


Does Assisted Living Capacity Influence Case Mix at Nursing Homes?

Gerontology & Geriatric Medicine
 January-December 2015: 1–8
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 DOI: 10.1177/2333721415587449
 ggm.sagepub.com


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Abstract

Assisted living facilities (ALFs) have grown over the past few decades. If they attract residents with lower care needs away from nursing homes (NHs), NHs may be left with higher case mix residents. We study the relationship between ALF bed market capacity and NH case mix in a state (Virginia) where ALF bed capacity stabilized after a period of growth. Similarly, NH capacity and use had been stable. While it is interesting to study markets in flux, for planning purposes, it is also important to examine what happens after periods of turbulence and adaptation. Our findings show some substitution of ALF for NH care, but the relationship is not linear with ALF market capacity. Communities need to consider the interplay of ALFs and NHs in planning for long-term care services and supports. Policies supporting ALFs may enable care needs to be met in a lower cost setting than the NH.

Keywords

nursing homes, assisted living, elderly

Introduction

The United States faces ongoing questions about how to plan for the mix of long-term services and supports (LTSS) to meet the needs of its aging population. By 2030, the U.S. Census Bureau projects people aged 65 and above will number nearly 72 million and comprise about 19% of the population in contrast to 40 million (13%) in 2010 (Vincent & Velkoff, 2010). Because the likelihood of functional and cognitive disabilities increases with age, an increase in the demand for long-term services and supports is expected to accompany this demographic shift. Over their remaining years of life, more than two thirds of 65 year olds are likely to need help dealing with decreases in functioning (Kemper, Komisar, & Alecxih, 2005).

LTSS may be provided in the community by informal or formal care givers or in institutional settings. Although support for home and community care programs has increased, the elderly who are unable to live independently must rely on institutional care (Hagen, 2013). Thus, with the aging population, such institutions will continue to be an important way to provide needed care for the elderly.

For many years, nursing homes (NHs) were the primary source of around-the-clock institutional long-term care for the elderly in the United States. However, assisted living facilities (ALFs), which provide care at a lower level in a more home-like setting than NHs, have emerged and grown over the past few decades. Estimates of assisted living capacity from different sources during a given year vary, but the data are consistent with rapid

growth from 1990 to the early 2000s and slower growth after 2000 (Bishop, 1999; Harrington, Chapman, Miller, Miller, & Newcomer, 2005; Mollica, Houser, & Ujvari, 2012; Mollica, Sims-Kastelein, & O'Keefe, 2007; Park-Lee et al., 2011; Stevenson & Grabowski, 2010).

In contrast, NH capacity and utilization have decreased. From 1995 through 2010, the number of NHs in the United States decreased by approximately 4% and the number of NH beds decreased by about 3%; occupancy went from 84.5% to 82% (National Center for Health Statistics, 2013). Data collected by the Long-Term Care Focus (LTCF) Project at Brown University also show increases in average NH case-mix from 2000 through 2010 (LTCF). The change in nursing home capacity and use may be related to several factors including greater availability of home and community care (Bishop, 1999), improvements in health among the elderly (Martin, Schoeni, & Andreski, 2010), or declining disability rates (Freedman, Schoeni, Martin, & Cornman, 2007; Kaye, 2013).

The role of assisted living capacity, if any, in changes in NH case mix is not well understood. However, it is important for policy makers and communities planning for LTSS to understand how ALFs and NHs do or do not interact in providing services to the elderly. One

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possible interaction is substitution of assisted living for NH care especially for the elderly whose care needs fall toward the lower end of the spectrum. They may select ALF care because they may prefer the more home-like setting and ALFs are less costly than NHs (Brodie & Blendon, 2001; Genworth Financial, 2010). According to the *Genworth 2010 Cost of Care Survey*, the median annual cost of NH care in the United States for a semi-private room in 2010 was \$67,525 but for assisted living care, it was \$38,200 (Genworth Financial, 2010). Assisted living care could also be a temporary substitute for NH care, delaying NH entry until a resident's care needs grow. If there is such a substitution, NH residents would have more intensive care needs where more ALFs are present in the market, resulting in a higher case mix in NHs.

Alternatively, ALFs may be unrelated to NH case mix if they address a previously unmet need for services, that is, a need that was not being met by NHs anyway. Without the option of ALF care, some elderly, especially those with lower care needs, would not choose to enter a NH. Instead, their care needs would be addressed by family care giving or purchasing care at home or from other community sources. If ALFs are an option, they may choose this type of care. In this case, ALFs would not be a substitute for NHs, and higher ALF market capacity would not be associated with a higher NH case mix. In this study, we examine the relationship between ALF bed capacity and NH case mix.

Previous Research

There has been little direct examination of how assisted living market capacity may be related to NH case mix in the same market. This is, in part, because of the difficulty in obtaining data on ALFs and beds, which must be gathered separately for each state from a state agency. The time period for which data may be available is dependent on state data retention policies.

A study by Newcomer et al. (2001) of the relationship between assisted living market capacity and NH resident case mix found little evidence of substitution of assisted living for NH care. To avoid the inability to control for state policy differences, the authors evaluated the relationship between NH case mix (facility average case mix and case mix for new admissions) and assisted living capacity separately for five states in 1995. Low (but not high) ALF capacity was significantly related to higher NH case mix in one state. In the other four states, there were no statistically significant relationships between assisted living capacity and NH case mix.

Grabowski, Stevenson, and Cornell (2012) report a small statistically significant positive relationship between growth in assisted living units per 1,000 residents aged 65 or older and in NH facility average case mix. Their study included NH panel data from 13 states from 1993 through 2007. The lengths of the panels for the states were not uniform, ranging from 5 to 12 years,

due to limited assisted living data availability. The times covered by the panels also differed by pace of growth in assisted living capacity.

Finally, a more focused study of Texas NHs in 2004 found that the presence of assisted living beds in a county was associated with a higher acuity for residents in NH dementia special care units (Gruneir, Lapane, Miller, & Mor, 2007). However, the authors also concluded that NH administrators may not view ALFs as competitors because their findings show that NHs invest in dementia special care units when other NHs do but not in response to competition from ALFs.

Thus, the findings are mixed, with some evidence indicating a small increase in NH case mix with higher ALF market capacity and other evidence supporting no such relationship. However, these studies examined time periods when ALFs were new entrants to the market or periods characterized by growth—sometimes rapid—in assisted living capacity. During such times, NHs may have been unprepared to adjust to this new market entrant. Even if there was substitution in earlier time periods, it is possible that after initial entry of ALFs or a period of growth in these alternative providers in their markets, NHs adapted to ALFs and made changes to attract potential residents including those with lower care needs, and there was less substitution. Alternatively, it is also possible that communities became more knowledgeable about ALFs and substitution became more common. Consequently, the current relationship between ALF capacity and NH resident case mix may be different from what has been previously reported. We examine this possibility by studying the relationship between assisted living bed capacity and NH case mix using more recent data in a state where assisted living capacity has stabilized.

Method

Sample

Given the limited availability of data on assisted living capacity and our study question, we focus on a single state, Virginia, during a recent time period, 2010. Virginia and this time period are interesting because the capacity of both ALFs and NHs was relatively stable for the 4 years prior to and 3 years after our study period. In contrast to the national trend, published reports show that the total number of licensed ALFs and beds in Virginia peaked in 2001 and declined from 679 to 579 facilities (14.7%) and from 34,696 to 31,824 beds (8.3%) from 2001 through 2007. However, the assisted living bed decline abated from 2007 through 2010 averaging only 0.6% per year. In addition, in the 3 years following the study period, bed capacity was stable, increasing slightly, by an average of less than 1% per year, from 2010 through 2013 (Mollica et al., 2012; Virginia Department of Social Services, 2014). From 2007 through 2010, the total number of NHs increased

by 8 (3%), whereas the total number of beds increased by 1.5% and occupancy held steady at 89.4% and 89.5%, respectively (National Center for Health Statistics, 2013). Thus, the relationship between the two types of care providers had the opportunity to stabilize and mature. Interestingly, Virginia has not been included in any of the previous studies.

Virginia has demographic and policy characteristics similar to and different from other states. Virginia falls in the mid-range of assisted living capacity nationwide (Mollica et al., 2012). The percentage of elderly population is only somewhat lower than the national average. In 2000, 11.2% of Virginia's population was above 65 years of age, whereas in 2010, it was 12.4%. The national average was 12.4% in 2000 and 13% in 2010 (Vincent & Velkoff, 2010). Virginia also has some similarities and differences in policies with other states. Similar to other states, for many years, Certificate of Public Need (COPN) review has been required for NHs but not for ALFs. In 2010, 36 states in the United States required COPN for NHs, but only 5 required certificate of public need review for ALFs (American Health Planning Association, 2011). As in many states, in Virginia, public funding for ALF care is limited (Mollica, 2009). There is a supplement to income for recipients of federal Supplemental Security Income program (Joint Legislative Audit and Review Committee [JLARC], 2012), but Medicaid does not pay for ALF care except for a waiver program paying \$50 per day for up to 200 residents statewide with Alzheimer's disease (Virginia Department of Medical Assistance Services, 2013). Finally, Virginia has been close to the national average in percent of Medicaid long-term care funds spent on home-based care (36% vs. 39% nationally) (Ng, Harrington, & Kitchener, 2010). Thus, Virginia has enough similarities to other states that findings from study of assisted living and NH case mix can provide some insights for planning of LTSS in a number of other states.

In addition to the market stability from 2008 to 2013, we chose 2010 as our study year for several reasons. First, although statewide totals of ALFs and beds in Virginia are available from written reports for a number of years, we were unable to obtain lists of facilities and their bed totals for years prior to 2008 from Virginia state sources. Second, NH case mix was only available through 2010. Third, 2010 is in the middle of the stable period. Finally, using 2010 allows sufficient time for ALFs to adapt to regulations passed in 2005 requiring licensing of ALF administrators and more training for medication administration aides among other regulations that increased costs to ALFs in Virginia (JLARC, 2005). Although an increase in costs to ALFs could decrease capacity, the decline in ALF capacity preceded the 2005 regulations and abated within 2 years of the regulation.

Data. The unit of analysis for the study is the NH. Data for the study are derived from four primary sources. First, data for NH case mix and other NH characteristics are obtained from the LTCF Project at Brown University. Available on the lctfocus.org website, through the year 2010, the LTCF data are compiled using a variety of primary and secondary sources, including the Minimum Data Set (MDS) and Online Survey Certification and Reporting System (OSCAR) from the Centers for Medicare and Medicaid Services, as well as other sources that describe market forces relevant to NHs. The MDS is a tool to assess the physical, psychological, and psychosocial functioning status for all residents in Medicare and/or Medicaid-certified long-term care facilities. It is required on admission and at least quarterly thereafter. All resident-level data are aggregated to the NH level. The OSCAR data show regulatory compliance, operational characteristics, and aggregate patient characteristics for each facility; they are collected during state surveys occurring at least every 15 months. Second, the Virginia Department of Social Services supplied data on the number and bed capacity of ALFs in NH market areas. Other NH market demographic data are drawn from the U.S. Department of Commerce, Bureau of Economic Analysis (BEA) (third data source) and the U.S. Census Bureau (fourth data source). Data from the latter three data sets are merged with the NH data by market area. Because all NH resident data are aggregated to the NH and are from public sources, and all market data are also publicly available, the study is exempt from institutional review board review.

Variables and analysis. Definitions for the study variables are shown in Table 1. The outcome of interest, NH case mix, is measured as the average Activities of Daily Living (ADL) score and the average Resource Utilization Group Nursing Case Mix Index (NCMI) during the calendar year for the NH. The ADL score is the NH's average of residents' total scores on seven ADL categories—bed mobility, transfer, locomotion, dressing, eating, toilet use, and personal hygiene. Each category is scored from 0 to 4. Thus, the total ranges from 0, which indicates complete independence to 28, indicating complete dependence. The average facility Resource Utilization Group NCMI reflects the relative staff time to care for different residents. A higher number means a higher average acuity of residents in the NH. To normalize their distributions, we use the natural logarithms of the case mix variables.

Explanatory variables reflect market as well as NH organizational characteristics likely to be related to case mix (Arling & Daneman, 2002; Feng, Grabowski, Intrator, & Mor, 2006; Grabowski et al., 2012; Newcomer et al., 2001; Scanlon, 1980). Similar to most research concerning NH performance, we use the county as the market area (Banaszak-Holl, Zinn, & Mor, 1996). However, in Virginia, because cities are not included in

Table 1. Variables and Descriptive Statistics.

Variables	M	SD	Source
Dependent variables			
Average facility level ADL score of nursing home residents (avg ADL)	17.73	1.92	LTCF ^a
Average facility level RUG case mix Nursing Case Mix Index of nursing home residents (avg NCMI)	0.84	0.06	LTCF
Explanatory variables			
Market characteristics^b			
ALF beds/1,000 population 65+	32.33	18.64	VA DSS, ^c U.S. Census ^d
Binary indicators using ALF beds/1,000 persons age 65+			
No ALF bed capacity (reference category)	0.07	—	
Low ALF bed capacity (>0 and <23)	0.23	—	
Mid-ALF capacity (≥23 and <37)	0.37	—	
High ALF capacity (≥37)	0.34	—	
Nursing home (NH) competition (Herfindahl index of beds)	0.38	0.28	LTCF
#home health agencies (HHA) per 1,000 persons age 65+	1.04	1.74	LTCF
Per capita income 2010	38,854	11,736	BEA ^e
% 2010 population age 65 years or older	14.43	4.17	U.S. Census
% 2010 Black population	20.63	15.05	U.S. Census
Nursing home organizational characteristics			
Total beds	117.08	58.19	LTCF
For-profit owned (0/1)	0.71	—	LTCF
Chain member (0/1)	0.71	—	LTCF
Has Alzheimer's specialty unit (0/1)	0.14	—	LTCF
% Medicaid residents	58.34	21.64	OSCAR ^f
% Medicare residents	18.83	12.87	OSCAR
Number of observations	248		

Note. ADL = Activities of Daily Living; RUG = Resource Utilization Group; NCMI = Nursing Case Mix Index; ALF = assisted living facility; BEA = Bureau of Economic Analysis; OSCAR = Online Survey Certification and Reporting System.

^aLong-Term Care Focus.

^bVariables measured for market of nursing home. Market is county or city/county combination as defined by the U.S. BEA.

^cVirginia Department of Social Services for numerator.

^dU.S. Census Bureau for denominator.

^eU.S. BEA.

^fOnline Survey Certification and Reporting System.

counties, no matter how small they are, we follow the U.S. BEA practice of combining small independent cities into their surrounding counties (U.S. BEA, 2010). NHs in the study are located in 1 of 92 markets.

The key explanatory variable is the density of assisted living bed capacity in a market, which is measured with the number of licensed assisted living beds per 1,000 population above age 65 (Grabowski et al., 2012). We also divided the measure into four groups, creating four binary indicators. The reference group is zero ALF beds in the market. The remainder of markets, those in which NHs and ALFs were present, were divided into 3 equal groups using the number of licensed assisted living beds per 1,000 population above age 65 to create categories of low, medium, and high assisted living market capacity.

Drawing on previous research, the other market variables chosen indicate competition among NHs and other NH alternatives in the market as well as sociodemographic characteristics. NH competition is measured with a NH Herfindahl index, which indicates NH market

share concentration of beds (Banaszak-Holl et al., 1996). It is defined as the sum of the squares of the market share of NH beds. A value of one indicates that there is no market competition, that is, there is one NH in the market. Lower values indicate higher competition. Availability of home health care, which may be an alternative to NH care for some elderly, is indicated with the number of home health agencies (HHA) per 1,000 persons aged 65 and older.

Sociodemographic characteristics related to demand for NH care and health status are per capita income, percent population above age 65, and percent Black population (Scanlon, 1980). It is important to control for per capita income in part because of the difference in sources of payment for ALF and NH services. Payment for assisted living services is largely from private sources, mostly out of pocket. Although some states provide some support for assisted living care, the large majority of ALF residents receive no assistance from state programs, and for those who do receive assistance, the dollar amounts provided are often low (Mollica, 2009). In

contrast, the largest payer for long-term NH care is the Medicaid program (American Health Care Association, 2013).

NH organizational variables reflect total bed size, ownership, chain membership, and service mix (an Alzheimer's specialty unit; Arling & Daneman, 2002). We also control for percent Medicare and Medicaid residents. Medicare residents generally need a higher level of care (Scanlon, 1980).

We estimate a linear regression model for each dependent variable using STATA Version 13. The empirical model is

$$CM = a + b_1ALF + b_2MKT + b_3ORG + e,$$

where CM refers to NH case mix, ALF refers to ALF bed capacity in the market, MKT refers to a vector of market variables, ORG refers to a vector of organizational variables, and e is the error term. We tested for endogeneity of NH competition using lagged NH market structure as an instrumental variable as suggested by Bowblis (2012) using the Durbin–Wu–Hausman test (Baum, 2006). We also tested for heteroskedasticity and adjusted standard errors for clustering of NHs within markets when it was present.

Results

Initially, there were 286 facilities included in the LTCF data. However, because hospital-based facilities are fundamentally different from other NHs (Banaszak-Holl et al., 1996), similar to most studies of NHs, we excluded 19 such facilities from this study. We also excluded specialty facilities such as training centers and acute long-term care facilities as well as NHs in operation for a year or less. Six facilities were excluded due to missing data for the dependent variables. These six were smaller facilities that were part of a continuing care retirement community. The final number of facilities in the study was 248.

Table 1 displays the descriptive statistics for the study variables. The mean number of ALF beds per thousand in 2010 was 32.33. The mean Herfindahl index of 0.38 shows that most NHs were located in markets with competition from other NHs; the range was from 0.08 to 1.0. Average bed size was 117 and NHs were largely for-profit and members of chains.

Both of our potential instruments for the 2010 Herfindahl index were strongly related to the index. However, results of tests of our models with the lagged (2009) Herfindahl index as an instrumental variable for NH competition indicated endogeneity for the NCMI but not for the ADL equations, and tests of the models total 2009 nursing home market beds indicated no endogeneity. We found heteroskedasticity for the average ADL but not the average NCMI models. Thus, in Table 2, we present the ordinary least squares models for average NH ADL with standard errors adjusting for clustering by NH markets.

We present the instrumental variable models for the average NH NCMI models; these results were very similar to the results for the models without the instrumental variable.

Initial models using the continuous measure of assisted living capacity showed no significant linear relationship between ALF capacity and either average facility ADL or NCMI. However, as shown in Table 2, when we examined the series of binary indicators of ALF capacity or included a squared term, we found some support for a nonlinear relationship. NHs in markets with low and mid-range of ALF capacity had a higher average all resident ADL case mix than those in market with no ALF beds ($p = .04$ and $.09$, respectively). However, NHs in markets with the highest ALF ratios did not have case-mix indices that were significantly different from NHs with no ALF capacity in their markets. An examination of the average ADL for NHs by ALF market capacity shows 17.04 for NHs in markets with no ALF beds, but 17.93 and 17.92 for NHs in the low and mid-range ALF markets, respectively. Instead of continuing the increase with ALF capacity, the average ADL for NHs in the markets with the highest capacity turns down to 17.51. A regression model with a squared ALF capacity term shows a nonlinear relationship with facility resident ADL case mix, confirming the downturn in case mix at higher ALF capacity levels (Table 2). The only other variable significantly related (positive) to average facility ADL is per capita income ($p < .10$).

The findings for the NCMI case mix are different. There is no statistically significant relationship between ALF capacity and this measure of NH resident case mix. However, both the percentage of Medicare and Medicaid residents are significantly positively associated with NCMI, whereas having an Alzheimer's unit is associated with a lower NCMI.

Our results did not change with two sensitivity analyses. First, although there was little change statewide in assisted living capacity in the 3 years preceding the study, in some markets in the state, there was greater change. We reestimated the models after eliminating markets with the highest and lowest deciles of change in ALF beds per 1,000 population above 65 from 2008 through 2010. In these markets, the ALF capacity ratio increased by more than 3.66 or decreased by more than 5.83. Second, we eliminated NHs that are part of continuing care retirement communities (CCRCs), which include assisted living care, because they may not compete with ALFs for NH residents.

Discussion

This study examined the relationship between assisted living market capacity and NH case mix in Virginia after the growth in ALFs subsided and bed capacity stabilized and, seemingly, adjusted to demand. NH bed capacity and use in Virginia were also stable. Although

Table 2. Results for Average Facility Case Mix.

	In average ADL ^a		In average NCMI ^b	
	Model 1	Model 2	Model 1	Model 2
Market characteristics				
ALF beds/1,000 population 65+	—	.0026 [†] (.0014)	—	.0005 (.0007)
ALF squared	—	-.00004 (.00002)*	—	-.0000 (.0000)
Low-ALF bed capacity	.0744* (.0359)	—	.0195 (.0188)	—
Mid-ALF bed capacity	.0731 [†] (.0426)	—	-.0016 (.0192)	—
High-ALF bed capacity	.0510 (.0388)	—	.0199 (.0192)	—
NH Herfindahl index	.0552 (.0375)	.0465 (.0357)	-.0036 (.0196)	-.0018 (.01998)
Number HHA/1,000 pop. 65+	.0009 (.0040)	.0015 (.0038)	.0036 (.0026)	.0027 (.0026)
Per capita income 2010/1,000	.0010 [†] (.0006)	.0007 (.0006)	.0005 (.0004)	.0002 (.0011)
% 2010 population age 65 years or older	-.0005 (.0018)	.0008 (.0020)	-.0003 (.0012)	.0005 (.0004)
% 2010 Black population	.0005 (.0007)	.0008 (.0006)	-.0007* (.0003)	-.0005 (.0003)
Organizational characteristics				
Total beds	-.0002 (.0001)	-.0002 (.0001)	.0001 (.0001)	.0001 (.0001)
For-profit owned	-.0162 (.0206)	-.0163 (.0206)	.0062 (.0099)	.0068 (.0100)
Chain member	-.0103 (.0187)	-.0081 (.0188)	.0097 (.0091)	.0127 (.0091)
Alz unit	-.0085 (.0211)	-.0013 (.0202)	-.0295*** (.0127)	-.0311** (.0117)
% Medicaid	-.0000 (.0004)	.0000 (.0004)	.0007* (.0003)	.0006* (.0003)
% Medicare	.0003 (.0008)	.0005 (.0007)	.0018*** (.0004)	.0018*** (.0004)
Constant	2.782*** (0.0714)	2.817*** (0.0674)	-0.2840*** (0.0434)	-0.2993*** (0.0403)
Prob. F	1.74 [†]	1.97 [†]	4.35***	4.16***
R ²	.0597	.0694	.2076	.1875
N	248	248	248	248

Note. ADL = Activities of Daily Living; NCMI = Nursing Case Mix Index; ALF = assisted living facility; HHA = home health agencies.

^aEstimated with ordinary least squares with standard errors adjusted for clustering by nursing home market area.

^bEstimated with instrumental variable for nursing home competition and unadjusted standard errors.

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

it is interesting to study markets in flux, for planning purposes, it is also important to examine what happens after periods of turbulence and adaptation.

Our findings provide some support for substitution of assisted living for NH care, but the relationship does not appear to be linear. That is, in markets with low- to mid-level ALF bed capacity, the facility average ADL score is higher than where there are no ALF beds. However, this is not the case in areas with the highest ALF bed capacity where there was no statistically significant

relationship. These results suggest that NHs in high ALF markets, perhaps because of their more frequent interaction with them, may have found a way to compete with ALFs for residents with care needs at the lower end of the case-mix spectrum.

In contrast, we did not find any significant relationship to ALF bed capacity for the NCMI case-mix measure. It is likely that the NCMI is more reflective of characteristics of NH residents likely to have a short stay for rehabilitation or medical care than the

characteristics of residents who must choose a long-term stay in assisted living or NH facility (Feng et al., 2006).

The study findings are consistent with Newcomer et al. (2001) for one state; however, our findings suggest a substitution in the mid-range of ALF capacity as well as the low range, although the results agree that there is no substitution where ALF capacity is high. There are also similarities in our findings to those from the Grabowski et al. (2012) panel study. They report a linear relationship between the change in ALF capacity and the change in both the average facility ADL and the NCMI measure. In their study, the coefficients for ALF capacity in both models are small, but especially in the NCMI equation. It is possible that the smaller size of our sample was not sufficient to detect a relationship of this small magnitude. Still, we differ by not finding a linear relationship between ALF capacity and NH case mix.

Our results suggest that policies that make more assisted living care accessible to the elderly may result in better matching of care needs to the appropriate type of facility. That is, the care needs of some of the residents in NHs where there are no ALFs may be able to be addressed by assisted living rather than NH care. Because state Medicaid programs pay for much care, states, and Virginia, in particular, may be able to lower their long-term care costs with such policies. However, families, care givers and policy makers must be careful to match individual elderly persons to the best care setting for each. They must be careful in assuming that equivalent outcomes are obtained in different settings. For example, recent research shows that placement in a home care setting rather than a NH may lead to a higher likelihood of potentially preventable hospitalizations (Wysocki et al., 2014). Other research concludes that the assumption that people always prefer less institutional care is not accurate (Guo, et al. 2015). Further similar studies are needed.

The current study involves NHs in one state chosen for the stability of ALF and NH capacity. Although the strengths of studying a single state include identifying an interesting market situation of stability and eliminating potentially confounding state policy differences, limitations include smaller sample size and, potentially, lack of generalizability of the results to other states. However, as noted previously, Virginia has many demographic and policy similarities to other states that are likely to make the findings relevant to other states. Still, reasonable care should be exercised in generalizing the results.

Although the results of this study increase our understanding of the market interplay between ALF capacity and the case mix of residents in NHs, state and federal policy changes could affect the relationship between ALFs and NHs. For example, as hospitals focus on avoiding rehospitalization payment penalties from Medicare, ALFs may find opportunities to assist hospitals by

increasing their service capabilities and forming partnerships with them (Stone, 2014). Planners will need to consider the evolution of ALFs as they address LTSS needs of the elderly in the United States. Consequently, NHs and policy makers must continue to monitor the ALF–NH market interplay to ensure the availability and best fit of long-term care services and supports for the aging U.S. population.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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