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Original Study

Modeling the Association Between Home Care Service Use and Entry Into Residential Aged Care: A Cohort Study Using Routinely Collected Data

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A B S T R A C T

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Objective: To examine home care service-related and person-based factors associated with time to entry into permanent residential aged care.

Design: Longitudinal cohort study using routinely collected client management data.

Setting: A large aged care service provider in New South Wales and the Australian Capital Territory, Australia.

Participants: A total of 1116 people aged 60 years and older who commenced home care services for higher-level needs between July 1, 2015 and June 30, 2016.

Methods: Survival analysis methods were used to examine service-related and person-based factors that were associated with time between first home care service and entry into permanent residential aged care. Predictors included service hours per week, combination of service types, demographics, needs, hospital leave, and change in care level. Cluster analysis was used to determine patterns of types of services used.

Results: By December 31, 2016, 21.1% of people using home care services had entered into permanent residential care (n = 235). After adjusting for significant factors such as age and care needs, each hour of service received per week was associated with a 6% lower risk of entry into residential care (hazard ratio = 0.94, 95% confidence interval 0.90-0.98). People who were predominant users of social support services, those with an identified carer, and those born in a non-main English-speaking country also remained in their own homes for longer.

Conclusions: Greater volume of home care services was associated with significantly delayed entry into permanent residential care. This study provides much-needed evidence about service outcomes that could be used to inform older adults' care choices.

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Internationally, aged care systems are under pressure from the increasing number and proportion of older adults in the population. Residential aged care is largely government-funded in Australia and is the main driver of projected increases in aged care costs.¹ There has consequently been a push toward the use of community-based care

services to support older people to remain in their own homes. While delaying entry into residential care does not always reduce care costs,² the vast majority of people express a desire to remain in their own homes as they age.³

A person-centered approach to care that takes into account the needs, preferences, and values of individuals has expanded into the aged care sector over the last 2 decades.⁴ In Australia, this move has been legislated by the federal parliament, with a 10-year reform package aimed at creating a market-based home care system with greater choice and control for consumers.⁵ Similar moves toward consumer-directed aged care have already taken place in the United Kingdom and New Zealand. Several qualitative studies have explored consumer and provider responses to the consumer-directed care model, revealing both positive and negative responses.^{6,7} Although

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the Australian model now requires that consumers have control over the types of care and services that they access, there is little evidence to guide them about the best way to utilize home care services.

Previous research has identified a number of consistent predictors of residential care entry, including increasing age, less independence in activities of daily living, and cognitive impairment.⁸ Although this research is valuable for determining at-risk groups who may benefit from increased care, fewer studies move beyond individuals' characteristics to evaluate the use of services that enable them to remain at home. Over the last 10 years, 5 studies have reported that receipt of any home care services,⁹ personal care services,^{10–12} home-making services,¹⁰ respite,¹³ and senior centers¹¹ delay nursing home placement. However, these studies did not measure events that may trigger entry into residential care such as functional decline, nor did they consider changes in service use over time or the interplay between service types provided. Issues around the accessibility of both residential and home care services in rural Australia¹⁴ suggest that local area-based factors also require exploration.

Although several national minimum datasets have been developed to capture information on government-subsidized aged care programs in Australia,¹⁵ there is little research measuring and monitoring the impact of service provision on older adults' outcomes.¹⁶ The aim of this study was to examine home care service-related and person-based factors that are associated with time to entry into permanent residential care.

Methods

Data Source

This study utilized routinely collected data from Uniting, a nonprofit organization and the largest provider of home and community care services in New South Wales (a state comprising one-third of Australia's 24 million population) and the Australian Capital Territory (population 398,000).¹⁷ Data on referral, care needs, service provision, demographics, leave from service, and service cessation were extracted from CareLink+,¹⁸ the centralized client management system used by Uniting. Further information about the implementation of CareLink+ at Uniting can be found elsewhere.¹⁹

Study Population

The study population comprised people aged ≥ 60 years who commenced services under the Home Care Package (HCP) program with Uniting between July 1, 2015 and 30 June 30, 2016. The HCP program is government-subsidized and provides coordinated services for older people with ongoing higher level needs to enable them to live independently. The other major form of home aged care in Australia is the Commonwealth Home Support Program, which provides entry-level support. [Appendix 1](#) contains information about the HCP program and the Australian community aged care system. The study population inclusion and exclusion criteria are outlined in [Appendix 2](#).

Study Outcome

The primary outcome was time between first home care service received and cessation of services because of entry into permanent residential care. The date and reasons for service cessation was available to December 31, 2016. The minimum and maximum potential follow-up time for study participants was 6 and 18 months, respectively. The median follow-up time was calculated using the reverse Kaplan-Meier method.²⁰

Predictors of Time to Residential Care

The explanatory factor of interest was hours of home care services received. The start time, end time, date, and service type was available. The total hours of services provided was summed by week. There were 15 types of services used by the study population, including domestic assistance (ie, light housework), personal care (eg, showering, dressing), social support (eg, one-on-one companionship visits at home, assistance to attend community-based social activities), transport, and

Table 1
Demographics and Service Characteristics of 1116 Older Adults Receiving Home Care Services

Characteristics	n (%)	Characteristics	n (%)
Sex		Person ever used service*	
Female	694 (62.2)	Domestic assistance	834 (74.7)
Male	418 (37.5)	Personal care	552 (49.5)
Missing	4 (0.4)	Social support	506 (45.3)
Age at start of service		Transport	403 (36.1)
Mean [SD]	82.4 [7.9]	Nursing services	325 (29.1)
60–69 y	84 (7.5)	Shopping	323 (28.9)
70–79 y	275 (24.6)	Meal preparation	268 (24.0)
80–89 y	554 (49.6)	In-home respite	146 (13.1)
≥ 90 y	203 (18.2)	Medication assistance	115 (10.3)
Marital status		Day center	56 (5.0)
Married/de facto	463 (41.5)	Service-type cluster [†]	
Divorced/ widowed/single	570 (51.1)	1 – Personal care	400 (35.8)
Missing	83 (7.4)	2 – Social support	308 (27.6)
Country of birth		3 – Domestic assistance	301 (27.0)
Australia	743 (66.6)	4 – In-home respite	60 (5.4)
Other English-speaking country	101 (9.1)	5 – Day center	47 (4.2)
Other country	248 (22.2)	Number ADLs needing help [‡]	
Missing	24 (2.2)	0	169 (15.1)
Remoteness [§]		1	195 (17.5)
Major city	726 (65.1)	2	253 (22.7)
Inner regional	279 (25.0)	3	203 (18.2)
Outer regional/ remote	111 (9.9)	4	167 (15.0)
Socioeconomic status (area-level) [§]		5	124 (11.1)
Lowest quintile	286 (25.6)	Missing	5 (0.4)
Other quintiles	830 (74.4)	Number IADLs needing help	
Has a carer		0	0 (0)
Yes	479 (42.9)	1	21 (1.9)
No	637 (57.1)	2	54 (4.8)
Has dementia		3	197 (17.7)
Yes	163 (14.6)	4	269 (24.1)
No	953 (85.4)	5	563 (50.4)
Contact reason:		Missing	12 (1.1)
hospital discharge		Hospital leave during care	
Yes	96 (8.60)	Yes	237 (21.2)
No	1020 (91.40)	No	879 (78.8)
Level of home care package [¶]		Increase in care package level ^{**}	
Low	806 (72.2)	Yes	133 (11.9)
Intermediate	115 (10.3)	No	983 (88.1)
High	195 (17.5)		

ADL, activities of daily living; IADL, instrumental activities of daily living.

*Ten most commonly used services only; other services used were advocacy, allied health and therapy, home maintenance, outings, and palliative care.

[†]A profile of service-types used by each cluster can be found in [Appendix 3](#).

[‡]ADLs consisting of bathing, dressing, eating, walking, and toileting.

[§]Accessibility/Remoteness Index of Australia and Index of Relative Socio-economic Advantage and Disadvantage based on each person's suburb or postcode if no matched suburb.

[¶]IADLs consisting of doing housework, getting places, shopping, taking medicine, and handling money.

**Level of care needs, where level 1 = basic, level 2 = low, level 3 = intermediate, and level 4 = high.

**Median time to increase = 154 days (IQR = 77–245).

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