Age and Ageing 2026; **55:** afag328
https://doi.org/10.1093/ageing/afag328
Published electronically 11 January 2026

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RESEARCH PAPER

Associations between income support payments and entry to long-term care facilities: a national retrospective cohort study

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Abstract

Objectives: To examine associations between amount of income support received and entry into long-term care facilities (LTCFs) among older income support recipients, by homeownership status.
Methods: A national retrospective cohort study was conducted. Individuals aged 65–105 years who received income support and had a first-time long-term care eligibility assessment in Australia between 01/01/2010 and 30/06/2021 were included. Associations between means-tested income support payments and rate of entry into LTCFs stratified by homeownership status were assessed using inverse probability of treatment weighted, cause-specific Cox proportional hazards models. Additional analyses included sex-specific analyses and sub-group analyses to examine associations for people with dementia.
Results: In total, 633 253 people were included [56.2% ($n = 355\,917$) female; median age 82 years (interquartile range 76–86); 17.8% ($n = 112\,724$) living with dementia; 69.1% ($n = 437\,445$) homeowners]. Higher levels of income support were associated with a higher rate of entry into LTCFs for both homeowners [hazard ratio (HR) highest quartile vs lowest quartile: 1.08; 95% confidence interval (CI): 1.06–1.10] and non-homeowners [HR 1.08; 95% CI 1.05–1.12]. Findings were consistent for males, but for females, only those with moderate income support (third quartile) had a higher rate of LTCF entry. The findings were similar when only including people with dementia.
Conclusions: Greater reliance on means-tested income support payments, a potential indicator of financial vulnerability in later life, was associated with a higher rate of entry into LTCFs among both homeowners and non-homeowners. The study findings also suggest a complex relationship between income support reliance later in life and LTCF entry among older females.

Keywords: long-term care; income; socioeconomic position; ageing; older people

Key points

- Income support payments were used as a proxy for financial vulnerability in an older cohort accessing long-term care.
- Higher income support was associated with a higher rate of entry into long-term care facilities.
- Associations were consistent for both homeowners and non-homeowners.
- Addressing socioeconomic disadvantage should be a key component of long-term care policy to support people to age in place.

Introduction

Ageing in place, or one's ability to live safely and independently in their own home for as long as possible, is the preferred option for the majority of older people [1]. From a policy perspective, ageing in place is regarded as a more cost-effective alternative to care provided in long-term care facilities (LTCFs) [2, 3]. An individual's capacity to age in place is largely affected by their health trajectory, but it is also influenced by access to resources such as informal care, home care services and secure and appropriate housing [4, 5].

Homeownership has consistently been associated with a higher likelihood of ageing in place [6], while living in social housing or high housing costs has been associated with a higher risk of entering LTCFs [7, 8]. However, the relationship between income and ageing in place is less clear, with higher income often found to be associated with increased probability of ageing in place [9, 10], but with several studies describing a non-linear relationship. This has included reporting of individuals with moderate income being less likely to age in place than those with both lower and higher levels of income [8, 11, 12].

Financial vulnerability in later life, which has been defined in various ways in multiple countries, may also influence individual ability to successfully age in place. In Switzerland, a population-based study demonstrated that receipt of means-tested benefits was associated with earlier entry into LTCFs [13]. Similarly, in another European study, the receipt of health insurance subsidies was associated with a higher likelihood of LTCF entry among men [14]. In the United States, Medicaid enrolment, a health and long-term care insurance programme for eligible individuals including those with low income, has been widely used as an indicator of economic disadvantage and has also been associated with higher likelihood of LTCF entry [8, 15]. Yet, further studies are needed to understand the relationship between financial indicators of economic disadvantage and LTCF entry across different populations and contexts.

In Australia, as in many high-income countries, older people may receive government assistance through means-tested income support payments, such as the Age Pension and Rent Assistance [16]. Receipt of such payments may provide a meaningful proxy for financial vulnerability in later life because both eligibility and payment levels are determined by legislated income and assets tests [17]. Consequently, while income support payments are not a direct measure of socioeconomic position and may be influenced by policy and eligibility criteria, the amount received reflects an individual's underlying financial circumstances. For instance, eligibility for the Age Pension is subject to income and asset thresholds, with payment rates progressively reduced once these thresholds are exceeded. Therefore, higher levels of income support generally indicate lower private financial resources, whereas lower or no payments suggest greater income and asset holdings.

Using a national cohort of older people applying to access long-term care services in Australia, this study examined associations between amount of income support received in the year prior to eligibility assessment and entry into LTCFs. Secondary aims were to evaluate sex-specific differences and associations in people living with dementia.

Materials and methods

Study design, setting and data sources

A retrospective cohort study was conducted using the Registry of Senior Australians (ROSA) National Historical cohort. ROSA contains integrated data on long-term care services, health care, income support and mortality for approximately 3.85 million individuals who were assessed for, or accessed, government-subsidised long-term care services between 2002 and 2022 [18]. Linked datasets included the National Aged Care Data Clearinghouse, Pharmaceutical Benefits Scheme (PBS), National Death Index (NDI) and Australian Government Department of Social Services Data Over Multiple Individual Occurrences (DOMINO) collections [19]. The DOMINO datasets included de-identified information on recipients' payment records, concessions and housing-related variables (Appendix S1. Supplementary Methods).

Study cohort

Individuals aged between 65 and 105 years with a first-time long-term care eligibility assessment in Australia between 1 January 2010 and 30 June 2021 who received income support payments in the 12 months prior to their assessment were included. Exclusions were Aboriginal or Torres Strait Islander peoples, Department of Veteran's Affairs card holders or payment recipients and individuals with no DOMINO records. Analyses were restricted to individuals approved for long-term care (home care or LTCFs) who had not accessed care services that required a comprehensive assessment prior

to their approval date (Appendix S2. Supplementary Figure S1). Given established associations between homeownership and ageing in place [5], analyses were stratified by homeownership status.

Exposure

The exposure was the total amount of income support received in the 12 months prior to eligibility assessment, adjusted to June 2021 Australian dollars using the quarterly Consumer Price Index. Amounts were categorised into quartiles (Q1–Q4), calculated separately for homeowners and non-homeowners.

Income support payments included the Age Pension, Disability Support Pension, Pension Supplement, Rent Assistance, Remote Area Allowance and other payments (e.g. Energy Supplement, Carer Payments). Income support payments were categorised separately for homeowners and non-homeowners because Australian Age Pension eligibility is assessed using asset thresholds that differ by homeownership status. As a result, the distribution of payment amounts varies between these groups. Deriving quartiles separately for homeowners and non-homeowners enabled participants to be compared with individuals in a similar housing and financial context, thereby reducing the risk of exposure misclassification.

Outcome

The primary outcome was entry into a LTCF. Individuals were followed from the date of approval for long-term care until the earliest of: LTCF entry, initiation of long-term care at home, or death. Individuals were administratively censored on 30 June 2022. For respite episodes (short-term, temporary stay in a LTCF) immediately followed by permanent LTCF entry, the respite start date was used as the LTCF entry date.

Covariates

Potential confounders included age, sex, country of birth (Australia vs other), preferred language (English vs other), living in a metropolitan area (yes vs. no), state of residence, living alone (yes vs. no), receiving informal carer support (yes vs. no) and individual health conditions (arthritis, dementia, depression and mood disorders, diabetes, disease of the eye, fracture, heart diseases, history of cancer, history of falls, hypertension, incontinence, kidney and urinary system disorders, osteoporosis and pressure injuries) and assessment-related factors (year, priority level, type of approved services) [20]. Health conditions were identified using information from the assessments and, where available, from the Rx Risk V comorbidity index derived from PBS data in the six months preceding the assessment [21].

Statistical analysis

Cohort characteristics were summarised using descriptive statistics. Associations between income support quartile and LTCF entry were estimated using inverse probability of treatment weighted (IPTW), cause-specific Cox proportional hazards models, while treating access to long-term care at home and death as competing events. Propensity score weighting was used to reduce measured confounding and improve comparability across the four income support payment quartiles. As the exposure consisted of four categories, propensity scores were estimated separately within each homeownership group using multinomial logistic regression [22]. Using all covariates described in the Covariates section, the model estimated each participant's probability of belonging to each income support quartile. In homeowners, an interaction between living alone and informal carer support was included in the propensity score model. In non-homeowners, age was modelled using a natural cubic spline (3 degrees of freedom) to capture non-linearity.

IPTW for the average treatment effect was applied as the inverse of each individual's predicted probability of receiving their observed exposure category [23, 24]. Weight stabilisation and weight truncation were applied to reduce the influence of extreme values [25]. Covariate balance was assessed using maximum pairwise standardised mean differences, with values below 0.1 indicating acceptable balance. Effective sample size was also examined to assess the loss of precision introduced by weighting and was considered, alongside covariate balance, when selecting the truncation threshold [26]. The resulting weights were incorporated into the cause-specific Cox proportional hazards models to create a weighted pseudo-population in which the distribution of measured baseline covariates was more comparable across income support quartiles.

Sex-specific associations were assessed using stratum-specific weighted cause-specific Cox proportional hazards models, fitted separately for males and females within homeowners and non-homeowners. For each subgroup, separate propensity score models, stabilised IPTW and weighted outcome models were estimated. All analyses were additionally repeated in the sub-cohort of individuals living with dementia. Hazard ratios (HRs) and 95% confidence intervals (CIs) were reported, with weighted estimates interpreted as population-average effects. The proportional hazards assumption was evaluated using Schoenfeld residuals and inspection of log–log survival plots. Complete case analyses were employed throughout. All covariates had less than 5% missing values. Analyses were performed using R 4.3.3.

Sensitivity analysis

To examine whether the association between the amount of income support received and entry into LTCFs remained consistent over time, sensitivity analyses were conducted by repeating the primary analyses separately within three calendar periods (2010–2013, 2014–2017 and 2018–2021). Income support payment quartiles, adjusted to June 2021 Australian dollars, were recalculated within each calendar period, and the same modelling approach as the primary analyses was applied. HRs and 95% CIs were estimated separately for each period.

Ethics approvals

This study has ethics approvals from the Adelaide University Human Research Ethics Committee (Ref: 200489) and the Australian Institute of Health and Welfare Ethics Committee (Ref: EO2022/4/1376).

Results

Cohort characteristics

A total of 633 253 individuals were included in the study. The median (interquartile range; IQR) age of the cohort was 82 (76–86) years; 56.2% ($n = 355\ 917$) were female, 40.5% ($n = 256\ 371$) lived alone, 65.9% ($n = 417\ 349$) resided in major cities and 80.7% ($n = 510\ 796$) had support from an informal carer. Overall, 69.1% ($n = 437\ 445$) were homeowners (Table 1).

Following approval [median (IQR) follow-up 216 (45–483) days], 37.4% ($n = 237\ 099$) of individuals entered LTCFs as their first service, 40.6% ($n = 256\ 854$) accessed long-term care at home and 22% ($n = 139\ 300$) did not access either service during the study period (Table 1). Participant characteristics differed according to the type of first service received. Compared with those receiving care at home, individuals entering LTCFs were slightly older [median (IQR) age 83 (77–87) vs 81 (75–85) years], had a higher proportion of people living with dementia [25.9% ($n = 61\ 481$) vs 14.1% ($n = 36\ 187$)] and a lower proportion of homeowners [65.4% ($n = 155\ 027$) vs 70.8% ($n = 181\ 851$)].

Associations between income support and entry into LTCFs among homeowners

Of the 437 445 homeowners, 407 129 (93.1%) homeowners were included after restricting to complete cases (Appendix S3. Supplementary Tables S1 and S2). The median (IQR) follow-up time was 232 (56–496) days. Among homeowners, the median (IQR) total amount of income support received in the 12 months prior to assessment was AUD $18 936 (16 357–24 406).

Among homeowners, higher levels of income support were associated with a higher rate of entry into LTCFs compared with the lowest quartile ($P < .001$; Appendix S3. Supplementary Table S3). There was no statistically significant difference in the rate of LTCF entry for those in Q2 relative to Q1 [HR 0.99 (95% CI 0.98–1.01)]; however, Q3 and Q4 were associated with a higher rate of LTCF entry compared to Q1 [HRs 1.02 (95% CI 1.00–1.04) and 1.08 (95% CI: 1.06–1.10), respectively] (Figure 1). The results for male homeowners were similar. Among female homeowners, moderate income support receipt (Q3) was associated with a higher rate of LTCF entry [HR 1.07 (95% CI 1.05–1.09)], whereas no statistically significant differences were observed for those in Q2 [HR 1.00 (95% CI 0.97–1.03)] and Q4 [HR 1.02 (95% CI 1.00–1.04)] relative to Q1.

Associations between income support and entry into LTCFs among non-homeowners

Of the 177 638 non-homeowners, 164 105 (92.4%) were included in the analysis (Appendix S3. Supplementary Tables S4 and S5). The median (IQR) follow-up time was 196 (35–461) days. Among non-homeowners, the median (IQR) amount of income support received in the 12 months prior to assessment was AUD $24 889 (20 601–26 782).

For non-homeowners, higher levels of income support were associated with a higher rate of entry into LTCFs compared with the lowest quartile (Q1) ($P < .001$). Compared with Q1, hazards of entry into LTCFs were higher for Q2 [HR 1.06 (95% CI 1.03–1.09)], Q3 [HR 1.15 (95% CI 1.11–1.18)] and Q4 [HR 1.08 (95% CI 1.05–1.12)] (Figure 2).

Similar to the results for homeowners, upon sex-specific analysis, the results were consistent for male homeowners, but among female non-homeowners, only moderate income support receipt (Q3) was associated with a higher rate of entry into LTCFs relative to Q1 [HR 1.09 (95% CI 1.05–1.14)].

Sensitivity analysis

Calendar-period sensitivity analyses showed that the associations between higher income support payments and increased rates of entry into LTCFs were generally consistent over time for both homeowners and non-homeowners. Although the magnitude of the associations was reduced during the 2010–2013 period and more variable among female non-homeowners, the overall pattern persisted across periods (Appendix S2. Supplementary Figures S2 and S3).

Subgroup analysis: People living with dementia

Following complete case analysis, 78 783 homeowners and 24 383 non-homeowners living with dementia were included (Appendix S3. Supplementary Tables S6-S9). For homeowners living with dementia, higher levels of income support were associated with a higher rate of entry into LTCFs ($P < .001$). There was no statistically significant difference in the rate of LTCF entry for those in Q2 relative to Q1 [HR 1.02 (95% CI 0.99–1.06)]; however, Q3 and Q4 were associated with a higher rate of LTCF entry compared to Q1 [HRs 1.11 (95% CI 1.07–1.15) and 1.11 (95% CI: 1.07–1.14), respectively]. The findings were similar for non-homeowners living with dementia and sex-specific analyses showed similar results for males and females (Figures 3 and 4). However, among female non-homeowners, no statistically significant differences in the rate of entry into LTCFs were observed across income support receipt quartiles (Q2–Q4) relative to Q1 ($P = .6$).

Discussion

This national population-based study of older people being assessed for long-term care eligibility for the first time found that greater reliance on income support payments in the year prior was associated with a higher rate of entry to LTCFs,

Table 1. Characteristics of individuals approved for long-term care at home or in long-term care facilities at the time of eligibility assessment ($n = 633\,253$), overall and by type of initial care service accessed in the study period.

Characteristics	Overall study cohort	Long-term care facility	Long-term care at home	No long-term care[a]
Total *N*	633 253	37.4 (237 099)	40.6 (256 854)	22.0 (139 300)
Age, median (IQR)	82 (76–86)	83 (77–87)	81 (75–85)	81 (75–86)
Age categories (years)				
65–74	20.5 (130 033)	16.5 (39 227)	23.2 (59 601)	22.4 (31 205)
75–84	45.4 (287 323)	43.4 (102 893)	47.6 (122 181)	44.7 (62 249)
≥ 85	34.1 (215 897)	40.1 (94 979)	29.2 (75 072)	32.9 (45 846)
Sex				
Female	56.2 (355 917)	55.6 (131 906)	60.9 (156 476)	48.5 (67 535)
Male	43.8 (277 336)	44.4 (105 193)	39.1 (100 378)	51.5 (71 765)
Preferred language				
English	82.2 (520 529)	88.3 (209 417)	83.6 (214 797)	69.1 (96 315)
Not English	13.1 (82 964)	11.5 (27 242)	16.1 (41 311)	10.3 (14 411)
Missing	4.7 (29 760)	0.2 (440)	0.3 (746)	20.5 (28 574)
Country of birth				
Australia	62.2 (393 798)	64.6 (153 216)	59.7 (153 329)	62.6 (87 253)
Not Australia	36.3 (230 010)	33.9 (80 322)	39.3 (101 042)	34.9 (48 646)
Missing	1.5 (9445)	1.5 (3561)	1.0 (2483)	2.4 (3401)
Living arrangements				
Lives alone	40.5 (256 371)	45.8 (108 675)	38.6 (99 257)	34.8 (48 439)
Lives with family/partner	56.3 (356 476)	49.8 (118 144)	59.0 (151 583)	62.3 (86 749)
Lives with others	2.2 (13 896)	2.7 (6377)	1.7 (4483)	2.2 (3036)
Missing/not applicable/not specified	1.0 (6510)	1.6 (3903)	0.6 (1531)	0.8 (1076)
Received support from an informal carer				
Yes	80.7 (510 796)	82.7 (196 183)	77.6 (199 312)	82.8 (115 301)
No	19.1 (120 720)	16.8 (39 929)	22.3 (57 211)	16.9 (23 580)
Missing/not applicable/not specified	0.3 (1737)	0.4 (987)	0.1 (331)	0.3 (419)
Health conditions				
Arthritis	66.6 (421 609)	59.4 (140 737)	71.8 (184 424)	69.2 (96 448)
Dementia	17.8 (112 724)	25.9 (61 481)	14.1 (36 187)	10.8 (15 056)
Depression and mood disorders	34.1 (215 981)	32.5 (77 112)	36.8 (94 407)	31.9 (44 462)
Diabetes	24.9 (157 963)	23.0 (54 597)	26.4 (67 712)	25.6 (35 654)
Disease of the eye	23.9 (151 238)	24.1 (57 130)	24.6 (63 158)	22.2 (30 950)
Fracture	8.9 (56 044)	9.6 (22 661)	8.2 (21 103)	8.8 (12 280)
Heart diseases	65.8 (416 933)	64.7 (153 316)	65.2 (167 543)	69.0 (96 074)
History of cancer	26.1 (165 054)	23.4 (55 559)	21.3 (54 830)	39.2 (54 665)
History of falls	14.6 (92 745)	18.7 (44 233)	11.9 (30 523)	12.9 (17 989)
Hypertension	67.2 (425 484)	66.3 (157 215)	68.5 (176 052)	66.2 (92 217)
Incontinence	12.3 (77 965)	14.5 (34 311)	10.9 (28 024)	11.2 (15 630)
Kidney and urinary system disorders	12.4 (78 361)	11.7 (27 741)	11.2 (28 771)	15.7 (21 849)
Osteoporosis	23.1 (146 098)	21.8 (51 599)	25.1 (64 418)	21.6 (30 081)
Pressure injuries	4.8 (30 405)	5.3 (12 503)	3.9 (10 023)	5.7 (7879)
Year of assessment				
2010	5.1 (32 495)	8.4 (20 011)	1.7 (4334)	5.9 (8150)
2011	5.6 (35 399)	8.5 (20 040)	2.6 (6653)	6.2 (8706)
2012	5.8 (36 893)	7.9 (18 783)	3.7 (9504)	6.2 (8606)
2013	5.8 (36 620)	7.5 (17 707)	4.3 (11 065)	5.6 (7848)
2014	5.6 (35 713)	7.4 (17 579)	3.9 (9945)	5.9 (8189)
2015	6.7 (42 117)	7.8 (18 471)	5.5 (14 029)	6.9 (9617)
2016	8.7 (55 155)	8.5 (20 082)	9.2 (23 576)	8.3 (11 497)
2017	11.5 (73 017)	10.4 (24 720)	12.9 (33 139)	10.9 (15 158)
2018	12.5 (78 887)	10.6 (25 049)	14.5 (37 239)	11.9 (16 599)
2019	12.9 (81 789)	9.9 (23 588)	16.0 (41 188)	12.2 (17 013)
2020	13.1 (82 764)	8.8 (20 972)	17.0 (43 793)	12.9 (17 999)
2021[b]	6.7 (42 404)	4.3 (10 097)	8.7 (22 389)	7.1 (9918)
Assessment priority				
Low	62.0 (392 360)	45.8 (108 616)	79.7 (204 802)	56.7 (78 942)
Medium	37.3 (235 992)	53.1 (125 975)	19.8 (50 776)	42.5 (59 241)
High	0.7 (4671)	1.0 (2461)	0.5 (1174)	0.7 (1036)
Missing/unknown/none	0 (230)	0 (47)	0 (102)	0.1 (81)
Approved for long-term care at home[c]				
Yes	63.0 (398 948)	39.7 (94 088)	86.1 (221 186)	60.1 (83 674)
No	37.0 (234 305)	60.3 (143 011)	13.9 (35 668)	39.9 (55 626)

(*Continued*)

Table 1. Continued

Characteristics	Overall study cohort	Long-term care facility	Long-term care at home	No long-term care[a]
Approved for long-term care in a LTCF				
Yes	76.9 (486 820)	91.2 (216 348)	62.6 (160 674)	78.8 (109 798)
No	23.1 (146 433)	8.8 (20 751)	37.4 (96 180)	21.2 (29 502)
Approved for transition care				
Yes	8.3 (52 875)	10.3 (24 533)	5.5 (14 183)	10.2 (14 159)
No	91.7 (580 378)	89.7 (212 566)	94.5 (242 671)	89.8 (125 141)
Approved for respite care				
Yes	85.1 (538 867)	83.9 (198 879)	84.6 (217 388)	88.0 (122 600)
No	14.9 (94 386)	16.1 (38 220)	15.4 (39 466)	12.0 (16 700)
Remoteness				
Major city	65.9 (417 349)	67.5 (159 940)	66.2 (170 049)	62.7 (87 360)
Inner regional	23.7 (150 239)	22.9 (54 399)	24.2 (62 247)	24.1 (33 593)
Outer regional	9.3 (59 102)	8.8 (20 976)	8.7 (22 230)	11.4 (15 896)
Remote	0.8 (4783)	0.5 (1249)	0.7 (1783)	1.3 (1751)
Very Remote	0.2 (1558)	0.2 (428)	0.2 (480)	0.5 (650)
Missing	0 (222)	0 (107)	0 (65)	0 (50)
State				
New South Wales	35.1 (222 579)	34.7 (82 188)	35.5 (91 145)	35.4 (49 246)
Victoria	24.0 (151 709)	24.5 (57 981)	23.8 (61 150)	23.4 (32 578)
Queensland	18.1 (114 361)	18.6 (44 095)	18.4 (47 284)	16.5 (22 982)
Western Australia	8.2 (52 163)	7.4 (17 530)	8.8 (22 705)	8.6 (11 928)
South Australia	10.5 (66 633)	10.9 (25 758)	9.5 (24 455)	11.8 (16 420)
Tasmania	2.6 (16 658)	2.9 (6803)	2.4 (6054)	2.7 (3801)
Australian Capital Territory	1.3 (8001)	1.0 (2457)	1.4 (3517)	1.5 (2027)
Northern Territory	0.2 (1144)	0.1 (285)	0.2 (544)	0.2 (315)
Missing	n.p.	n.p.	0 (0)	n.p.
Homeowner				
Yes	69.1 (437 445)	65.4 (155 027)	70.8 (181 851)	72.2 (100 567)
No	28.1 (177 638)	31.0 (73 556)	26.7 (68 626)	25.5 (35 456)
Missing	2.9 (18 170)	3.6 (8516)	2.5 (6377)	2.4 (3277)
Income support within 12 months prior, median (IQR)[d]	20 774 (17 518–24 927)	21 757 (17 291–24 913)	20 907 (18 583–24 936)	19 584 (15 720–24 876)

Note: This table presents the characteristics of the cohort before exclusion of participants with missing data. Values are % (*n*), unless otherwise stated. IQR: interquartile range; LTCF: long-term care facility; n.p.: not published due to small cell counts to protect confidentiality. [a]Had not accessed long-term care at home or in a long-term care facility during the study period. [b]Data for 2021 represent a partial year (1 January to 30 June 2021). [c]Service approval variables were coded as binary indicators and were not mutually exclusive, as individuals could be approved for more than one type of long-term care service at the time of assessment. [d]Amounts of income support received are presented in June 2021 Australian dollars, with adjustment performed using the Consumer Price Index (CPI).

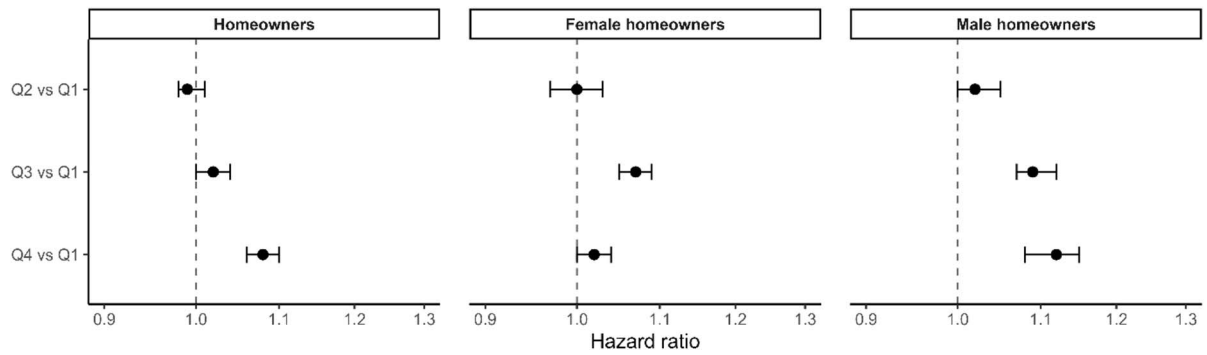


Figure 1. HRs and 95% CIs for the association between amount of income support payment quartiles and entry into LTCFs among homeowners. Estimates are presented for all homeowners and separately for females and males, with Q1 as the reference category. Median (IQR) income support within quartiles: Q1: AU$6 576 (881–12 533); Q2: AU$18 733 (17 768–18 799); AU$22 095 (20 327–23 148); AU$24 955 (24 904–25 854).

for both homeowners and non-homeowners. There were some differences observed upon further stratification by sex; whilst associations remained similar for males, only females in the third quartile of income support had a higher rate of LTCF entry, suggesting a more complex relationship between income support reliance and LTCF entry among older females. The results were similar when only including people living with dementia.

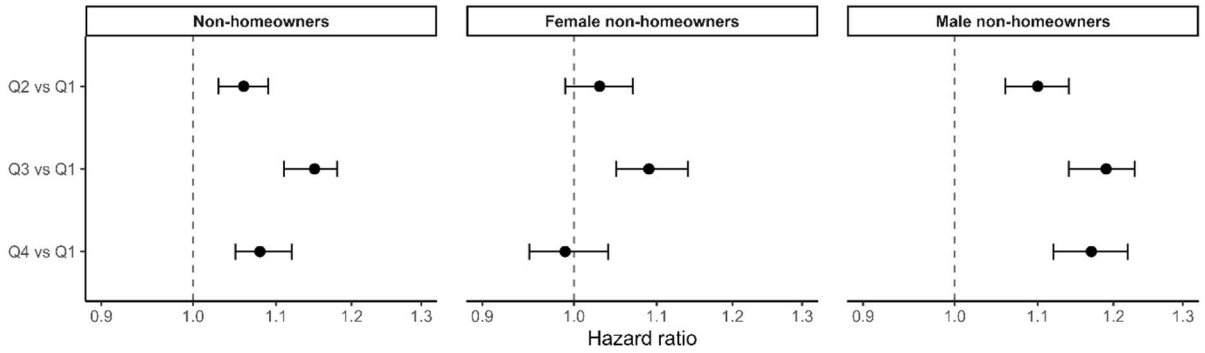


Figure 2. HRs and 95% CIs for the association between amount of income support payment quartiles and entry into LTCFs among non-homeowners. Estimates are presented for all non-homeowners and separately for females and males, with Q1 as the reference category. Median (IQR) income support within quartiles: Q1: AU$18 753 (15 834–19 636); Q2: AU$23 403 (22 349–24 406); Q3: AU$25 113 (24 938–26 160); AU$ Q4: 28 608 (27 636–28 825).

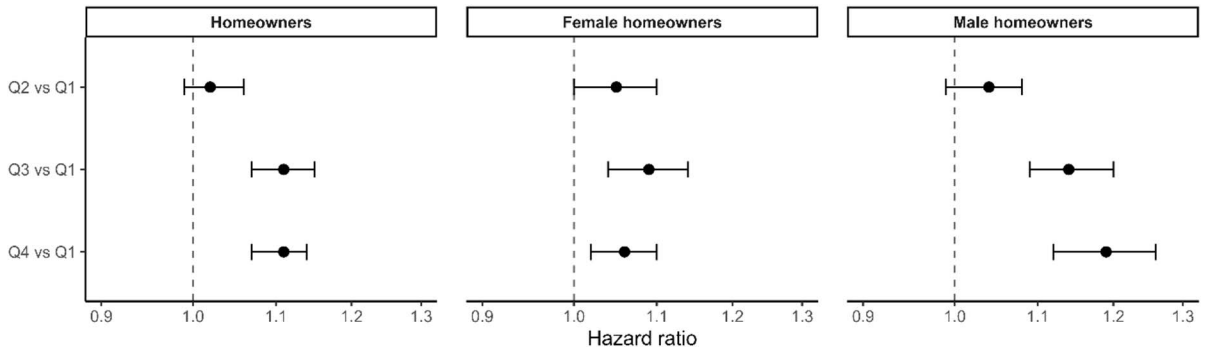


Figure 3. HRs and 95% CIs for the association between amount of income support payment quartiles and entry into LTCFs among homeowners living with dementia. Estimates are presented for all homeowners living with dementia and separately for females and males, with Q1 as the reference category. Median (IQR) income support within quartiles: Q1: AU$3829 (668–9901); Q2: AU$17 489 (16 587–18 396); Q3: AU$19 219 (18 805–20 560); Q4: AU$24 901 (23 891–25 100).

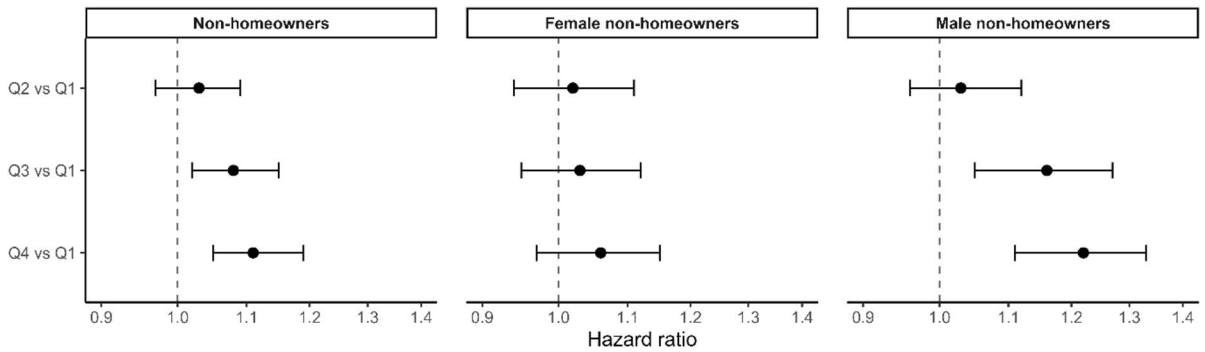


Figure 4. HRs and 95% CIs for the association between amount of income support payment quartiles and entry into LTCFs among non-homeowners living with dementia. Estimates are presented for all non-homeowners living with dementia and separately for females and males, with Q1 as the reference category. Median (IQR) income support within quartiles: Q1: AU$17 737 (13 712–18 782); Q2: AU$21 692 (20 524–22 847); Q3: AU$24 919 (24 661–25 057); Q4: AU$27 809 (26 782–28 659).

The study findings contribute to the growing body of international evidence suggesting that older people with more limited social resources or greater financial vulnerability are less likely to age in place and more likely to experience earlier entry to LTCFs [5]. Across high-, middle- and low-income countries, socioeconomic disadvantage is consistently associated with reduced access to healthcare, poorer health outcomes and earlier mortality [27–30]. Social disadvantage may also reduce access to informal support networks, which is a critical determinant of ageing in place [31]. Consequently, many global policy agendas, including those from the World Health Organisation and the Organisation for Economic

Co-operation and Development (OECD), prioritise reducing socioeconomic inequities as a central strategy for improving public health and enabling more people to age in place [32, 33]. Measuring socioeconomic inequities in older non-working age populations is challenging, and growing emphasis has been placed on intersectionality of socioeconomic, demographic and health-related factors (e.g. sex, living with dementia) and their impact on access to care and subsequent outcomes [5, 34, 35].

In the present study, we focused on income support payments as an indicator of financial vulnerability. In Australia, income support payments are the primary source of income for 49% of people aged 65–74 years, rising to 78% among those aged 85 years and older, with the means-tested Age Pension being the main contributor [36]. While the structure of income support systems varies widely across OECD countries, reliance on income support payments mainly through pensions in later life is common [37]. Importantly, several high-income countries including the UK, the US, Canada, Japan and some European countries including Austria, Denmark and Belgium use means- or asset-tested retirement income programs or means-tested supplements (benefits, top-ups, safety nets) for individuals with low income at retirement [38], and therefore, the level of support received often reflects an individual's broader financial circumstances. Understanding the relationship of this to LTCF entry highlights that reliance on income support may influence resources available for care, and timing and pathways into LTCFs, which is important for assessing equity within LTCF systems.

Global retirement systems are increasingly reliant on private pensions, savings and employment-linked schemes, which has led to concerns of potential rising inequalities in retirement wealth [37]. In Australia, the long-term impact of the mandatory employer-contributed retirement savings scheme (superannuation) introduced in 1992 remains uncertain [39]. Whilst superannuation may reduce absolute poverty among retirees, it may also widen wealth disparities by disproportionately benefiting higher-income workers [40]. However, early evidence suggests that inequalities in superannuation holdings are narrowing as the system matures [39, 41]. Whilst superannuation is unlikely to have significantly influenced individuals currently accessing long-term care, as most individuals will have retired before the scheme had matured, its effect on the future socioeconomic position of the ageing population remains unclear.

Gender disparities in relation to financial position post-retirement are well known, with women consistently reported to retire with lower pension assets and disposable income. In Australia, women approaching retirement have approximately 25%–28% less superannuation than men, with median balances at retirement age remaining substantially lower. This gap is often related to interrupted work histories due to caregiving responsibilities, persistent gender pay gaps, higher prevalence of part-time and casual employment and workplace inequalities, which together culminate in a higher risk of poverty in later life [37, 42]. The results of the current study indicate that the association between reliance on income support payments and entry into LTCFs differs for females, potentially reflecting disparities in lifetime earnings, savings and financial security.

Strengths and limitations

A strength of this population-level study is the use of linked national datasets providing objective records of income support receipt and long-term care assessments. The large cohort size and national coverage enhance the generalisability of findings within Australia's long-term care system and offer insights relevant to other high-income countries with comparable income support and long-term care arrangements. Importantly, the study used verified administrative data to capture income support, thereby reducing recall bias.

Several study limitations should be considered. Whilst individual-level income support data were available, household-level financial circumstances could not be assessed. However, household income can mask underlying financial circumstances in older populations due to variable income-sharing arrangements [34]. We examined income support payments as an indicator of financial vulnerability as although non-government income data were available, details of private savings were not and in the older population accessing long-term care who are largely not working, savings are an important component of wealth. In Australia, this population is also highly concentrated in the lowest income tax brackets, with the majority of older people deriving their main income from government pensions or allowances and many falling below standard taxable-income thresholds due to low assessable incomes. As a result, household or taxable income alone may understate underlying economic resources whilst income support receipt may provide a more consistent indicator of financial vulnerability in later life. Whilst many demographic and health-related characteristics were included in the analysis as covariates, residual confounding may remain in observational studies. We also recognise that the study does not account for the cumulative impact of socioeconomic disadvantage that people may experience across the life course [32]. Important covariates that could potentially confound the associations examined, but were not available in the current study, included level of education, prior occupation and lifetime earnings [43].

Conclusions

In this population-based study, we determined that greater reliance on income support was associated with a higher rate of entry into LTCFs. The results suggest that although income support provides essential financial support, it may not be sufficient to offset the broader disadvantages associated with lower lifetime wealth. This is consistent with international evidence linking socioeconomic disadvantage

to reduced access to care and support services and poorer health, which ultimately influences people's ability to age in place. These findings highlight the need for financial vulnerability to be central to long-term care policies.

Acknowledgements: We would like to acknowledge the Registry of Senior Australians' (ROSA) Advisory Committee, Consumer and Community Advisory Committee, Aboriginal and Torres Strait Islander Advisory Committee and the ROSA Research Centre team based at the South Australian Health and Medical Research Institute (SAHMRI) and the Caring Futures Institute, College of Health and Enablement at Flinders University for ensuring the success of the ROSA and support with this study. We also acknowledge the South Australian Government Department for Innovation and Skills (2017–2021) who provided us with support to establish ROSA, the Australian Government Medical Research Future Fund (2021–2024 PHRDI000009 and 2024–2029 NCRI000109) and ROSA collaborating partners (SAHMRI, Flinders University, ECH Inc, Silverchain, Bolton Clarke) for its ongoing support, and the Australian Institute of Health and Welfare for the linkage and construction of input data.

Supplementary Data: Supplementary data is available at *Age and Ageing* online.

Declaration of Conflicts of Interest: Prof Inacio is supported by a National Health and Medical Research Council (NHMRC) Investigator Grant (GNT119378) and holds/has held a number of Australian Government Medical Research Future Fund (MRFMMIP000019, GNT 2018250, GNT 2015823, PHRDI00000, GNT 2008752, GNT 2005904. GNT 1200056, GNT 1183855, GNT119378) and NHMRC (GNT 2004089) grants as Chief or Associate Investigator.

Prof Inacio has provided consultancy to the Australian Government, Department of Health and Aged Care, Department of Veterans' Affairs, South Australian Department of Health and Wellbeing, Attorney General's Department/Royal Commission into Aged Care Quality and Safety and Australian Association of Clinical Pharmacists. Prof Inacio is also a member of the Independent Health and Aged Care Pricing Authority.

Prof Caughey is supported by a National Health and Medical Research Council (NHMRC) Investigator Grant (GNT2026400) and holds/has held a number of Australian Government Medical Research Future Fund (MRFMMIP000019, GNT 2015823, PHRDI000009, NCRI000109, GNT2042451, GNT2045120, GNT2046840) and NHMRC (GNT 2004089, GNT2006957, GNT2044802) grants as Chief or Associate Investigator. Prof Caughey provides consultancy to the Australian Government, Department of Health and Aged Care, Department of Social Services, South Australian Department of Health and Wellbeing, Attorney General's Department/Royal Commission into Aged Care Quality and Safety and Australian Association of Clinical Pharmacists. Prof Caughey is a member of the Quality Indicator and Star Rating Technical Expert Advisory Group for the Department of Health, Disability and Ageing.

Declaration of Sources of Funding: The Registry of Senior Australians (ROSA) Research Centre is supported through the Australian Government Medical Research Future Fund (NCRI000109) and its partners (South Australian Health and Medical Research Institute, Caring Futures Institute, College of Health and Enablement at Flinders University, ECH Inc, Silverchain, Bolton Clarke).

Data Availability: Data may be obtained from a third party and are not publicly available. The data for this study were obtained from the Australian Institute of Health and Welfare. These data were made available to the researchers under ethical, governance and confidentiality agreements that do not allow public sharing.

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Received 12 May 2026; accepted 3 September 2026

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doi:10.1093/ageing/afag328 Published electronically 11 January 2026