Who benefits from public financing of home care for low-income seniors?

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Abstract

The past few decades have seen the emergence of a large formal home care industry as a significant source of long-term care for the elderly and disabled, who previously relied heavily on unpaid family members and nursing home care. Most formal home care is financed publicly through Medicaid programs, and this paper seeks to understand the implications of this financing. Using data from the 2000-2016 waves of the Health and Retirement Study and a difference-in-difference and triple-difference design, I investigate the effects of a policy adopted at the state level that increased the use of formal home care among Medicaid-eligible seniors by more than 50%. I show that rather than displace nursing home care or reach seniors who would otherwise be going without care, the policy's main effect is to replace informal care from family members, particularly spouses and daughters. For daughters, I find that this decrease in care supplied is accompanied by an increase in labor supply: for every 2.4-3 women whose parent receives formal home care as a result of this policy, one additional daughter works full-time. These results suggest that daughters who care for frail seniors may be a significant and overlooked beneficiary of public efforts to increase access to home care for seniors.

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1 Introduction

Most governments of advanced economies spend a significant share of their budgets on basic care for young children, the disabled, and the frail elderly. One motivation for this spending is to help ensure the health and well-being of these vulnerable populations. However, a second motivation for these programs is often to reduce the burden on unpaid caregivers (who are disproportionately women) and potentially to lessen the well-documented negative effect of caregiving obligations on labor force participation and labor supply. While this benefit has been studied extensively in the case of childcare (summarized in Section 1.1), there have been significantly fewer studies on the effect of public spending on eldercare on caregiver labor supply, particularly in the United States. This paper aims to fill that gap.

An estimated 70% of people who turn sixty-five will need long-term care at some point in their lifetime (Johnson, 2017). In the United States, this care has historically been provided mostly by unpaid family members, with nursing homes serving as a last resort for those with severe needs or without access to other sources of care. The government's role has traditionally been limited to paying for nursing home stays (through Medicaid) once a patient's other resources have been exhausted: roughly 60% of all nursing home stays are covered by Medicaid. However, the past few decades have seen the emergence of a formal home care industry that offers an alternative to institutional care and family care. Today, this industry employs over two million aides and generates $135 billion in revenue each year.[1] This growth reflects at least in part Medicaid policy reforms that have dramatically expanded Medicaid coverage of home and community-based long-term care. Compared to just $7.5 billion in 1990, Medicaid spent more than $86 billion on home and community-based long-term care in FY2015 (constant 2015 dollars; Eiken et al. 2017, Wenzlow et al. 2016).

This paper considers the impacts of this public spending. By using a source of Medicaid policy

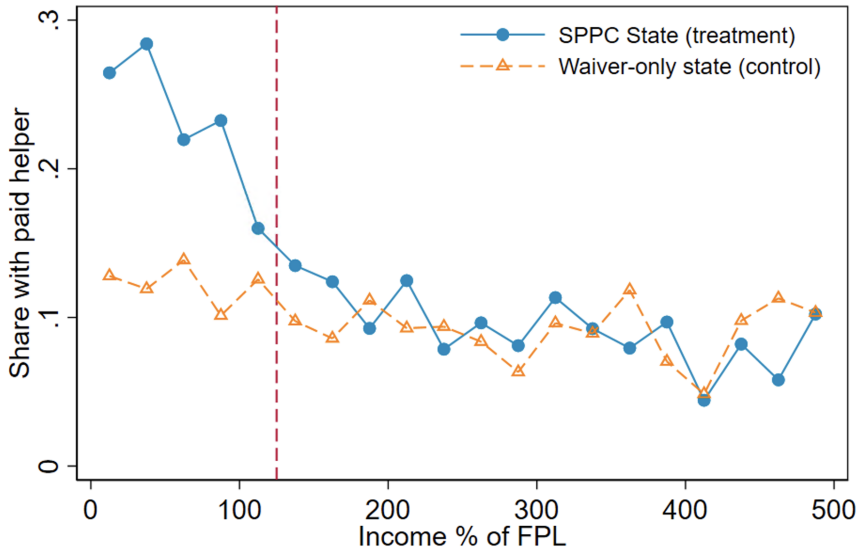
[1] I define the home care industry using two NAICS codes: 6216.00 (Home Health Care Services) and 6241.20 (Services for the Elderly and Disabled) and compute aide employment using the Occupational Employment Statistics and revenue using the 2017 Economic Census. Total revenue for these two industries is $135B, but some of this revenue is associated with skilled home health care, which is usually provided in a post-acute setting, rather than long-term care. We can use the Service Annual Survey to get a sense of the size of the post-acute home health care industry, which is mostly paid for by Medicare ($35B) and private health insurance ($15B).

variation that generates large variation in rates of home care use across states among Medicaid-eligible seniors, I estimate the impact of expanded access to home care on seniors, their families, and government revenues. The incidence of such a policy will depend crucially on how seniors and their families respond to the availability of home care: whether they use the program to delay or avoid nursing home use, to supplement care from informal caregivers, or to substitute for informal care. To explore these issues, I use data from the Health and Retirement Study that allows me to observe the care choices, income, health and functioning of a representative sample of seniors from 2000-2016. I leverage two main sources of variation in this data: (1) policy variation across state Medicaid programs in whether they have chosen to amend their Medicaid State Plan to include personal care as an offered benefit (described in more detail in Section 3), and, (2) income variation across seniors which affects their likelihood of being eligible for Medicaid. These two sources of variation allow me to estimate the effect of adopting the State Plan Personal Care (SPPC) benefit using a cross-sectional difference-in-differences design that compares outcomes for low-income (high Medicaid eligibility) seniors in "treatment" states (states with the SPPC benefit) to high-income (low Medicaid eligibility) seniors in those same states and to other low-income seniors in control states (states without the benefit).

Figure 1 previews this identification strategy. The figure graphs average utilization rates of paid home care among functionally impaired seniors as a function of income and whether they live in a state that adopted the SPPC benefit. Among seniors whose incomes are low enough that they are likely eligible for Medicaid (left of the dashed red line), those living in states adopting the SPPC benefit have significantly higher levels of paid home care utilization than those living in states that did not adopt the SPPC benefit. This difference across states becomes negligible at higher income levels. My preferred estimate of this effect, which also controls for individual characteristics such as marital status, education, chronic conditions, and the degree of functional difficulty, is that the SPPC benefit causes a seven percentage point increase in the probability that a Medicaid-eligible senior with functional impairments uses paid home care, compared to a baseline average of 12 percentage points, which translates to more than a 50% increase.

In order to understand the welfare effects of this increase, it is of first-order importance to

Figure 1: Share of functionally-impaired seniors who report having a paid helper by state plan PC policy and income



Seniors who reported having difficulty with at least one activity of daily living are grouped into 25 percentage point buckets by their countable income using Medicaid rules as a percentage of the federal poverty line (FPL). Seniors with income above 500% FPL are not shown in this graph. The x-coordinate represents the midpoint of each bucket's income range, and the y-coordinate represents the share of seniors in this bucket who reported having a paid home helper.

understand who the marginal recipients of paid home care are, and what type of care they would have been receiving in the absence of the policy. I show that most of the marginal recipients of care would have been living in the community and receiving at least some informal care in the absence of this policy. Thus, the policy only has a small (and statistically insignificant) negative effect on the probability that a senior is receiving any care or the probability that a senior is receiving nursing home care. However, the policy appears to induce a significant shift in *who* provides care to seniors living at home, causing eligible seniors to use more care from non-relatives in place of care from relatives.

These results suggest that unpaid family care has a fairly large elasticity with respect to the availability of paid home care. However, I also find that this elasticity varies by the type of caregiver: although wives, husbands, and daughters provide the majority of unpaid family care, I find that most of the decrease in care hours is concentrated among husbands and daughters, while care provided by wives appears to be relatively inelastic. I then study whether the policy affects the labor supply of these caregivers. I find no effect of the policy on the labor supply of spouses or sons (unsurprising because most spouses are above the usual age of retirement and I do not find much of a decrease in caregiving from sons), but large effects for daughters. Depending on the specification used, I estimate that one of every 2.4-3 daughters whose parent receives paid home care as a result of the policy works full-time as a result of the SPPC benefit.

I also evaluate the effect of the SPPC benefit on where seniors live, their health and well-being, and the health and well-being of their potential caregivers. While I find that seniors are more likely to live on their own as a result of the policy, I and find no significant impacts on the health and well-being of seniors, their children, or their partners, though the evidence for daughters is more suggestive of potentially positive impacts. For seniors, I discuss a couple reasons one might not expect to see significant impacts: one possibility is that this reflects heterogeneous treatment effects of switching from nursing home or informal care to formal home care that are dependent on the care quality of the different options and the health of the senior, and another possibility is that because most people are simply substituting home care from formal providers for home care from informal providers, the health impacts for all marginal seniors are small.

The finding that daughters of frail seniors have higher labor supply in states with the SPPC benefit has implications for the policy's impact on both equity and efficiency. From an equity perspective, this finding is consistent with other work that suggests that providing in-kind care benefits may be an effective tool to combat gender differences in labor force participation and pay (Blau and Kahn (2017), Olivetti and Petrongolo (2017)). From an efficiency perspective, the finding of a large labor supply effect implies the existence of a significant fiscal externality from financing home care for seniors in the increased income tax revenues from their daughters.

The paper concludes with a back-of-the-envelope calculation of the net cost to the government of a policy that would expand access to home care to the levels in SPPC states in the control states. I estimate that the fiscal externality could lead to a savings of roughly 15% of the program cost. However, as has been noted by many policymakers and analysts, the larger potential for savings to the government would be if the availability of home care could substantially reduce nursing home use. As I discuss in the next section, the literature's estimates of the size of this substitution effect vary widely; unfortunately, my own estimate is also imprecise: I obtain a point estimate that would imply one deferred nursing home admission for every five new paid home care users which would imply savings of roughly 40% of the program cost, but this estimate is not statistically significant at conventional levels and should therefore be treated with caution.

A significant concern with this identification is that there may be omitted variables at the state-level that may affect outcomes for low-income seniors that are statistically correlated with states' adoption of the SPPC benefit. Where the data allow, I also estimate a triple difference specification that expands the sample to include all seniors with and without ADL impairments and uses a third level of variation, whether or not a senior has an ADL impairment, to identify the treatment group. This allows me to check that the effects I estimate are specific to low-income seniors with ADL impairments in SPPC states, rather than low-income seniors in SPPC states at large, thus narrowing the set of plausible omitted variables threats to the identification. I also show that the effects are robust to both parametric tests (where I show that the effect of interest is robust to including other state-level controls such as average Medicare spending or Democratic vote share) and non-parametric tests (where I randomly simulate treatment states) of potential

omitted variable bias.

1.1 Related literature

There is a large literature that has studied the relationship between elder caregiving and labor supply (Ettner 1996, Johnson and Lo Sasso 2006, Van Houtven et al. 2013, Truskinovsky and Maestas 2018, Fahle and McGarry 2017). There have been fewer studies that investigate how long-term care policy may mediate the relationship between caregiving for parents and daughter labor supply (the focus of this paper). A few recent papers investigating this question include Coe et al. (2015), who use quasi-experimental variation in the use of long-term care insurance (LTCI) generated from tax subsidies to show that LTCI reduces informal care and increases child labor supply, Fu et al. (2017) who use policy variation in the provision of long-term care in Japan to show that public funding for long-term care increases the labor force participation of female caregivers, and Løken et al. (2017) who study a long-term care reform in Norway.

There is a much larger literature on the impact of providing childcare on maternal labor supply (e.g. Baker, Gruber, and Milligan (2008), Gelbach (2002), Havnes and Mogstad (2011), Bauernschuster and Schlotter (2015)). Many of these studies have found large positive effects on labor supply, while others (e.g. Havnes and Mogstad (2011)) have found no effect–these differences likely stem from differences in the baseline level of labor force participation, who is targeted by the policy, and whether parents have alternative private sources of childcare. More broadly, several researchers have argued that cross-country differences in pro-family policies and spending on work complements (such as childcare and eldercare) may explain differences across countries in female labor supply (Kleven (2014), Blau and Kahn (2013), Kleven, Landais, Posch, Steinhauer, and Zweimüller (2020)).

This paper is also related to the literature on the cost-effectiveness of providing home and community-based care through Medicaid. Early demonstration projects sponsored by the federal government often highlighted the "woodwork effect" (essentially a moral hazard extensive margin effect), where greater availability of home care would result in people "coming out of the woodwork" to claim the new benefit and thus increase rather than decrease total costs to the government (Doty 2000, Kemper et al. 1987, Berkeley Planning Associates 1984). These early studies estimated a

wide range of woodwork effects depending on the program being studied, ranging from one deferred nursing home admission for every 1.6-16 recipients of home care. More recent studies of state-level spending trends have been more optimistic as to the potential for home- and community-based care to achieve cost savings (Grabowski 2006, Kaye et al. 2009, Eiken et al. 2013). One limitation of the approach taken in these studies is that they generally compare states based on their realized spending on home- and community-based care, which may be endogenous to other factors that may contribute to a reduction in nursing home use. This paper uses a specific policy choice for identification, the adoption of the SPPC benefit, which should be subject to fewer endogeneity concerns. In addition, my data includes seniors who are likely and unlikely to be eligible for Medicaid, allowing me to control for other state-level factors better than studies that only use Medicaid data. My findings are consistent with other estimates of significant elasticities of supply for informal home care (e.g. Bolin et al. 2008, Van Houtven and Norton 2004 Golberstein et al. 2009) and small elasticities of demand for nursing home care (e.g. Grabowski and Gruber 2007) with respect to public program generosity and formal care availability.

2 Conceptual Framework

What are the potential effects of offering formal home care to low-income seniors? To help think through the possibilities, we consider a model where a family unit consisting of a functionally impaired senior and any potential caregivers (e.g. a spouse and children) jointly maximizes the total utility of each of its members. Our thought experiment involves comparing two environments: the control environment in which seniors have only two options for care (a nursing home or unpaid family care), and the treatment environment in which a third option is introduced (paid home care). Because we are considering people who receive long-term care through Medicaid, we assume that all care is provided at no cost to the families, except a hassle cost associated with applying for Medicaid (which may be significant, since families may need to deplete their assets).

In the control environment, each family evaluates the relative utility of using nursing home care or unpaid family care for the impaired senior. Families can also choose for the senior to go without care. The total family unit's utility of these three options will depend on the seniors' health status, and the caregiver's opportunity cost of caregiving.

In the treatment environment, there are thus three types of people who may take up formal home care: (1) people who previously chose nursing home care, (2) people who previously chose unpaid family care, and (3) people who previously chose no care. In general, people who had low costs or high valuations of either receiving family care or receiving nursing home care will not change their choice of care. The sum of these groups will be the people who "take up" the SPPC benefit in my study (the compliers), and the first order empirical question that I attempt to answer is how big each of these groups of compliers is.

Both with and without the paid home care option, there are several places where the private choices of individuals may diverge from the socially optimal choices. First, patients do not pay the monetary cost of nursing home care or paid home care, so one may expect greater consumption of both of these options compared to the optimum unless the hassle costs of applying to Medicaid are high enough. However, if a choice of care has health benefits relative to the other choices, some of the benefits of this choice may accrue to the government rather than to the individual in the form of lower health care spending, so there may also be under-consumption of care. Finally, if care choices affect other economic behavior, such as labor supply decisions, private choices will not account for potential fiscal externalities from changes in income tax revenues.

The question posed by this paper is who benefits (and by how much) from public financing for home care for low-income seniors. Considering only fiscal benefits, those seniors who are moved from choosing nursing home care to choosing paid home care are likely to have lower Medicaid spending, since the cost of nursing home care generally exceeds the cost of paid home care, leading to lower costs for the government. For the seniors who are moved from choosing family care to choosing paid home care, the expectation should be that costs to the government should increase, since these seniors are now receiving formal care that was previously provided for free by family members. However, if the people who make this switch are switching because they had a high opportunity cost of providing family care due to other outside labor market options, there is the potential of a positive fiscal externality from this switch resulting from more family caregivers being in the labor force.

3 Background

3.1 Long-term care for the elderly and Medicaid

Need for long-term care services is often defined in terms of having difficulty with activities of daily living (ADLs), usually defined as bathing, dressing, toileting, eating, transferring, walking. Using the 2007 American Community Survey, Kaye et al. (2010) estimate that roughly five million people over the age of 65 have difficulty with one or more of these activities. People can receive long term care in a variety of settings and ways, but the two most common in the US are: (1) nursing homes, which are highly regulated and provide 24-hour skilled care and are used by 1.3 million people with ADL difficulties, and (2) informal care (Mudrazija and Johnson, 2020).

There are at least two trends over the past few decades that have begun to offer alternatives for people who may not need the high level-of-care of nursing homes, but need more support than their potential informal caregivers may be able or willing to provide. First, many researchers have noted the expansion of alternative senior housing arrangements such as assisted and independent living communities. However, many of these facilities primarily serve private-pay residents and people with less severe needs, and the ACS estimates that only 150,000 people with ADL difficulties live in these types of residences. Nonetheless, the evidence suggests that the growth of these housing options has reduced the use of nursing home care (Grabowski et al., 2012). The second trend is the subject of this paper: the growth of paid home care, where an aide is hired (usually through an agency, but sometimes as an independent provider) to help with basic personal care or household tasks. Figure 1 shows that this type of care is commonly used by low-income seniors. I hypothesize that this pattern is because of Medicaid reforms that have expanded coverage of home-based long-term care for Medicaid enrollees.[2]

While Medicare does not pay for long-term care,[3] Medicaid has been required to cover nursing home care since its creation in 1965 and currently funds over 60% of nursing home stays. However, Medicaid is not similarly required to cover other forms of long-term care such as home care.

[2]Medicaid is generally prohibited from covering room and board except in nursing homes, thus limiting its ability to cover other sources of residential care such as assisted living.

[3]Nursing home stays or home health visits are only covered for short periods following a hospitalization.

Policymakers at the time were worried about the moral hazard (woodwork) effect discussed above (Smith and Feng, 2010). Many advocates have since argued that this has led to an "institutional bias" in Medicaid long-term care spending, and have argued in support of reforms that increase access to home and community-based services (HCBS). These reforms are commonly referred to as "rebalancing" reforms. These reforms were first passed beginning in the 1970s and 1980s, but Doty (2010) notes that growth of these programs was slow until the 1990s.[4]

Figure 2 shows how the allocation of Medicaid long-term care spending on the aged and physically disabled changed from 2000 and the present.[5] Per-enrollee spending on home and community-based care more than tripled between 1990 and 2016. On the other hand, nursing home spending increased over the 1990-2000 decade, but peaked in 2002 and is now substantially below 1990 levels. As a result, the share of long-term care Medicaid spending going toward home and community-based care was less than 15% percent in 1990, and exceeded 40% by 2016.

3.2 State variation in Medicaid provision of personal care

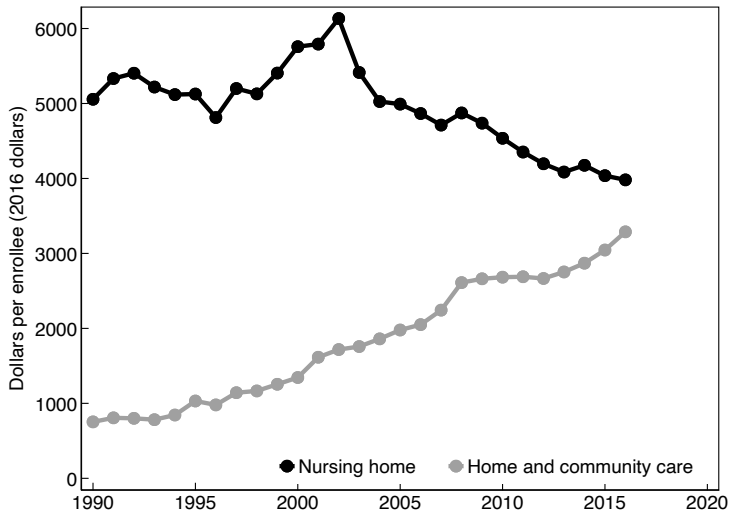
Medicaid spending on home and community-based care can include spending on a variety of services, including personal care, chore services, case management, adult day care, respite care for family caregivers, residential care (excluding room and board), home modifications, home-delivered meals. In this paper, I focus on one of the largest components of HCBS spending: personal care services, i.e. assistance from an aide with ADLs.

All states cover personal care, but there are two primary mechanisms they can use to do so. The first is that states have the option to add personal care as a benefit in their Medicaid State Plan. This option was first made available to states in 1975, and means that personal care becomes essentially like an entitlement benefit: as long as a Medicaid enrollee meets the need criteria for services, the state must provide them. The second primary mechanism used by states are 1915(c) waivers. Waiver programs have several features that allow states more flexibility in designing their HCBS benefits: instead of having to design a one-size-fits-all benefit, states can create several waiver

[4]Two factors that accelerated their growth were reforms during the Clinton administration and the Supreme Court's 1999 Olmstead decision, which asserted that states had an obligation to serve people with disabilities in the community if possible.

[5]While I make an attempt to exclude spending on the intellectually and developmentally disabled population, the data sources I use are unable to to isolate spending on the aged population only.

Figure 2: National Medicaid spending on long-term care for aged and physically disabled adults per enrollee (2017 dollars)



Spending numbers come from CMS-64 reports analyzed in Wenzlow et al. 2016 and adjusted for inflation using CPI-U. Spending is scaled by total aged and disabled enrollment from the Brief Summaries of Medicare and Medicaid reports from CMS, subtracting counts of intellectually and developmentally disabled LTSS recipients from the Residential Information Systems Project. In 2016, there were roughly 14.6 million aged and disabled enrollees.

programs covering different services for different groups of people (e.g. people with intellectual disabilities vs. older adults). Additionally, the 1915(c) program also allows states to set enrollment and/or cost caps. Ex-ante, it is not obvious whether these two mechanisms should induce different rates of personal care utilization among ADL-impaired seniors covered by Medicaid. However, as I previewed earlier in Figure 1, the data indicates that SPPC states have far higher rates of paid home care utilization than waiver-only states, suggesting that on balance, the different features of the 1915(c) program relative to an entitlement benefit has has led to slower growth of these programs.

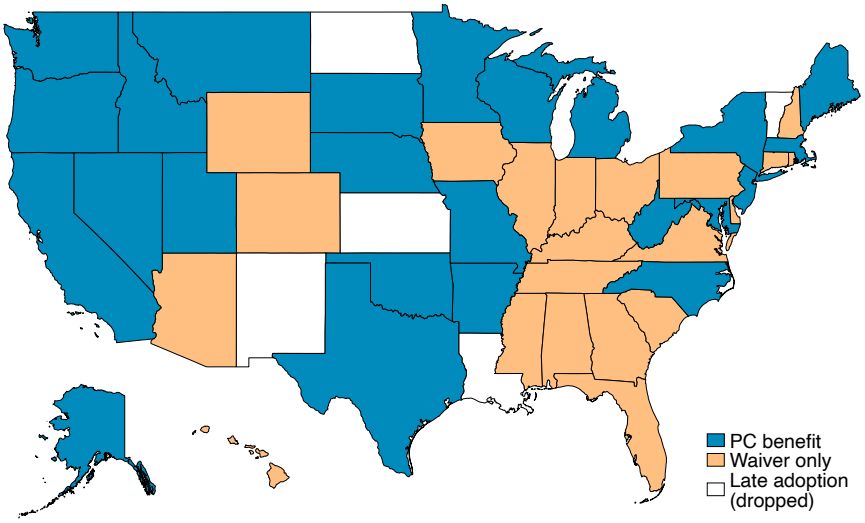
When the Personal Care benefit was introduced, many states were quick to adopt the benefit because they had already begun to subsidize home care for low-income seniors and the Medicaid benefit was a way to secure federal funds for these programs (Kennedy and Litvak, 1991). Twenty-five states adopted the Personal Care benefit in the late 1970s and early 1980s and are shown in blue in Figure 3. These states will be the main "treatment" states in the paper. Once the 1915(c) waiver program passed, state adoption of the SPPC benefit essentially stopped until the late 1990s, but none of the early adoption states retracted the benefit. The light orange states in Figure 3 never adopted the SPPC benefit and all cover personal care through waiver programs (I thus refer to these states, which are the main control states in the paper as "waiver-only" states[6]). Finally, five states adopted the Personal Care benefit between 1999 and 2007 and are shown in white.[7] For simplicity, I drop the late adoption states for the main analysis in the paper, Because these programs grow gradually, they are likely to be different from both control and treatment states. In Section 7, I present a version that includes these states as control states before the passage of the benefit, and treatment states after. The gradual, rather than sharp, of these programs is also the reason that it is necessary to conduct a cross-sectional, rather than time-series analysis.

One significant trend in Medicaid's provision of home care is in the increasing use of "consumer direction," where enrollees can hire their own aide (often a family member), rather than use an aide from a Medicaid-contracted agency. The use of consumer direction also varies widely by state

[6]Some states offer both state plan personal care services and waiver services, where the waiver services are used to supplement the SPPC benefit.

[7]A few things likely contributed to the resurgent interest in the SPPC benefit after 1999 including the Olmstead decision, and federal incentives through the 1915(i) program to adopt the benefit.

Figure 3: State variation in inclusion of personal care in the Medicaid State Plan during the analysis period (2000-2016)



The map shows whether states have adopted the Personal Care optional benefit in their state plans. The states in blue adopted the option in the 1970s or 1980s, while the late adoption states adopted the option between 1999 and 2007. Two states, FL and NH, adopted the option but in a very limited fashion (FL adopted the option only for 24-hour care and NH adopted it only for people who are wheelchair-bound) and so are coded as waiver-only states for this analysis.

Medicaid programs, but I do not exploit this variation in my analysis.

3.3 Medicaid eligibility for seniors

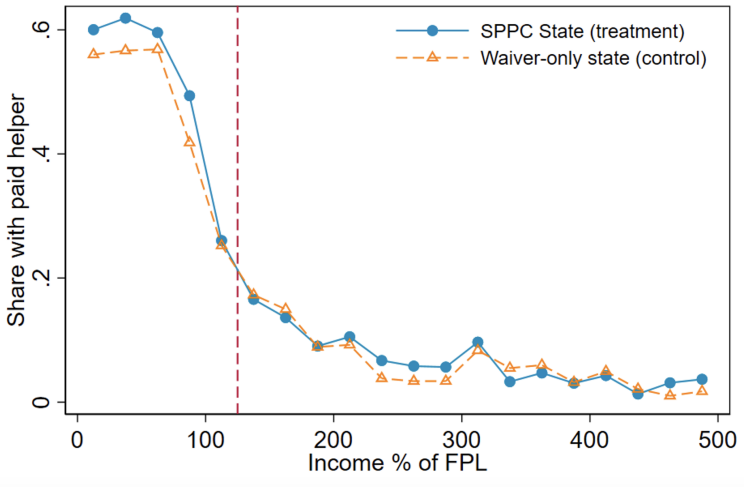
There are two main ways seniors can qualify for Medicaid. First, anyone over 65 who has income and assets below the state thresholds is eligible for Medicaid. Both income and assets are calculated after deducting certain exemptions (e.g. half of earned income, a primary residence). In general, the state's income threshold must be at least the federal SSI eligibility level (74% of the federal poverty level, or FPL) and at most 100% FPL to receive federal matching funds. In most states, the asset threshold is usually $2,000 for individuals and $3,000 for couples.[8] Roughly 70% of aged Medicaid enrollees qualify through this pathway (De Nardi et al., 2012). The remaining qualify through special eligibility pathways such as medically needy programs, which allow people to count medical costs against their income, and thus allow people with higher incomes but high medical costs to enroll in Medicaid. This is commonly referred to as "spending down" onto Medicaid, and is used by many long-term nursing home residents.[9]

Figure 4 shows how these rules translate into actual coverage rates in my analysis sample of ADL-impaired seniors. I group seniors by their countable income (gross income minus allowed exemptions) expressed as a percentage of the FPL, and plot the share of seniors in this income group who report being covered by Medicaid. I find that Medicaid coverage is high and relatively flat for incomes between 0 and 75% FPL, and then gradually falls between roughly 75% and 200% FPL before flattening out again (though it remains nonzero through the end of the graph at 500% FPL). The lack of a discrete drop in Medicaid coverage can likely be attributed to the asset requirement and spend-down pathways, which should mean under reasonable assumptions that people with incomes above the income threshold will face declining probabilities of qualifying for Medicaid. Another thing to note is that even among people with incomes below 75% FPL, Figure 4 shows that only 60% of respondents report having Medicaid coverage. This likely reflects a combination of both incomplete take-up of Medicaid (Bitler and Zavodny, 2017), and measurement error (either

[8] See Musumeci et al. (2019) for a complete description of state eligibility thresholds.

[9] While not all states have medically needy programs, all states without medically needy programs allow potential enrollees to put extra income in a trust in order to qualify for Medicaid if they are in an institution, and all except three states (AL, NV, and WY) also allow trusts to be used for home care (Musumeci et al., 2019).

Figure 4: Rates of reported Medicaid coverage by income among seniors with an ADL difficulty (2000-2016 HRS)



See notes from Figure 1. The x-coordinate represents the midpoint of each bucket's income range, and the y-coordinate represents the share of seniors in this bucket who reported having Medicaid coverage.

mismeasurement of income or misreporting of coverage, see Boudreaux et al. (2015)). For the main results in the paper, I use a threshold of 125% FPL to define the treatment and control groups; however, given that this choice is somewhat arbitrary, I perform sensitivity tests to this choice and report the results in Section 7 and in the Appendix.

4 Data

The data for this study comes from the 2000-2016 waves of the Health and Retirement Study (HRS), a longitudinal panel study that interviews people in the US who are over the age of 50 every two years from sample entry (usually when they are between 50-56) until death. The survey includes a broad range of questions related to aging, health, and financial well-being. The first cohorts were interviewed in 1992 and 1993, and new cohorts are added periodically to refresh the sample. A natural starting year for analysis is 1998, the first year where the HRS contained a representative sample of the over 50 population in the US; however, I start my sample in 2000 because the questions about caregiving change slightly in this year.[10]

[10]Before 2000, respondents were not asked detailed questions about caregiving by spouses.

My main analysis sample will be all respondent-years where the respondent is 65 or older and reports any difficulty with an ADL because of a health or memory problem. For some specifications, I will include the population over 65 with no reported ADL difficulties as a control group. On average, there are approximately 10,000 people per year over 65 in the HRS, and 21% report an ADL difficulty, resulting in a sample size of 21,918 respondent-years across the nine years in the sample. Seniors with an ADL difficulty are older (the two samples have average ages of 79 and 75, respectively), and more likely to be female (65% compared to 55%) and single (58% compared to 38%) than seniors without ADL difficulties. They are also more likely to have income below 125% FPL (36% compared to 16%). I summarize these and other characteristics of these samples in Table A1 in the Appendix. If a respondent reports having difficulty with any ADL(s), they are then asked to identify and provide details about up to 15 helpers such as the helper's relationship to them, the number of days and hours per day the helper provided help (over the past two months), whether the helper was paid, and if so, an estimate of the out-of-pocket costs the respondent paid.

Table 1 summarizes the living and care arrangements of seniors in the ADL-impaired sample. Panel A splits the sample based on whether the impaired senior is single or has a partner (married or living with a partner as if married). Just 15% of ADL-impaired seniors are in residential care (primarily nursing homes[11]. Residential care is particularly uncommon for people who have a partner, accounting for only 8% of partnered seniors with ADL impairments. By contrast, almost 60% of ADL-impaired seniors are living on their own (defined as alone or with only their spouse), and 20% of seniors are living with a child. The last few rows summarize sources of care for those living at home. Almost half of seniors living at home do not receive any help at all (true of both singles and people with a partner). Of those receiving help, most receive help from unpaid helpers only, but a non-trivial share of ADL-impaired seniors do receive some paid help: 16% of singles and 8% of people with a partner.

Panel B restricts the sample to ADL-impaired seniors living in private housing and receiving some help, and summarizes who their caregivers are, and how many hours of care they provide. The average senior receiving help at home has 1.8 helpers, who provide 41 hours of care a week. In

[11]In the HRS, just X% of seniors in non-nursing home residential care, e.g. assisted living facilities, report having any ADL difficulty.

Appendix Figure A1 , I show that this distribution of hours of care is actually bimodal: most seniors in my sample receive between 0-2 hours per day (less than 15 hours per week), but roughly 10% receive 24-hour care every day. For this reason, I focus many of my results on care provision along the extensive margin, rather than using hours, which are likely to be heavily influenced by people receiving 24-hour care. Daughters provide almost 30% of all care hours, followed by non-relatives and wives, who each provide roughly 20% of care hours. Panel B also reveals the importance of unpaid and co-resident helpers, who provide 79% and 70% of total hours, respectively.

In addition to information about seniors who receive care, the structure of the HRS is advantageous because it allows the researcher to construct samples of the children and partners of every respondent. This is because spouses are interviewed for the HRS sample (regardless of age), and respondents are asked to provide fairly rich detail on each of their children, such as the child's age, education level, where they live, and whether the child provides help (e.g. help with ADLs, financial help) or receives help (e.g. help with childcare, financial help) from the respondent. I summarize these samples in Table A2 and Table A3 in the Appendix.

To obtain even richer detail on child caregivers, I supplement my main analysis with a secondary analysis that samples HRS respondents who are potential caregivers, rather than care recipients. Specifically, I use data provided by respondents between the ages of 50 and 65 about their parents (whether each parent is alive, and whether they have personal care needs) and any care that they provide to their parents.

5 Empirical Strategy

I employ a few different specifications to study the effects of the SPPC benefit on seniors and their children. In general, these specifications use variation across (1) states, (2) income, and (3) presence of an ADL impairment, but which types of variation are used depends on the outcome and group being studied. Section 5.1, outlines my strategies for studying outcomes for ADL-impaired seniors in the HRS, while Section 5.2 outlines the strategies I use to study the children and partners of these seniors.

Table 1: Summary of care received and living arrangements of seniors with ADL impairments

Panel A. Place of residence and source of care for seniors with ADL impairments (N=21,918)

	All	Single	Partnered
% of sample	100	57	43
Live in residential care	0.15	0.23	0.08
Nursing home	0.14	0.21	0.07
Other residential	0.01	0.02	0.01
Live in private housing	0.85	0.77	0.91
Residence			
Living on own	0.58	0.50	0.70
Living w/ kid	0.20	0.33	0.23
Other	0.06	0.07	0.05
Care			
No help	0.40	0.38	0.42
Unpaid only	0.32	0.24	0.44
Paid help	0.13	0.16	0.08

Panel B. Types of caregivers and weekly hours of care for ADL-impaired seniors receiving some help at home (N=10,089)

		Hours per week				
	Number of helpers	Total	Unpaid	Paid	Co-res	Non co-res
Total	1.80	41.0	32.5	9.3	28.5	13.9
Wife	0.24	8.7	8.7	–	8.7	–
Husband	0.18	6.2	6.2	–	6.2	–
Daughter	0.40	11.9	10.6	1.3	7.9	4.0
Son	0.21	4.3	4.0	0.3	2.9	1.4
Other rel.	0.18	3.9	3.3	0.6	2.3	1.6
Non-rel	0.30	8.3	1.1	7.2	1.1	7.2

Note: I censor all hours values at 24 hours per day (144 hours per week) so the rows do not always sum perfectly. In the raw data, a person may have more than 24 hours of care per day if they report two caregivers who each help for 24 hours per day.

5.1 Effects on seniors

My main empirical strategy estimates a difference-in-differences specification on the sample of ADL-impaired seniors, where the policy variable of interest is whether or not a state has adopted the State Plan Personal Care benefit, and the treatment group is seniors who have low enough income to likely qualify them for Medicaid. For an ADL-impaired senior i residing in state s and year t, this equates to estimating the following equation:

$$Y_{it} = \beta SPPC_s \text{IncElig}_{it} + \gamma \text{IncElig}_{it} + \delta \lambda_{it} + \tau_s + \mu_t + \epsilon_{it} \quad (1)$$

where SPPC_s is a state-level variable that indicates whether or not the state has offers personal care through its state plan and IncElig_{it} is an indicator variable that is equal to 1 if the senior's income is below 125% FPL. The coefficient β, which multiplies the interaction of these two variables, is the main coefficient of interest. I also include the effect of IncElig_{it} by itself and state fixed effects τ_s (which would absorb the effect of SPPC_s by itself), as well as year fixed effects μ_t, and a vector of controls that vary at the individual or individual-year level λ_{it}. These variables include demographics (age, sex, race/ethnicity, foreign-born, education), family supports (whether the senior has a partner and/or kids), and measures of health and functioning (numbers of functional difficulties, chronic conditions). Summary statistics for all of these variables are presented in Table A1 in the Appendix. I use income eligibility, rather than Medicaid coverage, because the decision to enroll in Medicaid may be endogenous to the availability of public home care.[12]

Dependent variables Y_{it} include whether seniors receive different types of care, the number of hours of care they receive, living arrangements, and measures of health and well-being. While care outcomes are only asked for people with ADL impairments, living arrangements and health and well-being measures are asked for all respondents. For these outcomes, I also estimate a triple-

[12]Indeed, the primary source of income for seniors in my sample is Social Security retirement benefits, which are unlikely to be significantly affected by one's desire to obtain paid home care.

difference specification using the sample of all respondents i over 65:

$$Y_{it} = \beta SPPC_s \times \text{IncElig}_{it} \times \text{ADL}_{it} + \delta_1 \text{IncElig}_{it} \times \text{ADL}_{it} + \delta_2 SPPC_s \times \text{IncElig}_{it} + \delta_3 SPPC_s \times \text{ADL}_{it} + \gamma \text{IncElig}_{it} + \tau_s + \mu_t + \lambda_{it} + \epsilon_{it}. \quad (2)$$

Again, β is the coefficient of interest, and now multiplies a variable which is equal to 1 if a senior lives in a SPPC state, is low-income, and has an ADL impairment (ADL_{it}). All one-way and two-way interactions are also included.

Standard errors for all specifications are clustered at the state-level.

5.2 Effects on children and partners

The Medicaid SPPC benefit may also affect the potential caregivers of seniors with ADL impairments. In this section, I describe my strategies for studying these effects. I first use the HRS to construct samples containing all children and partners of the seniors used above, and estimate parallel strategies to identify the effect of the policy on caregiving and labor supply for these two groups. I then describe my strategy for studying the health and well-being of children and partners, which requires using a different sample of children for which these outcomes are observed.

A. Caregiving and labor supply among children and partners

Every HRS respondent's spouse is automatically included in the HRS sample, regardless of age, and we thus have detailed data on spouse outcomes such as labor supply and health and well-being, in addition to knowing how much care they are providing. Respondents also give basic information about each of their children, including whether the child is working, and whether or not that child helps them with ADLs and IADLs, as well as their age, education, marital status, and number of kids.

I again make use of both a difference-in-differences and triple difference specification. For the difference-in-differences specification, the sample is either all spouses j or all children j of an ADL-impaired senior HRS respondent. For dependent variables Y_{ijt} such as whether the spouse or child

helps the senior and whether or not the spouse or child is working, I estimate:

$$Y_{ijt} = \beta_g SPPC_s \text{IncElig}_{it} + \gamma_g \text{IncElig}_{it} + \delta\lambda_{it} + \pi\eta_{jt} + \tau_{sg} + \mu_t + \epsilon_{it} \quad (3)$$

This is the same equation as Equation (1), except I have added controls for demographic characteristics of each spouse or child j η_{jt} (for spouses: I use age, gender, education; for children: I use age, gender, education, marital status, and whether they have any children and any young children). I also estimate separate coefficients for each of the main effects by gender, since there are large gender differences in both labor supply and caregiving. The triple difference specification is likewise akin to Equation (2) except for the inclusion of the same controls η_{jt}.

B. Health and well-being of children and partners

To estimate effects on spouse health and well-being, we can make use of the same specifications as above. However, HRS respondents provide only basic demographic information about their children, and so we do not have any information on child health or well-being. To estimate the effects of Medicaid policy on these outcomes, I invert the sampling process for identifying potential caregivers: instead of using the children of HRS respondents with ADL difficulties, I use the sample of HRS respondents who may provide care to a parent, exploiting the fact that the HRS also asks respondents if their parents are alive and if they need help with personal care tasks. While this means that I now have detailed data on child health and well-being, a drawback to using this data is that I do not have the granular data on parent income that enabled me to compute a fairly accurate measure of Medicaid income eligibility in the main sample. I thus employ a slightly different strategy to study the effect of the Medicaid SPPC benefit on child health and well-being: rather than estimating differences among low- and high-income individuals in treatment and control states, I restrict my sample to people for whom the policy is likely to bind, and estimate the difference between the labor supply of children who have or do not have a parent with personal care needs in the two types of states.

My main analysis sample is the sample of all HRS respondents under the age of 65 who reported that their family financial situation was poor growing up (given the choices of pretty well off, about average, and poor). This sample differs from the child sample above in two ways: (1) it only

includes people over the age of 50,[13] (2) it includes people whose parents have passed away, and (3) the family financial situation restriction. Again, I make this last restriction to limit the sample to people who are likely to be affected by the policy of interest.

My preferred specification to estimate the impact of the SPPC benefit is again a difference-in-differences specification, but where the two sources of variation are (1) if they livs in a SPPC state, and (2) if they have any parent who needs help with personal care needs (ParentDiff_{jt}):

$$\begin{aligned} Y_{jt} =& \beta_1 SPPC_s \times \text{ParentDiff}_{jt} + \beta_2 SPPC_s \times \text{ParentAlive}_{jt} + \\ & \gamma_1 \text{ParentDiff}_{it} + \gamma_2 \text{ParentAlive}_{it} + \delta\lambda_{it} + \zeta\pi_{jt} + \tau_s + \mu_t + \epsilon_{it} \end{aligned} \tag{4}$$

The coefficient of interest above is β_1, and the specification also includes an estimate of the effect of having any living parent ParentAlive_{jt}, alone and also interacted with living in a SPPC state, as well as the same controls and state and year fixed effects as above.

6 Results

6.1 Care patterns and living arrangements for seniors

Table 2 begins by exploring the impact of the SPPC benefit on what type of care seniors with ADL difficulties receive. The sample is all senior-year observations where the senior reports having at least one ADL difficulty. The first three columns explore care provided to seniors in private housing, while the fourth and fifth columns look at residential care.

Starting with the third row (the control variables), the table shows that the strongest demographic determinants of receiving care at home vs. being in residential care are race/ethnicity, with minority patients significantly less likely to be in residential care and more likely to receive care at home. These differences by race and ethnicity have been noted previously in the literature. The table also shows that family supports are strongly associated with receiving only unpaid help at home, and negatively associated with being in residential care. Finally, worse health and functioning measures all decrease the probability that a senior receives no help (column 3), but have different effects on which type of care seniors choose: for example, having dementia signifi-

[13] From the earlier analysis, I estimate that approximately half of the children of ADL-impaired seniors are over 50.

cantly increases the probability a senior chooses nursing home care over other options, while having difficulties with more instrumental activities of daily living (cooking, grocery shopping, managing medication) has almost no effect on the probability a senior is in residential care, but a large effect on the probability that a senior receives paid help at home.

The top row shows the main coefficients of interest: the effect of the SPPC benefit on seniors' care choices. I find that high-eligibility seniors in SPPC states are 7.1 percentage points more likely to have a paid home helper, more than a 50% increase over the overall average utilization rate of 13 percentage points (column 1). Most of this effect comes from people who would otherwise have lived at home and received only unpaid help (column 2). The Medicaid SPPC benefit also has a smaller negative effect on the share of people living at home and receiving no help (column 3), and living in a nursing home (column 4), but neither effect is statistically significant at conventional levels. These results suggest that for the marginal seniors in this sample, paid home care is mostly used to supplement or replace unpaid home care, rather than reaching people who would be without help or living in a nursing home.

Table 3 turns to a continuous measure of care, the number of hours of care seniors report receiving at home each week. The first column shows that the Medicaid SPPC benefit increases the number of paid hours of care among the eligible population by 2.8 hours per week. If we assumed that this increase was entirely due to the extensive margin change in Table 2, this would mean that the average new recipient of paid home care receives 40 hours per week of paid care, which would be roughly in line with the findings in Table 1. The second column shows that the benefit also caused a reduction in unpaid hours equal to roughly 65% of the additional paid hours.[14] Thus, only 35% of the hours paid for by the program accrue as "new" hours of care to the impaired senior.

One possibility is that this effect is because the SPPC benefit simply converted unpaid caregivers into paid caregivers by compensating family members for their care provision through consumer direction programs, so there is no real effect on who is providing care. Another possibility is that the policy causes (paid) non-relative caregivers to take over some of the care that would otherwise

[14]These estimates should be interpreted with some caution because respondents are only asked whether each caregiver was paid or not, but it is possible that some caregivers provided both paid and unpaid care hours.

Table 2: Effect of Medicaid SPPC benefit on probabilities of receiving help and hours of help received per day among ADL-impaired seniors

	Private Housing			Residential Care	
	(1) Paid Help	(2) Unpaid Only	(3) None	(4) Nursing Home	(5) Other
$PC_s \times IncElig_{it}$	0.071***	-0.050***	-0.009	-0.015	-0.000
	[0.018]	[0.016]	[0.016]	[0.014]	[0.005]
$IncElig_{it}$	-0.011	0.035***	-0.042***	0.019*	0.002
	[0.015]	[0.012]	[0.012]	[0.010]	[0.004]
Demographics					
Age	0.003***	0.000	-0.008***	0.004***	0.001***
	[0.000]	[0.001]	[0.001]	[0.000]	[0.000]
Female	0.008	0.025*	-0.027**	-0.005	-0.001
	[0.016]	[0.014]	[0.012]	[0.013]	[0.004]
Black	0.036***	0.037**	0.006	-0.075***	-0.006***
	[0.009]	[0.016]	[0.011]	[0.009]	[0.005]
Hisp/Latino	0.070***	0.034**	0.013	-0.114***	-0.006
	[0.015]	[0.015]	[0.019]	[0.009]	[0.005]
Some college	0.028***	-0.055***	0.016	0.010**	0.003
	[0.009]	[0.012]	[0.010]	[0.005]	[0.003]
Family					
Has male spouse/partner	-0.038***	0.182***	-0.081***	-0.056***	-0.004*
	[0.011]	[0.011]	[0.011]	[0.009]	[0.002]
Has female spouse/partner	-0.049***	0.246***	-0.109***	-0.081***	-0.007
	[0.013]	[0.0014]	[0.013]	[0.009]	[0.004]
Has son	0.001	0.041***	-0.0123**	-0.019**	0.000
	[0.007]	[0.012]	[0.010]	[0.007]	[0.003]
Has daughter	0.004	0.042***	-0.014	-0.031***	-0.002
	[0.006]	[0.007]	[0.009]	[0.008]	[0.002]
Health and functioning					
Dementia	-0.042**	-0.085***	-0.059***	0.187***	0.003
	[0.016]	[0.014]	[0.014]	[0.012]	[0.003]
Other Cog Impairment	0.007	0.024**	-0.084***	0.051***	0.003*
	[0.008]	[0.011]	[0.011]	[0.006]	[0.002]
Stroke History	0.033***	0.006	-0.069***	0.031***	0.003
	[0.011]	[0.011]	[0.008]	[0.008]	[0.003]
Lung disease	0.026***	0.018	-0.008	-0.035***	-0.001
	[0.008]	[0.011]	[0.010]	[0.008]	[0.002]
Heart problem	0.003	0.032***	-0.015**	-0.021***	0.000
	[0.006]	[0.007]	[0.007]	[0.005]	[0.002]
Diabetes	0.002	0.033***	-0.037***	0.002	0.000
	[0.006]	[0.010]	[0.008]	[0.006]	[0.002]
# Mobility Diffs	0.005***	0.029***	-0.028***	-0.006***	0.001
	[0.001]	][0.002]	[0.002]	[0.001]	[0.000]
# ADL Diffs	0.022***	-0.036***	-0.051***	0.066***	-0.000
	[0.003]	[0.003]	[0.003]	[0.004]	[0.001]
# IADL Diffs	0.043***	0.082***	-0.130***	0.007*	-0.002
	[0.004]	[0.004]	[0.003]	[0.004]	[0.001]
Constant	-0.260***	-0.035	1.590***	-0.227***	-0.078***
	[0.046]	[0.058]	[0.045]	[0.037]	[0.016]
Depvar Mean	0.129	0.324	0.396	0.142	0.012
N	21918	21918	21918	21918	21918

Sample includes all senior-year observations where senior reports having at least one ADL difficulty in 2000-2016 panels of HRS. Coefficients are from OLS estimation of the difference-in-differences specification with sample survey weights. State fixed effects were included but omitted from the table. Standard errors are clustered at the state level and reported in brackets. Significance: $^{*}\ p < 0.1$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$.

Table 3: Effect of Medicaid SPPC benefit on hours of care received per day by ADL-impaired seniors, by whether caregiver is paid and relationship of caregiver to senior

				Relatives					
	(1) Paid	(2) Unpaid	(3) Non-rel	(4) All	(5) Wife	(6) Husband	(7) Daughter	(8) Son	(9) Other
$PC_s \times IncElig_{it}$	2.844***	-1.882*	2.241***	-1.321	-0.050	-0.484	-0.581	-0.135	-0.507
	[0.677]	[1.036]	[0.680]	[1.090]	[0.621]	[0.443]	[0.094]	[0.047]	[0.062]
$IncElig_{it}$	-2.193***	0.918	-1.968***	0.776	-0.672	-0.160	1.166***	-0.330	1.044**
	[0.560]	[0.811]	[0.556]	0.850]	[0.421]	[0.200]	[0.351]	[0.234]	[0.445]
Dep. Var. Mean	4.355	13.778	3.885	14.231	3.695	2.874	4.328	1.556	2.323
N	21918	21918	21918	21918	21918	21918	21918	21918	21918

Sample includes all senior-year observations where senior reports having at least one ADL difficulty in 2000-2016 panels of HRS. Coefficients are from OLS estimation of the difference-in-differences specification with sample survey weights. Regressions also contain state fixed effects and demographic and health controls shown in Table 2. Standard errors are clustered at the state level and reported in brackets. Significance: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

be provided by relatives. In columns 3 and 4, I show that the latter appears to be the case: the policy raises non-relative hours by 2.2 hours per day, and decreases relative hours by 1.3 hours per day. These estimates suggest that the policy significantly changes who is providing care to seniors with ADL impairments, replacing care from (unpaid) relatives with care from (paid) non-relatives. Finally, columns 5-9 attempt to allocate the reduction in relative care across different types of relatives. These estimates are all noisy, but the point estimates suggest that that husbands and daughters can account for most of the reduction in care from relatives.

Table 4 investigates whether the availability of paid home care through the Medicaid SPPC benefit alters the living arrangements of ADL-impaired seniors. Panel A presents results from the same difference-in-differences specification shown above, where each of the columns represents a mutually exclusive category of living arrangement. The results suggest that likely-Medicaid eligible seniors are more than four percentage points more likely to live on their own (column 1) as a result of the SPPC benefit. This increased rate of living independently appears to be due to reductions in the rates of living with one or more of their children (column 2), living with a non-child household member (column 3), and living in a nursing home (column 4), though none of these effects is statistically significant on their own. Panel B expands the analysis sample to

include all HRS respondents over 65 (with and without ADL impairments) and runs the triple difference specification outlined by Equation (2) above. The estimates are all similar in both sign and magnitude; if anything, they are slightly larger in absolute size; for example, the estimated effect on the probability that seniors are living independently using this specification is 6.5 percentage points. This suggests that the differences observed in Panel A are not due to overall differences in the residence patterns of low-income seniors in SPPC states relative to waiver-only states, but rather are specific to low-income seniors with ADL impairments, making it more plausible that they are related to the existence of the SPPC benefit.

Finally, Table 5 investigates whether the policy's effect on care choices differs based on the type of family support the senior has. This table reproduces the regressions in Table 2, but interacts the main effects with an indicator for one of three potential family situations: if the senior is partnered, single with kids, or single without kids. The signs of the coefficients in the first two rows (partnered seniors, and seniors with kids) generally follow the same pattern as Table 2, where the largest negative effect is on the probability that a senior is receiving only informal care at home. However, the third row displays a different pattern: there is no evidence of substitution away from informal care at home (column 2), and larger negative effects on the probability that a senior is receiving no help (column 3), or in residential care (columns 4 and 5), though the residential care effects are not statistically significant. While this group accounts for only ten percent of the ADL-impaired senior population, column 1 shows that they are very likely to take up paid home care as a result of the SPPC benefit, suggesting that if a policymaker is concerned with care substitution, it may be possible to target seniors who are unlikely to have other sources of care.

6.2 Caregiving and labor force participation among children and partners of ADL-impaired seniors

The evidence thus far indicates that offering the SPPC benefit to seniors with ADL impairments reduces the amount of care they receive from family members. In this section, I study the effects of this reduction on the activities of the caregivers by focusing on the children and partners of seniors with ADL impairments. I focus on these two groups for two reasons: (1) they provide the majority of unpaid care to seniors in my sample, (2) as discussed in Section 4, it is possible to use

Table 4: Effect of Medicaid SPPC benefit on living arrangements of seniors with ADL impairments

	Private housing			Residential care	
	(1) Alone or w/ partner	(2) With child	(3) Other	(4) Nursing Home	(5) Other
Panel A. Seniors with ADL impairments					
$PC_s \times IncElig_{it}$	0.048***	-0.021	-0.012	-0.015	-0.000
	[0.014]	[0.013]	[0.011]	[0.014]	[0.005]
$IncElig_{it}$	-0.065***	0.035***	0.007	0.019*	0.002
	[0.010]	[0.010]	[0.010]	[0.010]	[0.004]
Dep. Var Mean	0.583	0.203	0.061	0.142	0.012
N	21918	21918	21918	21918	21918
Panel B. All seniors					
$PC_s \times IncElig_{it} \times ADL_{it}$	0.064***	-0.036*	0.001	-0.027	-0.000
	[0.024]	[0.019]	[0.013]	[0.019]	[0.007]
$PC_s \times IncElig_{it}$	-0.013	0.018	-0.015**	0.007**	0.004
	[0.017]	[0.017]	[0.007]	[0.0003]	[0.004]
$PC_s \times ADL_{it}$	0.000	0.002	-0.007	0.002	0.002
	[0.015]	[0.016]	[0.010]	[0.010]	[0.006]
$IncElig_{it} \times ADL_{it}$	-0.017	0.007	-0.011	0.022**	-0.002
	[0.015]	[0.016]	[0.010]	[0.010]	[0.006]
$IncElig_{it}$	-0.043***	0.030***	0.018***	-0.003	-0.001
	[0.013]	[0.013]	[0.005]	[0.002]	[0.002]
Dep. Var. Mean	0.721	0.171	0.054	0.037	0.017
N Seniors	95891	95891	95891	95891	95891

This table presents two separate regressions, a DD regression using the sample of ADL-impaired seniors, and a DDD regression using the sample of all seniors. Both regressions contain controls for senior age, gender, race/ethnicity, education, marital status, whether they have a son and/or a daughter, cognitive status, history of stroke, and counts of mobility difficulties, ADL difficulties, IADL difficulties, and chronic conditions, as in Table 2. Standard errors are clustered at the state level and reported in brackets. Significance: $^{*}\ p < 0.1$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$.

Table 5: Heterogeneity of effect of Medicaid SPPC benefit on care choices by whether senior has a partner and/or children

	Private Housing			Residential Care	
	(1) Paid Help	(2) Unpaid Only	(3) None	(4) Nursing Home	(5) Other
$PC_s \times IncElig_{it}$					
× Partnered	0.030	-0.051*	0.023	-0.017	0.006
	[0.028]	[0.026]	[0.024]	[0.019]	[0.008]
× Single with kids	0.056***	-0.061***	0.005	0.000	-0.002
	[0.021]	[0.019]	[0.020]	[0.016]	[0.005]
× Single no kids	0.160***	0.052	-0.120***	-0.058	-0.028
	[0.061]	[0.064]	[0.059]	[0.006]	[0.020]
$IncElig_{it}$					
× Partnered	0.007	0.006	-0.025	0.017	0.003
	[0.024]	[0.021]	[0.018]	[0.016]	[0.004]
× Single with kids	-0.010	0.065***	-0.056***	0.002	0.001
	[0.016]	[0.014]	[0.014]	[0.012]	[0.003]
× Single no kids	0.005	-0.053	-0.061	0.092***	0.016
	[0.037]	[0.046]	[0.051]	[0.037]	[0.018]
Dep. Var. Mean	0.129	0.324	0.396	0.142	0.012
N	21918	21918	21918	21918	21918

Sample includes all senior-year observations where senior reports having at least one ADL difficulty in 2000-2016 panels of HRS. Coefficients are from OLS estimation of the difference-in-differences specification with sample survey weights. Regressions contain state-by-partner/kid status fixed effects and demographic and health controls shown in Table 2. Standard errors are clustered at the state level and reported in brackets. Significance: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

the HRS to construct samples of all partners and all children of HRS respondents, allowing for the estimation of treatment effects on these two groups.

Table 6 begins with children. Panel A shows the result of estimating Equation (3) using the sample of all children of ADL-impaired seniors in the HRS. As discussed in Section 5, this is the same difference-in-differences specification as above, except for the addition of controls for the demographic characteristics of the child (age, marital status, having young kids). The regressions also interact the main effects with the child's gender, given the stark differences in caregiving behavior by gender noted earlier. To help rescale the rest of the estimates in the table as treatment-on-the-treated effects, column 1 reproduces the first column from Table 2 of the effect of the SPPC benefit on the probability that a parent of a daughter or parent of a son receives paid home help as a result of the policy. For parents of daughters, the effect of the SPPC benefit (8.0 percentage points) is larger than the overall average effect in Table 2, while for parents of sons, the effect is smaller (5.5 percentage points), despite the baseline probabilities being quite similar.

The remaining columns examine the behavior of the children, beginning with whether or not they help the impaired parent with ADLs or IADLs. Overall, 11.4% of daughters whose parents have an ADL difficulty provide unpaid help to that parent, but the SPPC benefit reduces this rate by 3.1 percentage points, more than a 25% reduction (column 2). The share of sons who provide unpaid help is significantly lower on average (5.5%), and I estimate a small negative decline of 1.3 percentage points that is not statistically significant. As shown in column 3, a much smaller share of children provide paid help to their parents (0.8 percent of daughters, and 0.2 percent of sons of seniors with ADL difficulties), but the SPPC benefit is associated with an increase of 0.7 percentage points in the probability that a daughter is a paid helper. Column 4 shows that there is also a reduction in the share of daughters who live with the impaired parent of 1.8 percentage points, from a baseline of 7.4 percentage points, which is consistent with the earlier result that the SPPC benefit reduces co-residence with children in Table 4.

Finally, columns 5 and 6 look at whether the child is reported to be working by the parent. I find that daughters are 3.7 percentage points more likely to be working as a result of the SPPC benefit (column 6), but that the labor supply of sons is unaffected by the policy (in fact, the point

estimate is slightly negative). I find no effect of the policy on the share of daughters or sons working part-time. The survey does not specify whether providing paid care is considered work; however, comparing the sizes of the coefficients in column 3 with column 6 suggests that even if daughters are reported as working when they are paid helpers but not when they are unpaid helpers, this effect cannot explain the entirety of the labor supply effect. Together with column 1, this result implies a treatment-on-the-treated (ToT) effect of one additional daughter working full-time for every 2.4 daughters whose parent receives paid help as a result of the SPPC benefit. This is quite a large effect, potentially suggesting that the marginal seniors who use paid home care as a result of the SPPC benefit are people whose daughters may be on a labor supply margin.

Panel B re-estimates the co-residence and labor supply effects using the triple-difference specification and the larger sample of all children of seniors in the HRS. Unlike the DD specification in Panel A, this specification is able to account for unobserved factors that might lead to lower co-residence or higher labor force participation among lower-income women in SPPC states. I do not find much evidence of omitted variable bias along this dimension (which would show up in the effect of $\text{SPPC}_s \times \text{IncElig}_{it}$), and the DDD estimates of the effect of the SPPC benefit are similar to the DD estimates in Panel A. Using this specification, I estimate a ToT effect of one additional daughter working full-time per three daughters whose parents are new recipients of paid home care, a slightly smaller but still quite large and significant effect. Together, these results suggest that the SPPC benefit causes an increase in labor supply among daughters of low-income seniors with ADL difficulties, likely by reducing their caregiving burden. On the other hand, sons experience a slight reduction in caregiving, but no increase in labor supply, suggesting that unlike daughters, sons at the margin of caregiving do not appear to also be at a labor supply margin.

Table 7 turns to the effect on spouses and partners, again interacting the main effects by the gender of the potential caregiver (in this case, the spouse or partner). The first column reproduces the effect on the probability that an senior with ADL impairments is receiving paid help, and finds substantial heterogeneity based on the gender of their partner. While ADL-impaired seniors with male partners experience a statistically significant increase in their use of paid home care, ADL-impaired seniors with female partners do not, despite similar baseline probabilities of using

Table 6: Effect of Medicaid SPPC benefit on co-residence, caregiving, and labor supply of children of seniors with ADL impairments

	Respondent	Child of respondent				
	(1) Receives Paid Help	(2) Provides Unpaid Help	(3) Provides Paid Help	(4) Lives w/ parent	(5) Works PT	(6) Works FT
Panel A. Parent-child pairs where parent is ADL-impaired senior						
$PC_s \times IncElig_{it}$						
× Daughter	0.080***	-0.031***	0.007***	-0.018***	0.003	0.037***
	[0.021]	[0.012]	[0.003]	[0.007]	[0.008]	[0.014]
× Son	0.055***	-0.013	-0.001	-0.005	0.000	-0.026
	[0.025]	[0.008]	[0.001]	[0.010]	[0.008]	[0.019]
$IncElig_{it}$						
× Daughter	-0.018	0.036***	-0.003	0.006	-0.006	-0.049***
	[0.018]	[0.009]	[0.002]	[0.006]	[0.006]	[0.011]
× Son	0.003	-0.010	-0.001	0.005	0.003	-0.041**
	[0.020]	[0.008]	[0.001]	[0.007]	[0.006]	[0.018]
Daughter Mean	0.142	0.114	0.008	0.074	0.090	0.554
Son Mean	0.140	0.055	0.002	0.073	0.049	0.673
N	75757	75757	75757	75757	75757	71600
Panel B. Parent-child pairs where parent is any senior						
$PC_s \times IncElig_{it} \times ADL_{it}$						
× Daughter				-0.020***	0.001	0.031**
				[0.007]	[0.010]	[0.015]
× Son				-0.005	0.003	-0.020
				[0.010]	[0.008]	[0.020]
$PC_s \times IncElig_{it}$						
× Daughter				0.000	0.000	0.011
				[0.006]	[0.008]	[0.010]
× Son				0.004	-0.002	-0.009
				[0.008]	[0.005]	[0.011]
$PC_s \times ADL_{it}$						
× Daughter				0.003	0.008	-0.013
				[0.006]	[0.006]	[0.013]
× Son				0.003	-0.001	0.005
				[0.005]	[0.004]	[0.009]
$IncElig_{it} \times ADL_{it}$						
× Daughter				0.001	0.013*	-0.051***
				[0.005]	[0.007]	[0.012]
× Son				-0.001	-0.009	0.000
				[0.008]	[0.006]	[0.017]
$IncElig_{it}$						
× Daughter				0.004	-0.016***	-0.010*
				[0.004]	[0.006]	[0.006]
× Son				0.001	0.014***	-0.051***
				[0.007]	[0.003]	[0.009]
Daughter Mean				0.057	0.101	0.612
Son Mean				0.065	0.044	0.764
N				325709	325709	310446

This table presents two separate regressions, a DD regression using the sample of children of ADL-impaired seniors, and a DDD regression using the sample of children of seniors with and without ADL difficulties. Both regressions contain controls for senior demographics, family, and health, as in Table 2, and also controls for the child's age, sex, marital status, education, and whether they have young kids. The regressions also contain fixed effects at the state-by-child-gender level. Standard errors are clustered at the state level and reported in brackets. Significance: $^{*}\ p < 0.1$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$.

paid help. Column 2 looks at whether a senior's spouse is their "primary" ADL helper (the person who they report helps them the most). Consistent with the small take-up of the benefit shown in column 1 among seniors with wives, the SPPC benefit does not cause a significant reduction in primary caregiving. On the other hand, there is a substantial decrease in primary caregiving among husbands. This suggests that while the supply of care by husbands is fairly "elastic" to the availability of paid home care, the supply of care by wives is less so. Columns 3 and 4 then show that in contrast to the effects on daughters, the reduction in husband caregiving does not seem to be related to their labor market behavior, which is unsurprising given that most spouses in this sample are past the usual age of retirement and not working. Together, Tables 6 and 7 show that the SPPC benefit causes the most increased use of paid home care among seniors with daughters and/or husbands, and that both daughters and husbands significantly reduce their caregiving. However, daughters also increase their labor supply as a result of the policy, while the labor supply of husbands is not affected.

6.3 Health and well-being effects

The previous two sections have shown that eligibility for the Medicaid SPPC benefit has a significant effect on where and from whom seniors receive their care, how much care their family members (particularly husbands and daughters) provide, and whether their daughters are working. This section assesses whether these changes affect the health and well-being of seniors or their family members.

Beginning with ADL-impaired seniors, the switch toward more paid home care and less unpaid home care and nursing home care could plausibly have both positive or negative implications for senior health and well-being. On the one hand, one might expect that seniors who are able to live independently are happier and healthier than those who rely on family members or nursing homes for care. If paid care is more skilled than care from informal care providers, one might also expect fewer adverse health events or lower mortality as a result of the SPPC benefit. On the other hand, if paid home care is lower quality, or if they prefer receiving care from and living with their children, they may experience negative health and well-being effects. Table 8 tests these different hypotheses. The measures we use are how they self-rate their health (poor, fair, good, very good,

Table 7: Effect of Medicaid SPPC benefit on use of paid care, care from spouses, and spouse labor supply for partnered ADL-impaired seniors, by gender of impaired senior's partner

	Impaired senior	Spouse		
	(1) Receives paid help	(2) Is primary helper	(3) Works part-time	(4) Works full-time
$PC_s \times IncElig_{it}$				
× Wife	0.014	0.002	-0.010	0.001
	[0.031]	[0.043]	[0.025]	[0.026]
× Husband	0.070*	-0.066*	-0.011	0.010
	[0.036]	[0.035]	[0.025]	[0.034]
$IncElig_{it}$				
× Wife	0.0005	0.046	-0.010	-0.066***
	[0.026]	[0.030]	[0.012]	[0.023]
× Husband	-0.006	-0.019	-0.018	-0.021
	[0.026]	[0.026]	[0.021]	[0.022]
Wife Mean	0.096	0.443	0.055	0.113
Husband Mean	0.074	0.379	0.042	0.089
N	9302	9302	9022	9302

All regressions contain State X Gender fixed effects. Coefficients are from OLS estimation of the difference-in-differences specification on the sample of partnered ADL-impaired seniors with state fixed effects. Standard errors are clustered at the state level and reported in brackets. Significance: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

or excellent), their score on the Center of Epidemiological Studies Depression Scale (column 2), and their Diener life satisfaction score (column 3).[15] We convert these scores into binary measures using natural or conventional thresholds. Columns 4-6 focus on adverse event measures of health measured over the course of the two years following the survey: whether the senior experiences a decline in functioning, has a hospital stay, or dies. I find no statistically significant impacts of the benefit on any of these outcomes, and the estimates are fairly noisy, so unfortunately, it is not possible to rule out fairly large positive or negative ToT effects. These results could either reflect the presence of heterogeneous treatment effects, where some seniors experienced positive effects and others experienced negative effects, or they may indicate that most of the treated population does not experience any significant health effects, which is not too surprising given that most seniors only experience a change in who provides them care, rather than a change in whether they are receiving care or how much care they are receiving.

Table 9 looks at the effects on the health and well-being of children and spouses, using the same subjective well-being measures as above, and replacing the adverse event measures with two additional questions: first, whether or not the child or spouse reports ever being diagnosed with a psychiatric issue such as anxiety or depression, and second, whether or not the child or spouse reports being troubled with pain. Panel A begins with children, using the limited sample and alternative specification outlined by Equation 4. The first two rows show that there are again no statistically significant impacts on health and well-being for spouses or daughters, although the signs and point estimates for daughters are suggestive of potentially positive effects. The second two rows show that having a parent who has personal care needs are associated with significantly worse health and well-being outcomes, particularly for daughters. Panel B looks at effects of spouses, using the preferred DDD specification for these outcomes, but again finds no statistically significant effects on wives or husbands.

[15]This survey is an optional module that was only fielded beginning in 2004. It is completed by roughly 28% of respondents and this sample is non-random (may be subject to selection bias) and the results should therefore be interpreted with caution.

Table 8: Effect of SPPC benefit on health and well-being of seniors with ADL impairments

	Ratings and assessments			Adverse health event in next two years		
	(1) Good health	(2) Depressed	(3) High life sat.	(4) Func. decline	(5) Hospitaliz.	(6) Mortality
Panel A. Seniors with ADL impairments						
$PC_s \times IncElig_{it}$	-0.008	0.011	0.020	0.002	-0.002	-0.010
	[0.024]	[0.022]	[0.036]	[0.015]	[0.015]	[0.017]
$IncElig_{it}$	-0.049**	0.039**	-0.005	0.015	-0.004	-0.001
	[0.021]	[0.019]	[0.026]	[0.012]	[0.014]	[0.011]
Dep. Var. Mean	0.375	0.315	0.402	0.333	0.467	0.207
N	21967	16917	5110	15690	15690	20086
Panel B. All seniors						
$PC_s \times IncElig_{it} \times ADL_{it}$	-0.010	0.029	0.010	0.010	0.010	-0.017
	[0.027]	[0.024]	[0.043]	[0.016]	[0.020]	[0.018]
$PC_s \times IncElig_{it}$	0.002	-0.014	0.012	-0.005	-0.010	0.001
	[0.013]	[0.010]	[0.022]	[0.011]	[0.011]	[0.005]
$PC_s \times ADL_{it}$	0.024*	-0.017	-0.012	-0.002	-0.018	0.012
	[0.012]	[0.012]	[0.022]	[0.009]	[0.016]	[0.009]
$IncElig_{it} \times ADL_{it}$	0.048**	0.019	0.086***	-0.033***	-0.026	-0.014
	[0.021]	[0.019]	[0.022]	[0.012]	[0.016]	[0.013]
$IncElig_{it}$	-0.083***	0.039***	-0.069***	0.037***	0.014	0.006**
	[0.008]	[0.008]	[0.014]	[0.010]	[0.008]	[0.003]
Dep. Var. Mean	0.705	0.134	0.583	0.186	0.317	0.080
N	95891	86873	26799	81452	81452	89277

Standard errors are clustered at the state level and reported in brackets. Significance: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 9: Effect of SPPC benefit on health and well-being of children and partners of seniors with ADL impairments

	(1) Good health	(2) Depressed	(3) High life sat.	(4) Psych problem	(5) Troubled w/ pain
Panel A. Effects on children between 50-65					
$PC_s \times ParentDiff_{it}$					
× Daughter	0.041	-0.029	-0.037	-0.046	-0.089
	[0.06]	[0.04]	[0.09]	[0.05]	[0.06]
× Son	-0.037	0.009	-0.041	0.013	0.037
	[0.06]	[0.04]	[0.09]	[0.04]	[0.06]
$ParentDiff_{it}$					
× Daughter	-0.103***	0.135***	0.030	0.088**	0.098*
	[0.04]	[0.03]	[0.06]	[0.04]	[0.05]
× Son	-0.075*	0.094***	-0.018	0.026	0.096*
	[0.04]	[0.03]	[0.07]	[0.03]	[0.05]
Dep. Var. Mean	0.66	0.23	0.43	0.24	0.44
N	16591	15754	4028	16591	16591
Panel B. Effects on spouses					
$PC_s \times IncElig_{it} \times ADL_{it}$					
× Wife	-0.060	-0.007	-0.013	-0.048	0.009
	[0.054]	[0.042]	[0.081]	[0.041]	[0.047]
× Husband	-0.069	0.026	-0.111	-0.015	-0.029
	[0.047]	[0.047]	[0.106]	[0.042]	[0.043]
Dep. Var. Mean	0.63	0.18	0.49	0.20	0.31
N	53791	49589	15928	47547	53791

Sample contains all female HRS respondents under the age of 65. Standard errors are clustered at the state level and reported in brackets. Significance: $^{*}\ p < 0.1$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$.

7 Robustness Checks

This section probes the robustness of the findings in the paper to potential sources of bias and alternative empirical specifications. In general, the focus will be on three results: (1) the large and positive effect of the SPPC policy on paid home care utilization, (2) the negative effect on nursing home use (which has important policy relevance, but is not statistically significant), and (3) the positive effect on daughter labor supply.

7.1 Omitted variable bias

One threat to the identification strategy in this paper is that other factors may drive differences between treatment and control states in the outcomes of low-income ADL-impaired seniors and their daughters. For example, SPPC states might be richer states that spend more on all kinds of health care, thus enabling more seniors to live independently and their daughters to work more. While it is not possible to completely rule all confounders, Table 10 summarizes some potential confounders to help us understand the likelihood of this type of bias.

The first row uses data from the Dartmouth Atlas to show that SPPC states have slightly lower adjusted Medicare spending per enrollee than waiver-only states, but the difference is small and not statistically significant. I also specifically look at Medicare spending on home health care, which may reflect the propensity of providers to recommend home care over inpatient care or the robustness of the supply of aides in a state. Again, I find slightly lower adjusted home health spending in SPPC states, but the difference is not statistically significant. More broadly, higher income states or states with larger safety nets for low-income individuals may have better outcomes for low-income ADL-impaired seniors and their daughters. The next two rows of Table 10 show that SPPC states are slightly wealthier than waiver-only states, but have roughly equivalent Democratic voting shares in the past few presidential elections (both of which may proxy for the size of the safety net). Again, these differences are not statistically significant. Finally, the fifth row looks at a measure of cultural attitudes toward female labor force participation "outside the home" from the General Social Survey, and does not find significant differences between treatment and control states. On the other hand, the last two rows look at Medicaid spending on nursing homes and

Table 10: Average characteristics of SPPC states and waiver-only states

	SPPC states	Waiver-only states	Difference in means
Medicare spending	9,854	10,205	-352
Medicare home health spending	462	500	-38
Median income	31,115	29,757	1,358
Dem vote share (2000-2016)	.47	.47	0.002
Share pop favorable twd. female LFP	0.68	0.66	0.02
Medicaid NH spending	3,282	3,627	-346
Medicaid HCBS spending	2,214	1,046	1,169*
N	25	21	

This table calculates state-level averages of various state characteristics for SPPC states, waiver-only states, and then calculates the difference-in-means for each variable. Significant differences from a t-test of this difference are marked with an asterisk (*).

home and community-based care. SPPC states have almost double as much Medicaid spending per senior on home and community-based care as waiver-only states, and lower nursing home spending (though the second difference is not statistically significant). These differences are likely at least due in part to the adoption of the SPPC benefit, though they may pluasibly reflect other Medicaid long-term care policies as well. For this reason, a more conservative interpretation of the results is that the estimates above reflect the effect of more generous home and community-based care policies in Medicaid.

Taken collectively, Table 10 suggests that there are not large differences between SPPC states and waiver-only states in many plausible confounders, making it unlikely that these variables are driving the results. Table A4 in the Appendix tests this formally, by running a "horse race" regression that includes the interaction of being in the top half of states for each of these potential confounders with the individual variation in income eligibility and ADL impairments to see if the main effect disappears once these controls are added. I find that including these additional variables does not substantially change the estimates of the main effects.

7.2 Sensitivity analyses

This section probes the robustness of the result to two of the design decisions I made as the researcher by (1) including late adoption states in the sample, and (2) using alternative definitions of the treatment and control income groups.

The main specifications dropped the five late adoption states from the sample, because the programs in those states are likely to be less established, and so the states might look like a mixture of treatment and control states and be harder to interpret. However, to show that the results are not driven by this decision, Table A6 in the Appendix re-estimates the main results in a sample that includes the five late adoption states, coding them as treated in any years following their adoption of the SPPC benefit and control before, and shows that this alternative design does not substantially affect the results.

One might also be concerned that the results are sensitive to the particular income threshold I chose to define the treatment group of likely-Medicaid-eligibles. Figure 4 shows that Medicaid coverage appears to decline slowly with income above 75% FPL, which would be fairly consistent with the eligibility rules. If the results are driven entirely by people whose incomes fall between 75-125% FPL, one might worry that the results are caused by something other than differences in state Medicaid policy. Table 11 drops people from the sample whose incomes are in the "fuzzy" range of potential Medicaid eligibility (75%-150% FPL), thus defining the treatment income group as anyone whose income is below 75% FPL and the control group as anyone whose income is above 150% FPL. In effect, this compares people who are very poor and likely to automatically qualify for Medicaid to people who are almost definitely not eligible for Medicaid. The main results are robust to this specification, and the magnitudes of the estimates are actually larger, consistent with the hypothesis that only some individuals under the looser definition of treatment actually have access to paid home care. In this sample, the nursing home effect is statistically significant, and implies a reduction of one fewer nursing home residents per 2.8 additional people receiving home care.

Table A5 in the Appendix presents an alternative specification that drops people whose incomes are above 300% FPL. I do this because one might worry that people with high incomes are not a reasonable control group for people whose incomes are below 0-125% FPL, and may be more likely

Table 11: Main results estimated on sample that excludes people with incomes between 75-150% FPL

	(1) Paid Helper	(2) NH Resident	(3) Daughter Works FT
$PC_s \times IncElig_{it}$	0.084***	-0.029*	0.043*
	[0.024]	[0.023]	[0.024]
$IncElig_{it}$	0.005	0.026	-0.091***
	[0.021]	[0.018]	[0.022]
Dep. Var Mean	0.113	0.128	0.571
N	14830	14830	24248

Sample includes all senior-year observations where senior reports having at least one ADL difficulty in 2000-2016 panels of HRS and whose incomes are not between 75-150% FPL. Coefficients are from OLS estimation of the difference-in-differences specification with sample survey weights. Regressions also contain state fixed effects and demographic and health controls shown in Table 2. Standard errors are clustered at the state level and reported in brackets. Significance: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

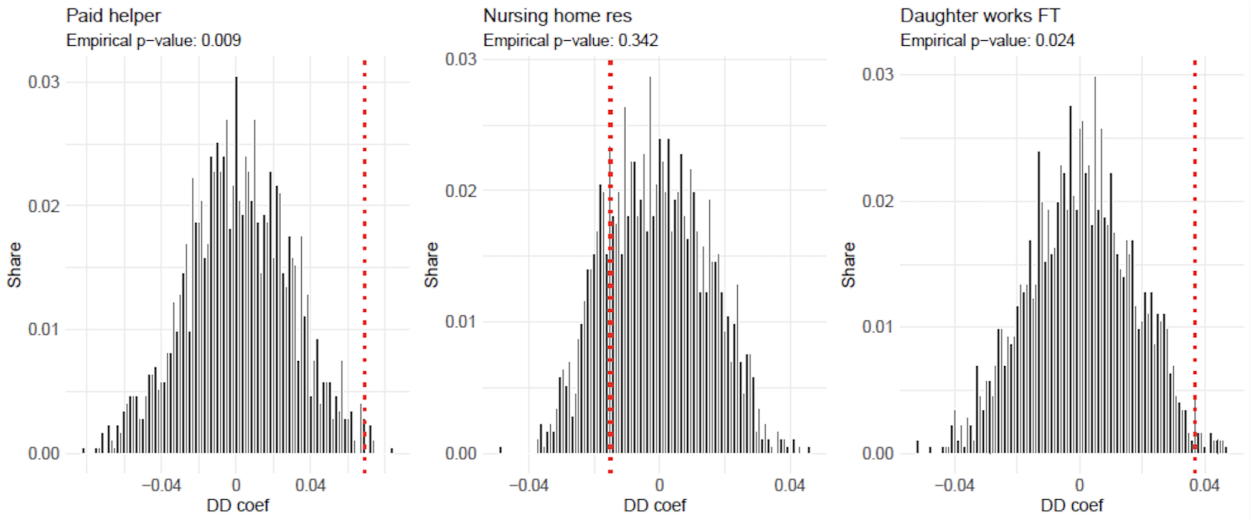
to participate in the private pay home care market, which could also be affected by geography. The results in this sample are somewhat smaller and less precisely estimated, but still tell the same story.

7.3 Permutation tests

Finally, we may be concerned that non-homoskedasticity in the errors will lead to over-rejection of the null hypothesis that there is no effect of state Medicaid policy on the use of paid home care, nursing home residence, or female labor supply. While I cluster standard errors at the state level in order to account for this, I also do a randomization test of the main results of the paper to test this possibility non-parametrically. I run a series of regressions equivalent to my baseline difference-in-differences specification, except in each run, I randomly sample 25 states to be "treatment" states. The estimated coefficients from 2,000 of these regressions are shown in Figure 5, where the red line indicates the coefficient from the regressions using the true assignment of treatment and control states. Each graph also reports the empirical two-sided p-value for the true coefficient: these p-values provide fairly reassuring evidence that the effects on having a paid helper and daughter labor supply are meaningful, but as expected, we cannot reject a null effect on nursing home use.

In Appendix Figure A2, I also provide a non-parametric test of robustness by reporting the results of 46 estimations of the baseline specification on the sample of states excluding each state

Figure 5: Distribution of placebo β coefficients from permutation test



N=2,000 simulations of difference-in-differences specification where $SPPC_s$ is randomly set to be 1 for 25 treatment states in each simulation. True coefficient is marked by the red dashed line, and the empirical two-sided p-value for the true coefficient is given in the subtitle of each graph.

in turn. This test shows that the results are not driven by any individual state.

8 Implications for government revenues

This paper evaluates the effect of expanding access to home care by exploiting state-level variation in whether or not personal care is an entitlement in the state's Medicaid program. Roughly, this natural experiment is similar to a policy proposed during the incoming presidential administration's campaign to end waitlists for HCBS (Gleckman, 2020). In this section, I perform a back-of-the-envelope calculation to illustrate how the estimates of this paper could be used to evaluate such a policy.

There are two main ways that the population receiving services may change if access to home care is expanded: (1) people who would otherwise use institutional care may opt to receive formal care at home instead, (2) people who otherwise would not receive any formal care may begin to receive care (the "woodwork" effect). Both populations are substantial at the policy margin that I consider in this paper. At the mean estimates, the SPPC benefit is associated with 1.5 percent fewer

nursing home users per eligible senior, but 7.1 percentage points more home care users, meaning that roughly 20% of the marginal population falls into the first category, and the remaining 80% are part of the "woodwork effect" population. We can map this into government costs by using estimates from the Genworth Cost of Care Survey that put the average price of home care at $23 per hour and the average price of a semi-private room in a nursing home at $90,000 per year. Using the estimate that the SPPC benefit increases paid care by 2.8 hours per week per eligible senior, this would mean that Medicaid would pay an additional $3,335 per eligible senior for home care services and save $1,350 in nursing home costs each year. This estimate should be viewed more as an illustration, given the noise in the nursing home coefficient, but shows that even with a fairly substantial woodwork effect (80%), the savings from nursing home use can be substantial (more than 40%), given the stark difference in costs per user.

The second source of savings to the government is the fiscal externality from increased labor supply from daughters. To estimate these externalities, I re-weight average earnings among women working full-time in the ACS using the age and education levels of daughters of income-eligible ADL-impaired seniors in my sample. This produces an estimate of $50,000 in annual full-time earnings for the average woman of a similar age and education level to the potential group of affected daughters, which would result in additional federal and state income tax revenues of roughly $10,000. Taking the more conservative DDD estimate of 3.1 percent more daughters working full-time and scaling the estimate by the average number of daughters per eligible senior (1.65), I estimate additional income tax revenues of $515 per eligible senior. The final cost of the program is thus roughly $3,335-$1,350-$515=$1,470 per eligible senior, meaning that the government is able to recover roughly 56% of the program's cost due to these two offsets. Expressed in terms of participants rather than the eligible population, this means that the program's cost would be roughly $47,000 per participant before taking into account these savings, but only $20,700 per participant after taking into account these savings.

9 Conclusion

Medicare was created to address the lack of health insurance among many seniors at the time, leading to both limited access to health care and the potential for health events to cause significant

financial distress. Today, lack of comprehensive long-term care insurance poses a similar problem, and Medicaid and families appear to bear a significant portion of the costs.

This paper identifies a source of state variation in Medicaid long-term care policy to evaluate the impact of financing home care for low-income seniors with functional difficulties. States that passed this policy have rates of paid home care utilization that are more than 50% higher than the baseline average. Notably, the total amount of care that seniors receive does not increase by much as a result of this increased access to home care. Rather, I find that this care is often used to replace care from unpaid family members, suggesting that family members may be a significant beneficiary of policies to expand home care. Focusing on daughters, who provide the most care to seniors in my sample, I find that providing low-income seniors access to paid care reduces the probability that a daughter is caring for their parent, and increases the probability that they are working full-time. For every 2.4-3 daughters of ADL-impaired parents who receive home care as a result of the policy, I estimate that one works full-time as a result of the policy.

From a policy design perspective, these results offer a few insights. First, despite their popularity, I find that waiver programs result in significantly reduced utilization of home care, relative to offering a state plan benefit. Second, my results suggest that care substitution is likely to be a significant effect of policies that expand access to home care for seniors unless the program is targeted very narrowly to people without other family support. However, this care substitution may result in positive social externalities, such as increased daughter labor supply, as in the case of the policy studied in this paper. Finally, the results follow other literature (summarized in Currie and Gahvari 2008) in emphasizing the importance of considering how take-up of an in-kind benefit will affect the targeting of that benefit toward potential beneficiaries who have the highest marginal social benefit of program participation. In this case, my results suggest that the take-up of in-kind home care may be concentrated among seniors whose potential caregivers are on a labor supply margin, more so than seniors on the margin of entering a nursing home. However, one would imagine that take-up would be significantly different for other potential long-term care reforms, such as respite payments for family caregivers or paid family leave or a cash benefit (for example, Lieber and Lockwood 2019 compare the targeting properties of an in-kind home care benefit to a cash

benefit), so a comparison of these reforms should take this into account.

Finally, this paper suggests the need to provide long-term care to a parent may be a significant uninsured risk in the population, particularly for women. Low-income seniors are particularly likely to have functional difficulties, and I find that Medicaid's provision of home care can significantly increase the labor force participation of their daughters. Future research is needed to examine whether this effect is similarly large for higher-income women, and how these policies ultimately impact women's lifetime earnings, given that parental caregiving needs often occur during peak earnings years.

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A Appendix

Table A1: Sample averages of all control variables for analysis sample seniors by functional status, 2000-2016

	No ADL difficulty	ADL difficulty
Live in SPPC State (PC_s)	0.57	0.58
(Countable) income below 125% FPL ($IncElig_{it}$)	0.18	0.36
Demographics		
Age	74.1	78.7
Female	0.55	0.65
Black	0.08	0.12
Hispanic/Latino	0.05	0.08
Some college	0.45	0.32
Family		
Has male partner	0.27	0.19
Has female partner	0.35	0.23
Has son	0.75	0.73
Has daughter	0.73	0.73
Health		
Dementia	0.06	0.25
Other cog impairment	0.18	0.26
Stroke	0.06	0.19
Lung disease	0.10	0.18
Heart problem	0.28	0.43
Diabetes	0.20	0.25
# Mobility difficulties (Max. 9)	2.0	6.3
# IADL difficulties (Max. 4)	0.1	1.0
# ADL difficulties (Max. 6)	-	2.5
N respondent-years	73,921	21,918
Unique respondents	18,445	9,692

Table A2: Sample averages of all control variables for children of HRS respondents

	Parent has no ADL difficulty	Parent has ADL difficulty
Age	46	50
Female	0.49	0.50
Partnered	0.69	0.66
Any kid	0.82	0.84
Young kid	0.08	0.06
Some college	0.22	0.22
College	0.32	0.30
N	249,952	75,757
Unique individuals	41,347	32,613

Figure A1: Histogram of hours of care per day received by ADL-impaired seniors

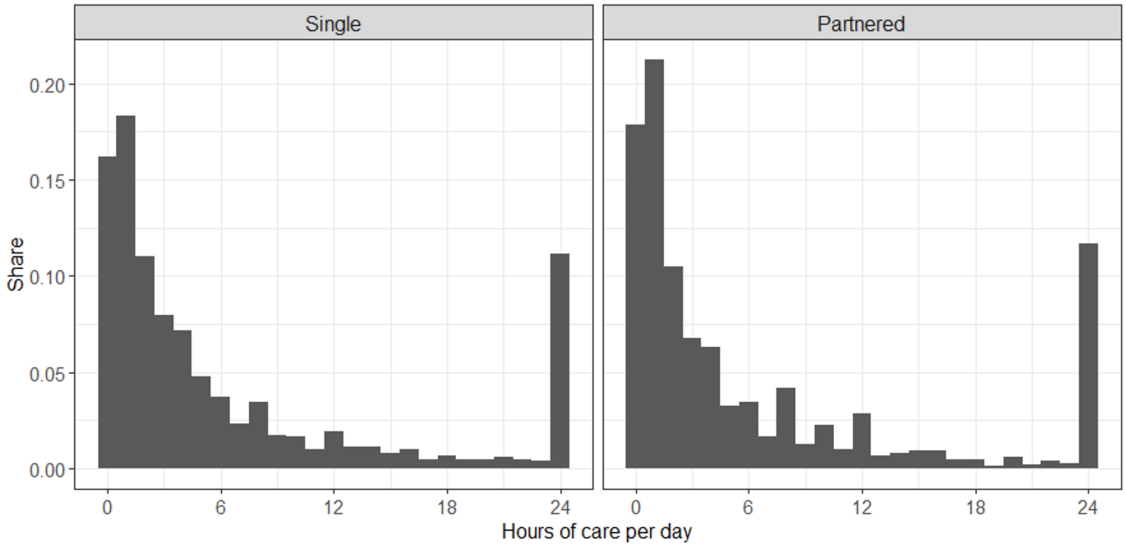


Figure A2: DD coefficient on paid home care after leaving out each state individually

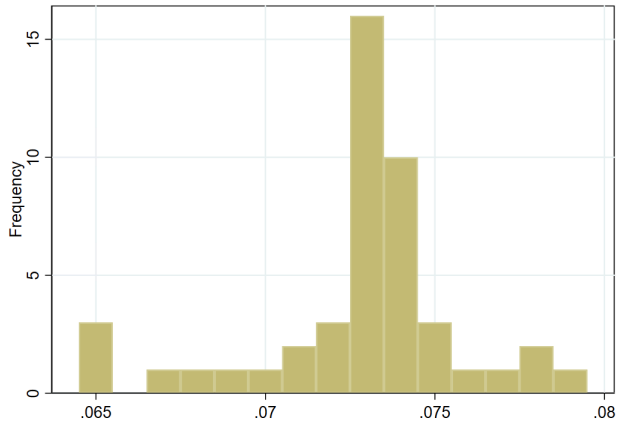


Table A3: Sample averages of all control variables for spouses and partners of senior HRS respondents

	Spouse has no ADL difficulty	Spouse has ADL difficulty
Age	72	75
Female	0.55	0.55
Black	0.09	0.13
Hispanic/Latino	0.06	0.09
Some college	0.44	0.35
Dementia	0.06	0.11
Other cog impairment	0.16	0.23
Mobility difficulties (Max. 9)	2.5	3.5
IADL difficulties (Max. 4)	0.2	0.4
ADL difficulties (Max. 6)	0.3	0.7
N	44,724	9,091
Unique individuals	12,177	4,590

Table A4: Horse race regression of state-level variables against SPPC benefit

	(1) Paid Helper	(2) NH Resident	(3) Daughter Works FT
$PC_s \times IncElig_{it}$	0.068***	-0.011	0.039***
	[0.018]	[0.013]	[0.013]
$HighMedicare_s \times IncElig_{it}$	0.047**	-0.026**	0.008
	[0.023]	[0.013]	[0.023]
$HighHomeHealth_s \times IncElig_{it}$	0.001	0.003	0.004
	[0.025]	[0.012]	[0.022]
$HighMedianIncome_s \times IncElig_{it}$	0.006	-0.012	0.007
	[0.023]	[0.016]	[0.017]
$HighGSS_s \times IncElig_{it}$	0.021	0.022	0.030**
	[0.023]	[0.014]	[0.015]
$HighDem_s \times IncElig_{it}$	-0.004	-0.007	-0.037**
	[0.022]	[0.014]	[0.017]
$IncElig_{it}$	-0.052*	0.037**	-0.047***
	[0.026]	[0.016]	[0.022]
Dep. Var Mean	0.129	0.142	0.554
N	21918	21918	33956

This table replicates the DDD specification for three main variables of interest. Standard errors are clustered at the state level and reported in brackets. Significance: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A5: Main results estimated on sample of seniors with income < 300% FPL

	(1) Paid Helper	(2) NH Resident	(3) Daughter Works FT
$PC_s \times IncElig_{it}$	0.060***	-0.015	0.028*
	[0.019]	[0.015]	[0.015]
$IncElig_{it}$	-0.003	0.019	-0.057***
	[0.014]	[0.010]	[0.010]
Dep. Var. Mean	0.127	0.151	0.542
N	17791	17791	30077

Table A6: Main results estimated including late adoption states

	(1) Paid Helper	(2) NH Resident	(3) Daughter Works FT
$PC_s \times IncElig_{it}$	0.071***	-0.020	0.034**
	[0.017]	[0.014]	[0.014]
$IncElig_{it}$	-0.012	0.023**	-0.059***
	[0.013]	[0.010]	[0.012]
Dep. Var Mean	0.119	0.142	0.554
N	22591	22591	37239