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# Changing the way the elderly live: Evidence from the home health care market in the United States

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ABSTRACT

I examine how decreases in government coverage of home health care visits to the elderly in the United States have affected their living arrangements. Specifically, I exploit geographic variation in the Medicare Home Health Care reimbursement rate that arose as a result of legislation passed in 1997 and I identify its impact on the living arrangements of older Medicare beneficiaries. I find that less generous reimbursement policies lead to a greater fraction of elderly giving up independent living. Baseline-model estimates suggest that a decline in reimbursement of one visit per user leads to a 0.98% increase in the fraction of elderly Medicare beneficiaries living in shared living arrangements, that is, living with somebody else, rather than alone or with only the spouse. This estimate implies that a decline in reimbursement of 5.1 visits per Medicare beneficiary increases the fraction of elderly that live in shared living arrangements by 1.12 percentage points. Such an increase is consistent with the time-series increase in the fraction of elderly that live in shared living arrangements between 1997 and 2000.

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## 1. Introduction

Large fractions of the elderly populations of many developed countries live in "shared living arrangements", where they live with other relatives or with friends rather than living alone or with a spouse (see Table 1). One of the most common explanations for sharing living arrangements in old age is a decline in health that leads the elderly to increasingly rely upon regular care.

Table 1 shows large cross country variation in the fraction of older individuals in shared living arrangements. Several factors might explain these differences, including diverse cultural norms associated with intergenerational living arrangements (UN, 2005). Moreover, Table 1 shows that there is a negative relationship between the fraction of elderly in shared living arrangements and the share of resources that a country devotes to home health care services. This evidence seems to suggest that formal home health care may substitute, at least in part, for informal care provided by family members and friends, and might be responsible for allowing a larger fraction of the elderly population to live independently. Establishing a causal relationship between the provision of formal and informal care is important, because government support for home health care is expensive (Table 1), and population aging has raised policymakers' worries about the affordability of publicly provided home health care services and the consequences of home care for such outcomes as labor supply (Ettner, 1995, 1996; OECD, 2005).

My study provides an estimate of the substitutability between formal and informal care. More specifically, I examine the impact of the sharp decline in the provision of formal home health care, which resulted from the change in Medicare home care reimbursement on the fraction of elderly in the United States who are in shared living arrangements. In principle, changes in formal home health care can impact the provision of informal care to the elderly without varying their living arrangements, but this is very difficult to measure empirically. Moreover, it is presumably easier and less expensive to provide informal care if the elderly person needing care lives under the same roof as their informal caregivers.

Therefore, I focus here on examining the causal relationship between the provision of formal home health care and the fraction of elderly living in a shared living arrangement as one dimension of substituting between formal and informal care. To investigate the impact of the Medicare reimbursement change on the fraction of older Medicare beneficiaries living in shared living arrangements, I use a policy change introduced in 1997, which imposed a cap on the average reimbursement per patient that home care agencies were entitled to receive when treating elderly Medicare patients. The cap was based on a blend of each home health agency's average per patient cost in 1994 and the average per patient cost of home health agencies in the agency's census division. The cap had a regional component. Even states with similar pre-policy utilization potentially faced different restrictive reimbursement limits relative to the average utilization in their census division. For instance, the regional

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**Table 1**
Living arrangements of the elderly and public expenditure on home health care, (as a percentage of the GDP), year 2000.

| | Fraction of elderly 65+ living in shared living arrangements[a] | Public expenditure on home health care as a % of the GDP |
|---|---|---|
| Sweden | 8.36 | 0.78 |
| Germany | 10.64 | 0.5 |
| Switzerland | 13.27 | 0.2 |
| UK | 15.09 | 0.32 |
| Canada | 20.64 | 0.17 |
| US[b] | 23.06 | 0.07 |
| Spain | 42.61 | 0.05 |

[a] Shared living arrangement means household size >2 if the respondent is married and living with the spouse, household size >1 otherwise. All data for the living arrangements of the elderly in European countries and Canada are from the Luxemburg Income Study, data for the United States are from March Current Population Survey, 2000. Data on public expenditures for home health care are from OECD, 2005 for all countries except the US.

[b] For the US, expenditures on Medicare Home Health Care in 2000 are from the Health Care Financing Review, Medicare and Medicaid Statistical Supplement. Data on the US GDP are from the Bureau of Economic Analysis.

average per patient cost in the South Atlantic census division prior to the law change was lower than the regional average in the West South Central census division.[1] Agencies in Georgia and Oklahoma provided similar average amounts of care to their users before 1997, but the agencies in Georgia faced a more restrictive cap as a result of the 1997 change than did the agencies in Oklahoma.

The peculiar reimbursement mechanism introduced by the policy change allows me to exploit the variation across time and across states. I can then estimate a reduced-form equation and identify the impact of the cap on the fraction of the elderly who live in a shared living arrangement. By relying on an exogenous source of variation in reimbursements, this study improves upon the previous literature that used potentially endogenous policies (Hoerger et al., 1996; Coyte et al., 2006) targeted towards selected populations of elderly (Applebaum, 1988). This is the first study that uses a quasi-experiment to estimate the impact of home-care policies on living arrangements by looking at all of the non-institutionalized population of elderly in a country.

In the last part of this study, I combine my reduced-form estimate and McKnight's (2004, 2006) estimate of the impact of the reimbursement change on the number of Medicare home health care visits received by Medicare beneficiaries. My analysis provides a structural estimate of the impact of the number of Medicare home care visits on the fraction of older Medicare beneficiaries that live in shared living arrangements.

## 2. Literature review

The decline in the fraction of elderly in the U.S. living in "shared living arrangements"—living with someone else rather than alone or only with the spouse—has been striking. Fig. 1 shows that in 1962 nearly 41% of the elderly had shared living arrangements, but by 2001 only 23.75% did. Fig. 1 also shows that the decline has been pronounced for both unmarried and married elderly, although the unmarried elderly are much more likely to live in a shared living arrangement over the entire period shown in Fig. 1.

The literature on living arrangements of the elderly has tried to uncover the major reasons behind the increase in independent living among older individuals. For example, Engelhardt et al. (2005) use the changes in Social Security payments produced by the 'benefits notch' to examine the role that pensions play in the decision for the elderly to live alone.

Costa (1997, 1999), focusing on earlier periods than Engelhardt et al. (2005), finds a strong relationship between income and independent living for older individuals. The author finds that the two major pension programs enacted in the US before Social Security, the Union Army Pension and the Old Age Assistance Program, were responsible for most of the increase in independent living by elderly veterans and older non-married women, respectively.

Although pensions are a major source of income for the elderly, Medicare represents a large source of transfers from the government to older individuals. Lee et al. (1999) note that in 1998, spending on Medicare was estimated as roughly two-thirds of total Social Security Benefits, and home health care was the fastest growing component of those expenditures.

Therefore, it is not surprising that a number of papers have attempted to study the role of in-kind benefits in the form of home care in the choice of living arrangements. The most comprehensive study using non-experimental evidence is probably the one by Hoerger et al. (1996) that used data from the National Long Term Care Survey conducted by the Census Bureau in 1989 on a population of elderly that needed help in one or more activities of daily living (ADL).[2] Both elderly in the community and those residing in institutions were included in the sample. The authors had information on Medicaid eligibility subsidies, number of nursing home beds, state subsidies of formal care in the community, and public cash payments to relatives and friends for care giving at a single point in time. They used a multinomial probit model to estimate the impact of the state policies on the probability that a disabled elderly person would live independently, in an intergenerational household, or enter a nursing home. When considering home health care, the authors find that the availability of local Medicaid[3] subsidies for home health care had no effect on nursing home entrance, while it increased the probability that the elderly would live independently.

Although the paper is very detailed, it also contains some limitations. Two points are worth noting. First of all, Medicaid home health care is available only to selected poor elderly. Therefore, findings for this group cannot be generalized to all the population of older individuals. Moreover, the study focuses on a reimbursement policy that is a function of unobservable characteristics of the elderly that likely impact their living arrangements. More specifically, Medicaid home and community based services are in part financed by state resources and thus are dependent on resource availability and not just medical needs. In fact, there is big variation in the level of physical impairment required to be considered eligible to receive Medicaid home and community based services. It follows that, if beneficiaries in richer states are also healthier on average than beneficiaries in poorer states, the finding that higher expenditures are associated with a higher percentage of elderly living independently might be due to the selection of healthier individuals into richer states rather than to the home-care benefit itself.

A more recent paper using Canadian data by Coyte et al. (2006) looks at the impact of publicly provided home-care benefits on informal care using repeated cross sections, but the impact on living arrangements is not studied. The reliance on comparing different Canadian provinces that self-select the level of care provided makes the paper subject to the same criticism as Hoerger et al. (1996). When looking at papers using experimental evidence, most studies rely on the National Long Term Care (Channeling) Demonstration Project financed by the Department of Health and Human Services in the 1980s. The goal of Channeling was to see whether home and community based services could be a cost effective alternative to institutionalization. The sample included individuals that were at least 65 years old and particularly frail. The average age was 79 and most of the participants in Channeling had multiple functional limitations. Moreover, 19% of the sample needed help with all activities of

[1] This example is taken from McKnight (2004, 2006).

[2] ADL include: bathing, dressing, toileting, transferring and eating.

[3] A brief description of Medicaid home health care is provided in Section 6.2.

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