Caregiving Across Generations

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Abstract

We show that interventions impacting informal caregiving exert effects across generations. We exploit the exogenous state-level decline in public funding for Medicare home health care after the Interim Payment System (IPS) reform in the United States and document that a more pronounced decline in funding not only increased the provision of informal care to elderly parents and parents-in-law, but it also exerted intergenerational spillovers by increasing the supply of informal care from children and grandchildren a few decades later.

Keywords: caregiving, role modelling effects, Medicare home health care reform, family ties, intergenerational transmission.

JEL: 113, J14, Z1

1. Introduction

Policy interventions can influence family behaviour across multiple generations.[1] As population ageing increases the demand for adult care in most countries (WHO, 2023), it is important to understand whether and to what extent intervention exerts an impact on care across generations. This paper studies the impact of a policy intervention influencing the provision of care support to old age individuals, and we document that it exerts long-term spillover effects on the care provided by the following generation of family members. We specifically focus on home health care and informal care, which are the most common forms of health care services provided in the patient's home supplied in many Western countries [2].

Given that informal care from family members is the most common alternative when home health care is unavailable, we examine the effects of a policy that significantly reduced public funding for Medicare home health care in the United States at the end of the 1990s. Prior to this policy change, Medicare home health care had effectively become a long-term care service for many elderly individuals following hospitalizations (Murtaugh et al., 2003). By 1996, 49% of Medicare home health care visits were provided by home health aides (see Figure 1). In light of this substantial share of visits being delivered by aides, we explore whether the large reduction in Medicare funding for home health care led to an increased reliance on informal care. Specifically, between 1996 and 2000, the number of Medicare home health aide visits dropped from 129.5 million to 27.7 million (Health Care Financing Administration, 1998, 2002).

We show that the decline in public funding for home health care not only increased informal care provided to the elderly by their adult children (and children in law), which we refer to as

[1]For example, in the United States Hartley *et al.* (2022) find that a mother's participation in the aid to families with dependent children (AFDC) and temporary assistance for needy families (TANF) programs increased her daughter's odds of adult participation in such programs down the line. Similarly, Jacobs (2020) documents that the introduction of the Earned Income Tax Credit (EICT) program in the United States led to higher approval of women labour market participation; children whose fathers were eligible for paternity leave in Spain, exhibited more egalitarian attitudes towards gender roles and equally engagement in the labour market and in the home (Farre *et al*, 2022).

[2] For instance, recent data from a few developed countries suggest that home health care makes up more than a third of all long term care spending in Lithuania and Austria and stands at around 20% in Ireland and Germany (OECD, 2020).

genegeneration 1, but also, after many years, we estimate an increase in informal caregiving provided to generation 1 by the following generations (from now on we refer to these next generations as generation 2). Caregiving duties are a core part of social norms in many societies, and informal care provided by the family is one of the main sources of care worldwide (Norton, 2016). Although it is estimated that the economic value of unpaid caregiving exceeds that of nursing homes and paid home care budgets (Chari et al., 2015; Arno et al, 1999), we still know little about the motivations that lead individuals to supply care to the elderly, and financial incentives such as the availability of publicly funded home health care may be important determinants of the decision to provide informal elderly care.

To identify the effect of caregiving across generations, we take advantage of a unique quasi-experiment, namely the Interim Payment System (IPS) in the United States in the late 90s that caused a steep decline in public funding of Medicare home healthcare. The IPS *imposed a cap* on the average reimbursement per patient that home care agencies (e.g., the providers of home health care) were entitled to receive when treating elderly Medicare patients. The cap was based on a blend of each home health agency's average per-patient cost in 1994 and the average per-patient cost of home health agencies in the agency's census division.[3] The cap was structured in a way that resulted in varying reductions in public funding for Medicare home health care across states with similar average pre-policy reimbursement limits. This variation was contingent on the average home health care costs specific to their census division (See Section 2 for more information).

Whether this large decline in Medicare home health care led to an increase in informal care by generation 1, and, many years later, by generation 2, is ultimately an empirical question.

[3] A Census division is a cluster of states. There are in total 10 Census divisions: the New England division (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont), Middle Atlantic (New Jersey, New York and Pennsylvania), the East North Central division (Illinois, Indiana, Michigan, Ohio, Wisconsin) the West North Central division (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota), the South Atlantic division (Delaware, District of Columbia, Florida, Georgia, Maryland , North Carolina, South Carolina, Virginia, West Virginia), the East South Central division (Alabama, Kentucky, Mississippi and Tennessee), the West South Central division (Arkansas, Louisiana, Oklahoma, Texas), the Mountain division (Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming), the Pacific division (Alaska, California, Hawaii, Oregon, Washington).

This ex-ante ambiguity is to be expected: the literature on informal care in several disciplines reports both positive and negative aspects related to providing informal care to the elderly (van Durme et al., 2012). On the one hand, informal care provides the caregiver with a positive sense of self, as caregivers feel that they have been useful. On the other hand, caregiving requires time and energy, so it invariably affects the caregiver's allocation of time. Additionally, the provision of care to frail elderly parents/parents-in-law means that caregivers spend time with people who are not well, and this direct exposure to suffering can impact caregivers' wellbeing. Even if there is an increase in informal care to the elderly due to the decline in public home health care, the increased exposure of generation 2 to informal care to the elderly provided by generation 1 does not necessarily imply an increased provision of informal care from generation 2 to generation 1. If generation 2 perceived the experience of caregiving by generation 1 as negative, it is not clear that generation 2 will increase care to their elderly parents once they age and require care.

Our estimates suggest that generation 1 adults living in states where on average the decline in public funding for home health care due to the IPS was relatively large were more likely to supply informal care to the elderly compared to those living in states where, on average, the decline in public funding for home health care to the elderly due to the IPS was not as large. We also find that in later years, once generation 1 aged and needed care, those of generation 1 who were living in states where on average the decline in public funding for home health care due to the IPS was relatively large, were also more likely to receive informal care from their children and grandchildren, suggesting that the IPS altered informal care behavior for the following generations as well. The plausible mechanism behind these findings rests on the variation in the severity of the IPS cuts: those of generation 2, who were young when the IPS happened and who witnessed a relatively large decline in funding for Medicare home health care, were also more likely to witness an increase in informal care provided by generation 1 to the elderly compared to their peers who faced less severe cuts in public home health care. It is entirely possibly that this higher exposure impacted their behavior in informal elderly care when needed.

The literature acknowledges that beliefs and behaviors across generations can be impacted by families and by peers' families as well. For instance, Dahl and Gielen (2021) find that children of parents whose disability insurance (DI) eligibility was reduced were 11 percent less likely to participate in DI themselves, did not alter their use of other government programs, and earned 2 percent more as adults. Olivetti, Patacchini, and Zenou (2020) find that a woman's labor supply as a young adult is shaped by the work behavior of her adolescent peers' mothers, in addition to the work behavior of her mother.

Our paper contributes to the existing literature in several key areas. First, it extends the body of research on the impact of public interventions on intergenerational behavior, a field that is rapidly growing but has not yet addressed our specific research question. As such, this study is the first to document the causal impact of changes in public funding for long-term care on informal caregiving across generations. Moreover, the limited literature on the intergenerational transmission of caregiving (Charles et al., 2015) remains largely descriptive, highlighting the novelty and significance of our work.

Second, we add to the literature on the effect of the cuts in public funding for home health care on several outcomes. Given the quasi-random variation introduced by the IPS, several studies have used the IPS as a quasi-experiment. Studies in this area have looked at the impact of the IPS on home health care and other healthcare services received by elderly Medicare beneficiaries (McKnight, 2006); home ownership among the elderly (Engelhardt and Greenhalgh-Stanley, 2009); elderly living arrangements (Orsini, 2010); elderly mortality (Huckfeldt,2014; Orsini, 2019); and home health care market structure (Orsini, 2016). Golberstein et al. (2009) looks at the impact of the IPS on informal care receipts by unmarried elderly respondents to the Health and Retirement Survey (HRS). We also use HRS data, but given that we look at caregiving across generations, the HRS respondents we focus on are the children of the elderly affected by the IPS and their report of provision of informal care to their elderly parents/parents-in-law. In selecting our sample we are not only focusing on the provision of care to elderly parents who are unmarried, because not all

unmarried elderly have children. Our research question focuses on the transmission of caregiving across generations, so we need to look at care provision by children to elderly who are unmarried as well as elderly who are married. This makes our sample different from the sample Golberstein et al. (2009) focus on.

Furthemore, we also study how the IPS impacted receipt of care for the following generation, leveraging the many years of HRS data now available. While the main focus of our analysis is informal care, we acknowledge that the IPS may have impacted the perceptions of the need to be insured and the importance of family support. We therefore look at how beliefs and other transfers between generations may have been impacted by the policy. In particular, we look at inter-vivos transfers from generation 1 to generation 2, the likelihood that children live within 10 miles from parents, the purchase of long-term care insurance by generation 1, generation 1's take-up of Medicaid, as well as the intention to leave a bequest. In doing so, we not only contribute to the academic discussion on the incentives for the supply of informal care, but we also highlight that long term care policies can trigger a host of behaviors across several generations.

2. Background: Medicare Home Health Care and the IPS

2.1 Medicare Home Health Care

Medicare was enacted by Congress in the United States in 1965 to meet the health insurance needs of the elderly and the disabled. During the period in which the IPS was implemented, Medicare consisted of three parts: hospital insurance, known as Part A; a supplementary medical insurance, known as part B; and Part C, which expanded beneficiaries' options to participate in private-sector health care plans. Medicare Part A is provided automatically and free of charge to people aged 65 or older who are eligible to receive Social Security or Railroad Retirement Benefits. Until 1997, Medicare Part A covered inpatient hospital care, short-term skilled nursing facilities services, hospice care, and home health care. Since 1997, Medicare Part A has covered all home

health care visits for individuals not enrolled in Part B For individuals enrolled in Medicare Part B, Medicare part A covers the first 100 home health care visits that follow an inpatient stay, and Part B covers visits in excess of the limit imposed after the inpatient stay and visits that are needed without a previous inpatient stay. Medicare home health care covers six health care services: skilled nursing, physical therapy, occupational therapy, speech therapy, medical social work, and home health aide. To be eligible to receive Medicare home health care, Medicare beneficiaries need to be "home-bound" and in need of "intermittent" and "part-time" care. Such care can be substantial. As Medicare defines part-time or "intermittent" care as the care needed or given on fewer than 7 days each week or less than 8 hours each day, with some exceptions for special circumstances, suggesting that a decline in Medicare home health care funding can substantially affect care received in the home for elderly beneficiaries. Medicare home health care providers are home health agencies that employ staff providing home health care. Home care agencies need to be certified by the Medicare program to be able to be reimbursed for the care provided to Medicare patients.

2.2 The IPS

The Balanced Budget Act (BBA) of 1997 changed reimbursement for Medicare home health care. Congressional action followed several years of rapid growth in the number of people using the benefit and in the number of visits provided. This rapid growth was largely responsible for an average increase in Medicare spending of 25 percent per year between 1990 and 1997 (Murtaugh et al., 2003). The large increase in the number of beneficiaries with many visits, and the large proportion of those visits provided by home health aides, made analysts question the compatibility of the *de facto* long-term care nature of Medicare home health care for many beneficiaries with the original focus of Medicare home health care as a skilled service (Murtaugh et al., 2003). The reform involved two phases. First, from 1997 to 2000, an Interim Payment System (IPS) was established that put a cap on how much each home care agency would be reimbursed per patient per year (home care agencies were reimbursed on a cost basis before the IPS). The cap had

two components: 75 percent of the value was based on each home care agency's 1994 average per-patient cost and 25 percent was based on the average per-patient cost of the home care agency's census division.[4] As a result, two home health agencies with similar per patient cost before the IPS but located in different census divisions faced different reimbursement limits if the per-patient costs in their census divisions were different. The reasoning applied to a home health agency in a state can be applied to the average of agencies in that state, so the IPS created time and state variation in reimbursement of Medicare home health care at the state level (McKnight, 2006). The second phase started in October 2000, when the IPS gave way to the Prospective Payment System (PPS).[5] As the rules of the PPS did not vary by state, they generated time series variation but did not generate state variation as did the IPS. Therefore, like previous research looking at the impact of the change in funding on Medicare home health care in 1997 (for example, See McKnight, 2006; Golberstein et al., 2009; Engelhardt and Greenhalgh-Stanley, 2010; Orsini, 2010), we concentrate on using the variation introduced by the IPS to study changes in caregiving provision across generations.

The drop in the provision of Medicare home health care following the IPS was large: the fraction of Medicare beneficiaries that used the service went from 10.7 percent in 1996 to 8.5 percent in 1999. Additionally, between 1996 and 1999, the average number of visits per user went from 74 to 42.[6] Not only did the number of visits declined. The composition of visits changed as well. Home aide visits declined from 129,502 millions (49% of the total Medicare Home health care visits) in 1996 to 27,652 millions (30.5% of the total Medicare Home health care visits). As services provided by home health aides are the most likely to be substitutable by informal care, as home health aides' duties involve the provision of personal care services, such as assistance with eating, bathing, and toileting; simple surgical dressing changes; assistance with certain medications; activities to support

[4] Please, refer to footnote 4 that illustrates the different Census Divisions.
[5] Under PPS, a home care agency receives a single payment for all items and services furnished during each 60-day episode of care. The payment rate is based on the national average cost of providing care in 1997, not on actual home health agency cost. To account for differences in beneficiary needs, PPS reimbursements are adjusted from a base rate.
[6] Data are from various years of the Medicaid and Medicare Statistical Supplement, Health Care Financing Administration (HCFA, various years).

skilled therapy services; and routine care of prosthetic and orthotic devices (United States General Accounting Office, 2003). Given the high substitutability of home health aide services with informal care, it is entirely plausible that the large decline in the provision of Medicare home health care visits provided by home health aides as a consequence of the IPS triggered an increase in the demand for informal care. It is also worth noticing that Medicaid also provides dual beneficiaries with some home visits, including personal care visits.[7] However, data on the receipt of home health care by the elderly in the IPS period does not support the idea that Medicaid compensated the decline in Medicare home health care with additional visits. Orsini (2011) using National Health Interview Survey aggregate data shows that the fraction of elderly Medicaid–Medicare enrolled that received home care visits between 1998 and 2001 decreased by 17.97 percent compared to a 15.91 percent decline in the fraction of Medicare only beneficiaries that received home care. The two numbers are remarkably similar, suggesting that it is unlikely that Medicaid policies had a balancing effect on the decline in visits received by the elderly as a consequence of the IPS.

3. Data and Description of the Outcome Variables

The data we use in our estimates come from the Health and Retirement Study (HRS). The HRS is a nationally representative longitudinal survey of individuals (both respondents and their spouses) who were 51-61 years old in 1992. We believe that the HRS is the most appropriate data set to use for our analysis, as it collects information on the supply and demand of long-term care services, as well as formal and informal care provided to the elderly. It also runs for a long enough period to allow us to look at the transmission of informal caregiving across generations. Finally,

[7] By federal mandate, states are required to provide Medicaid home health services to persons entitled to receive skilled nursing services under the state's Medicaid plan. These services include skilled nursing, home health aid, medical equipment and appliances to be used in the home. Moreover, states have the option of providing additional services like physical therapy, occupational therapy, speech pathology, and audiology services (United States House of Representatives, 2004). Medicaid regulations allow states to provide home and community based services under two programs: personal care services and home and community based waiver programs. Since 1975, states have the option of providing personal care services that include help with bathing, dressing, eating, toileting, personal hygiene, light housework, laundry, meal preparation and grocery shopping. By 1998-1999, 26 states offered personal care services (Le Blanc et al.,2001).

the HRS is a dataset with a relatively large sample size on the children of the elderly Medicare beneficiaries affected by the IPS reform. We use the restricted version of the HRS which allows us to use state identifiers.

We study two different segments of the HRS data. First, we use data from 1992 through 2000 to identify the impact of IPS on informal care supplied by respondents to their parents/parents-in-law. When studying the first segment of the sample, we limit respondents to those who are below age 65 in the first period of data we use (1992-2000). This is because 65 is the age at which most elderly individuals are eligible for Medicare in the United States. Respondents aged 65 or above are potentially directly affected by the IPS as well, but including them would make the interpretation of our estimates of the impact of the IPS on caregiving to elderly parents/parent in law difficult. Due to the outcome we study, we also limit the sample to those respondents who have at least one living parent. Furthermore, because we need to study caregiving across generations, we limit our sample to respondents who have at least one child. We limit the first period to end in 2000, because IPS was replaced by the PPS in October 2000. Subsequently, we track these respondents over time, using HRS waves from 2010 through 2018 to investigate caregiving received by generation 1 and provided by generation 2. We selected the second segment of the sample to start in 2010 to balance the need for a large enough sample size to carry out the estimates of the impact of the IPS on receiving care later in life for people who were not eligible for Medicare when the IPS happened, as well as the need to wait for generation 1 to age "enough" to be likely to require care. Table 1 displays summary statistics for the two different segments of the sample in Panel A and Panel B, respectively.

Regarding the main outcome variable, we opt for the measurement of caregiving at the intensive margin. Our main outcome variable is therefore a dummy equal to 1 if the respondent provides care to their parents/parents-in-law for the analysis on the first segment of the sample, and it is a dummy equal to 1 if the respondent indicates receiving care from children/children in

law and grandchildren when considering the analysis on the second segment of the sample. More precisely, when considering caregiving by generation 1 to their elderly parents/parents-in-law, the HRS asks respondents whether they spent at least 100 hours in the past 2 years/ since the last wave helping parents/parents-in-law with basic personal activities like dressing, eating, and bathing. The HRS also asks whether the respondent in the past 2 years/ since the last wave spent a total of 100 hours helping parents/parents-in-law with things such as household chores, errands, transportation, etc. Our outcome variable is equal to 1 if the respondent replied "Yes" to either one of these questions. We decided not to further study the exact reported number of hours spent on these activities by respondents, as this measure is likely prone to considerable error (particularly considering that HRS waves are two years apart).

In the second segment of the sample, covering generation 1 between the years 2010 and 2018, the HRS asks respondents whether in the previous two years/since the last interview respondent's children and/or grandchildren have helped them with chores, errands, transportation, etc. The HRS also asks respondents whether they have any Activities of Daily Living (ADL)[8] limitations and asks who most often helps with each ADL limitation. Our main outcome variable in this part of the analysis is a dummy equal to 1 if respondents answer yes to the first question and/or the dummy is equal to 1 if those who have ADL limitations list their children/children-in-law/grandchildren as those helping with those limitations.

We also look at other relevant outcomes to gain a more complete picture of the impact of the IPS. First, given the large decline in the provision of Medicare home health care with the IPS, it is possible to hypothesize that those of generation 1 in states relatively more impacted by the IPS became relatively more aware of the importance of health insurance, and this, in turn, may have induced them to look for long-term care insurance coverage. We consider two outcomes in

[8] ADL is used as an indicator of a person's functional status. The inability to perform ADLs results in the dependence of other individuals and/or mechanical devices (Edemekong et al., 2023).

this respect: Medicaid coverage, and private long-term care insurance coverage. Medicaid in the US provides some form of home care to eligible individuals who satisfy the income requirement, and it provides insurance for institutional care as well. In general, Medicaid takeup is estimated to be well below 100% (Borella et al, 2018). Since Medicaid eligibility is income related, and some elderly might not qualify, we also look at whether respondents report that they have long-term care insurance coverage. Although the private market for long-term care insurance is not large (Brown and Finkelstein, 2011), it is not inexistent, so it makes sense to consider private long-term care insurance as an outcome as well.

We also look at the stated probability of leaving a bequest to generation 2 as an outcome, as well as transfers of money from generation 1 to generation 2 in the period 2010-2018. There are several non-competing reasons to expect that the IPS might have impacted the subjective probability of leaving a bequest by generation 1 to generation 2. The IPS might have increased the belief that financial resources are needed in old age and might have prompted generation 1 to save more to be able to transfer more money to their children for their old age needs with a bequest or with inter vivos financial transfers. In addition to this, the increased intention to leave a bequest as well as an increase in financial transfers from parents to children might have been seen as an incentive to receive care from children when in need. For example, Groneck (2017) uses exit interviews in the HRS and finds that children who provided relatively more care to their elderly parents received larger bequests compared to their siblings. With our analysis, we complement this literature by showing that a trigger of the stated intention to provide a bequest/financial transfer to children can be a long-term care policy change. Finally, if the IPS increased the perception of the necessity to provide informal care to elderly parents, it is possible that children decided to live closer to their parents as a consequence of the policy. Although it would be nice to have a continuous measure to use in the analysis as an outcome, the HRS does not have this information. Instead, we can investigate the likelihood that children live within 10 miles from their parents.

4. Empirical Strategy

4.1 Cross-State Variation in the Policy Change

The new reimbursement rules for Medicare home health care introduced by the IPS meant that states with similar increasing trends between 1994 and 1997 but where, on average, home health agencies had average per-patient costs below the census division in 1994 faced a reimbursement limit that was less restrictive than the limit faced by home health agencies in states where, on average, the average per patient cost in 1994 was above the average per patient cost in their census division.

We use the same measure used by McKnight (2006) to capture a cross-state component of the state variation implied by the IPS.

Here we follow McKnight (2006) and identify the average number of visits per user as the most appropriate measure of cost to use. More formally, McKnight (2006) defines the following measure of restriction in reimbursement generosity:

$$\text{Restrictiveness}_{sc} = \bar{A}_S - \bar{A}_C \qquad (1)$$

where $\bar{A}_S$ is the average number of Medicare home care visits per user in 1994 in state s, and $\bar{A}_C$ is the average number of Medicare home care visits per user in 1994 in state's census division. The restrictiveness measure is between -40.9 (Kentucky) and 34.7 (Utah). It is worth noticing that the Restrictiveness measure is a relative number, hence it gives a measure of *relative* restriction of the policy. As other research has mentioned (for instance, McKnigh, 2006) all states were restricted by the policy. In fact, there was a decline in the provision of Medicare home health care measured by Medicare home health visits per user in all states as a consequence of the IPS. The decline in the provision of formal home health care was *more pronounced*, however, in those states that were relatively more restricted by the IPS, hence those with a relatively higher Restrictiveness measure. To illustrate this point, Figure 1 shows that the relative decline in the provision of Medicare home health care was more pronounced in states that were relatively more restricted by the IPS compared to states that were relatively less restricted. To construct Figure 1, we divide states into two groups:

one group is composed of relatively more restricted states (those with a Restrictiveness measure>=0), and another group is composed of relatively less restricted states (those with a Restrictiveness measure<0). Figure 1 shows four facts. First, in all states, there was an increase in Medicare home health care utilization between 1994 and 1997. Moreover, the trends over this period were very similar in the two types of states. Also, all states experienced a decline in utilization in the post policy period. Finally, the drop in visits per user was much more severe for the highly restricted states. Figure 1 is an approximate visual representation of the difference-in-differences estimation strategy used by McKnight (2004, 2006) to study the impact of the Interim Payment System on the number of home care visits received by Medicare beneficiaries. We use the same identification strategy to study the impact of the IPS on the provision of care by generation 1 to their elderly parents/parents-in-law. We also use the Restrictiveness measure in our empirical strategy when looking at the impact of the IPS on caregiving by generation 2 to generation 1. Both strategies are more formally illustrated below.

4.2 Difference-in-Differences Specification: the impact of the IPS on informal elderly care

Equation 2 below is estimated on the first segment of the sample introduced in Section 3 using data between 1994 and 2000 and presents the difference-in-differences strategy that compares changes in our outcome, namely informal care supplied to the elderly by generation 1 in states that faced a relatively restricted reimbursement by the IPS, with changes in the supply of informal care to the elderly in states that were less restricted by the IPS:

$$H_{it} = \alpha_t + S_i + Year_t + S_i t + Post_t \beta + Post_t * Restrictiveness_{st} \gamma + e_{it} \qquad (2)$$

H_{it} is a dummy equal to 1 if the respondents supplied care to her/his elderly parents/parents in law in state i in year t as defined in Section 3 ; α_t and S_i and $Year_t$ are year and state fixed effects, and $S_j t$ are state trends. $Post_t$ is a dummy equal to 1 for years 1998-2000 in which the IPS was in place (McKnight, 2006) and 0 otherwise. $Restrictiveness_{st}$ captures the state variation in the policy change and it is the variable introduced section 4.1; e_{it} is the error term. Given that the IPS

implied state differences in Medicare home health care financing as a consequence of the IPS, we cluster the standard errors at the state level (Bertrand, Duflo, Mullainathan, 2004).

The difference in differences model requires that absent the policy change the trends in informal caregiving for those in states relatively more impacted by the IPS compared to those in states relatively less impacted by the IPS should have been the same. Although an identifying assumption cannot be tested, it is possible to see whether it is plausible by testing whether trends in the outcome variable were plausibly parallel for the more impacted states compared to the less impacted states in the pre-IPS period. To this end, we restrict the sample to years 1992-1996 and interact year effects with the Restrictiveness measure and test the null hypothesis that the interactions of year dummies with the Restrictiveness measure are jointly 0. From this exercise, we cannot reject that trends in caregiving were the same for more and less restricted states in the pre-policy period (please, refer to Table A.1 in the appendix for the estimates).

To move to a more intuitive estimate from a policy perspective it is possible to recover the impact of a decline in reimbursement of one visit per user on the outcomes we consider. The point estimates of γ in Equation 2 represent the impact of an increase equal to 1 in the Restrictiveness measure, which is equivalent to the impact of a decline in reimbursement equal to 0.25 visits per user. This is because the state variation in the decline in Medicare home health care reimbursement rests on the portion of the cap (25%) due to the census division, so, to recover the impact of a decline in reimbursement of one visit per user one can multiply the point estimates of γ by 4 (See McKnight, 2006).

4.3 Transmission of Caregiving Across Generations

Equation 3 below presents the regression specification that looks at the transmission of caregiving across generations. Our results illustrated in the next section show that generation 1 increased informal care to their elderly parents/parents-in-law as a consequence of the IPS (i.e., the results are from estimating equation 2).

To look at the intergenerational effects of the IPS on caregiving we focus on the informal care received by generation 1 from generation 2 (as defined in section 3) and how such care varies depending on whether generation 1 was living during the IPS period in states that were more or less restricted by the IPS . For this analysis, we use the second segment of the sample described in section (3). The regression specification is as follows:

$$R_{ist} = \alpha_t + S_s + Year_t + S_s t + \rho\ Restrictiveness + \delta\ Restrictiveness * Caregiver_i + \gamma\ Caregiver + \beta\ X_{ist} + e_{ist} \quad (3)$$

R_{ist} is a dummy equal to 1 if individual i in state s in year t provided care as defined in section 3; α_t and S_s and $Year_t$ are year and state fixed effects, and $S_s t$ are linear state trends. Restrictiveness is measure assigned to the state where the individual was living during the IPS.[9] γ estimates the different intercept for those of generation 1 who provided care to their elderly parents when the IPS was enacted, as 'Caregiver' takes the value '1' if a respondent provided care to her parents during the IPS reform. X is a set of individual-level controls, which includes demographic indicators. As it wss the case for equation 2, to recover the impact of a decline in reimbursement of one visit per user, one needs to multiply by 4 the point estimates of ρ in equation 3.

5 Results

5.1 Main Estimates: Provision of caregiving to elderly parents by generation 1

Results from estimating equation 2 are reported in Table 2. The results from column 1 of Table 2 indicate that an increase equal to 1 in the Restrictiveness measure/ a decline in reimbursement of one visit per user increased the likelihood that generation 1 provides care to their parents/parents-in-law by 1.53/6.12 (6.12=1.53*4) percentage points. Since Table 1 reports that 33 percent of respondents provide care to their parent/parents-in-law in this period, this point estimates

[9] Since the IPS lasted for 3 years, to assign the state an individual was living in during the IPS we checked whether during the IPS respondents were likely to move states. Although in our sample we have a small number of individuals who changed state during the IPS, our estimates are unchanged if we exclude them.

imply an average increase in the provision of care to elderly parents/parents-in-law equal to 4.64 percent/18.56[10] percent. Subsequently, we run a fully specified model that incorporates controls for marital status, gender, and race/ethnicity and the point estimate in column 2 of Table 2 is almost unchanged, implying an effect equal to 1.55/6.2 percentage points (4.7 percent/18.8 percent).

We next look at the possibility that the IPS might have had a heterogeneous effect on different subsamples and report the resulting estimates from this exercise in Table 3. We estimate the model by gender, marital status, and race/ethnicity. We hypothesize that the effect of the IPS might vary by gender because of women's traditional role as caregivers. Indeed, when considering estimates by gender in columns 1 and 2 of Table 3, the point estimate for the sample of female respondents implies that an increase equal to 1 in the Restrictiveness measure/ a decline in reimbursement equal to 1 visit per user increases the fraction of women who provide care to their elderly parents/parents in law by 2.9/11.6 percentage points (9.28%/37.12%), but the impact on the provision of care by male respondents has a *negative* coefficient: an increase equal to 1 in the Restrictiveness measure/ a decline in reimbursement of one visit per user implies a decline in the fraction of men who provide informal care to their elderly parents/parents in law equal to 2.0/8 percentage points (-5.33%/-21.33%). This percent effect for males is smaller in absolute value than the effect on females and in the opposite direction. A possible reason behind this finding is that males, on average, might be more likely than females in normal times (namely when public home health care is available) to provide help with errands or transportation and when the need for personal care increases due to the decline in Medicare home health care, men's wives and sisters step in to provide such care. As there might be spillovers in certain care activities that were once performed by males, females might end up taking on those as well. For instance, one could think about the case of men going grocery shopping for their parents/parents-in-law before the IPS. Once their sisters/wives increase informal care in the home of the elderly after the IPS, they might simply

[10] Please, refer to section 4.2 for a justification of this calculation.

stop grocery shopping along the way, or they might just bring home cooked food to the elderly, so that the activities men were performing before the IPS declined after the IPS was implemented, hence the negative coefficient for the sample of men.

In Table 2, column 6, since health behavior and health outcomes in the United States also vary along race and ethnicity dimensions (see, for example, Nnduga and Artiga, 2023), we estimate equation 2 on the sample of white, non-Hispanic respondents (Table 2, column 4), and on the sample of all others. Due to the relatively small sample size, we are unable to further investigate the impact of the IPS along more refined race/ethnicity lines. Results in Table 3 indicate that for white non-Hispanic respondents an increase equal to 1 in the Restrictiveness measure/a decline in reimbursement equal to 1 visit per user caused an increase in informal care provision to parents/parents-in-law equal to 3.2/12.8 percentage points (9.48 %/37.63%), and equal to 0.94/3.76 percentage points (3.2%/12.97%) for all other groups. However, admittedly, given the coarse grouping we are looking at when estimating equations by race/ethnicity, more research is needed to understand whether informal care response to a change in public funding for home health care varies by race/ethnicity. The last two columns of Table 3 look at whether the effect is heterogeneous by marital status. The estimate in Table 3, column 6 suggests that an increase equal to 1 in the Restrictiveness measure/a decline in reimbursement of one visit per user increases the likelihood that single individuals provide care by 0.45/1.8 percentage points (14.1%/56.4%). The estimate is equal to 2.8/11.2 percentage points (8.23%/32.9%) for married individuals, suggesting that unmarried children were relatively more likely to increase the provision of care compared to married individuals. This result could be due to a relatively more inflexible time schedule of married individuals compared to married ones, as married individuals have their own family obbligations, which may prevent married individuals to increase informal care to the elderly relatively more compared to unmarried individuals.

5.*3 Main Estimates: transmission of caregiving across generations*

In this section we examine the results from estimating equation 3 on the second segment of the sample, the segment that includes data from year 2010 through 2018, to investigate whether there is evidence of transmission of caregiving across generations. Table 4 reports our results.

The most conservative estimate of Table 4 in column 2 implies that an increase of 1 in the Restrictiveness measure/ a decline in reimbursement of one visit per user increases the fraction of respondents who receive informal care from their children or grandchildren by 3.4/13.6 percentage points (6.3 %/25.2%). Table 4 also reports the coefficient estimate of the variable "caregiver" which is equal to 1 if the respondent during the years 1997-2000 provided care to her/his elderly parents/parents in law and it also reports estimates of the interaction between the variable "caregiver" and the Restrictivenss measure. This interaction looks at whether the impact of the IPS on the respondent receiving care from their children varies depending on whether the respondent provided care to her/his parents/parents-in-law in the past. When looking at the estimate of this interaction in column 1 of Table 4, we find that this interaction is not significant at the 1% or 5% level, and the point estimate (-0.0024) is very small: the 95 percent confidence interval implied by these estimates is [-0.00514, 0.000344], with estimates of the extremities that are one order of magnitude smaller than the main estimates, suggesting that the IPS unlikely had a differential impact on the care received by those who were direct caregivers to their elderly parents/parent in law in the past. Because family transmission is not the only mechanism that is at play when it comes to behavioral transmission across generations, and people who were young during the IPS witnessed an increase in informal care to the elderly from their parents but also likely witnessed increased informal care provided by their extended family or their peer's parents (Olivetti, Patacchini, and Zenou, 2020), our estimates are consistent with the interpretation that it is entirely possible that the combination of parental, extended family and peers' parents transmission rather than parental transmission alone played a role in determining the transmission across generations.

Table 5 considers results from estimating equation 3 on different subsamples. We first consider heterogeneous estimates by gender. It is well known that women live longer than men, so it is not surprising that in Table 5 the sample size for women is over two times as large as the sample size of men. Perhaps this difference is the reason why we find in column 1 a statistically significant effect of the Restrictiveness measure on the fraction of elderly women reporting receiving informal care from their children/children-in-law/grandchildren. For this sample, an increase equal to 1 in the Restrictiveness measure/a decline in reimbursement equal to 1 visit per user implies an increase in the fraction of elderly women reporting to receive care from generation 2 equal to 4.7/18.8 percentage points (7.32%/29.32%), and an increase in the fraction of men receiving informal care from generation 2 equal to 1.02/4.08 percentage points (3.19%/12.76%).

In principle, there could be two non-competing explanations behind these different results for women and men. The first possible explanation is driven by gender norms. A first possibility is that male respondents might report a lower likelihood of receiving informal care from generation 2 because they receive care from their wives, so the residual need for informal care from their children is smaller. A second explanation is driven by demographics. Husbands tend to be a few years older than wives, on average, and men tend to die younger than women, making the potential pool of spouses caregivers smaller for women compared to men.

Column 3 and 4 of Table 5 show our estimates when conducting a heterogeneous analysis by level of education of the respondent, and report these results in. We find that the point estimates and percentage effects for the two groups are very different: an increase equal to 1 in the Restrictiveness measure/ a decline in reimbursement of one visit per user increases the fraction of those elderly with a level of education equal to high school or less/some college or more receiving care from generation 2 by 4.3/17.2 percentage points (7.36%/29.58%). The point estimate for those who have at least some college is not significant and the 95% confidence interval of this estimate is

[-0.0072, 0.0026], estimates that are one order of magnitude lower than those for people with a level of education equal to high school or less.

When looking at the analysis by race/ethnicity reported in Table 5, column 5 and 6 we find that an increase equal to 1 in the Restrictiveness measure/ a decline in reimbursement equal to 1 visit per user implies an increase in the fraction of respondents receiving care from generation 2 for whites non-Hispanics equal to 3.7/14.8 percentage points (7.54%/30.19%). For all other grouos the corresponding estimates are equal to 2.8/11.2 percentage points (4.23%/16.92%) .

In all cases the interaction of the caregiving dummy with the Restrictiveness measure is not statistically significant at conventional levels and estimates are at least one order of magnitude smaller than those of the main effect.

5.4 Other Relevant Outcomes

The results summarized in the previous section support the idea that a relatively more pronounced exposure to a decline in funding for home health care for generation 1 during the IPS increased informal care received later in life. In this section, we try to draw a more complete picture of the impact of the IPS on behavior across generations.

The first two outcomes we consider are Medicaid and long-term care insurance coverage, as motivated in Section 3. In Table 6, column 5, we find that an increase equal to 1 in the Restrictiveness measure/ a decline in reimbursement of one visit per user increased the fraction of generation one purchasing long-term care insurance by 0.01/0.04 percentage points (9.09%/36.36%). Generation 1 might have become aware of the importance of insurance in general, and even if they ended up not having enough resources to purchase long-term care insurance in the private market, those eligible could have increased the take up of Medicaid. We find evidence of an increased take-up of Medicaid insurance in column 4 of Table 6. An increase

equal to 1 in the Restrictiveness measure increased the fraction of those of generation 1 having Medicaid by 2.2/8.8 percentage points (8.8%/35.2%).

Finally, Table 6 reports estimates of the parameter of interest in equation 3 when the outcome is financial transfers from the elderly to their children, either actual or forecasted, as explained in Section 3. Estimates in column 1 of Table 6 imply that an increase equal to 1 in the Restrictiveness measure/ a decline in reimbursement of one visit per user increased the likelihood of transferring money to children by 4.2/16.8 percentage points (18.3%/72.91% percent), whereas the estimate in column 3 suggests that an increase equal to 1 in the restrictiveness measure increases the probability that respondents in generation 1 state that they are likely to provide a bequest of $10,000 or more by 9.6/38.4 percentage points (22.36%/89.44%). In both cases these financial transfers to children might be a consequence of generation 1 being grateful for the care received to provide immediate and deferred monetary gifts to generation 2. Also, generation 1 after witnessing the sharp decline in the provision of home health care as a consequence of the IPS might have simply become more risk averse and less reliant on the government as a provider of long-term care and might have saved relatively more in those states where the IPS cuts were relatively more severe.

Finally, estimates reported in column 2, Table 6 look at the likelihood that children live less than 10 miles from their parents. The point estimate suggest that an increase equal to 1 in the Restrictiveness measure/a decline in reimbursement of one visit per user increases the fraction of children who live within 10 miles from their parents by 6.5/26 percentage points, namely 9.88/39.52 percent.

5.5 Conclusion

This paper documents evidence of policy changes influencing caregiving across generations, by estimating the impact of changes in the supply of formal care induced by a reduction in public financing of home health care brought about by the Interim Payment System (IPS) on the likelihood

of providing informal care to the elderly affected by the decline in public home health care. We also investigate the extent to which adults who were relatively more exposed to the decline in public home health care following the IPS received more informal care from their children and grandchildren when they aged and become frail. We use data from the HRS and find evidence of the impact of the IPS on informal care provided to the elderly affected by the IPS. We also find evidence of an increase in the receipt of informal care provided by children and grandchildren for those adults who were relatively more exposed to the IPS in their younger years, evidence supporting the transmission of caregiving across generations. Our study suggests that not taking into account the inter-generational spillovers of caregiving decisions as a consequence of changes in public funding of home health care underestimates the effects of these policy interventions on care across generations. Although informal care is the main focus here, we also find evidence of an impact of the IPS on other actual or predicted family transfers, such as inter vivo transfers, and the forecasted likelihood of leaving a bequest. We also find that the IPS led to an increase in health insurance coverage, since both Medicaid insurance and long-term care insurance coverage increase, pointing towards various changes in behavior across generation following changes in public financing for long-term care.

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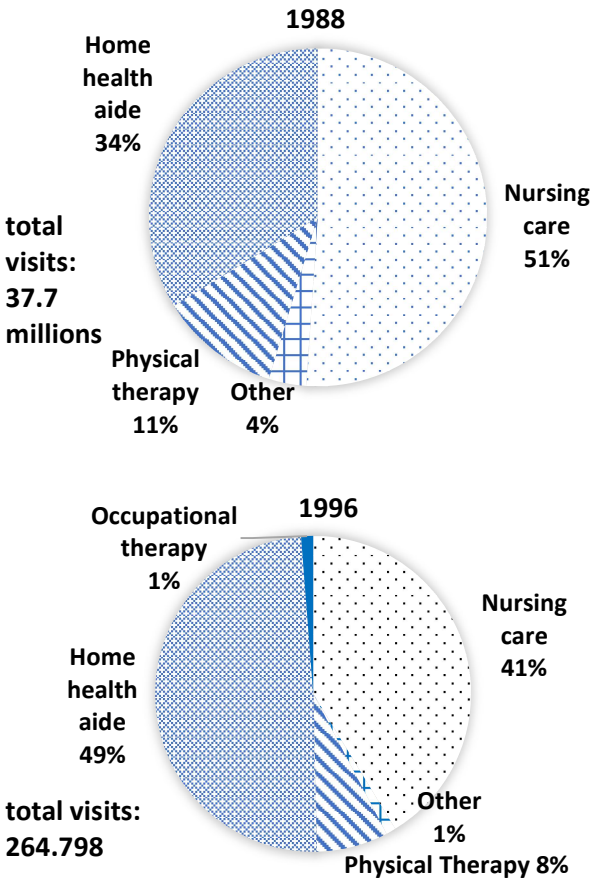
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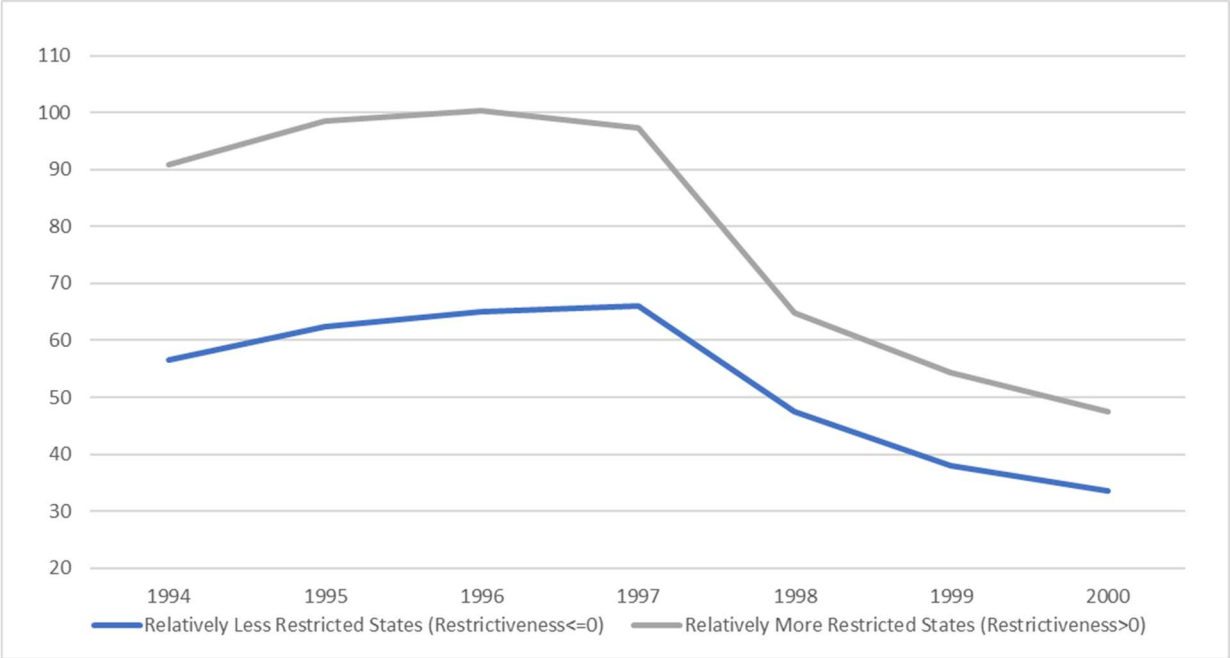
Figures

Figure 1: Percent Distribution of Medicare Home Health Visits and Charges, 1988 and 1996



Source: Health Care Financing Review, Medicare and Medicaid Statistical Supplement, various years.

Figure 2: Medicare Home Health Care Visits per User 1994-2000



Source: Health Care Financing Review, Medicare and Medicaid Statistical Supplement, various years. To construct the figure, we divide states into two groups: those where the IPS implied a relatively more substantial decline in Medicare home health care financing (i.e., those states where the restrictiveness measure defined in section 4.1 was <0) and those where the IPS implied a relative less pronounced decline in Medicare home health care financing (i.e., those states where the Restrictiveness measure defined in section 4.1 was >0).

Tables

Table 1: Summary Statistics

PANEL A **:** HRS Sample: 1992 - 2000			
Variable	**Observations**	**Mean**	**SD**
Helped parents and/or parents-in-law with care	24,664	0.33	0.47
Helped parents and/or parents-in-law with care (female respondent)	16,638	0.312	0.46
Helped parents and/or parents-in-law with care (male respondent)	8,026	0.375	0.48
Helped parents and/or parents-in-law with care (respondent has a level of education equal to high school or less)	14,502	0.32	0.47
Helped parents and/or parents-in-law with care (respondent has at least some college)	10,162	0.34	0.47
Helped parents and/or parents-in-law with care (respondent is white non-Hispanic)	20,062	0.342	0.47
Helped parents and/or parents-in-law with care (respondent is not white or is white Hispanic)	4,602	0.29	0.45
Helped parents and/or parents-in-law with care (respondent is single)	5,190	0.3	0.46
Helped parents and/or parents-in-law with care (respondent is married or with partner)	19,474	0.34	0.47
Helped parents and/or parents-in-law financially	24,600	0.16	0.37
Siblings helped parents with care	17,575	0.176	0.38
Siblings financially helped parents	16,976	0.13	0.34
Age	24,664	56	4.5
Male	24,664	0.325	0.47
At least some college education	24,664	0.41	0.49
Married	24,664	0.79	0.41
White non-Hispanic	24,664	0.813	0.39
PANEL B **:** HRS Sample: 2010 - 2018			
Variable	**Observations**	**Mean**	**SD**
Received care from generation 2	2,670	0.54	0.5
Received care from generation 2 (female respondent)	1,860	0.64	0.48
Received care from generation 2 (male respondent)	810	0.32	0.47
Received care from generation 2 (respondent has education equal to high school or less)	1,903	0.58	0.49
Received care from generation 2 (respondent has at least some college)	767	0.43	0.5
Received care from generation 2 (respondent is white non-Hispanic)	1,940	0.49	0.5
Received care from generation 2 (respondent is not white or is white Hispanic)	730	0.66	0.47
Received care from generation 2 (respondent is single)	1,478	0.71	0.45
Received care from generation 2 (respondent is married or with partner)	1,192	0.33	0.47
Age	2,670	74.5	6.0
Male	2,670	0.3	0.46
At least some college education	2,670	0.29	0.45
Money Transfer to Children	1,929	0.23	0.42
Has Private-Long Term Care Insurance	2,584	0.11	0.31
Has Medicaid	2,600	0.25	0.43
White (non-Hispanic)	2,670	0.73	0.45
P(leaving a bequest equal to $10k or above)	1,943	0.43	0.5

Panel A reports summary statistics for generation 1 from 1992 to 2000; Panel B carries forward the respondents from Panel A and uses HRS data from 2010 through 2018.

Table 2: Impact of the IPS on the provision of care to parents and/ parents-in-law (generation 1 providing care), years 1992-2000

	Cared for Parents/In-laws	
	(1)	(2)
Restrictiveness*Post	0.0153**	0.0155**
	(0.007)	(0.007)
State + Year FE	Yes	Yes
Linear Trends	Yes	Yes
Controls	No	Yes
R^2	0.39	0.39
N	24,664	24,664

*** means statistically significant at the 1% level. The table reports the estimate of the coefficient on the variable Post*Restrictiveness in equation 2. Controls include a dummy for marital status, a dummy for race/ethnicity (white non-Hispanic equal to 1), and a dummy equal to 1 if the respondent's level of education is equal to high school or less.

Table 3: Heterogeneous effect of the IPS on care provision to parents and/or parents-in-law (generation 1 providing care), years 1992-2000

	Female	Male	All, except White, non-Hispanic	White, non-Hispanic	Married	Single
	(1)	(2)	(3)	(4)	(5)	(6)
Restrictiveness*Post	0.029***	-0.02***	0.0094**	0.032***	0.028***	0.045***
	(0.0074)	(0.0024)	(0.0037)	(0.0012)	(0.0016)	(0.015)
State and Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Linear Trends	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.38	0.41	0.37	0.4	0.39	0.38
N	16,638	8,026	4,602	20,062	19,474	5,190

*** means statistically significant at the 1% level. The table reports the estimate of the coefficient on the variable Post*Restrictiveness in equation 2 which has been estimated on different subsamples. Controls includes age, gender, education, marital status, ethnicity, and physical and mental health status.

Table 4: Intergenerational transmission of caregiving: generation 1 receiving care from generation 2, years 2010-2018

	(1)	(2)
Restrictiveness	0.04***	0.034***
	(0.00252)	(0.0022)
Restrictiveness*Caregiver	-0.0024*	-0.0024*
	(0.0013)	(0.0014)
Caregiver	0.029	0.03
	(0.0243)	(0.026)
State and Year FE	Yes	Yes
Linear Trends	No	Yes
R^2	0.57	0.59
N	2,644	2,644

*** means statistically significant at the 1% level. The table reports estimates from equation 3.

Table 5: Intergenerational Transmission of Caregiving: Generation 1

Receiving care from generation 2, years 2010-2018

	Females	Males	Education equal to HS or Less	At least some College	All, except White non-Hispanic	White non-Hispanic
	(1)	(2)	(3)	(4)	(5)	(6)
Restrictiveness	0.047***	0.0102*	0.043***	-0.0023	0.028***	0.037***
	(0.002)	(0.0055)	(0.0026)	(0.0025)	(0.0039)	(0.0033)
Restrictiveness *Caregiver	-0.0014	0.003	-0.002	-0.006	-0.001	-0.0025**
	(0.0015)	(0.0037)	(0.0012)	(0.004)	(0.0034)	(0.00113)
Caregiver	0.042	0.07	0.02	0.099*	-0.034	0.039
	(0.028)	(0.063)	(0.032)	(0.058)	(0.072)	(0.035)
State & Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Linear Trends	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.69	0.47	0.64	0.554	0.74	0.56
N	1,845	799	1,880	764	724	1,920

*** means statistically significant at the 1% level. The Table reports estimates from equation 3. Controls include a dummy for marital status, a dummy for race/ethnicity (white non-Hispanic equal to 1) in all but columns 5 and 6, and a dummy equal to 1 if the respondent's level of education is equal to high school or less, in all columns ecept columns 3 and 4.

Table 6: Other Relevant Outcomes for Generation 1, 2010-2018

	Bequest	Child live within 10 miles	Money Transfer to children	Has Medicaid Insurance	Has Private-Long Term Care Insurance
	(1)	(2)	(3)	(4)	(5)
Restrictiveness	0.096***	0.065***	0.042***	0.022***	0.01***
	(0.003)	(0.0023)	(0.0023)	(0.0015)	(0.00132)
Restrictiveness* Caregiver	-0.005**	-0.0014	0.0007	-0.0005	-0.00073
	(0.0025)	(0.0019)	(0.0023)	(0.0011)	(0.0007)
Caregiver	0.087***	0.0072	0.062**	-0.052***	-0.0082
	(0.032)	(0.0336)	(0.025)	(0.022)	(0.0154)
State and Year FE	Yes	Yes	Yes	Yes	Yes
Linear Trends	Yes	Yes	Yes	Yes	Yes
R^2	0.506	0.0695	0.313	0.334	0.22
N	1,927	1,861	1,914	2,558	2,558

*** means statistically significant at the 1% level. The table reports estimates from equation 3. Controls include a dummy for marital status, a dummy for race/ethnicity (white non-Hispanic equal to 1), and a dummy equal to 1 if the respondent's level of education is equal to high school or less.

Online Appendix:

Table A.1 – Pre-trend test: Generation 1 Caring for Parents

Year94*Restrictiveness	-0.0009
	(0.0006)
Year96*Restrictiveness	0.00016
	(0.0009)
State & Year FE	Yes
Controls	Yes
State Linear Trends	Yes
N	12,959
P_Value of the F test for the null: Coefficients are jointly 0	0.316

Data restricted to years 1992-1996, omitted year is 1992, the outcome is generation 1 caring for parents/parents in law. We interact year effects with the Restrictiveness measure, conditioning on state and year fixed effects as well as state linear trends, and we test the null hypothesis that the interaction of year dummies with the Restrictiveness measure are jointly 0.