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Downward economic mobility in Australia

A report on households and people who have experienced income decline from 2011 to 2016

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Sensing Value has a unique toolkit that includes spatial analytics with 3D models, data science, economics, IoT technologies, market research, and advanced modelling capabilities. We help clients in the public and private sector to accurately articulate a problem or understand a use case, craft bespoke solutions, and operationalise their knowledge within a value chain or roadmap.

We have established relationships with leading universities, academics and industry partners to continuously develop and evolve our products and service capability. Sensing Value's strategic partners include the Public Sector Mapping Authority (PSMA), the Australian Population Research Institute (TAPRI), the Institute of Choice (University of South Australia) and Telstra.



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SUMMARY OF FINDINGS ON DOWNWARD MOBILITY IN AUSTRALIA

In August 2018, the Productivity Commission published a comprehensive research paper compiling the latest and most complete evidence measuring the prevalence of, and trends in, inequality, economic mobility and disadvantage across Australian society. One of the key findings from the Productivity Commission research was that sustained economic growth over the past 27 years has delivered significantly improved living standards for the average Australian in every income decile.

A key goal in the Productivity Commission report was to develop an evidence base on Australia's performance on wealth distribution, income inequality and economic mobility and to better understand any potential factors that may be driving peoples' perceptions of how they are faring in the current economy.

As noted in the Productivity Commission's report, there have been a number of surveys that have been undertaken in the last year, including a survey conducted by the Committee for the Economic Development of Australia (CEDA) where the findings from these surveys indicated a disconnect between the sustained economic growth and perceptions of how well off people felt. The CEDA survey found that:

- Only 5% of Australians considered that they had benefited significantly from 26 years of continuous economic growth
- 31% of survey respondents were finding it difficult to live on their current income

The Productivity Commission drew on a range of data sources to build their evidence base, including the longitudinal survey of Household Income and Labour Force Dynamics in Australia (HILDA). Their report looked at how individuals performed over time by identifying the movement of people through income deciles. They found that there was significant volatility in income patterns which they explained as being attributable to life-stage and life events:

"Life events — such as transitioning from education into work, career advancement, household formation, having children, divorce and retirement — underpin some of the observed trends in economic mobility. Typically, income rises during the working years, though this can be interrupted by childbearing and other life events, such as ill health. Similarly, Australians accumulate wealth in their middle years, and draw on this wealth in retirement when their earnings drop. These changes in income and wealth allow people to 'smooth' their consumption."

The methodology used by the Productivity Commission to examine economic mobility (movement through income deciles over time) does not allow attribution of the cause of the mobility – a person may move to a lower income decile even when their income remains constant, if others have an increase in income over the same time period. Alternatively, an individual may go into a lower income decile if their personal income declines while other people maintain their income level.

The present study was designed to complement the research conducted by the Productivity Commission and focuses on a recent time period from 2011 to 2016, which is a subset of the longer time period covered by the Productivity Commission. In our research we were looking to see if we could identify a cohort who had income decline over this time period, and to identify the magnitude of this cohort.

To complete our study we drew on data from the Australian Census Longitudinal Dataset (ACL D). This dataset has 1.2 million linked data records covering the 2011 and the 2016 Census. We cross-tabulated personal income levels for the same individuals 5 years apart. The study identified that a very significant proportion of personal income earners had declining income over the period.

The analysis of changes in household income from the ACL D shows that there were more than 5.92 million people in Australia who were living in households where the household income had declined over the five years from 2011 to 2016.

Further, there were 3.34 million people who had a decline in personal income over the five-year period from 2011 to 2016.

The ACL D included detailed data on demographics and employment and the age and sex composition of the cohort who had experienced income decline was analysed.

Surprisingly the data showed life events offered only a limited explanation for the downward mobility and **at least 15% of people in every sex and age band between the ages of 24 and 75 years experienced downward mobility over the five-year period.**

Further analysis of the industry and occupations held by those people who had experienced a decline in income showed income declines occurred (with some variation) across all industries and all occupations.

The final stage of analysis for the current report was to develop a model of income decline at the local government area (LGA) level and to rank and map LGA areas within each state (grouped into major metropolitan and rest of state) for both the percent of personal income earners living in the LGA with a decline in income over the period, and to also use the results of a study on cost of living pressures (Graham and Li) to better understand any geographic patterns of stress. Overall, the highest rates of income decline were observed in LGA areas in Queensland and West Australia.

PART 1: OUR APPROACH TO ASSESSING THE PATTERNS OF DOWNWARD MOBILITY IN AUSTRALIA FROM 2011-2016

The Australian economy is one of the few economies in the world to have experienced more than a quarter of a century without a recession. Together with a progressive transfer system supporting low income households, we would expect household income levels to be maintained (at least in nominal terms) over time. However, the story revealed in this study shows a different picture. It shows significant numbers of people and households that have seen their personal and household income decline over the most recent Census period. The high numbers of losers in the Australian economy may help to explain the mood of the Australian electorate, with high levels of uncertainty and anxiety about paying the bills now, and surviving into the future.

In reviewing the Productivity Commission’s report on inequality journalist Ross Gittins noted “the report does too little to remind us that all the averaging involved in GINI coefficients and decile groups rolls households who’ve gained together with households who’ve lost and tells us that little has changed...” (Gittins, 2018). Unlike studies that report on aggregate movement in wages, the current study tracks over 1.2 million individuals over time, and for each individual compares their personal income in 2011 and again in 2016. Because the analysis is conducted at the individual level, we can now identify the actual number of people who were in the workforce in 2011 whose income had declined 5 years later in 2016.

The data used in the current study is drawn from the Australian Bureau of Statistics Longitudinal database, where individual records are matched over successive Census counts. With the data linked in this manner it is then possible to both identify individuals and households that have experienced income loss over the period, and also to develop profiles and to identify geographic patterns of concentration of downward mobility in Australia.

The impact of income decline is magnified when cost of living pressures increase. A study commissioned by Coles Supermarkets released in 2017 (Graham & Li, 2017) quantified the impact of increases in the cost of living by local government area (LGA) in Australia. The report identified the factors associated with increased cost of living at the LGA level and quantified the increase in cost of living by LGA over the period 2011 to 2015.

In the present study we have first quantified the extent of downward income mobility at both the person and household level, next explored some hypotheses about potential factors that may be contributing to downward mobility, making a preliminary assessment of the impact of these hypothesised factors through analysis of the rates of downward income mobility by sex, age, occupation and industry.

Next, we have developed a model to estimate the count of households and persons by LGA area that have experienced downward income mobility over the five-year period from 2011 to 2016. This model was then used in conjunction with the work of (Graham & Li, 2017) to rank LGA areas on both the extent of downward income mobility and the level of increase in cost of living to identify key areas experiencing reduced discretionary spending capability. The LGA model shows that regions of Queensland, WA and the Northern Territory have been particularly affected by income decline. Chart 1 below shows the count of LGA areas in each State or Territory where the percentage of income earners who experienced income decline between 2011 and 2016 was 22% or higher.

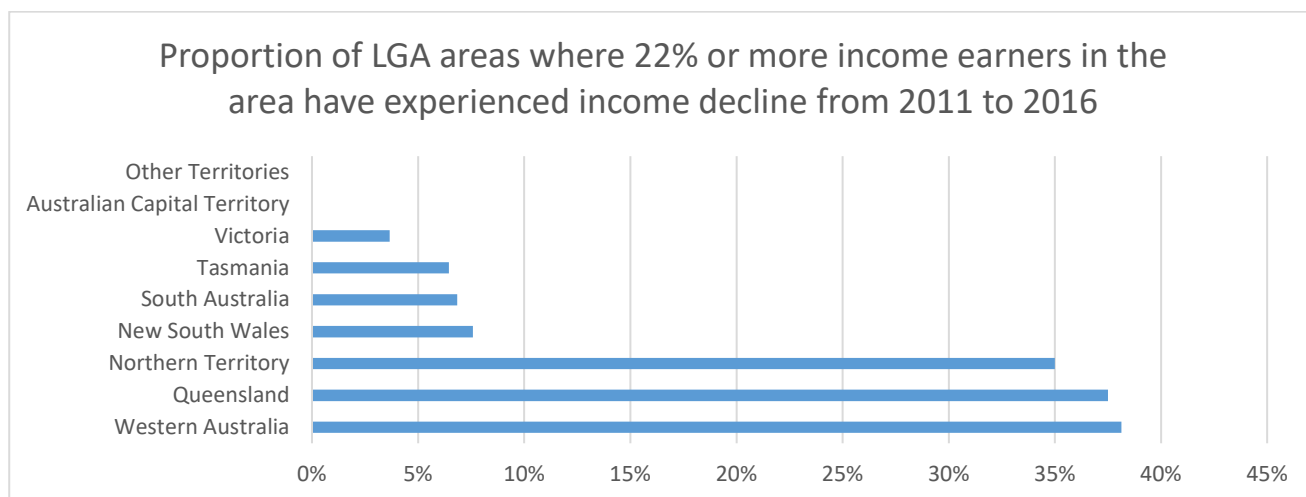
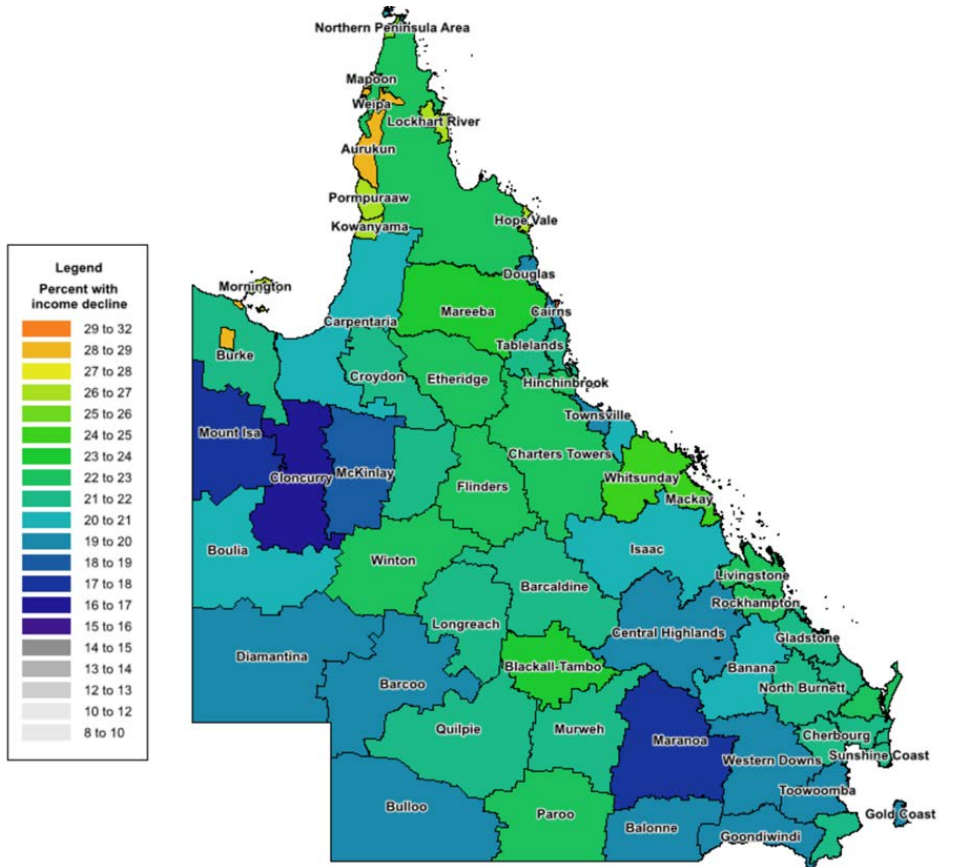
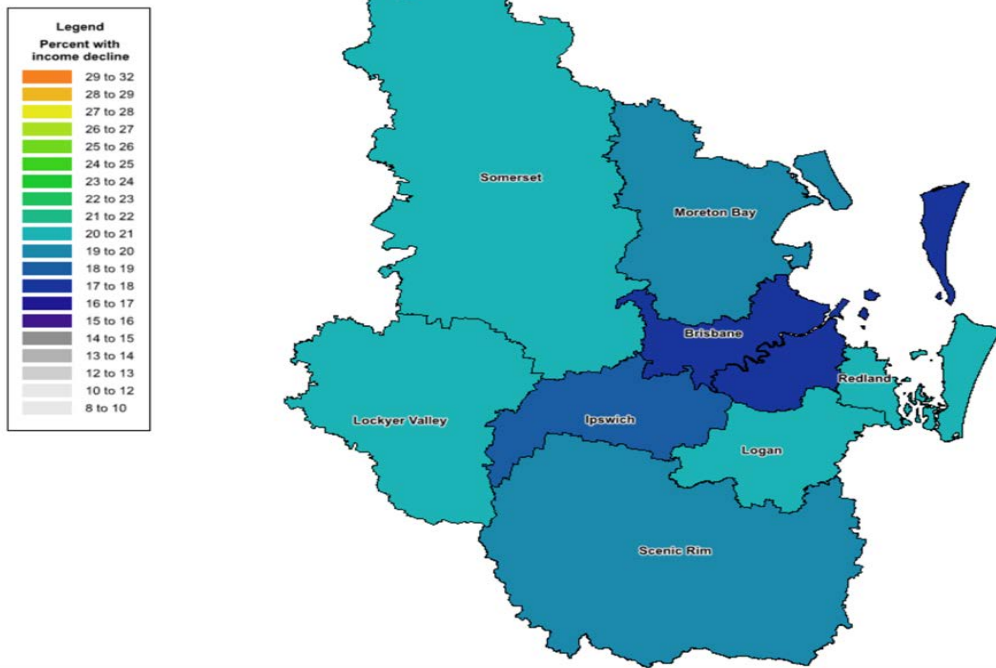


Chart 1 Proportion of LGA’s within each State or Territory that have 22% or more of personal income earners in the LGA that have experienced income decline from 2011 to 2016

The map below shows the non-metropolitan LGA areas in Queensland shaded by percent of personal income earners who had a decline in income between 2011 and 2016. Overall Queensland was over represented in persons with decline in personal income from 2011-2016 and there are large areas of the state where the proportion of personal income earners with decline in income exceeds 20% of income earners in the area.

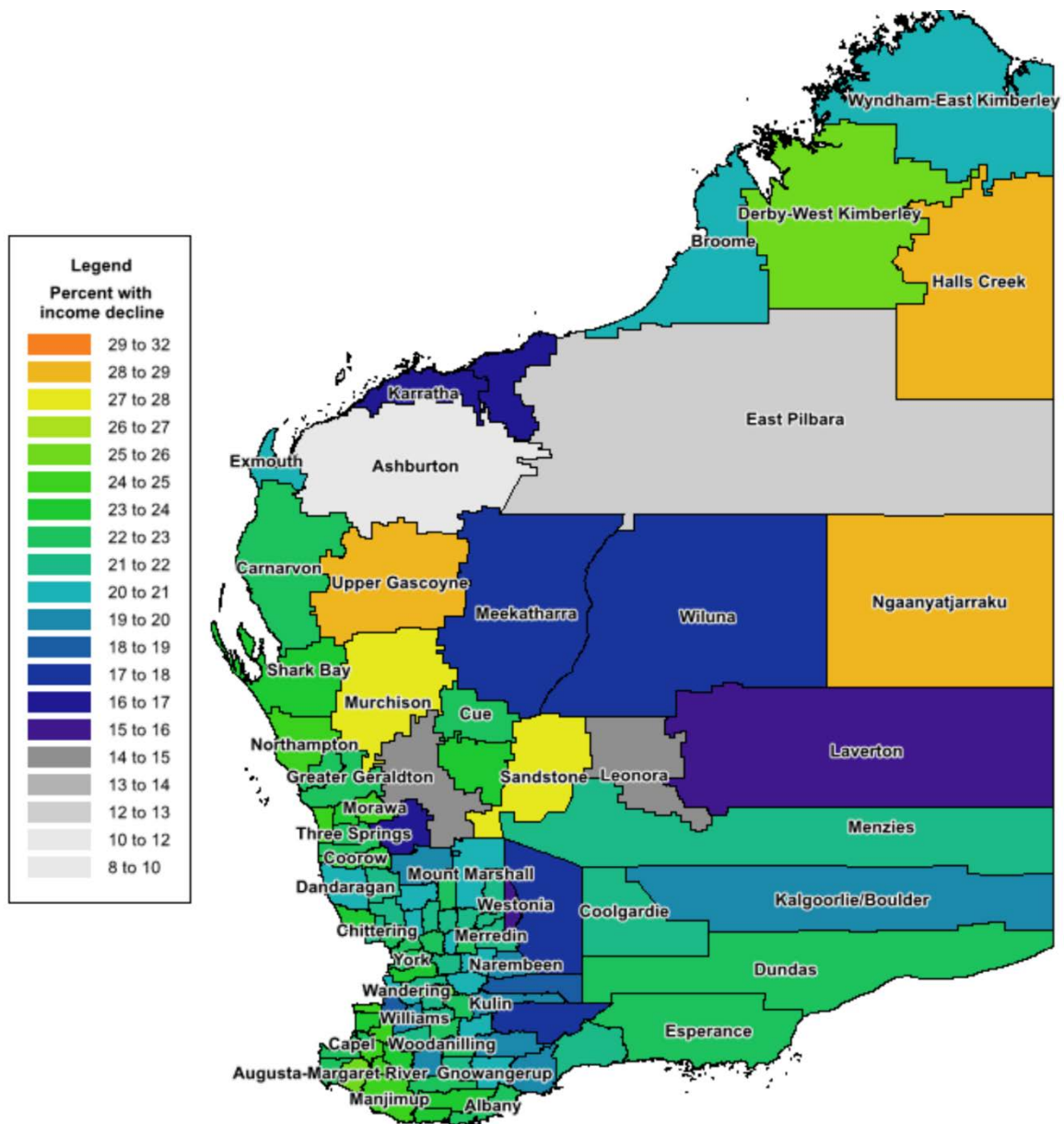


Map 1 Non-metropolitan LGAs in QLD shaded by percent of personal income earners with income decline 2011 -2016

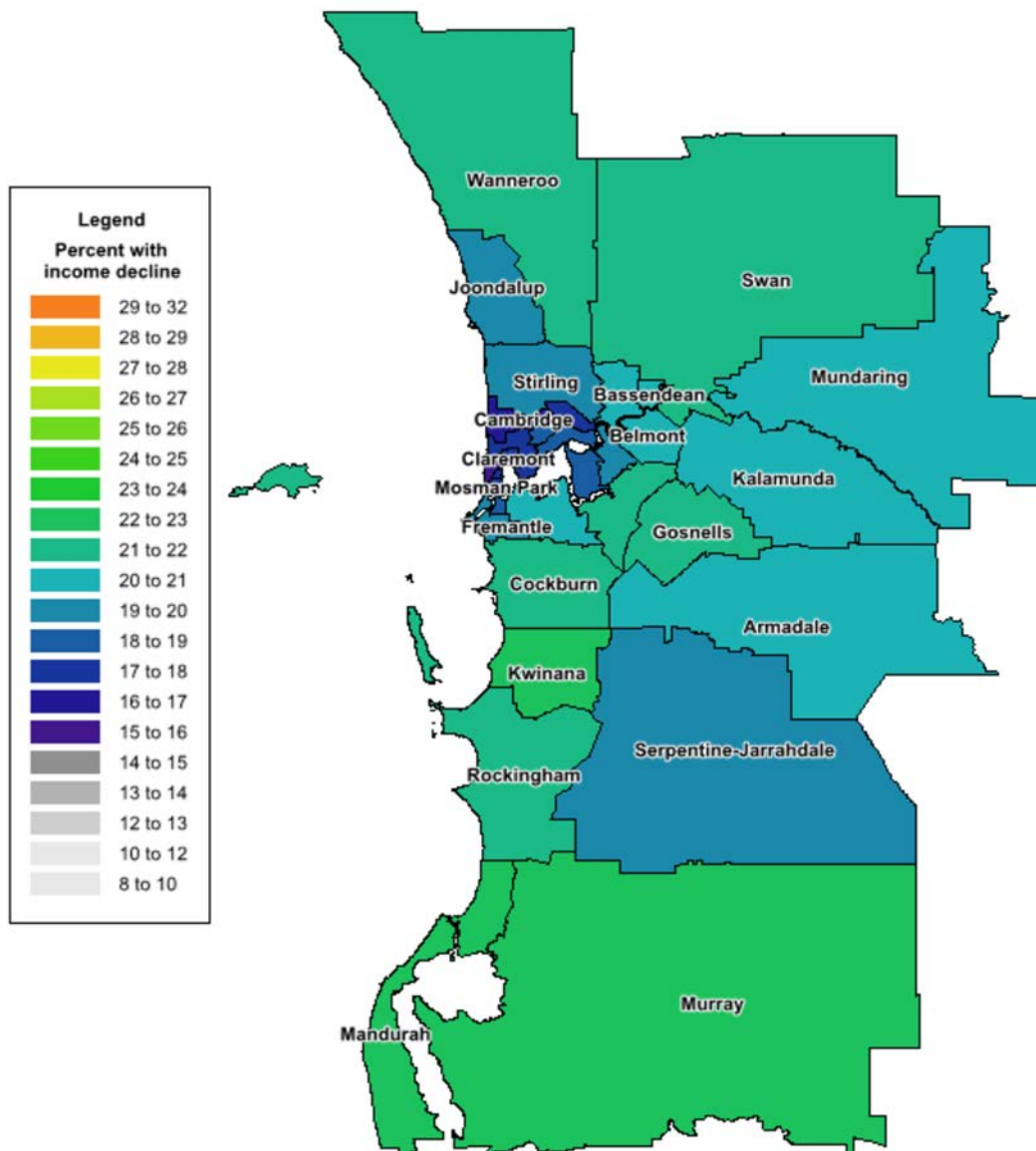


Map 2 Metropolitan LGAs in QLD shaded by percent of personal income earners with income decline 2011-2016

The areas in Greater Brisbane closest to the CBD experienced the least percent of personal income earners with decline in income over the 5 year period.



Map 3 Non-metropolitan Western Australian LGA's shaded by percent of personal income earners with income decline from 2011 to 2016



Map 4 Metropolitan Western Australian LGA's shaded by percent of personal income earners with income decline from 2011 to 2016

The metropolitan area of Greater Perth has a similar pattern to Greater Brisbane, with local government areas closest to the CBD experiencing the lowest proportion of income earners with income decline over the 5 years from 2011-2016.

The maps of West Australian and Queensland highlight the extent to which income decline has affected regional Australia over the period studies, with the Northern Territory similarly affected, albeit with a lower population.

Maps of all other states (metropolitan areas and non-metropolitan areas) are shown in Appendix 1 of this report.

PART 2: WHAT ARE THE IMPLICATIONS OF A LARGE COHORT WITH DECLINING INCOME IN A GROWING ECONOMY?

“People do not like to be treated unfairly, and they do not like to see others being treated unfairly either. If we feel that we are being treated unfairly then we are less likely to trust and reciprocate. This key element in our social interactions links our preference for fairness with how we feel we are doing relative to others. We do not like situations when others seem to be doing much better or worse than we are because we do not like inequitable outcomes. Behavioural economists call this preference inequity aversion.”(Baddeley, 2017)

Michelle Baddeley’s introduction to behavioural economics provides insight into loss aversion and the significantly higher impact caused by a loss compared to a gain. In practical terms, losing \$50 is felt much more strongly than the pleasure of winning \$50. Kahneman and Tversky (Kahneman, 1979) critiqued standard utility theory and demonstrated that many of the assumptions around rational behaviour and utility maximisation do not hold true when tested in experiments. They replaced the utility function with a prospect theory value function which mirrors the observations from experiments that they conducted that demonstrated the disproportionate impact that losses have on our estimate of value, equity and social standing.

Therefore, in addition to financial hardship and/or a loss in the level of discretionary spending power that is experienced by people and households with an income decline, there are also a range of psychological factors that can come into play that can affect decision making and outlook for the future, and these psychological factors (such as increased pessimism about the future) can in turn affect the level of economic activity in a society.

Declining income can not only trigger the loss aversion bias for those who experience the loss (and increase the pessimistic nature of their outlook on the future), it can also have impacts on others who have increased anxiety about risk that they too will experience loss. Thus, both actual loss and fear of loss form inputs into decision making on participation in the workforce, risk taking and spending. The larger the number of people who have experienced loss, and the more widespread the patterns of loss (across income groups and ages) the greater the overall level of fear and uncertainty in the community.

Further, the less interaction between ‘winners’ and ‘losers’, the higher the risk of the development of entrenched poverty and deprivation. Robert Putnam’s reflections on the changes in American society over the past 40 years highlighted the growing inequality gap and the bifurcation of cities and neighbourhoods into wealthy and poor areas, and the consequential reduction in opportunities for many Americans to experience upward mobility. (Putnam, 2015) Thus, the risks to social cohesion and full engagement of citizens in the economy is likely to be magnified if the community experiences both high numbers of ‘losers’ and concentration of ‘losers’ in specific geographic areas.

A recent report from the Committee for Economic Development of Australia – Community Pulse: the economic disconnect (Committee for the Economic Development of Australia, 2018) examined the community’s views through an on-line national poll covering:

- The level of satisfaction reported by Australians on their current circumstances
- Who the respondents think has gained from the 26 consecutive years of economic growth in Australia
- The most important issues identified by respondents both for themselves and for Australia.

Results from the survey indicated that:

- 5% of people believe they have personally gained a lot
- 31% of people are finding it difficult to live on their current income
- 74% of people believe large corporations have gained a lot
- 79% of people believe the gap between the richest and poorest Australians is not acceptable.

The reports’ authors note that there is “ a disconnect between Australia’s strong economic track record and the community’s sense of having shared in this growth. And, a disconnect between the clear policy priorities of the community and the policies which have so dominated public policy debate recently. Australia’s future prosperity and continued high living standards rests on the strength of business and a strong economy. For governments to have the political capital to implement the policy settings to support a vibrant and competitive business sector the community must trust that the benefits of growth will be broadly shared; that individuals themselves have opportunities to benefit from future growth; and that their aspirations for the way they and other Australians live will be supported by economic growth. CEDA’s report shows clearly that there is more work that needs to be done in this space and I hope the insights from this research help in tackling economic disconnect.”

Our report provides some insight into explaining the disconnect, with low wages growth and large numbers of individuals and households having a fall in income over the 5 year period from 2011 to 2016.

PART 3: CALCULATING THE NUMBER OF PERSONAL INCOME EARNERS WITH DECLINE IN INCOME FROM 2011 - 2016

The Australian Census Longitudinal Dataset (ACLD) was accessed using the ABS Table Builder with the following classifications for total personal weekly income in 2011 and 2016.

2011 weekly income categories used in the study	2016 weekly income categories used in the study
Negative income	Negative income
Nil income	Nil income
\$1-\$199	\$1-\$149
\$200-\$299	\$150-\$299
\$300-\$399	\$300-\$399
\$400-\$599	\$400-\$499
	\$500-\$649
\$600-\$799	\$650-\$799
\$800-\$999	\$800-\$999
\$1,000-\$1,249	\$1,000-\$1,249
\$1,250-\$1,499	\$1,250-\$1,499
\$1,500-\$1,999	\$1,500-\$1,749
	\$1,750-\$1,999
\$2,000 or more	\$2,000-\$2,999
	\$3,000 or more
Not stated	Not stated
Not applicable	Not applicable
Unlinked record	Unlinked record

Table 1 Personal income bands for 2011 and 2016 Census periods

In the current study we have worked with nominal income data to calculate counts of people who have experienced income decline. Further, where there is not a direct match between individual income bands in 2011 and 2016, for example in 2011 weekly personal incomes are banded between \$400- \$599, while in 2016 there were two separate income bands (\$400-\$499 and \$500-\$599) we have adopted a conservative approach and only classified persons who had a personal income in 2011 in the band \$400-\$599 as having a declining income if they were recorded in 2016 as having an income of \$399 per week or lower.

The conservative approach we have adopted means that the actual numbers with real income decline are most likely larger than reported in our study.

We have detailed below in Table 2 the classification rules applied to determine counts of personal income earners with declining income over the 5 year period.

CLASSIFICATION OF PERSONS WITH DECLINING INCOME 2011 TO 2016

Income class in 2011	Corresponding income classes in 2016 used to identify persons with income decline
2011 Negative income	No recorded income decline possible in 2016
2011 Nil income	Negative income 2016
2011 \$1-\$199	Negative or nil income in 2016
\$200-\$299	Negative, nil income and income under \$150 in 2016
\$300-\$399	Negative, nil income and income under \$300 in 2016
\$400-\$599	Negative, nil income and income under \$400 in 2016
\$600-\$799	Negative, nil income and income under \$500 in 2016
\$800-\$999	Negative, nil income and income under \$800 in 2016
\$1,000-\$1,249	Negative, nil income and income under \$1000 in 2016
\$1,250-\$1,499	Negative, nil income and income under \$1250 in 2016
\$1,500-\$1,999	Negative, nil income and income under \$1500 in 2016
\$2,000 or more	Negative, nil income and income under \$2000 in 2016
Not stated – not used to record income decline	Not stated – not used to record income decline
Not applicable – not used to record income decline count	Not applicable – not used to record income decline count
Unlinked record – all records linked in this analysis and unlinked record count =0	Unlinked record – all records linked in this analysis and unlinked record count =0

Table 2 Classification rules for counting persons with lower income in 2016 than earned in 2011

Applying these classification rules to the longitudinal data for personal income earners we were able to identify:

- The observed patterns of income decline by all personal income earners over the 5 year period
- The number of people in households where the household has experienced a decline in income over the 5 year period
- The age and sex profile of personal income earners (in the age ranges between 15 -74 years) and the percent of personal income earners by age band and sex who experienced income decline in the 5 year period
- The occupational profile of personal income earners and the percentage of personal income earners within each occupation who experienced income decline over the 5 years
- The industry profile of personal income earners and the percentage of personal income earners within each industry who experienced income decline over the 5 years

These insights and findings are detailed in the following sections of the report.

PART 4: FINDINGS

DOWNWARD MOBILITY IN PERSONAL INCOME 2011-2016: ALL PERSONAL INCOME EARNERS

Table 1 below provides a count of the people who have experienced income decline over the 5 year period from 2011 to 2016. The total counts in each table in the current report may vary as the ABS has introduced some randomisation in the cell counts and totals. Counts of persons with income decline are shown in the cells shaded pink. Overall, we can see that more than **3.3 million people** have experienced income decline over the 5 year period.

Total Personal Income (weekly) in 2016	Negative income	Nil income	\$1-\$149	\$150-\$299	\$300-\$399	\$400-\$499	\$500-\$649	\$650-\$799	\$800-\$999	\$1,000-\$1,249	\$1,250-\$1,499	\$1,500-\$1,749	\$1,750-\$1,999	\$2,000-\$2,999	\$3,000 or more	Not stated	Not applicable	Unlinked record	Total
Total Personal Income (weekly) in 2011																			
Negative income	3,355	14,974	6,507	11,199	10,257	7,645	8,708	7,623	6,732	5,309	2,561	1,938	1,199	1,547	889	4,862	87	-	95,253
Nil income	11,859	309,532	114,666	169,199	125,929	100,834	111,734	104,730	96,995	75,358	36,355	21,997	10,909	13,289	8,019	34,366	724	-	1,346,650
\$1-\$199	6,491	126,375	130,991	215,767	164,804	124,913	127,628	113,951	103,097	85,126	44,228	22,630	10,064	9,914	5,028	36,593	785	-	1,328,521
\$200-\$299	6,651	82,001	55,114	293,207	501,594	247,551	150,101	113,698	83,969	70,873	34,358	19,983	8,121	7,839	6,464	84,897	360	-	1,766,731
\$300-\$399	5,943	60,484	35,658	138,151	308,510	447,845	174,825	115,596	95,291	68,479	35,324	18,972	9,431	8,377	5,984	89,880	563	-	1,619,258
\$400-\$599	6,550	80,608	40,936	136,916	210,312	285,850	364,180	286,452	217,176	150,213	69,821	40,380	19,171	18,990	9,214	67,096	511	-	2,004,324
\$600-\$799	5,301	69,883	30,527	80,939	98,302	121,662	197,588	328,597	375,854	268,883	119,026	66,306	29,577	25,859	10,302	42,373	148	-	1,871,371
\$800-\$999	4,585	46,799	17,545	49,390	51,943	57,831	88,015	135,035	283,580	357,986	179,195	101,135	47,491	40,227	11,522	27,773	240	-	1,500,210
\$1,000-\$1,249	2,901	39,305	16,073	32,781	39,238	38,817	58,132	77,199	142,072	290,432	285,394	201,218	95,145	79,996	18,498	22,246	207	-	1,439,580
\$1,250-\$1,499	2,111	23,155	9,112	17,634	20,525	19,552	28,958	37,676	60,652	107,737	160,304	221,928	135,185	117,639	23,198	14,235	-	-	999,474
\$1,500-\$1,999	2,157	24,955	9,541	16,599	16,665	17,759	25,263	31,866	47,953	77,883	90,567	169,410	221,598	346,200	65,707	14,236	-	-	1,178,284
\$2,000 or more	2,660	22,453	7,705	13,540	12,132	12,365	16,447	19,462	27,197	40,834	39,767	57,864	66,064	319,937	429,737	14,594	76	-	1,102,993
Not stated	3,501	41,442	20,507	50,688	62,013	58,399	44,429	41,487	38,710	33,161	17,000	12,833	7,668	11,340	7,391	82,161	1,141	-	533,797
Not applicable	19,707	647,589	361,061	155,449	60,984	57,630	50,165	27,242	14,233	5,385	1,918	962	413	501	1,191	69,096	2,819,874	-	4,293,755
Unlinked record	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	83,727	1,589,867	856,194	1,381,314	1,683,071	1,598,725	1,445,954	1,440,523	1,593,393	1,637,211	1,116,348	957,848	661,894	1,001,910	602,799	604,533	2,824,906	-	21,080,111
Negative income count	57,207	576,017	222,209	485,950	449,117	267,985	216,815	301,237	277,873	226,455	130,334	57,864	66,064						3,335,126

Table 3 Count of personal income earners who experienced a loss in personal income from 2011 to 2016

There are many possible factors that may explain or be correlated with patterns of downward mobility. The Productivity Commission report hypothesised that a large amount of variation in income that occurred during the lifespan of a person could be explained by life events and lifestage. In the present study we have conducted preliminary analysis across a range of demographic (age and sex) and employment (industry and occupation) to see whether patterns in the data provide clear clues as to possible life stage or life event factors are significantly involved in downward mobility.

For example, demographic factors and family formation may play a role. A shift to one income households around the time of having children, followed by resumption of working (part time), could explain some reductions in personal income. Second, older people transitioning to retirement may work reduced hours and receive less income. However, if these were the main explanatory factors we would expect to have very significant skews in downward mobility associated with both sex of income earner and the age band of the income earner, and while some skews are present in the data, the majority of observed income decline is not explained by these factors in our preliminary analysis.

DOWNWARD MOBILITY BY AGE AND SEX

Chart 2 below show the proportion of male income earners in each age band who experienced a decline in income over the 5 year period. As the income earner age analysis is limited to 15-74 years, not all income earners are shown in these charts. The pattern of income decline for males shows an increase in overall numbers experiencing income decline in each successive age band from 30-34 years through to 60-64 years. It may be expected that retirement (including early retirement) may be a factor in declining income for those males aged 55 years or more.

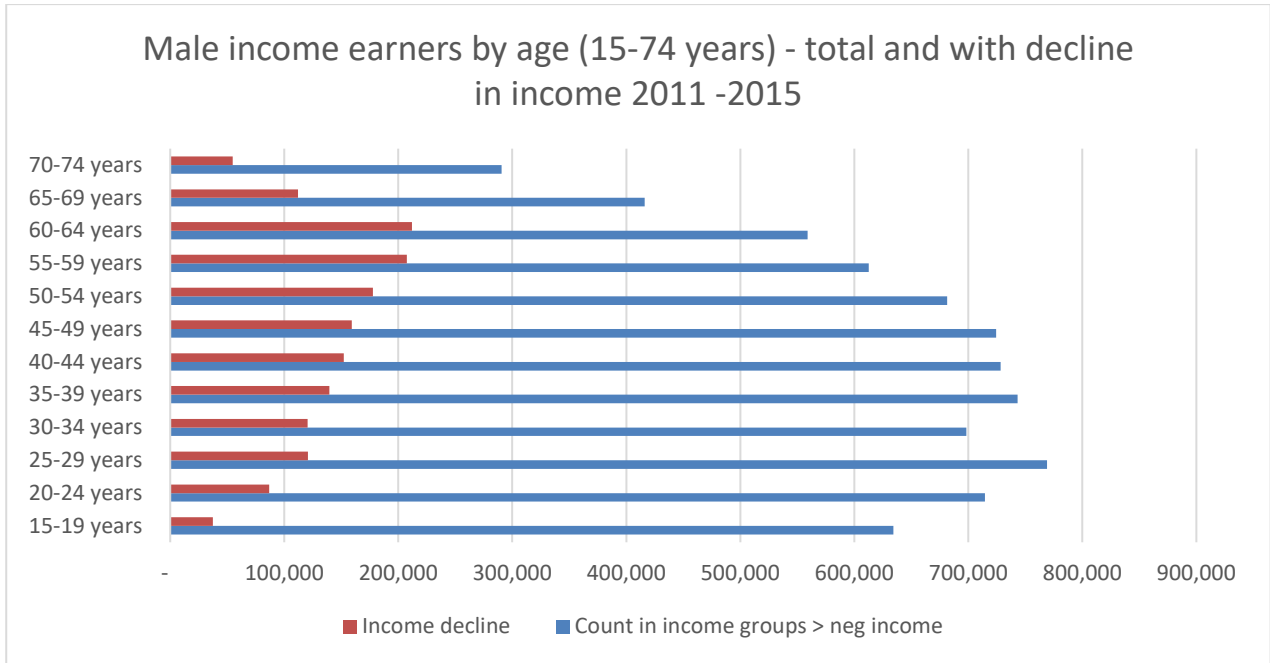


Chart 2 Count of male personal income earners by age group (total in group and count with income decline) Percent of male personal income earners by age group who have experienced income decline from 2011 to 2015

However, as chart 3 below shows, the overall proportion of males in the age groups from 15 to 74 years that have experienced income decline was 21%, and for all age bands from age 30-34 through to 70-74 years the minimum proportion with income decline in any age band was 17%. Therefore, it appears that factors other than life-stage events are contributing at a significant level to the observed patterns of income decline for males.

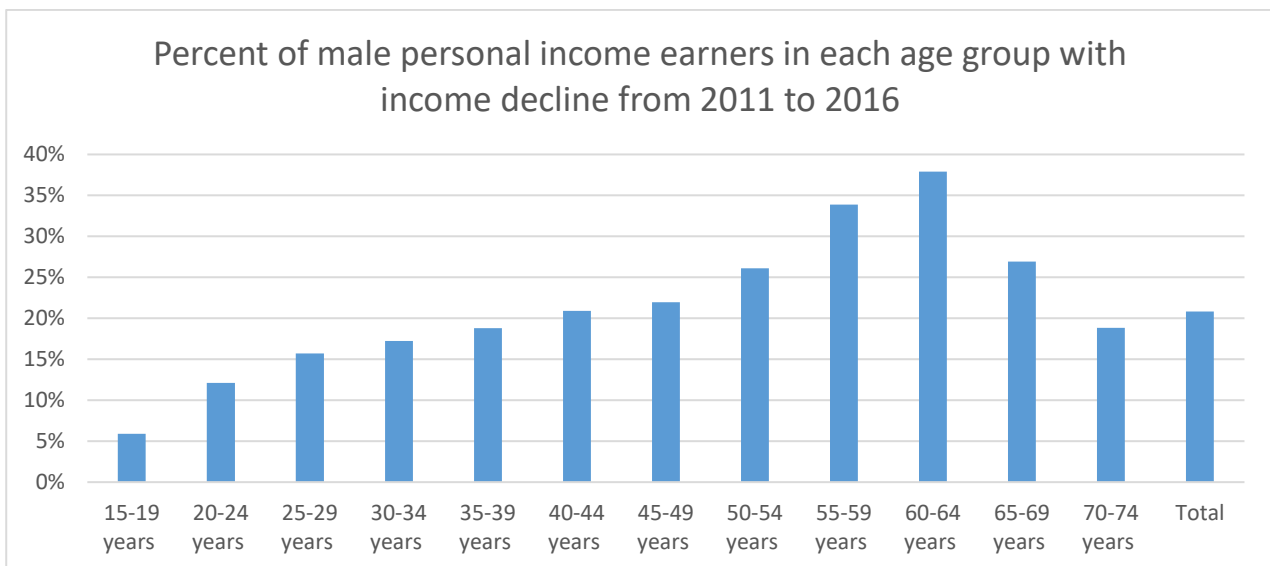


Chart 3 Proportion of male personal income earners in each band who have experienced income decline from 2011 – 2016

The pattern for decline in income for women is different to men. There is a peak in the 25-29 year age band, which would correspond with reduced participation in the labour force associated with starting a family, with a second peak in the 55-59 year age band.

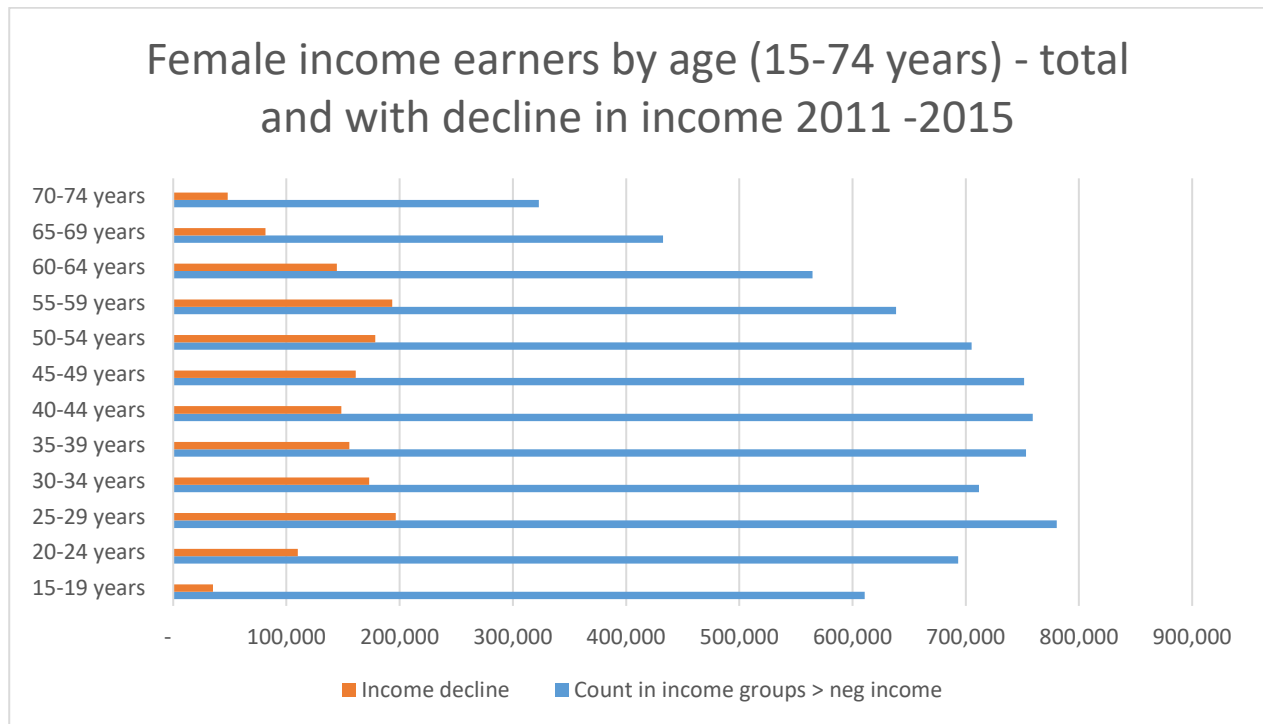


Chart 4 Count of females by age group who have experienced decline in personal income from 2011 – 2016

Overall women have a similar proportion of personal income earners that have experienced a decline in personal income from 2011 – 2016 to the proportion of males with income decline (22%). For the age bands from 25-29 years through to the 60-64 year age band, no age group had less than 20% of personal income earners with decline in income.

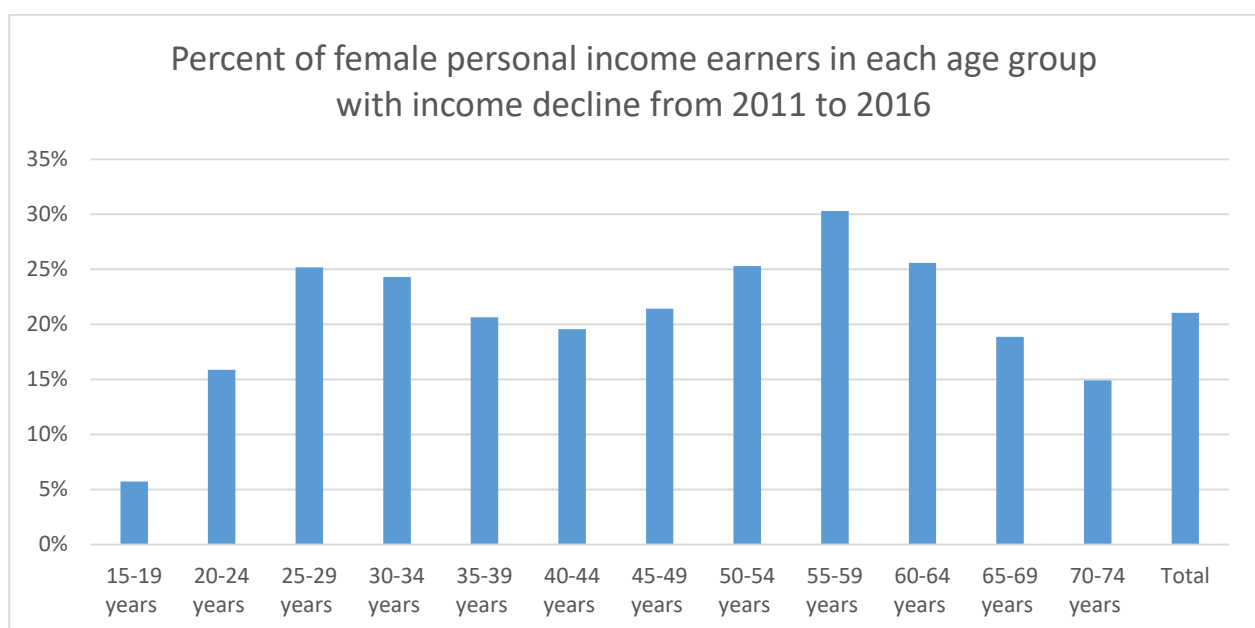


Chart 5 Proportion of female personal income earners in each band who have experienced income decline from 2011 – 2016

DOWNWARD MOBILITY BY INDUSTRY OF EMPLOYMENT

Chart 6 below shows the pattern of income decline by industry worked in during 2011. The industry experiencing the highest decline was mining, with almost 35% of people working in this industry experiencing a decline in income over the 5 year period. This data reflects the end of the mining boom and provides a partial explanation for the higher levels of declining income experienced by people in West Australia and Queensland over the period.

However, the underlying pattern of income decline has applied across all industries, with no industry having less than 20% of people employed in the sector experiencing income decline over the 5 year period.

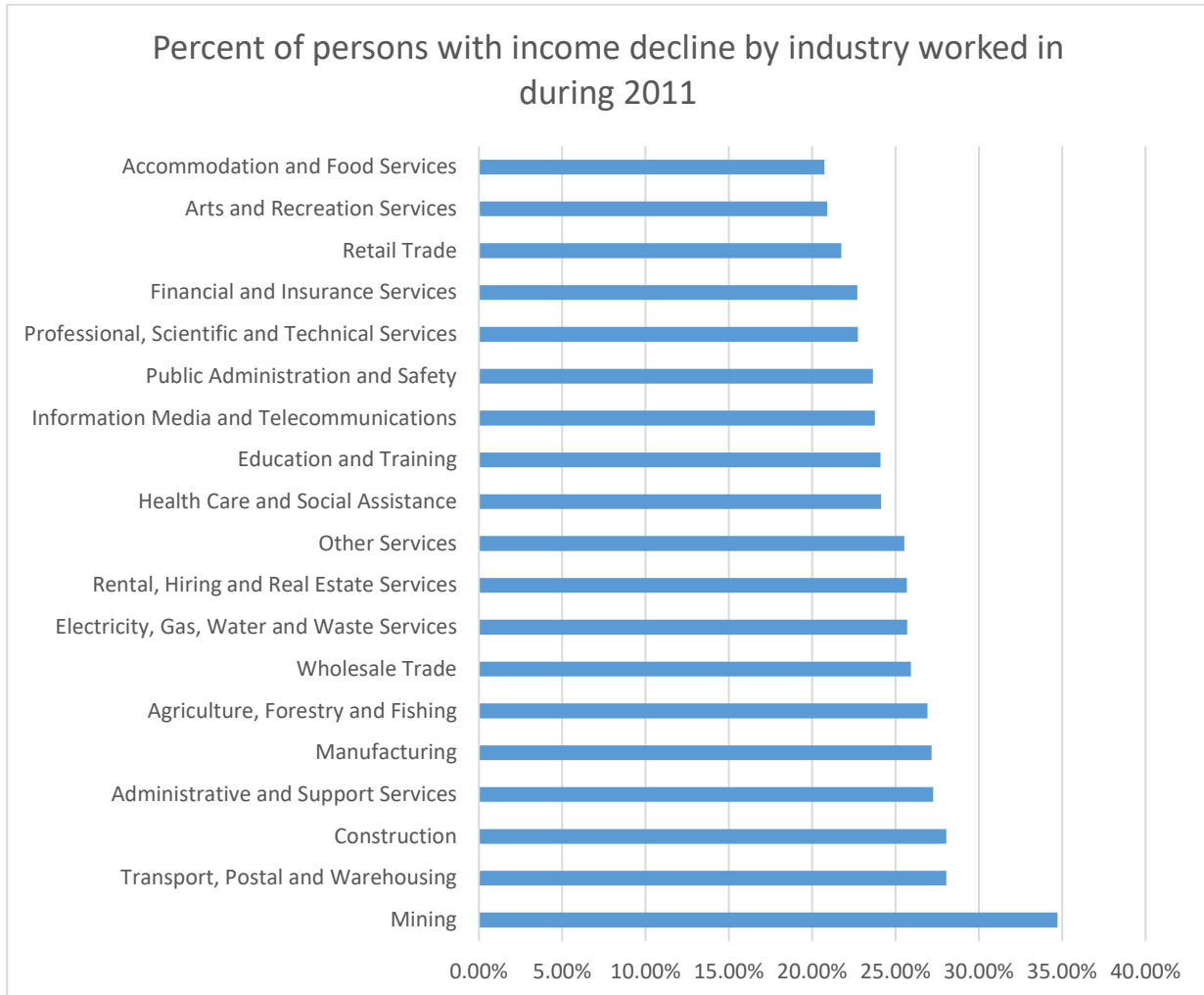


Chart 6 Percent of personal income earners with decline in income from 2011 - 2016 by industry grouping

Table 4 below provides a breakdown of the count of workers in each industry, the number in each industry that have experienced income decline over the 5 year period and the percentage of workers who have experienced income decline.

Industry of Employment in 2011	Count of persons with income decline	Count employed in industry	Percent with downward mobility
Mining	58,434	168,329	34.71%
Transport, Postal and Warehousing	136,340	486,072	28.05%
Construction	230,922	823,360	28.05%
Administrative and Support Services	91,112	334,388	27.25%
Manufacturing	258,132	950,148	27.17%
Agriculture, Forestry and Fishing	60,754	225,689	26.92%
Wholesale Trade	107,833	415,960	25.92%
Electricity, Gas, Water and Waste Services	29,829	116,069	25.70%
Rental, Hiring and Real Estate Services	40,139	156,360	25.67%
Other Services	99,035	388,094	25.52%
Health Care and Social Assistance	289,342	1,199,203	24.13%
Education and Training	201,389	836,074	24.09%
Information Media and Telecommunications	43,368	182,512	23.76%
Public Administration and Safety	168,763	713,503	23.65%
Professional, Scientific and Technical Services	170,989	751,860	22.74%
Financial and Insurance Services	87,793	386,818	22.70%
Retail Trade	237,113	1,090,165	21.75%
Arts and Recreation Services	31,650	151,397	20.91%
Accommodation and Food Services	135,846	655,196	20.73%
Not stated	19,210	76,077	25.25%
Inadequately described	29,837	107,971	27.63%
Industry of employment is not applicable	804,669	10,531,858	7.64%
Total	3,332,498	20,747,103	16.06%

Table 4 Count of personal income earners with income decline by industry worked in during 2011

DOWNWARD MOBILITY BY OCCUPATION

The downward mobility was analysed across occupational groups, using the stated occupation in 2016 at level 2 of the ABS classification of occupations. Many of the occupational groups with the highest percent of people with declining income over the five year period were from lesser skilled groups and/or working in industries subject to changes in commodity prices.

The data shown in Table 5 below is for a subset of the ABS classification where there were at least 1900 people in the occupation group who had experienced income decline over the 5 year period.

A significant question, which is not addressed in the current study, is the extent to which the reduction in income earned by people was as a result of voluntary decisions and choices made by individuals, or life-stage events experienced by the individual, versus them experiencing reduced opportunity to earn income associated with factors such as a decline in bargaining power, changes in the nature of work and demand for specific skills or structural changes to industry.

The focus of the current study has been to establish an evidence base on the magnitude of income decline in Australia during a relatively recent period during which Australia has been experiencing aggregate economic growth.

The profiling of the people with reduced income over the 5 years from 2011-2016 by age, sex, industry and occupation demonstrates that income decline has occurred at significant levels for almost every age group and sex, and is experienced across all industries and occupations.

Occupation in 2016	Percent of group with income decline
Farmers and Farm Managers	25%
Road and Rail Drivers	22%
Sports and Personal Service Workers	21%
Machinery Operators and Drivers	20%
Arts and Media Professionals	20%
Other Labourers	20%
Skilled Animal and Horticultural Workers	19%
Cleaners and Laundry Workers	19%
Labourers	19%
Supplementary Codes	19%
Farm, Forestry and Garden Workers	18%
Construction Trades Workers	18%
Clerical and Office Support Workers	18%
Construction and Mining Labourers	17%
Managers	17%
Mobile Plant Operators	17%
Other Technicians and Trades Workers	17%
Food Trades Workers	17%
Hospitality, Retail and Service Managers	16%
Sales Representatives and Agents	16%
General Clerical Workers	16%
Automotive and Engineering Trades Workers	16%
Numerical Clerks	15%
Sales Assistants and Salespersons	15%
Electrotechnology and Telecommunications Trades Workers	15%
Personal Assistants and Secretaries	15%

Occupation in 2016	Percent of group with income decline
Food Preparation Assistants	15%
Inquiry Clerks and Receptionists	15%
Health and Welfare Support Workers	14%
Storepersons	14%
Machine and Stationary Plant Operators	14%
Carers and Aides	14%
Health Professionals	13%
Education Professionals	13%
Sales Support Workers	13%
Factory Process Workers	13%
Legal, Social and Welfare Professionals	13%
Chief Executives, General Managers and Legislators	12%
Office Managers and Program Administrators	12%
Technicians and Trades Workers	12%
Business, Human Resource and Marketing Professionals	12%
Hospitality Workers	12%
Engineering, ICT and Science Technicians	12%
Other Clerical and Administrative Workers	12%
Design, Engineering, Science and Transport Professionals	11%
Protective Service Workers	11%
Specialist Managers	10%
Professionals	10%
ICT Professionals	8%

Table 5 Percent of income earners by occupational group (2016) who had experienced decline in income from 2011

DOWNWARD MOBILITY – THE MAGNITUDE OF REDUCTION IN HOUSEHOLD INCOME OVER THE 5 YEAR PERIOD

From an economic modelling perspective, the reduction in household income observed over the 2011 – 2016 period does not necessarily translate into a reduction in economic activity. For example, if the profit of private sector firms increased when household income declined, the increased profits may stimulate additional investments and spending in other parts of the economy.

A separate question is whether we can estimate the reduction in purchasing power of income earners who were affected by a decline in personal income over the 5 year period. Using the mid-point value in each income band (and adding \$500 per week to the start value of the open ended top income band) an estimate of loss was calculated for downward movement from each income band in 2011 to each lower income band in 2016. The count of people in each income band decline was multiplied by the level of income loss generated using the income band mid-point values. The analysis of changes in personal income from the ACLD shows that the pattern of decline in personal income had a weekly value of \$1.9 billion.

Total Personal Income (weekly) in 2011	Total Personal Income bands (weekly) in 2016														
	Negative income	Nil income	\$1-\$149	\$150-\$299	\$300-\$399	\$400-\$499	\$500-\$649	\$650-\$799	\$800-\$999	\$1,000-\$1,249	\$1,250-\$1,499	\$1,500-\$1,749	\$1,750-\$1,999	\$2,000-\$2,999	\$3,000 or more
Nil income	-	-	14,333,238	38,069,730	44,075,220	45,375,300	64,247,223	75,929,033	87,295,320	84,777,413	49,987,988	35,744,638	19,909,473	33,221,250	28,066,150
\$1-\$199	649,090	12,637,520	3,274,770	26,970,813	41,200,975	43,719,690	60,623,443	71,219,063	82,477,920	87,253,945	56,390,445	34,510,140	17,360,228	23,794,080	17,094,860
\$200-\$299	1,662,650	20,500,200	6,889,200	7,330,178	50,159,350	49,510,120	48,782,955	54,006,550	54,579,720	62,013,963	38,653,088	27,476,488	12,789,945	17,637,525	21,008,975
\$300-\$399	2,079,945	21,169,295	8,023,073	17,268,863	-	44,784,470	39,335,535	43,348,650	52,409,885	53,070,915	36,207,305	24,188,663	13,910,873	18,011,195	18,849,285
\$400-\$599	3,274,800	40,303,800	15,350,925	37,651,845	31,546,830	14,292,500	27,313,508	64,451,745	86,870,400	93,882,875	61,093,200	45,427,950	25,401,443	37,979,200	27,642,600
\$600-\$799	3,710,420	48,918,310	17,553,025	38,445,835	34,405,595	30,415,450	24,698,513	8,214,918	75,170,860	114,275,403	80,342,213	61,333,420	33,274,013	46,546,380	28,845,880
\$800-\$999	4,126,320	42,118,830	13,597,220	33,338,250	28,568,375	26,023,995	28,604,875	23,631,038	-	80,546,760	85,117,388	73,322,948	43,929,545	64,363,520	29,958,240
\$1,000-\$1,249	3,263,963	44,218,575	16,072,500	29,503,170	30,409,760	26,201,408	31,972,820	30,879,480	31,966,178	-	71,348,425	100,609,150	66,601,710	109,993,950	43,932,988
\$1,250-\$1,499	2,901,938	31,837,575	11,389,500	20,279,330	21,038,433	18,085,323	23,166,560	24,489,335	28,809,463	26,934,250	-	55,482,025	60,833,070	132,344,213	49,295,113
\$1,500-\$1,999	3,775,450	43,671,600	15,503,313	25,313,628	23,330,300	23,086,180	29,683,555	32,662,855	40,760,135	48,677,063	33,962,588	21,176,200	16,619,850	259,649,625	114,987,425
\$2,000 or more	6,650,000	56,132,000	18,299,375	30,803,955	26,083,585	25,347,225	31,659,898	34,544,873	43,514,720	56,147,300	44,737,988	50,630,825	44,592,998	-	429,736,800
Total decline/week	32,094,575	361,507,705	122,678,130	239,935,053	195,382,878	163,452,080	169,786,220	146,207,580	145,050,495	131,758,613	78,700,575	71,807,025	44,592,998	1,902,953,925	-
Total decline value per week	-\$1,902,953,925														

Table 6 Theoretical value of loss based on number of people in each income change band and mid point values of each income band

The recent CEDA report (Committee for the Economic Development of Australia, 2018) found that 31% of people in Australia reported that they are finding it difficult to live on their current income, indicating that capacity for discretionary spending is limited for more than 3 in 10 Australians. Table 6 below shows that in terms of absolute value, the mid to highest level income bands in 2011 had the highest reduction in income.

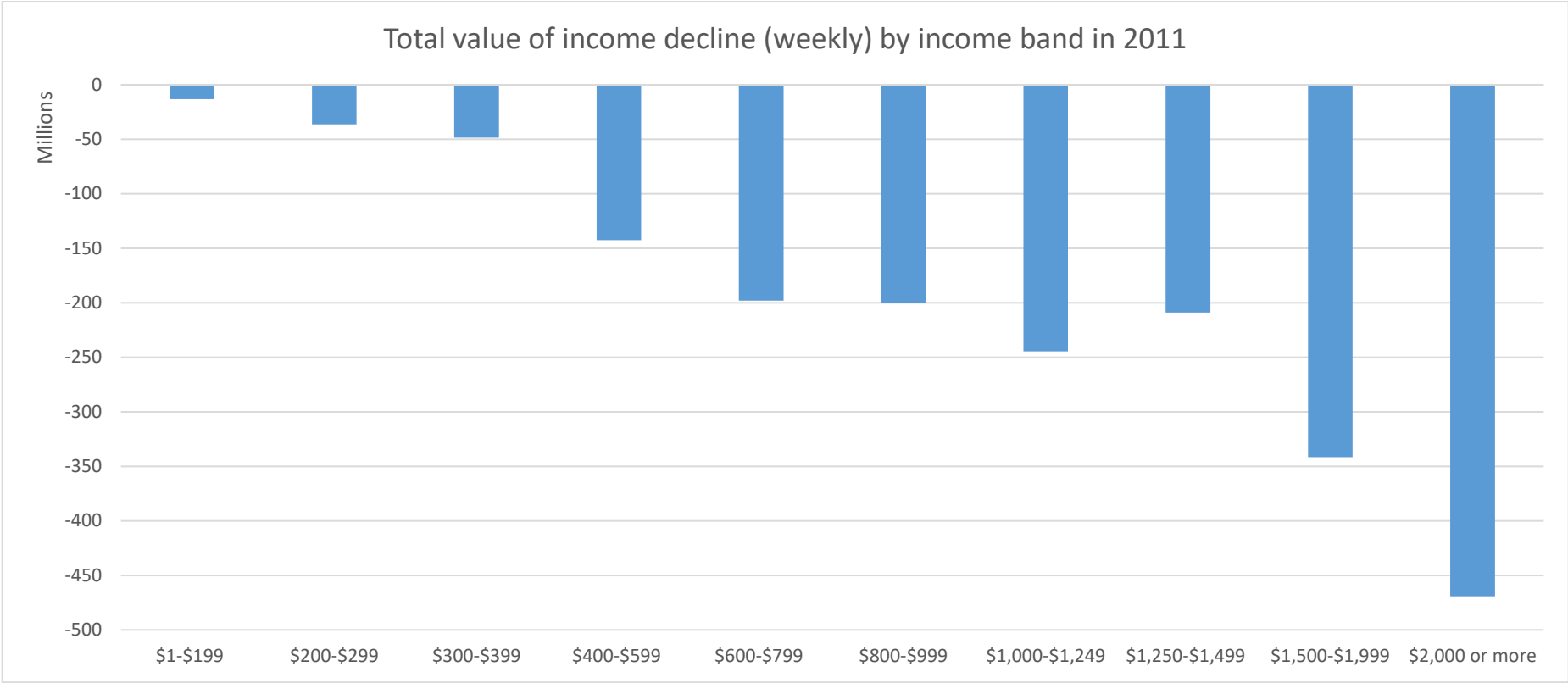


Chart 7 Total estimated value of income decline by personal income level in 2011

PART 5: THE GEOGRAPHIC PATTERN OF INCOME DECLINE

The ACLD database has a range of geographic areas on which longitudinal Census data can be reported. With the level of granularity applied in the current study (cross tabulation of each personal income band from 2011 and 2016) the ABS Table Builder suppressed data at the Local Government Area level (to ensure data confidentiality). Data with a relative standard error (RSE) of estimate of zero was available at the Statistical Area 4 (SA4) level which are typically larger regions than local government areas.

Previous work had been conducted by economists (Graham & Li, 2017) on the cost of living pressures in Australia at the local government area level (LGA). The report by Graham & Li found significant differences across Australia in cost of living pressure. In their study they found correlations between areas of high cost of living and higher use of home brands in supermarket shopping. For the current study we wanted to identify the extent to which people in specific regions in Australia were experiencing a 'double whammy' of both decline in personal/household income and increased cost of living pressures.

To enable the data from both studies to be assessed at the same geographic level a geographic concordance was developed between SA4 areas and LGA areas, and the proportion of people in each 2016 income group who had an income decline from 2011 was calculated for each SA4 area. Using the geographic concordance model these proportions were then applied to data counts in each personal income band from 2016 for each LGA area.

The tables below show the ranked areas (from highest proportion of decline to lowest) for first, LGA areas in greater metropolitan areas by State, then LGA areas outside these regions in each State. The current study also reports on the cost of living pressures by LGA to allow identification of geographic areas that have experienced both high rates of decline in personal income and high cost of living pressures.

The cost of living study (Graham & Li, 2017) draws on data from the Australian Bureau of Statistics (including unpublished data commissioned from the ABS for their report), the National Centre for Social and Economic Modelling (NATSEM) and research from social policy groups, consumer groups and business surveys. The report's findings also draw on an analysis of customer spending behaviour in Coles supermarket stores across the country.

The cost of living study had 3 main components

- A review of existing reports and research on cost of living trends in Australia and the behavioural changes households make to address cost of living impacts
- Analysis of cost of living trends over the period 2011 to 2015 at the Local Government Area (LGA) level
- Analysis of customer spending behaviour in specific Coles supermarkets across Australia

The key themes identified in relation to cost of living trends from published reports and research include the following:

- **Cost of living impacts have been greater for lower income households:** While the cost of living increased for all households over the relevant period, specific types of households have experienced greater impacts than others. Specifically, the impacts have been greater for low income households, due to a higher proportion of their expenditure being spent on items with the most significant price increases over this period
- **Households have been reducing expenditure on both essential and non-essential items:** Surveys of consumers indicate that while the majority of households have responded to cost of living trends by reducing their consumption of non-essential goods (such as entertainment and travel), some households have also reduced their consumption of essential goods (such as groceries and transport)
- **Households will substitute between classes of items to make ends meet:** Changes in the consumption of particular items will not always be directly driven by the relative prices of those items. For example, spending on groceries and food items was reported in consumer surveys as being one of the most common sources of expenditure reduction, despite relatively low food and grocery price inflation over the period.

To understand how cost of living trends vary on a geographic basis, Cost of Living Scores (COLS) Graham & Li (2017) calculated for the period from March 2011 to June 2015 for individual LGAs. The COLS derived for 537 LGAs used a methodology that combines ABS and NATSEM data. On the basis of these COLS, LGAs were then ranked nationally by those most impacted to those least impacted over the relevant period. This national ranking then provided the basis for segmenting LGAs into quintiles to identify the relative impact of cost of living trends on a geographic basis across Australia (see Figure E.1 below).

Their main finding is that cost of living pressures have increased across all regions, but the pressures have been greatest in LGAs in a number of regional areas and within particular states (South Australia, Tasmania, Queensland and Victoria). In the major metropolitan centres, cost of living pressures have tended to be greatest in the outer-metropolitan areas. The tables in Appendix 2 to show the LGAs in Australia grouped by State and within state into Greater Metropolitan areas and Remainder of State areas, and sorted within these groupings from highest percent of persons with income loss to lowest.

When both the proportion of personal income earners who have experienced income loss and the cost of living pressures experienced in a local government area are ranked, it becomes possible to identify areas which are more severely affected by both factors. In the section of States classed as Greater Metropolitan Areas there are a number of LGAs which are ranked high for both cost of living pressures and proportion of income earners with decline in income. These areas include:

In NSW:

- Burwood
- Cumberland
- Canterbury-Bankstown

In VIC:

- Dandenong
- Brimbank
- Whittlesea

In QLD:

- Lockyer Valley
- Somerset
- Logan

In SA:

- Onkaparinga
- Marion
- Playford

In WA:

- Mandurah
- Gosnells
- Canning

In TAS:

- Derwent Valley
- Brighton
- Glenorchy

PART 6: THE NEED FOR FURTHER ANALYSIS OF DOWNWARD MOBILITY IN AUSTRALIA

The current study has established a quantitative assessment of the size and structure of the Australian population and households that have experienced income decline over the 2011-2016 period. While there has been preliminary analysis and profiling of the cohort that experienced income decline (age, sex, industry and occupation), there remains a critical need to build on the current study to identify the extent to which structural issues in the economy are at play.

In the absence of further analysis of the factors associated with a significant section of the Australian community experiencing declining income in a period of overall economic growth policy debate on how to address these issues will be uninformed.

We note that the comprehensive study from the Productivity Commission produced findings across data aggregates, and the approach followed in that study does not allow identification of specific cohorts who have experienced income loss over a period of time. The current study focuses on a relatively small part of the time interval studied by the Productivity Commission (5 recent years), and this time period (2011 to 2016) has been a time of low wages growth.

Traditionally, we would expect specific patterns of income decline associated with particular occupations and/or industries if there are structural adjustments going on in the economy. The widespread nature of income decline (across all 2011 income groups) and the patterns of income decline across both a wide range of industries and occupations doesn't allow an easy explanation for the decline being primarily due to structural changes to specific industries.

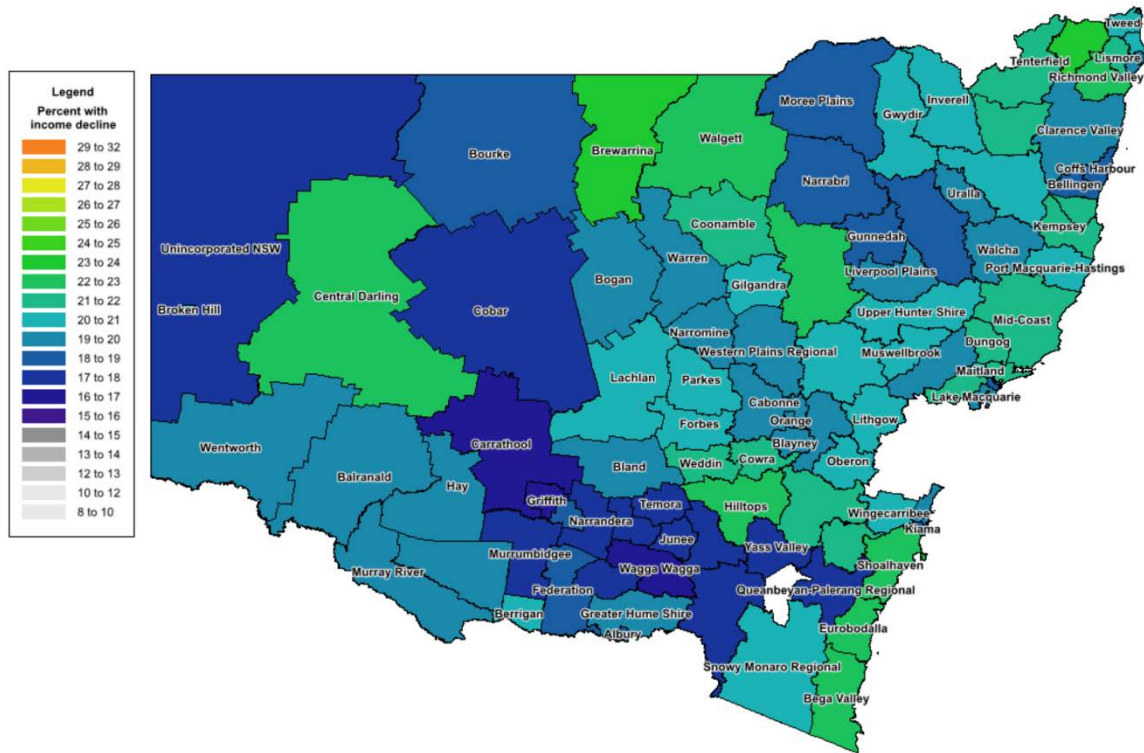
We recommend an approach to building insights into factors associated with downward mobility that involves enhanced use of longitudinal data on individuals, households and businesses. In addition to the longitudinal Census data used in the current study, there is a major longitudinal study of household income and labour force dynamics – HILDA (Melbourne Institute of Applied Economics and Social Research) and this study was used by the Productivity Commission. We recommend that both these longitudinal studies be supplemented by the Australian Tax Office creating a new longitudinal dataset, and that the specific cohort approach we have adopted in our current study be applied as part of any future research.

The Australian Tax Office (ATO) currently produces annual snapshots of tax return data using a 5% sample. Using a linkage strategy to provide de-identified data on longitudinal patterns of recorded income and expenses at the personal, household and business level would help develop insights into both the dynamics of changes in wealth and the patterns of distribution of wealth and wealth creation. Importantly, the ATO data covers all taxpayers and the development of de-identified longitudinal files would remove many of the potential confounding issues associated with sampling that can apply to surveys such as HILDA.

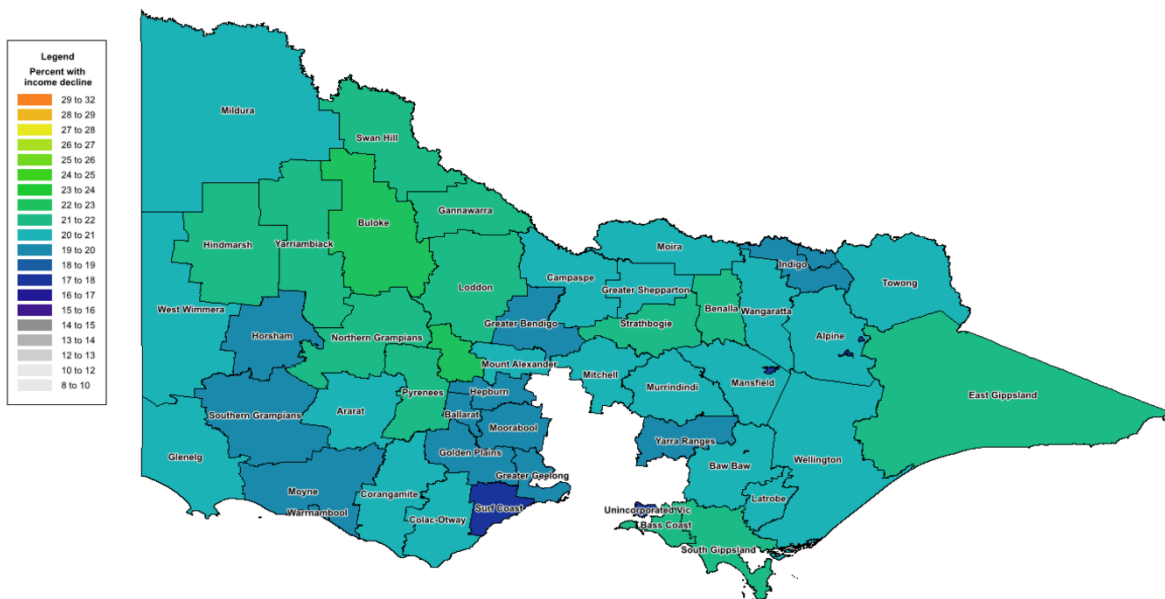
We note that the ATO has been reluctant to produce such a file to date, citing concerns over potential for identification of individuals from such a file. However, the fact that the ABS has been able to provide to researchers files of similar sensitivity through Confidentialised Unit Record Files (CURFs) with access limited to bona fide researchers who have to enter undertakings on use of the data indicates these issues can be addressed through appropriate policy and data access agreements.

Critically, the development and extended use of these longitudinal datasets can help build insight into what makes jobs sticky, and the identification of policy levers that can support the growth of long term well- paying jobs in Australia.

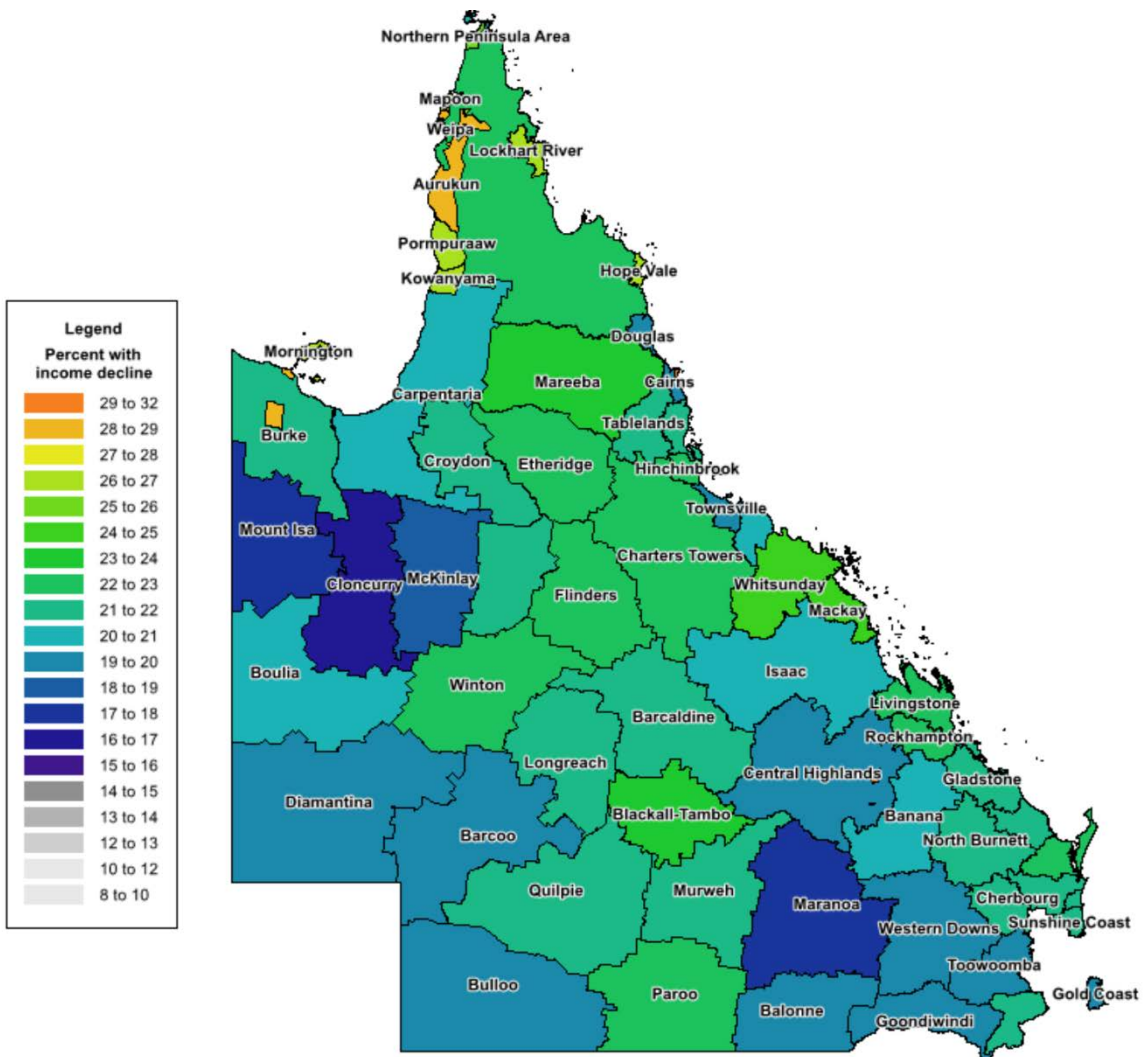
APPENDIX 1 – MAPS OF LGA AREAS IN AUSTRALIA SHOWING INCOME DECLINE PROPORTIONS BY LGA AREA



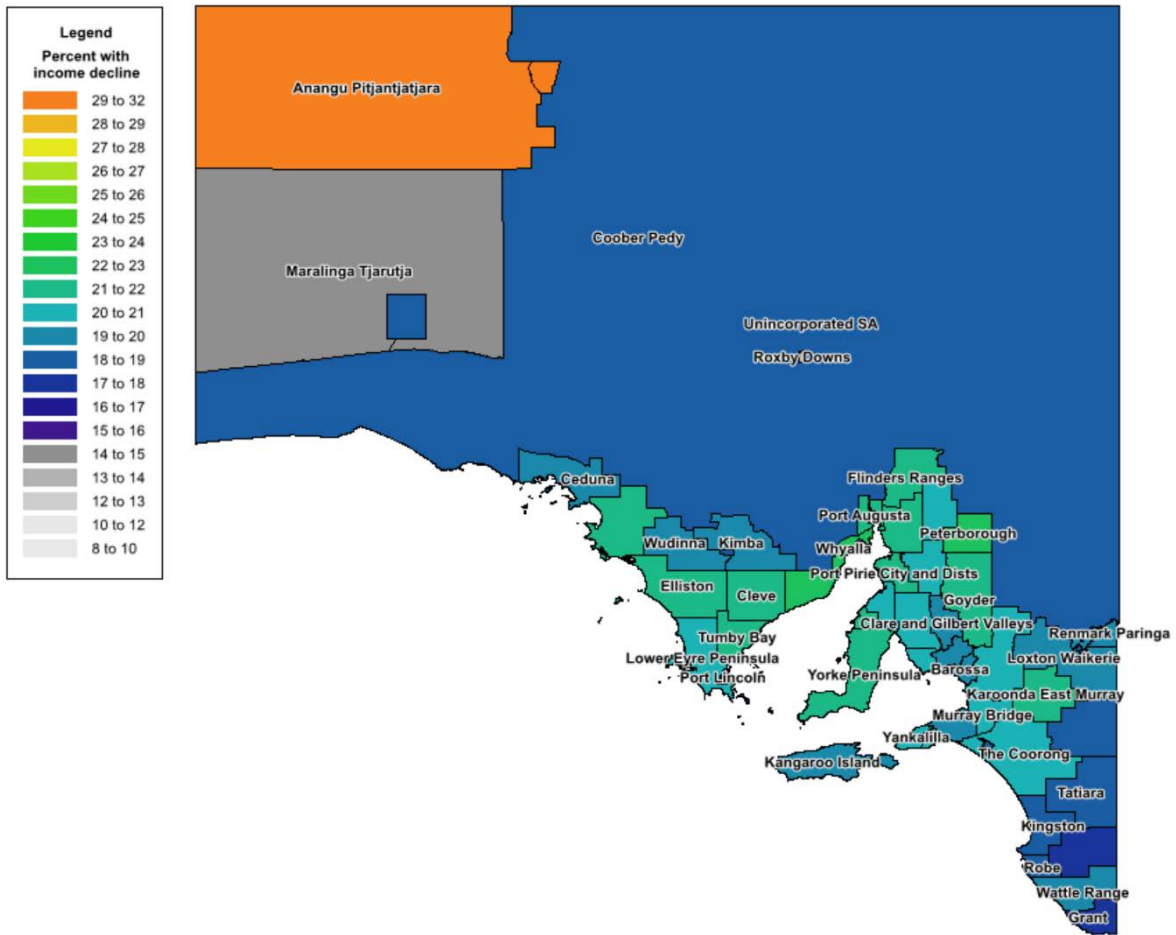
Map 5 Non metropolitan NSW LGA areas with rate of income decline of personal income earners



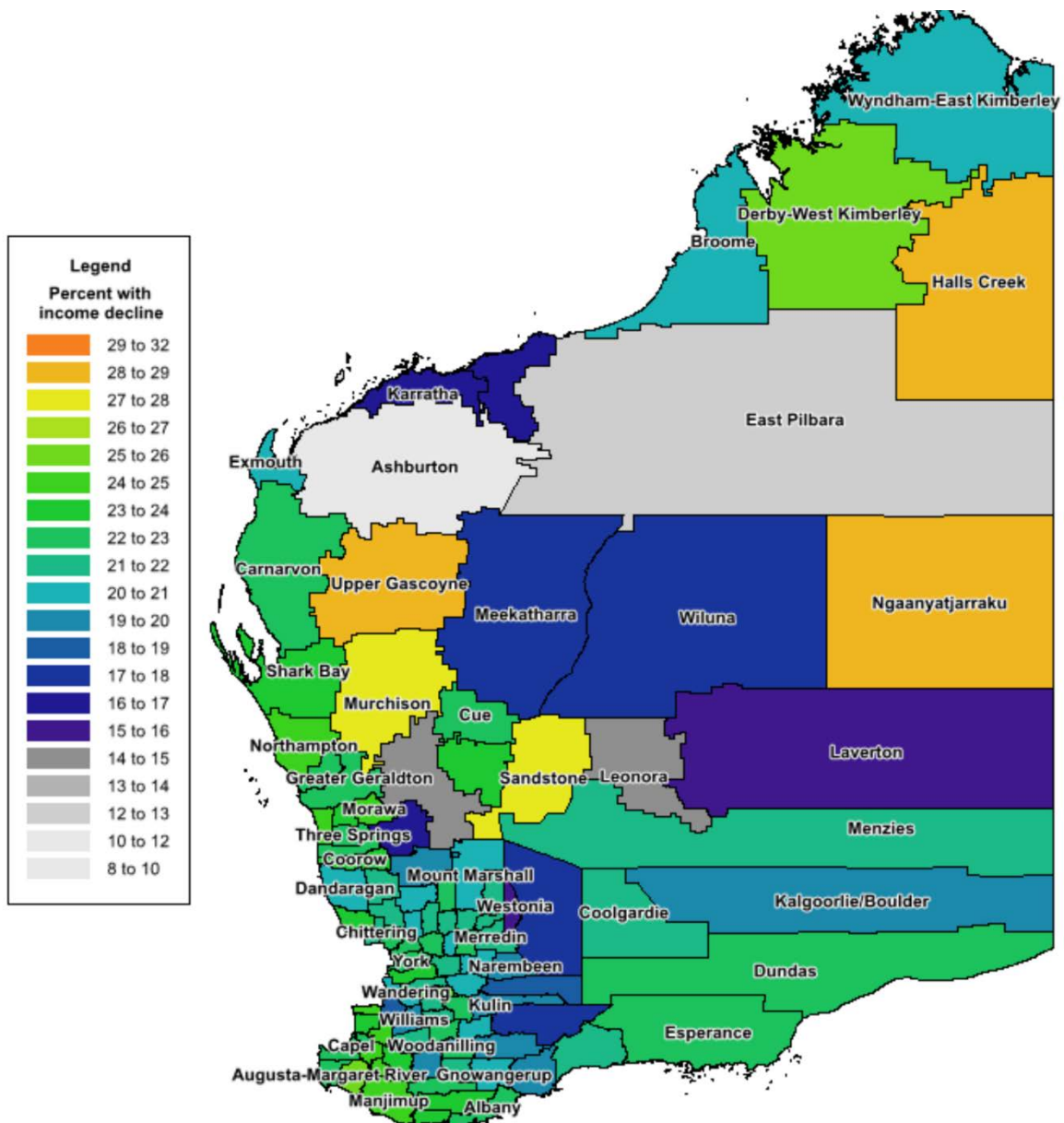
Map 6 Non metropolitan VIC LGA areas with rate of income decline of personal income earners



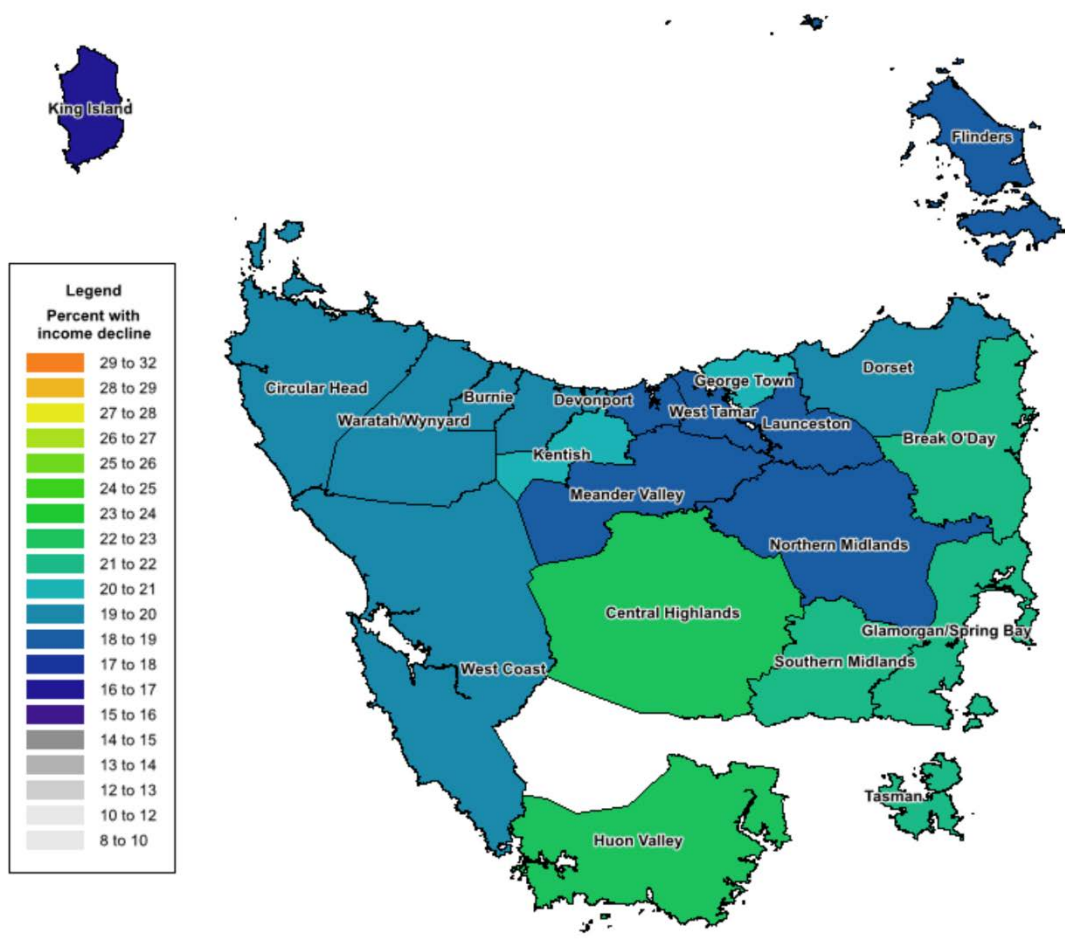
Map 7 Non metropolitan QLD LGA areas with rate of income decline of personal income earners



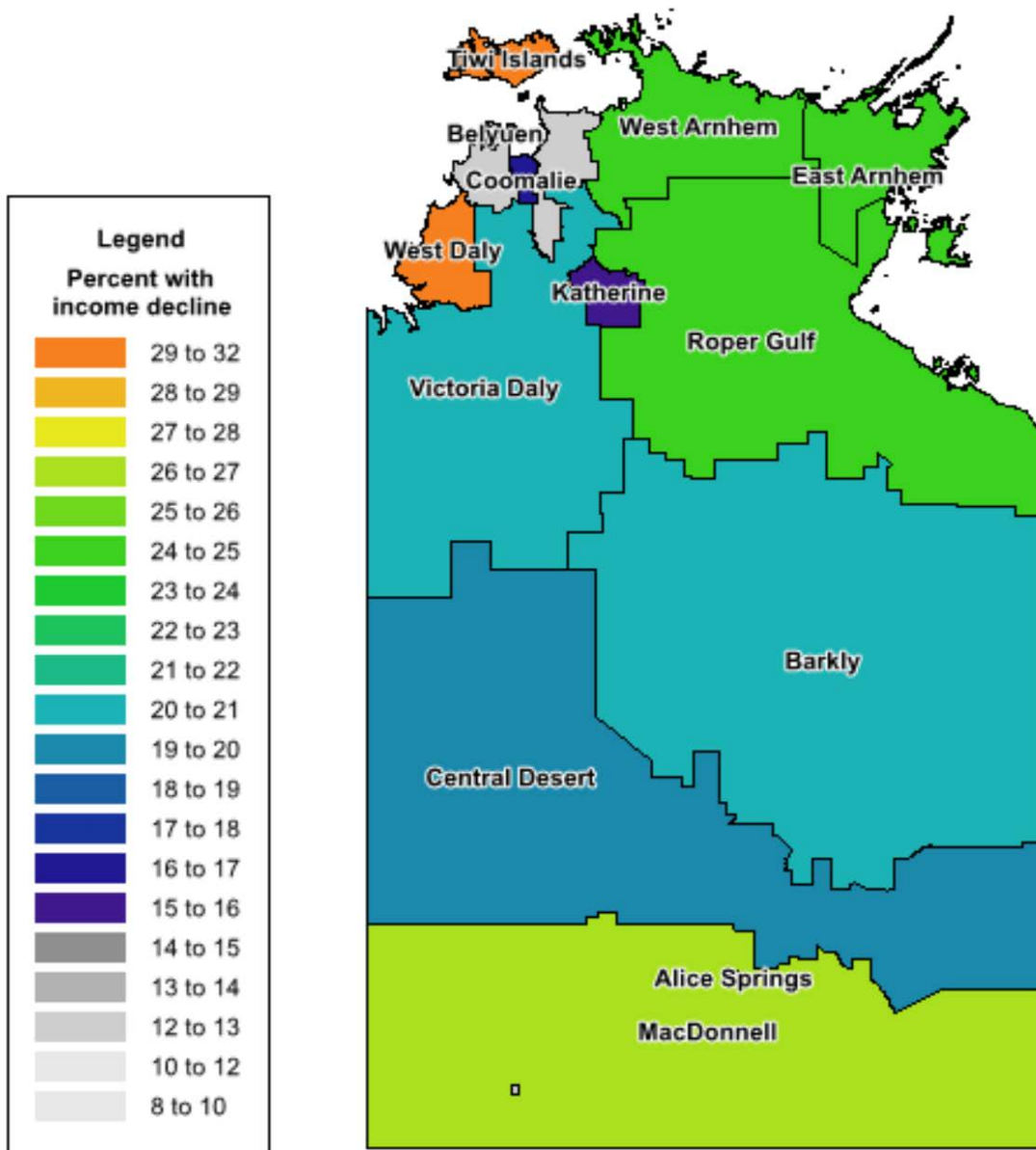
Map 8 Non metropolitan SA LGA areas with rate of income decline of personal income earners



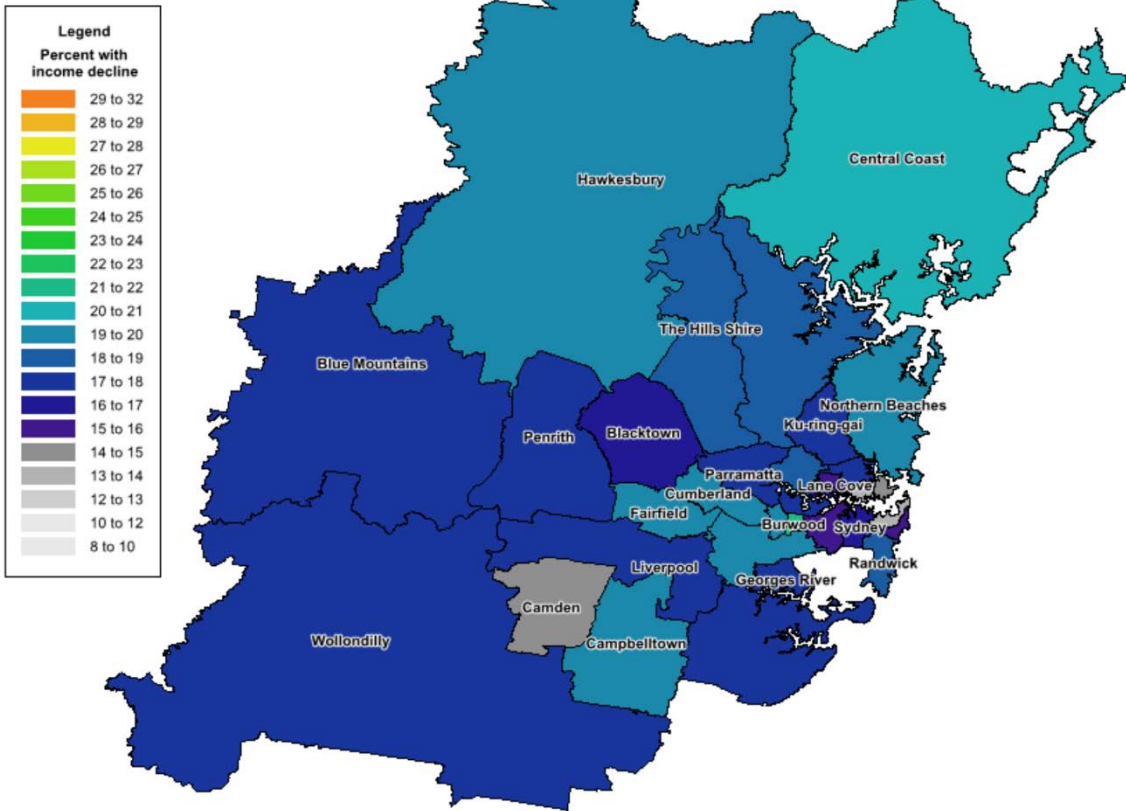
Map 9 Non metropolitan WA LGA areas with rate of income decline of personal income earners



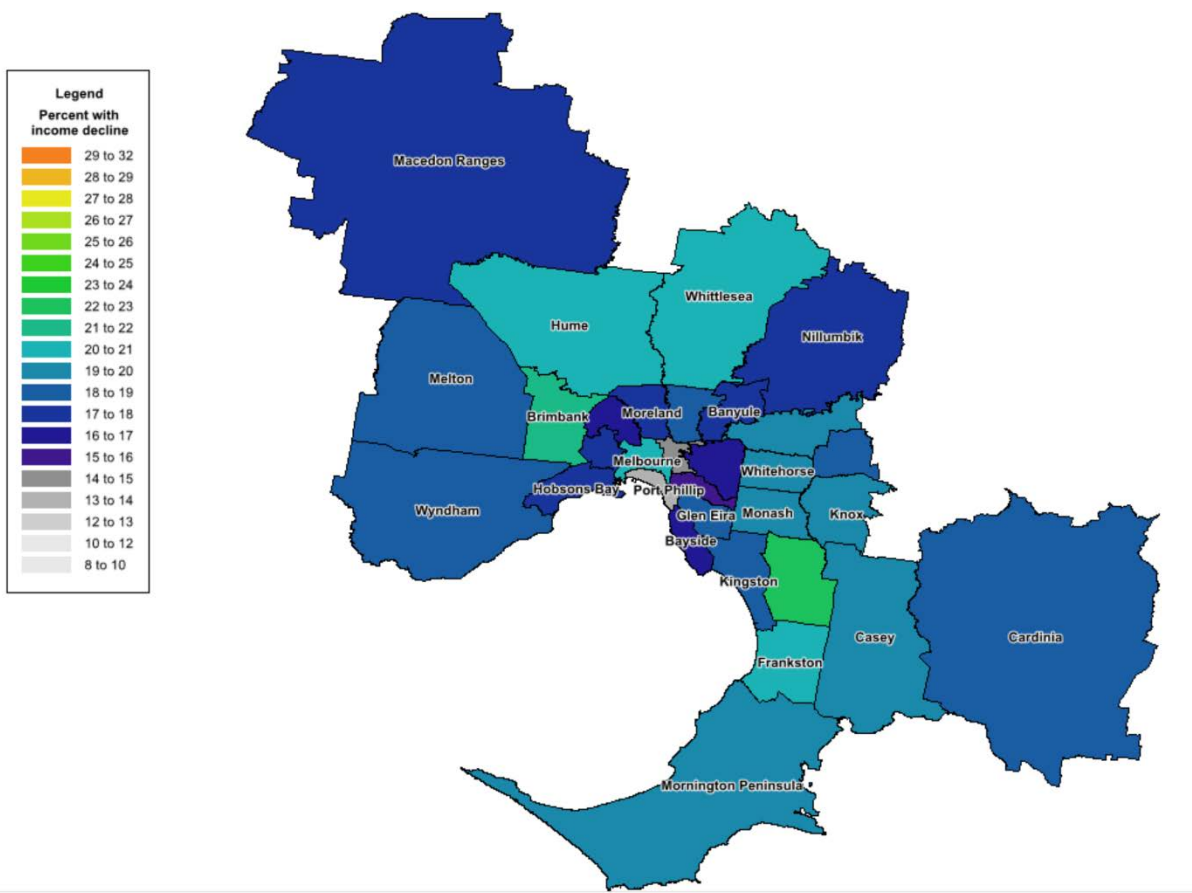
Map 10 Non metropolitan TAS LGA areas with rate of income decline of personal income earners



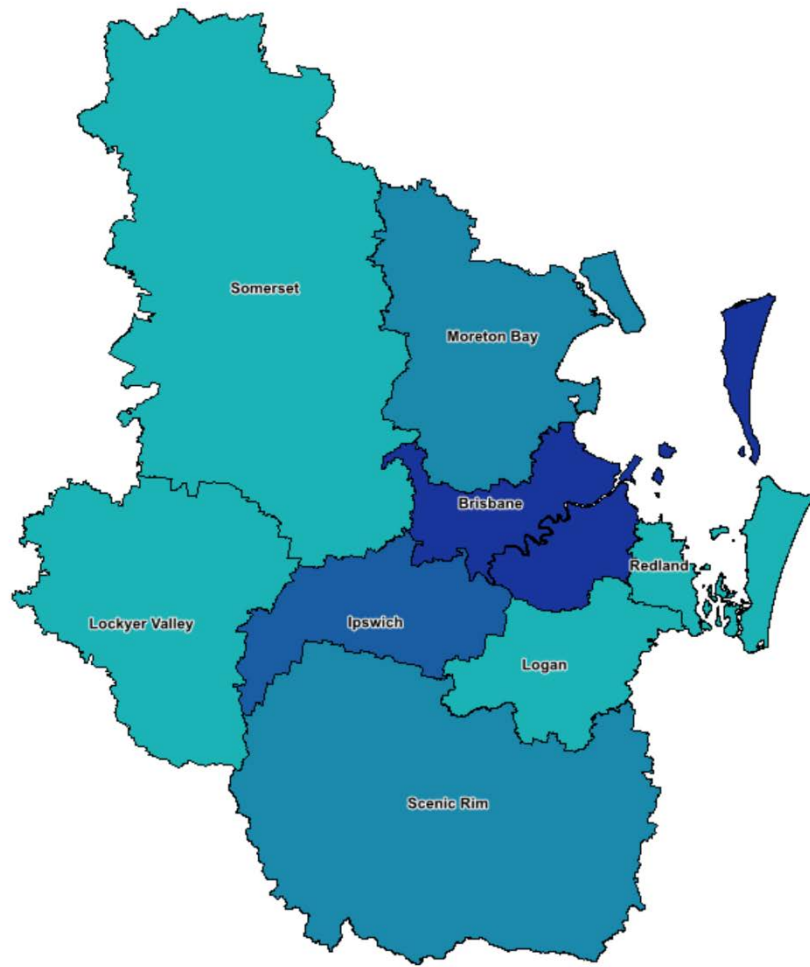
Map 11 Non metropolitan NT LGA areas with rate of income decline of personal income earners



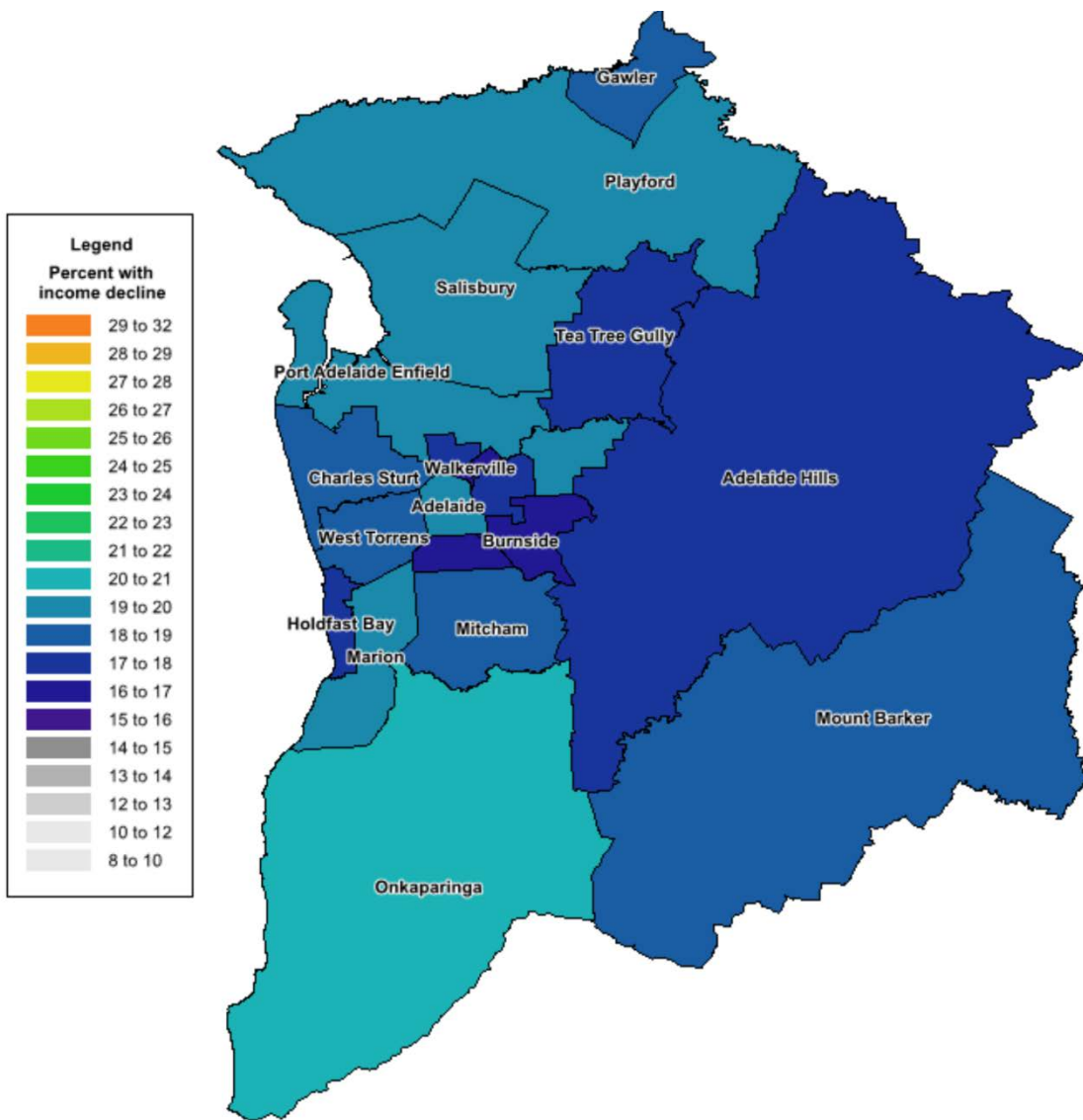
Map 12 Metropolitan NSW LGA areas with rate of income decline of personal income earners



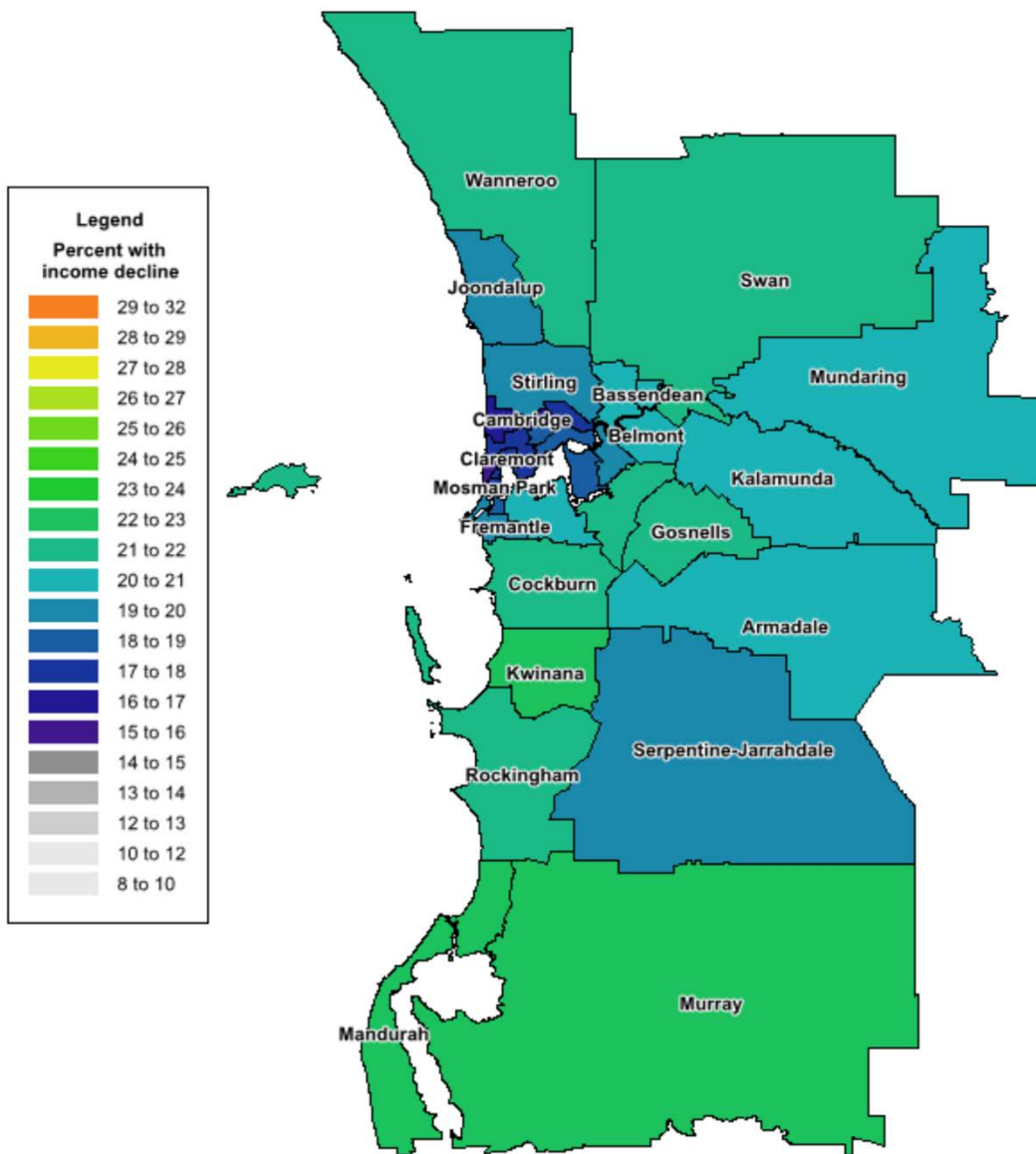
Map 13 Metropolitan VIC LGA areas with rate of income decline of personal income earners



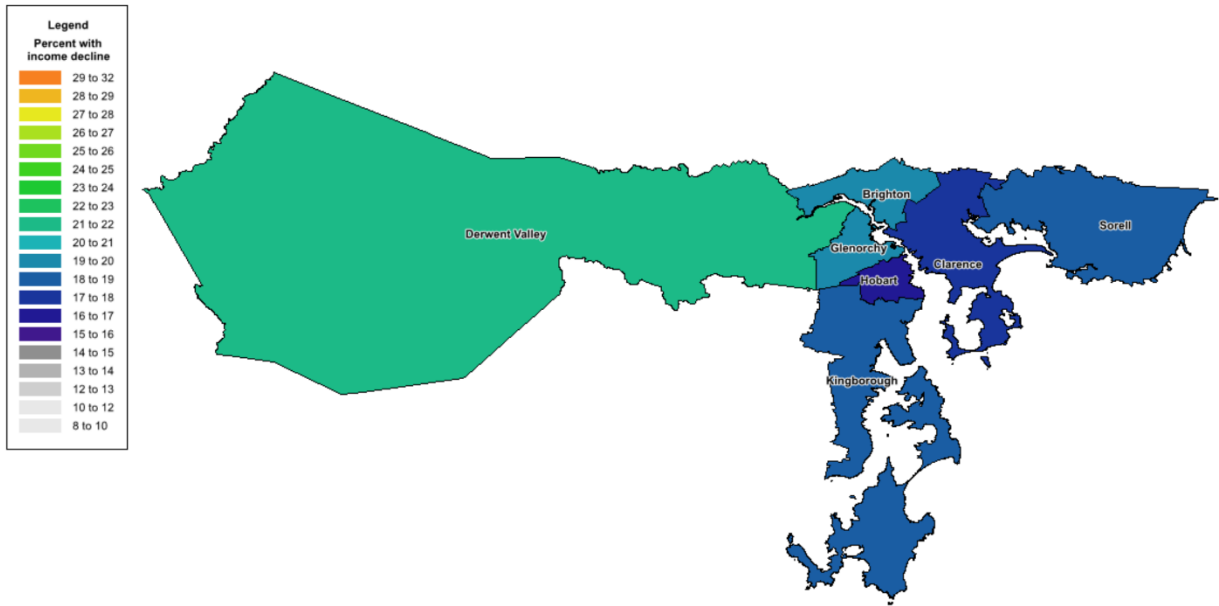
Map 14 Metropolitan QLD LGA areas with rate of income decline of personal income earners



Map 15 Metropolitan SA LGA areas with rate of income decline of personal income earners



Map 16 Metropolitan WA LGA areas with rate of income decline of personal income earners



Map 17 Metropolitan TAS LGA areas with rate of income decline of personal income earners

APPENDIX 2 – RANKINGS OF LOCAL GOVERNMENT AREAS BY METROPOLITAN AND NON METROPOLITAN AREAS BY STATE BY PROPORTION OF PERSONAL INCOME EARNERS WITH DECLINE IN INCOME FROM 2011 -2016

Local Government Area	Percent decline	Within region decline rank (1= highest decline)	Within region cost of living rank (1=Highest cost of living pressure)	National cost of living ranking
GREATER SYDNEY REGION				
Burwood	22%	1	3	130
Central Coast	20%	2	15	352
Strathfield	20%	3	20	392
Cumberland	20%	4	1	61
Canterbury-Bankstown	20%	5	6	175
Hawkesbury	19%	6	33	466
Fairfield	19%	7	2	68
Northern Beaches	19%	8	26	414
Campbelltown	19%	9	8	214
Ryde	19%	10	21	394
Randwick	19%	11	17	359
Hornsby	19%	12	10	237
The Hills Shire	18%	13	28	442
Georges River	18%	14	9	229
Sutherland Shire	18%	15	30	449
Penrith	18%	16	13	323
Blue Mountains	18%	17	4	157
Wollondilly	18%	18	27	441
Willoughby	17%	19	16	357
Ku-ring-gai	17%	20	25	407
Liverpool	17%	21	5	166
Canada Bay	17%	22	12	282
Parramatta	17%	23	24	401
Blacktown	17%	24	19	376
Sydney	16%	25	7	200
Hunters Hill	16%	26	23	398
Inner West	16%	27	11	271
Lane Cove	16%	28	32	460
Waverley	15%	29	34	473

Local Government Area	Percent decline	Within region decline rank (1= highest decline)	Within region cost of living rank (1=Highest cost of living pressure)	National cost of living ranking
Camden	15%	30	22	396
Mosman	14%	31	35	497
Woollahra	14%	32	31	451
North Sydney	13%	33	29	447
Botany Bay	NA	NA	14	343
Rockdale	NA	NA	18	361

GREATER MELBOURNE REGION

Greater Dandenong	22%	1	2	102
Brimbank	21%	2	10	210
Whittlesea	20%	3	8	187
Frankston	20%	4	24	411
Melbourne	20%	5	7	167
Hume	20%	6	26	432
Monash	20%	7	6	147
Mornington Peninsula	20%	8	12	223
Knox	20%	9	3	110
Whitehorse	20%	10	4	131
Casey	20%	11	9	188
Manningham	19%	12	13	227
Wyndham	19%	13	1	94
Melton	19%	14	14	232
Kingston	19%	15	23	397
Maroondah	19%	16	20	372
Darebin	19%	17	15	285
Cardinia	18%	18	11	215
Glen Eira	18%	19	16	289
Moreland	18%	20	21	383
Banyule	17%	21	5	133
Macedon Ranges	17%	22	17	297
Maribyrnong	17%	23	18	312
Hobsons Bay	17%	24	28	445
Nillumbik	17%	25	30	463
Moonee Valley	17%	26	19	345
Boroondara	17%	27	29	457
Bayside	16%	28	25	421
Stonnington	15%	29	27	434

Local Government Area	Percent decline	Within region decline rank (1= highest decline)	Within region cost of living rank (1=Highest cost of living pressure)	National cost of living ranking
Yarra	14%	30	31	487
Port Phillip	14%	31	22	389

GREATER BRISBANE REGION

Lockyer Valley	21%	1	5	270
Somerset	21%	2	3	233
Logan	20%	3	7	351
Redland	20%	4	8	417
Scenic Rim	20%	5	2	196
Moreton Bay	20%	6	1	191
Ipswich	18%	7	4	264
Brisbane	18%	8	6	276

GREATER ADELAIDE REGION

Onkaparinga	21%	1	8	309
Marion	20%	2	4	159
Playford	20%	3	5	183
Adelaide	20%	4	19	430
Campbelltown	20%	5	11	341
Salisbury	20%	6	1	82
Port Adelaide Enfield	19%	7	9	332
Mount Barker	19%	8	15	388
West Torrens	19%	9	3	154
Charles Sturt	19%	10	6	204
Mitcham	18%	11	17	419
Gawler	18%	12	2	129
Norwood Payneham St Peters	18%	13	18	423
Adelaide Hills	18%	14	10	335
Prospect	18%	15	7	273
Holdfast Bay	18%	16	16	418
Tea Tree Gully	17%	17	12	346
Burnside	17%	18	13	370
Walkerville	17%	19	20	481
Unley	17%	20	14	381

GREATER PERTH REGION

Murray	23%	1	11	433
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Local Government Area	Percent decline	Within region decline rank (1= highest decline)	Within region cost of living rank (1=Highest cost of living pressure)	National cost of living ranking
Mandurah	23%	2	9	425
Kwinana	23%	3	12	437
Rockingham	22%	4	29	490
Gosnells	22%	5	1	240
Canning	22%	6	3	305
Wanneroo	21%	7	4	337
Swan	21%	8	8	422
Cockburn	21%	9	19	453
Mundaring	21%	10	6	409
Armadale	21%	11	2	259
Melville	21%	12	10	431
Bayswater	20%	13	7	413
Bassendean	20%	14	17	448
Belmont	20%	15	5	384
Kalamunda	20%	16	24	474
Joondalup	20%	17	26	482
Stirling	20%	18	14	440
Serpentine-Jarrahdale	20%	19	20	455
Fremantle	20%	20	18	450
Victoria Park	19%	21	25	479
East Fremantle	19%	22	15	443
Subiaco	18%	23	13	439
South Perth	18%	24	21	462
Perth	18%	25	16	444
Mosman Park	18%	26	28	485
Peppermint Grove	18%	27	31	504
Claremont	18%	28	23	472
Nedlands	17%	29	27	483
Vincent	17%	30	30	503
Cambridge	17%	31	22	467
Cottesloe	15%	32	32	505

GREATER HOBART REGION

Derwent Valley	22%	1	5	258
Brighton	20%	2	2	105

Local Government Area	Percent decline	Within region decline rank (1= highest decline)	Within region cost of living rank (1=Highest cost of living pressure)	National cost of living ranking
Glenorchy	19%	3	3	228
Kingborough	19%	4	6	275
Sorell	19%	5	1	73
Clarence	17%	6	4	249
Hobart	17%	7	7	296
Palmerston	17%	1	3	507
Darwin	16%	2	1	420
Litchfield	16%	3	2	491
ACT				
Unincorporated ACT	16%	1	1	464
REST OF NSW				
Brewarrina	23%	1	4	28
Kyogle	23%	2	15	64
Eurobodalla	23%	3	5	29
Hilltops	23%	4	42	169
Bega Valley	23%	5	24	93
Central Darling	23%	6	91	424
Shoalhaven	23%	7	36	140
Walgett	22%	8	1	2
Richmond Valley	22%	9	32	127
Warrumbungle Shire	22%	10	38	151
Nambucca	22%	11	30	120
Kempsey	22%	12	20	77
Tenterfield	22%	13	2	9
Mid-Coast	22%	14	26	97
Cessnock	22%	15	89	412
Cowra	22%	16	50	224
Lismore	21%	17	48	216
Goulburn Mulwaree	21%	18	80	333
Dungog	21%	19	64	284
REST OF NSW (Cont.)				
Weddin	21%	20	11	54
Upper Lachlan Shire	21%	21	83	353
Glen Innes Severn	21%	22	3	15
Port Stephens	21%	23	28	99

Local Government Area	Percent decline	Within region decline rank (1= highest decline)	Within region cost of living rank (1=Highest cost of living pressure)	National cost of living ranking
Coonamble	21%	24	17	66
Tweed	21%	25	9	44
Parkes	21%	26	86	390
Lithgow	21%	27	14	63
Gwydir	21%	28	19	72
Gilgandra	21%	29	13	60
Wingecarribee	21%	30	77	318
Inverell	21%	31	39	153
Maitland	21%	32	27	98
Forbes	20%	33	51	242
Lachlan	20%	34	70	299
Mid-Western Regional	20%	35	62	268
Upper Hunter Shire	20%	36	58	262
Muswellbrook	20%	37	45	179
Snowy Monaro Regional	20%	38	61	267
Armidale Regional	20%	39	40	158
Port Macquarie-Hastings	20%	40	23	92
Broken Hill	20%	41	93	436
Byron	20%	42	49	218
Berrigan	20%	43	52	245
Oberon	20%	44	75	316
Shellharbour	20%	45	94	475
Ballina	20%	46	25	96
Narromine	20%	47	7	35
Bland	20%	48	6	32
Liverpool Plains	20%	49	43	171
Singleton	20%	50	54	250
Blayney	20%	51	90	415
Uralla	20%	52	16	65
Wentworth	20%	53	46	184
Clarence Valley	20%	54	10	46
Wollongong	20%	55	44	178
Bathurst Regional	20%	56	60	265
Murray River	19%	57	66	287
Lake Macquarie	19%	58	82	348
Warren	19%	59	92	435
Cabonne	19%	60	69	298

Local Government Area	Percent decline	Within region decline rank (1= highest decline)	Within region cost of living rank (1=Highest cost of living pressure)	National cost of living ranking
Walcha	19%	61	8	37
Hay	19%	62	85	364
Balranald	19%	63	63	269
Edward River	19%	64	84	360
Western Plains Regional	19%	65	55	252
Orange	19%	66	72	306
Bogan	19%	67	87	404
Greater Hume Shire	19%	68	68	293
Newcastle	19%	69	76	317
Bellingen	19%	70	33	135
Federation	19%	71	12	58
Tamworth Regional	19%	72	73	310
Narrabri	19%	73	37	149
Bourke	18%	74	34	137
Moree Plains	18%	75	21	83
Gunnedah	18%	76	88	408
Albury	18%	77	74	315
Kiama	18%	78	53	247
Coffs Harbour	18%	79	67	291
Leeton	18%	80	56	255
Gundagai	18%	81	65	286
Coolamon	18%	82	59	263
Unincorporated NSW	18%	83	78	320
Yass Valley	18%	84	81	347
Cobar	17%	85	95	488
Temora	17%	86	35	139
Murrumbidgee	17%	87	57	256
Snowy Valleys	17%	88	29	118
Lockhart	17%	89	41	163
Junee	17%	90	18	67
Queanbeyan-Palerang Regional	17%	91	79	321
Narrandera	17%	92	22	89
Griffith	17%	93	31	126
Carrathool	16%	94	71	300
Wagga Wagga	16%	95	47	189

Local Government Area	Percent decline	Within region decline rank (1= highest decline)	Within region cost of living rank (1=Highest cost of living pressure)	National cost of living ranking
REST OF VIC				
Buloke	23%	1	2	6
Central Goldfields	22%	2	4	22
Loddon	22%	3	21	101
Gannawarra	22%	4	43	290
Hindmarsh	22%	5	15	62
Pyrenees	22%	6	37	207
East Gippsland	22%	7	12	53
Yarriambiack	21%	8	1	5
Northern Grampians	21%	9	5	33
Bass Coast	21%	10	11	49
Benalla	21%	11	10	47
Strathbogie	21%	12	14	56
South Gippsland	21%	13	8	42
Swan Hill	21%	14	17	76
Towong	21%	15	41	239
Mildura	21%	16	31	156
Alpine	21%	17	38	217
Murrindindi	21%	18	9	43
Latrobe	21%	19	49	367
Ararat	21%	20	29	150
Moira	21%	21	46	314
West Wimmera	21%	22	13	55
Glenelg	21%	23	20	95
Corangamite	21%	24	28	146
Baw Baw	21%	25	34	181
Mansfield	21%	26	18	81
Wellington	20%	27	30	155
Wangaratta	20%	28	44	303
Mitchell	20%	29	48	350
Greater Shepparton	20%	30	32	160
Campaspe	20%	31	25	122
Mount Alexander	20%	32	6	34
Colac-Otway	20%	33	33	168
Greater Bendigo	20%	34	24	113

Local Government Area	Percent decline	Within region decline rank (1= highest decline)	Within region cost of living rank (1=Highest cost of living pressure)	National cost of living ranking
Southern Grampians	20%	35	7	40
Golden Plains	20%	36	26	138
Wodonga	20%	37	47	340
Greater Geelong	20%	38	36	203
Hepburn	20%	39	23	109
Indigo	20%	40	16	74
Horsham	20%	41	19	90
Warrnambool	20%	42	27	143
Yarra Ranges	20%	43	40	235
Moyne	19%	44	35	201
Ballarat	19%	45	39	231
Moorabool	19%	46	45	313
Surf Coast	18%	47	42	241
Unincorporated Vic	18%	48	3	7
Queenscliffe	18%	49	22	108

REST OF QLD

Woorabinda	31%	1	4	11
Yarrabah	31%	2	24	132
Cherbourg	30%	3	36	197
Palm Island	29%	4	19	107
Napranum	29%	5	15	91
Doomadgee	28%	6	12	52
Wujal Wujal	28%	7	48	274
Aurukun	28%	8	10	30
Torres Strait Island	27%	9	56	331
Mapoon	27%	10	NA	NA
Pompuraaw	27%	11	1	3
Lockhart River	27%	12	5	13
Hope Vale	26%	13	6	14
Kowanyama	26%	14	7	16
Mornington	26%	15	38	199
Northern Peninsula Area	25%	16	34	193
Whitsunday	25%	17	37	198
Mackay	24%	18	55	325
Mareeba	24%	19	23	123
Blackall-Tambo	24%	20	44	238

Local Government Area	Percent decline	Within region decline rank (1= highest decline)	Within region cost of living rank (1=Highest cost of living pressure)	National cost of living ranking
Paroo	23%	21	3	10
Etheridge	23%	22	17	103
Cook	23%	23	31	177
Flinders	23%	24	2	4
Rockhampton	22%	25	47	257
Winton	22%	26	8	19
Livingstone	22%	27	57	339
Fraser Coast	22%	28	13	71
Charters Towers	22%	29	35	195
Hinchinbrook	22%	30	21	117
Murweh	22%	31	41	212
Gympie	22%	32	25	141
Quilpie	22%	33	61	366
Southern Downs	22%	34	11	36
Bundaberg	22%	35	16	100
South Burnett	22%	36	22	119
Croydon	22%	37	32	180
North Burnett	22%	38	26	144
Gladstone	22%	39	68	506
Tablelands	22%	40	28	162
Burke	21%	41	14	86
Barcaldine	21%	42	52	292
Noosa	21%	43	43	236
Richmond	21%	44	9	27
Longreach	21%	45	39	205
Sunshine Coast	21%	46	62	385
Cassowary Coast	21%	47	18	104
Banana	21%	48	49	278
Burdekin	21%	49	33	190
Carpentaria	21%	50	40	206
Torres	21%	51	50	279
Isaac	20%	52	66	486
Boulia	20%	53	45	248
Gold Coast	20%	54	53	301
Townsville	20%	55	54	319
Western Downs	20%	56	59	349
Goondiwindi	20%	57	42	219

Local Government Area	Percent decline	Within region decline rank (1= highest decline)	Within region cost of living rank (1=Highest cost of living pressure)	National cost of living ranking
Barcoo	20%	58	51	280
Central Highlands	20%	59	63	387
Diamantina	20%	60	58	344
Toowoomba	20%	61	64	393
Douglas	19%	62	27	148
Balonne	19%	63	20	114
Cairns	19%	64	60	356
Bulloo	19%	65	46	251
McKinlay	19%	66	30	176
Maranoa	18%	67	29	172
Mount Isa	17%	68	67	502
Cloncurry	17%	69	65	477
Weipa	15%	70	69	512

REST OF SA

Anangu Pitjantjatjara	29%	1	49	461
Peterborough	23%	2	3	20
Cooper Pedy	23%	3	22	128
Franklin Harbour	22%	4	20	124
Whyalla	22%	5	47	406
Karoonda East Murray	22%	6	1	8
Elliston	22%	7	12	78
Goyder	22%	8	14	87
Tumby Bay	22%	9	24	142
Streaky Bay	22%	10	30	209
Port Pirie City and Dists	21%	11	38	281
Copper Coast	21%	12	46	403
Flinders Ranges	21%	13	48	428
Port Lincoln	21%	14	42	355
Cleve	21%	15	26	161
Mount Remarkable	21%	16	31	211
Port Augusta	21%	17	43	358
Yorke Peninsula	21%	18	16	111
Lower Eyre Peninsula	21%	19	25	145
Mid Murray	21%	20	11	59
Barunga West	21%	21	41	354
Wakefield	21%	22	15	106

Local Government Area	Percent decline	Within region decline rank (1= highest decline)	Within region cost of living rank (1=Highest cost of living pressure)	National cost of living ranking
Orroroo/Carrieton	21%	23	4	21
Mallala	21%	24	18	115
Victor Harbor	20%	25	5	23
Northern Areas	20%	26	13	80
Murray Bridge	20%	27	28	170
The Coorong	20%	28	7	38
Yankalilla	20%	29	9	48
Wudinna	20%	30	10	51
Renmark Paringa	20%	31	19	116
Kimba	20%	32	21	125
Berri and Barmera	20%	33	39	294
Wattle Range	20%	34	37	260
Clare and Gilbert Valleys	20%	35	35	244
Ceduna	20%	36	34	226
Light (RegC)	20%	37	45	386
Alexandrina	20%	38	33	221
Loxton Waikerie	19%	39	17	112
Kangaroo Island	19%	40	6	26
Barossa	19%	41	40	327
Mount Gambier	19%	42	29	185
Unincorporated SA	19%	43	36	246
Kingston	19%	44	32	213
Tatiara	18%	45	2	18
Southern Mallee	18%	46	8	41
Robe	18%	47	27	165
Naracoorte and Lucindale	18%	48	23	134
Grant	18%	49	44	375
Maralinga Tjarutja	15%	50	NA	
Roxby Downs	13%	51	50	515

REST OF WA

Upper Gascoyne	28%	1	NA	NA
Ngaanyatjarraku	28%	2	NA	NA
Halls Creek	28%	3	25	324
Murchison	27%	4	NA	NA
Sandstone	27%	5	NA	NA
Nannup	25%	6	12	208

Local Government Area	Percent decline	Within region decline rank (1= highest decline)	Within region cost of living rank (1=Highest cost of living pressure)	National cost of living ranking
Derby-West Kimberley	25%	7	26	328
Northampton	25%	8	13	225
Bridgetown-Greenbushes	25%	9	48	426
Morawa	24%	10	8	84
Pingelly	24%	11	70	498
Donnybrook-Balingup	24%	12	29	334
Collie	24%	13	42	391
Manjimup	24%	14	30	336
Waroona	24%	15	55	458
Irwin	24%	16	44	400
Coorow	24%	17	19	266
Boyup Brook	24%	18	32	362
Plantagenet	24%	19	14	230
Mount Magnet	23%	20	10	152
Gingin	23%	21	15	234
Denmark	23%	22	17	253
Shark Bay	23%	23	16	243
Harvey	23%	24	58	468
Beverley	23%	25	54	456
Mingenew	23%	26	34	369
Dardanup	23%	27	45	402
Greater Geraldton	23%	28	46	410
Bunbury	23%	29	27	329
Cue	23%	30	1	1
York	23%	31	47	416
Wickepin	23%	32	87	523
Three Springs	23%	33	6	69
Toodyay	23%	34	23	311
Busselton	23%	35	33	368
Cunderdin	23%	36	79	514
Wagin	23%	37	35	371
Capel	23%	38	63	478
Carnarvon	23%	39	11	186
Kellerberrin	23%	40	74	508
Chapman Valley	22%	41	37	374
Carnamah	22%	42	39	379
Dundas	22%	43	7	75

Local Government Area	Percent decline	Within region decline rank (1= highest decline)	Within region cost of living rank (1=Highest cost of living pressure)	National cost of living ranking
Esperance	22%	44	36	373
Katanning	22%	45	61	471
Augusta-Margaret River	22%	46	21	295
Koorda	22%	47	91	527
Northam	22%	48	49	429
Cranbrook	22%	49	18	261
Albany	22%	50	22	302
Coolgardie	22%	51	40	380
Cuballing	22%	52	86	522
Wyalkatchem	22%	53	77	511
Merredin	22%	54	65	484
Chittering	22%	55	51	446
Trayning	22%	56	94	530
Menzies	22%	57	5	45
Broomehill-Tambellup	22%	58	81	517
Nungarin	22%	59	62	476
Brookton	21%	60	68	494
Mukinbudin	21%	61	52	452
Narrogin	21%	62	64	480
Ravensthorpe	21%	63	43	399
West Arthur	21%	64	67	493
Victoria Plains	21%	65	75	509
Moora	21%	66	57	465
Quairading	21%	67	89	525
Dowerin	21%	68	71	499
Dumbleyung	21%	69	99	535
Wandering	21%	70	92	528
Dandaragan	21%	71	38	377
Mount Marshall	21%	72	76	510
Exmouth	21%	73	28	330
Wyndham-East Kimberley	21%	74	20	288
Wongan-Ballidu	21%	75	24	322
Goomalling	20%	76	73	501
Corrigin	20%	77	90	526
Broome	20%	78	50	438
Bruce Rock	20%	79	97	533
Gnowangerup	20%	80	72	500

Local Government Area	Percent decline	Within region decline rank (1= highest decline)	Within region cost of living rank (1=Highest cost of living pressure)	National cost of living ranking
Tammin	20%	81	95	531
Dalwallinu	20%	82	9	85
Kojonup	20%	83	59	469
Narembeen	20%	84	93	529
Kulin	20%	85	96	532
Jerramungup	20%	86	80	516
Kalgoorlie/Boulder	19%	87	60	470
Williams	19%	88	85	521
Woodanilling	19%	89	88	524
Kent	19%	90	101	537
Kondinin	19%	91	98	534
Boddington	18%	92	82	518
Yilgarn	18%	93	66	489
Meekatharra	18%	94	41	382
Lake Grace	18%	95	100	536
Wiluna	18%	96	31	342
Karratha	16%	97	56	459
Port Hedland	16%	98	83	519
Perenjori	16%	99	2	12
Westonia	15%	100	78	513
Laverton	15%	101	3	31
Yalgoo	15%	102	4	39
Leonora	15%	103	53	454
East Pilbara	13%	104	69	495
Ashburton	9%	105	84	520

REST OF TAS

Central Highlands	22%	1	11	174
Huon Valley	22%	2	8	136
Southern Midlands	22%	3	3	50
Tasman	22%	4	1	17
Glamorgan/Spring Bay	21%	5	4	57
Break O'Day	21%	6	2	24
Kentish	21%	7	12	182
George Town	20%	8	13	192
West Coast	20%	9	10	173

Local Government Area	Percent decline	Within region decline rank (1= highest decline)	Within region cost of living rank (1=Highest cost of living pressure)	National cost of living ranking
Devonport	20%	10	5	79
Burnie	20%	11	16	220
Dorset	20%	12	6	88
Waratah/Wynyard	20%	13	18	254
Central Coast	19%	14	7	121
Circular Head	19%	15	22	326
Meander Valley	19%	16	14	194
Latrobe	19%	17	20	304
Launceston	19%	18	17	222
Northern Midlands	19%	19	21	308
West Tamar	19%	20	9	164
Flinders	18%	21	19	283
King Island	17%	22	15	202
REST OF NT				
Tiwi Islands	31%	1	2	70
West Daly	29%	2	13	492
MacDonnell	26%	3	6	338
Roper Gulf	25%	4	1	25
East Arnhem	25%	5	11	405
West Arnhem	24%	6	8	365
Belyuen	23%	7	NA	
Victoria Daly	21%	8	3	272
Barkly	20%	9	9	378
Central Desert	20%	10	14	496
Coomalie	16%	11	10	395
Katherine	15%	12	4	277
Wagait	14%	13	5	307
Alice Springs	14%	14	12	427
Unincorporated NT	12%	15	7	363

APPENDIX 3 – NOTES ON SOURCE DATA

The data used in the current study has been sourced from the Australian Bureau of Statistics (ABS) Tablebuilder. All data generated through TableBuilder has an element of randomisation introduced into the data, and hence table totals will not necessarily match the sum of individual elements. The following notes are taken from the ABS User Guide (Australian Bureau of Statistics, 2017) that explain the 'noise' applied to the data in the ACLD database from which data was sourced for the current study.

CONFIDENTIALITY

In accordance with the Census and Statistics Act 1905 all the data in TableBuilder is subjected to a confidentiality process before release. This confidentiality process is undertaken to avoid releasing information that may allow for the identification of particular individuals, families, households, dwellings or businesses. For further details of how the ABS handles your information, see the ABS Privacy Policy and Census Privacy Policy.

This section covers:

*Perturbation
Additivity
Sparsity*

PERTURBATION

To minimise the risk of identifying individuals in aggregate statistics, a technique has been developed to randomly adjust cell values. Random adjustment of the data, known as perturbation, is considered to be the most satisfactory technique for avoiding the release of identifiable data while maximising the range of information that can be released. These adjustments have a negligible impact on the underlying pattern of the statistics.

Perturbation is applied across all non-zero cells in a table, including the totals cells. Perturbation may change the true cell value by either increasing or decreasing the value by a small amount. These adjustments result in introduced random errors, but with almost no bias. The information value of the table as a whole is not significantly impaired.

Random perturbation can be a source of frustration to users, as it can result in inconsistencies in the data. Most tables reporting basic statistics will not show significant discrepancies due to random perturbation. However, as the degree of complexity of tables increases, the need for random perturbation remains and it will continue to be used in most TableBuilder datasets.

TOTALS

In TableBuilder, totals are not calculated by summing the interior values of the table. Instead, more accurate totals are provided by calculating the true total, and then perturbing this value. If you attempt to reconstruct a total on the basis of the perturbed interior cells, you will add together the small changes made to each cell which may result in a large change relative to the perturbed total. It is recommended that totals are constructed in TableBuilder, rather than by summing the interior cells from an exported table.

In addition to perturbation, some TableBuilder datasets use the additivity technique to make further adjustments to the data to ensure that the interior cells add up to the totals. As additivity is not required for confidentiality purposes, most datasets in TableBuilder do not use the additivity technique. For further information, see Additivity below.

SMALL CELLS

When calculating proportions, percentages or ratios from cross-classified or small area tables, the introduced random error can be ignored except for small cells. The introduced random adjustments made to cells in a table are independent of the size of the original cell value, so perturbation has the greatest relative impact on small cell values. The information value of the table as a whole is not impaired as small cell values are also strongly affected by other factors, such as sampling error, respondent errors and processing errors.

Caution should be exercised when interpreting and using cells with small values or large percentage relative standard error (RSE) values. RSEs are provided for survey-based datasets that are subject to sampling variability. Datasets in Census TableBuilder are not weighted so RSEs are not applicable for Census data. See the Relative standard error section for further information in relation to survey datasets.

When analysing a table of means or sums of a continuous variable, it is recommended that the table be compared to the corresponding table of counts of units with a valid response for that continuous variable. No reliance on estimates of means or sums should be placed on cells with a large RSE or for which the corresponding cell count is small. For more information about using continuous variables, see the Summation options, ranges and quantiles section.

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Cost of living study

Further information of the cost of living study can be sourced through david.graham@sensingvalue.com.au, this study is one of a number of economic analyses that has been completed by the economics team at Sensing Value Pty Limited.