

Do Quality Awards correlate with better outcomes among assisted living residents?

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Introduction

The American Health Care Association and National Center for Assisted Living (AHCA/NCAL) National Quality Award Program is an initiative that aims to improve quality of care provided in long-term care communities, including assisted living. Based on the Baldrige Criteria for Performance Excellence, the program assesses assisted living communities on criteria pertaining to leadership, strategic planning, customer and workforce, operations, and knowledge management. Assisted living communities can apply each year and can progress through three levels (i.e., Bronze, Silver, and Gold); each level requires a progressively more detailed demonstration of superior performance.¹

Bronze applicants fill out a profile for their organization that is based on Baldrige Criteria; they also must describe linkages among their mission, key customers, and strategic position. Silver and Gold applicants are scored in two overall categories: Process and Results. Process categories evaluate the maturity of organizational processes on approaches, deployment, integration, and evaluation and improvement. Many Process criteria questions are open-ended. For example, applicants are asked to describe how they determine health care services to meet residents' needs. Results are measurable impacts of the processes applicants enact. These include, but are not limited to, 30-day hospitalization rates, overall customer satisfaction, and staff turnover. At all three levels, applicants are assessed by examiners and are provided with feedback regarding areas for improvement

One study found nursing homes that obtained a Silver or Gold Quality Award experienced lower rates of deficiency citations, pressure ulcers, and antipsychotic medications than nursing homes without a Silver or Gold Quality Award.² However, the relationship between Quality Awards and outcomes has not been assessed in assisted living communities. This study examined the relationship between AHCA/NCAL Quality Awards and healthcare outcomes among a national sample of assisted living residents, examining outcomes both before and after the onset of the COVID-19 pandemic.

Methods

Data

Data on assisted living communities that received Quality Awards came from a national list provided by AHCA/NCAL. Data on assisted living community addresses and ZIP codes came from a 2019 national directory maintained by Brown University, which was created using information from individual state licensing agencies. We used Medicare claims data from 2018, 2019, and 2020. Specifically, data on assisted living resident demographic characteristics came from the Medicare Master Beneficiary Summary File; the Chronic Conditions Warehouse segment contained Medicare beneficiaries' chronic conditions. We used the inpatient Medicare Provider Analysis and Review files and the outpatient Medicare claims to obtain hospitalizations and emergency department visits. Nursing home visits were obtained using the Residential History File, which details Medicare beneficiaries' location of care during each day of the year. The Residential History File was created by applying an algorithm to Medicare claims and assessment data.³

Sample

Using a previously published methodology, we identified assisted living residents using their 9-digit ZIP codes reported in Medicare enrollment data.⁴ We first identified residents who lived in an assisted living community that received a Silver or Gold Quality Award.⁴ We excluded residents who were enrolled in Medicare Advantage within the current or prior year, as Medicare claims data were not complete for these residents. Please refer to Figure S1 in the supplementary materials for more information about how the sample of Quality Award recipients was selected. We then created a comparison group of residents in assisted living communities that did not receive a Silver or Gold Quality Award; this included assisted living residents in communities that did not apply for an award, assisted living residents in communities that applied and did not get an award, and assisted living residents who received a Bronze Award only. We only included residents in states that contained Quality Award recipients to make sure the samples were comparable (please see Table S1 for a list of states included and Figure S2 for more information about the sample selection process). Applicants can elect to apply for the entire organization. We included assisted living providers that provided multiple levels of care such as a nursing home.

We created two different cohorts of assisted living residents. The first cohort resided in an assisted living community on December 31st, 2018. The second cohort resided in an assisted living community on December 31st, 2019. We followed each cohort's outcomes for one year.

Measures

We examined five outcomes in this study, which included separate indicators of whether any of the following events occurred within the year: any inpatient hospitalization; any ambulatory care sensitive hospitalization; any emergency department visit; any injury-related emergency department visit; and any long-term nursing home transition. We excluded emergency department visits and hospitalizations that occurred while residents were in a nursing home. We classified whether an emergency department visit represented an injury using the New York University algorithm.^{6,7} This algorithm provided the probability that an emergency department visit primary discharge diagnosis code fell into 8 categories based on the type and severity of the diagnosis. Injuries are a separate category.^{6,7} Ambulatory care sensitive hospitalizations are a group of diagnoses representing conditions believed to be preventable with appropriate treatment in primary care (e.g., diabetes, hypertension) and are also identified using diagnosis codes.⁸

The key measure of this study was an indicator of whether an assisted living community had an active Silver or Gold Quality Award between the years 2017-2020. Unlike Bronze awardees, who are at the beginning of the Quality Award journey, Silver and Gold awardees must provide evidence of quality improvement.^{1,2} We combined Silver and Gold Quality Award recipients because of the relatively small number of Gold Quality Award recipients ($n=7$).

At the assisted living resident level, we adjusted for age in years, sex, dual eligibility for Medicare and Medicaid, and a count of 19 chronic conditions (Alzheimer's/dementia and related disorders, arthritis (rheumatoid and osteoarthritis), asthma, atrial fibrillation, autism spectrum disorders, cancer, chronic kidney disease, chronic obstructive pulmonary disease, depression, diabetes, heart failure, ischemic heart disease, hepatitis (chronic viral B and C), HIV/AIDS, hyperlipidemia, hypertension, osteoporosis, schizophrenia and other psychotic disorders, and stroke).⁵ At the assisted living level, we adjusted for the total number of licensed beds and

whether the assisted living community had for-profit or nonprofit ownership. We also incorporated state fixed effects.

Analysis

First, we described differences between residents in assisted living communities with a Silver or Gold Quality Award (awardees) and residents in communities without a Silver or Gold Quality Award (non-awardees) using *t*-tests and χ^2 tests. Additionally, we examined differences in the unadjusted outcomes between awardees and non-awardees. Using multilevel logistic regression models, we then investigated the relationship between the receipt of a Quality Award and assisted living resident outcomes in 2019 while controlling for resident and assisted living community characteristics. This adjustment accounts for factors such as the age of assisted living residents that may differ between Quality Award recipients and non-recipients that also influence outcome measures such as emergency department use.

We used estimates from the logistic regression models to make two predicted risks for each person, based on their chronic conditions and other attributes: one prediction assigning their exposure to 0 (i.e., no Quality Award) and a second prediction assigning it to 1 (Quality Award). The predicted values were averaged across all the assisted living residents in each exposure category to yield two mean predicted risks. Random intercepts were included at the assisted living level. We repeated analysis for the year 2020 to understand whether awardees had better outcomes than non-awardees during the COVID-19 pandemic.

Results

Our final sample included 122,019 assisted living residents in the 2019 cohort and 128,768 assisted living residents in the 2020 cohort. Approximately 3% of residents in each cohort resided in assisted living communities that were Quality Award recipients. Characteristics of the study population are displayed in Table 1. Awardees were older on average and were less likely to be dually eligible for Medicare and Medicaid than residents in communities that were non-awardees.

In Table 2, we describe the unadjusted risk of healthcare outcomes, comparing awardees to non-awardees. Rates of all outcomes were lower among awardees than non-awardees in each year. Emergency department use was lower among awardees than non-awardees in 2019 (47.2% vs. 50.7%) and in 2020 (47.2% vs. 50.7%). However, not all differences were statistically significant at the $p < .05$ level. Nursing home placement, for example, did not differ significantly between awardees and non-awardees in either year. Rates of hospitalization, ambulatory care sensitive hospitalizations, and injury-related emergency department use were significantly lower among awardees when compared to non-awardees in 2020 but not in 2019.

Table 3 shows the adjusted risk of healthcare outcomes, comparing awardees to non-awardees. The adjusted risk of emergency department use was 49.1% (46.9%, 51.3%) for awardees compared to 51.7% (51.3%, 52.1%) for non-awardees. This translates to a 5.3% lower relative risk of emergency department use for awardees compared to residents in non-awardees. Awardees also experienced lower risk of emergency department use during COVID-19 (43.7% [95% CI 41.5, 45.9] vs. 46.0% [95% CI 45.6, 46.4%]). All other differences were not statistically significant at the $p < .05$ level.

Discussion

This study examined the relationship between the receipt of a Silver or Gold Quality Award and healthcare outcomes among residents in assisted living communities, both before and during the COVID-19 pandemic. Rates of emergency department use among assisted living residents in a community that received a Quality Award were 5% lower than assisted living residents who did not reside in a community that received a Quality Award. These findings persisted during the COVID-19 pandemic. Previous studies have found that emergency department use among assisted living residents is common and varies substantially among assisted living communities. This variability persists even after adjusting for resident and assisted living characteristics.^{9,10} Therefore, emergency department use may be an outcome that is especially influenced by assisted living practices.

There could be multiple reasons that explain why residents in Silver and Gold assisted living communities experience lower risk of emergency department use. The Baldrige focus on

workforce could potentially explain the relationship, as the nursing home literature shows that increased staffing levels relate to better resident outcomes.¹¹ At the Silver Award level, assisted living communities are expected to begin to change the processes of their organization (e.g., training, new employee orientation) and demonstrate improvement in workforce metrics such as turnover rates. The Baldrige focus on leadership may also play a role in the differences in emergency department visits. Previous studies in the nursing home sector have highlighted the importance of leadership on outcomes.¹²

We did not observe a statistically significant relationship between the Quality Award recipients and non-recipients in other outcomes such as hospitalizations and nursing home placement in our multivariate models. These outcomes may not be as sensitive to changes in assisted living practices as emergency department use. Notably, we did not have the data to adjust for clinical factors such as functional impairment and the severity of dementia. Quality Award recipients were older on average than non-recipients and may have had higher levels of functional impairment and cognitive decline that we were not able to measure in the dataset. Therefore, we may have seen a stronger association between Quality Awards and resident outcomes had we been able to adjust for these factors.

There were additional limitations to this analysis. We lacked data to include Medicare Advantage enrollees, which limits generalizability to this population. Additionally, the cross-sectional design only presents data at one point in time rather than changes in resident outcomes.

Conclusions

Overall, results from the study suggest that industry-associated quality awards may reflect better outcomes among assisted living residents. Additional research is needed to examine mechanisms linking Quality Awards and outcomes, as well as the relationship between Quality Awards and additional resident outcomes.

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Table 1. Characteristics of residents in assisted living communities with Silver or Gold Quality Awards compared to residents in assisted living communities without Silver or Gold Quality Awards, by year

	2019			2020		
	Award (<i>n</i> =3,875 residents , 164 AL communities)	No Award (<i>n</i> = 118,144 residents , 8,539 AL communities)		Award (<i>n</i> =3,912 residents , 163 AL communities)	No award (<i>n</i> = 124,856 residents , 8,580 AL communities)	
	Mean or %	Mean or %	P value*	Mean or %	Mean or %	P value*
Assisted Living Resident characteristics						
Female sex (%)	68.1	68.6	0.47	68.48	68.74	0.73
Age (%)			<.001			<.001
<65	1.2	3.2		1.1	2.8	
65-74	7.5	10.0		7.1	9.8	
75-84	26.7	26.8		27.9	27.3	
85 +	64.7	60.0		64.0	60.1	
Race (%)†			<.001			<.001
White	92.4	92.8		92.1	93.0	
Black	1.4	2.5		1.5	2.4	
Hispanic	1.0	1.6		0.9	1.6	
Other	5.2	3.1		5.6	3.1	

Dual eligibility	4.2	11.6	<.001	4.0	10.8	<.001
Chronic conditions‡ (mean)	7.4	7.3		7.4	7.4	0.10
Assisted Living characteristics						
Number of beds (mean)	98.0	114.0	<.001	97.9	113.6	<.001
Nonprofit (%)	18.3	16.7	.012	18.7	16.1	<.001

* Compared using a *t*-tests and χ^2 tests.

† Asian, American Indian, Alaska Native, Native Hawaiian, or Pacific Islander

‡ Sum of the following conditions, diagnosed before present month: Alzheimer's/dementia and related disorders, arthritis (rheumatoid and osteoarthritis), asthma, atrial fibrillation, autism spectrum disorders, cancer, chronic kidney disease, chronic obstructive pulmonary disease, depression, diabetes, heart failure, ischemic heart disease, hepatitis (chronic viral B and C), HIV/AIDS, hyperlipidemia, hypertension, osteoporosis, schizophrenia and other psychotic disorders, and stroke

Table 2. Unadjusted percent of residents who experienced each healthcare outcome with Quality Awards compared to residents in assisted living communities without Quality Awards, by year

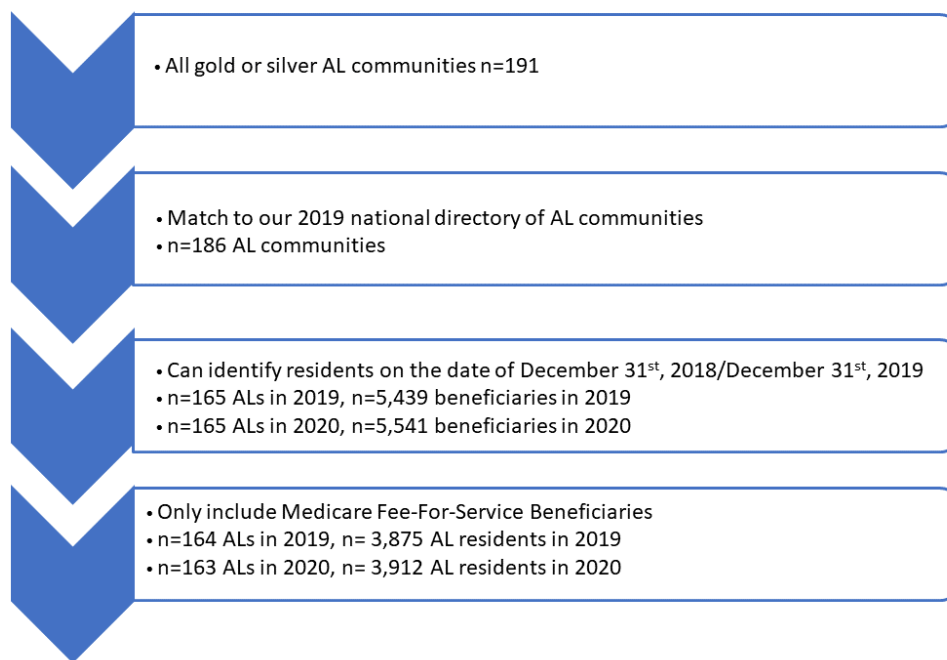
	2019			2020		
	Awardees (n=3,875)	Non- awardees (n=118,144)	<i>P</i> value	Awardees (n=3,912)	Non- awardees (n=124,856)	<i>P</i> value
Hospitalization (%)	29.9	31.3	0.07	26.7	28.4	0.02
Potentially avoidable hospitalization (%)	6.7	7.5	0.07	4.6	5.5	0.01
Emergency department visit (%)	47.2	50.7	<.001	40.9	44.9	<.001
Injury-related emergency department visit (%)	16.9	18.1	0.05	13.8	15.2	0.01
Long-term nursing home placement (%)	5.6	5.9	0.46	5.0	5.7	0.07

Table 3. Adjusted risk of assisted living residents that experience healthcare outcomes by year, comparing residents in assisted living communities with Quality Awards to residents in communities without Quality Awards

	2019 Results (n=121,820)			2020 Results (n= 128,768)		
Outcomes	Adjusted Risk(%)* (95% CI)			Adjusted Risk(%)* (95% CI)		
	Awardee	Non-awardees	P value	Awardee	Non-awardees	P value
Hospitalization	30.4 (26.6, 32.3)	31.8 (31.4, 32.1)	0.17	28.2 (26.3, 30.1)	29.0 (28.7, 29.3)	0.15
Preventable hospitalization	6.8 (5.9, 7.8)	7.7 (7.6, 7.8)	0.10	4.9 (4.1, 5.6)	5.5 (5.4, 5.7)	0.10
Emergency department visit	49.1 (46.9, 51.3)	51.7 (51.3, 52.1)	0.023	43.7 (41.5, 45.9)	46.0 (45.6, 46.4)	0.04
Injury-related emergency department visit	17.5 (16.0, 18.9)	18.5 (18.2, 18.8)	0.17	14.3 (13.0, 15.7)	15.7 (15.4, 15.9)	0.072
Long-term nursing home placement	5.7 (4.7, 6.8)	6.1 (5.9, 6.3)	0.51	5.2 (4.2, 6.3)	5.9 (5.7, 6.1)	0.23

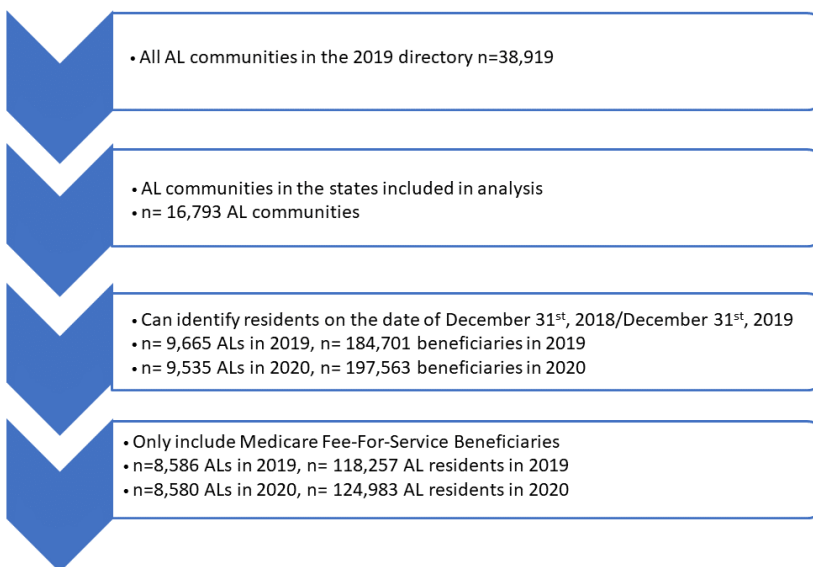
a. Adjusted for age, race, sex, dual eligibility, number of chronic conditions, bed size, for-profit status, and state fixed effects

Figure S1. Diagram depicting how the residents in assisted living communities that received a Quality Award were selected



Abbreviation: AL, assisted living

Figure S2. Diagram depicting how the residents in assisted living communities that did not receive a Quality Award were selected



Abbreviation: AL, assisted living

Table S2. States included in the analysis

State name
Arizona
California
D.C.
Delaware
Florida
Georgia
Hawaii
Iowa
Idaho
Illinois
Indiana
Kentucky
Louisiana
Maryland
Maine
Michigan
Montana
Nebraska
North Dakota
New Jersey
New York
Ohio
Oklahoma
Oregon

Pennsylvania
South Dakota
Tennessee
Texas
Utah
Virginia
Vermont
Washington