Final Report

At Risk:

Understanding the population size and demographics of older women at risk of homelessness in Australia

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SVA Social Ventures Australia

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Key Insights

The housing circumstances of low income older households, in particular female headed households, has become a matter of significant concern over the last few years with increasing numbers of women at risk of homelessness and experiencing homelessness, often for the first time in older age.

Unfortunately, there is no one data set that can capture all of the factors that appear to influence low income older women's risks of homelessness. This project utilises the longitudinal Household Income and Labour Dynamics in Australia (HILDA) Survey – collected annually since 2001 – which allows the comparison of people's characteristics and experiences over time. As well as reporting descriptive statistics an econometric model is used to estimating the risk of homelessness for women as they age.

The HILDA (weighted) data indicates that for 2018:

- The number of females aged 45-55 years at risk of homelessness is estimated to be approximately 165,000 (±10 per cent);
- The number of women aged 45 years and over likely to be at risk of homelessness is approximately 405,000 (±10 per cent); and
- The number of females aged 55 years and over, estimated to be at risk of homelessness is estimated at 240,000 (±10 per cent).

The researchers constructed a model of At Risk of Homelessness (*AtRisk*) post Global Financial Crisis (GFC[1]) that incorporates people who hold a mortgage, pay rent in private rental or in public housing and are aged 45 and above.

Although there is a strong association between *AtRisk* and age, age is not the cause of an increased probability of being *AtRisk*.

Women aged 45 years and above are more likely to be *AtRisk* if they have one or a number of the following characteristics:
- have been previously *AtRisk*,
- are not employed full time
- are an immigrant from a non-English speaking country
- are in private rental
- would have difficulty raising emergency funds
- are Aboriginal
- are a lone-person household
- or a lone-parent (but little evidence for those never married).

The type of employment women are engaged in plays a significant role in influencing their risk of homelessness (all other things equal):
- In the post-GFC period, compared to full-time employment women are between 2 to 4 times more likely to be AtRisk if they are employed part-time (e.g. employed part-time are about twice as likely; close to four times as likely if unemployed; and not in the labour force about 3 times as likely to be at risk).
- Household structure combined with marital status has the strongest influence (all other variables being equal) on being AtRisk post-GFC:

- Lone person households face a very significant likelihood of being AtRisk (lone person never married female households are about 8 to 9 times more likely to be AtRisk than a dual person household);
- Lone-parent separated/divorce/widow females are more AtRisk compared to a dual person household;
- Never married couples are about a third less likely to be AtRisk than married couples.

According to Australian Bureau of Statistics projections lone person households are expected to comprise between 24 per cent and 27 per cent of all households by 2041. This equates to between 3.0 and 3.5 million Australians (of all ages) in 2041. Male lone person households will increase by between 38.1 per cent and 46.4 per cent while female lone person households will increase by between 27.6 per cent and 58.8 per cent (ABS 2019b).

Older single women in the private rental market face increased risks

Noting limitations due to small sample for disaggregated data, and that the data tends to be volatile from year to year at disaggregated levels, the HILDA data, for the post-GFC period, suggests that:
- for women aged 55-64 in a private rental, the likelihood of being AtRisk is approximately 28 per cent;
- but this number is about 34 per cent for women who are also not employed full time;
- over 65 per cent for those who are a lone parent;
- and over 85 per cent if they have additionally experienced at least one prior occurrence of being AtRisk.

From the multivariate statistical model we can suggest that, all other things being equal, for the post-GFC period:
- those in the private rental market are over twice as likely to be AtRisk (model estimated Odds Ratio for females is 3) compared to those with a mortgage;
Public rental may provide a safety net compared to private rental (statistically not significantly different to mortgage holders for females).

Known experiences of homelessness

At the 2016 census there were 6872 women aged 55 years and over, who were estimated as homeless. The number of women homeless across all older age groups has continued to rise from census to census since 2006 and also as a proportion of all women homeless at ages 55 years and 65 years and over.

In terms of particular characteristics available at the 2016 census a greater proportion of homeless older women were Aboriginal; and unemployed either looking for part time or full time work, 3.5 per cent of females (compared to 1.2 per cent of females in the general population) at the 2016 census).

Background and objectives

Changes in the nature of work, the inadequacy of some income support payments, the privatisation of social policy, changes in household dynamics but particularly changes in the housing market and scant policy attention and action, means low to middle income households are struggling to live a good life in modern day Australia. While older people are considered to be at less risk because of their higher levels of home ownership, there is a growing body of evidence and concern, in the context of an increasingly unaffordable housing market with rising housing costs (CEPAR 2019; Coates and Chivers 2019) about the circumstances and living situations of older people who have not attained or retained home ownership, have limited wealth and savings and do not have the privilege of living in social housing. These households are reliant on the private rental market and are at considerable risk of housing affordability issues and homelessness. Recognition by the state and Commonwealth governments of the difficulties these older people face has resulted in this group being one of a number of national priority cohorts in the National Housing and Homelessness Agreement (CFFR 2019). These groups are to be specifically addressed in each state and territory's homelessness strategy (AIHW 2019a).

Concerns for this group, are particularly focussed on older women, as reflected in a number of recently released reports (see for example Sharam A Predictable Crisis: Older, Single Women as the New Face of Homelessness (2010); the Mercy Foundation report by Petersen and Parsell Older Women's Pathways out of Homelessness in Australia (2014); Homelessness Australia and the Equality Rights Alliance's report Ending and Preventing Older Women's Experiences of Homelessness in Australia (2015); the Australian Association of Gerontology background report on Older Women Experiencing, or at Risk of, Homelessness (2018); the National Older Women's Housing and Homelessness Working Group's Retiring into Poverty – A National Plan for Change: Increasing Housing Security for Older Women (2018) and the Australian Human Rights Commission report Older Women's Risk of Homelessness: Background Paper(2019)).

This concern is due to a variety of factors including:

- older women are experiencing homelessness for the first time later in life (Petersen and Parsell 2014);
- women's longer life expectancy – currently life expectancy at birth is 80.7 for males and 84.9 for females, a difference of 4.2 years; and at age 65 19.9 years for males and 22.6 years for females, a difference of 2.7 years (ABS 2019a);
- greater likelihood to be single in older age, with 1.258 million persons aged 55 years and over lone person households and of these close to two-thirds (62.3 per cent) were female at the 2016 census;
- experiences of family and domestic violence – one in six women in Australia have experienced physical or sexual abuse from a current or previous partner and 25 per cent of women have experienced emotional abuse since the age of 15; 36 per cent of women, aged 55 years and over, attending Specialist Homelessness Services in 2018-19 were there because of issues related to domestic and family violence;
- personal factors including health issues, loss of a partner or relationship breakdowns (AHRC 2019);
- greater likelihood to be renting (Senate Standing Committee on Economics 2016);
- poverty rates among older people renting is more than double the overall poverty rates for people aged 65 years and over (ACOSS and UNSW 2018, p.38);

- there has been a significant increase in female job seekers in the older age groups. Between July 2013 and July 2019 the number of older females on Newstart Allowance increased by 64 per cent for those aged 50-59 and 180 per cent for those aged 60 years and over. Close to 79 per cent of these job seekers in July 2019 were long term job seekers; that is, they had been receiving the Newstart Allowance for more than 12 months. Data indicates the cost of living for people on welfare payments is rising faster than it is for the rest of the population due to the items people on welfare payments need to buy (Taylor 2019);
- economic inequality (Homelessness Australia and Equality Rights Alliance 2015). According to the Workplace Gender Equality Agency the total full-time remuneration across all industries and occupations for women is 20.8 per cent less than for men. As the Workplace Gender Equality Agency states 'The gender pay gap can start when women first enter the workforce. A combination of factors affect women's lifetime economic security and makes it likely that over a lifetime women will earn less than men, be less likely to advance their careers as far as men, and accumulate less superannuation and savings than men, and will therefore be more likely to live in poverty in old age'[1].

In addition, a greater emphasis on understanding the situation for older women is due to the fact older women's homelessness and housing struggles are often hidden[2] and therefore not easily captured by statistical measuring tools or the data or analyses is not gender specific. Therefore, official counts are expected to be understated due to undercounting (Petersen and Parsell 2014; AHRC 2019).

While there are a limited, but growing number of studies highlighting the experiences of older women who are homeless or at risk of homelessness, there are few studies identifying the consequences and therefore the evidence base, for tackling this problem and providing real solutions. Some of the identified consequences for older single women in Australia however are:

- older women's feelings of being trapped and sense of fear and vulnerability about their future (Fiedler and Faulkner 2019, 2020);
- going without – restrictions on spending on food, heating and cooling, transport and health needs (Smith and Hetherington 2016; Fiedler and Faulkner 2017, 2019);
- older single women renting face 7.7 years of financial hardship (CEPAR 2019);
- older single women renting face a life expectancy deficit of two years in comparison to homeowners (CEPAR 2019).

As it is considered that older women experience homelessness differently to men then the approaches to solving their housing crises and associated needs is likely to require tailored responses. Questions remain however about the current scale and the trajectory of older women's homeless or risk of homelessness and quantifying the relative importance of identified risk factors. As Petersen and Parsell noted for the Mercy Foundation (2014), disparities exist between the available data counts and the numbers and trends identified by service providers who work with older women. Planning for this group would therefore be aided by a clearer understanding of the size of the population of older women homeless and at risk of homelessness and the role of particular risk factors.

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1   https://www.wgea.gov.au/topics/the-gender-pay-gap.
2   Hidden because older women are reluctant to seek assistance do not recognise they are homeless, are affected by stigma and shame and consciously hiding, have concerns about the safety of housing options such as boarding houses, may not be aware of services, or living in their homes but under the threat of violence.

The research objectives of this report are (within the limitations of available data) an estimate of:

- the number of older women experiencing homeless;
- the number of older women at risk of experiencing homelessness;
- the risk profiles of these groups; and
- provide an estimate of the spatial distribution of women at risk of homelessness.

Data Availability and limitations

With respect to data required for any examination of homelessness or at risk of homelessness there is no single national source of data that is considered superior in all situations and thus can provide the necessary information for Australia's homelessness policy to be adequately information and evidence based.

For homelessness, arguments tend to suggest that the ABS Census of Population and Housing: Estimating Homelessness (ABS various years) is probably superior for homelessness data as it has the imprimatur of the ABS. Estimates of homelessness are now available for 2001, 2006, 2011 and 2016 (and presumable will be in future censuses) and hence average changes in estimated homelessness can be examined. Importantly it is the only national source of homelessness data at the household level (see Appendix I for a more detailed discussion on data sources and availability and limitations and for definitions of examining homelessness in Australia.)

As with homelessness, the debate about the most appropriate generalised measure of housing affordability stress (at risk of homelessness) has been long running in Australia (see, for example, Gabriel et al. 2005; Burke et al. 2011; Stone et al. 2011). One of the most commonly applied ratios is the 30/40 Rule (households in the lowest 40 per cent of the income distribution spending 30 percent or more of income on housing costs). The calculation of ratios is uncomplicated, and this contributes to their pervasive use in housing research. Nonetheless, there is no clearly accepted approach to this research.

There are a number of data sources that could be/and are used to examine housing affordability risk. These data sources are:
- The Household, Income and Labour Dynamics in Australia (HILDA[3]) – household-based **longitudinal** annual data collection 20012018.
- ABS Census, (data collected at five yearly intervals).
- ABS General Social SurveyJune 2014.
- ABS Survey of Income & Housing Various Years to 2017-18.

For examining those at risk of homelessness – if a ratio rule (e.g. the 30/40 Rule) is to be used – then the HILDA annual data collection (currently 2001 to 2018 are available) is a strong contender to the most useful data set (see for examples, e.g. Daniel et al. 2018; Baker et al. 2016; Baker et al. 2015; Mason et al. 2013; Bentley et al. 2012; Rowley and Ong 2012; Wood and Ong 2009 – and used by

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3   The Household, Income and Labour Dynamics in Australia (HILDA) Project was initiated and is funded by the Australian Government Department of Social Services (DSS) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this paper, however, are those of the author and should not be attributed to either DSS or the Melbourne Institute.

the Australian Institute of Health and Welfare-AIHW). HILDA is considered most helpful, primarily, as it is available annually from 2001 to 2018 and so can inform on change over time for individuals and the same groups of people, but also because of its extensive collection of personal data following more than 17,000 Australians each year collecting information on many aspects of life (e.g., household and family relationships, income and employment, and health and education). Only HILDA data is able to follow people over multiple time periods and hence can be used for sophisticated analysis compared to other data sources that give point in time data that cannot link records for people. In addition, weights are supplied with the data set to make inference from the sample to the population. As with all datasets, there are limitations to its use (discussed later in this paper).

Quantifying the scale/nature of the problem - homelessness

Current research on homelessness

There are few publications in Australia that examine the level of homelessness for the older population.[4] The *Australian Homelessness Monitor* (Pawson et al. 2018) uses a range of resources to provide a 'first-of-its-kind authoritative insight into the current state of homelessness in Australia' examining from a longitudinal analysis, the social, economic and policy drivers influencing the changes identified in Australia. Based on census estimates, this monitor identified the population aged 55-74 as the fastest growing age cohort in the homelessness population from 2006 to 2016, an increase of 55 per cent. This is considerably greater than the 30 per cent of growth for all age groups (p.10). There is no breakdown by gender or further discussion of the older population.

The CEPAR report (2019), *Housing in an ageing Australia: nest and nest egg*, provides an analysis of housing tenure across the generations, housing consumption in older age and the lack of housing in older age. This report has a section on homelessness and identifies that older people (55 years and over), at the 2016 census comprised, at 16 per cent, a significant proportion of the homelessness population. This report singles out the older female population, indicating the number of older women 55-64 increased by 74 per cent since the 2001 census – 'the largest increase of any age group, and far more than the increase for men.' (CEPAR 2019, p.50). The authors qualify these trends by stating that 'while rates are increasing among some older cohorts, and among women, the change is not as severe for older as it is for younger people' (CEPAR 2019, p.50).

Both reports provide commentary on the rising incidence in the use of homelessness services by the older population defined as 55 years and over. In fact this rising incidence, an annual average increase of 5.8 per cent over the five years to 2017-18, led to the AIHW producing its own report in 2019 – *Older clients of specialist homelessness services* in addition to the Institute's annual reports on client use of specialist homelessness services. In this comprehensive report it was identified in 2017-18, 24,100 people aged 55 years and over were clients of services. Of these, 7000 older clients were experiencing homelessness and double that, 14,000 were at risk of homelessness. The AIHW provides a gendered breakdown of service users with 57 per cent female, and of these women, 52 per cent presented as a lone person and 31 per cent were unemployed. Females are

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4   There are some state reports that analyse the level of homelessness – see Kaleveld et al. (2018) and Fiedler and Faulkner (2019) for Western Australia, Fiedler and Faulkner (2020) for Queensland.

more likely to present at risk of homelessness rather than being homeless. If females do present as homeless, they are more likely to be couch surfing than sleeping rough.

AHURI funded an Inquiry into homelessness and the older population was a group of focus. The objective of this study was to inquiry into what an effective homelessness service system should look like rather than any statistical analysis (Thredgold 2019).

Brief review of census data on homelessness

Census data is limiting in the analyses that can be undertaken, especially in relation to identifying contributory risk factors. Therefore, only a brief outline is provided below.

At the 2016 census there were 6872 women aged 55 years and overestimated as homeless. As can be seen from Table 1 the number of women homeless across all older age groups has continued to rise from census to census and also as a proportion of all homeless women at both ages 55 years and 65 years and over.

Table 1 Older female population homeless, 2006, 2011 and 2016 censuses

Age group	2006	2011	2016
55-64	2603	3095	3938
65-74	1298	1320	1995
75+	871	915	939
Total 55+	4722	5330	6872
Total 65+	2169	2235	2934
Total female population	38567	45813	49017
Rate per 10,000 population			
55-64	23.1	23.6	27.7
65-74	18.0	15.4	18.8
75+	11.5	11.2	10.4
Total 55+	18.1	17.8	20.3
Total 65+	14.7	13.3	14.9
Total Female Population	37.0	40.3	40.4
Population 55+ as a percentage of all homeless women			
	12.2	11.6	14.0
Population 65+ as a percentage of all homeless women			
	5.6	4.9	6.0

Sources: Derived from ABS (2012a), (2012b), (2018).

Work by Pawson et al. (2018) indicates that over the ten year intercensal period 2006-2016 the greatest per cent change in homelessness numbers has been for the population aged 55-64 at around 53 per cent and 65-74 years at close to 60 per cent.

Older women (Table 2) who are homeless are likely to have a roof over their heads but their living conditions are unstable, for example living temporarily with others or living in severely crowded dwellings.

Table 2 Count of females experiencing homelessness by homelessness accommodation category, 2016 census

ABS Homelessness type	Number	Percent
Improvised dwellings	560	8.2
Supported accommodation for homeless	1331	19.4
Staying temporarily with others	1939	28.3
Boarding houses and temporary lodgings	1096	16.0
Living in severely crowded dwellings	1919	28.0
Total homeless*	6845	100

Source: ABS 2018. Note: Due to randomised adjustments in the data to protect confidentiality and rounding totals may add.

The census does allow the identification of some of the demographic characteristics of the population estimated as homeless.

Aboriginal and Torres Strait Islander Identification

Around 2.4 per cent of the general older population identify as Aboriginal (1.2 per cent of males and 1.2 per cent of females) yet in the older homeless population 14.5 per cent of older women homeless were Aboriginal.

Disability

The census collects information about a person's need for assistance with one or more core activity areas of self-care, communication or mobility because of a disability or long-term health condition (lasting six months or more) or the effects of old age. Levels of disability within the population increase with increasing age. At the 2016 census around 13.8 per cent of females in the general population were identified as having a disability as defined in the census. Of those older females (55 years and over) estimated to be homeless the percentage with a disability was slightly higher at 15.4 per cent.

Work force status

In terms of workforce status, two-thirds (females) of the general population and older homeless population are not in the labour force. Of those in the workforce, a much lower proportion of females who were recorded as homelessness in the census held employment, either full-time or part-time, 6 per cent for females who were homeless compared to 12 per cent in the general older population. A higher proportion (3.5 per cent) of older females homeless at the 2016 census were unemployed either looking for part-time or full- time work compared to women aged 55 years and over who were not homeless at 1.2 per cent.

Marginally housed

In addition to a count of people homeless, the census also classifies people as marginally housed (defined as 'persons living in other crowded dwellings', 'persons in other improvised dwellings'; and 'persons marginally housed in caravan parks'). At the 2016 census there were 1990 females aged 55 years and over classified as marginally housed.

Conclusion

Homelessness is becoming of increasing prevalence among the older population and this very brief review of census data tends to indicate older women, that could be considered at a disadvantage in the community (Aboriginal; having a disability; and unemployed and looking for work) are more at risk of homelessness.

Quantifying the scale/nature of the problem – At risk

A major undertaking of this research is to identify the number of women in Australia who are at risk of homelessness as they age and to test some of the identified social and economic indicators that place the older population at risk of homelessness.

Current research on at risk

The latest CEPAR report (2019) on housing and older people provides an analysis of households at risk of housing affordability issues. Analysing ABS data, the authors estimated there were about 870,000 renter and 320,000 owner occupier households (representing 1.8 million and 780,000 persons respectively) experienced housing stress in 2016, that is these households were paying more than 30 per cent of their income in housing costs. If this analysis is confined to just lower income households (incomes in the bottom 40 per cent of household incomes adjusted for household size) then the number of households at risk of housing stress is estimated to be about 750,000 renter households and 280,000 owner occupied households (representing 1.6 million and 680,000 people respectively) across the country.

Concentrating just on the **older population** the research indicates:

> Compared to other age groups, older renters are at greatest risk of housing affordability stress. In 2016, about 44% of renters aged 65-74 spent more than 30% of their income on rent, the highest rate of all age groups and the highest level over time [comparing 1996 with 2016]. In fact, the rate is about twice as high as it is for renters aged 25-34 (23%) and it has increased dramatically since 1996 (when it was 19% for the older age group). The pattern is the same when restricting the measure to those that also have low incomes, with 37% of renters aged 65-74 experiencing affordability issues. (CEPAR 2019, p.46).

There is no breakdown of housing affordability by gender.

For some time now Hulse and colleagues have produced a series of reports that have charted for each census since 1996 the 'changes in the supply of affordable -and affordable and available private rental housing for lower income households' (Hulse et al. 2019, p. 2) (see Wulff and Yates 2001; Yates et al. 2004a, 2004b; Wulff et al. 2009, 2011; Hulse, Reynolds and Yates 2014). The analyses are based on customised tables of ABS Census of Population and Housing data using a consistent methodology across the years.

In the latest report the researchers estimate that in 2016 there were 477,000 lower income private rental households (across all age groups) paying unaffordable rents (305,000 households in the lowest 20 per cent of the income range and 172,000 households between the 20th and 40th percentile of household incomes). Data provided for 2006 and 2011 indicates an increasing number of households over time are paying unaffordable rents. Of the households in 2016, 28 per cent were paying more than 50 per cent of their income in rent. In undertaking a socio-demographic analysis of these households they found it is younger households that are at the greatest risk of housing affordability issues though 33 per cent of Quintile 1 households paying unaffordable rents were aged

55 years and over and 18 per cent of households paying severely unaffordable rents were older. In Quintile 2, 16 per cent of the households paying unaffordable rents were 55 years and over at the 2016 census.

There is no gender breakdown in the published research.

Table III-6 in the appendices provides data on female lone person households by major regional breakdown at both the 2016 census (for females aged 65 years and over) and as collected by Department of Social Services (DSS) on female lone person households (55-64, 65-74 and 75+) receiving a government payment and Commonwealth Rent Assistance and at risk of homelessness. The data indicates the geographical breakdown reflects he general population distribution by regions. In all, this census data suggests 35,000 older people in private rental were at risk of housing stress and an additional 20,300 households in other forms of rental tenure (including those who did not state a landlord type) were at risk of housing affordability stress. The DSS data for the states indicates around 49,000 income units where the person was aged 65 years and over were at risk of housing stress with an additional 30,000 females aged 55-64 at risk of housing stress.

Clearly establishing the number of older households at risk of housing stress depends heavily on the data source and method of analysis used.

Estimating risk and risk profiles

This project examines older people at risk of homelessness by utilising the 18 waves of the Household Income and Labour Dynamics in Australia (HILDA) longitudinal survey. As stated previously only HILDA data is able to follow people over multiple time periods and hence can be used for sophisticated analysis compared to other data sources that give point in time data that cannot link records for people.

Using the 30/40 Rule, as discussed above, we generate a measure of at risk of homelessness (*AtRisk*) also referred to as housing affordability stress in the literature. In regression models, this measure is the dependent variable. For this study we use gross household income and for housing costs rent and first (plus second) mortgage. The 40th percentile is based on ABS gross income scales (ABS 2019f). We select this set of measures as they tend to give a conservative estimate of the number *AtRisk*.

Nonetheless, as the HILDA are examined at more sub-aggregate levels cautions must be exercises as estimated become more volatile and subject to estimation error due to small sample numbers, missing data issues and outliers. Once the data has been restricted to those individuals we are considering, the sample is as shown in Table 3 below. As is clear, for the cohort of interest sample numbers *AtRisk* are relatively small and so population inference must be made with caution. To estimate an approximate population value from the sample we weigh the data. When applying weights to sub-samples it should be noted that the results are not accurate representations the population, but a guide.

While there are no definitive counts of females at risk of homelessness, we use the HILDA data to examine the risk for older females. With the caveat that estimates are always subject to data reliability the HILDA data are considered reliable and are commonly used by researchers for

Australian Housing and Urban Research Institute (AHURI) (see, e.g., Ong et al. 2019). Nonetheless, because the data are a sample, and we must use relatively small sample numbers for sub-groups and apply sample weights to derive population level estimates there is a degree of uncertainty in those estimates. From the latest wave of HILDA (2018) we estimate that in the age cohort 55-plus years about 240,000 (±10%) females were *AtRisk* based on the commonly used 30/40 Rule. Notwithstanding focus tends to be on older individuals we estimate that about 165,000 (±10%) females age 45-55 are *AtRisk*. In total there are approximately 405,000 (±10%) females age 45 years and above who are *AtRisk*.

Table 3 HILDA, age 45 plus by gender, rent or mortgage payer

	Male		Female	
Wave	Not AtRisk	AtRisk	Not AtRisk	AtRisk
1	1695	227	1134	177
2	1606	227	1073	150
3	1739	231	1111	205
4	1706	197	1163	219
5	1747	236	1260	213
6	1869	236	1416	240
7	1931	267	1513	286
8	2024	251	1512	306
9	2192	244	1707	280
10	2202	306	1806	314
11	2715	415	2385	394
12	2783	394	2233	426
13	2890	337	2437	341
14	2882	334	2552	413
15	2939	350	2581	403
16	2912	375	2663	415
17	2855	349	2632	451
18	2933	366	2650	470

Source: Derived from HILDA (unweighted).

From the extensive literature we select a number of independent variables to include in the model – these include those we are specifically interested in (e.g. age group) and those that are potentially important as casual influences, but are not necessarily the subject of this report (e.g. control variables include, whether there are children age 0 to 4 in the household, country of birth, and others).

The majority of the independent variables are objective, e.g. labour market status and marital status, but we also include two variables that have a subjective component: (i) the individual reported they could not pay their mortgage or rent on time, and (ii) the individual had difficulty raising emergency funds.

The model sample includes those age 45-years and over and who hold a mortgage, or pay rent in

public housing or in the private rental sector.

Prior to addressing the results of the model we consider the proportions in the observed data for the post-GFC period for the sample to be modelled.

Table 4 below provides the average rate of *AtRisk* for two post-GFC periods: 2010 to 2014 and 2015 to 2018. Noting that estimates may be based on small sample numbers and should be treated with caution, it can be seen that there is no clear pattern of change in *AtRisk* for females. As demonstrated, however this average over various tenures hides a great deal of inequality. For example, on average females in 2015-2018 in the age group 55-64 have a 13 per cent probability of being *AtRisk*, but within tenures this ranges from 6 per cent to 27 per cent. That is, there is a lot of information lost in averaging.

Those in rental always have higher risk; females in public rental always have lower risk that private rental.

Table 4 *AtRisk* by tenure for females, age 45-plus, average percentage 2010-2018

	Females	
	% AtRisk 2010-14	% AtRisk 2015-18
45-54		
Mortgage	6	5
Rent Private	20	20
Rent Public	16	15
Total	10	10
55-64		
Mortgage	7	6
Rent Private	28	27
Rent Public	17	25
Total	13	13
65+		
Mortgage	8	7
Rent Private	44	43
Rent Public	9	23
Total	21	25

Notes: Source HILDA waves 10 to 18. (1) Data are weighed and rounded. (2) Estimates are based on small sample numbers and should be treated with caution.

Figures 1, 2 and 3 in Appendix III provide proportions of those AtRisk and simple linear trend lines for the post-GFC period – by tenure type. These figures demonstrate the volatility in the data but are an accessible guide to the average time trends for AtRisk. For example Figure III-2 (Private renters) shows that for the age group 65 plus AtRisk has been trending upwards for females. On the other hand, for the 55-64 year age group the trend has been static for females.

Regional differences in the observed data are apparent (Table 5 and Table 6), but the model indicates

that when controlling for multiple individual attributes location appears to have no material influence on the probability of being at risk of homelessness.

HILDA survey data, weighted for population levels, shows a similarity in the numbers AtRisk for New South Wales, Victoria and Queensland. Lower numbers are estimated AtRisk in the other States and Territories (small sample numbers for Tasmania, the Northern Territory and the Australian Capital Territory indicated estimates should be treated with caution).

Table 5 Women aged 45 years and over AtRisk by state, 2018

State	Number	Per cent
NSW	110,000	11
Vic	120,000	13
Qld	100,000	15
SA	20,000	14
WA	50,000	14
Tas	6000	6
NT	1000	8
ACT	1000	5

Notes: Source HILDA. (1) Data are approximations. (2) Data are weighted and rounded.

Table 6 AtRisk by gender, age-group and city, average 2015-2018

	Females		
City	45-54	55-64	65+
Sydney	34000	27000	10000
%	9	15	12
Melbourne	46000	22000	20000
%	8	11	26
Brisbane	30000	12000	10000
%	16	13	22
Adelaide	9000	3000	6000
%	12	8	23
Perth	16000	7000	9000
%	9	11	50
Tasmania	5000	1000	3000
%	8	6	21
Total	140,000	71,000	58,000
%	10	12	22

Notes: Source HILDA waves 15 to 18. (1) Data are weighed and rounded. (2) Totals exclude NT & ACT. (3) Estimates are based on small sample numbers, should be treated with caution, and should be used for comparative not absolute purposes only.

Empirical analysis

While Tables 4, 5 and 6 above provide guides to numbers and proportions AtRisk they cannot indicate any of the causal factors relating to being AtRisk. As noted above (pages 6-7) a range of factors have been identified as possible contributory factors and often a combination of factors can precipitate a housing affordability issue for households. Multivariate regression models allow simultaneous consideration of the multiple influences on the probability of being AtRisk. The following analysis modelling the HILDA data considers the profile of those AtRisk, and the influence of individual variables on the probability of being AtRisk.

Prior to discussing the implications of the regression model it is important to note the caveats that apply to the model analysis.

1) Although longitudinal data are superior to a single cross-section it is an annual collection of point-in-time details and may not provide a comprehensive picture for those at the margin of being AtRisk, nor of short-term transitions in and out of AtRisk.

2) The AtRisk measure is a mechanical device. For example, low-income high-wealth individuals may be technically, but not practically, AtRisk.

3) As described in Appendix I there are difficulties with the collected superannuation data in HILDA. As well as cash-benefits only being collected in five waves there are a great deal of missing data (e.g. for females age 45-plus in wave 18 about 60 per cent of data is missing). The inability to include superannuation excludes a measure that strongly favours males (e.g., in 2017–18, the median superannuation balance at, or approaching, preservation age (55-64 years) for females was about 65 per cent that of males[5]. Although we include total assets in the models it is a household level variable not individual level and it is also collected in five waves and we interpolate the missing waves.

4) As the models are 'panel' data model individual time-invariant heterogeneity is controlled.

5) There are, however, other factors – particularly for females – that are very likely by virtue of individual factors to influence individuals. For example, females in a household not technically AtRisk, but are the subject of domestic and family violence (DFV) and who leave their home. As noted by Flanagan et al. (2019) an absence of affordable, suitable housing means victims of DFV trying to move into permanent, independent housing find it very difficult, and sometimes unachievable.

In this section we use the results of the regression model to present a profile of those AtRisk.

Model details

Table 7 (pages 21-22 below) provide a summary of regression model results for the HILDA data for those age 45 years and above and who hold a mortgage, or pay rent in public housing or in the private rental sector.

Initially we examined three time periods: All waves (2001 to 2018); Pre Global Financial Crisis (2001-2006); and Post Global Financial Crisis (2009-2018). Models also include a measure based on previous

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5   In 2017–18, the median superannuation balance at, or approaching, preservation age (55-64 years) was $119,000 for women and $183,000 for men (ABS 2019 c).

AtRisk status (simple models with lags of AtRisk strongly indicated prior AtRisk is a causal factor for current AtRisk).

We estimate a non-linear longitudinal econometric model (panel logit) to analyse the relationship between AtRisk and various measures in which we have a particular interest. In addition, we control for key demographic and socio-economic characteristics that are expected to influence the probability of being AtRisk, but are not the focus of this study (e.g., for tenure type we exclude owners and those classed as "Others"). All analysis is carried out with Stata 16.1. See Appendix I (Technical) for further details.

The majority of the explanatory variables are categorical; the exceptions are the count of previous period AtRisk (Cumulative AtRisk) and the value of real total assets (Financial Assets). For all but Cumulative AtRisk and Financial Assets the model compares the included categories to the exclude (base case) category. For example, in the models we test the influence of being in the age-group 55-64 or the 65-plus group compared to the base-case category 45-54 years.

Using the model results we take two approaches. First, we consider the profile of those AtRisk, second we examine the influence of individual variables on the probability of being AtRisk.

A Profile of those AtRisk

As we note in Appendix II the initial models included an extensive set of independent variables and using the general-to-specific method we reduce the model to a more parsimonious form (the conservative model reduction process stops at p-values0.50). We discuss, generally, only those variables that have an influence on being AtRisk.

Model results are considered 'all other things held constant' so for example, when considering Indigenous (Aboriginal) status, the comparison is between those who are Aboriginal and those who are not Aboriginal holding all other individual attributes constant.

From the model we conclude that a female age 45-years and above (on average in the post GFC period 2010 to 2018) is more likely to be AtRisk if they one or more of the following attributes: have been previously AtRisk, are not employed full time, are an immigrant from a non-English speaking county, are in private rental, would have difficulty raising emergency funds, are Indigenous (Aboriginal), are a lone-person household, a lone-parent who is separated, divorce or widowed, or specifically indicate they would have trouble paying their mortgage or rent.

There is less likelihood of being AtRisk if in a couple household, they have higher levels of financial assets, or they are living in Tasmania. While age group may be a proxy for multiple other factors it is not when controlling for multiple other individual attributes (and unobserved heterogeneity), itself, an influence on the probability of being AtRisk.

Although this cannot be formally tested[6] we expect that the cumulative impact of variables that individually increase the likelihood of being AtRisk will also accumulate. Thus, not being employed full-time combined with prior incidences of being AtRisk and a non-English speaking immigrant will significantly increase the probability of being AtRisk.

Although restricted by small numbers when we consider more defined sub-groups we demonstrate the cumulative effect for females in lone-person households, who are not employed full time and who have experienced at least one prior occurrence of being AtRisk. On average, for the post-GFC period, females in the age-group 55-64 in private rental had a 24 per cent probability of being AtRisk, but if a

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6   The regression model would require multi-variable interactions resulting in very small counts. For example in the unweighted data, for females age 45-plus, there is a single observation for Public Rent, Married and Unemployed. Small cells counts (referred to as sparse data) generally results in low statistical power and raise concerns with bias and lack of robustness in standard errors.

female as describe above, the probability of being AtRisk increases to about 70 per cent.[7]

Model results

In the model summaries that follow coefficients from the (panel) logit model are reported as odds ratios (OR). An OR equal to 1 means the explanatory variable does not affect AtRisk; an OR greater than 1 means the probability of AtRisk occurring goes up when an explanatory variable increases or for categorical variable the chance that an individual will be AtRisk is more likely to be observed than the base-case (or excluded category); an OR less than 1 means the probability of AtRisk occurring goes down when an explanatory variable increases or, AtRisk is less likely to be observed than the base-case (Gujarati 1988).

The level of statistical significance is included as p-values[8] using the conventional practice: * p<0.1 (10% level); ** p<0.05 (5% level); *** p<0.01 (1% level). Following convention, we consider the 5% (or lower) level as statistically significant – we consider the 10% level as marginal or indicative and perhaps not to be ignored.

Interpretation of model results

First, we note that the sample sizes for the three models are dissimilar. That is, the pre-GFC data (2001-2009) is about 38 per cent of the total and post-GFS is therefore about 62 per cent.[9] Unsurprisingly the results for larger sub-sample post-GFC are much closer to the model for the full timespan than pre-GFC. For example, females' Indigenous (Aboriginal) status is statistically significant for post-GFC, but not pre-GFC. The post-GFC is more in accord with our prior expectations as are a number of other results, and the data are more recent and so we generally restrict our discussion to the model Post-GFC for those age 45-plus who are not home owners.

- First, for females once demographic and socio-economic attributes are taken into account ("control variables") age group is not a significant factor in explaining the risk of homelessness (that is, risk is not different for age groups 55-64 or 65-plus compared to the age group 45-54). We would suggest that this is not surprising; it is not age per se that causes AtRisk– the observed relationship is the consequence of other individual attributes (several of which will have occurred several years prior to measuring AtRisk) and age group simply summarises the accumulation of these other casual attributes. That is, age is the proxy for the cumulative effect of prior circumstances which, when older, are beyond altering.

- Second, those AtRisk in previous periods are more likely to be AtRisk in the current period; each increase in the number of periods previously AtRisk increases the probability of being AtRisk in the current period by almost double for females, i.e. AtRisk displays hysteresis (this is a well-known phenomenon in, e.g., labour economics where periods of high unemployment tend to increase the rate-of-unemployment in later periods).

- Third, those in the private rental market are over twice as likely to be AtRisk (model estimated Odds Ratio for females is 3) compared to those with a mortgage. Public rental may provide safety

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7   We use the average over the period 2010-2018 as, in the unweighed data, numbers for sub-groups for single years become too small to provide reliable estimates.

8   That is the probability value. In statistical hypothesis testing, the *p*-value indicates when the null hypothesis (that the estimated coefficient is zero) is rejected (or not rejected). If rejected we conclude there is a statistically significant relationship between the dependent and independent variable (all other things equal).

9   Note that as the count of prior periods *AtRisk* is included as a lagged explanatory variable the regression sample falls by one wave.

compared to private rental (statistically not significantly different to mortgage holders for females).

- Fourth, household structure combined with marital status has the strongest influence (all other things equal) on being AtRisk. The impact of a lone-persons household (irrespective of marital state – e.g., divorced, separated, never married or gender –is a very significant increase in the probability of being AtRisk (e.g., 9-times more likely for a lone-person never-married female). Similarly, but with much less weight, lone-parent separated/divorce/widow females are more AtRisk, but not those who are 'never married'. Interestingly, never married couples are about over half less likely to be AtRisk. Some individuals self-report what appear to be contradictory household structure and marital status. For example, a small number of females report they are separated but also a couple household – one could speculate they are separated from a previous partner and are now in a couple household.

- Fifth, there are a few differences in the models estimates for females that appear to be important:
    - Aboriginal females are about 2½ time more likely to be AtRisk (OR 2.7)
    - Female from a non-English speaking background are more likely to be AtRisk.
    - Females in Tasmania (compared to Sydney) are less likely to be AtRisk;
    - For access to emergency cash there are differences in the importance of the three levels of stress, but the conclusion is, unsurprisingly, that lack of access to emergency cash significantly influences the probability of being AtRisk.
    - Females who stated they had trouble paying their mortgage were about 1½ more times likely to be AtRisk; somewhat more likely if having difficulty paying their private rent . Difficulty paying public rent did not influence AtRisk;
    - For females the level of financial assets had a small impact – lowering the probability of being AtRisk by about 10 per cent for each $100,000 in total assets.
    - The labour market plays a significant role. Compared to full-time employment both females are between 1½ to 4 times more likely to be AtRisk (e.g. employed part-time are about twice as likely; close to four times as likely if unemployed; and not in the labour force about 3 times).

- Lastly, other attributes found not to be influential – either non-significant if retained or initially included in the models but excluded as they gave no indication that the measure had any influence on AtRisk: long-term disability or health condition, general health, children age 0 to 4 or 59 years in the household; and the level of social support.

With the assistance of these estimates and using ABS population projections it is clear that, without changes to policy, AtRisk is likely to increase due to a single important factor. According to the model, a lone-person household is a dominant factor in increasing the likelihood of being AtRisk. According to Australian Bureau of Statistics projections lone person households are expected to comprise between 24 and 27 per cent of all households by 2041. This equates to between 3.0 and 3.5 million Australians (of all ages) in 2041. Male lone person households will increase by between 38.1 and 46.4 per cent while female lone person households will increase by between 27.6 per cent and 58.8 per cent (ABS 2019b).

Table 7[Part A] – Summary regression results for age 45 plus (various time periods)

HILDA Age 45 plus	Female		
Variable	2002-18	Pre-GFC	Post-GFC
Cumulative AtRisk	1.932***	3.206***	1.842***
Age Group			
45-54	(base)	(base)	(base)
55-64	0.901	0.691	0.917
65+	0.938	1.962**	0.819
Labour Force Status			
Employed Fulltime	(base)	(base)	(base)
Employed Part-time	1.488***	0.984	1.666***
Unemployed	2.267***	2.275*	2.101***
NLF Retired	1.951***	1.193	2.097***
NLF Not Retired	2.169***	1.224	2.317***
Country of Birth			
Australian	(base)	(base)	(base)
English Speaking Background	0.999	0.782	1.018
Other Country	1.349**	0.918	1.418**
Location			
Sydney	(base)	(base)	(base)
Melbourne	0.897	0.826	0.81
Brisbane	0.97	0.974	0.977
Adelaide	0.756	1.062	0.778
Perth	1.251	1.302	1.324
Tasmania	0.466***	0.567	0.524**
NT	1.098	2.252	0.716
ACT	1.866*	4.127**	1.427
Tenure			
Mortgage Holder	(base)	(base)	(base)
Rent-Private	2.611***	2.262***	2.912***
Rent-Public	0.652**	0.372***	0.787

Legend: * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Table 7 [Part B] – Summary regression results for age 45-plus (various time periods)

HILDA Age 45 plus	FEMALE		
Variable	2002-18	Pre-GFC	Post-GFC
Financial Assets [$-real]	0.942***	1.031***	0.926***
Trouble Paying Rent Public	1.641	4.063*	1.63
Trouble Paying Mortgage	1.12	1.045	1.537*
Trouble Paying Rent Private	1.789**	1.356	1.888**
Emergency Cash			
Could easily raise funds	(base)	(base)	(base)
Would involve some sacrifice	0.996	1.129	0.958
Do something drastic	1.355**	1.484	1.374*
Couldn't raise funds	1.287**	1.205	1.277
Indigenous Status			
Non-Indigenous	(base)	(base)	(base)
Indigenous Status	2.039***	0.809	2.682***
Social Support			
High	(base)	(base)	(base)
Low	1.141	1.155	1.15
Any Children Age 0-4			
No children			
Children	0.494	(omitted)	0.517
Couple-Married	(base)	(base)	(base)
Couple-SDW	0.255*	(empty)	0.345
Couple –Never Marry	0.325***	0.255***	0.280***
Lone Parent-Marry	1.825	1.431	1.886
Lone Parent-SDW	1.540***	2.158***	1.595**
Lone Parent-Never Marry	1.137	0.933	1.291
Lone Person-Marry	4.272*	(empty)	2.63
Lone Person-SDW	4.747***	3.138***	5.842***
Lone Person-Never Marry	6.105***	2.170*	8.992***

Legend: * p<0.1; ** p<0.05; *** p<0.01. Notes: SDW represents Separated or divorced or widow.

Summary - conclusions

At risk of homelessness is clearly not a minor matter. According the HILDA data for 2018 in the age cohort 55-plus years it is estimated that about 240,000 (±10%) females were AtRisk based on the commonly used 30/40 Rule. Although focus tends to be on older individuals it is important to note that about 165,000 (±10%) females age 45-55 are AtRisk. In total there are about 405,000 (±10%) females age range 45 and over AtRisk. While estimates are always subject to the reliability of the data source the HILDA data are considered reliable and are commonly used by researchers for Australian Housing and Urban Research Institute (AHURI) (see, e.g., Ong et al. 2019). Nonetheless, because the data is a sample and sample weights are used to obtain tabulated estimates at population level there is a degree of uncertainty in those estimates; and the uncertainty is extended for the examination of sub-groups. The uncertainly is not, however, likely to influence the estimates to the point where they no longer show a significant problem of being AtRisk in Australia.

We examined the regional differences in AtRisk and find there are significant differences, but the observed data do not show any obvious regional patterns. From the model results we suggest that it is not 'city' that is a driver of levels of AtRisk but the other significant variables in the models.

Generally, the probability of females being AtRisk is observed to increase in the three tenure types (mortgage holder, public renter and private renter) as age increases noting that increases in the probability of being AtRisk does not imply an increase in numbers AtRisk since counts by age-group and tenure type do not change with any pattern.

Although there is a strong association between AtRisk and age, age is not the cause of increased probability of being AtRisk. Causal factors are a set of multiple individual factors – several of which occur prior to the individual being AtRisk (for example in the labour market, or a consequence of events in the past such as education level). Many of these are intuitive (e.g. labour market status is strongly correlated with ability to pay rent and accumulate wealth), but it is important to know to what extent the socio-economic or demographic factors are associated with AtRisk, e.g. post-GFC female immigrants from non-English speaking backgrounds were about 40 per cent more likely to be AtRisk compared to Australians suggesting an unambiguous policy intervention.

Controlling for the multiple individual factors found to be a causal influence on AtRisk demonstrates that the one-dimensional summary of the probability of being AtRisk (e.g. a cross-tabulation) cannot provide a guide as to which particular groups of individuals are AtRisk. A more nuanced approach is required if long-term policy is to be fully informed.

This analysis has provided an insight into the multiple influences on being at risk of housing affordability issues and homelessness. As noted above it is the cumulative aspects over a lifetime that can increase the prospect of being at risk in older age as noted in the personal experience below:

> Apart from the years bringing up my children, I've worked all my life and now it's come to nothing. I don't know what to do about my situation as I'm 68 and the only way I can afford my rent is to keep on working but when will this situation end, when I'm in my 80s and can't cope anymore? What happens then? I guess I always expected I could cope and hadn't thought about retiring and I expected my super would be more than I've ended up with but having worked many casual jobs I've barely got $40,000 in savings. I'm not sure how to go about applying for public housing but everyone says I'd be waiting 10 years or more anyway. – Focus group participant WA Ageing on the Edge Project (Fiedler and Faulkner 2019, p32).

Similarly while people have a number of risk factors that they manage for some time it is a precipitating factor that often tips them into homelessness:

> I am staying with my daughter and her family which is not fair to them or myself. My name is down at housing commission but I have to wait 2-3 years even though I am a priority. I had a nervous breakdown due to assault and was suicidal and virtually disowned by my family except one daughter.... For me to be able to survive on an age pension I have to look around (country NSW town) or further to be able to afford just to survive but doing this is taking me away from my support people.- Focus Group participant NSW Ageing on the Edge Project (Fiedler and Faulkner 2017 p.93).

Appendix I - Data Availability, limitations and recommendations; and a formal description of homelessness and at risk of homelessness

Comparable quality statistics, over time and across data sources, require a clear conceptual framework and definition to underpin the operationalisation of that definition in multiple collections, including fine tuning those datasets for that purpose (ABS 2012c, p.6).

Homelessness

At a national level the enumeration of homelessness, and being at risk of homelessness, depends on the precise definitions of homelessness and risk that are used. Thus, a definition of homelessness that refers only to those who are 'roofless' (living on the streets, sleeping in derelict buildings or using cars for temporary shelter) results in a different count to the definition of homelessness that also includes 'home'lessness and marginally homeless (e.g. those living without secure housing tenure such as those in caravans).

When measuring homelessness there is a contrast between those who propose a cultural definition and the way the Australian Bureau of Statistics (ABS) defines homelessness.

According to Chamberlain (2014):

- The definition of who is homeless ... has been as much a subject of debate as the question of how many homeless there are (see Peroff 1987).

- The questions—What is homelessness? Who are the homeless? ... are I think simply unanswerable (see Field 1988).

In 1992 Chamberlain and Mackenzie concluded that a definition of homelessness that was based on individual judgment was unworkable from a research point of view. They suggested a statistical definition of homelessness that could measure whether people were 'homeless' or 'housed' in an objective way was needed and this was their intellectual rationale for the cultural definition they developed in the early 1990s. Chamberlain and Mackenzie (2008) provide the following summary of what such a measure of homelessness would require:

Table I-1 Cultural definition of homelessness

Culturally recognised exceptions: where it is inappropriate to apply the minimum standard for example seminaries, gaols, student halls of residence	Marginally housed: people in housing situations close to the minimum standard.
	Tertiary homelessness: people living in single rooms in private boarding houses without their own bathroom, kitchen or security of tenure.
	Secondary homelessness: people moving between various forms of temporary shelter including friends, emergency accommodation, youth refuges and hotels
	Primary homelessness: people without conventional accommodation (living on streets, in deserted buildings, improvised dwellings, under bridges, in parks, etc.).
Note: Minimum community standard: equivalent to a small rented flat with a bedroom, living room, kitchen and bathroom.	

Source: Chamberlain (2014, p.6).

According to Chamberlain and McKenzie (2003, p.1) the ABS sowed the seeds for an enumeration of the homeless population in the 1996 census: 'The 1996 census was the first census to target Australia's homeless population with a special enumeration strategy, using the cultural definition of homelessness'. For 2001 Chamberlain and McKenzie provided estimations for the 2001 census using the same definition as 1996 utilising data from the census, the national Supported Accommodation Assistance Program (SAAP) data collection and a national census of homeless school students.

An ABS Information Paper noted that '[u]p until 2008, the ABS had neither developed its own definition of Homelessness nor adopted any other definition' (ABS 2012c, p.9). Nonetheless, the ABS subsequently stated that they had '...identified the need to develop a robust, defensible and evidence informed definition of Homelessness for statistical purposes' (ABS 2012c, p.10); thus they sought to address the fundamental question of what it was to have a home (see also Chamberlain and Mackenzie 2008).

The ABS view recognised the earlier view that a definition of homelessness should take account of people's perceptions of homelessness; people in conventional houses or flats were deemed to be homeless if they believed that their dwelling failed to provide them with privacy, safety and security. In essence, one can be housed and homeless at the same time (Chamberlain and Mackenzie 2008).

The 2012 ABS statistical definition follow that of Chamberlain and Mackenzie (1992) – in which people's homelessness was not simply the act of being without a home; the definition was constructed from a conceptual framework that occurs on the three-level continuum, summarised above by Chamberlain and Mackenzie (2008) with levels, Primary, Secondary and Tertiary homelessness.

These three levels are core elements relate to (ABS 2012c, p.7):

- is it a dwelling that is inadequate; or

- has no tenure, or if their initial tenure is short and not extendable; or

- does not allow them to have control of, and access to space for social relations;

- people who meet these criteria are referred to as the housed-homeless;

- but, with the caveat that people should be excluded from the homeless count if they are homeless by choice and have accommodation alternatives.

Notwithstanding the development of the ABS' measure of homelessness, a number of issues arise in respect to the operationalisation of the 2012 ABS definition of homelessness. First, with regard to the three levels (Primary, Secondary and Tertiary) the ABS does not distinguish between them in data reports or publications. Second, ABS census' do not gather information on the quality of kitchen and bathroom facilities; whether buildings are being used for the purposes for which they have been zoned; or whether dwellings have improvement or control orders on them. It is therefore impossible to operationalise exactly this part of the ABS definition using census data (Chamberlain and Mackenzie 2008).

Consequently, Chamberlain and Mackenzie (2008) describe the difference between the ABS definition and the Cultural definition:

Table I-2 Comparison of ABS operational categories and cultural definition

	ABS operational categories		Cultural definition
1	Improvised dwelling, tents or sleepers out	1	Primary homelessness
2	Supported accommodation for the homeless	2	Secondary homelessness
3	Staying temporarily with other households	3	Secondary homelessness
4	Boarding houses	4	Tertiary homelessness
5	Other temporary lodgings*		
6	Severely crowded dwellings		

Source: Chamberlain (2014, p10). Note: * Included in tertiary population but not a separate analytical category.

Using the 2011 census the difference in numbers between the two definitions is demonstrated (Chamberlain and Mackenzie 2008) – showing clearly that the issue is very important with regard to adequate enumeration of homelessness – the ABS measure is about 65 percent larger than the measure based on a cultural definition:

Table I-3 Age of homeless people, cultural and ABS definitions, 2011

Age (years)	Cultural Definition			ABS Definition		
	N	%	%	N	%	%
Under 12	7,774	12.2		17,845	17.0	
12-18	4,774	7.4	31.8	10,913	10.4	41.9
19-24	7,755	12.2		15,325	14.5	
25-34	11,965	18.8		19,312	18.3	
35-44	10,246	16.0	49.2	14,484	13.8	44.0
45-54	9,191	14.4		12,507	11.9	
55-64	7,097	11.1		8,649	8.2	
65-74	3,536	5.5	19.0	4,174	4.0	14.1
75 and over	1,509	2.4		2,028	1.9	
	63847	100.0		105,237	100.0	

Source: Chamberlain (2014).

It is also important to note that reported changes in the number of homelessness must be examined carefully. For example, there was 14 per cent growth in homelessness between 2006 and 2011, but most of this increase was due to the increase in overcrowded dwellings (up from 31,531 to 41,370 or 24 per cent): this category accounted for 35 per cent of the homeless in 2006, increasing to 39 per cent in 2011 (Pawson et al. 2018). Changes within categories are common such that for the 2016 census changes were made to the boarding house definition which resulted in a revision downwards of the total number of homeless for 2011 reported as a comparison with the 2016 census data. Table I-4 (below) highlights the differences between the original devised estimations and the later revisions.

Table I-4 ABS Census counts of the homeless population: original and revised counts

Census year	2001	2006	2011
Original count	99900	89728	105237
Revised count	95314	89728	102439

Source: ABS 2006, 2012a, 2012b, 2018a.

The major reason for this, as mentioned above, is that homelessness as a variable is not a 'characteristic that is directly collected in the Census of Population and Housing, estimates of the homeless population may be derived from the census using analytical techniques based on both the characteristics observed in the census and assumptions about the way people may respond to census questions' (ABS 2018a). Data item categories such as 'improvised home, tents, sleepers out' and 'no usual address' will include both people who were likely to have been homeless on census night and people who were not homeless. For example, people travelling away from home for considerable periods and having no place in which they are likely to stay for six months or more in the year of the census should correctly report 'no usual address'. People living in a shed as they build their new home will be enumerated as living in 'improvised home, tents, sleepers'. Such variables need to be considered along with other data collected in the census in determining whether or not a person was likely to have been homeless on Census Night (ABS 2012a). In addition, 'In 2006, there was a special effort to count people in the primary population. We know that in some areas census collectors had very good local knowledge and made an extraordinary effort to count people sleeping rough. We also know that in other areas census collectors felt they had partially counted the population. It is unlikely that all rough sleepers were identified" (ABS 2008, p.11).

The ABS also provides estimates of those that are considered to be marginally housed, that is 'people whose living arrangements are close to the statistical boundary of homelessness, but who are not classified as homeless' (ABS 2018a).

In addition it must be noted that the census homelessness estimates are very limited in providing estimates for particular groups within the community – homeless youth, people who become homeless due to domestic and family violence and for Aboriginal and Torres Strait Islander peoples (ABS 2018a).

When considering changes within age groups between the census of 2006 and 2016 data for single age groups can imply large changes in homelessness. For example, the percent of homelessness in age group 55 to 64 increased by 1.43 percentage points (7.75% to 9.18%), but the overall increase in homelessness between 2006 and 2016 was 0.04 percentage points (0.44% to 0.48%); the raw increase in homelessness from 89,728 to 116,421 disregards the fact that Australia's population increased by about 17% (Table I-5 below). What is more important is that the proportion of total homelessness – compared to the total population has grown. This growth may appear marginal (see final column of Table I-5), but any increase indicates that government policy directed at reducing homelessness appears to have failed.

Table I-5 Changes in the number of people homeless and changes in population growth

| Persons | 2006 | | | | 2016 | | | | 2006-16 |
Age groups	Frequency Homeless	% of Homeless	Frequency Population	% Of Age Group	Frequency Homeless	% of Homeless	Frequency Population	% Of Age Group	% Change Age
Under 25	37,658	41.97%	6,552,631	0.57%	43,552	37.41%	7,741,825	0.56%	-0.01%
25–34	15,848	17.66%	2,847,682	0.56%	24,224	20.81%	3,608,381	0.67%	0.11%
35–44	13,180	14.69%	3,043,929	0.43%	15,745	13.52%	3,234,238	0.49%	0.05%
45–54	10,581	11.79%	2,892,922	0.37%	14,278	12.26%	3,153,406	0.45%	0.09%
55–64	6,950	7.75%	2,355,751	0.30%	10,682	9.18%	2,780,806	0.38%	0.09%
65–74	3,560	3.97%	1,485,879	0.24%	5,651	4.85%	2,083,269	0.27%	0.03%
75 and over	1,951	2.17%	1,426,694	0.14%	2,289	1.97%	1,588,982	0.14%	0.01%
	89,728	100.00%	20,605,488	0.44%	116,421	100.00%	24,190,907	0.48%	0.05%

Notes: (1) Homelessness based on Table 1.1 (ABS 2012a; 2018a; 2019d; 2019e).

Finally, it is necessary to be aware that census estimated homelessness data relates to the night of the census, and specifically homelessness on that night. Such data are not able to distinguish between current homeless (at the time of data collection); lifetime homelessness (a period of homelessness at some previous point); and a spell of homelessness, (e.g. over the last 3 months). Such differentiation is likely to have policy implications which cannot be assessed with census estimated homelessness (Van Hooff et al. 2019).

There are a number of other sources of data that provide an insight into homelessness.

Other ABS data sources

The ABS states there are a number of other published ABS data collections that include some information on the incidence of homelessness. These publications are the Disability, Ageing and Carer, Australia: Summary of Findings 2012 (Cat No. 4430.0), General Social Survey: Summary Results, Australia, June 2014 (cat no 4159.0) and the National Aboriginal and Torres Strait Islander Social Survey, 2014-15 (NATSISS) (Cat No. 4714.0). As stated by the ABS however 'These data give a picture of the incidence of homelessness, as well as trends in homelessness over time, at least for those who have transitioned out of homelessness at the time of interview.' (ABS 2018a). They do not include data for those currently homeless.

Specialist Homelessness Services (SHS) Collection

As noted above the census data captures a snapshot count at a particular point in time and only at five yearly intervals. The Specialist Homelessness Services (SHS) Collection, managed by the Australian Institute of Health and Welfare (AIHW) however provides a rich source of data on people homeless or at risk of homelessness on an annual basis and the services provided to assist people. This data has been collected since 2011 (replacing the SAAP dataset) however there are a number of factors that need to be kept in mind when examining this data:

- SHS statistics do not capture the situation of people whose situation may be effectively 'homeless' but who do not seek housing-related assistance from a service provider within the AIHW system (AIHW 2019a).

- This is an administrative dataset and while the AIHW plays a role in developing and maintaining the quality and consistency of the data there are variations in the interpretation of the data required and in the completeness of records (AIHW 2019b). For example even though this data has been collected since 2011-12, changes made in 2014-15, resulting 'in a substantial

improvement in data quality for mandatory data items' means 'care should be used when comparing results from 2011-12 to 2013-14 with results from 2014-15 onwards.' (AIHW 2019a).

- Considerable numbers of older people who engage with SHS are actually living in public and community housing at the start of a support period– in 2018-19 20.6% of older people.

- The definition of homelessness in the SHS collection differs from that of the census. For this collection (AIHW 2018) a person is considered homelessness if they are living in either:

  - Non-conventional accommodation or 'sleeping rough' (primary homelessness), or

  - Short-term or emergency accommodation due to a lack of other options (secondary homelessness).

  - A person is defined 'at risk of homelessness' if they are at risk of losing their accommodation or they are experiencing one or more of a range of factors or triggers that can contribute to homelessness. There are a range of risk factors that represent physical, emotional, social, cultural or economic safety of a person. At risk also includes inadequate or inappropriate dwelling conditions, including accommodation that is unsafe, unsuitable or overcrowded (AIHW 2018). As noted by Flatau et al. (2018, p11) 'This represents a divergence in both definition and measurement of homelessness across the ABS and SHSC systems; wherein a person living in severely crowded conditions is considered to be homeless (ABS) whereas in the SHSC the same person (if being supported) may be treated as being at risk of homelessness.'

The data does however provide an insight into prevailing trends as experienced by those older people who engage with the services.

Journeys Home

Funded by the Department of Social Services (Commonwealth) and administered by The Melbourne Institute, the Journeys Home survey was a longitudinal survey of close to 1700 people homeless or at risk of homelessness. The survey which began in 2011 and concluded in 2014 aimed to 'identify the factors leading to homelessness and the support strategies required to exit from it'. To do this the survey 'collected information on the complexities of homelessness by tracking the same people over a two-and-a-half-year period.' (For further details on the survey https://melbourneinstitute.unimelb.edu.au/journeys-home.)

Registry week

In the Australian context, Registry Week counts (previously known as local rough sleeper counts) are increasingly being instigated as a means to track in real time the incidence, needs and outcomes of people on the street.[10] Currently limited in their geographic coverage even though while a larger number of councils have undertaken one or more such surveys over recent years, only four are believed to have done so on a regular and consistent basis — namely the City of Sydney, the City of Parramatta, the City of Melbourne and the City of Adelaide (Pawson et al. 2018), they are a step forward in a collective impact approach and achieving measurable outcomes (for example see the Zero Project https://dunstan.org.au/adelaide-zero-project/).

At Risk of Homelessness

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10 For a history of Registry Week see Flatau et al. (2018, p13-20).

As with homelessness, the debate about the most appropriate generalised measure of housing afford-ability stress (At Risk of Homelessness) has been long running in Australia (see, for example, Gabriel et al. 2005; Burke et al. 2011; Stone et al. 2011).

One of the most commonly applied ratios is the 30/40 Rule (households in the lowest 40 per cent of the income distribution who spending 30 percent or more of income on housing costs). The calculation of ratios is generally uncomplicated and this contributes to their pervasive use in housing research. Nonetheless there is nothing sacrosanct about these definitions; Henman and Jones (2012, p.1) note that the 30/40 rule "...has been criticised as being somewhat arbitrary and insensitive to the varied cir-cumstances of different household types" and Lester et al. (2013) undertake Receiver Operating Char-acteristic (ROC) curve analysis to evaluate the degree to which a ratio measure such as the 30/40 Rule predicts self-identified housing stress and find that this ratio rule is not particularly accurate. Finally, there is not a clearly accepted approach; for example, the calculation of the at risk rule can be based on various income options (e.g. gross income, disposable income, or equivalised income) and in each case estimates of the number or proportion of at risk will differ. For this study we use gross household in-come and for housing costs rent and first (plus second) mortgage. The 40th percentile is based on ABS gross income scales (ABS, 2019f). We select this set of measures as they tend to give a conservative estimate of the number at risk.

It has also been argued in several papers released by the Australian Housing and Urban Research Institute (AHURI) (e.g., Stone et. al 2011; Henman and Jones 2012) that the alternative method, the Residual Income Approach (RIA) is a superior measure of housing affordability. That is, 'It has demon-strated that the residual income approach does have merits vis-à-vis traditional ratio approaches to as-sessing housing affordability' (Henman and Jones, 2012, p.29; see also Stone 2006). The calculation of the components is, however, complex as its aim is to consider what various household types can afford to spend on housing after taking into account all their other necessary living expenditure. In addition it is necessary to develop normative standards of a minimum income required to meet other household requirements at a basic level after paying for housing – clearly there is a requirement to specify or de-fine what is to be a "normative standard" and "a basic level" (Stone et al. 2011). Moreover, normative standard and basic level need to be evaluated for various configurations of households (e.g. by marital status and number of children). Hence, although simply measures are criticised because of their lack of theoretical rigour a switch to the RIA is not unambitiously superior. Finally, data requirements for the RIA are onerous (see Baker et al. 2012; Henman and Jones, 2012) making it beyond the scope of most data sources (Lester et al. 2013). As is often the case, because of the restrictions of data availability and the general acceptance of the 30/40 measure we suggest that for policy development related to housing affordability (or At Risk of Homelessness) the 30/40 Rule will be considered generally accept-able and will be comparable with other Reports (particularly those from AHURI).

Finally, it is useful to recall that although a fairly simple rule has been developed to represent the Risk of Homelessness, the underlay path to housing affordability is complex. Clearly housing affordability is influenced by several connected and, generally, correlated factors. That is, the demand for housing is influenced by demographic factors, household income, interest rates on borrowing, house prices or rental prices and the supply of housing. Moreover several of these measures interact – household income is a direct influence on the demand for housing, but demographic factors have both a direct effect and an indirect effect through income and interest rates. These points provide compelling evi-dence that a comprehensive measure of housing affordability (and therefore At Risk of Homelessness) is heavily data dependent, and appears to require sophisticated quantitative modelling; thus, the at-traction and reliance on a rule-of-thumb measure such as the 30/40 Ratio.

Risk of Homelessness

- The Household, Income and Labour Dynamics in Australia (HILDA) – household-based longi-tudinal annual data collection 20012018.

- ABS Census, (data collected at five yearly intervals).

- ABS General Social SurveyJune 2014.

- ABS Survey of Income & Housing Various Years to 2017-18.

Only the HILDA data allows the individual experience to be tracked over several years. All other data sources that are collected on more than one occasion are not linked; they can only provide average annual changes; it is not possible to identify if those At Risk experienced it for the first time, if it has been an ongoing situation, or if their life has been a series of risk periods between non-risk spells.

At Risk of Homelessness – Data Recommendation

For examining those At Risk of Homelessness – if a ratio rule (e.g. the 30/40 Rule) is to be used – then the Household, Income and Labour Dynamics in Australia (HILDA) annual data collection (currently 2001 to 2018 are available) is a strong contender to the most useful data set (see for examples, e.g. Daniel et al. 2018; Baker et al. 2016; Baker et al. 2015; Mason et al. 2013; Bentley et al. 2012; Rowley and Ong 2012; Wood and Ong 2009 – and used by the AIHW). HILDA is considered most helpful, primarily, as it is available annually from 2001 to 2018 and so can inform on change over time for individuals and the same groups of people, but also because of its extensive collection of personal data following more than 17,000 Australians (including all ages ranging from less than one-year old to over 100 years) each year collecting information on many aspects of life (e.g., household and family relationships, income and employment, and health and education) – and weights are supplied with the data set to make inference from the sample to the population.

Appendix II - Data and variable description; descriptive statistics; and modelling methods and specification

The Household Income and Labour Dynamics in Australia (HILDA) longitudinal survey now follows more than 17,000 individuals (from over 9,500 households); it has been collected annually since 2001 and there are currently 18 waves. HILDA is based on a nation-wide probability sample of Australian households, and collects detailed longitudinal information across housing, income, and other socio-economic and demographic characteristics. Information is collected from all household members aged 15 years and over via self-completion questionnaires and face to face surveys (see Wooden and Watson 2007).

- Waves 1 to 18 are used in this analysis. We examine three possible ranges for the data (noting that when including previous AtRisk status the sample will contain fewer waves):

  - All waves (2001 to 2018).

  - Pre Global Financial Crisis[11] (2001-2009).

  - Post Global Financial Crisis (2010-2018).

- Age range is restricted to age 45 years and above. Three categories are included: 45-54, 55-64, 65-plus (in regression models the base-case is 45-54 years).

- Housing tenure is restricted to those who hold a mortgage, those pay private rental and those paying public rental (in regression models the base-case is mortgage holders).

- The focus of analysis is females (age 45 plus), but males are retained to be included where desired.

- Therefore the initial sample (prior to considering missing data on variables other than age and tenure) is over 86,000 person-year observations.

Additional Information on Various Explanatory Variables

Index of Social Support

The model includes a measure of social support. It is constructed from 10 HILDA questions (see Flood 2005):

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[11] "The global financial crisis (GFC) refers to the period of extreme stress in global financial markets and banking systems between mid-2007 and early 2009" (RBA) https://www.rba.gov.au/education/resources/explainers/the-global-financial-crisis.html (accessed 15/2/2020).

Question: B17a   People don't come to visit me as often as I would like

Question: B17b   I often need help from other people but can't get it

Question: B17c   I seem to have a lot of friends

Question: B17e   I have no one to lean on in times of trouble

Question: B17f   There is someone who can always cheer me up when I'm down

Question: B17g   I often feel very lonely

Question: B17h   I enjoy the time I spend with the people who are important to me

Question: B17i   When somethings on my mind, just talking with the people I know can

Question: B17j   When I need someone to help me out, I can usually find someone

Each of the 10 questions has a range of [1:7]. The "Index of Social Support" (ISS) is a simple additive index (several questions are reverse-coded). After construction the ISS has a potential range of zero to seventy [10, 70]. The ISS is re-shaped so that it is centred on zero with a range from -30 to +30; a score of -30 indicates very little support and a score of +30 indicated a high level of support. We convert the ISS into a dichotomous measure of low social support (-30 to 0) and high social support (0 to +30). According to Baker et al. (2012) a negative score on the index score indicates people who have experienced an episode of loneliness over an extended period of time (rather than occasional feelings of loneliness).

Financial assets

HILDA collects data on multiple measures of assets and constructs three derived variables that we consider: Financial assets, Non-financial assets and Total assets. These measures are included in the Wealth module collected in waves 2, 6, 10, 14 and 18. We use the collected data to interpolate across other waves. We examine the influence of assets in the regression models and find that it is immaterial which is used. For example, for females age 45 plus (2001-2018) extracting the odds-ratio for assets we find that Total assets is significant (model 1); Non-financial assets are significant singularly (Model 2); or with Financial assets (Model 4), but Financial assets alone are not significant. We note the following two interesting outcomes. First, in models (which also include controls for access to emergency cash and a stated difficulty in paying the mortgage or rent) the level of assets has a very minor impact (e.g. with a value for females of about 0.94, i.e. about 7 per cent less likely). Second, exclusion of any asset measure has negligible impact on the models. This is consistent with findings reported in Rowley et al. (2015) where housing affordability stress (HAS – which we refer in this paper to as AtRisk) is found to be only weakly correlated with financial situation. Although, the authors found that the relationship between HAS and financial stress is strengthened when the assessment is expanded from 'point-in-time' analysis to analysis overtime.   This is also consistent with our finding that the lagged value of AtRisk has a strong and statistically significant influence on current AtRisk (see also Baker et al. 2015) who show the important dynamics of housing affordability stress.

Table II-1 Preliminary models – Types of financial assets (HILDA)

Asset Type	Model1	Model2	Model3	Model4
Assets Total	0.942***			
Non-Financial Assets		0.933***		0.942***
Financial Assets			0.955	0.969

Notes: *** Significant at 1% or better.

As we wish to ensure the model is consistent with theory we report models which do included assets and we select Total assets.

Health

HILDA data contains information on individual general health status (Likert scale range 1-5), mental health (the mental health SF36 component) and about long-term health conditions (no disability, disability does not affects work, and disability does affects work). We ran preliminary models with various combinations of these measures and find no evidence that general health or mental health influences AtRisk in a multivariate model. As there are extensive missing data for health measures (e.g. the measure of mental health has about 26% missing data in the sample of about 86,000 person-year observations) and so they were excluded.

Previous AtRisk status

It is generally accepted that previous AtRisk status is highly correlated with current AtRisk status and in a number of paper using HILDA evidence is presented supporting the view that cumulative periods in AtRisk have a direct relationship with current AtRisk status. For example in the HILDA data (W1-W18) over 55 per cent of those AtRisk in the previous period are likely to be AtRisk in the current period; for females age 45-plus the probability rises to about 59 per cent . Further, for females age 45-plus of the approximately 83,000 person-years of data (2002 to 2018) there are over 10,000 person-years of data AtRisk (i.e. over the whole period the average AtRisk in about 13 per cent). Of those approximate 4,800 currently AtRisk, were also AtRisk at a previous point in time.

Consequently models of AtRisk must account for previous AtRisk status. There are a number of ways to accomplish this and after a number of preliminary models we select a measure of cumulative AtRisk (the count of periods previously AtRisk for up to the previous 6 waves of data). An alternative to this is to include lagged values of AtRisk, and although we find no evidence[12] of this, lagged dependent variables can result in biased estimated of the lagged dependent variable and in some case other coefficients may be biased. Because of this potential bias we choose to use the cumulative measure of AtRisk.

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12   We informally examine the potential for bias due to lagged dependent variables by comparing regression results with and without lags and by estimating a linear-probability model with and without lags.

Model & variable specification

We use a linear longitudinal (panel) econometric model to analyse the relationship between at risk of homelessness (or housing affordability stress) and various measures in which we are particularly interested. In addition, we control for key demographic and socio-economic characteristics that are expected to influence the outcome. We use Stata 16.1 for all econometric analysis.

The starting model is a non-linear (i.e. panel Logit) random effects model which takes the general form:

$$AtRisk_{it} = a + d_1 CumulativeAtRisk_{t-1} + l\,\bar{x}_i + b'X_{it} + e_{it} + u_i \quad \text{.............................(1)}$$

where the dependent binary variable is AtRisk vs. Not AtRisk. Unobserved individual heterogeneity is given by u_i and with the former being a time-invariant parameter and the latter representing the time variant component of individual specific effects. These are assumed independent across individuals. X is the matrix of explanatory variables and CumulativeRisk is the number of previous spells in AtRisk.

To account for potential correlation between the individual specific effects and explanatory variables, which may cause bias and inconsistency in the estimates, the Mundlak augmentation is applied: $\bar{x}_i$

are the set of Mundlak means of continuous time-variant explanatory variables (Baltagi 2003; Mundlak 1978).

Table II-2 Descriptive statistics for females

Variable	Count	Percent
Not AtRisk (not Stressed)	33,828	85.6
AtRisk (in Housing Affordability Stress)	5,703	14.4
Cumulative AtRisk	4,301	2.0 (mean)
Age Group		
45-54	25,406	64.3
55-64	9,124	23.1
65+	5,001	12.7
Labour Force Status		
Employed Fulltime	12,861	39.6
Employed Part-time	7,863	24.2
Unemployed	1,430	4.4
NLF Retired	7,973	24.5
NLF Not Retired	2,381	7.3
Marital Status		
Married/De facto	14,541	44.7
Separate/Divorce/Widow	8,215	25.3
Never Married	9,748	30.0

Country of Birth		
Australian	25,188	77.5
English Speaking Background	3,637	11.2
Other Country	3,679	11.3
Household Structure		
Couple	22,321	60.1
Lone Parent	8,838	23.8
Lone Person	5,954	16.0
Location		
Sydney	7,862	28.6
Melbourne	7,720	28.8
Brisbane	4,186	15.6
Adelaide	2,266	8.4
Perth	3,088	11.5
Tasmania	1,320	4.9
NT	219	0.8
ACT	371	1.4
Tenure		
Mortgage Holder	24,792	62.7
Rent-Public	10,785	27.3
Rent-Private	3,954	10.0
Trouble Paying Mortgage	986	2.5
Trouble Paying Rent Public	194	0.5
Trouble Paying Rent Private	832	2.1
Emergency Cash		
Could easily raise funds	13,425	46.4
Would involve some sacrifice	6,152	21.3
Do something drastic	3,197	11.1
Couldn't raise funds	6,156	21.3
Indigenous Status	1,066	2.7
Financial Assets [$'000-real]	36,768	$9.7 (mean)

Notes:(1) Data are unweighted; (2) Sample for period (2001-2018); (3) For those with at least one AtRisk period.

All the effects of state dependence are characterised through the coefficient on the cumulative AtRisk measure. The larger the value of the coefficients the greater the degree of state dependence in the likelihood of being AtRisk in the following period.

Panel models are useful for analysis of individual behaviour as they can account for unobserved heterogeneity in the data (i.e. the unobserved individual differences typical in any group of people which, if ignored, lead to unreliable model results), a perennial problem in cross-sectional models. Nonetheless, the advantages of longitudinal panel methods are not costless—issues raised include state depen-

dence (or time dependence, e.g. past status influences current status) and initial condition (i.e. those who are in Poor-Derelict dwellings in the first year of the survey may be a non-random sample of the population). We control for both these factors in the models. Error is assumed to be composed of two elements, u_i represents the unobserved individual specific heterogeneity and e_{it} the individual time-specific zero-mean random errors.

General-to-specific method

The modelling process included the general-to-specific method. The econometrically derived general-to-specific specification results in a parsimonious model that removes irrelevant variables, avoids large Type I errors, and reduces the likelihood of multicollinearity which would reduce the validity of the estimates and of the statistics used to measure individual and model goodness-of-fit (Cameron and Trivedi 2005). This method is recognised as superior to other model construction methods (i.e., forward selection, backward elimination, and a stepwise process (Hendry 1995; Greene 2003). On the other hand, in applied analysis of panel data there is a tendency to retain statistically non-significant variables (trying to balance over-fitting and under-fitting). To balance the opposing approaches, and to adopt a conservative approach, we retain variables in models with a p-value of ≤ 0.50 – exceptions are made when it is of particular interest to demonstrate the non-significance of a particular attribute (e.g. the age-category variables). Note that the exclusion of non-significant independent variables also has the benefit that, generally, model sample size is increased as many variables in survey data have missing-observations.

An extract from the specific longitudinal model is:

$$
\begin{aligned}
AtRisk_{it} = &\ a + d_1 CumulativeAtRisk_{it-1} + l_1 Morgage_{it} + l_2 PublicRent_{it} + \\
&\ l_3 PrivateRent_{it} + b_1 Age45\text{-}54_{it} + b_2 Age55\text{-}65_{it} + b_3 Age65plus_{it} + \\
&\ OtherVariables_{it} + e_{it} + u_i
\end{aligned}
$$

...............................(2)

where 'Other Variables' includes country of birth; capital city; access to emergency cash; long-term health condition; marital status; trouble paying the mortgage, or rent; Indigenous status; if there are children age to 4 years in the household; an indicator of social support; total financial assets; labour market status; household structure (see table of descriptive statistics below for further details).

Variables included in preliminary models which are removed following the general-to-specific method are:

- Level of education. This measure is never statistically significant when labour market status is included in models. Generally education level is a strong causal factor for labour market status, which plays in role in the models. Moreover, education level may have been established several decades ago while labour market status is current information.

- General health, mental health, and physical health. These measures are not statistically significant (individually or jointly) and show less relevance 'long-term' disability.

- Children age zero to 4 and 5 to 9 years, or the number of children in the household (a dummy for children 4 and under is statistically significant and retained).

- A dummy for Cash-flow problems is not significant (but access to emergency cash is).

- Superannuation accounts. There are difficulties with this measure in HILDA. (i) it was only collected in waves 2, 6, 10, 14 and 18; (ii) it is collected in ranges and is a "best estimate of the exact value"; (iii) Even when collected there are a great deal of missing data (e.g. for females age

45-plus in wave 18 there are 2,399 observations which is about 42% of the available sample). We examined the option of extrapolation and interpolation and while increasing the size in regression models it was never statistically significant (females, age 45-plus: p-values = 0.935). As expected therefore its inclusion has very little impact on the model (except that the influence of Indigenous status is no longer significant in the model including superannuation as it cuts the Indigenous representation in the model in wave 18 from 128 to just 54). We conclude that this is not a reliable measure.

- Interactions: we test several interactions (e.g. age-groups and gender) and find the interaction between household type (e.g. lone person, couple, etc.) and marital status to be a worthwhile inclusion in our gender specific models.

Interpreting models

The models are longitudinal non-linear regression model results (using the Stata 16.0 xtlogit) for females and males and for three time periods (the full sample 2001-2018; pre-GFC 2001-2006; post-GFC 2009-2018).

We report odds ratios (OR) interpreted as:

- OR=1 Explanatory variable does not affect the odds of AtRisk.

- OR>1 The odds of AtRisk occurring go up when an explanatory variable increase; or comparing a categorical variable to the base (excluded) case.

- OR<1 The odds of AtRisk occurring goes down when an explanatory variable increase; or comparing a categorical variable to the base (excluded) case.

- As we consider only a one-unit change (or switch from one category to another) the odds can be interpreted as 'the chance that an individual will be AtRisk is the OR more likely to be observed than the base-case', i.e. a probability (Gujarati, 1988).

- Statistical significance of odds-ratios are indicate with p-values using the legend: * p<0.1; ** p<0.05; *** p<0.01. The smaller the p-value the stronger the evidence that the null hypothesis (that the explanatory variable has no influence on the dependent variable) should be rejected. Following convention we consider the 5% (or lower) level as statistically significant – we consider the 10% level as marginal or indicative and perhaps not to be ignored

The majority of the explanatory variables are categorical; the exceptions are the count of previous period AtRisk (Cumulative AtRisk) and the value of real total assets (Financial Assets). For all but Cumulative AtRisk and Financial Assets the model compares the included categories to the exclude (base case) category. For example, in the models we estimate the influence of being in the age-groups 55-64 or 65-plus years compared to the base-case category 45-54 years.

Appendix III - Descriptive data: tables and figures

Table III-1 At Risk of Homelessness Age-group & Sex (percent)

Year	Female 45-54	55-64	65+
2001	7.2	19.1	21.0
2002	9.3	15.1	19.4
2003	9.6	18.5	29.9
2004	10.6	13.7	17.6
2005	8.2	10.1	24.2
2006	8.5	9.1	33.1
2007	10.3	18.5	26.6
2008	11.2	13.5	21.9
2009	10.9	8.2	19.4
2010	10.7	12.8	16.9
2011	9.4	14.5	23.9
2012	11.6	15.3	22.6
2013	8.6	10.3	19.7
2014	9.8	10.8	19.6
2015	9.6	11.3	26.7
2016	9.8	13.7	21.9
2017	10.5	13.7	19.8
2018	9.7	14.0	29.0
Average	9.8	13.1	22.9
Average Post GFC	9.9	12.9	22.3

Notes: (1) Source HILDA Release 18. (2) Data are weighted & rounded. (3) Estimates are based on small sample numbers, should be treated with caution, and should be used for comparative not absolute purposes only.

It is clear from Table III-1 above that the HILDA data for AtRisk is volatile and this is more so as the sub-groups become more refined (and cell contents smaller). For example, for males (age 45 plus post-GFC) the average AtRisk is 8.4 per cent but the annual range for this age group is from 5.5 per cent to

12.4 per cent and the range of percent AtRisk between 2001 and 2018 is about 3 per cent to 15 per cent (a maximum difference of over 10 percentage points). Consequently estimates should be treated with caution and should be used for between group\year comparisons and not as standalone data.

Table III-2 At Risk of Homelessness (Estimated Frequency – Weighted)

AtRisk	Female				%change
Year	45-54	55-64	65+	Total	Annual
2001	50000	50000	40000	300000	
2002	70000	30000	30000	260000	-13%
2003	80000	50000	70000	350000	35%
2004	90000	50000	30000	330000	-6%
2005	80000	40000	40000	290000	-12%
2006	90000	40000	70000	380000	31%
2007	120000	90000	70000	480000	26%
2008	130000	70000	50000	490000	2%
2009	140000	50000	60000	390000	-20%
2010	150000	70000	60000	470000	21%
2011	130000	90000	100000	490000	4%
2012	150000	100000	80000	510000	4%
2013	120000	70000	80000	420000	-18%
2014	150000	70000	80000	430000	2%
2015	160000	80000	90000	440000	2%
2016	160000	100000	80000	470000	7%
2017	180000	110000	70000	530000	13%
2018	170000	110000	130000	570000	8%

Notes: (1) Source HILDA Release 18. (2) Data are weighted & rounded. (3) Make a mortgage or rent payments. (4) AtRisk based on 2017-2018 Prices

(ABS6 2019d) and 40th percentile of gross income (2019e). (5) Data are volatile and should be used with caution. and should be used for between group\year comparisons and not as standalone data.

Table III-3 AtRisk by City Age 45-plus: Sydney, Melbourne & Regional Victoria (weighted) average 2015-2018, percent

2018		Sydney			Melbourne			Regional Victoria		
Age-Group		Mort-gage	Rent Private	Rent Public	Mort-gage	Rent Private	Rent-Public	Mort-gage	RentPri-vate	Rent Public
45-54	%	5	16	10	3	23	28	13		7
55-64	%	3	29	28	3	23	37	6	25	41
65+	%	4	38	25	7	42	49	7	50	4
Total	%	4	23	21	3	27	40	6	26	14

Notes: (1) Source HILDA Release 18. (2) Data are weighted & rounded (3) Use with caution – observed sample too small for reliable result (e.g regional Victoria Public renter age 65+ sample=4). (5) Data are volatile and should be used with caution and should be used for between group comparisons and not as standalone data.

Table III-4 AtRisk by State & Age 45-plus: average 2015-2018

		Female					
45-54	NotAtRisk	477000	423000	342000	75000	139000	44000
	AtRisk	44000	40000	49000	11000	18000	4000
	Total	521000	462000	390000	86000	156000	48000
55-64	NotAtRisk	201000	206000	120000	39000	61000	19000
	AtRisk	37000	28000	23000	5000	7000	1000
	Total	238000	233000	143000	43000	69000	20000
65+	NotAtRisk	94000	68000	74000	24000	14000	11000
	AtRisk	23000	27000	20000	9000	10000	3000
	Total	117000	95000	94000	33000	24000	13000

Notes: (1) Source HILDA Release 18. (2) Data are weighted & rounded (3) Use with caution – observed sample too small for reliable result (e.g Tasmania AtRisk 65+ sample=10). (4) Data are volatile and should be used with caution and should be used for between group comparisons and not as standalone data.

Table III-5 AtRisk by State Age 45-plus: (%) Weighted average 2015-2018

	Age Group	NSW	VIC	QLD	SA	WA	TAS
Female	45-54	9	9	12	13	11	8
	55-64	16	12	16	11	10	6
	65+	19	29	22	26	43	21

Notes: (1) Source HILDA Release 18. (2) Data are weighted & rounded (3) Use with caution – observed sample too small for reliable result (e.g Tas. AtRisk 65+ sample=10).

Table III-6 At Risk of Homelessness – Females by Age-Group, Capital City and Rest of State

Area	Census 2016*			Department of Social Services March 2017**				
	Single female households 65 years and over			Single female households				
	Private renters	Other renters including NS	Total renters	55-64	65-74	75+	Total pop 55+	Total pop 65+
Sydney	3426	4847	8273	5973	5300	3455	14728	8755
Rest NSW	5835	2886	8721	4418	3615	2542	10575	6157
Total	9258	7728	16986	10391	8915	5997	25303	14912
	4100	2442	6542	4739	4160	2746	11645	6906
Rest Vic	3786	1063	4849	1843	1593	1263	4699	2856
Total	7888	3512	11400	6582	5753	4009	16344	9762
Brisbane	1458	1027	2485	3253	3320	2291	8864	5611
Rest Qld	7670	2440	10110	4685	4380	2973	12038	7353
Total	9120	3453	12573	7938	7700	5264	20902	12964
Adelaide	1617	1641	3258	1663	1210	855	3728	2065
Rest SA	698	443	1141	391	283	258	932	541
Total	2317	2087	4404	2054	1493	1113	4660	2606
Perth	1822	1811	3633	1991	1708	1159	4858	2867
Rest of WA	734	740	1474	487	367	305	1159	672
Total	2555	2542	5097	2478	2075	1464	6017	3539
Hobart	409	264	673	341	258	201	800	459
Rest Tas	703	383	1086	374	342	275	991	617
Total	1109	640	1749	715	600	476	1791	1076

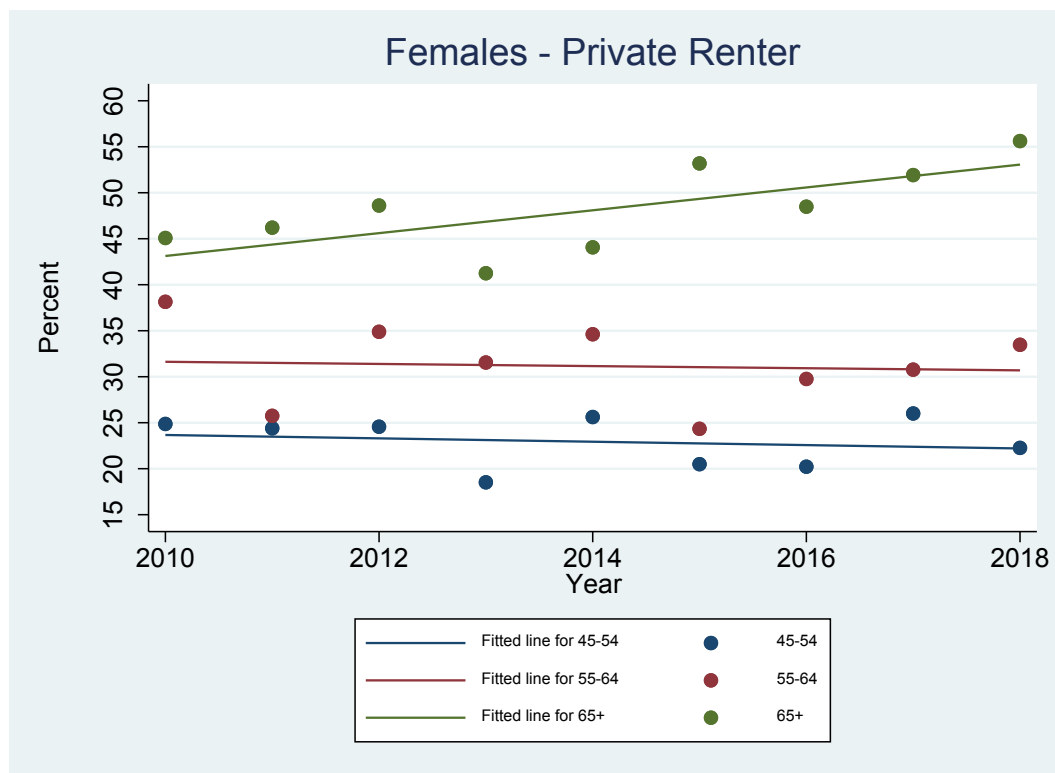|								
Darwin	51	44	95	n.a.	n.a	n.a	n.a	n.a
Rest NT	16	18	34	n.a.	n.a	n.a	n.a	n.a
Total	64	64	128	n.a.	n.a	n.a	n.a	n.a
ACT (total)	179	316	495	n.a.	n.a	n.a	n.a	n.a
TOTAL	32495	20349	52844	30158	26536	18323	75017	44859

*Source: based on ABS Customised report 2018; ** Source: based on unpublished DSS Commonwealth Housing dataset March 2017

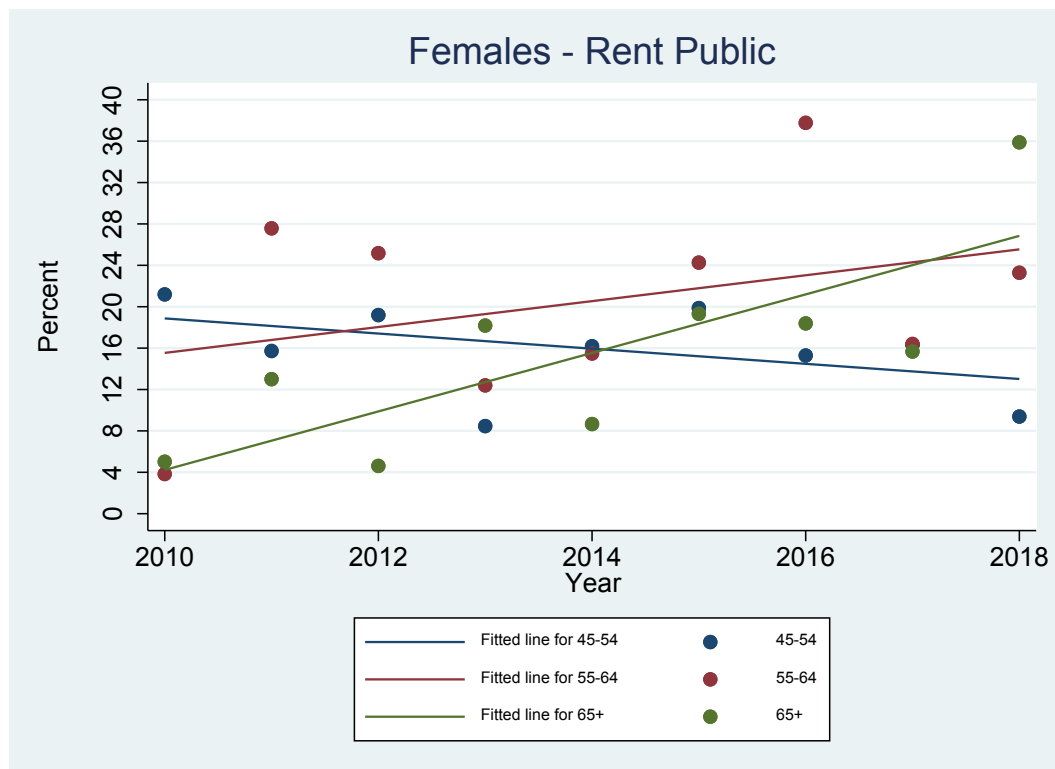Figure III-1 Females AtRisk by Age Group – Mortgage Holder
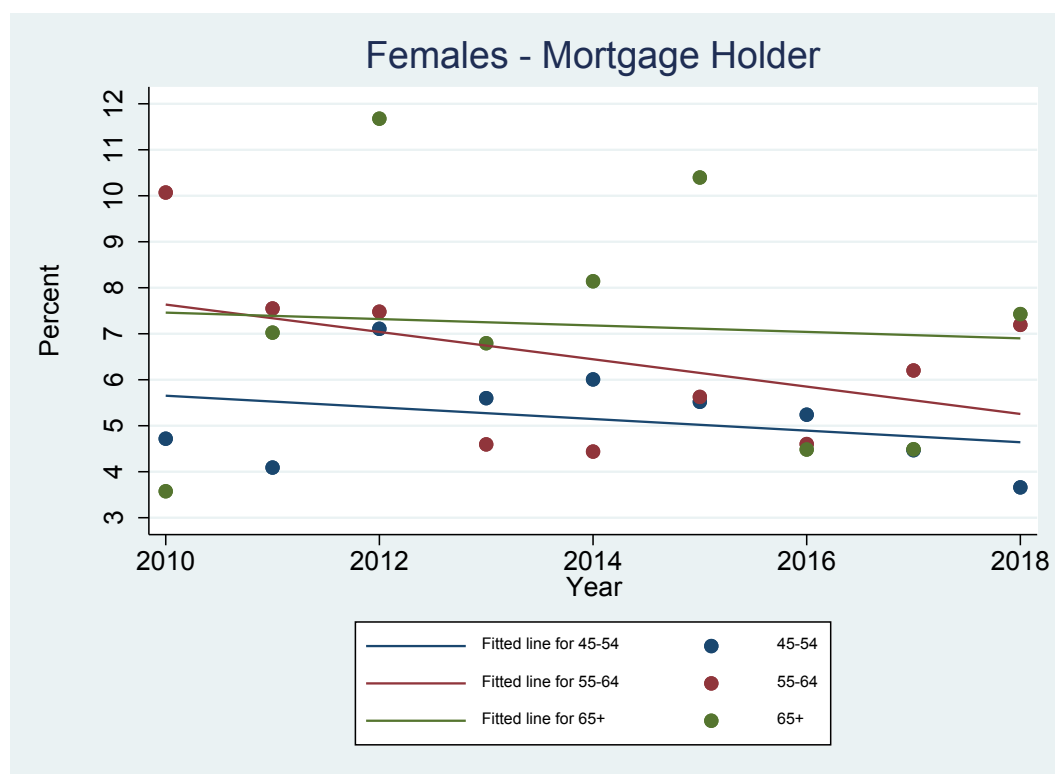
Notes: (1) Fitted line is the linear trend from 2010 to 2018. (2) Data are weighted.

Figure III-2 Females AtRisk by Age Group - Private Renters

Females - Private Renter

Notes: (1) Fitted line is the linear trend from 2010 to 2018. (2) Data are weighted.

Figure III-3 Females AtRisk by Age Group - Public Renters

Females - Rent Public

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