ACROSS THE STATES:

DO LONG TERM SERVICES & SUPPORTS

POLICIES AFFECT THE NUMBER OF

NURSING HOME RESIDENTS

WITH LOW-CARE NEEDS?

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Executive Summary

Long term care for the elderly has been steadily gaining salience in the public policy realm for many years. The federal government has been vigorously studying and exploring solutions, including the Centers for Medicare and Medicaid Services' (CMS) efforts to expand access to home and community-based services (HCBS) in order to reduce dependence on institutional care. These federal efforts include various incentive programs and policies recently offered under the Affordable Care Act. However, data on the strength of each state's long term services and supports system has not been easily accessible until recently. The report "Raising Expectations: A State Scorecard on Long-Term Services and Supports for Older Adults, People with Physical Disabilities, and Family Caregivers" (Reinhold 2014) measures twenty-six indicators across five dimensions of these supports systems in the states. Using five indicators related to public policy, I explore the relationship between a strong long term services and supports system and the percentage of low-care residents in nursing homes. The indicators used in the analysis have data ranging from 2008 to 2011 (see Research Design).

The results of my analysis reveal that two of the five public policy variables have a statistically significant effect on the dependent variable, the percentage of low-care residents in nursing homes. These two indicators are the Aging and Disability Resource Center Functions and the Percent of Medicaid and state-funded long term services and supports spending going to home and community based services for older people and adults with physical disabilities.

Background

There is strong evidence in the literature that it is more cost-effective to provide long

term care for the elderly in home and community based settings rather than institutional settings.

Studies have shown that delaying entry into a nursing home by a year or more through providing

assistance and enabling independence can accumulate significant cost savings. The median

annual cost of a private room in a nursing home in 2013 was $83,950, while the median annual

cost of 30 hours a week of home care was $30,326 (Reinhard 2014). People who require 24 hour

nursing care and have a high acuity level need nursing home care, but many nursing home

residents averaged into that median could be supported at less cost through home care.

However, the provision of long term services and supports systems varies widely across states,

and the balance of public spending leans heavily toward institutional care.

Supporting the ability for elderly citizens to maintain their independence and live in the

community rather than in institutions has both economic and social welfare advantages, since the

majority of older people want to remain in their own homes as they age. Notwithstanding the

economic investment most older adults have made in their homes, there is a strong psychological

attachment to their homes and communities. This "attachment to place" is an important

phenomenon for policy makers to consider, as millions of older Americans have lived in the

same place for 40 years or more (Rowles 2016).

Providing long term care services in the community is not just a matter of economics. In

a landmark 1999 decision, *Olmstead v. L. C.*, the United States Supreme Court ruled that

"unnecessary institutionalization of people with disabilities is a type of discrimination prohibited

by the Americans with Disabilities Act" of 1990 (National Senior Citizens Law Center 2010).

The Court ruled that the states had an obligation to protect against discrimination by providing

programs and services to accommodate the needs of people with disabilities, including older adults. Loneliness is often one of the many challenges faced by an older person, and unnecessary institutionalization leads to unjustified isolation and limits a person's exposure to the outside community. This ruling is a motivator in efforts by the states to rebalance long term care provision towards increased home and community based services.

In response to this mandate, Congress and federal agencies have subsequently made efforts to increase access to home and community based care. The federal government has been actively pursuing ways to support what is termed "aging in place", such as the Centers for Medicare and Medicaid Services' (CMS) efforts to expand access to home and community-based services (HCBS) in order to rebalance long term care spending away from institutional care. The Medicaid Section 1915(c) Home and Community-Based Services Waiver allows states to provide services in these settings and waive certain Medicaid requirements.[1] Most recently, the Patient Protection and Affordable Care Act of 2010 expanded the Money Follows the Person Program (allowing continued home and community based service coverage as a person exits an institution) and the State Plan Benefit Program. The Act also established a Medicaid State Balancing Incentives Program (higher federal matching funds in exchange for a commitment to provide choices other than institutionalization) and a Medicaid Community First Choice Option (ensuring qualified Medicaid beneficiaries have home and community options) to encourage states to invest in home and community based services.

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[1] These include: 1) Statewideness, so states can target particular areas of need, or where certain types of providers are available; 2) Comparability of services, lets states make waivers available only to certain groups of people who are at risk of institutionalization; 3) Income and resource rules applicable, allows states to relax the income and resources rules so people don't have to "spend down their assets" and be institutionalized in order to receive Medicaid. Medicaid.gov https://www.medicaid.gov/medicaid-chip-program-information/by-topics/long-term-services-and-supports/home-and-community-based-services/home-and-community-based-services-1915-c.html

There is no universal level of care requirement for someone to receive nursing home care, and each state is charged with designing its own assessment. There are no national or state organizations, or professional associations for assessors. Three methods of determining level of care requirements are used across states: Some states stress clinical information over activities of daily living (ADL) requirements, some stress ADLs over clinical information, but the majority (39) use a mixed clinical and ADL assessment (Rutgers 2008). For residents with low-care needs, their ability to live independently in their own homes and to avoid nursing home placement is enhanced when the state has a strong long term services and supports system in place.

The number of nursing home beds in a state can be regulated by Certificate of Need programs, but there is controversy over whether this is a useful policy, and only 36 states have these programs as of 2016. The aim of a Certificate of Need program is to coordinate planned construction of new facilities and restrain health care costs; however, opponents argue that by restricting facilities price competition is curtailed. In theory, facilities are built based on an objective analysis of a community's need, but opponents contend that institutional prestige, political influence and other factors are often predominant. In summary, the debate is the classic "open market" versus "regulated market" discussion (National Conference of State Legislatures 2016).

Nursing home residents are classified as low-care "if they require no physical assistance in any of the four late-loss ADLs (activities of daily living) (bed mobility, toileting, transferring, and eating) and if they were not classified in the two lowest functioning RUG-III classifications ("special rehab" or "clinically complex")." (Thomas 2014). This definition is used in a 2014 study and is consistent with previous research that used Resource Utilization Groups, Version III

(RUG-III) (an internationally-used system of classifying individuals based on clinical descriptions) (interRAI 2016) and ADL classifications. It is widely-used across states and does not vary much between states.

As the Reinhold report points out, residents in institutional settings "generally have the most severe disabilities, complex medical conditions, or advanced dementia", and those who have low-care needs have the potential to remain independent. While long term services and supports performance is improving gradually, there is a great deal of variation across states, with some measures in higher performing states being more than three times as much as those in poorer performing states (Reinhold 2014). For example, in the top five scoring states 77.6% of new Medicaid long term services and supports users were served in home and community based settings, compared to 25.6% in the bottom five states. There is growing national concern from consumers and policymakers over long term services and supports in light of the aging population, changing demographics, tight federal and state budgets, and the rising cost of these services.

This paper examines the public policy indicators in the Reinhold report to determine whether a stronger long term services and supports system is correlated with a smaller percentage of low care residents in a state's nursing homes. The goal of my analysis is to assist poorer-performing states in understanding the relationship between strengthening their services and supports systems and reducing the numbers of nursing home residents who are unnecessarily receiving care in a more expensive and restrictive setting.

Because I am analyzing cross-sectional data, I need to be cautious about making causal assertions, and to keep the possibility of reverse causation, a type of endogeneity, in mind. My theory is that the dependent variable (percentage of low-care residents in nursing homes) is *not*

affecting the independent variables (particularly the percentage of Medicaid and state-funded long term services and supports spending going to home and community based services for older people and adults with physical disabilities) for a number of reasons. I believe the policy factors are exogenous, or externally imposed, and are driven by 1) the *Olmstead* decision's requirements to provide home-based living if residents prefer it; 2) the fact that CMS programs have been found to be cost-effective (Doty 2000) and states want to save money; and 3) people's preference to age in place rather than in a nursing home. However, reverse causation remains a possibility. States that recognize their nursing homes house a substantial percentage of low-care need residents may be spurred by that factor alone to take steps to increase spending and options for home and community based care.

Literature Review

The longer lifespan of the American population combined with the aging baby-boomer generation means there is a greater proportion of seniors than ever who will need some degree of long term care. The number of Americans aged 65 and older is projected to be 88.5 million in 2050. All of the baby boomers will be over 70 around 2034 (Census Bureau 2010). The U.S. Department of Health and Human Services reports that seven in 10 people turning age 65 can expect to use some form of long-term care during their lives. The Department defines long-term care as "a range of services and supports necessary to meet health or personal care needs. Most long-term care is not medical care, but rather assistance with the basic personal tasks of everyday life, sometimes called Activities of Daily Living (ADLs), such as: bathing, dressing, using the toilet, transferring (to or from bed or chair), caring for incontinence, eating" (U.S. Dept. HHS 2016). According to the Congressional Budget Office, the demand for long-term care among the elderly is expected to more than double in the next thirty years (CBO 1999). These statistics

clearly demonstrate the relevance of long-term care and the great need to improve the

mechanisms and costs of caring for our elderly citizens.

Long term care has been steadily gaining salience in the public policy realm for many

years. Interest groups and policy experts including AARP, The SCAN Foundation, the Urban

Institute and The National Council on Aging (NCOA) are actively producing research and

reports and vocally advocating for improvements in long term care policy. The federal

government has been vigorously studying and pursuing solutions to lessen the cost, including the

Centers for Medicare and Medicaid Services' (CMS) efforts to expand access to home and

community-based services (HCBS) in order to reduce dependence on institutional care. In

particular, there has been growing state-wide participation in the Section 1915(c) waivers,

allowing states to waive certain federal requirements so that people who would otherwise require

long term services and supports in an institutional setting can receive these services in their own

homes (Kaiser 2015). Other expanded Medicaid options like the Balancing Incentives Program

(to encourage more HCBS and less institutional spending), the Money Follows the Person

Demonstration (allowing continued HCBS coverage as a person exits an institution), and

Community First Choice (allowing states to get a higher federal matching rate for HCBS) are all

offered under the Affordable Care Act. The Bipartisan Policy Center's initiative America's

Long-Term Care Crisis: Challenges in Financing and Delivery (BPC 2014) was launched in late

2013 with the goal of raising awareness among the general public and policy makers of the need

for action. In addition, the 2015 White House Conference on Aging highlighted the need for

family caregiver support, with $50 million in new funding earmarked for the 2016 Budget as

well as $15 million establishing a Family Support Initiative (WHCOA 2015).

Most long-term care services are provided by unpaid family and friends in their community, but it can prove very difficult for the adult children of these elderly, as they are either fully employed in the workplace or may live far away. In addition, the numbers of those available family caregivers are diminishing due to declining birth rates over the past fifty years. A recent study done by AARP projects a "dramatic decline over the next 20 years in the caregiver support ratio: from 7 potential caregivers for every person in the high-risk years of 80-plus in 2010 to 4 for every person 80-plus in 2030" (Senate Commission 2013).

It is much more cost-effective for people to remain in their homes with community-based services than it is to pay for institutional care. According to AARP, almost 90 percent of seniors want to stay in their own homes as they age, often referred to as "aging in place." The U.S. Department of Health and Human Services reports that a year of nursing home care costs about $75,000, while a year of home health care costs about $18,000 (Greenlee 2011). On average, for every person in an institution, Medicaid dollars can support roughly three people with home and community-based services (Houser 2012). However, it is important to remember when comparing these costs that nursing homes provide room and board, three meals a day, supervision, medication, therapies and rehabilitation, as well as skilled nursing care 24 hours a day, and generally house those with the most complex medical conditions. While keeping in mind that nursing homes bear a necessary burden of caring for the very frail and medically needy, there remains a very real portion of residents with low care needs. With this cost differential, deinstitutionalizing low-care nursing home residents would result in significant potential cost-savings.

There is a great deal of variation across states in the percentage of low-care residents in nursing homes, from an unusually low 1.1% in Maine to a high of 26.7% in Illinois (Reinhard

2014). When states invest in long term services and supports they will, in the long run, save money on the cost of nursing home admissions for that proportion of low-care residents who could be living independently with minor assistance. One of the few studies done in this regard reached that very conclusion. The study was published in the Journal on Aging and Health and analyzed State Program Reports and nursing home facility–level data using a two-way fixed effects model. "Results suggest that every additional 1% of the population age 65+ that receives personal care services is associated with a 0.8% decrease in the proportion of low-care residents in nursing homes" (Thomas 2014, 4). The study also suggests that a high level of unmet need for personal care results in several adverse consequences. These include compromised safety, increased risk of hospital admissions, going hungry, losing weight, dehydration and emotional strain. As noted in that insightful article, "Given the known benefits of in-home personal care services and underutilization due to inability to access these services, expanding the program to meet the needs of older adults is justified."

The majority of long term care costs are borne by Medicaid (62.2%), followed by out of pocket (21.9%), other private (11.6%) and other public (4.4%) (Scan Foundation 2013). Truven Health Analytics compiled a very extensive report as a subcontractor for Mathematica Policy Research, Inc. and the Centers for Medicare & Medicaid Services (CMS) (Eiken 2015). This 2015 report tracks expenditures on Medicaid long term services and supports for each state, but then adds the federal matching funds to the data. For the past several years, growth in spending for LTSS was entirely due to community-based services expenditures; institutional expenditures decreased 0.7 percent. Unfortunately, most spending for long-term care for older adults is for institutional services, while the majority of spending for those with developmental disabilities goes toward home and community based services (HCBS).

Many states are increasingly making efforts to improve access to HCBS for the low income population. Public HCBS cost-effectiveness studies from those states which have conducted them "consistently found much lower per-individual average costs for HCBS compared with institutional costs" (Fox-Grage 2013). One concern is the difficulty in identifying people in the community with unmet long term care needs who are at high risk of nursing home placement. The Arkansas Community Connector Program identified such people by using community health workers who were familiar with the region in outreach efforts to connect them to Medicaid HCBS (Felix 2011). The results were a return on investment of $2.92 per dollar invested in the program, and a 23.8% average reduction per participant in average Medicaid spending. "Similar interventions may help other localities achieve cost-saving and equitable access to publicly funded long-term care options other than institutional care."

Another study done in Florida acknowledges the myriad challenges (service organization and delivery, administrative structures, funding complexity and organization) in demonstrating clear cost effectiveness of HCBS, but also points out that there are methodological flaws in many evaluations (Shapiro 2011). This study strived to avoid selection bias between the treatment and comparison groups in order to discern the Medicaid cost savings associated with HCBS use. They compared differences between hospital service utilization, nursing home usage, and acute medical care expenses between those enrolled in HCBS programs and those on waiting lists. Results showed evidence of Medicaid cost savings in several HCBS programs, the majority coming from the reduction in use of Medicaid nursing home expenses. This study is a significant addition to the literature because it utilizes a large longitudinal dataset and econometric models to document the direct Medicaid cost-savings that can be attributed to

HCBS programs. As the authors note, "This finding confirms the role of HCBS programs in delaying or avoiding expensive long-term care."

The Administration on Aging provides services under Title III of the Older Americans Act (part of Lyndon Johnson's Great Society programs passed in 1965). Targeted to the most vulnerable, low-income elderly who live alone, its services include case management, home-delivered meals, congregate meals, transportation, homemaker services, preventative health, and respite for caregivers under the National Family Caregiver Support Program (U.S. Dept. HHS 2010).   They identify the following factors that lead to increased risk of nursing home placement:

- Demographic (older and non-Hispanic white)
- Socioeconomic (low incomes)
- Health status (cognitive impairment, diabetes, history of strokes and falls) and physical functioning (difficulty with activities of daily living (ADLs)
- Prior health care utilization (in hospital or nursing home)
- Living arrangement/family structure (live alone, non-homeowner, few children)
- Availability of support (lack caregiver support)

Compared to their peers nationally, Title III recipients are older, more likely to be impoverished, not married, and to live alone. They also have a higher number of average difficulties with ADLs. Participants in the program are at a much higher risk of nursing home placement than the national population in that age group, and results from the National Survey of Program Participants show that most recipients believe the services have helped keep them independent and out of nursing homes.

AARP, The Commonwealth Fund and The Scan Foundation produced a multidimensional, cross-sectional report measuring long term services and supports across states. "Raising Expectations: A State Scorecard on Long-Term Services and Supports for Older

Adults, People with Physical Disabilities, and Family Caregivers" measures twenty-six

indicators across five dimensions:

1) Affordability and access
2) Choice of setting and provider
3) Quality of life and quality of care
4) Support for family caregivers
5) Effective transitions

Finding comprehensive information about long term services and supports is difficult, so

this compilation is a valuable addition to the literature. There is tremendous variation in the

strength of these care systems across states, and unfortunately where you live makes a huge

difference in your long term care experience. The report has the potential to become a valuable

resource to policy makers as they can learn from the states which scored well and gain an

understanding of which areas to focus on in their own state.

A review of the literature reveals multiple studies which conclude that providing home

and community based long term care, especially for those with low care needs, is more cost

effective than institutional care. It was also found that these provisions are generally

underutilized and underprovided in many states, with the majority of long term care spending

going towards adults with disabilities rather than older adults, so the potential for cost savings in

states that increase their in-home supports for *older adults* is substantial. Studies showed a

decreased hospitalization and nursing home utilization among people receiving home and

community based services, and users of Title III services self-report their belief that these

services allowed them to avoid nursing home placement. Overall, the literature review lends

support to my theory that providing a strong long term services and supports system will allow

those older adults with low care needs to avoid institutionalization and remain in the community,

while leading to cost-savings.

Research Design

I analyze whether the strength of a state's long term services and supports system has any effect on the percentage of low-care residents in nursing homes. The report, "Raising Expectations, 2014: A State Scorecard on Long-Term Services and Supports for Older Adults, People with Physical Disabilities, and Family Caregivers" (Reinhard 2014), contains state-level measures on various aspects of their performance regarding long term care. I chose measures relating to public policy to test the hypothesis that if a state has a strong long term services and supports system, it will have a correspondingly lower percentage of low-care residents in nursing homes. The units of analysis are 49 states (Alaska was excluded), specifically their performance on various measures. In addition to the main explanatory variables involving public policy, I include demographic, economic and political variables that may show effects on the strength of the state's long term services and supports.

The data in this report cover a range of years for different indicators, with a baseline year for each indicator ranging from 2007 to 2011 corresponding with the most recently available data ranging from 2009 through 2013. Seven of the twenty-six indicators are new measures and thus have no baseline. I use the most recently available data, 2010, for the dependent variable, and the public policy variables range from 2008 to 2011.

Based on my review of the literature, my theory is that a state with a strong supports system will have a correspondingly smaller percentage of low-care residents in nursing homes. My research design involves multi-variate regression analysis of cross-sectional data on 49 states.

Description of Variables:

The dependent variable, the percentage of low-care residents in nursing homes in 2010, is one of the indicators included in the State Scorecard. (Data for Alaska is unavailable on this measure.) My theory is that this percentage will be lower when a state's public policy measures reveal a strong, supportive long term services and supports system. I have included several control variables that might also affect the dependent variable, as listed below.

The following five independent variables also came from the State Scorecard:

- Aging and Disability Resource Center functions (composite indicator, scale 0-62, higher means more functions) (2010): Aging and Disability Resource Centers are "publicly sponsored entities that are designed to help consumers and their families find information about the full range of long-term services and supports available in their community. ADRCs are for people of all incomes and all types of disability. By providing objective information, advice, counseling, and assistance, their purpose is to empower people to make informed decisions and more easily access available programs and services. Similar entities are sometimes referred to as "single entry point" or "no wrong door" systems." Centers can be organized through the Administration on Aging (under the Administration for Community Living, part of the U.S. Department of Health and Human Services), through the Area Agencies on Aging and Independent Living (under the state Department of Aging and Independent Living as in Kentucky), or through other state agencies. The number of resource centers ranges widely across states, from as few as one in a small state to one for every county in large states (ADRC 2014). State progress toward developing fully functional ADRCs was assessed using 30 criteria for services

typically provided by ADRCs across six domains. The composite score ranged from 0 –

62. The six domains are:

- Information, Referral, and Awareness: how easily consumers can find

  information about services and get efficient direction to the correct source (i.e.

  through websites or visibility at senior centers, etc.)

- Options Counseling: states' efforts to inform consumers about options other than

  nursing homes.

- Streamlining Access: facilitating access to the needed service regardless of which

  agency is approached.

- Care Transitions: how smoothly transitions are made between one care setting (or

  doctor) and another, providing information and support to caregivers.

- Target Populations and Partnerships: older people and adults with physical

  disabilities, and how well various agencies and resources work together to reach

  them.

- Quality Assurance: Quality measures in place to continually improve the

  system.

This would affect the dependent variable because if a state has a stronger, more visible

and supportive resource center, elders and their families may be more aware of options other

than institutionalization.

- Percent of Medicaid and state-funded long term services and supports spending going to

  home and community based services (HCBS) for older people and adults with physical

  disabilities (2009): This measures how much of the total state Medicaid/state-funded

  long term services and supports budget is being spent on home and community based

services rather than nursing homes. Expenditures related to Medicaid and state-funded long term services and supports include older people and adults with physical disabilities together (Eiken 2015). However, according to the Kaiser Family Foundation, 63 percent of Medicaid long term services and supports spending goes to home and community based services for younger adults with physical disabilities, while just 28 percent goes to home and community based services for people over 65 (Kaiser 2013). This may be related to ageist or outdated prejudice that nursing homes are the safest place for the elderly. It may also be that younger people have access to more social resources to assist in home-care, such as parents or siblings. However, according to the data, the average proportion of elderly in the population across states is 13.3% while that of younger adults with physical disabilities is 10.7%. Those two percentages across states are therefore included as control variables. This would affect the dependent variable because states that try to tip the balance of long term services and supports spending towards HCBS may make it easier for low-care residents to utilize those supports. When a state demonstrates a commitment to rebalancing, more people with low-care needs have options other than nursing homes and may be able to remain in the community longer. Those who stay in nursing homes generally have the most complex medical conditions, severe disabilities, or advanced dementia (Reinhard 2014). My hypothesis is that a better rebalancing of funding will decrease the number of low-care residents, but may have no effect on the overall usage of nursing homes.

- Percent of new Medicaid aged/disabled long term services and supports users first receiving services in the community (2009): This is the proportion of Medicaid long term services and supports beneficiaries in 2009 (who did not receive any long term

services and supports in 2008) who in the first calendar month of receiving long term services and supports received HCBS only and *not* institutional service. (Hawaii did not have available data for 2009 so I used 2007. Data was unavailable for five states.) This would affect the dependent variable because states that have strong community long term services and supports in place provide options for first-time users to stay out of nursing homes. This variable and the percent of individuals in nursing homes would not necessarily be determined by the same factors because the many people already in nursing homes have been there for a long time and may have medical conditions that require 24 hour nursing care, while those who are just utilizing long term services and supports have not developed conditions as serious and have a good chance of remaining independent with support. The average length of a nursing home stay is 835 days (National Care Planning Council, 2016).

- Legal and system supports for family caregivers (composite indicator, scale 0-12)(2008-2010): This is another composite index consisting of six factors: Family medical leave; Mandatory paid family leave and sick days; Unemployment insurance; State policies that protect family caregivers from employment discrimination; State policies on financial protection for spouses of Medicaid beneficiaries who receive HCBS; State assessment of family caregiver needs. This would affect the dependent variable because a state that shows legal/system commitments to caregivers is more likely to lessen their burden and make it easier for them to support elders at home and thereby avoid institutionalization.

- Number of health maintenance tasks able to be delegated to long term services and supports workers (out of 16 tasks)(2011): This is the number of 16 tasks that can be performed by a direct care aide through delegation by a registered nurse. The number of

tasks varies widely by state and depends on each state's policy through State Nurse

Practice Acts. (Four states did not have 2011 data, so I used 2013. Pennsylvania data

was not available.) This would affect the dependent variable because a state that allows

nurses to delegate tasks to home health aides may facilitate the ability of the elder to

remain at home. Many states will only legally allow nurses to delegate tasks to family

caregivers, imposing a burden since the family caregiver will need to leave work or hire a

(more expensive) nurse. As in the above indicator, easing this burden would allow

families to support elders at home and avoid institutionalization.

These independent variables are all related to each other because they are all public

policy measures for which each state has control, and all show the extent to which states have

prioritized establishing and maintaining a strong, supportive long term services and supports

system.

The control variables below are included because demographic and economic factors

regarding a state's elderly population living in poverty and median household income of those

over age 65 may be related to the percentage of low-care residents in nursing homes. The

number of nursing home beds is similarly relevant because more beds mean more pressure to fill

them, and I included the numbers of assisted living beds because the level of competition, or the

availability of an alternative, might affect the number of low-care residents in nursing homes.

Assisted living facilities provide long term services and supports to people with functional or

cognitive impairments who do not require the level of skilled nursing care provided in nursing

homes but cannot live independently. Including the percentage of adults with physical

disabilities is important since two of the public policy explanatory variables of interest apply to

older people *and adults with physical disabilities*. The cross-sectional data in the "Raising

Expectations" report used in my analysis pertains to older adults, people with physical disabilities, and family caregivers. It is also important to control for the private cost of, as well as Medicaid spending on, a nursing home room, as both could be related to the percentage of low-care residents in nursing homes. (All Medicaid spending includes state and federal expenditures.)

The political variables were included in an effort to check whether party affiliation has any effect on the dependent variable. Recent legislation was developed by the Obama Administration, specifically the incentives and encouragements under the Affordable Care Act to rebalance long term services and supports towards home and community based care. These three variables include whether the governor was a Democrat; this measure is presented in the form of dummy variables. I also include the fraction of a State House that is Democrat and the fraction of a State Senate that is Democrat. I chose fractions instead of an indicator variable because percentages provide a richer indication of just *how* strongly Democratic a house is. A state with a larger number of Democratic Senators and members of the House of Representatives could demonstrate more political will to accept and adopt the incentives and encouragements regarding a strengthened long term care system under the Affordable Care Act. The political variables used are from 2009, the year before the outcome variable measurement (percentage of low-care residents in nursing homes). While I recognize that this outcome developed over an extended period of time and is not simply the result of who holds office in a given year, I believe it is a viable consideration in light of the Obama Administration's recognition of the need for stronger long term care policy.

Thus, the independent variables included in the analysis are:

- % of a state's population age 65+ that are below 200% of the Supplemental Poverty Measure, 2011-2013 (Kaiser 2015)
- Median household income 65+ (Reinhard 2014)
- # Nursing home beds (CDC 2014)
- # Assisted living beds (AARP 2012)
- % adults with physical disabilities (Reinhard 2014)
- Median annual cost of private room in a nursing home (Ibid)
- Medicaid spending on nursing homes (FY 2014)(Kaiser 2014)
- Governor is a Democrat (2009 – the year before the outcome variable) (UK Center for Poverty Research 2015)
- Fraction of State House that is Democrat (2009) (Ibid)
- Fraction of State Senate that is Democrat (2009) (Ibid)

In order to maintain as much data as possible in my relatively small dataset, I had to make a couple of adjustments where there were missing values. I needed to control for the fact that Nebraska only has one house and therefore a value cannot be given for the fraction that is Democrat. I consequently coded it zero and then created a separate dummy variable (Nebraska = 1) in order to determine if it was fundamentally different, and it was not. The variable for New Medicaid LTSS Users First Receiving Services in the Community had five states missing data, so they were coded as zero and a separate dummy variable (1) created for the missing data to control for the fact that they were missing. These adjustments allowed the observations to stay in the dataset, to control for the fact that they were missing, and to confirm the fact that the missing values do not appear to be doing anything significant.

Summary Statistics

Summary statistics for the model are listed below. The percentage of residents with low care needs in nursing homes varies from as little as 1% to as much as 27%, so the results of the analysis will have relevance to policy makers. Gaining knowledge about which policy factors will decrease that percentage can guide states toward a more effective strategy for long term care. The strength of a state's Aging and Disability Resource Center Functions varied from a low of 9 to a high of 57, with a mean of 43.6 on a scale of 62. This is the policy variable found to matter the most to the number of low care nursing home residents. The percent of Medicaid and state-funded long term services and supports spending that is devoted to home and community based services has a great deal of variability, from just 14% in some states to a high of 65%. This factor was also found to have statistical significance.

Of the control variables, since the number of nursing home and assisted living beds proved to be so significant, it is worth noting the wide variability across states. Iowa (32,183 beds) had the most nursing home beds per capita, equivalent to 96 people per nursing home bed, while Alaska (779 beds) had the least with 938 people per bed. Variation in regard to assisted living beds was similarly wide. Minnesota (53,712 beds) had more assisted living beds per capita than all other states, equivalent to 100 people per bed, while Louisiana (5,860 beds) had the least, equivalent to 785 people per bed. Another large variation worth noting is the cost of a private room in a nursing home, which ranged from a low of $55,360 in Oklahoma to a high of $255,891 in Alaska.

Table 1: Long Term Services & Supports (LTSS) Regression Summary					
Variable	**No. Obs.**	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**
Public Policy Variables					
% Low Care Residents in Nursing Homes	49	12.32	5.36	1.00	27.00
ADRC Functions (Scale 0-62)	50	43.55	9.57	9.00	57.00
% Medicaid & State-Funded LTSS Spending going to HCBS	50	34.36	13.57	14.50	65.40
% New Medicaid LTSS Users First Receiving Services in the Community	44	49.88	16.22	21.60	81.90
Legal & System Supports (Scale 0-12)	50	3.31	1.70	0.50	6.89
Number of health maintenance tasks able to be delegated by a Nurse (out of 16)	49	8.68	5.86	0.00	16.00
Control Variables					
# Nursing Home Beds (Thousands)	50	33.57	33.06	2.98	135.35
# Assisted Living Beds(Thousands)	49	24.64	33.12	1.44	211.40
% Adults with Physical Disabilities	50	10.80	2.33	7.70	17.00
% 65+ below 200% Supplemental Poverty Measure	50	44.36	4.63	36.00	54.00
Median Household Income 65+ (Thousands of Dollars)	50	36.86	5.23	28.39	59.38
Cost Private Room in Nursing Home (Thousands of Dollars)	50	91.61	32.35	55.36	255.89
Medicaid Spending on Nursing Homes (Billions of Dollars)	50	0.99	1.29	>0.00	7.12
Governor is a Democrat (1 if yes)	50	0.57	0.50	0.00	1.00
% State House that is Democrat	49	55.92	15.02	26.00	92.00
% State Senate that is Democrat	49	53.59	17.26	2.00	92.00

Source: Compiled by author using Stata

Regression Results

Table 2: Long Term Services & Supports (LTSS) Regression Statistics	
VARIABLES	**% Low Care Residents in Nursing Homes**
Aging & Disabilities Resource Center Functions (Scale 0-62)	-0.128** (0.0621)
% Medicaid & State-Funded LTSS Spending going to Home and Community Based Services	-0.122* (0.0687)
% New Medicaid LTSS Users First Receiving Services in the Community	0.052 (0.0533)
Legal & System Supports (Scale 0-12)	0.691 (0.518)
Number of health maintenance tasks able to be Delegated by a Nurse (out of 16)	-0.023 (0.135)
Number of Nursing Home Beds (Thousands)	0.098** (0.0361)
Number of Assisted Living Beds (Thousands)	-0.061** (0.0283)
% Adults with Physical Disabilities	-0.908* (0.453)
% 65+ below 200% Supplemental Poverty Measure	-0.286 (0.242)
Median Household Income 65+ (Tens of thousands of Dollars)	-0.002 (0.002)
Cost Private Room in Nursing Home (Thousands of Dollars)	-0.140*** (0.0495)
Medicaid Spending on Nursing Homes (Billions of Dollars) (state & federal expenditures)	-0.831 (0.710)
Governor is a Democrat (1 if yes)	0.697 (1.392)
% State House that is Democrat	-0.015 (0.107)
% State Senate that is Democrat	0.153** (0.0729)
Nebraska	1.281 (3.098)
miss_pcnm	-0.185 (4.155)
Constant	51.23*** (10.42)
Observations	47
R-squared	0.644

Robust standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.1$; By author using Stata

Results and Analysis

The results of my analysis revealed several independent variables that have a statistically significant effect on the dependent variable (number of low care residents in nursing homes). Two of the five explanatory variables related to public policy were significant. The percentage of Medicaid & State-Funded Long Term Services and Supports Spending going to Home and Community Based Services is significant at a <10% level. This means that if the null hypothesis was true (that the policy variables have *no* effect on percentage of low care residents), then a finding like mine or larger would be observed less than 10% of the time. This significance allows us to interpret that for every additional percentage in this type of spending, the percentage of low care nursing home residents will decrease by .12%. The variable for Aging & Disabilities Resource Center Functions is significant at less than a 5% level, an even stronger rejection of the null hypothesis. Again, this result rejects the null hypothesis that this public policy variable will have *no* effect on the dependent variable. In contrast, for every unit increase on the scale (0-62) for these resource functions (higher on the scale means more resource functions are available), the percentage of low care nursing home residents is expected to decrease by .13%.

Perhaps most surprising about this analysis is the extent to which some of the control variables really mattered. The number of nursing home and assisted living beds were both significant at a level of less than 5%, although they affect the dependent variable in opposite directions. When a state's nursing home beds is increased by 1,000 the number of low care nursing home residents is expected to increase as well, by .10%. This would seem logical, as the nursing home industry is a very strong one and most are for-profit, so the more beds they have the more residents they want, and people with low care needs cost less to take care of. In contrast, a similar increase of assisted living beds will cause the number of low care nursing

home residents to *decrease* by .06%. As mentioned previously, assisted living provides an alternative to the more restrictive nursing home environment, and is a viable option for older adults with low care needs. The large significance of the variable for cost of a private room in a nursing home was a bit of a surprise. Theory would suggest it would, of course, be a driver, but it is the *major* variable affecting low care residents, at less than 1% significance. For every increase of $1,000 in the cost of a private room, the number of low care residents is expected to decrease by .14%. This seems reasonable as well, since the more expensive a nursing home becomes, the more effort will be put into finding an alternative, whether state-provided resources, friends or family, or doing without any assistance at all.

This model proved to have a pretty good overall fit, with the R^2 resulting in 64%. This means that 64% of the overall variance in the dependent variable (low care residents) can be explained by the independent variables in the model. Since I am particularly interested in the public policy variables, I ran a test of joint significance on 1) all five public policy variables; and 2) the two policy variables which proved statistically significant in the overall model. All five public policy variables resulted in a joint significance at less than the 10% level, and the two variables alone proved to be statistically significant at less than the 5% level. This is not surprising given the regression analysis, but is another way to confirm my results. This supports my theory that a state's public policy regarding long term care can have an effect on the numbers of low care residents in nursing homes. Strengthening these policies so that people with low care needs have the necessary resources to remain in an integrated community setting rather than a restrictive nursing home setting is shown by the model to be statistically significant. In a real world setting, this reduction in low care residents should lead to costs savings, an increased

compliance with the *Olmstead* decision, and quality of life improvements for those who prefer to live at home.

This analysis is limited by the small number of observations, and as additional years of data are gathered for the indicators in this report, future studies will have the advantage of multiple years of observations for the states. Because I have a relatively small dataset and therefore a low number of observations, I thought it would be prudent to confirm that the dependent variable is normally distributed. I produced a Kernel Density estimate for normality, and as shown in Figure 1 below, this variable, the percentage of low care residents in nursing homes, has a normal distribution.

Figure 1: Normal Distribution of Dependent Variable
(% of Low-Care Residents)
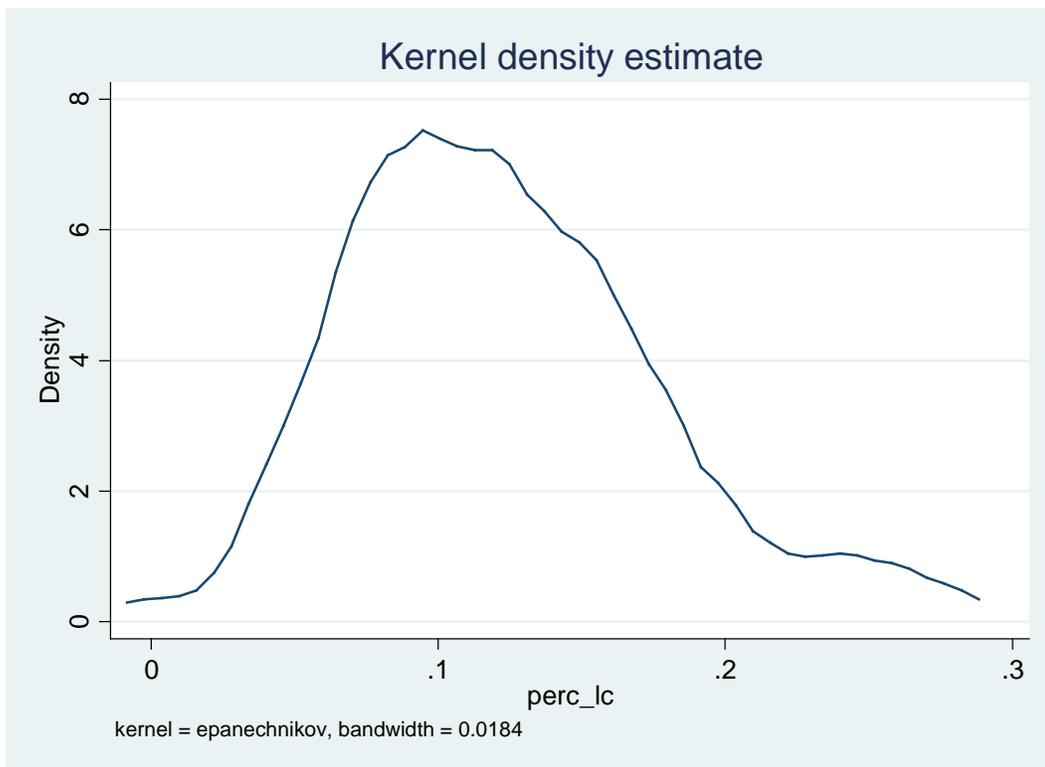
I confirmed this result by running a Skewness/Kurtosis test for Normality, and it did not reject the null hypothesis that it has a normal distribution, at a less than 5% level of significance.

Limitations

In addition to the small sample size mentioned above, there are other limitations worth mentioning. One factor that could affect the dependent variable (the percentage of low-care residents in nursing homes) is the proximity of family members and the availability (or not) of friends or neighbors to help with care needs. This is something that is unmeasurable and is a limitation of the data. Another unmeasurable factor which could affect the dependent variable is cultural/social environment. Certain geographical areas may encourage self-reliance and an acceptance of poor independent living conditions that strongly resist nursing home placement.

As discussed earlier in this report, the possibility of reverse causation, or the fact that the dependent variable may in fact be affecting some of the independent variables, cannot be ruled out with certainty. For example, a state that has a large percentage of low care residents (the dependent variable) in nursing homes may influence developers to build more assisted living facilities (an independent control variable). Similarly, state policy leaders may observe a large percentage of low care residents in its nursing homes and become highly motivated to increase long term services and supports spending going to home and community based services. However, while reverse causality remains a possibility, I will reiterate that I believe the policy factors are exogenous, or externally imposed, and are driven by 1) the Olmstead decision's requirements to provide home-based living if residents prefer it; 2) the fact that CMS programs have been found to be cost-effective (Doty 2000) and states want to save money; and 3) people's preference to age in place rather than in a nursing home.

Conclusions

The population in the United States is aging rapidly, as the oldest baby-boomer turns 70 and the youngest boomer turns 52 in 2016. Providing effective and cost-efficient long term care for this growing population is a pressing concern nationwide, and has gained urgency in many states as they struggle with a shrinking budget and an increasing need. The national dialogue about prioritizing long term care in home and community settings has gained salience, and the growing body of studies showing a lower cost for long term care in these settings has gained recognition by policy leaders. Those who require long term services and supports would achieve dignity and independence through an increased use of home and community based services, and federal and state costs have great potential for reduction over the long term.

States vary widely, however, in the strength of their service provision, as the report used in this analysis demonstrates. By analyzing the policy variables, those that can be directly affected by state policy leaders, and their effect on the percentage of low care residents in nursing homes, I was able to conclude that there *is* a resulting reduction. In other words, states that choose to strengthen their long term services and supports will observe a reduction in low care need residents in nursing homes. Based on the body of literature which concludes that providing care in home and community settings is more cost-effective, this reduction should in turn lead to cost savings since that portion of residents have the ability to live independently with some supports in a less expensive setting. As more state data on long term care is made available and subsequent years are added, this methodology and research design can be recreated and confirmed.

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