analysing household income trends.

Thank you! Paper details

- Bradbury, B. and Longmuir, M. (2026). *Cross-sectional Representativeness in Longitudinal Surveys: Income Distribution Trends in HILDA*.
- This research is supported by ARC project DP220103811.



Scan for the full paper

References

- P. Lynn et al. *Maintaining cross-sectional representativeness in a longitudinal general population survey*. Institute for Social and Economic Research, University of Essex Colchester, UK, 2011.
- M. Summerfield, B. Garrard, R. Kamath, M. K. Nesa, N. Macalalad, N. Watson, and R. Wilkins. *HILDA User Manual – Release 24*. Melbourne Institute: Applied Economic and Social Research, University of Melbourne, Melbourne, Australia, 2025.
- N. Watson. Longitudinal and cross-sectional weighting methodology for the HILDA Survey. 2012.
- N. Watson. Choosing who to follow: The long-run impact of following rules on the sample size and composition of household panel surveys. In *Survey Research Methods*, volume 16, pages 301–328, 2022.
- N. Watson and M. K. Nesa. Data quality and representativeness of older respondents in the hilda survey. *International Journal of Market Research*, 67(4):493–509, 2025.
- N. Watson and M. Wooden. The HILDA survey: a case study in the design and development of a successful household panel survey. *Longitudinal and life course studies*, 3(3):369–381, 2012.
- N. Watson and M. Wooden. Adding a Top-Up Sample to the Household, Income and Labour Dynamics in Australia Survey. *Australian Economic Review*, 46(4):489–498, 2013.
- R. Wilkins. Evaluating the Evidence on Income Inequality in Australia in the 2000s. *Economic Record*, 90(288):63–89, 2014. doi: 10.1111/1475-4932.12099.