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Title:

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Date:

2025-07-26

Citation:

Sully, A., Aitken, Z., Bailie, J. & Bishop, G. M. (2025). Trends in disability-related inequalities in housing affordability in Australia, 2003 to 2022. *Health and Place*, 95, <https://doi.org/10.1016/j.healthplace.2025.103523>.

Persistent Link:

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Trends in disability-related inequalities in housing affordability in Australia, 2003 to 2022

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ARTICLE INFO

Keywords:

Disability
Health inequalities
Housing affordability
Australia
Population trends
Housing crisis

ABSTRACT

Housing affordability is a global concern although its impacts are not experienced equally across society, disproportionately impacting people with disability. Housing affordability is an important social determinant of health and living in unaffordable housing is associated with physical and mental ill-health, reinforcing systemic health inequalities for people with disability. In 2008 the Australian Government committed to ensuring equal access to affordable housing under the UN Convention on the Rights of Persons with Disabilities and this has been outlined as a policy priority in Australia's Disability Strategy. To date, there is no evidence to monitor whether Australia is meeting these commitments. This study analysed 20 years of data from the Household, Income and Labour Dynamics in Australia Survey to examine trends in housing affordability inequalities between people with and without disability. We found from 2003 to 2022, people with disability in Australia experienced persistent and significant inequalities in housing affordability for every year during the 20-year period with no evidence of improvement in either absolute or relative inequalities over time. People with disability were between 1.8 and 2.5 times more likely to experience unaffordable housing than people without disability. This pattern was consistent across age and sex stratifications. The persistence of these inequalities indicates there is a housing affordability crisis for people with disability in Australia and this is a critical public health concern. Without targeted, structural reforms, people with disability will continue to experience both housing and health inequalities during the ongoing global housing crisis and for the foreseeable future.

1. Background

Housing is an important and well-established social determinant of health. Access to safe, affordable, and stable housing is associated with a range of health outcomes, including reduced rates of disease and increased quality of life (World Health Organization, 2018). Conversely, unaffordable housing, defined as households spending more than 30% of their income on housing costs, has been directly linked with poor physical and mental health, as well as adverse effects on social relationships and employment security (Aitken et al., 2019; Baker et al., 2014, 2020; Bentley et al., 2016a; Kavanagh et al., 2016a). The relationship between unaffordable housing and health outcomes is particularly significant, as unaffordable housing limits financial capacity for other essential needs, such as food, healthcare, and education, which in turn worsens health inequalities (Baker et al., 2014).

The global housing crisis has heightened concerns over housing

affordability, with rising property prices and rents overtaking wage growth across many countries in the aftermath of the 2008 Global Financial Crisis (International Monetary Fund, 2022; Wetzstein, 2017). This issue has been exacerbated by the COVID-19 pandemic, international conflict and climate-related events causing increased costs of living, further straining household finances and worsening housing affordability (Greenwell, 2024; Rajagopal, 2023; Rogers and Power, 2021). The United Nations estimates these circumstances have left 1.6 billion people seeking affordable housing globally, a number predicted to increase to 3 billion by 2030 (Rajagopal, 2023). This global context provides a critical lens through which to examine Australia's national trends in unaffordable housing.

In Australia, unaffordable housing has been a growing concern over the past two decades (Australian Institute of Health and Welfare, 2023b; Yates et al., 2007). Australians have seen significant increases in housing costs relative to income, leading to increased rates of unaffordable and

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<https://doi.org/10.1016/j.healthplace.2025.103523>

Received 12 February 2025; Received in revised form 16 June 2025; Accepted 23 July 2025

Available online 26 July 2025

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insecure housing (Australian Institute of Health and Welfare, 2023b). This housing stress is not experienced equally across the population, disproportionately affecting certain subgroups, including those in insecure employment and with lower socio-economic status (Bentley et al., 2019).

One subgroup of the population known to experience significant housing-related inequalities is people with disability.¹ Disability can best be understood through the biopsychosocial model, which conceptualises disability through the complex interaction between biological, psychological, personal and environmental factors that impact an individual's participation in society (World Health Organization, 2001). This model positions disability as a phenomenon impacted by environmental and societal barriers that prevent people with disability from accessing the same opportunities as people without disability, rather than the presence of functional impairment or activity limitation.

People with disability experience a range of socioeconomic disadvantage that increases their likelihood of living in unaffordable housing, including lower rates of employment and participation in the labour force, lower income levels, higher healthcare costs, and additional requirements for accessibility and home modifications, all of which impact the ability to secure affordable housing (Kavanagh et al., 2013, 2015; Mitra et al., 2017). Additionally, people with disability are more likely to live in housing that is inadequate or inappropriate for their needs, further exacerbating their vulnerability to housing stress and related mental ill-health (Aitken et al., 2019; Baker et al., 2016; Kavanagh et al., 2016a; Semeah et al., 2019). These inequalities in housing are deeply intertwined with broader social determinants of health that perpetuate the inequalities in unaffordable housing experienced by people with disability compared to the general population (Aitken et al., 2019; Burns et al., 2021; Kavanagh et al., 2016b; Luffman, 2006). Despite the well-documented inequalities in unaffordable housing for people with disability, there is a significant evidence gap regarding trends in these inequalities over time (Aitken et al., 2019; Burns et al., 2021; Luffman, 2006). The existing literature, focused on cross-sectional analyses or on the acquisition of disability, lacks insight into how unaffordable housing for people with disability has evolved in response to policy changes or broader economic pressures, such as the impacts of the COVID-19 pandemic, the global housing crisis, and rising costs of living (Rajagopal, 2023; Rogers and Power, 2021).

This evidence is needed because Australia is a signatory to the United Nations Convention on the Rights of Persons with Disabilities (CRPD), which recognises the right of people with disability to access adequate, secure, accessible and affordable housing (United Nations General Assembly, 2007). Thus, Australia is obligated to undertake appropriate measures to ensure that people with disability can enjoy this right without discrimination and on an equal basis with others (United Nations General Assembly, 2007). To date, there is no available evidence to monitor whether Australia is meeting these obligations. This evidence gap is particularly critical to address given the substantial changes to the disability policy landscape in Australia since the ratification of the CRPD in 2008, beginning with the development of Australia's National Disability Strategy 2010–2020 (Australian Department of Social Services, 2019). The implementation of the National Disability Strategy 2010–2020 sought to achieve a unified national approach to supporting people with disability across several areas intersecting with the social determinants of health. Within this framework, secure and affordable housing was initially addressed as part of the broader economic security outcome area. Recognising the critical role of housing affordability in achieving equitable outcomes for people with disability, the updated Australia's Disability Strategy 2021–2031 now prioritises housing as a standalone key outcome area (Australian Department of Social Services,

2022). The first policy priority under this outcome explicitly aims to increase the availability of affordable housing for people with disability. Alongside these strategies, the National Disability Insurance Scheme (NDIS) was progressively rolled out between 2013 and 2020 to provide reasonable and necessary supports for people with significant and permanent disability (Australian Institute of Health and Welfare, 2024b). The impact of these changes on housing affordability for people with disability over this period has not yet been reviewed.

It is important to note that the 5.5 million people with disability in Australia are a diverse group with varying needs and experiences due to unique physical, environmental and socioeconomic factors that can influence their vulnerability to unaffordable housing (Australian Bureau of Statistics, 2022a). We also know that disability increases with age (Australian Bureau of Statistics, 2022a) and that the experience of unaffordable housing can change over the lifespan with younger adults facing different challenges in income and tenure compared to established older households (Bentley et al., 2019, 2022; Yates et al., 2007). Additionally, there are notable differences in income, employment and housing by sex (Australian Bureau of Statistics, 2024; Stone et al., 2024). This diversity underscores the importance of stratifying analyses by both age and sex to capture the unique housing challenges faced by different subgroups within the population of people with disability.

This study addressed this evidence gap by investigating whether inequalities in unaffordable housing for people with disability have changed over time in Australia between 2003 and 2022. Using data from a nationally representative sample, we compared unaffordable housing for people with and without disability annually over the 20-year period. Given the role of household income in shaping housing affordability, we focused on people of working age (25–64 years) to capture the intersection of employment, income, and housing costs. Additionally, we stratified our analyses by age and sex to examine how inequalities in unaffordable housing may differ across these subgroups. By examining time trends in disability-related unaffordable housing inequalities, this study provides critical insight into whether housing inequalities for people with disability have improved, worsened or stayed the same over time. This has implications for whether the Australian Government is fulfilling its obligations under the CRPD to ensure access to affordable housing for people with disability.

2. Methods

2.1. Data source and sample

The data source for this study was the Household, Income and Labour Dynamics in Australia (HILDA) Survey, a nationally representative longitudinal survey of Australian households. The HILDA Survey has been conducted annually since 2001 and collects extensive data on a wide range of aspects including household and family relationships, housing circumstances, income, expenditure and disability. The first collection included 7682 households and 13,969 respondents sampled from a national probability sample of Australian households occupying private dwellings (Watson, 2021). Later waves included all participants from the original sample, any children born or adopted into the household, and any new household members. All household members were part of the survey sample but only those aged over 15 years were invited to participate in individual interviews. In 2011, a top-up of 2153 households containing 4009 respondents was added to retain representativeness in the sample (Watson, 2021). Selection of this sample followed the same methodology as the original HILDA Survey (Summerfield et al., 2023). Across the waves, individual response rates for continuing participants have been approximately 95% (Summerfield et al., 2023). This study used data from 20 annual waves (2003–2022) from General Release 22 of the HILDA Survey (Australian Department of Social Services & Melbourne Institute of Applied Economic Social Research, 2023).

Our sample was restricted to working age adults, 25–64 years of age.

¹ In this paper 'person first' language is used when referring to people and groups with disability. We acknowledge that many people with disability also use identity first language.

This age cohort was selected for two reasons. Firstly, it was determined that a large proportion of 15–24 year olds lived at home with parents (75%) and therefore household level data may not reflect a young person's experience of housing affordability (Australian Institute of Health and Welfare, 2021). Secondly, those aged 65 years and over were more likely to be owners of property without a mortgage (74%) and not participating in the labour force (85%), therefore not making housing payments or receiving income from salaries (Australian Institute of Health and Welfare, 2024a).

2.2. Disability measure

In every wave of the HILDA Survey, participants were asked 'do you have any long-term health condition, impairment or disability (such as these) that restricts you in your everyday activities, and has lasted or is likely to last, for 6 months or more?' and were presented with flashcards with example conditions. This aligns with the biopsychosocial model of disability endorsed by the International Classification of Functioning, Disability and Health framework (World Health Organization, 2001). In 2003, the flashcards were updated with a wider range of conditions. Therefore, to ensure for consistency in the definition of disability, only data from 2003 to 2022 was used in this analysis.

2.3. Unaffordable housing measure

Unaffordable housing is most commonly defined in Australia using the 30/40 rule (Yates et al., 2007). This approach considers an individual to be in unaffordable housing if their household spends more than 30% of its gross income on housing costs while being in the lowest 40% of the equivalised disposable household income distribution (Baker et al., 2015; Yates et al., 2007). This indicator requires households to be in the lowest 40% of the income distribution, taking into account household size and composition, based on the assumption that households with higher incomes may choose to allocate more than 30% of their income to housing costs without experiencing housing affordability stress (Nepal et al., 2010). There are two commonly used approaches for calculating the 30/40 indicator of unaffordable housing, differing by whether *gross* or *disposable* household income is used to determine the proportion spent on housing payments. We have used gross household income because this is the most common method in the existing literature (e.g., Baker et al., 2015; Yates et al., 2007).

Housing costs in the HILDA Survey are calculated from mortgage or rent payments at the household level. When respondents did not provide answers for mortgage (1.5% of households) or rent (0.4% of households) payments, household values for these measures were imputed by Nearest Neighbour Regression, Little & Su, or Carryover imputation methods and supplied within the HILDA dataset (Summerfield et al., 2023).

Gross household income in the HILDA Survey is calculated by summing an extensive list of individual income components for each member of the household including wages, government payments, and income from investments. Missing values for income components are imputed at the individual level by the aforementioned imputation methods and supplied within the HILDA dataset (Summerfield et al., 2023). Further information on imputed variables can be found in the HILDA User Manual (Summerfield et al., 2023).

Disposable household income represents income after tax and is calculated in the HILDA Survey by subtracting an individual's estimated income tax from their gross income, which is then summed for all household members (Summerfield et al., 2023). Equivalised household income enables the comparison of financial circumstances of households of different compositions by adjusting for a household's needs relative to its members. We used the 'modified OECD' scale endorsed by the Organization for Economic Cooperation and Development (OECD) to calculate equivalised household income by assigning different weightings to each household member depending on whether they are an adult

or child (Hagenaars et al., 1994). This scale recognises the increased financial needs of larger households while also recognising the differing costs associated with an adult versus a child and the economies of scale in sharing household resources. We used reference data from the Australian Bureau of Statistics (ABS) to determine whether a household's equivalised disposable income was in the lowest 40% of the population distribution. The ABS collects information about income and wealth of residents in private dwellings in Australia every two years in the Survey of Income and Housing (Australian Bureau of Statistics, 2022b). Using this data the ABS calculates and publishes deciles of the distribution of equivalised disposable household income for the Australian population using the modified OECD scale (Australian Bureau of Statistics, 2022b). As the ABS data are only published for every second year, the values for alternate missing years were produced by calculating the mean of the years previous and following. To calculate values for 2021 and 2022, which had not yet been published by the ABS, the average rate of increase between the two previous years was applied to the latest year to predict the future values. We used the deciles to identify households in the HILDA Survey with disposable equivalised income in the lowest 40% of the population distribution.

To prevent missing values being produced when calculating proportions of income spent on housing costs, household income values of \$0 were recoded to \$1. Households whose housing payments exceeded 100% of their gross income (<1% of observations) were excluded as previous research suggests these households may be experiencing temporarily low or irregular income or drawing on accumulated wealth to support their expenses (Australian Bureau of Statistics, 2022c).

2.4. Age standardisation

As the rate of disability increases with age, age is likely to be an important driver of the differences in the prevalence of unaffordable housing between people with and without disability (Australian Institute of Health and Welfare, 2024b). To control for the effect of age, we applied direct age standardisation using the age distribution of people with disability in the most recent wave of the HILDA Survey (2022) as the standard population using 5-year age groups. This means that our estimates of unaffordable housing for people without disability were adjusted to reflect what they would have been, had this group shared the 2022 disability population's age distribution. The estimates of unaffordable housing for people with disability were adjusted slightly to account for differences in their age distribution across survey years. This approach follows a method commonly used in research for Indigenous populations, which demonstrates that using a national age distribution can mask inequalities experienced by subpopulations with distinct age structures (Robson et al., 2007; Thurber et al., 2021). This approach allows us to present actual age-specific estimates for people with disability, ensuring that the results reflect the reality of the population of interest.

2.5. Statistical analysis

The analytic sample consisted of 199,922 observations from 22,641 participants aged 25–64 years, who responded to the disability question and whose housing repayments did not exceed 100% of their gross income (99.2% of observations). There were no missing values in the dataset due to these restrictions, complete values for age and sex, and the use of imputed values for household income, mortgage and rent payments. We performed population-weighted descriptive analyses to describe the Australian population aged 25–64 years, stratified by disability status, for the first and last wave contributing to the analysis (2003 and 2022). Estimates of the distribution of demographic and socioeconomic characteristics, by disability status, were tabulated for age (in ten-year age groupings), sex, education, labour force status, tenure, household structure and equivalised income distribution. To adjust for clustering and stratification in the survey design and non-response, we

used the Taylor Series linearisation method for standard error calculation along with survey weights provided by the HILDA Survey (Hayes, 2008).

To compare the prevalence of people with and without disability living in unaffordable housing for each wave of the HILDA Survey, we calculated population-weighted age-standardised estimates of the percentage of people living in unaffordable housing, stratified by disability status. We then calculated absolute and relative inequalities in unaffordable housing between people with and without disability for each wave. Absolute inequality was calculated by subtracting the prevalence of people with disability in unaffordable housing from the prevalence of people without disability in unaffordable housing. We calculated relative inequality by dividing the prevalence of people with disability in unaffordable housing by the prevalence of people without disability in unaffordable housing. The 95% confidence intervals were also calculated for each estimate. Each of these analyses were repeated for sub-populations by 10-year age group and by sex. To identify trends in the proportions, absolute inequalities, or relative inequalities in unaffordable housing between individuals with and without disabilities from 2003 to 2020, we examined each measure for non-overlapping 95% confidence intervals between the first and last years.

All analyses were conducted in Stata/SE 18.0. Graphs were prepared using R version 4.3.2, RStudio version 2023.12.0 and ggplot 2 version 3.5.1.

2.6. Ethics

Ethics approval for the collection of the HILDA Survey was granted by the University of Melbourne Human Research Ethics Committee in 2001 (ID, 1955879) and has been updated or renewed annually. All respondents consent to participate in the HILDA Survey. Ethics approval for the secondary analysis of HILDA Survey data was obtained from the

University of Melbourne Human Research Ethics Committee (ID 30402). The research was carried out in accordance with the National Health and Medical Research Council National Statement on Ethical Conduct in Human Research (National Health and Medical Research Council, 2023).

2.7. Reflexivity statement

The authors of this study work on research programmes investigating how the social determinants of health impact the lives of people with disability, with a particular focus on reducing the persistent inequalities experienced by this group. Within the author team, one researcher (GB) identified as having disability and two researchers (AS and JB) have close family members with disability. All authors have a commitment to improving the health outcomes of people with disabilities.

3. Results

3.1. Population characteristics

Table 1 presents population-weighted demographic characteristics and 95% confidence intervals (CI) for the first and final waves of data, stratified by disability status. The population-weighted prevalence of disability in the sample was relatively stable over the study period, with a prevalence of 25.3% (95% CI [24.0%, 26.6%]) in 2003 and 26.1% (95% CI [24.7%, 27.6%]) in 2022. The populations differed across a number of characteristics and there were changes within the populations from 2003 to 2022. People with disability were more likely to be older than people without disability. In 2003, the mean age of people with disability was 47.0 years (95% CI [46.4, 47.6]), while the mean age for people without disability was 41.7 years (95% CI [41.3, 42.2]). Similarly, in 2022 the mean age of people with disability was 46.7 years

Table 1
Population-weighted estimates of demographic and socioeconomic characteristics for people with and without disability aged 25–64 years in 2003 and 2022.

Characteristic	2003		Disability (n = 2140)		2022		Disability (n = 2701)	
	No disability (n = 6431)		%	95% CI	No disability (n = 7482)		%	95% CI
Age								
25–34 years	30.2	[28.4, 32.0]	16.9	[15.0, 19.0]	29.6	[27.6, 31.7]	20.9	[19.1, 23.0]
35–44 years	30.1	[28.7, 31.5]	23.1	[21.0, 25.3]	28.2	[26.1, 30.5]	20.3	[17.9, 22.8]
45–54 years	25.3	[23.7, 26.9]	28.1	[25.8, 30.6]	23.6	[21.9, 25.5]	26.6	[24.1, 29.2]
55–64 years	14.4	[13.2, 15.7]	31.9	[29.4, 34.5]	18.5	[17.3, 19.8]	32.2	[29.8, 34.7]
Sex								
Male	48.6	[47.5, 49.8]	52.8	[50.7, 54.8]	50.2	[48.9, 51.5]	45.8	[43.4, 48.3]
Female	51.4	[50.2, 52.5]	47.2	[45.2, 49.3]	49.8	[48.5, 51.1]	54.2	[51.7, 56.6]
Education								
Bachelor degree or higher	25.1	[23.5, 26.7]	14.8	[13.2, 16.7]	42.9	[40.5, 45.4]	26.9	[24.2, 29.9]
Adv. Dip., Diploma, Certificate or Year 12	43.8	[42.2, 45.3]	41.8	[39.1, 44.5]	47.6	[45.5, 49.7]	51.0	[48.2, 53.8]
Year 11 or below	31.1	[29.5, 32.9]	43.4	[40.6, 46.2]	9.5	[8.5, 10.6]	22.1	[19.8, 24.5]
Labour force status								
Employed	79.9	[78.3, 81.4]	48.6	[45.6, 51.6]	87.3	[86.1, 88.4]	58.1	[55.3, 60.9]
Unemployed	2.3	[1.9, 2.8]	4.1	[3.1, 5.3]	1.5	[1.2, 1.8]	3.7	[2.5, 5.4]
Not in the labour force	17.8	[16.5, 19.2]	47.3	[44.5, 50.2]	11.3	[10.2, 12.4]	38.2	[35.6, 40.9]
Tenure type								
Outright owner	33.3	[31.3, 35.4]	41.0	[38.0, 44.1]	19.8	[18.2, 21.5]	24.9	[22.7, 27.3]
Mortgage	40.6	[38.6, 42.6]	28.0	[25.5, 30.7]	50.6	[48.6, 52.6]	33.9	[31.2, 36.8]
Private renter	20.4	[18.3, 22.6]	19.3	[17.0, 21.9]	26.1	[24.5, 27.8]	32.9	[30.2, 35.7]
Public renter	2.7	[2.0, 3.5]	8.8	[6.7, 11.4]	1.2	[0.9, 1.6]	5.0	[3.9, 6.3]
Other	3.1	[2.5, 3.7]	2.9	[2.1, 3.9]	2.3	[1.9, 2.8]	3.3	[2.6, 4.2]
Household structure								
Couple, ± children, ± other adults	77.0	[75.1, 78.8]	71.3	[68.5, 74.0]	74.9	[72.7, 77.0]	61.4	[58.5, 64.2]
Lone parent, without other adults	8.0	[7.0, 9.1]	8.9	[7.3, 10.7]	7.4	[6.5, 8.4]	12.8	[11.1, 14.8]
Lone parent, with other adults	1.1	[0.7, 1.6]	2.8	[1.8, 4.4]	1.0	[0.7, 1.6]	2.9	[1.9, 4.3]
Lone person	9.1	[8.1, 10.2]	12.1	[10.7, 13.6]	10.8	[9.8, 11.7]	14.8	[13.1, 16.7]
Not part of a couple, with other adults	4.9	[3.8, 6.3]	5.0	[3.7, 6.6]	5.9	[4.2, 8.4]	8.1	[6.4, 10.2]
Equivalent disposable household income distribution								
Upper 60%	81.3	[79.5, 82.9]	61.9	[58.8, 65.0]	80.2	[78.6, 81.6]	59.5	[56.4, 62.5]
Lower 40%	18.7	[17.1, 20.5]	38.1	[35.0, 41.2]	19.8	[18.4, 21.4]	40.5	[37.5, 43.6]

(95% CI [46.2, 47.3]), while the mean age for the non-disabled group was 42.5 years (95% CI [42.1, 43.0]).

The distribution of males and females was equivalent for the non-disabled group but varied for people with disability, with a greater proportion of males in 2003 and a greater proportion of females in 2022. Education levels increased for both populations between 2003 and 2022; however, people with disability had lower education levels than people without disability at both time points. A similar trend was seen for labour force status, with the percentage of people employed increasing over time although people with disability were more likely to be unemployed or not in the labour force than people without disability at both time points.

The distribution of tenure types changed across the 20-year period. The percentage of outright owners decreased from 2003 to 2022, while the percentage of mortgage holders and private renters increased, regardless of disability. In 2003, the proportion of private renters was similar for both populations, but people with disability were more likely to be outright owners or public renters while people without disability were more likely to be mortgage holders. In 2022, the gap between people with and without disability who were outright owners decreased and people with disability were more likely to be living in private rentals and less likely to be mortgage holders than people without disability.

When considering household composition, people with disability were more likely to be lone parents or living with other adults but not as part of a couple. People with disability were 2-times more likely to be in the lowest 40% of the equivalised disposable household income distribution compared to people without disability across both time points. From 2003 to 2022, median weekly housing costs increased 3.9-fold for people with disability (\$72.50 in 2003 and \$280.09 in 2022) and 2.9-fold for people without disability (\$139.24 in 2003 and \$400.00 in 2022). In contrast, there was a slower rate of growth in median weekly household income for people with disability of 2.1-fold (\$997.42 to \$2113.67), compared to a 2.3-fold (\$1406.47 to \$3130.38) growth for people without disability.

3.2. Inequalities in unaffordable housing by disability

Fig. 1A shows that across all 20 waves, the prevalence of people with disability living in unaffordable housing was greater than for people without disability, and the 95% confidence intervals did not overlap between populations at any time point. There was some fluctuation in the prevalence of unaffordable housing within populations over time but the 95% confidence intervals for 2003 and 2022 overlapped for people with disability, indicating the percentage remained stable. In contrast, the percentage of people without disability in unaffordable housing increased from 2.9% (95% CI [2.4, 3.5]) in 2003 to 4.6% (95% CI [3.9, 5.4]) in 2022. Fig. 1B shows that absolute inequalities in unaffordable housing between people with and without disability ranged between 3.0 and 7.5 percentage points across the waves. The greatest inequality was seen in 2018 and lowest inequality in 2005. The 95% confidence intervals overlapped at the first and last time points indicating the absolute inequality has not changed from 2003 to 2022.

Fig. 1C presents trends in relative inequality and shows that people with disability were between 1.8 and 2.5 times more likely to live in unaffordable housing compared to people without disability over the 20-year period. The relative inequality peaked in 2003 and 2018 and was lowest in 2006. The 95% confidence intervals overlapped for the first and last years of the analyses (2003 95% CI [1.9, 3.1] and 2022 95% CI [1.8, 2.7]), demonstrating the relative inequality has not changed over time.

3.3. Inequalities in unaffordable housing by disability and age group

Fig. 2A shows that when stratified by age group, inequalities in unaffordable housing for people with disability were present in every age group and there was no evidence that absolute or relative inequalities

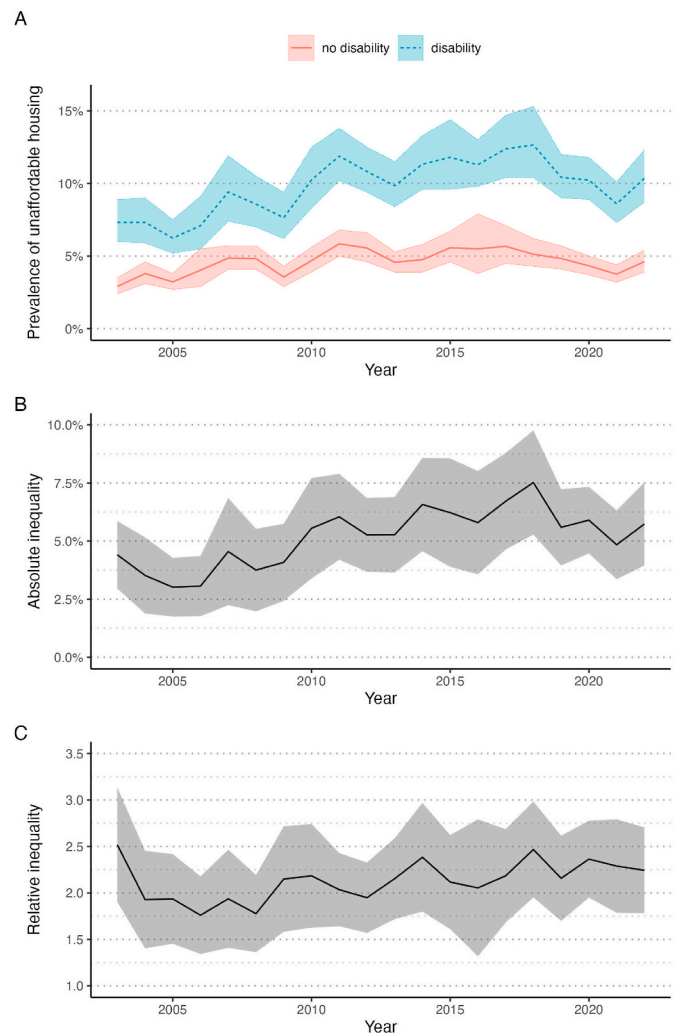


Fig. 1. Unaffordable housing over time for Australians aged 25–64 years with and without disability. (A) Age-standardised population-weighted percentages of people in unaffordable housing over time, with 95% confidence intervals. Absolute (B) and relative (C) inequalities in the percentages in unaffordable housing over time, with 95% confidence intervals.

were improving over the 20 years. The trends were not linear and fluctuated year to year depending on the age group. The 95% confidence intervals are wider for these analyses due to smaller sample sizes, particularly in the disability subgroups for younger people. Regardless of this, for all age groups there were years where the 95% confidence intervals did not overlap between populations.

Fig. 2A demonstrates that the percentage of people living in unaffordable housing was higher in the younger age groups and peaked at 19.1% (95% CI [11.9, 29.3]) for 25–34 year olds with disability in 2018. Despite this, the only statistical evidence of an increase in the percentage of people in unaffordable housing between the first and last waves was in the disability group in the oldest age band (55–64 years) from 1.4% (95% CI [0.9, 2.3]) in 2003 to 4.4% (95% CI [3.2, 6.1]) in 2022.

Fig. 2B shows that although absolute inequalities were variable, they persisted for people with disability in all age groups except for the 35–44 years group in 2007 when the inequality dipped to -0.5% (95% CI $[-3.4, 2.3]$). Fig. 2C demonstrates that relative inequalities between people with disability and people without disability existed for all age groups, increasing with age and becoming more variable. Although there was a higher percentage of 24–35 year olds in unaffordable housing than for older age groups, the relative inequality in unaffordable housing was larger for the 55–64 years group.

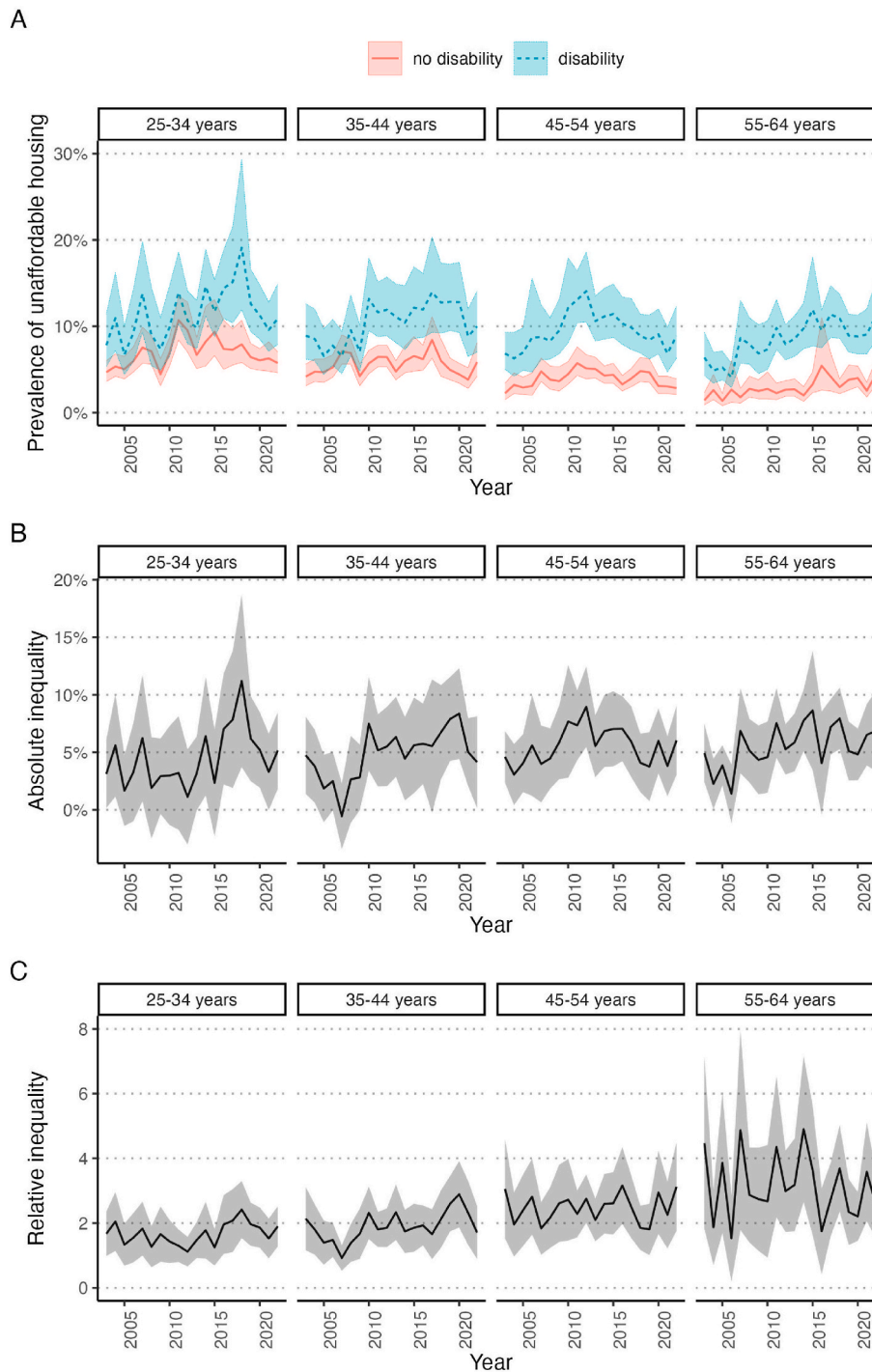


Fig. 2. Unaffordable housing over time for Australians aged 25–64 years with and without disability, stratified by age group. (A) Age-standardised population-weighted percentages of unaffordable housing over time, stratified by age group, with 95% confidence intervals. Absolute (B) and relative (C) inequalities in the percentages of unaffordable housing over time, stratified by age group, with 95% confidence intervals.

3.4. Inequalities in unaffordable housing by disability and sex

Fig. 3 presents inequalities in unaffordable housing stratified by sex. These findings are similar to the trends seen for the whole population and show that regardless of sex, people with disability are more likely to live in unaffordable housing than people without disability. Although there appears to be an increasing trend in unaffordable housing for males with disability (Fig. 3A), the 95% confidence intervals in 2003 and 2022 overlapped (2003 95% CI [5.3, 9.2] and 2022 95% CI [8.0, 13.4]). This was also true for males without disability (2003 95% CI

[2.0, 3.3] and 2022 95% CI [3.2, 5.1]), indicating there was no evidence that the percentages of males with and without disability living in unaffordable housing changed over the period.

For females there also appeared to be an increasing trend in unaffordable housing for both groups, however for females with disability the 95% confidence intervals overlapped in 2003 (95% CI [6.1, 9.7]) and 2022 (95% CI [8.6, 12.3]) indicating no evidence of change over the period. For females without disability, in 2003 the percentage in unaffordable housing was 3.2% (95% CI [2.7, 3.9]) and this increased to 5.2% (95% CI [4.5, 6.2]) in 2022 with no overlapping confidence

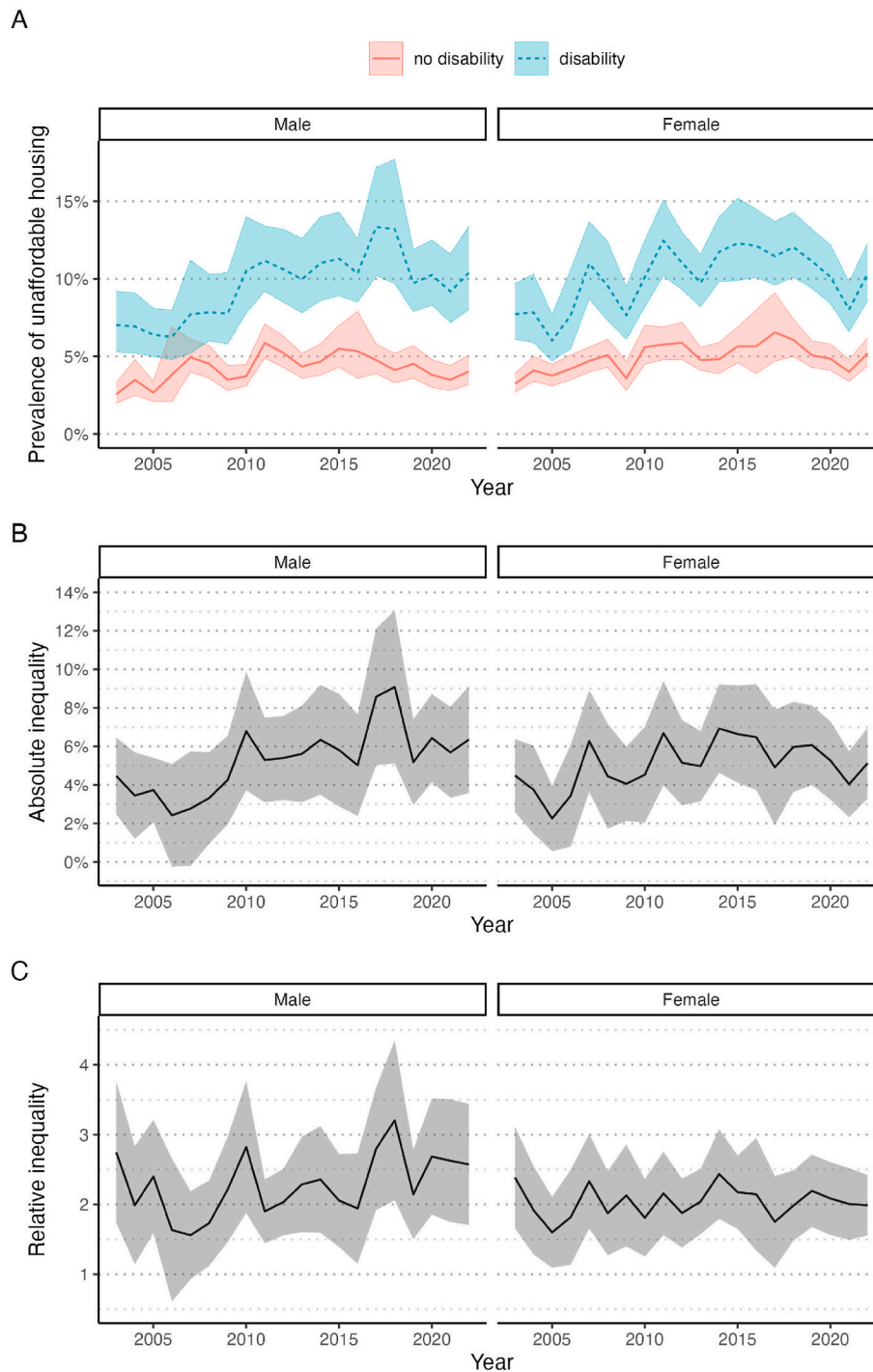


Fig. 3. Unaffordable housing over time for Australians aged 25–64 years with and without disability, stratified by sex. (A) Age-standardised population-weighted percentages of unaffordable housing over time, stratified by sex, with 95% confidence intervals. Absolute (B) and relative (C) inequalities in the percentages of unaffordable housing over time, stratified by sex, with 95% confidence intervals.

intervals. However, the percentage of females with disability in unaffordable housing was higher at all time points than the percentage of females without disability, with no overlapping confidence intervals between populations. Despite this increase observed for females without disability, the pattern between males and females in both groups was consistent.

Fig. 3B demonstrates absolute inequalities between males with and without disability was lowest in 2006 at 2.4% (95% CI [-0.2, 5.1]), where the 95% confidence interval crossed zero, and was highest in 2018 at 9.1% (95% CI [5.1, 13.1]). Absolute inequalities between

females with and without disability ranged between 2.3% (95% CI [0.6, 4.0]) and 6.9% (95% CI [4.6, 9.2]). The 95% confidence intervals in 2003 and 2022 overlapped for both sexes demonstrating absolute inequalities were stable over time. Fig. 3C shows relative inequalities persisted for males and females with disability at all time points and were stable over time. Males with disability were between 1.6 and 3.2 times more likely to live in unaffordable housing than males without disability. In contrast, females with disability were between 1.6 and 2.4 times more likely to live in unaffordable housing than females without disability.

4. Discussion

This study found that from 2003 to 2022, people with disability in Australia experienced persistent and significant inequalities in unaffordable housing for every year during the 20-year period. Although there were fluctuations in the magnitude of the inequality year to year, people with disability were consistently more likely to live in unaffordable housing, with no evidence of improvement in either absolute or relative inequalities over time. While the percentage of people with disability living in unaffordable housing remained stable from 2003 to 2022, the percentage of people without disability living in unaffordable housing increased, leading to variations in absolute inequality. Despite this, absolute inequality was present at every time point, peaking in 2018. Additionally, relative inequalities persisted across all waves, with people with disability being between 1.8 and 2.5 times more likely to experience unaffordable housing. This pattern was consistent across age and sex stratifications, with younger age groups showing particularly high levels of unaffordable housing, but no evidence of change over time in the magnitude of the inequality between those with and without disability.

To our knowledge, this is the first study to describe time trends in unaffordable housing for people with disability, demonstrating that inequalities have persisted for two decades without improvement. Our findings that people with disability are more likely to live in unaffordable housing are consistent with previous Australian (Aitken et al., 2019; Kavanagh et al., 2016b) and international research (Plouin et al., 2021). However, in addition to extending the research by examining trends over time, the present study added nuance by stratifying by age group and sex to reveal important trends for subgroups within the disability population.

We found that younger adults experienced higher rates of unaffordable housing than older age groups, for both people with and without disability. These results are supported by findings among the general population that younger people were more likely to experience unaffordable housing due to increased vulnerability to financial trends when entering the housing market (Bentley et al., 2019; Bentley et al., 2022). Conversely, while the prevalence of unaffordable housing was lower for older adults, the relative inequality between people with and without disability was larger and more variable for the 55–64 years group. This is of particular concern given the prevalence of disability increases with age, having consequences for employment and income that could increase strain on household finances (Hosseinpour et al., 2016; Sevak et al., 2015).

The present study found that stratification by sex revealed ongoing and stable inequalities for both males and females with disability compared to their non-disabled peers. Based on the presence of non-overlapping confidence intervals, there appeared to be an increase in unaffordable housing for females without disability. However, it should be noted the trends were similar across all groups. Given a recent review of the evidence linking housing and health found women's health was more severely affected by unaffordable housing than men's (Vásquez-Vera et al., 2022), our findings warrant further research to determine whether the effect of unaffordable housing on health is different for subgroups of the population, including by disability status, sex and age group.

Although the consequences of inequalities in unaffordable housing were not examined in this study, the public health implications of these findings are critical. There is considerable evidence that unaffordable housing is associated with poor health outcomes, including increased risk of cardiovascular conditions (Rodgers et al., 2019; World Health Organization, 2018), poor mental health (Baker et al., 2020; Bentley et al., 2016b, 2019, 2022; Dotsikas et al., 2023; Kavanagh et al., 2016a), and detrimental effects on social relationships and community cohesion (Costello, 2009). It is also known that households often prioritise mortgage and rent payments in budget decisions over other essential needs such as food, medical prescriptions, and healthcare, further

impacting health status (Baker et al., 2014; Meltzer and Schwartz, 2016; Pollack et al., 2010). This suggests that the persistent inequalities observed in unaffordable housing for people with disability are likely to be one of the drivers of health-related inequalities experienced by this group.

Our findings have important implications for Australia's disability policy and its international commitments under the CRPD. Australia's Disability Strategy outlines a national framework to improve the lives of people with disability across multiple domains, including housing, employment, and health, aligning with CRPD obligations. The strategy's progress is monitored annually against key indicators for each priority area, however, unaffordable housing has not been reported on since 2019–20 (Australian Institute of Health and Welfare, 2023a). Another major policy change in Australia over the last 20 years was the implementation of the NDIS (Australian Institute of Health and Welfare, 2024b). The NDIS currently covers approximately 14% of people with disability in Australia who meet very specific eligibility criteria (Australian Institute of Health and Welfare, 2024b). Participants of the NDIS can access home supports and Special Disability Accommodation however these components are aimed at accessibility and home modifications and do not address housing affordability. This is not surprising considering the work by Aitken et al. (2019) that found that people with disability had more than double the odds of living in unaffordable housing in 2011 before the roll-out of the NDIS, and predicted this was not likely to improve given that the NDIS only funds the costs of housing for a small proportion of participants. Our study highlights the persistent housing affordability crisis faced by people with disability in Australia has not been prioritised or attenuated by the overhaul of the disability policy landscape, underscoring a failure to meet obligations of the CRPD.

4.1. Strengths and limitations

This study had several strengths. First, by using a large, nationally representative sample of the Australian population over a 20-year period (2003–2022), we were able to identify time trends in unaffordable housing for people with and without disability. Second, we employed age-standardised population-weighted statistics, which provide a more accurate representation of the experiences of people with disabilities across Australia. Third, we used the disability question in the HILDA Survey to select our disability population rather than focussing on individuals receiving disability benefits or formal support. This broader definition captures a more comprehensive picture of the lived experiences of people with disability, recognising that many individuals may not qualify for formal support yet still experience significant barriers in socioeconomic participation that impacts housing affordability. Finally, the findings were stratified by sex and age, presenting how unaffordable housing inequalities vary across different demographic groups. This offers more detailed insights into the intersection of disability, sex, and age, which may influence access to affordable housing.

There are also limitations to this study. First, the HILDA Survey includes individuals living in the community, underrepresenting people with disabilities who reside in institutional settings, such as care homes. These individuals often face unique housing challenges and increased vulnerability, so their exclusion may lead to an underestimation of the differences in unaffordable housing between people with and without disabilities. Second, we were not able to stratify the analysis by disability types as the sample sizes in unaffordable housing became too small, which may obscure important differences within the population of people with disabilities. This problem also existed when attempting to stratify at state and territory level to understand geographical patterns. A further limitation is that the 30/40 rule is not able to capture the full complexity of household expenses including utilities, transport and healthcare costs, which can disproportionately impact low-income households and people with disability (Mitra et al., 2017; Vidyattama et al., 2012). This measure of unaffordable housing is a binary cut-off,

which simplifies the range of experiences of financial hardship, failing to capture the actual proportion of income spent on housing or the extent of housing stress and therefore its impact on health. Despite this, we chose to use the 30/40 rule due to its ubiquity in the literature and acceptance among Australian policymakers (Australian Bureau of Statistics, 2022c).

4.2. Future research

Future research should address the limitations of the current 30/40 measure and expand the analysis in two key areas. First, future studies could develop a more comprehensive affordability measure by incorporating the costs of transport and utilities into the measure of unaffordable housing. This would provide a more complete view of household expenses, offering deeper insights into the total proportion of income spent on housing-related costs and accounting for potential trade-offs between living in areas with lower housing costs and higher travel expenses for work, education, or healthcare access. Second, given that Australian states and territories differ in terms of housing policies and housing markets, future research may examine inequalities in housing affordability on a state/territory level. Third, future studies should examine housing affordability by disability type to understand if there are differences within the disability population. These further analyses will provide a more nuanced understanding of the experiences of people with disability across Australia to inform targeted policy interventions to improve housing affordability.

4.3. Policy directions

Our findings suggest that Australian policies aimed at supporting people with disability over the last 20 years were not sufficient in addressing inequalities in housing affordability for people with disabilities. Despite not finding a statistically significant increase in inequalities in unaffordable housing over time, over the 20-year period of this study people with disability in Australia experienced an additional 35% increase in median housing costs relative to people without disability while experiencing a slower rate of growth in median weekly household income compared to people without disability. To improve housing affordability for people with disability, policies can either address housing costs or increase household income. Rent affordability could be addressed through rent control policies and caps on rent increases, which have been successful in tackling housing costs in parts of Europe (Haffner et al., 2008). Increasing social housing stock and rental assistance payments could also relieve households, given that Bentley et al. (2016b) found that these were two reasons that the mental health of renters in the United Kingdom was less likely to be affected by unaffordable housing than Australian renters. Increasing the supply of low-cost housing would also improve affordability (Ong et al., 2017).

Policies aimed at reducing the financial disadvantage people with disability experience could also relieve housing affordability stress. We know people with disability are more likely to require government income support but due to strict eligibility criteria, less than half of people with disability in Australia aged 15–64 years receive any type of government payment (Australian Institute of Health and Welfare, 2024b). Broader eligibility criteria would ensure more people with disability, especially those who face barriers in accessing housing, receive the necessary financial assistance. Additionally, given that people with disability are more likely to be low-income earners, live in socio-economically disadvantaged areas with higher transport expenses, and face higher healthcare costs, these areas could be alternative policy levers (Airgood-Obyrcki et al., 2023; Aitken et al., 2019; Mitra et al., 2017). For instance, subsidies and assistance programmes for healthcare and transportation for low-income groups could free up household disposable income and reduce the overall financial stress for households without altering housing costs or household income.

4.4. Conclusion

Inequalities in unaffordable housing for people with disability in Australia remain persistent and significant over the past 20 years, presenting a critical public health concern. Despite Australia's commitment to the CRPD, people with disability continue to face considerable disadvantage in securing affordable housing, demonstrating that existing supports are insufficient. This inequity is particularly troubling given the well-established links between housing affordability and health. The lack of progress in reducing these inequalities underscores the need for fundamental reforms to bridge the gap in housing affordability to ensure that people with disability can access affordable housing without compromising other aspects of their wellbeing. Policymakers must consider not only direct housing policies but also measures that address the broader social determinants of health, such as income and healthcare costs, to fulfill its obligations under the CRPD and improve both housing and health outcomes for people with disability.

CRedit authorship contribution statement

Alex Sully: Writing – review & editing, Writing – original draft, Formal analysis, Conceptualization. **Zoe Aitken:** Writing – review & editing, Supervision, Methodology, Conceptualization. **Jodie Bailie:** Writing – review & editing, Supervision. **Glenda M. Bishop:** Writing – review & editing, Visualization, Supervision, Methodology, Formal analysis, Conceptualization.

Data sharing

The data used are available free of charge to researchers through the Australian Data Archive (ADA) Dataverse, conditional on approval by the Director of Longitudinal Studies. HILDA General Release 22 (Waves 1–22) can be obtained here: <https://doi.org/10.26193/R4IN30>

Funding statement

This work was supported by the Australian Government Medical Research Future Fund (Grant ID, 2024940) and the NHMRC Centre for Research Excellence in Achieving Health Equity for All People with Disabilities (AHEAD) (Grant ID, 2035278).

Declarations of interest

We declare no competing interests.

Acknowledgements

This paper uses unit record data from Household, Income and Labour Dynamics in Australia Survey [HILDA] conducted by the Australian Government Department of Social Services (DSS). The findings and views reported in this paper, however, are those of the author[s] and should not be attributed to the Australian Government, DSS, or any of DSS' contractors or partners. DOI: [10.26193/R4IN30](https://doi.org/10.26193/R4IN30)

Data availability

The authors do not have permission to share data.

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