The Unequal Availability of Affordable Assisted Living Units in Florida’s Counties

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The supply of affordable assisted living facilities (ALFs) is now insufficient to meet the demands of low-income, frail older persons. This gap between demand and supply is much more apparent in some locations than others. This article uses various measures of locational inequality to assess the extent to which counties in Florida have less than their fair share of ALFs, particularly in comparison to the locations of Medicaid nursing home beds. It employs least squares regression models to identify the demographic and economic antecedents underlying the variation in the number and prevalence of affordable ALF units and Medicaid nursing home beds. The findings show that a large percentage of the older population who are vulnerable are underserved by affordable ALFs and that it is possible to explain adequately the variation in the number but not the unequal prevalence of affordable ALF units in Florida’s counties.

Keywords: assisted living facilities; affordable elderly housing; location inequities; nursing homes; housing inequality; Florida

The private-sector-developed assisted living facility (ALF) is the most prominent and fastest-growing shelter and care alternative for frail older persons (National Center for Assisted Living, 2001). This noninstitutional housing option provides shelter, meals, personal care services, and some nursing services to older and disabled persons who are unable to live independently in their own homes (Golant, 1998). It formally emerged in the United States in the mid-1980s, inspired by models in Oregon and on the east coast (Kane & Wilson, 2001). As one prominent consultant sums up, it was “a reaction against premature institutionalization” (Manard, 1999, p. 24). Nursing homes were considered “too medical, too regulated, too stifling to the human spirit of those who worked and lived in them” (Manard, 1999, p. 24). This alternative has grown considerably in the past decade, with the number of beds or units increasing by almost 115% between 1991 and 1998 (Mollica, 2001).
2000). Although its growth has slowed because of oversaturated markets, it still experienced a 14.5% growth rate between 2000 and 2002 (Mollica, 2002). About 95% are owned by for-profit entities (either privately or publicly held), and 5% are owned by not-for-profits (American Seniors Housing Association, 2001). The typical ALF resident is a woman in her early 80s who requires assistance with an average of 2.3 activities of daily living. In contrast, the average nursing home resident needs assistance with 3.8 activities of daily living (National Center for Assisted Living, 2001).

This alternative has primarily catered to higher income elderly consumers. Most low-income, frail older persons, however, find it an unaffordable option unless they can rely on financial help from their families or government subsidies (Promatura Group, 1999). As of October 2002, 41 states were able to use their Medicaid waiver programs to subsidize the personal care and nursing services provided in ALFs (Mollica, 2002). To subsidize the shelter cost component, however, state governments must find alternative funding sources. Typically, Medicaid beneficiaries rely on their Supplemental Security Income (SSI) payments in combination with supplements to SSI from state governments (Mollica, 2001). Slots available for these subsidization approaches, however, are very limited, and most assessments agree that the current supply falls very short of meeting the latent, low-income, elderly demand for affordable assisted living (Florida Policy Exchange Center on Aging, 2001).

Published research is nonexistent, however, on where the shortfall is most pronounced within states. To address this issue, we compare the current county locations of affordable ALFs in Florida with the county locations of the at-risk population of low-income, frail older persons. We carry out two sets of analyses. First, we examine the extent to which the county location distributions of affordable ALFs are similar to those of the at-risk low-income, frail older population. Second, we assess the extent to which the variation in the number and prevalence of affordable ALFs in Florida’s counties can be explained by their social and economic characteristics. In both analyses, we use the locational patterns of Medicaid-funded nursing home beds as a standard by which to interpret the locational pattern of affordable ALFs.

Method

Definitions

ALFs. In Florida, smaller (often family-owned) board-and-care facilities and professionally administered (often corporate-owned) facilities are...
licensed as ALFs by the Agency for Health Care Administration (AHCA). Most older persons who are low income cannot afford to occupy ALF units; however, two state-federal programs provide subsidies to low-income older persons. First, needy older, disabled, or blind persons who receive federal SSI benefits are also eligible to receive a State of Florida Optional State Supplement (OSS) income subsidy to cover the shelter costs of the ALF and, as of 2001, the Assistive Care Services State Plan option to cover personal care services. Second, older persons who are frail are eligible to receive a Medicaid waiver (a state-federal program) to cover the care costs of an ALF. This program requires them to have an income less than 300% of the SSI eligibility threshold. This analysis relied on the first definition of affordable ALF units. Medicaid waiver funding in 1999 in Florida was not statewide and served only 1,284 persons (Vinton, 1999).

Medicaid nursing home beds. Licensed nursing homes are made affordable to low-income persons with limited financial assets who are in medical need of nursing facility care under the state-federal Medicaid program.

Frailty. Based on respondent self-report measures collected by the U.S. Census, persons are considered frail if they have either mobility or self-care limitations. Mobility-limited persons have a limitation that has lasted for 6 or more months making it difficult for them to go outside the home alone. Self-care limited persons have a condition lasting for 6 or more months making it difficult for them to take care of personal needs, such as dressing, bathing, or getting round inside the home. Very frail older persons are defined as those having mobility and self-care limitations.

Lower income persons. The different eligibility standards used to make ALFs and nursing homes affordable result in multiple income cut-offs. Because it was impossible to determine for any given ALF or nursing home facility the income-level threshold by which older persons became eligible, we employed the most liberal definition of lower income. This resulted in persons with lower incomes having annual incomes of $13,320 or less (based on 300% of SSI income thresholds of $4,440 annually). We defined persons with higher income as having incomes above this threshold.

Vulnerable older persons. Persons age 65 and older who are frail and have lower incomes.

Very vulnerable older persons. Persons age 65 and older who are very frail and have lower incomes.
Nonvulnerable older persons. Persons with higher income who are age 65 and older with no self-reported frailty.

County locations. Counties offer a standardized and relatively unchanging small area unit to summarize the locations of frail, low-income older persons and their affordable ALF and nursing home accommodations.

Estimating the Number of Affordable ALF Units and Medicaid Nursing Home Beds by County

The AHCA maintains a list of all licensed ALF facilities in Florida. To be able to live in an ALF, a person must meet residency criteria that is defined by Florida statute and regulation and facility policies. Florida state agency databases do not classify the residents of ALFs by age or income. They do indicate, however, the number of units in each facility receiving Optional State Supplements (OSS). On average, approximately 50% of the total number of OSS recipients in these ALFs are age 65 and older (Oakley, 2000a). Based on this ratio, the analysis included 6,463 OSS elderly occupants in Florida’s ALFs. Some of the 67 counties had no recorded affordable ALF units, and in these instances, it was necessary to assign each of these counties one bed to carry out some of the statistical analyses in the current study. This resulted in an increase of 12 beds and had no significant effect on the results.

The question arises whether any of the other ALF units can also be considered affordable. Typically, ALFs that accept exclusively private-pay residents charge 50% more for a private room than ALFs that accept OSS residents (Brooks, 1994). Data are not available, however, to establish if these charged prices are affordable to their private-pay residents, especially because the cost of living varies throughout the state. For this reason, affordable ALF units included only those that were subsidized under the State’s OSS program.

Data from Florida’s annual review of nursing home bed supply for its Certificate of Need process (Agency for Health Care Administration, 2000) were used to record the number of Medicaid nursing home beds in each county. Data on the age of nursing home residents by payer source were also not available; however, based on the national elderly-nonelderly nursing home occupancy ratio (Jones, 2002), it was assumed that 90.3% of all beds reimbursed by Medicaid were elderly occupied. In the year 2000, this resulted in the identification of 47,551 Medicaid nursing home beds. Some of the 67
counties had no Medicaid-occupied nursing home beds, and these were assigned one bed each to carry out the analysis. This resulted in an increase of 3 beds and had no significant effect on the results. These data necessarily describe bed utilization by persons who are Medicaid eligible during a particular year. At any future time, persons who are Medicaid eligible could conceivably occupy all nursing home beds in the state (except for sheltered beds in continuing care retirement communities).

Estimating the Size of Low-Income, Frail Older Persons by County in the Year 2000

Household projections by age of householder for each county in the year 2000 were available from the University of Florida’s Shimberg Center on Affordable Housing in conjunction with estimates made by the University’s Bureau of Economic and Business Research (BEBR). Comparable household data for the year 1990 were available from the November 28, 1994, reissue of the 1990 U.S. Census (Department of Commerce) Population and Housing, Public Use Microdata Samples published on CD-ROM. The 5% Florida data sample includes 337,516 households and 652,504 persons (excluding persons in institutions or group homes).

For the state overall in 1990, cross-tabulation analyses returned the number and percentage of low-income, frail older persons (age 65 to 74 and age 75 and older) found in households headed by four age groups of householders: younger than age 55, age 55 to 64, age 65 to 74, and age 75 and older. The 1990 percentages were then used to estimate the number of low-income, frail older persons found in the comparable year 2000 projected householder groups. (As of this date, the U.S. Census has not published year 2000, income by frailty data for counties.) This procedure obviously assumes that the percentage of an age-defined householder group containing low-income and frail older persons in 1990 will remain constant in 2000. For example, if 20% of the persons in a given low-income householder age group was frail in 1990, it was assumed that 20% of the persons in the comparable year 2000 householder group were also poor and frail. Data availability constraints made this a necessary assumption.

These procedures were repeated to obtain comparable county estimates. This task was complicated because the 70 Florida geographic units of the Public Use Sample (PUMAS) do not always neatly coincide with the 67 county boundaries. Some PUMAs contain multiple counties; other PUMAs must be aggregated to coincide with a single county; and some PUMAs and counties are exactly equivalent. Fifteen PUMAs exactly correspond to the
boundaries of specific counties. Twelve PUMAs each encompass the boundary areas of 2 or more counties (44 counties in all). Forty-three PUMAs each correspond to a part of a single county (8 counties in all). Given the requirement of summarizing data indicators by counties, it was necessary to assume that all the counties enclosed within a given multicounty PUMA had the same data values (income and frailty percentages) as for the overall PUMA. Data values for multi-PUMA counties were aggregated to the appropriate county boundaries. No boundary aggregation assumptions were necessary when PUMA and county boundaries exactly matched.

**Locational Measures and Analyses**

The first set of analyses measures the extent to which affordable ALF units and Medicaid nursing home beds are unequally found throughout Florida’s counties and the extent to which vulnerable and very vulnerable older persons at risk of needing these facilities are living in counties that are under- or overserved by them. These analyses are based on the following locational measures.

*County inequality quintiles.* These inequality measures are typically used to describe the extent to which the wealth of a population is concentrated in the hands of a relatively few, as in \( x\% \) of the wealth is possessed by \( y\% \) of the population (Schwartz & Winship, 1979). Here these measures document the extent to which either affordable ALF units or persons at risk of needing affordable ALF units are disproportionately concentrated in relatively few counties. For any given measure, the 67 counties are ranked from high to low and then are divided into five groups (quintiles) based on their ranked positions (four groups of 13 counties each, and a fifth group of 15 counties). This allows an assessment, for example, of the percentage of the state’s vulnerable elderly population that is found in the 20% of the counties having the largest number of vulnerable elderly persons.

*Index of Dissimilarity.* Sociologists and urban analysts have primarily relied on the Index of Dissimilarity to assess racial and ethnic segregation patterns at the neighborhood (census tract or block) level (Massey & Denton, 1989). Here the Index is designed to offer a global and generalized measure of the extent to which two populations (e.g., vulnerable older persons and affordable ALF units) are unequally distributed across a set of counties (James & Taeuber, 1985; White, 1987).

The mathematical formula for this measure is computationally simple. Consider the \( r = 67 \) Florida counties. The \( i \)th county contains a population of
V_i, vulnerable older persons and A_i, persons in affordable ALF units. Summing over i,

\[ \sum_i V_i = V \quad \text{and} \quad \sum_i A_i = A \]

give state totals. Then, the mathematical formula for the Index of Dissimilarity calculated over r = 67 counties is

\[ \frac{1}{2} \times \sqrt{\sum_{i=1}^{r} \left| \frac{V_i}{V} - \frac{A_i}{A} \right|} \]

It can assume values ranging from 0.0 to 1.0. Multiplied by 100, it can be interpreted as the percentage of one group (of persons) that would have to change counties (from those counties where they are overrepresented) for the population and affordable ALF units to display identical county location distributions.

Location quotient. This measure assesses the degree of concentration of one subgroup in each of a set of specific geographic areas relative to the degree of concentration exhibited by a comparison subgroup. As an example, County X may be occupied by 5% of the state’s vulnerable elderly population but may contain only 1% of the state’s total supply of affordable ALF units. In contrast, County Y may be occupied by 5% of the state’s vulnerable elderly population but may contain 9% of the state’s total supply of affordable ALF units. In this example, County X has fewer affordable ALF units than would be expected given its population in need, whereas County Y has more affordable ALF units than expected. A location quotient of 1.0 for a county (Q_i) would be returned if its percentage share of vulnerable elderly population equaled its percentage share of affordable ALF units. The mathematical formula using the above symbols is

\[ Q_i = \left( \frac{V_i}{V} \right) / \left( \frac{A_i}{A} \right) \]

or perhaps more easily interpreted is

\[ Q_i = \left( \frac{V_i}{A_i} \right) / \left( \frac{V}{A} \right) \]

A unique Q_i is computed for each of 67 counties. The location quotient can return a value as low as zero and as high as 1/(V/A).

The latter formulation makes clear that the size of a county’s computed location quotient depends on the similarity between the county and the state ratios of, for example, the number of affordable ALF units to the number of vulnerable elderly persons. If a county has two affordable ALF units for every 10 vulnerable older persons (a ratio of 0.2), and in the state overall there is one affordable ALF unit for every 10 vulnerable older persons (a ratio of 0.1), then the county’s location quotient would equal 2.0. In this example, the county in question has 2 times the number of affordable ALF units than
would be expected given the availability of affordable ALF units in the state overall. This particular interpretation makes clear a characteristic of most inequality or segregation measures. They measure how a subarea’s concentration compares with the overall (state) concentration of some population.

The location quotient values are categorized into five groups with equal intervals (with the exception of the last group having a variable upper limit): 0.0 to 0.49, 0.50 to 0.99, 1.00 to 1.49, 1.50 to 1.99, and 2.00 and more. By statistical definition, the first two intervals designate underserved counties. The analysis will refer to counties with this statistical range of location quotient values as having fewer than their fair share of affordable ALF units or Medicaid nursing home beds (depending on the analysis). The other intervals designate appropriately- or overserved counties (1.0 or higher), that is, counties with at least or more than their fair share of affordable units or beds. The analysis then computes the percentage of Florida’s vulnerable elderly population found in each group of counties defined by the five location quotient (under- or overserved) intervals.

Demographic and Economic Correlates of the Variable Locations of Affordable ALF Units and Medicaid Nursing Home Beds

The second set of analyses assesses the extent to which the diverse demographic and economic makeup of Florida’s 67 counties can account for the county locations of affordable ALF units and Medicaid nursing home beds. The first two dependent variables describe the number of affordable ALF units or Medicaid nursing home beds found throughout Florida’s counties:

**ALF.** Number in each county of affordable ALF units occupied by persons who are age 65 and older, in the year 2000 ($M = 96.6; SD = 323.7$).

**MEDICAID.** Number in each county of Medicaid-funded nursing home beds occupied by persons who are age 65 and older in the year 2000 ($M = 709.8; SD = 1050.0$).

The second two dependent variables describe the extent to which counties have an over- or undersupply of affordable ALF units or Medicaid nursing home beds relative to their share of their vulnerable older populations:

**ALFHEAVY.** A county’s location quotient showing the extent to which the ratio of affordable ALF units to vulnerable older persons is greater (or lesser) than the comparable ratio computed for the state overall. Values greater than
1.0 indicate counties that are overrepresented or have a greater than their fair share of affordable ALF units ($M = .94; SD = 1.5$).

**MEDHEAVY.** A county’s location quotient showing the extent to which the ratio of Medicaid beds to vulnerable older persons is greater (or lesser) than the comparable ratio computed for the state overall. Values greater than 1.0 indicate counties that are overrepresented or have a greater than their fair share of Medicaid beds ($M = 1.2; SD = .71$).

There is a relatively weak and insignificant relationship between the number of affordable ALF units in Florida’s counties and the extent to which these counties are under- or overserved by affordable ALF units (simple $r = .18$). Thus, the two dependent variables, ALF (the number of ALF units) and ALFHEAVY (degree of representation of ALF units), are describing very different indicators of locational availability. Similarly, a weak and insignificant relationship exists between the number of Medicaid nursing home beds in Florida’s counties and the extent to which these counties are under- or overserved by Medicaid nursing home beds (simple $r = -.04$).

Six independent variables are proposed to describe the variable demographic and economic makeup of Florida’s 67 counties. Along with the earlier described measures of the low-income older population’s vulnerability, county population poverty measures for the year 1997 are based on data from the U.S. Census, March 1998 current population survey (U.S. Census Bureau, 1998). The size of the county’s year 2000 old-old population (age 75 and older) is based on year 2000 U.S. Census Bureau’s profile of general demographic characteristics (2001). The variables and their simple statistical properties are as follows:

**VERYVULOLD.** The number in each county of very vulnerable persons in the year 2000 ($M = 1,113.1; SD = 1835.3$).

**PERGROWTHVUL.** 1990-2000 percentage growth in each county of the number of vulnerable older persons ($M = 43.6; SD = 21.5$).

**VULHEAVY.** Location quotients computed for each county showing the extent to which the ratio of vulnerable older persons to nonvulnerable (higher income, no self-reported frailty) older persons in 2000 is greater than the comparable ratio computed for the state overall. Values greater than 1.0 indicate counties that are overrepresented or top heavy with vulnerable older persons ($M = 1.7; SD = 1.1$).
MEDALFHEAVY. Location quotients computed for each county showing the extent to which the ratio of Medicaid beds to affordable ALF units in 2000 is greater than the comparable ratio computed for the state overall. Values greater than 1.0 indicate counties that are overrepresented or top heavy with MEDICAID beds relative to affordable ALF units ($M = 6.5; SD = 10.1$).

POVERTY. Percentage of the total population in the county that is below the 1997 Bureau of Labor Statistics 100% poverty level threshold ($M = 16.8; SD = 5.2$).

OLDOLD. Percentage of the county population age 75 and older in the year 2000 ($M = 7.7; SD = 3.5$).

The following ordinary least squares multiple regression equations were computed (where $\beta_i$ are standardized regression coefficients, and $a$ is the intercept) to assess the extent to which the availability of affordable ALF units and Medicaid nursing home beds in a county can be explained by its demographic and economic characteristics.

$$\text{ALF} = a + \beta_1 \text{VERYVULOLD} + \beta_2 \text{PERGROWTHVUL} + \beta_3 \text{VULHEAVY} + \beta_4 \text{OLDOLD} + \beta_5 \text{MEDALFHEAVY} + \beta_6 \text{POVERTY} + \beta_7 \text{MEDHEAVY}$$

$$\text{MEDICAID} = a + \beta_1 \text{VERYVULOLD} + \beta_2 \text{PERGROWTHVUL} + \beta_3 \text{VULHEAVY} + \beta_4 \text{OLDOLD} + \beta_5 \text{MEDALFHEAVY} + \beta_6 \text{POVERTY} + \beta_7 \text{ALFHEAVY}$$

$$\text{ALFHEAVY} = a + \beta_1 \text{VERYVULOLD} + \beta_2 \text{PERGROWTHVUL} + \beta_3 \text{VULHEAVY} + \beta_4 \text{OLDOLD} + \beta_5 \text{MEDALFHEAVY} + \beta_6 \text{POVERTY}$$

$$\text{MEDHEAVY} = a + \beta_1 \text{VERYVULOLD} + \beta_2 \text{PERGROWTHVUL} + \beta_3 \text{VULHEAVY} + \beta_4 \text{OLDOLD} + \beta_5 \text{MEDALFHEAVY} + \beta_6 \text{POVERTY}$$

It is hypothesized that counties with larger numbers of vulnerable older persons, higher growth rates of the vulnerable older population, higher rates of poverty, and higher proportions of old-old persons (age 75 and older) will have more affordable ALF units or Medicaid nursing home beds. Counties having a larger number of Medicaid nursing home beds are also expected to have an underrepresentation of affordable ALF units (relative to Medicaid nursing home beds). The inverse will also be true: Counties having more affordable ALF units are also expected to have an underrepresentation of Medicaid nursing home beds (relative to affordable ALF units). The availability of home and community-based alternatives, including ALF facilities,
is related to the supply of nursing home beds (Oakley, 2000b). Thus, an individual who is Medicaid eligible is more likely to be placed in a nursing home bed than in an alternative noninstitutional setting, where the nursing home bed supply is larger.

It is hypothesized that counties with larger populations of vulnerable older persons will have older populations that are more top heavy with the vulnerable old, have overall higher rates of poverty, have a higher proportion of old-old persons, and will be overrepresented with either affordable ALF units or Medicaid nursing home beds relative to the size of their vulnerable older populations. Counties that have an underrepresentation of Medicaid nursing home beds (relative to affordable ALF units) will also be overrepresented with affordable ALF units. Counties that have an underrepresentation of affordable ALF units (relative to Medicaid nursing home beds) will be overrepresented with Medicaid nursing home beds.

Findings

Locational Inequality of Older Vulnerable Persons and Affordable ALF Units and Medicaid Nursing Home Beds

More than two thirds of the vulnerable and very vulnerable older populations are concentrated in only 20% of Florida’s counties (Table 1). Just more than two thirds of Medicaid nursing home beds are also concentrated in only 20% of Florida’s counties. Affordable ALF units, on the other hand, present a more unequal locational distribution with 84% of these accommodations found in only 20% of Florida’s counties.

The dissimilarity index analysis shows that 40% of affordable ALF units would have to be relocated if their county distribution were to be similar to that of Medicaid nursing home beds (Table 2). It also shows that about 33% of affordable ALF units would have to be relocated if they were to have a county distribution similar to the vulnerable older population. There is a marginally better fit between the county locations of affordable ALF units and the very vulnerable older population (31%). In contrast, only 15% of Medicaid nursing home beds would have to be relocated if they were to achieve a county distribution similar to the vulnerable older population.

These uneven distributions result in 36.6% of the vulnerable older population living in counties with “much below their fair share” of affordable ALF units, compared to just 11.3% of this same group living in counties with
When including counties that have “somewhat below their fair share,” of these options, 66.6% of the vulnerable older population is underserved by affordable ALF units, and 60.2% are underserved by Medicaid nursing home beds. The same pattern holds true for the very vulnerable older population. At the other extreme, however, between 15.1% and 16.7% of the vulnerable or very vulnerable older population are living in counties that have “extremely above their fair share” of affordable ALF units. This contrasts sharply with the between 1.5% and 2.2% of vulnerable or very vulnerable older persons who occupy counties that have “extremely above their fair share” of Medicaid nursing home beds. Overall, the findings show that relative to the county locations of the at-risk, vulnerable older population, Medicaid nursing home beds are less likely than affordable ALF units to be either extremely under- or overavailable in most counties.

### Regression Modeling Results

As expected, counties with higher poverty rates and larger numbers of very vulnerable older populations have larger numbers of affordable ALF units (Table 4). The model to predict the number of Medicaid beds performs somewhat differently. Although the number of very vulnerable older persons significantly increases the number of Medicaid beds in a county, contrary to expectations, the percentage growth of the vulnerable older population decreases the number (Table 4). Poverty is also not a significant predictor of the number of Medicaid nursing home beds in a county. The other

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**Table 1. County Distributions of Vulnerable Older Population and Affordable Long-Term Care Options (in percentages; N = 67)**

<table>
<thead>
<tr>
<th>Vulnerable Older Population or Accommodations</th>
<th>Top One Fifth of Counties</th>
<th>Second One Fifth of Counties</th>
<th>Third One Fifth of Counties</th>
<th>Fourth One Fifth of Counties</th>
<th>Bottom One Fifth of Counties</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persons age 65 and older, vulnerable</td>
<td>67.6</td>
<td>18.3</td>
<td>8.7</td>
<td>3.7</td>
<td>1.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Persons age 65 and older, very vulnerable</td>
<td>68.3</td>
<td>17.3</td>
<td>9.0</td>
<td>3.6</td>
<td>1.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Medicaid-funded nursing home beds, 2000</td>
<td>66.8</td>
<td>18.1</td>
<td>8.4</td>
<td>4.5</td>
<td>2.2</td>
<td>100.0</td>
</tr>
<tr>
<td>Affordable assisted living units, 2000</td>
<td>83.8</td>
<td>9.5</td>
<td>4.6</td>
<td>1.8</td>
<td>0.3</td>
<td>100.0</td>
</tr>
</tbody>
</table>

"much below their fair share” of Medicaid nursing home beds (Table 3).
demographic and supply variables do not contribute to either model after controlling for the significant variables. The models explain 81% and 84% of the variance, respectively.

These findings can be explained by the fact that ALFs operate on a free-market basis, and counties with higher poverty rates will attract ALF providers who accept OSS residents. In contrast, nursing homes are constricted by a certificate of need process and are located where the demand for private pay or Medicaid beds is believed to be the greatest. In Florida counties, the percentage growth of vulnerable older populations in the past decade was negatively correlated with their number of vulnerable old (\( r = -0.37, p \leq 0.01 \)). That is, even small percentage growth rates often yield relatively large numerical growth of the vulnerable older population in larger counties. In contrast, the higher growth rates experienced by many smaller counties still yield relatively small increases in the size of their very vulnerable older populations. In this way, percentage growth of a county’s vulnerable older population is an indicator of the size of its population who is older.

The models become even more complex to interpret when predicting counties that are top heavy with affordable ALF units or Medicaid nursing home beds (ALFHEA\_VY and MEDHEA\_VY) relative to the number of their vulnerable old (Table 5). Counties that are top heavy with affordable ALF units can no longer be significantly explained by the number of their very vulnerable older persons, and the poverty rate emerges as the strongest positive predictor. As expected, the ratio of Medicaid nursing home beds to affordable ALF units (MEDALFHEA\_VY) reduces the top heaviness of affordable ALF units (\( \beta = -0.28 \)).

The size of a county’s very vulnerable older population now unexpectedly reduces the top heaviness of its Medicaid nursing home beds emphasizing the incongruence between demand and supply (Table 5). The percentage

<table>
<thead>
<tr>
<th>County Distribution Comparisons</th>
<th>Index of Dissimilarity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affordable ALF units vs. vulnerable older persons</td>
<td>.33</td>
</tr>
<tr>
<td>Affordable ALF units vs. very vulnerable older persons</td>
<td>.31</td>
</tr>
<tr>
<td>Medicaid nursing home beds vs. vulnerable older persons</td>
<td>.15</td>
</tr>
<tr>
<td>Medicaid nursing home beds vs. very vulnerable older persons</td>
<td>.15</td>
</tr>
<tr>
<td>Affordable ALF units vs. Medicaid nursing home beds</td>
<td>.40</td>
</tr>
</tbody>
</table>

NOTE: ALF = assisted living facility.
<table>
<thead>
<tr>
<th>Groups Compared</th>
<th>Somewhat Below Fair Share 0.00 to 0.49</th>
<th>Somewhat Above Fair Share 1.00 to 1.49</th>
<th>Much Above Fair Share 1.50 to 1.99</th>
<th>Extremely Above Fair Share 2.00 or more</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affordable ALF units vs. vulnerable older persons</td>
<td>36.6</td>
<td>18.3</td>
<td>0.0</td>
<td>15.1</td>
<td>100.0</td>
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<tr>
<td>Affordable ALF units vs. very vulnerable older persons</td>
<td>34.3</td>
<td>18.8</td>
<td>0.1</td>
<td>16.7</td>
<td>100.0</td>
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<tr>
<td>Medicaid nursing home beds vs. vulnerable older persons</td>
<td>11.3</td>
<td>24.4</td>
<td>13.2</td>
<td>2.2</td>
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<tr>
<td>Medicaid nursing home beds vs. very vulnerable older persons</td>
<td>1.8</td>
<td>23.8</td>
<td>13.1</td>
<td>1.5</td>
<td>100.0</td>
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</table>

NOTE: ALF = assisted living facility.
growth of this vulnerable population also reduces the top heaviness of these beds and is the strongest predictor. As expected, the ratio of Medicaid nursing home beds to affordable ALF units increases the top heaviness of Medicaid beds (β = .24). The percentage of a county’s old-old population also has a negative and significant effect, contrary to expectations. This is because counties with higher proportions of old-old persons tend to be overall smaller and be occupied with smaller numbers of very vulnerable older persons. These two models are not as strong as the first two (R² = .19 and .21, respectively).

Table 4. Effects of Social and Economic Factors on Availability of Affordable Long-Term Care Options (N = 67)

<table>
<thead>
<tr>
<th>Variables</th>
<th>ALF Number of Affordable ALF Units</th>
<th>MEDICAID Number of Medicaid Nursing Home Beds</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERYVULOLD</td>
<td>.99***</td>
<td>.82***</td>
</tr>
<tr>
<td>PERGROWTHVUL</td>
<td>.10</td>
<td>−.12*</td>
</tr>
<tr>
<td>VULHEAVY</td>
<td>.02</td>
<td>−.04</td>
</tr>
<tr>
<td>OLDOLD</td>
<td>−.07</td>
<td>.01</td>
</tr>
<tr>
<td>MEDALFHEAVY</td>
<td>.04</td>
<td>−.06</td>
</tr>
<tr>
<td>POVERTY</td>
<td>.22**</td>
<td>−.10</td>
</tr>
<tr>
<td>MEDHEAVY</td>
<td>.06</td>
<td>−.03</td>
</tr>
<tr>
<td>ALFHEAVY</td>
<td></td>
<td>−.03</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.81</td>
<td>.84</td>
</tr>
<tr>
<td>F</td>
<td>41.815***</td>
<td>50.125***</td>
</tr>
</tbody>
</table>

NOTE: ALF = number in each county of affordable assisted living facilities occupied by persons age 65 and older, in the year 2000; VERYVULOLD = number in each county of very vulnerable persons in the year 2000; PERGROWTHVUL = 1990-2000 percentage growth in each county of the number of vulnerable older persons; VULHEAVY = location quotient: extent that counties are overrepresented or top heavy with vulnerable older persons, compared with the state overall; OLDOLD = percentage of county population that is age 75 or older; MEDALFHEAVY = location quotient: extent that counties are overrepresented or top heavy with Medicaid beds relative to affordable ALF units in 2000, compared with the state overall; POVERTY = percentage of the total population in the county that is below the 1997 Bureau of Labor Statistics 100% poverty level threshold; MEDHEAVY = location quotient: extent that counties are overrepresented or top heavy with Medicaid beds relative to vulnerable older persons, compared to the state overall; ALFHEAVY = location quotient: extent that counties are overrepresented or top heavy with affordable ALF units relative to vulnerable older persons, compared to the state overall.

*p ≤ .05. **p ≤ .01. ***p ≤ .001.
Discussion and Policy Implications

This article conducted an ecological analysis of the locational relationship between the at-risk, vulnerable older population and the number and prevalence of affordable ALF units and Medicaid nursing home beds in Florida’s counties. The findings reveal the much-skewed locational distribution of affordable ALF units, with about 84% of these units found in only 20% of Florida’s counties. These ALF units are concentrated in fewer counties than the state’s vulnerable (physically frail and low income) older (age 65 and older) population or the state’s Medicaid nursing home beds. The result is that 33% of Florida’s affordable ALF units, but only about 15% of Medicaid nursing home beds, would have to shift locations if their county distributions

Table 5. Effects of Social and Economic Factors on Predicting Counties with Higher Overrepresentations of Affordable Long-Term Care Options (N = 67)

<table>
<thead>
<tr>
<th>Variables</th>
<th>ALFHEAVY ALF Overrepresentation</th>
<th>MEDHEAVY Medicaid Nursing Home Bed Overrepresentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERYVULOLD</td>
<td>–.01</td>
<td>–.28*</td>
</tr>
<tr>
<td>PERGROWTHVUL</td>
<td>–.14</td>
<td>–.40**</td>
</tr>
<tr>
<td>VULHEAVY</td>
<td>–.21</td>
<td>–.19</td>
</tr>
<tr>
<td>OLDOLD</td>
<td>–.10</td>
<td>–.32*</td>
</tr>
<tr>
<td>MEDALFHEAVY</td>
<td>–.28*</td>
<td>.24*</td>
</tr>
<tr>
<td>POVERTY</td>
<td>.41**</td>
<td>–.06</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>.19</td>
<td>.21</td>
</tr>
<tr>
<td>$F$</td>
<td>3.530**</td>
<td>3.954**</td>
</tr>
</tbody>
</table>

NOTE: ALF = assisted living facility; ALFHEAVY = location quotient: extent that counties are overrepresented or top heavy with affordable ALF units relative to vulnerable older persons, compared to the state overall; MEDHEAVY = location quotient: extent that counties are overrepresented or top heavy with Medicaid beds relative to vulnerable older persons, compared to the state overall; VERYVULOLD = number in each county of very vulnerable persons in the year 2000; PERGROWTHVUL = 1990-2000 percentage growth in each county of the number of vulnerable older persons; VULHEAVY = location quotient extent that counties are overrepresented or top heavy with vulnerable older persons, compared with the state overall; OLDOLD = percentage of the population that is age 75 or older; MEDALFHEAVY = location quotient: extent that counties are overrepresented or top heavy with Medicaid beds relative to affordable ALF units in 2000, compared with the state overall; POVERTY = percentage of the total population in the county that is below the 1997 Bureau of Labor Statistics 100% poverty level threshold.

*p ≤ .05. **p ≤ .01. ***p ≤ .001.
were to be the same as those of the vulnerable older population. These unequal locational patterns result in relatively high shares of vulnerable older persons who are living in counties that are especially underserved by affordable ALF units (37%). A notable share of vulnerable older persons (17%) was in counties that were especially overserved by affordable ALF units. In contrast, Medicaid nursing home beds were less likely to be either extremely under- or overavailable in most counties relative to the locations of the vulnerable older population. The analyses thus emphasize that whatever the level of overall unmet need in the state for affordable ALF units (a question not addressed in this article), the county locations of affordable ALF units are shortchanging a large percentage of low-income, frail older persons at risk of needing this shelter and care option.

The regression models show that the usual market location demand indicators, the number of low-income and frail older persons, and the presence of poverty largely account for the skewed county numerical distributions of affordable ALF units. These findings are consistent with an affordable ALF facility subsidy strategy that creates units in markets with larger numbers of the targeted vulnerable elderly population. The number of vulnerable older persons, however, is not a significant factor when explaining the oversupply (relative to the at-risk, older vulnerable population) of affordable ALF units, although a county’s overall poverty level remains an important indicator. Affordable ALF units are also not overconcentrated in those counties that have the greatest prevalence of unmet need for these facilities. This is demonstrated by the statistical insignificance of the VULHEAVY and OLDOLD variables to explain the oversupply of affordable ALF units; that is, concentrations of low-income or vulnerable older persons do not predict very well which counties have more than their fair share of affordable ALF units, after controlling for other potentially important influences. What is found important is the supply ratio of Medicaid beds to affordable ALF units (MEDALFHEAVY). Counties with a lower ratio of Medicaid beds to ALF units have more of an oversupply of affordable ALF units. This suggests that affordable ALF units may be filling in for otherwise absent and needed Medicaid nursing home beds.

Counties with a larger number of Medicaid beds also have larger numbers of vulnerable older people; however, they unexpectedly have experienced a smaller percentage growth of their vulnerable older population. This is explained by the fact that counties experiencing higher percentage growth of their vulnerable older populations are often smaller counties in which high growth rates still yield relatively small numbers of at-risk, low-income, frail older persons. A greater oversupply (relative to the at-risk, older vulnerable population) of Medicaid beds is also found in counties with low percentage
growth of the vulnerable population and smaller concentrations of the old-old population. Similarly, counties with a higher ratio of Medicaid beds to ALF units (MEDALFHEAVY) had an oversupply of Medicaid beds.

Public policy makers should draw two important lessons from these findings. First, they must recognize that the need for affordable ALF units is substantially greater in certain counties than in others. A possible response is for them to target the available supply of Medicaid waivers for ALFs in a manner that recognizes these locational inequalities.

Second, the findings draw specific attention to counties that have high Medicaid bed–affordable ALF unit ratios and are undersupplied with affordable ALF units. These outcomes are inconsistent with the desire of most vulnerable older persons to avoid nursing homes (Lumpkin, Gibler, & Moschis, 1992). Florida’s legislature understood this relationship and froze its certificate of need process in 2001. No new nursing home beds will be certified by the state until July 2006 (Florida State Legislature, 2001). The legislative intent was

that the continued growth in the Medicaid budget for nursing home care has constrained the ability of the state to meet the needs of its elderly residents through the use of less restrictive and less institutional methods of long-term care. It is therefore the intent of the Legislature to limit the increase in Medicaid nursing home expenditures in order to provide funds to invest in long-term care that is community-based and provides supportive services in a manner that is both more cost-effective and more in keeping with the wishes of the elderly residents of this state. (Florida State Legislature, 2001, pp. 126-127)

Theoretically, this will allow for an increase in alternatives, especially ALF units. Affordable ALF units will only increase, however, if there are sufficient increases in state general revenue funding for the Medicaid-assisted living waivers. States that have made similar commitments to balance the Medicaid budget in favor of community-based care have found cost savings in the overall Medicaid budget, increased numbers of vulnerable older persons served, and more satisfied citizens (Benjamin, Matthias, Franke, & Mills, 1998; Doty, Benjamin, Matthias, & Franke, 1999; Ladd & Ladd, 1997). The locational analyses presented here suggest that the freeze on new nursing home beds coupled with an increase in general revenue dollars spent on alternatives such as ALFs, and a review of how the Medicaid waiver for assisted living is distributed in relationship to the population in need, are necessary steps to better serve the 37% of vulnerable older people in Florida living in counties that are especially undersupplied with an affordable alternative to nursing home care.
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