Should Elder Care Be Subsidized? Theory and Evidence from Sweden

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Abstract

This paper examines how subsidies for formal elder (long-term) care services impact the economic and health outcomes of both seniors and their adult children, who often function as informal caregivers to their old-age parents. We exploit a reform in Sweden in 2002 lowering the fee for elder care services by 40% on average across two-thirds of Sweden's municipalities. Using new data on these fees, combined with administrative data in a difference-in-differences design, we find that increases in the take-up of formal elder care go along with both reductions in hospitalizations among affected seniors and increases in the labor supply of their adult children. Seniors benefit from significant improvements in morbidity, due to fewer hospitalizations for conditions preventable or treatable outside of the hospital. At the same time, adult children increase their annual earnings, which suggests a trade-off between informal caregiving and working depending on the price of formal care. We show that these effects are persistent as adult children keep working in less flexible, but higher-paying jobs, also after the parental care responsibilities have ended. To assess the welfare implications, we build a stylized model that incorporates formal and informal caregiving. We show that the implicit optimal subsidy balances the value created from insuring parents against substantial permanent health shocks and the costs on the children of raising taxes to finance the subsidy. Combining the theory with the empirical results, we find that subsidizing elder care becomes self-financing within a decade of implementation. This demonstrates that the benefits of improved health management and spillovers on adult children can outweigh the direct costs of subsidizing elder care.

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1 Introduction

Rapidly aging populations worldwide increasingly put pressure on public finances and prompt many welfare states to explore more cost-effective policies that target the elderly (OECD, 2017). A key element of such policies is the question of how to organize care for the growing number of seniors, most of whom will eventually require assistance with personal or nursing activities at some point in their lives (Johnson, 2019). To address the seniors' financial risks associated with dependency and the requirement for care, numerous countries have introduced or reformed large-scale public programs over the past few decades.

When designing such programs, policymakers must determine both the overall level of public spending and whom to target. Subsidizing *formal* elder care services, such as nursing homes and home care, aims to ease the burden on family members who often serve as *informal* caregivers and, consequently, are more likely to reduce their work hours or leave the labor market. Subsidies for formal elder care can thus be fiscally appealing, since the greater labor market participation of caregivers translates into higher taxes. However, subsidizing formal elder care also imposes substantial direct costs on taxpayers. In addition, the formalization of elder care can critically affect the health and well-being of seniors themselves. The broader welfare implications of such formal care subsidies, therefore, depend on their impact not only on seniors but also on their children, whose role as informal caregivers is closely tied to these dynamics. These welfare implications of formal elder care subsidies are not well understood, however, primarily due to limited opportunities to measure the causal effects of such policies on relevant output measures.

This paper addresses these questions by leveraging a reform that subsidized elder care services in two-thirds of Sweden's municipalities. We provide new evidence on how the price for formal elder care affects the economic and health outcomes of both seniors and their adult children. Our analysis proceeds in two steps. First, by exploiting the pre-reform regional variation in elder care fees and the timing of the policy in a difference-in-differences (DiD) framework, we provide causal estimates on seniors' take-up of formal elder care services (nursing homes and home care) as well as the accompanying effects on seniors' health outcomes and the labor supply of their potential informal caregivers—their children. For this analysis, we combine novel data on elder care utilization and fees at municipality level with comprehensive individual-level data on healthcare utilization, employment histories, and family links from administrative registers. This approach allows us to decompose the main effects into the underlying mechanisms that drive seniors' healthcare consumption and children's career dynamics. In a second step, we build a stylized model to quantify the welfare implications of subsidizing formal elder care. In the model, parents face the risk of becoming dependent, which, if realized, incurs costs for medical treatment and formal care. Children can help mitigate these costs through informal caregiving, but incur opportunity costs from forgone earnings in the labor market. In a last step, we empirically implement the sufficient statistics characterized by the model's optimal subsidy formula. This allows us to assess the costs and benefits of the subsidy, while accounting for behavioral responses in care utilization, healthcare consumption, and labor supply.

To identify the causal effects of subsidizing elder care, we exploit quasi-random variation from a reform that standardized the fee schedule for elder care across municipalities in Sweden. Specifically, in 2002, elder care fees were capped at a maximum of 1,544 SEK per month (182 USD at the time). The reform significantly reduced out-of-pocket fees for elder care across Sweden's municipalities, with reductions ranging between 0 and 66 percent, depending on the senior's municipality of residence. We leverage pre-reform regional variation at municipality level as exposure to the reform in combination with the timing of the reform in a DiD design. Our identification strategy relies on the assumption that, in the absence of the reform, outcomes for individuals in more exposed, higher-pre-reform-fee (treated) municipalities would have evolved in parallel with those in less exposed (control) municipalities. We test this parallel trends assumption for the pre-reform period.

We find that subsidizing elder care increases the demand for elder care services. This increase is primarily driven by seniors entering nursing homes. More specifically, a 10 percent decrease in the fees for elder care leads to a 1.12 percent increase in the share of seniors above the age of 80 who are residing in nursing homes. This finding suggests that seniors are price-sensitive and take up more formal care services as the price decreases. Furthermore, the increase in the demand for formal care is accompanied by increases in the supply of formal care, as we find that treated facilities in the nursing home and home care industry are both less likely to close and increase the number of care workers and medical staff.

To assess whether the increased demand for formal elder care affects seniors' health, we estimate the impact of the reform on hospitalizations, prescription drug use, and mortality among seniors. We find that seniors in treated municipalities spend, on average, 0.2 fewer nights in the hospital, which represents a 5 percent reduction from the pre-reform mean. These reductions in hospital stays are driven by conditions that are either urgent or preventable through timely care, such as injuries and poisoning (e.g., hip and thigh fractures) or infectious diseases (e.g., pneumonia). We find little to no effect on conditions such as cancer or diseases of the blood and blood-forming organs (e.g., leukemia). This is consistent with the notion that genetic conditions such as cancer are unlikely to be influenced by increased elder care utilization or changes in financial circumstances. Also, we observe larger reductions in conditions that can be managed by professional care outside of hospitals (e.g., wound care or medication services), which suggests a substitution of medical treatments from the hospital into the elder care sector. Finally, we rule out large positive or negative effects on seniors' overall health, since the decrease in healthcare utilization does not appear to affect mortality rates.

Increased demand for formal elder care services and improvements in parents' morbidity can influence the next generation's labor supply by alleviating children's caregiving responsibilities. To test this hypothesis, we first show that children whose parents are affected by the reform increase their annual earnings by 1.1 percent. This effect is to a larger degree driven by the intensive margin, which means that adult children increase their earnings rather than entering or exiting the labor market. We argue that these adult children are more likely to work in "greedy work" (Goldin, 2021), because they are more likely to work full time, have higher-paying occupations—such as managerial roles—and remain employed at firms that offer less flexibility but pay higher wage-premia on average. Consistent with the idea that these career changes are often time-critical, we also document that taking these career steps translates into persistently higher earnings. Specifically, we show that the earnings effect persists after parental death, i.e., when care responsibilities vanish, which indicates persistently higher earnings over at least 10 years following the reform.

To determine whether adult children are reducing informal care activities while increasing labor earnings, we leverage parental health events as a shock to parental care requirements. Specifically, following Frimmel et al. (2021) and Chen et al. (2024), we exploit the occurrence of a parental stroke as a quasi-random shock to caregiving needs. Our results show that, in response to the reform, children are less responsive to parental health shocks that require care, which demonstrates a substitution between informal and formal caregiving. Furthermore, we analyze how children adjust their location choices and living arrangements in response to enhanced accessibility of formal elder care. We find that adult children significantly increase the distance to and reduce coresidence with their parents. This is consistent with the idea that greater accessibility to formal care decreases the need to live close to each other, and thereby increases children's geographical flexibility.

Overall, our findings suggest that by increasing demand for elder care services, these subsidies lead to improvements in seniors' health, enhance children's labor market flexibility, and boost their earnings and, thereby, tax revenue. However, paired with the substantial fiscal costs of subsidizing elder care, this raises questions about both the cost-effectiveness and the welfare implication of the reform.

To evaluate the welfare implications, we build a stylized model that features formal and informal care. In the model, parents face the risk of becoming dependent—which, if realized, creates significant costs in terms of elder long-term care spending. These costs can be alleviated by children who provide informal care. Although children are altruistic toward their parents, they face a trade-off between providing informal care and working in the labor market. If the care needs of the parent are not met, either through buying formal care services or getting informal care from children, seniors experience costs from being in poor health. The subsidy provides seniors with insurance against consumption losses in the sick state of the world, but must be financed by income taxes on adult children's labor earnings. We use the model to show that the subsidy can be welfare-improving if the value created from insuring parents against substantial permanent health shocks exceeds the costs on the children of raising taxes to finance the subsidy. This critically depends on the fiscal externalities arising from behavioral changes: As the price of elder care decreases the utilization of elder care increases, but seniors' healthcare consumption decreases and the labor supply of adult children increases.

Combining the theory with the empirical results, we then empirically implement the sufficient statistics characterized by the optimal subsidy formula to assess the costs and benefits of the subsidy. Focusing on the government cost, we show that the reform is costly in the short run. After 7 years, the cumulative net government costs for the policy become negative, which means that the policy "pays for itself". This arises from the fact that the fiscal externalities stemming from the behavioral changes of the reform outweigh the direct costs of providing the subsidy in the long run. The largest contributor to this is additional tax revenue from the persistent increases in adult children's earnings. Since we show a positive insurance value of the policy, we conclude that the policy is welfare-improving. This shows that spillovers on adult children should be taken into account when evaluating public spending on elder care.

Related literature This paper contributes to several strands of the literature. First, we add to the growing literature on the impact of the accessibility of formal care on health outcomes (Lei et al., 2022; Hollingsworth et al., 2022; Serrano-Alarcón et al., 2022; Shen, 2021; Costa-Font et al., 2018; Srakar et al., 2020; Walsh et al., 2019). The majority of these studies either rely on self-reported health measures in surveys or use mortality rates as outcome variables.[1] While these provide credible measures of direct effects on health and well-being, they do not capture the relocation effect that stems from medical treatments being shifted from the hospital into the elder care sector. We contribute to this literature by exploring detailed mechanisms behind the changes in healthcare consumption by leveraging rich administrative data.

Second, by examining adult children's labor market responses to price changes in formal elder care, we contribute to the large literature on the relationship between informal caregiving and the labor supply of adult children.[2] In particular, caregivers to parents are more likely to have lower labor earnings and employment (Fahle and McGarry, 2017; Frimmel et al., 2021). While this relationship is well established, less is known about how policies affect this relationship. Løken et al. (2017), for example, show that the expansion of long-term care coverage increases daughters' labor supply in Norway (other examples are Shen, 2021; Coe et al., 2015). Our setting allows us to study how this relationship depends on the *price* of formal care when access to elder care and the general healthcare system is universal.

Finally, by evaluating the cost and welfare consequences of the policy, we contribute to the literature on the cost-effectiveness and welfare implications of government policies that target elder care (Barczyk and Kredler, 2018; Mommaerts, 2016; Van Houtven and Norton, 2004; Bolin et al., 2008; Mommaerts, 2018; Shen, 2021; Eiken et al., 2013; Golberstein et al., 2009; Grabowski, 2006; Grabowski and Gruber, 2007). We add to this literature using tools to characterize the welfare effects of reforms in terms of reduced-form sufficient statistics. This method stems from a recent literature that typically evaluates social insurance programs such as unemployment insurance or pension designs (for an overview, see Chetty and Finkelstein, 2013). We build on this work by developing a sufficient statistics framework that features the intergenerational components of elder care provision.

The remainder of the paper unfolds as follows. Section 2 describes the institutional setting and the reform. Section 3 provides details on the data, samples, and measures used in our analysis. Section 4 defines the treatment and outlines our empirical approach, and Section 5 presents the results. In Section 6 we test that our empirical results are robust to varying controls and treatment definitions, and test the validity of the assumptions underlying the DiD framework. Section 7 discusses the welfare implications by developing and implementing a stylized model of caregiving, and Section 8 concludes by summarizing our key findings.

[1] As an exception, Serrano-Alarcón et al. (2022) show that increases in long-term care benefits reduce the probability of avoidable hospital admissions.

[2] For example: Ettner (1996); Johnson and Lo Sasso (2006); Brito and Contreras (2023); Truskinovsky and Maestas (2018); Norén (2020); Van Houtven et al. (2013); Rellstab et al. (2020); Wen and Huang (2024); Fu et al. (2017); Casella and Mazzone (2022); Løken et al. (2017); Frimmel et al. (2021); Fahle and McGarry (2017); Shen (2021); Mommaerts (2016); Coe et al. (2015).

2 Institutional Setting

2.1 Elder Care in Sweden

Public long-term care (LTC)[3] is universal and uses in-kind benefits in Sweden.[4] It is highly subsidized, where seniors' out-of-pocket spending is about 4 percent of total LTC expenditures (Jennbert, 2009). The services are the responsibility of Sweden's 290 municipalities.[5] Municipalities provide two main types of elder care: home care and nursing homes. Home care involves assistance with household chores, food provision, and basic health-related needs (home nursing), which are provided in the recipient's home. The amount of care provided at home can range from just a few hours per month to 24 hours per day—i.e., around-the-clock care. In cases of severe care needs, individuals can move into a nursing home, which entails moving to a specialized accommodation with access to 24-hour care and often includes a full board.

Elder care is available to all individuals aged 65 and older who are in need of care. To receive elder care, seniors must apply to their municipality of residence, where care is allocated based on their individual needs as assessed by a caseworker.[6] In practice, however, there are often delays in providing care even if seniors are legally entitled to it. Waiting times range between 1 and 6 months.

In 2001, around 250,000 people aged 65 or older received home care or lived in nursing homes, representing just under 16.5 percent of that age group. Of these, around 180,000 people aged 80 or older received at least 1 hour of elder care, which represented about 52 percent of that age group. Just over half received home care, while the remainder were cared for in nursing homes. While in nursing homes everyone receives 'round-the-clock' care (200+ hours per month), hours in home care may vary. The majority of individuals on home care

[3]We use the terms long-term care and elder care interchangeably.

[4]The take-up of private LTC insurance is low compared with other countries. For example, about 6 percent of individuals aged over 65 take up voluntary LTC insurance in Sweden, while this number is 15 percent in the US (Barczyk and Kredler, 2019).

[5]Since the 1992 Elder Reform Act ("Ädel-reformen"), municipalities are in charge of the planning, funding, and resource allocation of elder care. Alongside elder care, municipalities are also accountable for childcare, education, care for the disabled, welfare, and local infrastructure. These activities are primarily financed through local income tax, followed by grants from the central government and user fees.

[6]Some municipalities have opted to privatize certain aspects of elder care provision. However, the responsibility for funding and allocating elder care services remains with the municipalities. Even if care recipients receive services from a private operator, the municipality is responsible for important aspects of elder care, such as determining the amount and type of care seniors receive, and the fees for care must be the same for private or publicly provided care within a municipality. During our primary study period, 1996 to 2011, over 80% of all elder care is provided directly by municipalities (with 95% public in 1996).

have 1-9 hours (33%), 10-24 hours (23%), 25-49 hours (17%), or 50-119 hours per month (15%) per month (measured in November 1999), with 3% for 120-199 hours, 1% for 200+ hours (Socialstyrelsen, 1999).

Take-up of formal care services is high in Sweden compared with other countries. For example, among seniors who receive care, 27 percent rely on informal care vs. 35 percent on nursing homes and 11 percent on formal home care (the remaining 27 percent receive a combination of home care and informal care) (Barczyk and Kredler, 2019). Furthermore, there is high public support: Over 80% of the population believe that formal elder care is the best option for an elder parent who needs care, which is significantly higher than in other European countries (see Figure A.1). Yet despite the popularity of formal elder care, a significant share of informal caregivers are often adult children. In 2019, 3.7 percent of individuals above the age of 50 give weekly or daily care to an elder parent (see Figure A.2).

2.2 Unification of the Fee Schedule with the Elder Care Reform

Prior to the reform, municipalities were mandated to adhere to the "self-cost principle," which mandates that the fees charged for services (such as elder care) cannot exceed the cost incurred by the municipality to provide those services (Kommunallagen, 1991:900). Nonetheless, variations in how municipalities structured elder care fees during the 1990s led to significant differences in the out-of-pocket (OOP) costs for elder care across municipalities. For example, in 1999 the average fee for 35 hours of monthly home care ranged from 205 SEK to 2,645 SEK—a difference of 2,400 SEK per month between the least and most expensive municipalities. The average fee for a nursing home ranged from 1,000 SEK to 6,545 SEK, a difference of almost 5,500 SEK per month (Proposition 2000/01:149, 2001).[7] As a consequence, individuals with similar care needs could experience relatively large differences in elder care costs, given the mean pension of around 8,500 SEK per month in 2001.

To address the large variation in OOP costs for elder care, the then-governing Social Democratic Party introduced a reform on November 14, 2001, that standardized elder care fees across Sweden (Proposition 2000/01:149, 2001). The bill went into effect on July 1, 2002, but the rules did not become binding until January 1, 2003. Ultimately, the purpose of the bill was to regulate the fees municipalities can charge for elder care services and make

[7]In addition to differences between municipalities, fees for elder care varied also within municipalities because of progressive fee adjustments based on income (pension) and capital gains. The lowest monthly fee charged for home care in 1999 was 0 SEK, compared with almost 14,000 SEK per month for individuals who pay the full fee (Proposition 2000/01:149, 2001).

elder care accessible independent of financial circumstances.[8]

At a high level, the bill consists of two main parts: A *monthly fee cap* and a *reservation amount*. First, the monthly fee cap is set to 1,544 SEK in 2003. The fee cap ensures that no one should have to pay more than 1,544 SEK per month for elder care services. Second, the reservation amount is defined as the minimum amount individuals should have left from their total monthly income (pension) after paying taxes, housing and living costs, and care service fees. In 2003, the amount is 4,283 SEK per month for single seniors and 3,615 SEK per month for cohabiting seniors.

Both the fee cap and the reservation amount introduced by the reform only apply to fees for formal care services and not services such as food provision or rent for nursing homes. Importantly, after the reform, the fee cap becomes the same for both home care and nursing homes. This ensures that an individual's economic resources do not limit the type or amount of care they can afford.

While both features of the reform—the fee cap and the reservation amount—ensure that the average OOP cost for elder care effectively decreases, the reform does not specifically target low-income seniors, since most of them were already exempt from or had reduced fees prior to the reform. This is because many municipalities used progressive fee schedules prior to the reform. In 1999, roughly 10 percent of elder care recipients were exempted from fees due to low income. Consequently, the reform primarily affects more affluent seniors who are more likely to exceed the fee cap.

Financing of the Reform To finance the reform, the central government allocated 1,250 million SEK for the year 2002 to compensate municipalities for anticipated revenue losses, which amounted to just under 0.1 percent of Sweden's GDP in 2002.

3 Data and Sample

We combine data on elder care utilization and fees at the municipality level with comprehensive individual-level data on healthcare utilization and employment histories using administrative registers. Individual-level data cover the universe of Swedes and allow us to link family members across generations. We use two samples in the analysis: the *senior*

[8]The explicit statement in the government bill is "Syftet med högkostnadsskyddet är att säkerställa att den enskilde skyddas mot allt för höga avgifter" ("The purpose of the high-cost protection is to ensure that the individual is protected against excessively high fees") (Proposition 2000/01:149, 2001, p. 1).

sample and the *children sample*, described in detail in Section 3.3.

3.1 Elder Care Utilization and Fees

Utilization of Elder Care The National Board of Health and Welfare ("Socialstyrelsen") collects data on elder care utilization by surveying municipalities every year since November 1998. These data are reported in annual "elder care and welfare" reports (Vård och omsorg om Äldre).[9] The reports provide statistics on the number of individuals aged 65 to 79 and those aged 80 or older who receive home care or live in a nursing home in November of each year. In some years, the reports also provide information on the number of individuals within different brackets of home care hours, which allows us to also estimate the average monthly hours of home care. These annual reports constitute our primary source of data on elder care utilization.

Fees for Elder Care To construct a measure of the average fee for elder care, we use publicly available data from municipalities' balance sheets on annual revenue generated from fees for elder care services in nursing homes. Note that revenues on other types of out-of-pocket expenditures in elder care, such as food services or rent for nursing homes, are separately listed in municipalities' balance sheets. These revenue data are available from 2001.[10] Since every individual in a nursing home receives round-the-clock care, we can compute a consistent measure of the average monthly fee for round-the-clock care by dividing the total out-of-pocket spending on care by the number of individuals in nursing homes:

$$\text{Care-Fee}_{mt} = \frac{\text{Revenue}_{mt}^{NH}}{\#\ \text{Individuals in Nursing Home}_{mt}} \cdot \frac{1}{12} \ ,$$

where Revenue_{mt}^{NH} is the total fee revenue of municipality m in year t.[11] Note that we compute the monthly fee for round-the-clock care for both home care and nursing homes using revenues from nursing homes only. This is possible, because the fee for 1 hour of care in a nursing home is equal to 1 hour of home care. However, entering a nursing home

[9] For details on the reports, see https://www.socialstyrelsen.se/.

[10] Balance sheet data are collected and processed by Statistics Sweden and are freely available for download at www.kolada.se [last accessed on January 13, 2023]. The balance sheets also include information on the total cost to the municipality for the elder care services provided and information on the total rents collected for nursing homes.

[11] Data on the number of elder care recipients in nursing homes are missing for 45 of 290 municipalities in 2001. As a result, we can not calculate the average pre-reform fee for these municipalities and excluded them from the analysis.

requires an individual to purchase round-the-clock care, which allows us to hold fixed the demanded hours among care recipients in nursing homes. Intuitively, Care-Fee$_{mt}$ can be interpreted as the monthly average amount an individual would pay in municipality m in year t when requesting round-the-clock care, either in home care or a nursing home.[12] In practice, however, only about 1 percent of seniors have round-the-clock care in home care in 1999 with the majority having lower hours and, thus, a lower fee.

3.2 Individual-level Data

The primary source of individual-level data is the Longitudinal Integrated Database for Health Insurance and Labour Market Studies (LISA), provided by Statistics Sweden. The LISA database includes a wide array of third-party reported information on income (labor earnings, social security benefits, and pension payouts) and demographic characteristics (year of birth, gender, education, place of residence, marital status, etc.). The data are at individual-by-year level for all individuals aged 16 or older residing in Sweden on December 31 of each year. Using this multigenerational register allows us to link parents and children across generations.

Finally, we augment the LISA data with information on healthcare utilization using the National Patient Register (NPR). The NPR covers the universe of inpatient hospitalization events from 1998 onward. An inpatient event is defined as staying in the hospital for at least 1 night. The register records detailed information on each hospital visit, including the date of admission and discharge, as well as diagnoses in the form of ICD-10 codes.

3.3 Sample Construction

Senior sample We impose two inclusion restrictions on the *senior sample*. First, the individuals must be alive and at least 75 years old in 1996 (that is, 80 years old at the time of the reform). Although individuals become eligible for elder care services at age 65, in practice only 2% to 5% of individuals between the ages of 65 and 79 purchase elder care services, compared with 20% to 30% among individuals aged 80 or above. One reason for this

[12] Note that the estimated monthly Care-Fee$_{mt}$ may not equal the "true" monthly fee for round-the-clock care in the year 2001. For example, the fact that $\sim$ 10% of low-income individuals are exempted from paying fees shifts the average fee toward zero. However, given that municipalities follow the same rules when reporting fee revenues for care services, the rankink of fees is consistent. That is, we assume that if Care-Fee$_{i,t}$ < Care-Fee$_{j,t}$ the true underlying fee in municipality i is lower than the fee in municipality j. Thus, if we were to miscategorize municipalities, our results would be biased toward zero.

is that the risk of permanent health shocks requiring care increases with age. For example, in Figure A.4b, we report that the probability of having a stroke—which often requires intense care afterward—significantly increases with age. Similarly, the risk of developing dementia, a care-intensive health condition, doubles every 5 years from the age of 60. While the risk lies at 1.5 percent for individuals aged 65 to 70, this increases to a risk of 45 percent for individuals aged 95 and above (Jennbert, 2009). Supplementary results are provided for individuals aged 65-79 (eligible but low health risk) and below 65 (ineligible). Second, we only include individuals who are observed throughout all years between 1996 and death (or 2011). This is to mitigate compositional changes arising from individuals who enter or exit the sample for other reasons than death.

Children sample To create the *children sample* we start with the universe of individuals over the age of 20 observed in the LISA database for all years between 1996 and 2011. Using the multigenerational register, we augment the data with information on their parents' year of birth, year of death (when applicable), pension income, and municipality of residence. We drop individuals if both parents are deceased or if the oldest living parent is younger than 80 years in 2001. We assign the oldest parent as the "main parent". If both parents are the same age, we randomly select one parent. We consider a child as "treated" by the reform if the main parent lives in a treatment municipality in 2001. We do not impose any restriction whereby the parent has to be alive after 2001; we only require that the parent be alive in 2001.

Note that the senior sample and adult children sample do not perfectly overlap because, for example, we include seniors who do not have any children. To address concerns around the comparability of the samples, we construct a matched parent-child dataset and verify that our estimates are robust to the specific choices of the sample constructions. More details on the matched parent-child dataset are provided in Section 5.4.

4 Empirical Strategy

To identify the causal effect of reducing elder care fees, we use quasi-random variation stemming from standardization of the fee schedule for elder care across Sweden. Because municipalities greatly vary in their fee schedule prior to the reform, the switch to the unified national fee schedule allows for a DiD design with variation at the municipality level. In particular, municipalities with relatively higher pre-reform fees are in practice more exposed to the reform. We outline details of the treatment definition and DiD specification in the following section.

4.1 Municipality Variation in Reform Exposure

Our main empirical strategy exploits pre-reform variation across municipalities in the average fee for elder care as a measure of exposure to the reform. Our primary exposure measure is a binary indicator, which categorizes municipalities into a treatment group (those with pre-reform fees above the fee cap) and a comparison group[13] (those with pre-reform fees below the fee cap). We use the introduced fee cap of 1,544 SEK per month as a threshold to classify municipalities into treated and comparison groups, since municipalities that charge *average* fees above the nationally introduced *maximum* fee before the reform are likely to be affected. Thus, our empirical strategy effectively compares municipalities that are on average more exposed to the reform—and thus experience a price reduction—with municipalities that are on average less exposed. To ensure that our results are not sensitive to the exact choice of the threshold, we complement the binary treatment indicator with a continuous measure of pre-reform fees. This exploits the entire variation of the reform and captures the "bite" of the price change. To avoid conditioning the explanatory variation on post-reform information, both measures are based on pre-reform fees rather than the observed change in fees. We further adjust fees to 2003 price levels.

Table A.1 shows that treatment and comparison municipalities are similar regarding population demographics and ruling political parties prior to the reform. Table A.2 further suggests that the sample of seniors is well balanced between the treatment and control groups across observable characteristics such as age, gender, having a spouse, education, pension income, number of children, and 1-year mortality. The sample size in the first year (1996) is 682,193 individuals, but it decreases over time due to mortality, with an average annual mortality rate of 9 percent. Importantly, Column (3) highlights the fact that the reform does not change the observable characteristics of seniors in treatment versus comparison municipalities. Table A.3 provides descriptive statistics for the children sample by treatment status, both with respect to the children and main parent characteristics measured during the pre-reform period (1996-2001). There are no economically significant differences in baseline characteristics across the treatment and comparison groups. Adult children in the sample are on average 51 years old with a senior parent who is on average 82 years old in the pre-reform

[13] We use the terms *comparison* group and *control* group interchangeably.

period.

Figure 1 illustrates how the reform impacts average elder care fees for the 86 comparison and 159 treatment municipalities included in the main sample. Panel 1a displays a binned scatter plot of municipalities in which the horizontal axis represents average pre-reform fees and the vertical axis represents the average change in fees in response to the reform. The figure demonstrates that municipalities that have average fees below the cap prior to the reform do not change the fees in response to the reform. In contrast, municipalities with fees above the cap prior to the reform decrease their fees. In particular, there is a gradient in the fee reduction such that municipalities with higher fees prior to the reform also respond the most to the reform by reducing their fees. For example, a municipality with a pre-reform fee of 4,000 SEK per month decreases the average fee by approximately 1,900 SEK per month. Panel 1b shows the evolution of average fees over time using the binary treatment indicator: average reduction in fees among treatment municipalities amounts to approximately 1,420 SEK per month, which corresponds to around 10 percent of the average pension at the time. There is no discernible change in nursing home fees for comparison municipalities.

[Insert Figure 1]

Finally, Figure A.5 displays the spatial variation in pre- and post-reform fees. Comparing pre-reform fee variation (Figure A.5a) with post-reform fee variation (Figure A.5b), it is evident that blue colors fade. This implies that the majority of municipalities reduce their fees.[14]

4.2 Econometric Specification

Our main empirical specification in this paper relies on a DiD design that compares treated vs. control individuals before and after the reform. In particular, we consider a senior (or the parent of an adult child) as treated if the individual lives in a municipality with high pre-reform elder care fees in the year prior to the reform and thus is likely to experience a

[14]Note that not all municipalities complied with the new rules according to our measure of the average fee. Some municipalities with high fees prior to the reform still have average fees above the cap after the reform. This could be for two reasons. Either some municipalities simply did not comply with the reform and kept high fees even after the fee cap is introduced, or our aggregate data on the number of elder care recipients or municipality revenues include measurement error. Figure A.5 shows that pre-reform fees and noncompliance with the reform are not geographically clustered. We keep all municipalities for which we have pre-reform fee information in the sample, including municipalities that did not comply with the reform according to our fee measure.

reduction in elder care fees compared with the control group who live in municipalities with low pre-reform fees. Formally, we estimate a dynamic DiD specification:

$$Y_{it} = \alpha D_{m(i)} + \sum_{t=1996 \neq 2001}^{2011} \beta_t P_t \times D_{m(i)} + \gamma X_{it} + \theta_t + \theta_m (+\theta_i) + \epsilon_{it}, \tag{1}$$

where Y_{it} is the respective outcome of interest for individual i in year t (e.g., health and labor outcomes), θ_t captures calendar year fixed effects, θ_m captures municipality fixed effects, θ_i describes individual fixed effects, and X_{it} is a vector of individual characteristics. $D_{m(i)}$ is the treatment indicator, which is equal to 1 if the senior (or parent of the adult child) lives in a high-fee municipality pre-reform. P_t are indicators for each calendar year, respectively. The coefficients of interest are the $\{\beta_t\}$, which captures the effect of the interaction term between treatment status and years from the reform. We use 2001—the year prior to implementation of the reform—as the baseline year. Specifically, β_t captures the causal effect of a price change in formal elder care fees on the respective outcome of interest in the 10 years following the reform and 5 years prior to the reform.

In alternative specifications, we also use a more parsimonious specification by pooling across pre- and post-reform years (static DiD). Formally, we estimate

$$Y_{it} = \alpha D_{m(i)} + \beta \, \text{Post} \times D_{m(i)} + \gamma X_{it} + \theta_t + \theta_m + (\theta_i) + \epsilon_{it}, \tag{2}$$

where the only difference in Equation 1 is that we replace the time indicators P_t with a single variable $Post$ that captures the average causal effect of a price change over the 10 years following the reform.

Since the effect of the fee cap may vary significantly between household types, we modify Equation 2 to allow for heterogeneity in the effects of the reform. That is, we estimate the regression equation

$$Y_{it} = \sum_{g \in G} [\alpha_g D_{m(i)} \times g + \beta_g \, \text{Post} \times D_{m(i)} \times g + \theta_t \times g] + \gamma X_{it} + \theta_m + (\theta_i) + \epsilon_{it}, \tag{3}$$

where G describes the heterogeneity of interest; for example, income deciles. β_g captures the average effect of the reform for the respective group $g \in G$. When presenting the results from Equation (3), we scale the estimate by the pre-reform mean within each g.

Depending on the analysis, we run Equation 1, Equation 2, or Equation 3 at the municipality level (when focusing on the utilization of formal care), senior individual level (when focusing on the senior's health outcomes), adult children individual level (when focusing on the children's labor market outcomes), or plant level (when focusing on the supply of elder care). While we keep the general specification of the respective equation fixed, we slightly vary the set of controls depending on the specific regression setting. Standard errors are clustered at the municipality level, and thus allow for arbitrary covariance structures over time within each municipality.

Internal Validity Interpretation of the coefficients of interest as the causal effects of lower elder care fees on the outcome of interest rests on the assumption that, absent the reform, the outcomes of treated and comparison municipalities would have developed in a parallel manner. While we cannot observe what would have occurred in the absence of the policy, the identifying assumption does provide testable implications. Equation (1) allows us to probe the validity of our approach empirically by assessing whether the outcomes of treatment and comparison municipalities are parallel prior to treatment and examine whether changes in the observable characteristics of seniors in treatment and comparison municipalities coincide with the introduction of the reform. The results suggest that treatment and comparison municipalities exhibit parallel trends prior to the reform and that the composition of seniors is similar prior to the reform and did not change as a result of the reform.

Another potential concern is a reallocation of seniors *because* of the reform: if seniors strategically move to low-fee municipalities prior to the reform, or move to previous high-fee municipalities after the reform, this would violate the stable unit treatment value assumption. We alleviate this concern by highlighting the fact that the reform did not affect the probability of seniors' moving between municipalities.

5 Main Results

This section analyzes the effect of the price change in elder care services on the utilization of home care and nursing homes, the utilization of healthcare services, and the labor supply of seniors' potential caregivers—their children.

5.1 Is Elder Care Utilization Price Sensitive?

Figure 2 displays the evolution of the share of seniors above the age of 80 who are in any type of elder care, including home care and nursing homes. The solid dark-blue line denotes the share in treated municipalities, and the dashed light-blue line the share in comparison municipalities.

[Insert Figure 2]

Treated municipalities have on average 51.2 percent of seniors in one form of elder care. This share is 1.5 percentage points lower compared with control municipalities that experience relatively lower prices in the years prior to the reform. Despite this difference in levels, the decreasing trend of seniors in elder care is similar across treated and control municipalities, which supports the assumption of parallel trends in the absence of treatment. Further, and in line with the homogenization of the fee schedule in 2002 that equalized the affordability of elder care across municipalities, the share of seniors in elder care between treated and control municipalities converges in response to the reform. This is driven by the treatment group's experiencing a relatively lower decline in the share of individuals in elder care compared with control municipalities.

Table 1 reports the corresponding main estimates of interest when running the DiD specification (Equation 2) on the total share of seniors in elder care, the share in nursing homes and the utilization of home care.

[Insert Table 1]

As can be seen from Column (1), treated municipalities with pre-reform fees above the price cap experience a 1.5 percentage point increase in the share of seniors receiving any type of elder care compared with the comparison group, which is equivalent to a 2.8 percent increase over the pre-reform mean. This effect is primarily driven by increased demand for living in a nursing home, as evidenced by the fact that the share of seniors living in nursing homes increases by 1.2 percentage points, which corresponds to a 4.5 percent increase relative to the pre-reform mean (see Column (2)). While there is a positive increase in both the share of individuals who have at least 1 hour of home care (extensive margin of home care in Column (3)) and the number of hours conditional on having home care (intensive margin of home care in Column (4)), we fail to detect a statistically significant relationship in either of the specifications. What is more, we document that the effect of entering nursing homes is persistent over the decade following implementation of the reform and increases over time (compare Figure A.6a). This is in line with the hypothesis that municipalities need time to adjust the supply of elder care.

To further test this hypothesis, in the next step we explore responses on the supply of elder care in Table A.4. Specifically, we perform a DiD specification (Equation (2)) for firms in the nursing home and home care industry. We consider a plant to be treated if it is located in a high-fee municipality in the year prior to the reform. Consistent with a positive supply-side effect of the reform, we show that the supply of elder care increases on both the extensive margin in the nursing home industry and the intensive margin in the home care industry. Specifically, plants in the nursing home sector are 1.3 percentage points less likely to exit in response to the reform (Column (1)). This goes along with an increase in the number of care workers per plant in both the nursing home sector (Column (2)) and the home care sector (Column (5)), where only the latter is statistically significant. On average, plants in the home care sector employ 22 care workers prior to the reform. Thus, the increase of about two care workers corresponds to an economically sizeable increase of 11 percent over the pre-reform mean.

Where do these workers come from? We find that the share of immigrants among care workers in the home care industry, increases by 1.5 percentage points from a pre-reform average of 12 percentage points, which suggests that at least part of the additional workforce comes from abroad. Interestingly, the change in the composition of care workers in plants does not go along with changes in average earnings, wages, or hours worked by care workers in these plants (compare Table A.5; Column (3)-(6)).

While the age group of seniors above the age of 80 is the primary focus of this paper, individuals are eligible to apply for elder care from the age of 65 onward. In line with our previous results, Figures A.6c and A.6d show that responses of seniors aged 65-79 follow patterns similar to the group of 80-plus seniors, albeit on a lower level. The share of individuals aged 65-79 in nursing homes increases by 0.12 percentage points, which corresponds to a 5 percent increase over the baseline average of 2.3 percentage points. We do not document a significant change in the share of seniors aged 65-79 using home care.

5.2 Effects on Seniors' Health and Well-being

So far, we have shown that the elder care reform significantly increases demand for elder care services. However, an important factor of the reform is its effect on seniors' health and well-being. Therefore, to understand how the increase in demand for elder care translates into changes in senior' health outcomes and well-being, we consider three health-related outcomes: hospitalizations, the prescription of drugs, and mortality.[15] Ex ante, the effect of the reform on health-related outcomes is ambiguous. On the one hand, increased access to formal elder care could have positive effects on seniors' health: if formal care is more skilled, acute health conditions could potentially be prevented, detected early, or be treated outside the hospital. This would correspond to a reduction in the utilization of healthcare services. Also, being able to manage their life independent of family members could increase seniors' mental health, since seniors can avoid feeling like a "burden" to family members (Coe et al., 2015). On the other hand, however, less exposure to family members could stimulate feelings of loneliness and isolation and ultimately lead to a deterioration of seniors' health.

To test the respective channels, we start by examining dynamic changes in healthcare consumption. Figure 3b displays dynamic DiD estimates of regressing seniors' number of hospital nights on the treatment following Equation 1. We document that the number of hospital nights of seniors who experience a reduction of elder care fees (treated individuals) decreases by 0.2 nights, which corresponds to a 4.9 percent reduction relative to the pre-reform mean of 3.8 hospital nights per year. While the effect gets slightly larger over time, the initial steep drop highlights particularly strong immediate effects of the reform. Overall, the effect persists up to 10 years after reform implementation. In line with the fact that treated seniors' hospitalizations exhibit time trends similar to those of seniors in the control group, we document no significant differences prior to implementation of the reform.

[Insert Figure 3]

When further dissecting this effect, Table A.6 documents that the decrease in hospitalizations is driven by changes along both the extensive margin and the intensive margin. On the extensive margin, seniors are 0.5 percentage points (2.1 percent over the pre-reform mean) less likely to go to the hospital (Column (2)) and experience a reduction of 6.6 percent in the number of hospitalizations per year (Column (3)). On the intensive margin, seniors stay 0.4 nights fewer in the hospital (2.8 percent over the pre-reform mean) conditional on being hospitalized (Column (4)). When adding fixed effects for the cause of being hospitalized, the magnitude of the effect becomes smaller and loses significance. This suggests that, within the same diagnosis, the length of hospital stays does not change in a statistically significant

[15] Hospitalizations include all hospital stays that require at least one overnight stay (inpatient stay). Health conditions that require inpatient care are usually severe and are either acute or require a referral from a primary care or specialized outpatient physician. Any changes in inpatient hospitalization should thus be interpreted as a change in healthcare utilization for severe health conditions. Prescriptions are only captured if the individual buys the medication, and hence this can be seen as a measure of consumed prescriptions. Mortality describes a dummy that switches to 1 if the individual dies in the following year.

way. Instead, our results suggest that there is a shift in the composition of diagnoses among those coming to the hospital.[16]

These reductions in healthcare utilization for certain conditions can be driven by several underlying mechanisms. First, access to formal elder care increases access to medical care (trained nurses) and professional care (trained care workers). As a result, conditions such as minor injuries or infections can be treated outside the hospital; for instance, directly in the nursing home. This would imply a substitution of medical services from hospitals to the elder care sector. Second, accessibility to formal elder care might improve seniors' general health and thus decrease hospital visits. In particular, certain diseases might be detected early or prevented altogether through access to a professional and age-appropriate environment. Third, seniors can experience a reduction in the number of hospital visits due to neglect. Specifically, if professional caretakers are emotionally less attached to the senior, certain conditions might be overlooked despite having benefited from hospital visits.

To investigate these potential channels, we classify hospitalizations based on how urgent, preventable ("ACSC"), or treatable within a nursing home ("ANHAC") the hospitalization is.[17] To assess potential health improvements or neglect, we further investigate the effects of the reform on mortality and prescription drug use. Table A.6 shows that treated seniors are 3.16 percent less likely to be hospitalized for conditions that are urgent, 3.85 percent less likely for preventable conditions, and 4.66 percent less likely for conditions treatable in a nursing home. Compared with the baseline reduction in the likelihood of any hospitalization by 0.5 percentage points (2.12 percent), this suggests that treated seniors indeed experience a combination of reductions in hospitalizations due to preventable or treatable conditions in response to the reform.[18]

Further, and in line with the fact that treated seniors are less frequently hospitalized for certain conditions that are preventable or treatable outside the hospital setting, we find

[16] In Table A.18, we run our main DiD specification on the respective (mutually exclusive) diagnosis groups. We find that conditions such as *infectious or parasitic diseases* or *injuries* experience a relatively larger reduction in hospital admissions compared with hospitalizations of the group *cancer* or *diseases of the blood and blood-forming organs*.

[17] These measures are based on the main diagnosis when admitted to the hospital. For example, the diagnosis *Hip and thigh fracture* (ICD-10 code S72) is considered to be urgent and preventable based on the expertise of physicians (e.g., Billings et al., 2000; Krämer et al., 2019). More details on the definition of these variables can be found in Appendix Section B.

[18] In support of this argument, two prominent examples common among this age group that can be considered both preventable and urgent, are *Hip and Thigh Fracture* and *Pneumonia*. In Columns (5) and (6), respectively, we find large reductions in hospitalizations in these groups. Column (7) shows that there is no significant reduction in hospitalizations for *cancer*, which arguably is less preventable through increased access to professional care services.

that the number of prescribed drugs per individual is decreasing for certain conditions.[19] In total, the number of prescriptions per person drops by 1.5 in response to the reform, which corresponds to a 2.6 percent reduction over the pre-reform mean (see Figure A.7o). Figure A.8 additionally shows that reductions are relatively larger for specific drug groups, such as those for the *respiratory system* or *anti-infectives*, which mirrors the changes in hospital admissions along these dimensions.

Finally, Figure 3a shows the dynamic effect of the reform on mortality rates using Equation (1). While the point estimates are close to zero, the effects are imprecisely estimated. This means that they could be consistent with both significantly negative and positive effects. Thus, while we cannot rule out an effect on mortality, our results overall suggest that seniors do not experience large health declines, which renders the third channel of potential neglect less plausible.

Effect on Mental Health Increased utilization of formal elder care might also go along with changes in mental health. On the one hand, seniors might feel disconnected and lonely if professional care workers are emotionally less attached than family members. On the other hand, being able to live their lives independently in an organized environment—and thus avoid feeling like a burden to family members—might increase mental health. We test this by estimating the effect of the reform on the number of prescribed psychotropic drugs per person. In Figure A.9 we classify psychotropic drugs into four categories: drugs for depression, drugs for anxiety and insomnia, drugs for psychotic disorders, and a residual category of other psychotic drugs. We do not find any statistically significant effect on a change in the prescription of psychotropic drugs, which suggests that the reform does not greatly affect seniors' mental health. However, the large confidence intervals make it impossible to rule out fairly large negative or positive effects.[20]

Heterogeneity Lastly, we test whether the effect of the reform on seniors' hospitalizations varies based on observable characteristics, such as health status or family arrangements. Figure 4 shows a gradient in the reduction of hospital nights based on seniors' predicted

[19]Note that due to data restrictions, we measure prescriptions as the average number of prescribed drugs per individual who is over the age of 80 at the municipality level. Raw means over time and treatment status by drug-group are provided in Figure A.7.

[20]Due to data limitations (prescriptions are only observed on the municipality level), we cannot test whether the insignificant result is masking cross-sectional heterogeneities.

health status.[21] The largest reduction is observed among those seniors categorized as being in poor health (a 9.2 percent decrease compared with the pre-reform mean), with smaller effects among those in median health (5.1 percent) and good health (3.7 percent). Furthermore, we find larger responses among seniors that have children or spouses. Taken together, this suggests that seniors are more price sensitive to formal care services if they are in poor predicted health—and thus likely have a higher demand for care—or have family members, and thus have access to alternative care arrangements in the absence of the reform.

[Insert Figure 4]

5.3 Effects on Adult Children's Labor Supply

How does more affordable elder care shape the next generation's labor supply? A priori, it is unclear whether we should expect a positive, negative, or no change in children's labor supply in response to the reform. On the one hand, children could substitute caregiving for labor by trading off forgone earnings in the labor market and costs spent on formal elder care. In this case, we would expect to observe an increase in children's labor supply in response to the reduction in the fee for formal care (substitution effect). On the other hand, if children primarily support their parents by financing (rather than directly providing) care, lower fees could reduce labor supply through an income effect.

Throughout this section, we use the *children sample* described in Section 3.3. We find that adult children whose main parent lives in a treatment municipality increase their annual labor earnings by 1.1 percent within a decade after the reform, equivalent to over 2,062 SEK per year (Table A.7 Column (1)). Figure 5a shows that this effect is persistent for at least 10 years after the reform. When splitting the labor supply into an extensive and intensive margin response (Figures 5b and 5c, respectively), we show that the effect is to a larger degree driven by the intensive margin (individuals increasing their earnings) rather than the extensive margin (individuals entering or exiting the labor market). More specifically, we find that adult children are 0.3 percentage points more likely to be gainfully employed (0.6 percent over the pre-reform mean) and have 1.4 percent higher earnings conditional on having positive earnings (Table A.7 Columns (2) and (4)). In line with the fact that treated

[21] We categorize individuals into *poor*, *median*, and *good* health based on predicted 5-year mortality rates. We predict 5-year mortality rates based on demographic information (age, education, civil status, and pension income) and healthcare utilization (indicators for 3-digit ICD-10 codes and the sum of inpatient nights for each 3-digit ICD-10 code) using two predictors, a LASSO and a random forest. Figure A.19 provides further details and performance tests for the predictor.

adult children's earnings exhibit time trends similar to those of individuals in the control group, we document no significant differences prior to implementation of the reform.

[Insert Figure 5]

These effects on earnings are persistent and last beyond the point at which care responsibilities have ended. We measure exposure to care responsibilities for parents as the exact timing of both parents' deaths, when parental care requirements likely go to zero. Figure 6 displays the dynamic DiD estimates on earnings using Equation 1, where we categorize individuals into four groups: individuals with parents who die before implementation of the reform in 2001 (placebo group) and individuals with parental deaths ranging between 2003 and 2007, 2007 and 2011, or after 2011.[22] We find that treated individuals whose parents are dead by 2007 have 1.9 percent higher earnings 6 years after the reform compared with control individuals in the same group. After the parents' death in 2007, this effect does not revert to the control mean; instead earnings remain persistently higher compared with the control group in following years. We find similar effects when parents die in a later year. This suggests that adjustments around earnings are permanent rather than temporary based on a parent's care requirement. Reassuringly, we do not find any earnings response among the group of individuals whose parents die before the reform.

[Insert Figure 6]

One argument in favor of sticky labor market responses is that adult children are on average 51 years old before the reform (see Table A.3) and thus at the peak of their working life, facing (nonreversible) career progression decisions such as becoming a manager or changing their workplace. Figure 7 highlights the average intensive-margin response of earnings to the reform along these margins using Equation 2 and scaling the estimates by the pre-reform mean. We find that adult children whose parents are exposed to the reform are 2 percent less likely to work part-time and continue working in work arrangements that are less flexible but higher-paying.[23] We also document that they are 2.5 percent more likely to become a

[22]Note that individuals with parents who are dead before the reform are not part of the *children sample*. We test that the two samples are comparable in terms of observable characteristics.

[23]We define workplace (or occupation) *flexibility* as the leave-one-out share of part-time workers, where we define a part-time worker by working fewer than 30 hours per week in the main job following OECD's classification. We define *working in a high-paying firm* using the AKM framework (Abowd et al., 1999). Specifically, we regress log-earnings on individual fixed effects and firm fixed effects using the largest connected set of firms in the Swedish working population between the years 1985 and 2018. Following Card et al. (2013), we control for a polynomial of experience (age - years of education), gender, and year fixed effects. Then, we define a worker *working in a relatively higher paying* firm if the individual works in a firm with a higher estimated firm fixed effect.

manager. This suggests that higher access to formal care for parents potentially frees adult children's capacities to work in "greedy" jobs that pay higher earnings but have longer hours.

[Insert Figure 7]

Heterogeneity The positive impact on annual earnings suggests that adult children trade off labor supply and providing informal care based on the relative price of wages and formal care. Therefore, we expect a stronger response to the reform among adult children with greater caregiving needs for their parents. Figure 8 presents the pooled DiD effect on earnings by group, using Equation 2, with the estimates scaled by the pre-reform mean. Consistent with this hypothesis, we find that adult children are more responsive to the reform if they have a parent in poor predicted health—which indicates higher predicted care needs—or if they are only children, and thus cannot share caregiving responsibilities with siblings. Interestingly, the earnings response is larger for sons than daughters in the average effect. At first glance, this challenges the conventional view that it is primarily daughters who provide informal care for the older generation. To explore this further, in Figure A.10 we provide additional evidence suggesting that—while both genders engage equally in caregiving activities—it is primarily men who adjust their behavior in response to lower care fees. This is dicussed in more detail in Section 6.

[Insert Figure 8]

We also show that across both genders, children with higher-earning parents respond more. Given that the fee schedule was progressive based on income prior to the reform, the stronger response among high-income parents suggests higher treatment exposure—because these seniors were more likely to exceed the introduced fee cap—rather than a larger substitution effect within this group. To disentangle these two forces, we plot the labor supply response by both the parent's and the child's income ranks in Figure A.11. The figure displays a heatmap, in which each cell represents the treatment effect on annual earnings, expressed as a percentage, by the income rank tercile of the parent and the income rank tercile of the child. Keeping the treatment intensity (parent's income rank) fixed, we observe that children with lower pre-reform income ranks adjust their labor earnings more. For example, while children of low-income parents in the highest income bracket show no significant changes in earnings, children in the lowest income bracket increase their earnings by 1.9 percent. This suggests that credit-constrained individuals are more sensitive to the price of formal elder care.

Our interpretation that credit-constrained individuals increase their labor supply as a substitution effect is further supported when examining adult children's saving choices. Figure A.12d shows that the likelihood of partial retirement (defined as receiving pension payouts while reducing earnings) decreases by approximately 6 percent for daughters and 3 percent for sons in response to lower care fees after a decade.[24] This suggests that pension payments may serve as a margin to compensate for lost labor income due to caregiving, especially for daughters.[25]

[Insert Figure 9]

Within-Family Response As shown in Figure 8, only children have a larger response to the reform compared with individuals with siblings. This suggests that families with multiple children can divide caregiving responsibilities among family members. If individuals trade off labor market attachment and providing informal care based on the relative price of wages and formal care, we would expect the sibling with the lower opportunity cost of providing informal care to respond. In Figure 9, we report the percentage DiD effect on earnings using Equation 2, dividing siblings into four groups: the sibling with the higher earnings rank, the sibling living closer to the parent's residence, and the older sibling. Consistent with the hypothesis of lower opportunity costs, we find larger responses among siblings who have lower earnings, live closer to their parents, and are younger.

5.4 The Informal Caregiving Channel

As discussed in the previous section, the heterogeneities in earnings already point to a trade-off between adult children's informal caregiving responsibilities and their labor supply. Since we cannot directly observe informal caregiving in the data, we propose three tests to validate this channel. First, we examine whether there are changes in living arrangements between parents and their adult children. Second, we assess whether responses to the reform are correlated between adult children and their parents. Third, we leverage parental health shocks as quasi-random events to capture shifts in caregiving needs. Strokes, in particular,

[24] Starting from the age of 55 (depending on collective agreements between employer organizations and the unions), it is possible to "partially" retire in Sweden. Individuals are allowed to reduce their work hours by 25%, 50%, or 75% and supplement their labor income with early pension payouts.

[25] Previous literature shows that social security is a way to adjust labor supply when caring for elderly parents (Løken et al., 2017). Auxiliary analysis further documents that there are no changes in social security utilization, such as short- and long-term disability insurance benefits, parental leave benefits, or care for close relative benefits as a result of the reform.

are commonly used in the literature to measure responses to informal caregiving when direct observation is not possible (e.g., Frimmel et al., 2021).

Living Arrangements To test whether labor market adjustments stem from informal care decisions, we examine the treatment effects on living arrangements. We find that adult children are 2 percent less likely to live with their parent if the parent is treated and experiences a reduction in formal elder care fees (see Figure 10). Also, we find that the average distance between adult children and their parent increases in response to the reform: the probability of living more than 13.5 km from the parent rises by 1 percent. This is consistent with the idea that greater accessibility to formal care reduces the need for close proximity.

[Insert Figure 10]

Correlated Responses between Parents and their Adult Children Next, we examine whether parents' responses to the reform are correlated with their children's responses. While we cannot directly measure responses to elder care, since they are captured at the municipality level, we can construct individual-level DiD estimates for parents' changes in hospitalizations and children's changes in earnings. By mapping each adult child to their parent, we can infer whether these responses are correlated. Specifically, if children increase their earnings in response to reduced caregiving responsibilities, we would expect that children with the largest earnings increases are also those whose parents experience the greatest reductions in hospitalizations. To test this, we first construct the sample of matched child-parent pairs.[26] The final sample consists of 171,905 control pairs and 289,745 treated pairs in the year 2001. To ensure comparability with the main sample specification, we apply our DiD design to the reform and find similar treatment effects (see Table A.11).

We then construct the *individual-level* DiD by subtracting the mean of the control group and then the mean of the pre-period. Formally:

$$\hat{Y}_{it}^{Treated} = Y_{it}^{Treated} - \bar{Y}^{Control} \tag{4}$$

$$\hat{\hat{Y}}_{it}^{Treated} = \hat{Y}_{it}^{Treated} - \bar{\hat{Y}}^{Treated,Pre} \tag{5}$$

[26]This sample is smaller than the senior sample, since the senior sample also includes seniors without children. It may also be smaller than the children's sample, since we exclude child-parent pairs if the parent died.

The first step removes the mean of the control group, while the second step accounts for the time trend. This results in a distribution of individual-level DiD effects, in which the average of the distribution corresponds to the main DiD effect estimated in Table A.11.

We plot the correlation of the individual-level responses in Figure A.13b for the years 2001–2008 and in Figure A.13a for the entire period. We find a negative correlation, which indicates that children who increase their earnings the most tend to have parents with the largest reductions in hospitalizations; this reinforces the informal caregiving channel. To further ensure that our results are not driven by measurement error—which may arise when constructing the individual-level DiD response—we perform a split-sample IV analysis (see Table A.12). For the split-sample IV, we collapse the sample by groups that show heterogeneity: gender, age (above or below the median age of 54), parent's gender, parent's spouse, number of siblings, education, income (5 bins), and parents' pension (20 bins). We then randomly split the sample into two parts. We use the individual-level DiD response from one sample as an IV for the other sample to account for potential measurement error. This yields very similar results, which suggests that the findings are not driven by underlying measurement error.

Parental Health as Shock to Parental Care Requirements Finally, we use strokes as a shock to parental care requirements, which is a standard measure in the literature for informal caregiving, because strokes typically require intensive care afterward (Frimmel et al., 2021; Brito and Contreras, 2023; Chen et al., 2024; Norén, 2020). Specifically, we construct an event study of earnings around the time of the first parental stroke. The decline in children's earnings in response to this care-intensive shock suggests involvement in informal caregiving. In the second step, we test how this response depends on the price of formal care by interacting the event study with our DiD design of the reform. In the following sections, we outline these steps in more detail and discuss the results.

Following Chen et al. (2024); Nekoei and Seim (2023); Fadlon and Nielsen (2021), we run the following event-study design:

$$Y_{it}^c = \alpha_i + \sum_{l \neq -1} \gamma_l \mathbb{I}[t = l] + \delta_l D_{it}^c \mathbb{I}[t = l] + \varepsilon_{it}^c, \tag{6}$$

where Y_{it}^c denotes the income of adult child i in event-year t relative to calendar year c in which the parental stroke occurs. We compare "treated" individuals who experience a parental stroke in calendar year c ($D_{it}^c = 1$) with observably similar "control" individuals who experience a parental stroke 6 years later in year $c+6$ ($D_{it}^{c}=0$). The main assumption is that the exact timing of the shock is as good as random.[27] The sample consists of 151,352 treated individuals who experience a parental stroke between the calendar years 1998 and 2005, along with an equal number of matched control individuals per year.

Figure A.10a presents earnings responses around the event of a parental stroke. We find that earnings for both genders—men in purple and women in blue—decrease by approximately 2 percent in response to a parental health shock, which suggests an increase in informal caregiving. In the second step, we split the sample along two dimensions: (1) those experiencing the health shock pre-reform in the years 1998 to 2000 and those experiencing the health shock post-reform between 2002 and 2005 ($P=1$); (2) those with a parent in a treated municipality ($T=1$) and those with a parent living in a control municipality. We then compare the response to a parental health shock, interacted with P and T, including all interaction terms, formally:

$$Y_{it}^{c}=\sum_{l\neq-1}\beta_l\mathbb{I}[t=l]\times\mathrm{P}\times\mathrm{T}+\sum_{l\neq-1}\zeta_l\mathbb{I}[t=l]+\sum_{l\neq-1}\gamma_l\mathbb{I}[t=l]\times\mathrm{P}+\sum_{l\neq-1}\eta_l\mathbb{I}[t=l]\times\mathrm{T}+\alpha_i+\varepsilon_{it}^{c} \quad (7)$$

The interacted event-study-DiD design above shows how the response in earnings responds to the decrease in formal care fees. Figure A.10b plots the dynamic causal effects. We find a positive effect for sons, which indicates that the reform mitigates their earnings drop after experiencing a parental health shock. This suggests that while both genders respond to parental health shocks—likely due to caregiving activities—only sons are price-sensitive and adjust their caregiving behavior in response to the reform.

6 Robustness Analysis

Treatment definition In Table A.8 (seniors) and Table A.9 (adult children), we show that the results are robust to different specifications of control or treatment definition. For example, we discretize the treatment variable into high and low treatment exposure and find a gradient in the results. This means that individuals facing a larger change in fees respond more in absolute terms. Also, we use pre-reform elder care fees as a linear and continuous measure of treatment intensity, since municipalities with higher fees before the

[27]Since the control group is by construction younger at the time of the event, we match on the following variables at $t=-1$ to render our treatment and control sample more comparable: year of birth, age, age of parent, education, number of siblings, parental death within a year, and five bins of earnings in $t=-1$. We keep a balanced sample of 5 years prior to and after the stroke.

reform experienced larger fee reductions.

Placebo group We test whether our main results on elder care utilization, senior hospitalizations, and adult children's labor supply differ for groups that are either less exposed to the reform or not exposed at all. Regarding elder care utilization, we find similar responses among the eligible age group of 65 to 79, albeit at a much lower level (see Figures A.6c and A.6d). For senior hospitalizations, we observe smaller responses among seniors aged 65 to 79 and no responses for those ineligible for the reform (placebo group), as shown in Figure A.17. Lastly, concerning children's earnings, we test whether there is a response among children whose parents had both passed away prior to the reform's implementation. Figure 6 demonstrates that this effect is indeed zero.

Alternative fee measure We construct elder care fees using municipalities' balance sheet data, taking advantage of the fact that municipalities were the primary providers of elder care at the time. We validate this measure using a secondary data source. During this period, Socialstyrelsen conducted a survey on the minimum and maximum fees for elder care. Figure A.16 shows the treatment effect on the respective price measure from the survey. We observe that the reform significantly reduced the maximum fee for nursing homes. This aligns with the interpretation whereby low-income individuals, who were already exempt from fees before the reform (approximately 10%), did not experience a change. However, individuals facing higher elder care fees—for example, due to greater care needs—did experience a decrease in fees.

Cost shifting instead of cost reduction Figure A.3a illustrates the average municipality spending per senior receiving home care and those residing in nursing homes. The figures suggest that the cost per person for providing home care and nursing homes (or "special housing") is similar between treatment and comparison municipalities, and that the reform did not differentially change average spending based on treatment status. This indicates that the quality of care, measured by average spending per recipient, did not change as a result of the reform. Panel A.3b further shows that treatment municipalities did not compensate for the revenue losses from lower care fees by increasing rents for nursing homes.[28]

[28]We do not have information on revenues from food provision in elder care, so we cannot verify whether municipalities increased food costs to offset revenue losses. However, because municipalities are required to follow a self-cost principle (as described in Section 2), we do not expect significant margins for adjusting other prices associated with elder care.

DiD and Parallel Trends Assumption A potential threat to the DiD assumption is anticipation of the reform. Figure A.20 shows newspaper coverage of the reform across all Swedish newspapers. We can see that there was no significant reporting on elder care fees before the reform was announced in 2001. Also, there is concern that other events occurring around the same time could confound the results. To address this, we test whether a childcare reform implemented around the same period is correlated with the elder care reform in Table A.10.

7 Stylized Model

This section presents a static model to evaluate the welfare impact of increasing the government subsidy level for formal elder care services. We build on the work of social insurance models (for an overview, see Chetty and Finkelstein, 2013), but extend the framework to feature the intergenerational trade-offs associated with elder care. Guided by our empirical results, the model features both seniors and their adult children, in which seniors face the risk of becoming dependent and requiring care. When realized, the state of being dependent and sick creates significant cost in terms of formal care spending, medical treatments, and forgone labor earnings of informal caregivers. The subsidy provides seniors with insurance against consumption losses in the sick state of the world, but must be financed by income taxes on adult children's labor earnings. Similar to the Baily-Chetty case (Baily, 1978; Chetty, 2006), the model delivers an implicit optimal insurance formula that balances the value created by insuring parents against consumption losses in the sick state of the world and the costs for children of raising taxes to finance the subsidy. The cost of insurance can be divided into a direct cost component and a fiscal externality cost component stemming from behavioral changes in the utilization of formal care, healthcare consumption, and labor supply when the price of formal care services is subsidized.

To make the problem tractable, we rely on three main assumptions. First, we abstract from private markets of elder care insurance, assuming that resources can only be transferred into seniors' sick state of the world through the government.[29] Second, we assume that there is a unitary government that provides and finances the subsidy. This is a simplification of the real-world case, in which the government is organized on several levels: municipalities

[29] In Sweden, the take up of private long-term care insurance is low compared with other countries. For example, 6 percent of individuals aged over 65 take up voluntary LTC insurance in Sweden compared with 15 percent in the US (Barczyk and Kredler, 2019). Finkelstein and McGarry (2006) discuss the case of private information in this market.

organize elder care, regions organize healthcare, and both can raise local income taxes to finance their local services. Third, we assume that agents optimize through a representative agent and take the subsidy and tax schedule offered by the government as given when solving the maximization problem. This allows us to apply the envelope theorem. In Appendix C, we provide further details on the setting and full derivations of all equations.

7.1 Setting

Each child K has one parent P. Children choose their consumption c, their labor supply l, and how much informal care to provide h. We assume that adult children make decisions on behalf of their parents, where children are altruistic toward the parent with parameter $\beta \in [0,1)$. An alternative way to interpret β is as a bargaining weight. Rather than children making decisions on their parent's behalf with altruism parameter β, this would imply that choices are the outcome of a bargaining process between parents and children with bargaining weight β. Hence, they also choose their parent's consumption c_S and c_H, the parent's healthcare consumption m, and how much formal care the parent buys f. Formally, individuals optimize over a weighted average of the child's and parent's expected utility

$$(1-\beta)\ \mathbb{E}(\underbrace{U^K(c,l,h)}_{\text{Child's Utility}})\ +\ \beta\ \mathbb{E}(\underbrace{U^P(c_S,c_H,m,f)}_{\text{Parent's Utility}}). \tag{8}$$

Parents face the risk of experiencing an adverse health event with exogenous probability π. We denote the sick state of the world with the subscript S and the healthy state of the work with the subscript H. If the health shock is realized, the parent has a care requirement H^P. The timing is as follows: Before the health shock is realized, children choose their labor supply l and consumption c. This implies that they, for example, settle on a certain career or occupation facing uncertainty on whether their parent is sick.[30] After the health shock is realized, they choose how much formal care to provide h, the parent's consumption depending on the state c_S and c_H, how much formal care to buy f, and how much medical treatment to seek m. The health shock alters the utility in several ways. First, providing informal care h gives disutility to the adult child. Second, parents incur costs from spending on formal care f. Finally, parents experience disutilty from going to the hospital and consuming medical services m. The state-specific child's utility and budget constraint is given by

[30] Note that this model choice resembles our empirical findings, in which adult children experience persistent earnings changes by working in different career paths in response to the reform.

$$
U^K = u(c) - \begin{cases} \psi(l) & \text{if } P \text{ healthy} \\ \psi(l,h) & \text{if } P \text{ sick} \end{cases} \qquad (9)
$$
$$
\text{s.t.} \qquad c = (w-\tau)l
$$

where w is the wage and τ the income tax. This utility uses the same simplifying assumption as in Baily (1978) and Chetty (2006). First, we assume an additive structure in utility from consumption u and disutility from labor and informal care ψ. We assume homogeneous preferences u over consumption that are strictly increasing and concave. ψ is assumed to be a strictly increasing and convex function that captures the disutility of work and informal care. Specifically, we assume $\psi(l+h)$.

Similarly, parents exhibit a state-specific utility function and budget constraint:

$$
\begin{aligned}
U^P &= \begin{cases} u(c_H) & \text{if } P \text{ healthy} \\ u(c_S) - \phi(m) & \text{if } P \text{ sick} \end{cases} \\
\text{s.t.} \qquad c_H &= a \\
c_S &= a - (p-\sigma)f
\end{aligned} \qquad (10)
$$

where a indicates exogenous assets, p is the price of formal care, and σ the subsidy of formal care. Similar to the child's utility, we assume an additive structure between the parent's utility from consumption and disutility from going to the hospital.[31]

We make the crucial assumption that a senior's care requirement H^P must be met by either providing informal care through the child h (e.g., time investment), buying formal care services f (e.g., financial investment), or going to the hospital as a response to poor health m (e.g., medical treatment). In particular, we assume an additive structure of the form

$$
H^P = h + f + m. \qquad (11)
$$

Intuitively, we can interpret the first two components $(h+f)$ as *preventative care*. Suppose care requirements are not met, either through a child's informal care provision or outsourcing the task to the elder care sector. In that case, the parent suffers from being sick, measured

[31]There are two ways we could generalize the model. First, there is evidence that the utility of consumption may change as individuals get sick (Finkelstein et al., 2009). We assume the same utility function for consumption across states. Second, one can argue that utility might differ between parents and their children. Both extensions do not change the implications of our model.

by the residual "care requirement gap" $m = H^P - f - h$, and seeks medical treatment. Each of these components has a cost attached: (i) informal care h creates disutility to the child, (ii) formal care f creates monetary costs, and (iii) going to the hospital m creates disutility to the parent. Note that we assume perfect substitutability in meeting the care requirement through h, f, or m.

7.2 The Planner's Problem

Individuals cannot transfer resources between the sick and healthy state of the world, which creates value for insurance. This becomes salient by comparing the laissez-faire solution to the first best, where individuals experience perfect consumption smoothing in the first best scenario (see Appendices C.1 and C.2, respectively). While this offers scope to the government to provide social insurance, ex-ante it is ambiguous whether this would imply a net welfare gain. This is due to the marginal costs of public funds that must be raised in order to fund the subsidy. These costs can be substantial as the subsidy is paid to both infra-marginal individuals—those already using elder care—and to marginal individuals—those entering elder care due to the subsidy.

We address this question by solving the planner's optimization problem subject to the government budget constraint. In particular, the planner chooses the optimal subsidy σ by adjusting income taxes τ taking into account the fact that individuals optimize over c, l, h, c_S, c_H, m, f.

$$\begin{aligned} V(\sigma,\tau) = \max_{c,c_H,c_S,l,h,f,m} \quad & (1-\beta)\ \left(u(c) - (\pi \cdot \psi(l) \ \ + (1-\pi)\psi(l+h))\right) \\ & + \quad \beta \quad (\pi u(c_H) + (1-\pi)(u(c_S) - \phi(m))) \\ & - \quad \lambda \quad ((w-\tau)l - c) \\ & - \quad \lambda_S\ (a - (p-\sigma)f - c_S) \\ & - \quad \lambda_H\ (a - c_H) \\ \text{s.t.} \qquad & l\tau = (1-\pi)\sigma f + (1-\pi)m \\ & h = H^P - f - m, \end{aligned} \tag{12}$$

where λ, λ_S, and λ_H describe the Lagrange multipliers. Hence, the planner chooses $\{\sigma, \tau\}$ by maximizing the individual's indirect utility V subject to a balanced budget constraint for the elder and medical care system (tax revenues $l\tau$ equal spending on formal elder care σf and hospitalizations m in case of sickness). We normalize the price of medical care to 1.

Note that we focus our attention on welfare effects in the case of linear taxation and benefits similar to the Baily-Chetty setting. Solving this generally for a nonlinear tax and transfer system is beyond the scope of this paper.

Proposition 1. *Consider a marginal increase in the subsidy for formal elder care σ in the sick state of the world, which realizes with probability π. Suppose that the increase is financed by a linear tax τ on children's labor earnings, such that the policy change stays budget-neutral from a government perspective. Then, the policy is welfare-improving if*

$$\underbrace{\frac{\beta}{1-\beta}\frac{u'(c_S)}{u'(c)}}_{\textit{Value of insurance}} > \underbrace{1}_{\textit{Direct Cost}} + \underbrace{\frac{\sigma f + m}{\sigma f}\left(\frac{\sigma f}{\sigma f + m}\varepsilon_{f,\sigma} + \frac{m}{\sigma f + m}\varepsilon_{m,\sigma} - \varepsilon_{l,\sigma}\right)}_{\textit{Fiscal Externality / Behavioral Response}} \tag{13}$$

where $\varepsilon_{i,\sigma}$ describes the elasticity of i with respect to the subsidy σ.

Interpretation Equation 13 reveals that the implicit solution to σ can be rearranged into three main terms. First, on the left-hand side (LHS), we report the value of insurance measured as the ratio of the parental marginal utility in the sick state of the world to children's marginal utility of consumption (similar to Chetty, 2006). The ratio is weighted by the respective altruism parameter. The term describes the markup individuals are willing to pay over actuarially fair insurance in order to transfer resources between the sick and the healthy state. Second, on the right-hand side (RHS), we can see the costs of providing social insurance. These can be decomposed into a direct cost and a fiscal externality stemming from the fact that individuals change their behavior in response to the subsidy. The RHS resembles the Baily-Chetty case but requires more information. In specific, the fiscal externality depends on all three elasticities: For formal care $\varepsilon_{f,\sigma}$, healthcare utilization $\varepsilon_{m,\sigma}$, and labor supply $\varepsilon_{l,\sigma}$. As highlighted by Hendren (2016), all behavioral changes that affect the government's budget show up.

Equation 13 provides two main insights. First, the implicit optimal level of the subsidy—LHS equals RHS—balances the marginal costs of raising taxes on the children by 1 SEK (RHS of Equation 13) and the marginal benefits of increasing parents' consumption by 1 SEK in the sick state (LHS of Equation 13). Second, from a theoretical perspective, it is ambiguous whether the policy change is welfare-improving, i.e., whether the LHS > RHS. While the LHS of the equation is always positive, the sign and magnitude of the RHS are ambiguous. This depends on the interplay of the three elasticities: a weighted average of the parental elasticities—the elasticity of formal care and healthcare consumption with respect to the subsidy—and the child's elasticity of labor supply with respect to the subsidy. Two special cases are worth discussing. (i) If all elasticities equal each other ($\varepsilon_{f,\sigma} = \varepsilon_{m,\sigma} = \varepsilon_{l,\sigma}$), they cancel each other out and result in a fiscal externality of zero. In this case, the policy equals the first best solution and provides an (on average) non-distortionary transfer between the sick and healthy state of the world. In other words, this means that the willingness to pay for the policy equals the direct cost of providing it. (ii) In some cases, the fiscal externalities can be significant enough to fully offset the transfer cost of the policy: For instance, if the behavioral responses of healthcare utilization ($\varepsilon_{m,\sigma}$) and labor supply ($\varepsilon_{l,\sigma}$) outweigh behavioral responses from changes in formal care ($\varepsilon_{f,\sigma}$), the RHS can become negative. In this case, the behavioral changes from the reform offset the direct cost of the reform, which results in an effective net saving to the government's budget. This case is labeled as a "self-funding" policy that is also welfare-improving (Hendren and Sprung-Keyser, 2020).

7.3 Sufficient Statistics Implementation

To empirically investigate whether the policy is welfare-improving, we use our empirical research design in combination with Equation 13. In particular, we test whether and by how much the benefits generated by the provided insurance are larger than the cost of providing the policy. The cost combines the government's direct spending on the program (the transfer) and the behavioral effects on the government's budget (i.e., fiscal externalities due to behavioral changes). Hence, we measure the amount of welfare delivered to policy beneficiaries per unit of government spending on the policy financed by an income tax on the children.

We consider the first 10 years after the reform, for which we have empirical estimates, so we do not need to rely on any extrapolations. We use a yearly discount factor of 3 percent and account for the fact that the seniors in our sample have an average annual mortality rate of approximately 9 percent. We summarize estimations of the benefit and cost components in the following and provide the details of the calculation in Appendix C.4.

Value of insurance The willingness to pay for the policy is described by the insurance value, the LHS of Equation 13. Because we are still in the process of gaining access to consumption data to directly estimate this value, similar to Chetty (2006), we currently mainly focus on the cost side (as described in the following). Note that we can still assess whether the policy is welfare-improving in the case of a self-funding policy, because the LHS is positive.

Costs Focusing on the cost side (RHS of Equation 13), a natural implementation of the three elasticities are the causal effects generated by exploiting the policy variation in the price change. Since the central government reimbursed municipalities for implementing the reform, we can interpret change in the OOP fees for elder care as an underlying subsidy change. Hence, we use our causal directly estimates as elasticities for seniors' formal care utilization, hospital nights, and children's earnings with respect to the subsidy. Then, the remaining challenge is to measure government spending in the domain of healthcare (m) and elder care (σf) as well as additional tax revenues (τl). In terms of tax revenues, we use a shortcut by running our empirical DiD design directly on adult children's income taxes using tax data from register data. This immediately captures the change in the government's budget in response to the subsidy. For the case of healthcare consumption, we multiply the causal effect on a change in hospital days by an estimate of the costs for an average hospital night in Sweden at that time for the given age group (Wimo and Jönsson, 2001).[32] Finally, we calculate the government's spending on elder care σf as the residual of the average total costs of providing elder care from municipalities' balance sheets minus paid user fees, and exploit the feature whereby elder care is almost exclusively publicly provided at the time. We follow Hendren and Sprung-Keyser (2020)'s *marginal value of public funds* framework when calculating the costs and adjusting the estimates to make them comparable to each other. This includes, for example, scaling the effect of hospital nights and taxes by the first stage of seniors entering elder care. Furthermore, we assume a standard discount rate of 3% and adjust for the fact that 9% of seniors die each year after the reform. We report all estimates and their adjustments in Table 3.

[Insert Table 3]

7.4 Is subsidized elderly care welfare-improving?

The dashed line in Figure 11a shows how the cumulative net government cost evolves over time and the corresponding bootstrapped 95% confidence interval.[33] The red and blue bars

[32] Assuming full subsidization of healthcare services is a simplification. In practice, seniors pay a small OOP cost and healthcare services are almost fully subsidized for the age group 80 and above.

[33] To produce the confidence interval, we assume that our estimates of each cost component are normally distributed, centered at the true cost values, with standard deviations corresponding to the reported standard errors. We then draw 1000 bootstrap estimates for each year and cost component from its assumed

in Figure 11b illustrate how each cost component contributes to the 9-year net government cost, which is depicted by the right-most yellow-golden bar (i.e., the sum of the red and blue bars).

[Insert Figure 11]

We estimate that the government's direct cost for beneficiaries already living in nursing homes at the time of the reform increases by $13,632$ SEK per beneficiary per year (the average subsidy), which results in a 9-nine discounted cost of $78,633$ SEK. Behavioral responses through increased elder care utilization in treated municipalities also create indirect costs: The 9-year accumulated cost is $111,304$ SEK due to the 4.5 percent increase in seniors living in nursing homes, and $7,782$ SEK due to the 0.7 hours increase in home care following the reform. The largest contributor on the cost side stems from seniors entering nursing homes. This is because seniors entering a nursing home in response to the reform not only get the subsidy change of $13,632$ SEK per year but also the subsidy that is in place before the reform. In fact, the reform increased the subsidy level of elder care from approximately 90 percent to 95 percent for subsidized services.

We contrast these increased costs for the government with savings on inpatient hospital care and increased tax revenues for children's labor supply. We estimate 9-year total savings to be $84,844$ SEK after discounting and adjusting for annual mortality rates. We estimate a cumulative increase of $195,512$ SEK in additional tax revenues due to the increase in labor supply among affected seniors' children. Taken together, the results show that the cumulative net government cost turns negative after 7 years, with approximately $56,058$ SEK in savings after 9 years.

Welfare Figure 11a shows that the costs of the policy are positive during years 1 to 6 after implementation. This turns in year 7 when costs become negative with significantly different from zero negative costs 9 years after implementation. This implies that the subsidy becomes self-funding within a decade, meaning that the policy "pays for itself". Through the lens of our model (which shows a positive insurance value of the policy), we can further conclude that this subsidy change is welfare-improving. Why does the welfare impact change over time? Note that the estimated effect on children's labor market outcomes persists even after a parent's death (as shown in Figure 6)—i.e., they contribute to the government's

distribution. We calculate the cumulative net government cost for each year within each bootstrap draw and calculate the confidence interval. Figure C.2 shows the distribution of the bootstrap draws.

budget through additional labor taxes even after the government has stopped paying the subsidy to the parent. Hence, over time the relative contribution of the children's income taxes is growing as depicted in Figure A.22. A direct implication of this finding is that elder care policies with seemingly large costs in the short run may still become cost-effective after several years because of the persistent behavioral responses of individuals indirectly affected by the subsidy. This result emphasizes the importance of considering (long-run) fiscal externalities beyond the directly targeted group of seniors when evaluating large-scale elder care policies.

Limitations We note that our calculation of welfare components may exclude some important components that could affect our conclusion. For example, we do not account for the potential increase in staffing costs and costs for new infrastructure related to an increase in the demand for formal care. Furthermore, we do not include the fiscal externality of behavioral responses in pension payments among adult children.[34] Finally, we acknowledge that our cost-benefit analysis does not account for the impact of the reform on true health or "soft values", such as changes in loneliness and social isolation, which can significantly influence the well-being of seniors and, consequently, their willigness to pay for the policy. While we believe these to be important aspects of the policy, we are bound by data limitations.

8 Conclusion

As life expectancy increases and birth rates decline, the proportion of older adults in the population is rising compared with the working-age population. This demographic shift has implications for social and economic policies, especially in the domain of long-term care for seniors. In this paper, we investigate how subsidizing elder care impacts the utilization of elder care services and the utilization of healthcare by seniors, as well as the labor supply of their children.

We exploit a unique reform that makes formal elder care more affordable in two-thirds of Sweden's 290 municipalities using a difference-in-differences design. Specifically, individuals in treated municipalities experience, on average, a fee change in elder care of over $13,500$ SEK per year, which corresponds to a relative fee change of approximately 40 percent to the pre-reform fee. We find that treated seniors increase their utilization of elder care in

[34] This effect may be positive if the increase in annual pension payments due to reaching the full retirement age is outweighing the payments for additional years in (early) retirement.

response to the reform. This is accompanied by significant reductions in specialized hospital care utilization, but without any effects on mortality rates. Children with parents affected by the reform increase their labor supply, measured as annual earnings. These effects persist for at least 10 years after the reform, which suggests that both behavioral changes and the costs of the reform are long-lasting. The finding of both large health effects among seniors and labor supply effects among their children implies the existence of a significant fiscal externality from financing elder care for seniors through reduced healthcare costs and increased tax revenues.

To quantify the welfare implications of the reform, we build a stylized model of formal and informal care. In the model, parents face the risk of becoming dependent, which, if realized, incurs costs for medical treatment and formal care. Children can help mitigate these costs through informal caregiving, but incur opportunity costs from forgone earnings in the labor market. We then empirically implement the sufficient statistics characterized by the model's optimal subsidy formula to assess the costs and benefits of the subsidy, while accounting for behavioral responses in care utilization, healthcare consumption, and labor supply. Focusing on the costs, We find that the subsidy is costly in the short run from a government's perspective. After 7 years, however, the net government costs for the policy become negative. This means that the policy is "self-funding". Since we show a positive insurance value of the policy, we conclude that the policy is welfare-improving.

The results of this paper demonstrate that although publicly subsidizing elder care imposes a high direct cost for the government, the benefits of improved health management and increased labor supply can outweigh direct costs in the long run. This contributes to the view that policies targeted at adults can create higher benefits for the costs if they have spillovers on children, as demonstrated in Figure A.21 (see Hendren and Sprung-Keyser, 2020).

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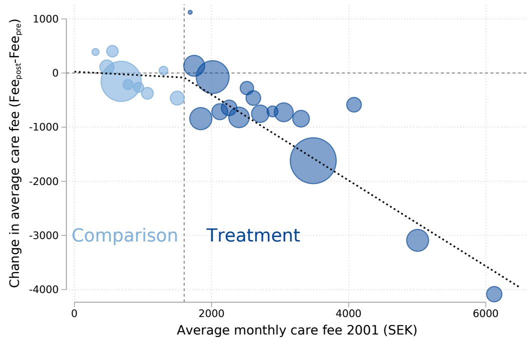
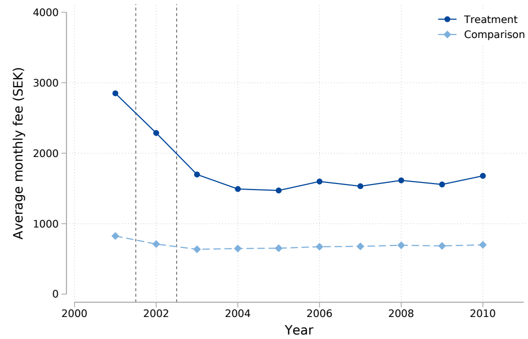
FIGURES

Figure 1: Identification: Fees for Elder Care drop in Municipalities above the Fee Cap

(a) Change in Fees by pre-reform Fee Level

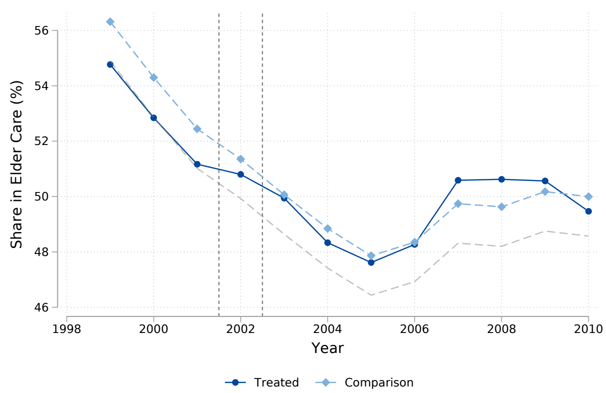


(b) Fees over Time by Treatment Status



Note: This figure displays the elder care fee changes in response to the reform. Panel 1a is a binned scatter plot showing the average change in elder care fees by pre-reform fee level for treated and comparison municipalities. The size of each dot indicates the relative number of individuals aged 80+. We fit a line using a linear weighted regression on each side of the fee cap of 1544 SEK. Panel 1b shows the respective evolution of average monthly fees over time for treatment and comparison municipalities. Due to data availabilities, we focus on the period 2001 to 2010 where the year 2002 onwards counts as *post-reform* period. A municipality is classified as *treated* if the pre-reform fees exceed the cap of 1,544 SEK per month. The figure is based on municipality-level data featuring 245 municipalities. We winsorize fees at the 5th and 99th percentile and deflate all prices to the 2003 year price level.

Figure 2: First Stage: Share of Elderly in Formal Care increases with the Reform

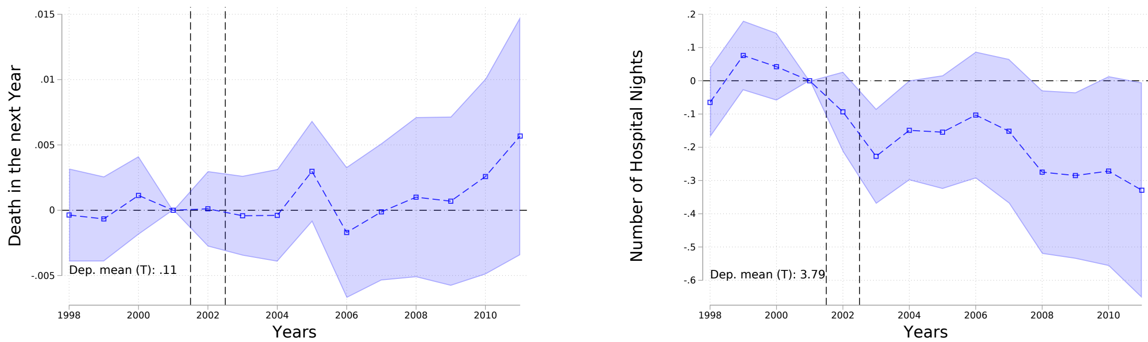


Note: This figure shows the share of individuals above the age of 80 in treatment (dark blue line) and comparison municipalities (dashed light blue line) having any type of care (nursing home or home care). The dashed gray line indicates the counterfactual of how treated municipalities would have evolved in the absence of the treatment. We construct this line by normalizing the comparison municipalities to equal the mean of treated municipalities in the year 2001. Due to data availabilities, we focus on the period 1999 to 2010 where the year 2002 onwards counts as *post-reform* period. A municipality is classified as *treated* if the pre-reform fees exceed the cap of 1,544 SEK per month. The figure is based on the municipality-level data. The corresponding figures divided by nursing home and home care utilization are reported in Figure A.6.

Figure 3: The Effect of Reducing Elder Care Fees on Seniors' Health Outcomes

(a) Mortality

(b) Hospital Nights

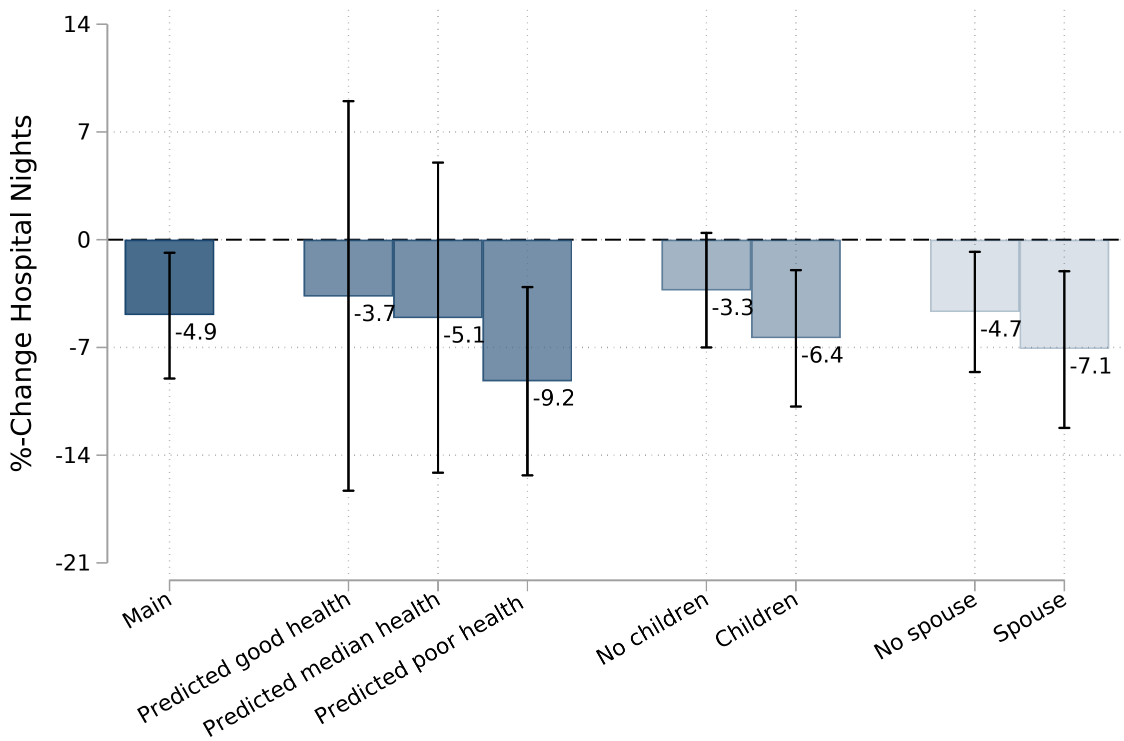


Note: This figure shows the dynamic estimates of the DiD regression using Equation (1), formally:

$$\underbrace{Y_{it}}_{\text{Senior's Health}} = \alpha D_{m(i)} + \sum_{t=1998\neq 2001}^{2011} \beta_t P_t \times D_{m(i)} + \gamma X_{it} + \theta_t + \theta_m + \epsilon_{it},$$

where β_t captures the causal effect of being exposed to the reform on mortality (Panel 3a) and the number of hospital nights (Panel 3b). We define mortality as an indicator variable that takes the value one if the individual dies in the following year. This is equivalent to running a survival analysis (Jenkins, 2005, for details, see). The regressions include baseline covariates, in particular: indicators for gender, year of birth, having a spouse, and number of children (X_it) as well as year fixed effects (θ_t) and municipality fixed effects (θ_m). The treatment indicator $D_{m(i)}$ switches to one if the senior lives in a treated municipality in the year before the reform. A municipality is classified as treated if the pre-reform fees exceed the cap of 1,544 SEK per month. Due to data availabilities of healthcare consumption, we need to restrict our analysis to the years 1998 and 2011. The shaded areas indicate the 95% confidence intervals. Standard errors are clustered at the municipality level.

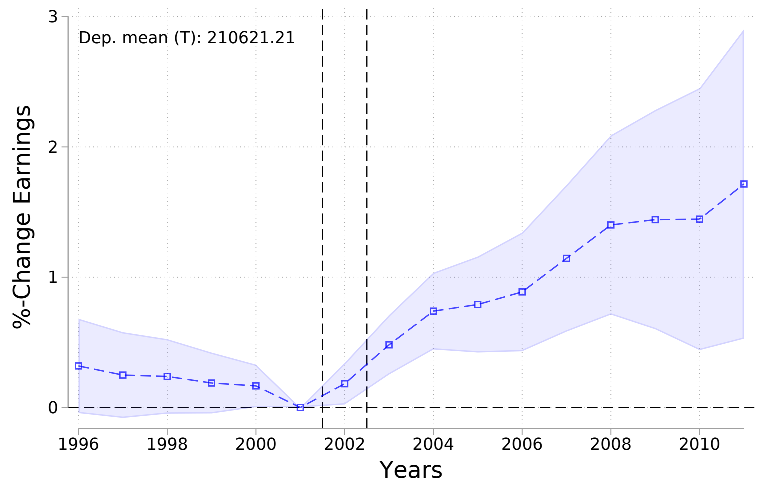
Figure 4: Seniors' decrease in hospitalizations by health status and family constellation



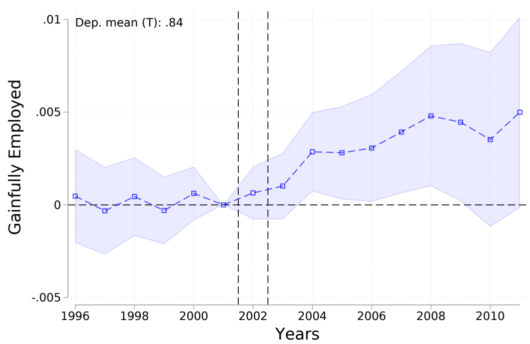
Note: The figure displays heterogeneities in the effect of hospitalizations by indicated subgroups. In particular, we report the pooled estimate from being treated by the reform running the regression of Equation (2) separately for each respective subgroup. In order to make coefficients comparable across groups, we scale the coefficients by the corresponding pre-reform mean of the treatment group to derive the percentage change. Health status is measured as predicted five-year mortality in 2001. As we use 30 percent of our sample as the training dataset, the health heterogeneity is based on the remaining 70 percent of the *adult children sample*. More details on the prediction are provided in Figure A.19. The number of children includes all biological offspring. Spouse is defined as living together in a partnership that is either married or has a common child. Standard errors are clustered at the municipality level. The capped bars indicate the 95% confidence interval.

Figure 5: The Effect of Reducing Elder Care Fees on Adult Children's Earnings

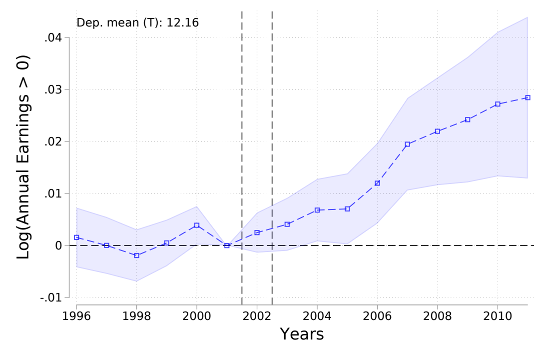
(a) Earnings



(b) Extensive Margin: Gainfully Employed



(c) Intensive Margin: Log(Earnings>0)

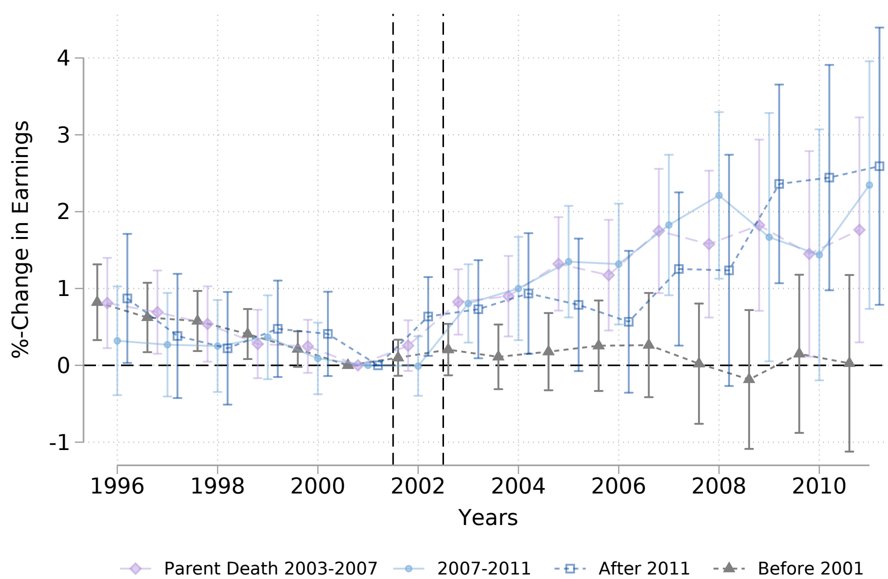


Note: This figure shows the dynamic estimates of the DiD regression using Equation (1), formally:

$$\underbrace{Y_{it}}_{\text{Child's Earnings}} = \sum_{t=1996\neq 2001}^{2011} \beta_t P_t \times D_{m(i)} + \gamma X_{it} + \theta_t + \theta_i + \epsilon_{it},$$

where β_t captures the causal effect of being exposed to the reform on annual earnings (Panel 5a), an indicator for being gainfully employed (Panel 5b), and earnings conditional on having positive earnings (Panel 5c). Following Chen and Roth (2024), we compute percentage changes of earnings in Panel 5a using a Poisson regression. Poisson quasi-maximum likelihood (QMLE) consistently estimates the ATE in levels as a percentage of the baseline mean under certain assumptions (Wooldridge, 2010). In Appendix Figure A.12, we show that the effect is not sensitive to the specification by using OLS with the level of earnings (see Figure A.12b) or the annual earnings rank (see Figure A.12a). *Gainfully employed* describes an indicator that is one if the individual earns more than an age-, gender-, and education-specific employment threshold constructed from the Swedish population register. Both Panel 5a and 5b are based on the *children sample*. In Panel 5c, we further restrict to year-person observations that have positive earnings. We use Log(Earnings> 0) as an outcome. The shaded areas indicate the 95% confidence intervals. Standard errors are clustered at the parent-municipality level. The regressions control for individual fixed effects (θ_i), year fixed effects (θ_t), and an indicator for dead parents (X_{it}). The treatment indicator $D_{m(i)}$ switches to one if the parent of the adult child lives in a treatment municipality with an average elderly care fee above the cap of 1,544 SEK/month in the year before the reform.

Figure 6: Labor market effect persists beyond time of care responsibilities

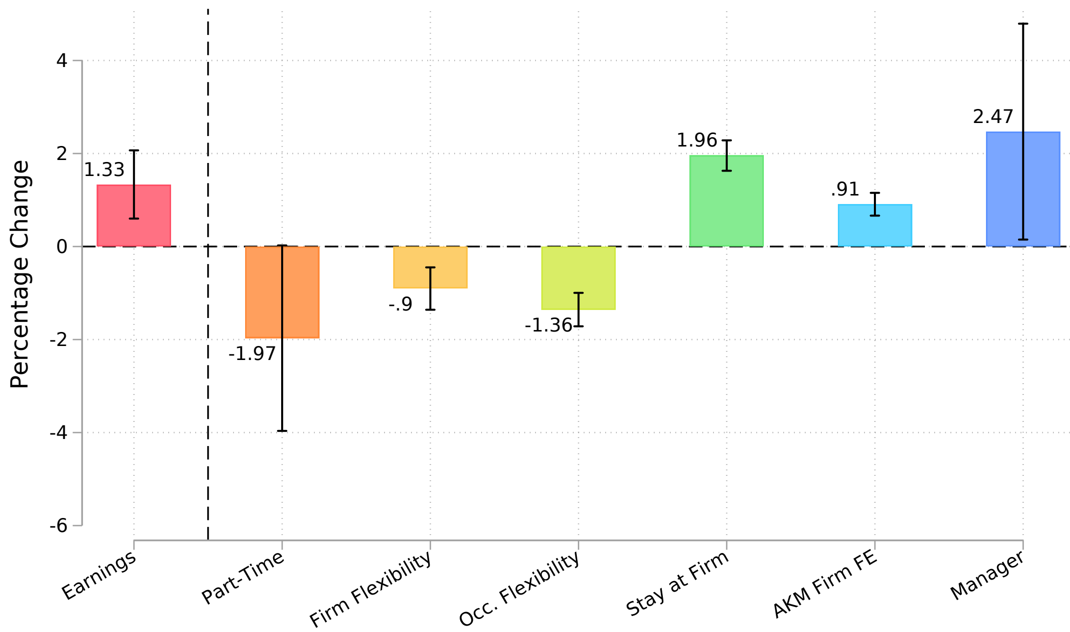


Note: This figure shows the dynamic estimates of the DiD regression using Equation (1), formally:

$$\underbrace{Y_{it}}_{\text{Child's Earnings}} = \sum_{t=1996\neq 2001}^{2011} \beta_t P_t \times D_{m(i)} + \gamma X_{it} + \theta_t + \theta_i + \epsilon_{it},$$

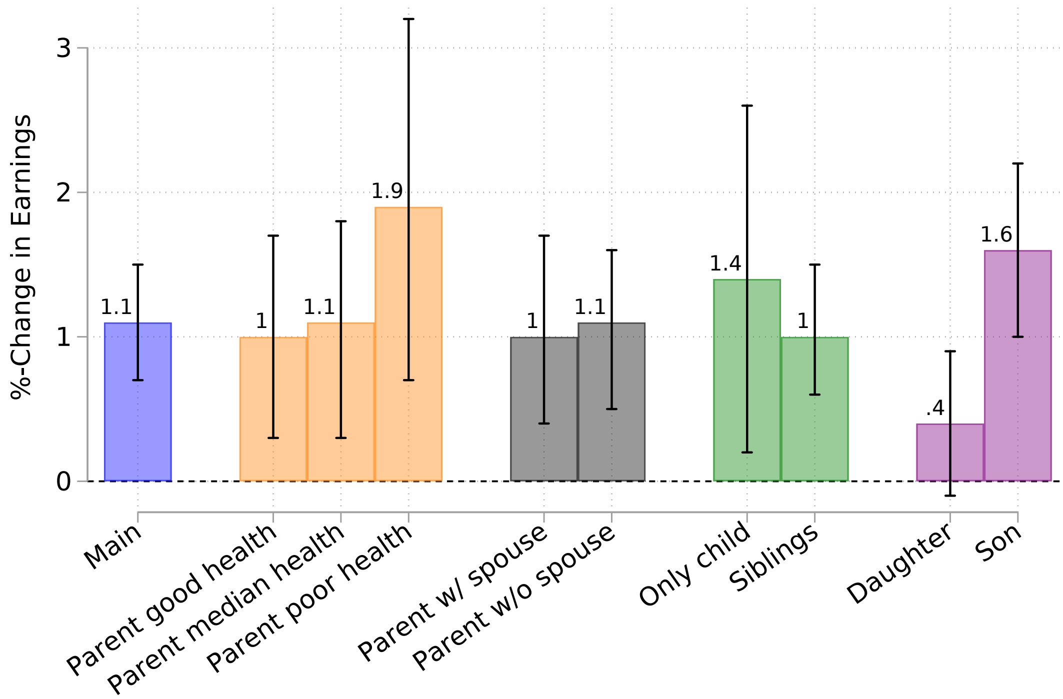
where β_t captures the causal effect of being exposed to the reform on annual earnings. We run the regression separately by group depending on the exact timing of the parents' death. Following Chen and Roth (2024), we compute percentage changes of earnings in Panel 5a using a Poisson regression. Poisson quasi-maximum likelihood (QMLE) consistently estimates the ATE in levels as a percentage of the baseline mean under certain assumptions (Wooldridge, 2010). The figure is based on the *children sample*. The shaded areas indicate the 95% confidence intervals. Standard errors are clustered at the parent-municipality level. The regressions control for individual fixed effects (θ_i), year fixed effects (θ_t), and an indicator for dead parents (X_{it}). The treatment indicator $D_{m(i)}$ switches to one if the parent of the adult child lives in a treatment municipality with an average elderly care fee above the cap of 1,544 SEK/month in the year before the reform.

Figure 7: The effect of reducing elderly care fees on children's career progression steps



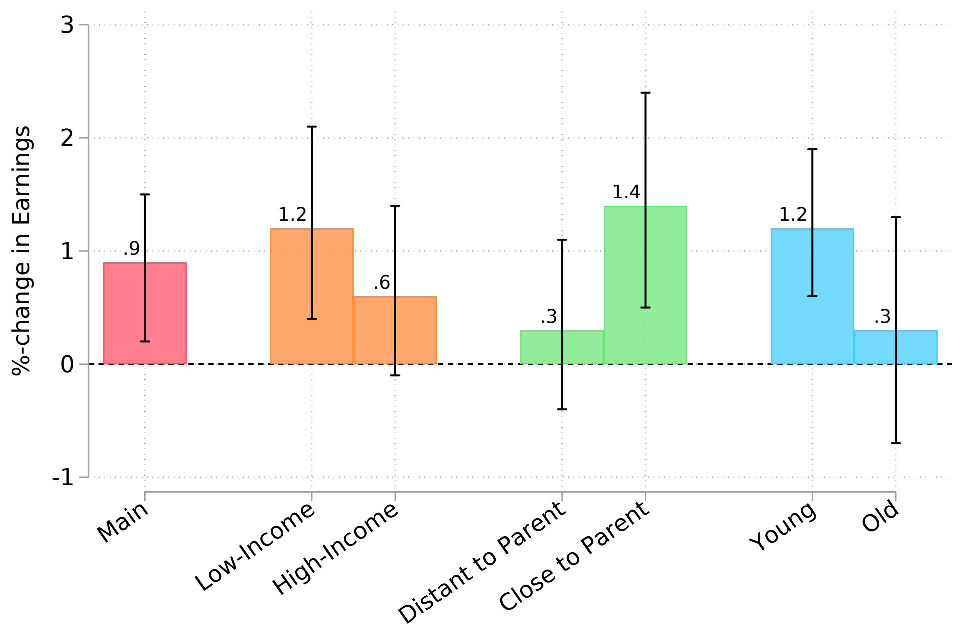
Note: This figures plots the estimated treatment effects using Equation (2) scaled by the pre-reform mean. We define workplace (or occupation) *flexibility* as the leave-one-out share of part-time workers, where we define a part-time worker by working less than 30 hours per week in the main job following OECD's classification. We define *working in a high-paying firm* using the AKM framework (Abowd et al., 1999). Specifically, we regress log-earnings on individual fixed effects and firm fixed effects using the largest connected set of firms in the Swedish working population between the years 1985 to 2018. Following Card et al. (2013), we control for a polynomial of experience (age - years of education), gender, and year-fixed effects. Then, we define a worker *working in a relatively higher paying* firm if the individual works in a firm with a higher estimated firm fixed effect. More details on the variable construction are provided in the Appendix Section B. Standard errors are clustered at the parent-municipal level. A child is considered as *treated* if his/her parent lives in a municipality with an average elderly care fee above the cap of 1,544 SEK/month (2003 price) in the year 2001. The regressions include individual fixed effects, year fixed effects, and an indicator for a dead parent.

Figure 8: Heterogeneity Adult Children



Note: This figure shows the estimated labor response of the respective subgroup using Equation (3). Specifically, we interact the treatment dummy with an indicator for the post-reform period and run the regression separately for each respective group. We include individuals of the main *Children Sample*, except when showing the results on predicted health. To predict the health status of the senior parent, we categorize individuals into *poor*, *median*, and *good* health based on predicted five-year mortality rates. We predict five-year mortality rates based on demographic information (age, education, civil status, and pension income) and healthcare utilization (indicators for 3-digit ICD-10 codes and the sum of inpatient nights for each 3-digit ICD-10 code) using two predictors, a LASSO and a random forest. As we run the prediction out-of-sample, this result includes about 70 percent subsample of the main *Children Sample*. Figure A.19 provides further details and performance tests for the predictor. Following Chen and Roth (2024), we compute percentage changes using a Poisson regression. Poisson quasi-maximum likelihood (QMLE) consistently estimates the ATE in levels as a percentage of the baseline mean under certain assumptions (Wooldridge, 2010). We classify individuals into groups based on pre-reform characteristics. For example, *Parent w/ spouse* refers to the individual having a parent with spouse in the years 2001 prior to the reform. Standard errors are clustered on the parent-municipal level. We show the 95%-confidence intervals. As in the main regression, we control for individual fixed effects, year fixed effects, and an indicator of a parent's death.

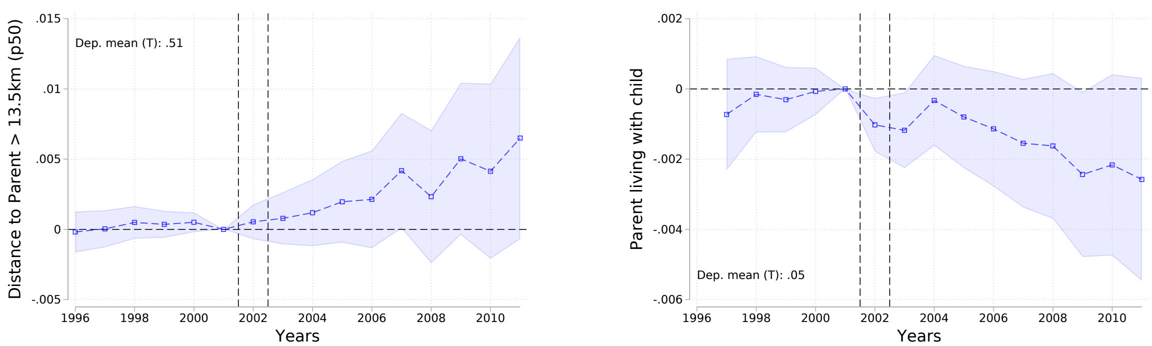
Figure 9: Within Family Responses: Comparing two Siblings



Note: This figure shows the estimated labor response of the respective subgroup using Equation (3). Specifically, we interact the treatment dummy with an indicator for the post-reform period and run the regression separately for each respective group. To allow for a within-family comparison, we restrict the main *Children Sample* to adult children that have at least one sibling, i.e. two-sibling families. If there are more than two siblings, we pick one randomly. Following Chen and Roth (2024), we compute percentage changes using a Poisson regression. Poisson quasi-maximum likelihood (QMLE) consistently estimates the ATE in levels as a percentage of the baseline mean under certain assumptions (Wooldridge, 2010). We classify individuals into groups based on pre-reform characteristics. For example, *High-Income* refers to the sibling with the higher income rank in the years 2000-2001 prior to the reform. Standard errors are clustered on the parent-municipal level. We show the 95%-confidence intervals. As in the main regression, we control for individual fixed effects, year fixed effects, and an indicator of a parent's death.

Figure 10: Relocation Choices and Living Arrangements

(a) Indicator of Distance to Parent (km)   (b) Indicator of Living with Parent



Note: This figure shows the dynamic estimates of the DiD regression using Equation (1), formally:

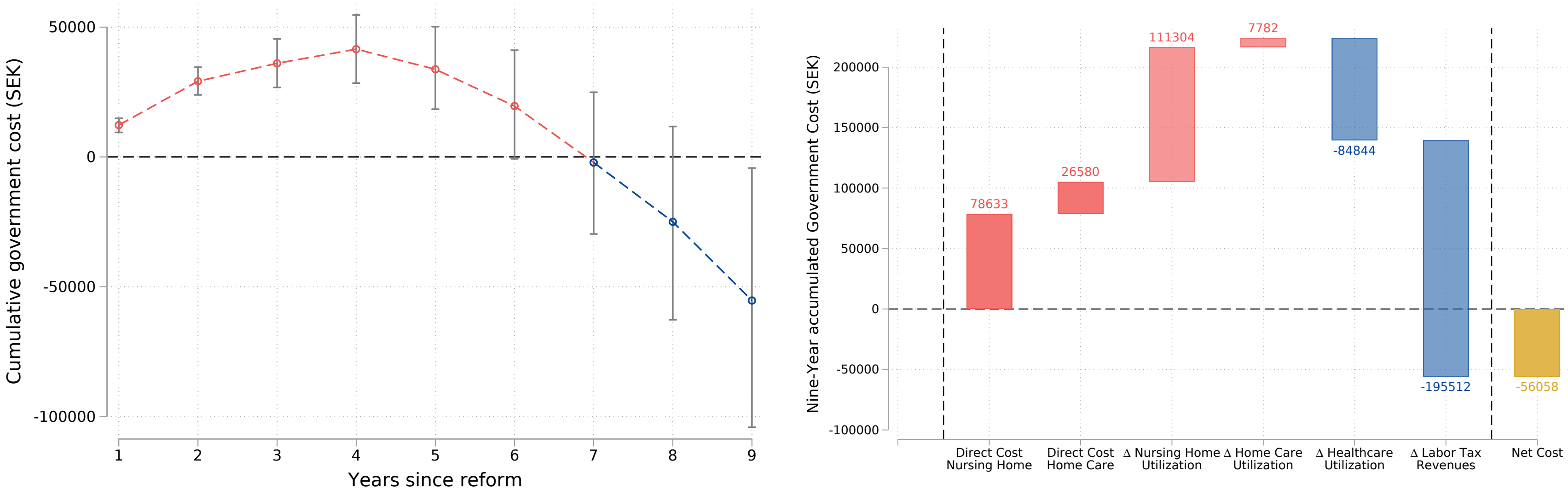
$$\underbrace{Y_{it}}_{\text{Residence Choice}} = \sum_{t=1996\neq 2001}^{2011} \beta_t P_t \times D_{m(i)} + \gamma X_{it} + \theta_t + \theta_i + \epsilon_{it},$$

where β_t captures the causal effect of being exposed to the reform on residential choices. Panel (10a) uses an indicator as an outcome that has the value of one if the distance between the adult child and parent is larger than the median (p50) distance of ≈ 13.5 km. Panel (10b) represents an indicator of the adult child living with the parent. The figure is based on the *children sample* where we restrict the sample to seniors having at least one child. We condition on the senior surviving up to the year 2001. The shaded areas indicate the 95% confidence intervals. Standard errors are clustered at the parent-municipality level. The regressions control for individual fixed effects (θ_i), year fixed effects (θ_t). The treatment indicator $D_{m(i)}$ switches to one if the parent of the adult child lives in a treatment municipality with an average elder care fee above the cap of 1,544 SEK/month in the year before the reform.

Figure 11: Is subsidizing elder care cost-effective?

(a) Policy Cost over time

(b) Nine-year Cumulative Costs



Note: Panel (a) illustrates how the cumulative net government cost evolves over time. The capped bars represent bootstrapped 95% confidence intervals (see Figure C.2 for details). Panel (b) shows the year nine cumulative cost components used in the Equation 13. The red bars show the positive cost to the government's budget, the blue bar represents the negative costs from behavioral responses to the policy, and the yellow-golden bar shows the net government cost (the sum of the red and blue bars). Details on the calculation of each component are provided in Appendix Section C.4.

TABLES

Table 1: Elder Care Utilization

	Extensive margin: Share 80+			Intensive margin: Hours
	Elder Care	Nursing Home	Home Care	Home Care
	(1)	(2)	(3)	(4)
Treated × Post	1.49***	1.22***	0.26	0.72
	(0.54)	(0.38)	(0.47)	(0.73)
Constant	55.39***	28.46***	26.93***	32.34***
	(0.50)	(0.38)	(0.41)	(0.64)
Dependent Mean	52.91	27.28	26.14	31.49
Municipality FE	X	X	X	X
Year FE	X	X	X	X
Observations (NxT)	2,120	2,120	2,120	1,399
R-Squared	0.66	0.76	0.60	0.69

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: The table shows the pooled effects on different types of elder care utilization using Equation (2). A municipality is considered *treated* if the average elder care fee was above the cap of 1,544 SEK/month in 2001. The *post* dummy indicates the period after the reform, from 2002 onward. The coefficients are reported in percentage points.

Table 2: Hospitalization by Cause of Admission

	Any	Urgent	ACSC	ANHAC	Hip-Thigh Fracture	Pneumonia	Cancer
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treated × Post	-0.0055**	-0.0051***	-0.0035***	-0.0033***	-0.0046***	-0.0025***	-0.0001
	(0.0025)	(0.0018)	(0.0011)	(0.0011)	(0.0009)	(0.0006)	(0.0007)
Constant	0.2756***	0.1723***	0.0977***	0.0793***	0.0317***	0.0229***	0.0289***
	(0.0008)	(0.0006)	(0.0004)	(0.0004)	(0.0003)	(0.0002)	(0.0003)
Dep. Mean (T)	.26	.16	.09	.07	.03	.02	.03
% of Mean (T)	-2.12	-3.16	-3.85	-4.66	-15.27	-12.73	-.26
Year FE	X	X	X	X	X	X	X
Treated	X	X	X	X	X	X	X
Municipality FE	X	X	X	X	X	X	X
Spouse	X	X	X	X	X	X	X
YOB FE	X	X	X	X	X	X	X
Gender	X	X	X	X	X	X	X
Nr Children FE	X	X	X	X	X	X	X
Observations (N × T)	3,970,046	3,970,046	3,970,046	3,970,046	3,970,046	3,970,046	3,970,046
R-Squared	0.0065	0.0084	0.0048	0.0080	0.0050	0.0029	0.0017

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: The table shows results from estimating Equation (2). Standard errors are clustered at the municipality level. An individual is considered treated if they live in a municipality with an average elderly care fee above the cap of 1,544 SEK/month (2003 price) in the year 2001. The *post* dummy indicates the period after the reform, starting from 2002 onward. Urgent is an indicator of how time-sensitive the hospital admission is. ACSC is an indicator of whether the hospitalization is preventable based on the diagnosis code. ANHAC is an indicator of conditions that can be treated in a nursing home (and thus outside the hospital setting). *Hip-Thigh Fracture* is an indicator for admissions to the hospital with hip and thigh fractures (ICD-10 code S72). More details on the variable construction are provided in Appendix Section B. Hospitalization data are available from 1998.

Table 3: Choice of Parameters when Empirically Implementing the Sufficient Statistics

	Parameter	**Estimate**	**Adjustments**
Δ Subsidy	$\Delta\sigma$	13,632 SEK	Mortality rate 9%; Discount rate 3%
Δ Formal Care	ε_f	$\hat{\beta}_t^f = +2.8\%$	Mortality rate 9%; Discount rate 3%
Δ Healthcare	ε_m	$\hat{\beta}_t^m = -4.9\%$	Scaled by FS NH = 4.5%; Mortality rate 9%; Discount rate 3%
Care Costs	σf	431,472 SEK	
Hospital Costs	m	12,726 SEK	Hospital nights per year = 4.84 (Wimo and Jönsson, 2001)
Δ Tax Revenue	$\varepsilon_\tau \times \tau l$	$\hat{\beta}_t^\tau = +802$ SEK	Scaled by FS NH = 4.5%; Discount rate 3%; Pr(Parent has child) = 0.8; 1.4 parents per child; 2.2 children per parent; Pr(Parent alive 2001) = 0.88

Note: The figure summarizes the choice of empirical parameters for their theoretical counterparts from Equation (13). All details on adjustments and how these are used to calculate the cost components of Equation (13), are provided in Appendix Section C.4.

A APPENDIX

A.1 Additional Tables

Table A.1: Municipality Characteristics in 1998

	Treatment		Comparison	
	Mean	SD	Mean	SD
	(1)	(2)	(3)	(4)
Demographics				
- Population	31939	(48554)	35147	(82492)
- Individuals 80 + individuals	1534	(2379)	1756	(4562)
- Share 80 + individuals	5.28	(1.27)	5.25	(1.49)
- Individuals 65 + individuals	5512	(8100)	6128	(14083)
- Share 65 + individuals	18.90	(3.58)	18.71	(4.04)
Voting shares after 1998 election				
- Left parties (national election)	56.17	(11.20)	56.48	(10.61)
- Left parties (municipal election)	53.58	(12.24)	54.20	(11.64)
- Social Democrats (national election)	38.72	(7.66)	38.74	(7.42)
- Social Democrats (municipal election)	36.78	(8.22)	36.45	(8.14)
Average care fee 2001				
- Elder Care Fees 2001	2951	(1132.40)	914	(348.93)
Observations	159	159	86	86

Note: This table reports means and standard deviations of municipality characteristics for the treatment (Column 1-2) and comparison (Column 3-4) municipalities. A municipality is categorized as treated the average elderly care fee is above the cap of 1,544 SEK/month (2003 price) in the year 2001.

Table A.2: Covariate balance: Seniors

	Pre-period Mean		Estimate
	Treatment	Comparison	DiD
	(1)	(2)	(3)
Age	82	82	-.017
	(5.1)	(5.1)	(0.0076)
Female	0.62	0.63	-0.00056
	(0.48)	(0.48)	(0.00084)
Spouse	0.37	0.36	-0.0044
	(0.48)	(0.48)	(0.00079)
Primary school	0.76	0.73	0.0059
	(0.42)	(0.45)	(0.00079)
High school	0.18	0.2	-0.0033
	(0.38)	(0.4)	(0.00073)
Vocational tertiary education	0.026	0.03	-0.00083
	(0.16)	(0.17)	(0.00032)
College	0.032	0.038	-0.0017
	(0.18)	(0.19)	(0.00036)
Pension	100990	106748	-97
	(57106)	(61066)	(109)
Nr of kids (1-5)	1.7	1.6	-0.007
	(1.4)	(1.3)	(0.0023)
One year mortality	0.079	0.079	0.0007
	(0.27)	(0.27)	(0.00059)
Observations	2,879,482	1,756,354	5,846,392
Individuals	4238,56	258,337	682,193

Note: This table reports the pre-period (1996-2001) means and standard deviations of background characteristics for the treatment group (Column 1) and the comparison group (Column 2). The difference-in-differences estimate of the difference between the groups before and after the elderly care reform from 2002 is presented in Column 3. The table is based on the *senior sample*. Individuals are considered treated if they live in a municipality with an average elderly care fee above the cap of 1,544 SEK/month (2003 price) in the year 2001.

Table A.3: Adult children's characteristics

	Treatment		Comparison	
	Mean	SD	Mean	SD
	(1)	(2)	(3)	(4)
Demographics Child				
- Female	0.50	(0.50)	0.50	(0.50)
- Age	50.75	(6.83)	50.79	(6.78)
- Educ > High School	0.34	(0.47)	0.36	(0.48)
- Annual Earnings (SEK x 1000)	204.65	(157.37)	211.41	(174.47)
- Gainfully Employed	0.81	(0.39)	0.81	(0.39)
- Partial Retirement	0.08	(0.26)	0.08	(0.27)
- Full Retirement	0.04	(0.20)	0.04	(0.20)
- Number of siblings	2.04	(1.68)	1.93	(1.55)
- Only child	0.13	(0.33)	0.13	(0.34)
- Oldest Sibling	0.42	(0.49)	0.43	(0.50)
- At least one sister	0.81	(0.39)	0.80	(0.40)
- At least one brother	0.82	(0.38)	0.81	(0.39)
- Living in the same municipality as parent	0.50	(0.50)	0.49	(0.50)
- Moving between municipalities	0.01	(0.12)	0.02	(0.12)
Demographics Parent				
- Female Parent	0.62	(0.48)	0.63	(0.48)
- Age Parent	82.13	(4.24)	82.10	(4.24)
- Parent living alone	0.61	(0.49)	0.61	(0.49)
Observations (N×T)	2,089,914	2,089,914	1,233,048	1,233,048
Individuals	348,319	348,319	205,508	205,508

Note: This table reports the pre-period (1996-2001) means and standard deviations of background characteristics for the treatment (Column 1-2) and comparison (Column 3-4) groups using the *children sample*. Children are categorized as treated if their parent lives in a municipality with an average elderly care fee above the cap of 1,544 SEK/month (2003 price) in the year 2001.

Table A.4: Supply Side Employment: Careworkers in the Care Industry

	Nursing Home			Home Care		
	Firm Exit	Plant Size	Immigrated	Firm Exit	Plant Size	Immigrated
	(1)	(2)	(3)	(4)	(5)	(6)
Treated × Post	-0.0133**	0.3299	0.0079	0.0096	2.3755*	0.0146*
	(0.0059)	(0.7242)	(0.0070)	(0.0138)	(1.3157)	(0.0077)
Constant	0.0200***	29.2168***	0.0901***	0.0351***	22.4603***	0.1027***
	(0.0019)	(0.2290)	(0.0022)	(0.0041)	(0.3923)	(0.0023)
Dep. Mean (T)	0.04	28.27	0.1	0.1	21.55	0.12
Plant FE	X	X	X	X	X	X
Year	X	X	X	X	X	X
Observations (N × T)	43,863	43,863	43,862	15,057	15,057	15,057
Observations (N)	5,059	5,059	5,059	1,925	1,925	1,925
R-Squared	0.1990	0.8951	0.7301	0.2337	0.7725	0.7005

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table shows the pooled effect using Equation (2). This is a plant-level regression where we consider a plant as treated if the plant is located in a treated municipality. A municipality is *treated* if the average elder care fee is above the cap of 1,544 SEK/month in the year 2001. The *post* dummy indicates the period after the reform from 2002 onward. The coefficients are in percentage points. We consider all plants that have a 4-digit industry code in the nursing home (Column (1)-(3)) or home care (Column (4)-(6)) sector. Immigrated is defined as being born outside of Sweden. It defines the share of immigrated workers within a plant.

Table A.5: Supply Side Wages and Hours: Careworkers in the Care Industry

	Nursing Home			Home Care		
	Log(Earnings)	Log(Wage)	Log(Hours)	Log(Earnings)	Log(Wage)	Log(Hours)
	(1)	(2)	(3)	(4)	(5)	(6)
Treated × Post	-0.0141*	-0.0063	-0.0112	-0.0053	-0.0034	-0.0119
	(0.0077)	(0.0054)	(0.0104)	(0.0153)	(0.0110)	(0.0137)
Constant	11.8959***	4.5879***	4.1856***	11.8382***	4.5269***	4.2233***
	(0.0024)	(0.0017)	(0.0033)	(0.0045)	(0.0033)	(0.0041)
Dep. Mean (T)	11.85	4.54	4.15	11.81	4.49	4.18
Plant FE	X	X	X	X	X	X
Year FE	X	X	X	X	X	X
Observations	43,863	43,776	43,733	15,057	14,974	14,951
R-Squared	0.5616	0.5922	0.4372	0.4936	0.5269	0.4358

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table shows the pooled effect using Equation (2). This is a plant-level regression where a plant is considered treated if it is located in a *treated* municipality. A municipality is treated if the average elder care fee is above the cap of 1,544 SEK/month in the year 2001. The *post* dummy indicates the period after the reform, starting from 2002 onward. The coefficients are in percentage points. We consider all plants with a 4-digit industry code in the nursing home sector (Columns (1)-(3)) or home care sector (Columns (4)-(6)).

Table A.6: Hospitalizations

	Hospital Nights	Any Hospitalization	Hospitalizations	Nights ‖ Hospitalized	Nights ‖ Hospitalized
	(1)	(2)	(3)	(4)	(5)
Treated × Post	-0.1887**	-0.0055**	-0.0320***	-0.4134**	-0.1461
	(0.0791)	(0.0025)	(0.0083)	(0.1655)	(0.1199)
Constant	3.8700***	0.2756***	0.5029***	14.0489***	13.9616***
	(0.0234)	(0.0008)	(0.0025)	(0.0523)	(0.0407)
Dep. Mean (T)	3.9	.26	.48	14.71	14.71
% of Mean (T)	-4.84	-2.12	-6.66	-2.81	-.99
Year FE	X	X	X	X	X
Treated	X	X	X	X	X
Municipality FE	X	X	X	X	X
Spouse	X	X	X	X	X
YOB FE	X	X	X	X	X
Gender	X	X	X	X	X
Nr Children FE	X	X	X	X	X
Diagnosis FE					X
Observations (N × T)	3,970,046	3,970,046	3,970,046	1,087,170	1,087,170
R-Squared	0.0055	0.0065	0.0061	0.0166	0.2334

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: The table shows results from estimating Equation (2). Standard errors are clustered at the municipality level. An individual is considered treated if they live in a municipality with an average elderly care fee above the cap of 1,544 SEK/month (2003 price) in the year 2001. Hospitalization data are available from 1998.

Table A.7: Adult Children Labor Market Earnings

	Total	Extensive Margin	Intensive Margin	
	Annual Earnings (SEK)	Gainfully Employed	Annual Earnings > 0	Log(Annual Earnings > 0)
	(1)	(2)	(3)	(4)
Treated × Post	2062.2100***	0.0031*	1226.9176**	0.0140***
	(688.5582)	(0.0016)	(556.5644)	(0.0038)
Constant	2.06e+05***	0.7587***	2.57e+05***	12.1377***
	(272.0135)	(0.0006)	(209.9840)	(0.0014)
Dep. Mean (T)	204647.58	.872	229064.20	
% of Mean (T)	1.01	.35	.54	
Year FE	X	X	X	X
Individual FE	X	X	X	X
Parent Dead	X	X	X	X
Observations (N × T)	8,861,212	8,861,212	6,910,534	6,910,534
R-Squared	0.6617	0.5662	0.6701	0.5002

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: The table shows results from estimating Equation (2). Standard errors are clustered at the parent-municipality level. An individual is considered treated if their parent lives in a municipality with an average elderly care fee above the cap of 1,544 SEK/month (2003 price) in the year 2001. The *post* dummy indicates the period after the reform, starting from 2002 onward. Gainfully employed describes an indicator that equals one if the individual earns more than an age-, gender-, and education-specific employment threshold constructed from the Swedish population register.

Table A.8: Number of Hospital Nights: Sensitivity to Controls and Treatment Definition

	Binary Treatment				Linear Treatment Exposure		
	Hospital Nights	Hospital Nights	Hospital Nights	Hospital Nights	Hospital Nights	Hospital Nights	ihs(Hospital Nights)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treated × Post	-0.1943**	-0.1887**	-0.1839**				
	(0.0906)	(0.0791)	(0.0893)				
Low Treatment × Post				-0.1665*			
				(0.0883)			
High Treatment × Post				-0.2017**			
				(0.0821)			
Log(Pre-Reform Fee) × Post					-0.1078*		
					(0.0554)		
Log(Pre-Reform Fee)					0.1348**		
					(0.0669)		
ihs(Pre-Reform Fee) × Post						-0.1078*	-0.0121*
						(0.0554)	(0.0068)
ihs(Pre-Reform Fee)						0.1348**	0.0119
						(0.0669)	(0.0085)
Constant	3.8718***	3.8700***	3.7910***	3.8700***	3.0242***	2.9689***	0.6948***
	(0.0412)	(0.0234)	(0.0287)	(0.0234)	(0.5506)	(0.5893)	(0.0778)
Dep. Mean (T)	3.9	3.9	3.9	3.9			
% of Mean (T)	-4.98	-4.84	-4.71				
Year FE	X	X	X	X	X	X	X
Treated	X	X	X	X			
Municipality FE		X	X	X	X	X	X
Spouse		X	X	X	X	X	X
YOB FE		X	X	X	X	X	X
Gender		X	X	X	X	X	X
Nr Children FE		X	X	X	X	X	X
Individual FE			X				
Observations (N × T)	3,970,046	3,970,046	3,916,544	3,970,046	3,970,046	3,970,046	3,970,046
R-Squared	0.0001	0.0055	0.2439	0.0055	0.0055	0.0055	0.0069

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: The table reports estimates of regressing the number of hospital nights using different types of controls (Column (1)-(3)) and treatment definitions (Column (4)-(7)). An individual is considered as treated if he/she lives in a municipality with an average elder care fee above the cap of 1,544 SEK/month (2003 price) in the year 2001. Columns (1) to (3) gradually add more controls. In Column (4), we classify seniors into "highly" ("low") treated if they live in a municipality with fees above the 1,544 SEK threshold in 2001 *and* have fees above (below) the median. *Pre-Reform Fee* in Column (5)-(7) is the continuous measure of annual elder care fees in the year 2001. As municipalities with higher fees before the reform reduce the fees relatively more compared to low-fee municipalities, *Pre-Reform Fee* is interpreted as a linear treatment exposure (see Figure 1a). *log(Pre-Reform Fee)* describes the fees in the natural logarithm and *ihs(Pre-Reform Fee)* is the inverse hyperbolic transformation. Hospitalization data are available from 1998. Standard errors are clustered at the municipality level.

Table A.9: Children's labor earnings: sensitivity to controls and treatment definition

	Binary Treatment OLS			Poisson	Linear Treatment Exposure			
	Earnings (SEK)							ihs(Earnings)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treated × Post	2000.9386***	1755.4456**	2062.2100***	0.0098***				
	(695.6540)	(688.0857)	(688.5582)	(0.0032)				
Low Treatment × Post					1712.9937**			
					(836.5299)			
High Treatment × Post					2258.9017***			
					(737.3690)			
Log(Pre-Reform Fee)						1542.3551***		
						(434.0278)		
ihs(Pre-Reform Fee)							1542.3559***	0.0265**
							(434.0278)	(0.0125)
Constant	2.06e+05***	2.06e+05***	2.06e+05***	12.5080***	2.06e+05***	1.97e+05***	1.97e+05***	10.3839***
	(472.4220)	(327.2611)	(272.0135)	(0.0013)	(272.0079)	(2.7e+03)	(2.8e+03)	(0.0817)
Dep. Mean (T)	204647.18	204647.18	204647.18		204647.18			
Year FE	X	X	X	X	X	X	X	X
Treated	X	X						
Municipality FE		X						
Gender		X						
Education FE		X						
YOB FE		X						
Nr Siblings FE		X						
Individual FE			X	X	X	X	X	X
Parent Dead		X	X	X	X	X	X	X
Observations (N × T)	8.86e+06	8.85e+06	8.86e+06	8.86e+06	8.86e+06	8.86e+06	8.86e+06	8.86e+06
R-Squared	0.0038	0.2001	0.6617		0.6617	0.6617	0.6617	0.5812

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: The table reports estimates of regressing the annual earnings using different types of controls (Column (1)-(3)), specifications (Column (4)), and treatment definitions (Column (5)-(8)). An individual is considered as treated if his/her parent lives in a municipality with an average elderly care fee above the cap of 1,544 SEK/month (2003 price) in the year 2001. Columns (1) to (3) gradually add more controls. In Column (4), we show that running a Poisson regression leads to similar results. In Column (5), we classify individuals into "highly" ("low") treated if their parent lives in a municipality with fees above the 1,544 SEK threshold in 2001 *and* have fees above (below) the median. *Pre-Reform Fee* in Column (6)-(6) is the continuous measure of annual elder care fees in the year 2001. As municipalities with higher fees before the reform reduce the fees relatively more compared to low-fee municipalities, *Pre-Reform Fee* is interpreted as a linear treatment exposure (see Figure 1a). *log(Pre-Reform Fee)* describes the fees in the natural logarithm and *ihs(Pre-Reform Fee)* is the inverse hyperbolic transformation. Hospitalization data are available from 1998. Standard errors are clustered at the parent-municipality level. This table is based on the *children sample*.

Table A.10: DiD Assumption Test: Controlling for a Childcare Reform Happening around a similar Time

	Child Care Fees	Child Care Fees	Annual Earnings (SEK)	Annual Earnings (SEK)	Annual Earnings (SEK)
	(1)	(2)	(3)	(4)	(5)
Treated × Post	124.50***	157.24***	2,062.21***	1,802.59***	0.01***
	(25.5322)	(13.8364)	(688.5582)	(671.1568)	(0.0031)
Grandchild eligible for childcare		14,140.41***		-11955.78***	-0.06***
		(10.1238)		(438.5007)	(0.0025)
Child Care Fees				1.86***	0.00***
				(0.0266)	(0.0000)
Constant	3,178.33***	-7.87	205888.03***	202660.84***	12.49***
	(10.0835)	(6.2637)	(272.0135)	(270.2997)	(0.0013)
Dep. Mean (T)	3375.86	3375.86	204647.18	204647.18	
% of Mean (T)	3.69	4.66	1.01	.88	
Year FE	X	X	X	X	X
Individual FE	X	X	X	X	X
Parent Dead	X	X	X	X	X
Observations (N × T)	8,861,212	8,861,212	8,861,212	8,861,212	8,861,212
R-Squared	0.4527	0.8216	0.6617	0.6628	0.6474

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: This table shows the regression output using a slightly modified version of Equation (2) when controlling for effects of the childcare reform happening at a similar time. As adult children are on average 51 years old before the reform, the relevant person potentially eligible for childcare is the grandchild or the adult child (the great-grandchild of the senior). Hence, we identify for each adult child whether there already exists a first grandchild that would be in an eligible age for childcare. Using the information on 1) the number of the grandchildren, 2) the age of the grandchildren, and 3) the predicted household income, we can calculate the individual-level childcare fee, following the formula collected and derived in Lundin et al. (2008) and Mörk et al. (2013). Following Lundin et al. (2008), we use predicted household income from a Mincer-style regression rather than actual income in order to construct the predicted childcare fee for households that have zero earnings. We fill up the childcare fee with zeros whenever there is no eligible grandchild for childcare. Note that we report the annual childcare fee for full-time care (i.e., 40 hours). Column (1)-(2) shows the correlation between adult children who have a senior parent in a treated municipality (i.e., facing a reduction in formal elderly care fees) and childcare fees of the municipality of the grandchild. Grandchildren to seniors' children in treatment municipalities have higher childcare prices after the elder care reform compared to the comparison group, but the effect is small and economically not sizable. Columns (3) to (6) show how the estimate for annual earnings of the adult children is affected when controlling for childcare prices. Column (6) runs a Poisson regression in the style of Chen and Roth (2024) and can thus be interpreted as a percentage (0.01 corresponds to 1%). The results indicate only marginal changes in the estimated effect when controlling for childcare fees. Note that adult children are considered as treated if his/her parent lives in a municipality with an average elderly care fee above the cap of 1,544 SEK/month (2003 price) in the year 2001. Note that the treatment from the reduction in elder care fees is on the municipal level while childcare fees are on the individual level. The regressions include individual fixed effects, year fixed effects, and an indicator for the death of the parent. The table is based on the *children sample*. **Institutional Background.** The Social Democratic party also introduced a max fee reform for childcare in 2002. The motivation for the reform is to give all children equal access to early education, to improve economic conditions for families with young children, and to promote parental labor force participation. Previous research shows that the childcare reform has only a limited effect on the uptake of childcare (Wikström et al., 2007), female labor supply decisions (Lundin et al., 2008), and households fertility decisions (Mörk et al., 2013). To alleviate concerns that the introduction of the childcare reform biases our results, we show that controlling for competing effects of the childcare reform does not significantly affect our results with respect to the children's labor supply.

Table A.11: Matched Parent-Child Sample Regressions

	Earnings	Earnings	Hospitalizations	Hospitalizations
	(1)	(2)	(3)	(4)
Treated × Post	1285.488*	1337.174**	-0.026	-0.025*
	(757.0728)	(678.1710)	(0.0242)	(0.0151)
Mean Dep. (T)	203201.01	203201.01	0.42	0.42
YOB		X		X
Female		X		X
Education		X		X
Nr Siblings		X		X
YOB Parent		X		X
Female Parent		X		X
Spouse Parent		X		X
Municipality Parent		X		X
Observations (N × T)	4,256,744	4,256,744	4,256,744	4,256,744
R-Squared	0.0010	0.2299	0.0019	0.0068

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < .01$

Note: This table reports the main DiD pooled estimate using the matched parent-child sample.

Table A.12: Split-Sample IV

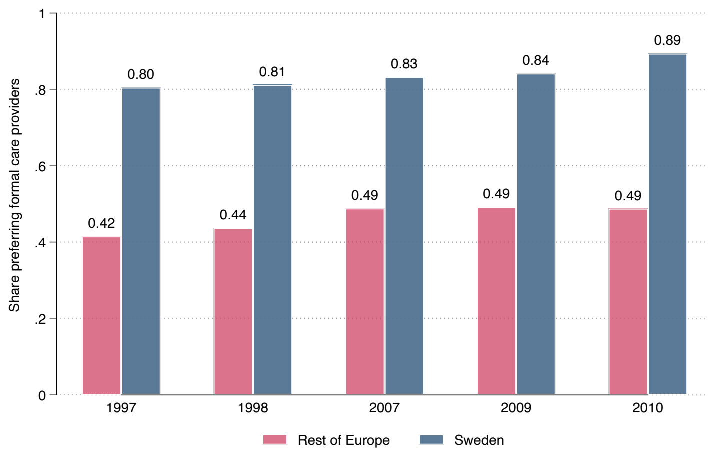
	DiD_health	DiD_health	DiD_health
	(1)	(2)	(3)
DiD_labor	-0.0008***	-0.0011***	-0.0008**
	(0.0002)	(0.0003)	(0.0004)
Constant	-0.0348***	-0.0327***	-0.0328***
	(0.0031)	(0.0040)	(0.0040)
Model	Total Sample	Split Sample	IV
Observations	21,408	16,685	16,685
R-Squared	0.0006	0.0009	0.0008

* $p < 0.10$, ** $p < 0.05$, *** $p < .01$

Note: This sample performs the split-sample IV test for the individual-level DiD measure. Observations grouped by variables: gender young gender_parent spouse_parent nr_kids_parent educ income_bin vtile_pens. Earnings are divided by 10,000.

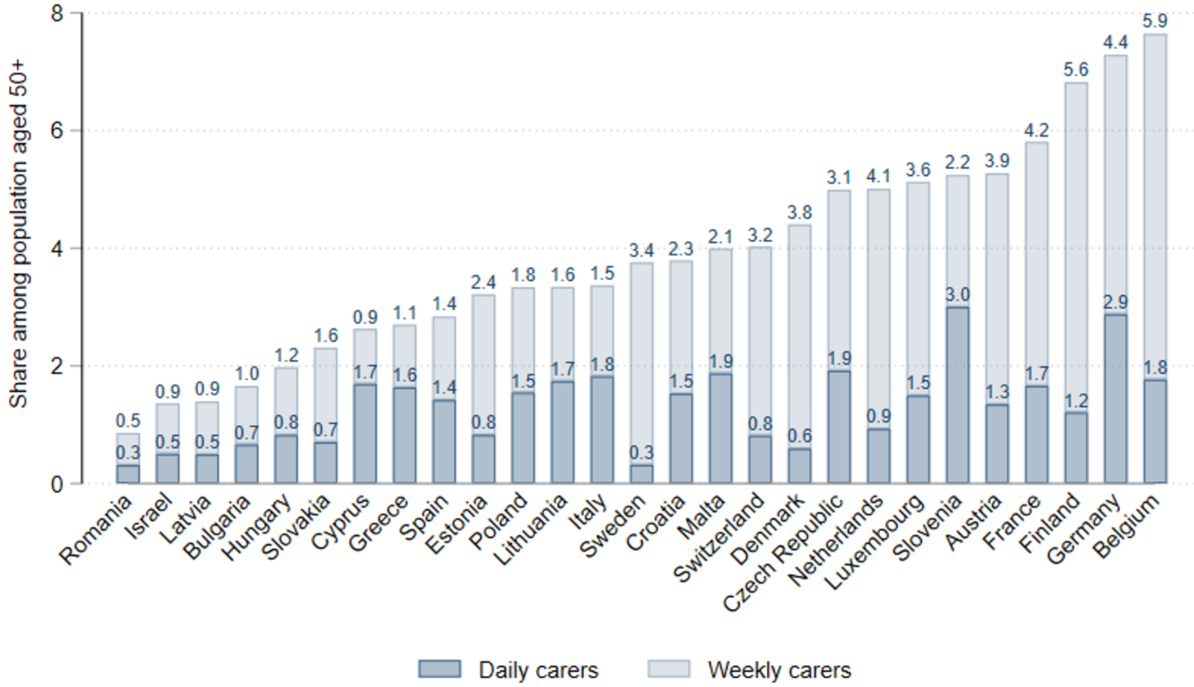
A.2 Additional Figures

Figure A.1: Who Should Provide Care for an Elderly Parent?



Note: This figure is derived from the Eurobarometer surveys conducted between 1997 to 2010, which involved interviewing approximately 28,000 citizens per wave from 25 European Union countries. The survey participants are all residents of European countries in the survey year and are 15 years of age or older. The respondents are asked the following question: "Imagine an elderly father or mother who lives alone and can no longer manage to live without regular help because of her or his physical or mental health condition. In your opinion, what would be the best option for people in this situation?". Survey respondents are presented with a set of six options to choose from: (1) "They should live with one of their children", (2) "One of their children should regularly visit their home, in order to provide them with the necessary care", (3) "Public or private service providers should visit their home and provide them with appropriate help and care", (4) "They should move to a nursing home",(5) "It depends", and (6) "None of these". The graph shows the share of respondents who answered (3) or (4), in Sweden (blue) and other European countries (red).

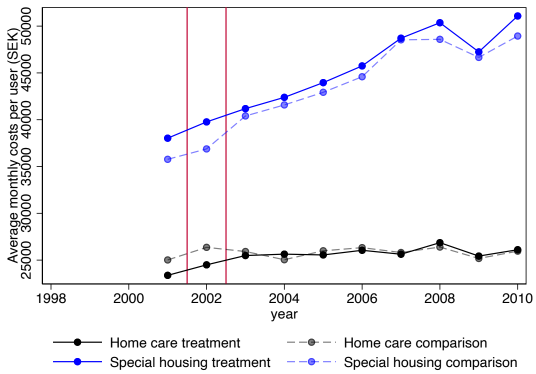
Figure A.2: Share of Informal Caregivers by Country



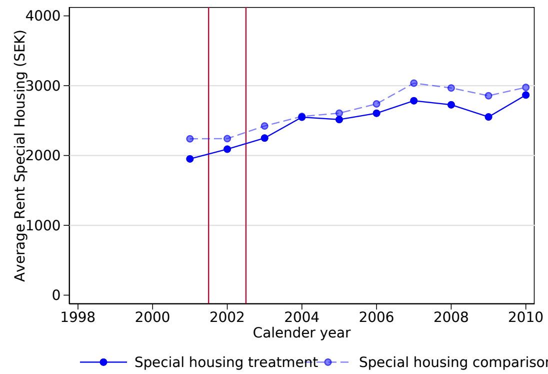
Note: The figure shows the share of individuals above the age of 50 providing informal care to a parent in the year 2019 and the beginning of 2020. Respondents are asked if they have given care in the last twelve months and if so how often they have given such help to their parent; the following options are then presented: About daily, about every week, about every month or less often. Caregivers are defined as individuals who provide care daily or weekly to their parents. The definition of parent in the figure is defined as biological parent, stepparent or parent in-law. The figure is based on the SHARE survey wave 8 (2019/2020) featuring 53 419 individuals of which 2 526 represent Sweden.

Figure A.3: Total costs and rents for nursing homes ("special housing")

(a) Average monthly Costs



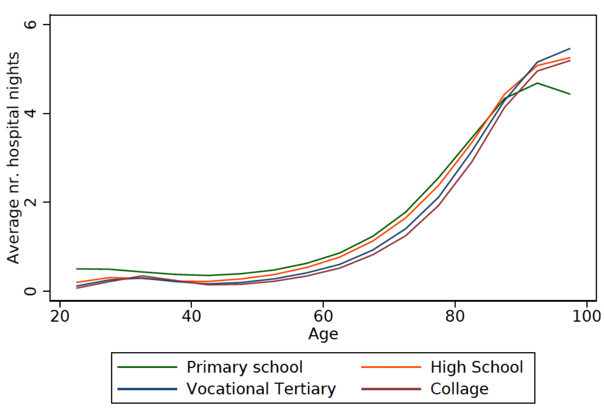
(b) Average Nursing Home Rent



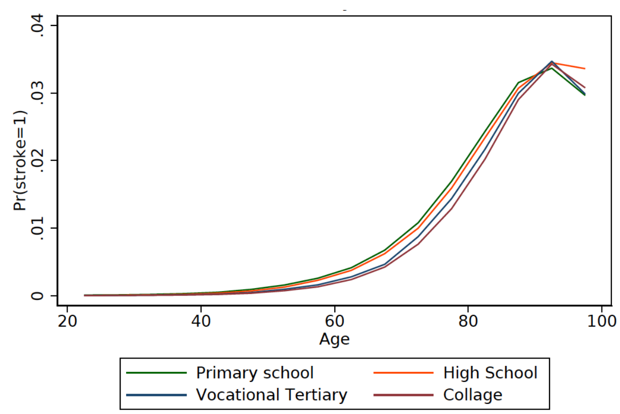
Note: Panel A.3a displays the mean municipality expenditure per home care and special housing recipient. Panel A.3b illustrates the mean rent for special housing accommodation per special housing recipient. The figures are based on municipality-level data and the sample includes the 245 municipalities in the main sample. Costs and rents are deflated to 2003 years price levels.

Figure A.4: Health Events by Age

(a) Number Hospitalizations

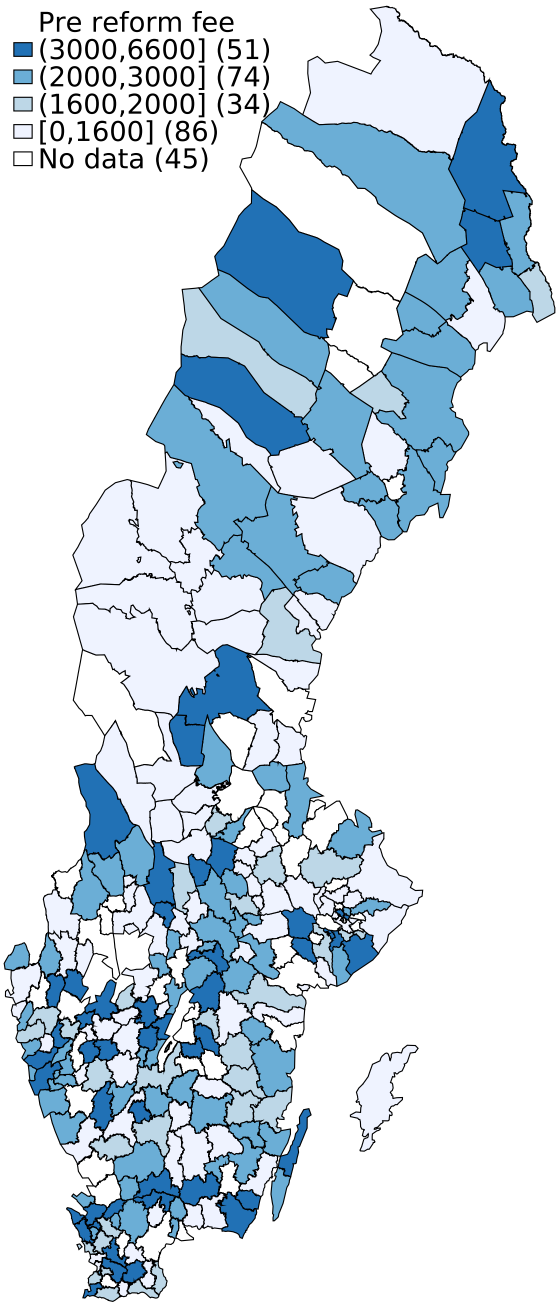


(b) Share with Stroke Event

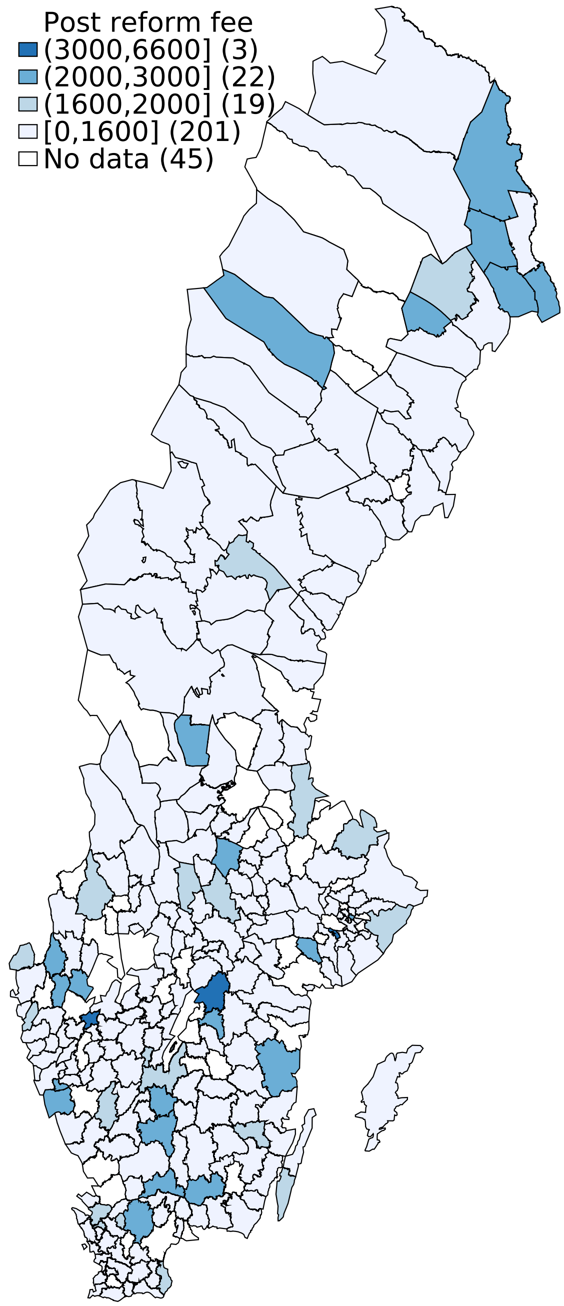


Note: This figure illustrates the average number of hospitalizations (left Panel) and the average share of individuals with a stroke event (right Panel) by age group. The figures are based on the Swedish population where we observe hospital stays that require at least one overnight stay between the years 1998 and 2011.

Figure A.5: Geography of Average Monthly Fees Before and After the Reform



(a) Pre Reform Fees

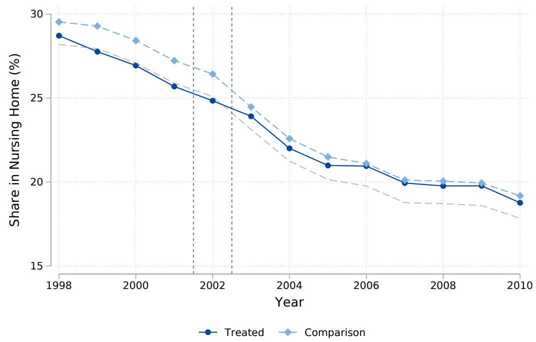


(b) Post Reform Fees

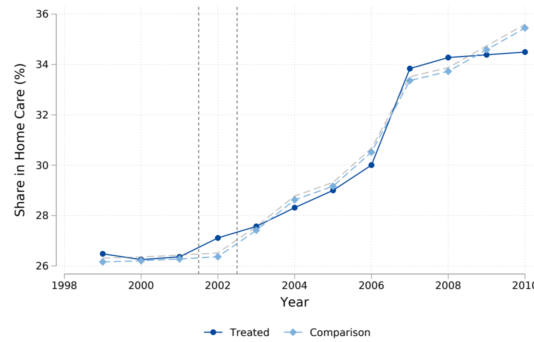
Note: These figures show the geographic distribution of treatment (the lightest blue) and comparison (darker blue) municipalities before and after the reforms. White indicates municipalities with missing information on either the number of individuals in elderly care or the revenue from fees in 2001. Fees are winsorized at the 5th and 99th percentile. In the pre-reform, the fee is equal to the municipal fee in 2001. For the post-reform period, we use the minimum municipality fee over the years 2003-2010.

Figure A.6: Seniors' Utilization of Elder Care by Type and Age

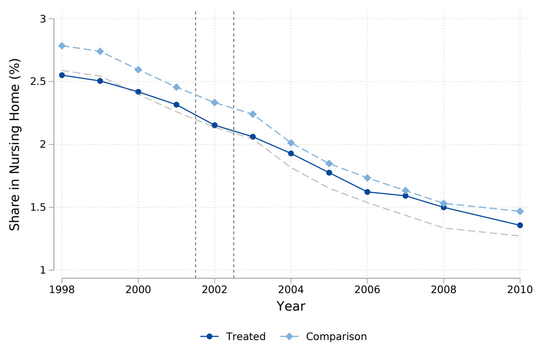
(a) Nursing Home: Individuals aged 80+



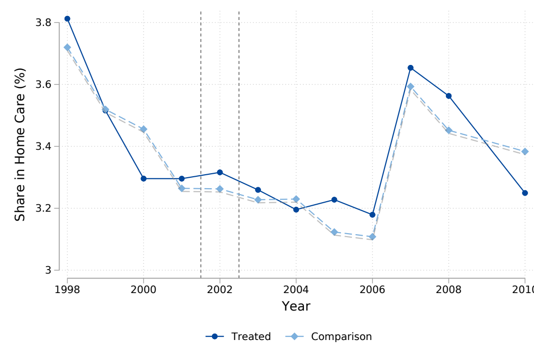
(b) Home Care: Individuals aged 80+



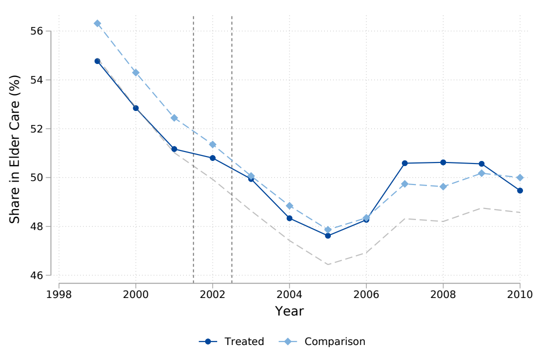
(c) Nursing Home: Individuals aged 65-79



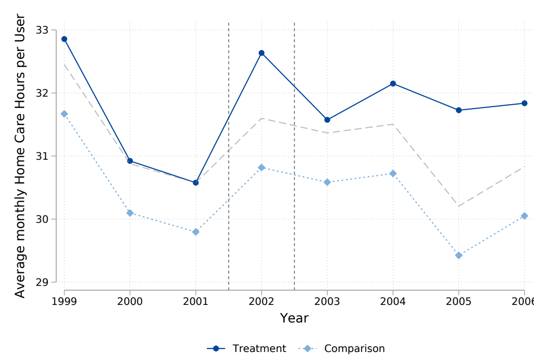
(d) Home Care: Individuals aged 65-79



(e) Total Elder Care: Individuals aged 80+



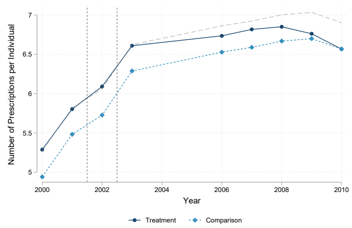
(f) Hours Home Care: Individuals aged 65+



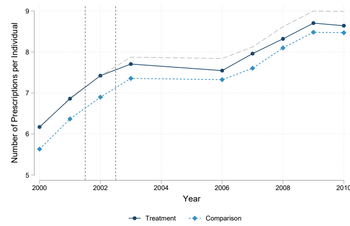
Note: The top row of figures shows the share of individuals above the age of 80 in treatment (dark blue line) and comparison municipalities (dashed light blue line) living in nursing homes (Panel (a)) and having at least one hour of home care (Panel (b)). The middle row shows the equivalent outcomes of the age group 65-79. Panel (e) shows the total share of seniors above the age of 80 in elder care (home care + nursing home). Panel (f) shows the average number of hours in home care conditional on having home care in treated and comparison municipalities. The gray represents the counterfactual of how treated municipalities would have evolved in the absence of the treatment. We construct this line by normalizing the comparison municipalities to equal the mean of treated municipalities in the year 2001. All figures are based on municipality-level data. A municipality is treated if the average elderly care fee is above the cap of 1,544 SEK/month (2003 price) in 2001. Aggregate municipality-level data on nursing is available from 1998 and for home care from 1999. Hour brackets are only available for the years 1999-2006.

Figure A.7: Drug Consumption by Drug Group

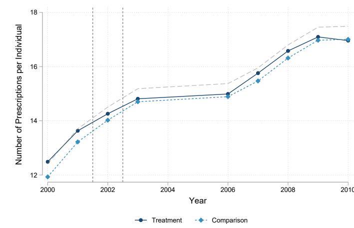
(a) Alimentary tract



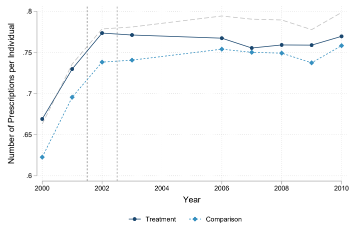
(b) Blood+blood forming organs



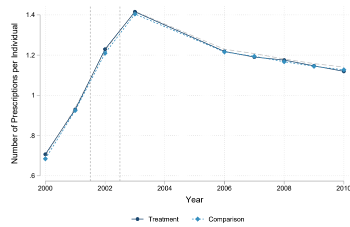
(c) Cardiovascular system



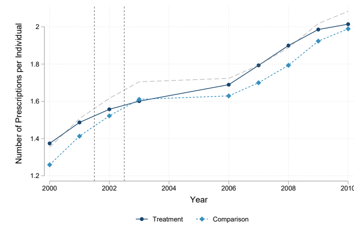
(d) Dermatologicals



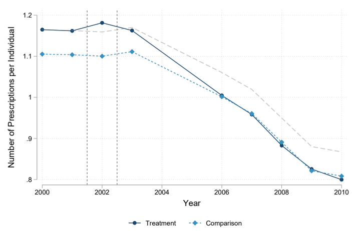
(e) Genito urinary system



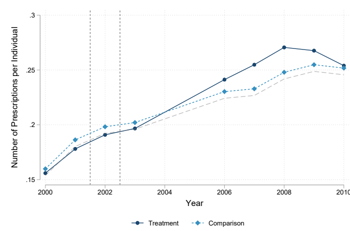
(f) Hormonal preparations



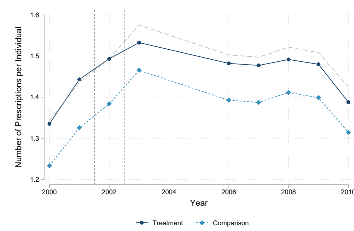
(g) Antiinfectives



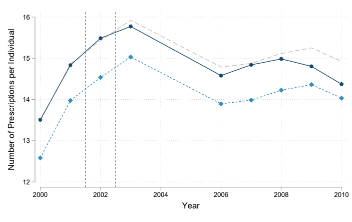
(h) Antineoplastic



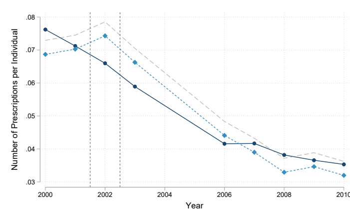
(i) Musculo-skeletal system



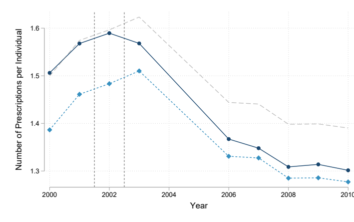
(j) Nervous system



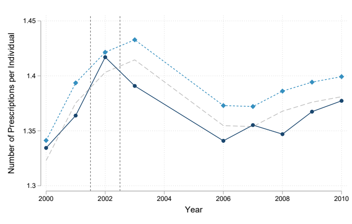
(k) Antiparasitic products



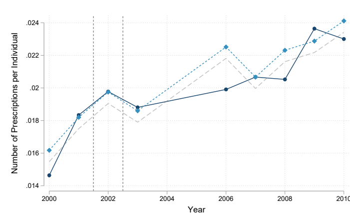
(l) Respiratory system



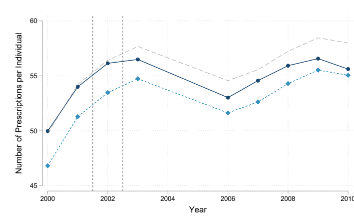
(m) Sensory organs



(n) Various

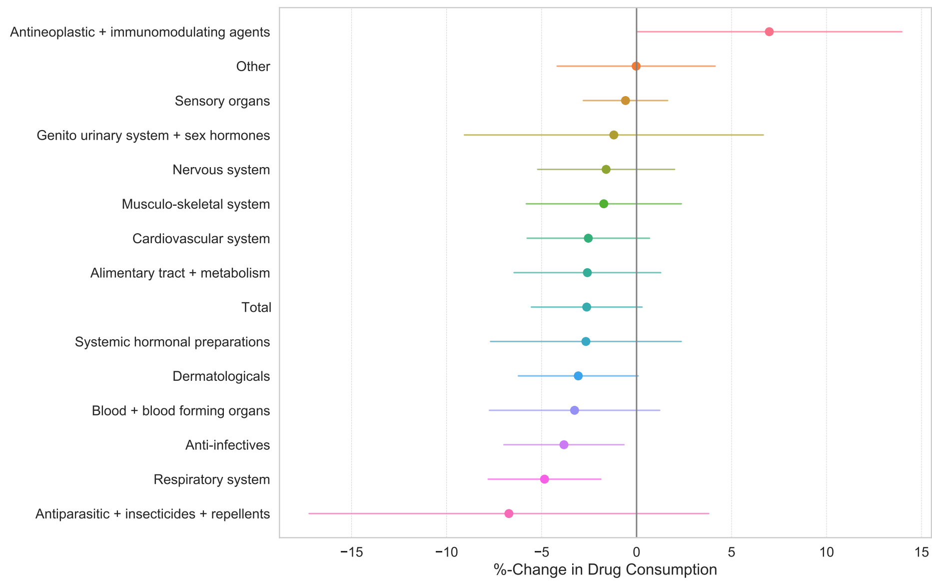


(o) Total



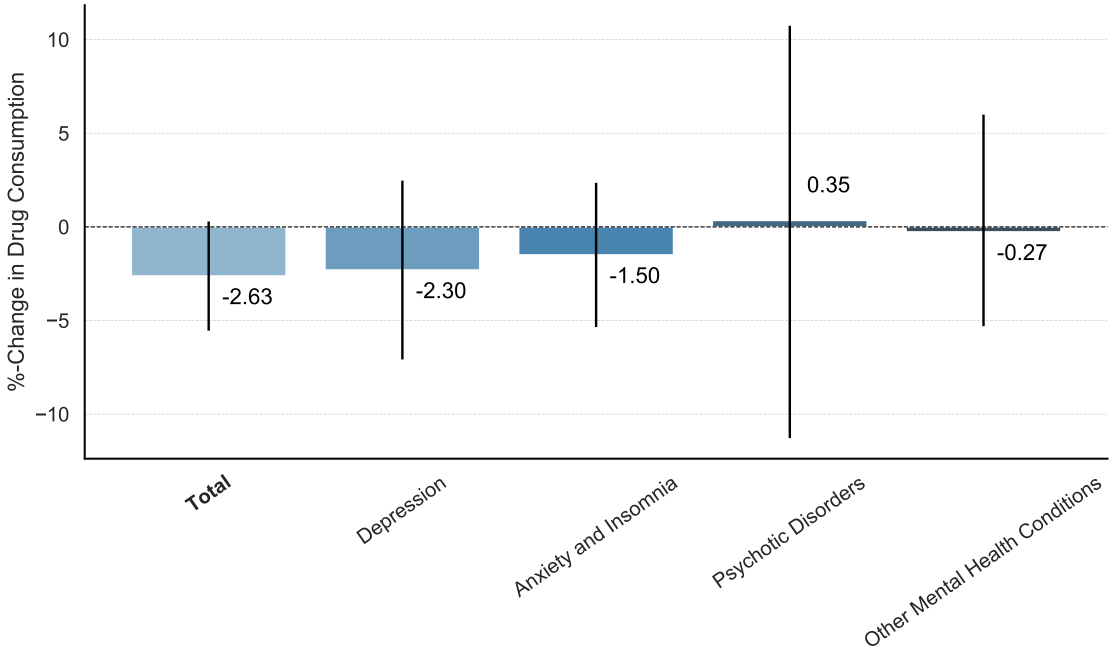
Note: Municipality-level war averages by ATC group for treated and comparison group; the number of purchases of prescribed drugs per person restricted to individuals above the age of 80. The gray line represents the counterfactual, that is the evolution of the treatment group in the absence of the treatment.

Figure A.8: Purchases of Drugs by ATC Group



Note: Municipality-level regressions of Equation 2 by ATC code; the number of purchases of prescribed drugs per person restricted to individuals above the age of 80. We compute the percentage effect by dividing it by the pre-period mean of the treatment group and adjusting the SE accordingly.

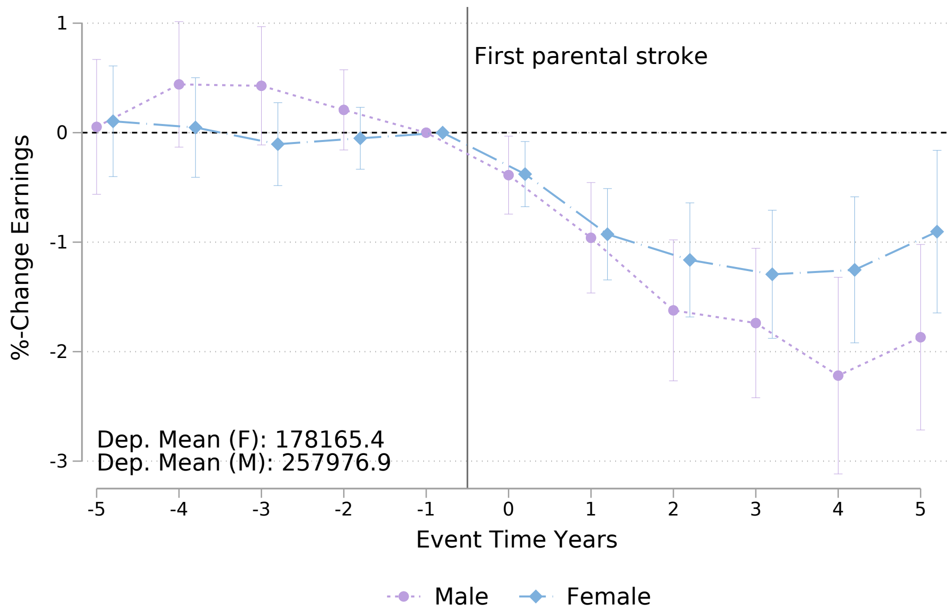
Figure A.9: Seniors: Purchases of prescribed Psychotropic Drugs



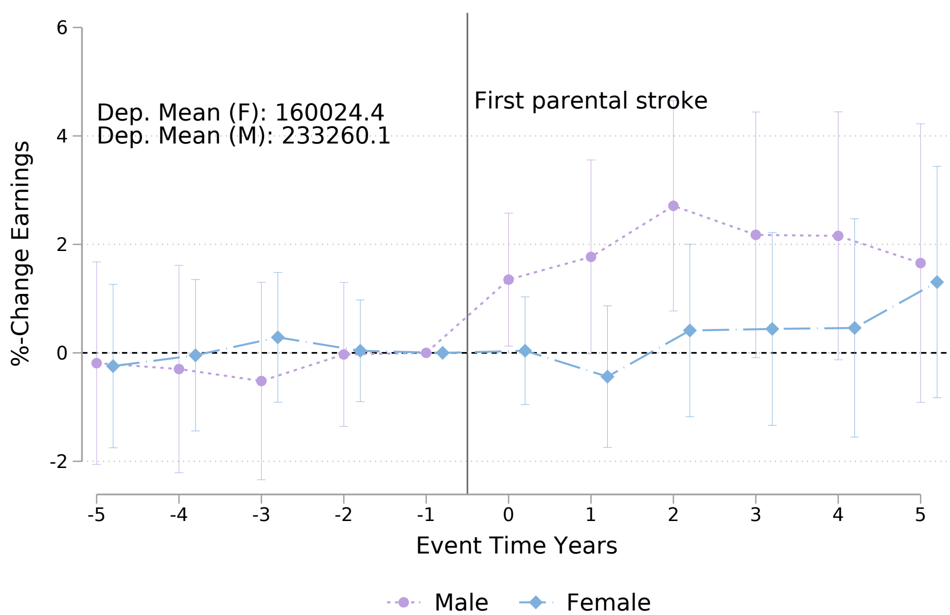
Note: Municipality-level regressions; the number of purchases of prescribed drugs per person restricted to individuals above the age of 80. ATC codes: Depression: N06AB, N06AX; Anxiety and insomnia: N05C, N05B; psychotic disorders N05A; other mental health conditions: everything else in ATC group N06. We compute the percentage effect by dividing it by the pre-period mean of the treatment group and adjusting the SE accordingly.

Figure A.10: Adult Children's Labor Market Responses to Parental Strokes

(a) Event Study: Earnings relative to Event Parental Stroke

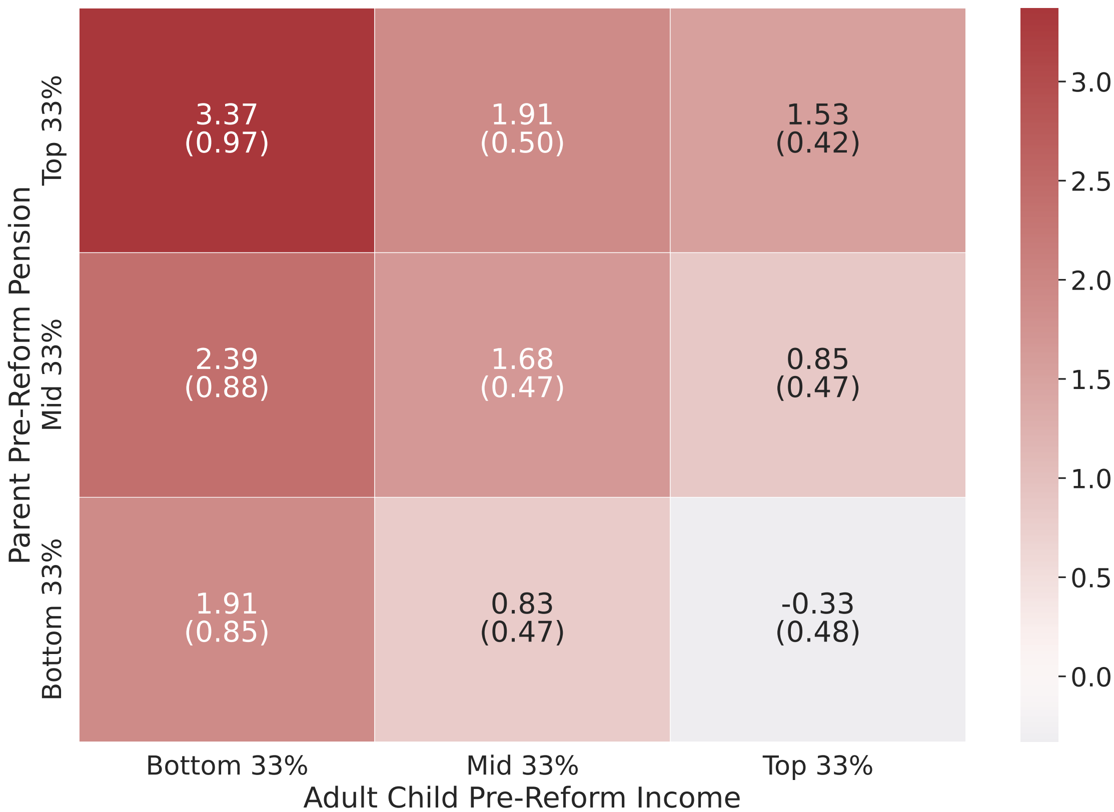


(b) Event Study x Reform-DiD: Price-sensitivity in the Response to Strokes



Note: Panel (a) shows the evolution of children's earnings relative to the event of a parental stroke in $t = -1$. We calculate the percentage change using a Poisson regression (Chen and Roth, 2024). Panel (b) further interacts the event-study with our DiD design of the reform. A positive effect can thus be interpreted as a mitigation of the response to parental strokes. We rely on strokes as a measure of a quasi-random health shock that requires care following Frimmel et al. (2021).

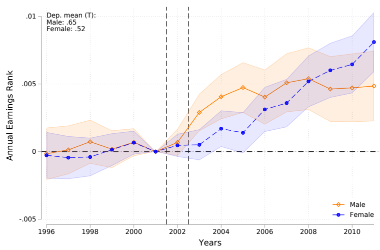
Figure A.11: Effect on Adult Children's Earnings [in %] by Pre-Reform Income Ranks



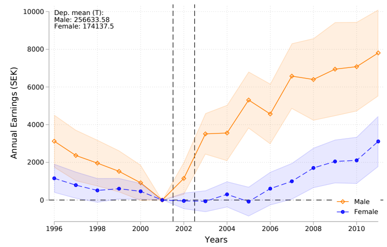
Note: This figure represents a heatmap where the color of a cell highlights the estimated labor response of the respective subgroup using Equation (3). In specific, we interact the treatment dummy with an indicator for the post-reform period and run the regression separately for each cell of income rank of the individual and the parent. Following Chen and Roth (2024), we compute percentage changes using a Poisson regression. Poisson quasi-maximum likelihood (QMLE) consistently estimates the ATE in levels as a percentage of the baseline mean under certain assumptions (Wooldridge, 2010). We construct the income groups by ranking adult children's income or parents' pension within each respective birth cohorts for the years 2000-2001. For example, *Bottom 33%* denotes the 1st tertile of the groups with the lowest 33 percent of earnings. This rank categorization is time-constant. The figures are based on the *children sample*. Standard errors are clustered on the parent-municipal level and shown in brackets. As in the main regression, we control for individual fixed effects, year fixed effects, and an indicator of a parent's death.

Figure A.12: Effects lowering Elder Care Fees on Adult Children's Labor Market Outcomes

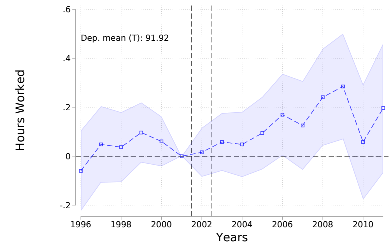
(a) Annual Earnings Rank



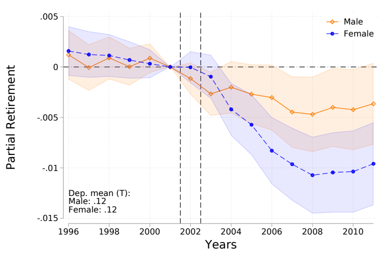
(b) Annual Earnings



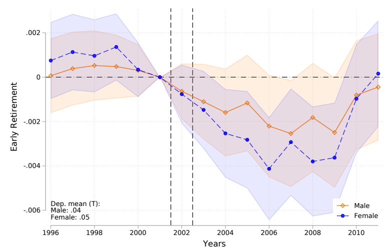
(c) Hours Worked



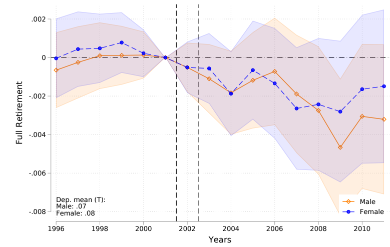
(d) Partial Retirement



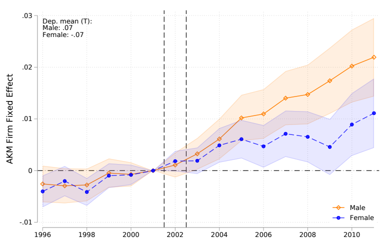
(e) Early Retirement



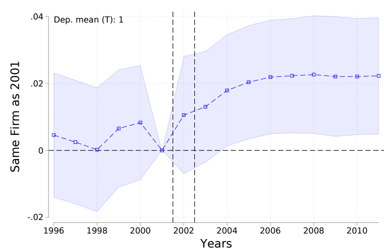
(f) Full retirement



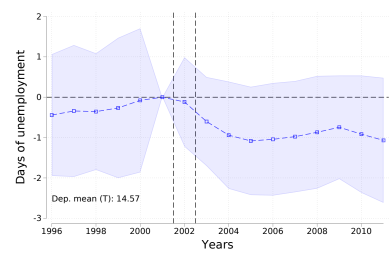
(g) Working at high-paying firm (Level)



(h) Probability of Staying in Firm of 2001



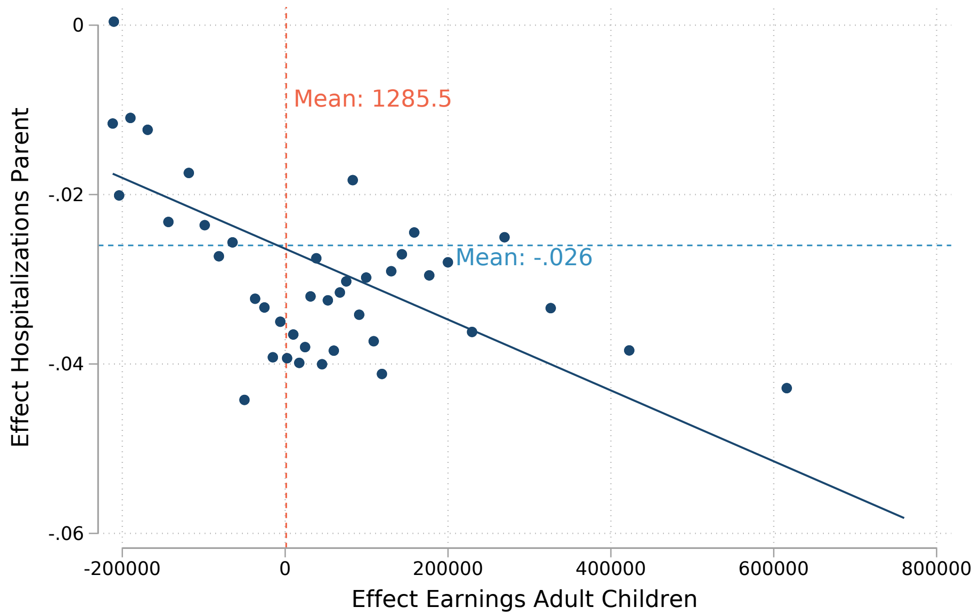
(i) Days Unemployment



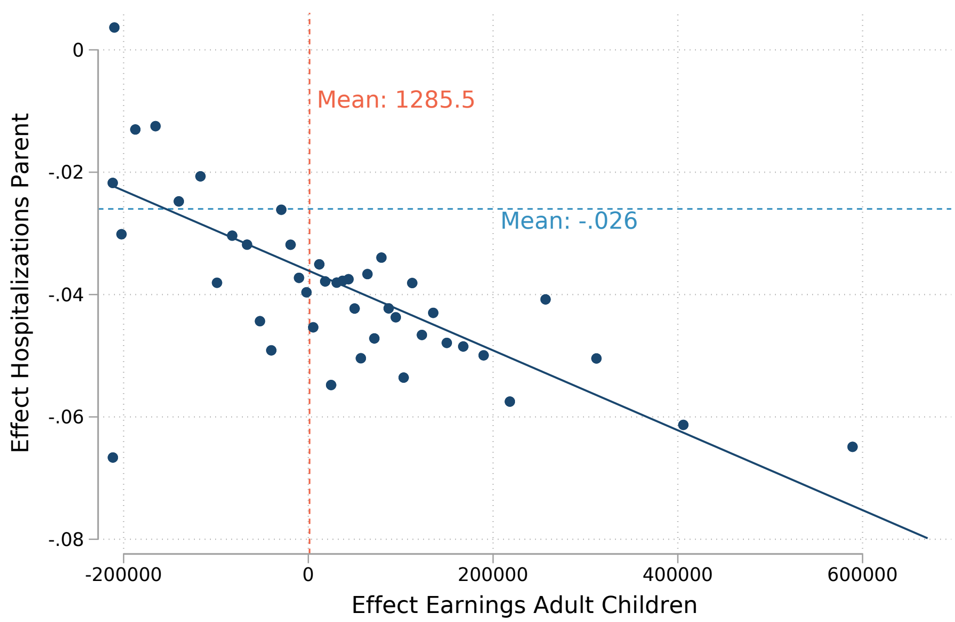
Note: These figures plot the estimated treatment effects using Equation (1) with different labor outcome variables. *Annual Earnings Rank* is computed by ranking the earnings of individuals within each calendar year. *Partial retirement* indicates a dummy that turns one if the individual has positive pension payouts in a combination with a reduction of earnings. *Full retirement* is an indicator that switches to one if the individual has positive pension payouts in combination with earnings below the gainfully employed threshold. *Early retirement* is a dummy that indicates whether an individual enters full retirement before the age of 65. *Working at high paying firm* is measured using the AKM framework (Abowd et al., 1999). Specifically, we regress log-earnings on individual fixed effects and firm fixed effects using the largest connected set of firms in the Swedish working population between the years 1985 to 2018. Following Card et al. (2013), we further control for a polynomial of experience (age - years of education), gender, and year fixed effects. We define a worker working in a *relatively more high paying* firm if the worker reports a higher estimated firm fixed effect. The shaded areas indicate the 95% confidence intervals. Standard errors are clustered at the parent-municipality level. The regressions control for individual fixed effects and an indicator for dead parent. The figures are based on the *children sample* but in Panel A.12g and A.12h we further restrict to individuals with positive earnings. A child is considered treated if his/her parent lives in a municipality with an average elderly care fee above the cap of 1,544 SEK/month (2003 price) in the year 2001.

Figure A.13: Correlation of Responses in the matched Parent-Child Sample

(a) All Post Years



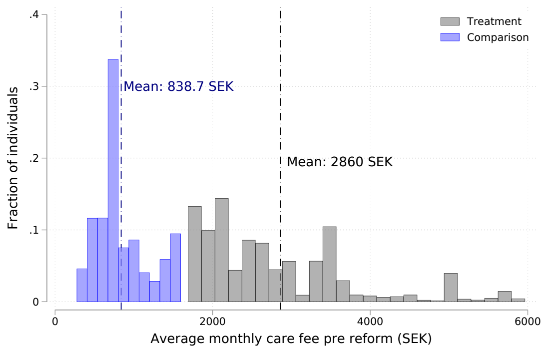
(b) Years 2003-2006



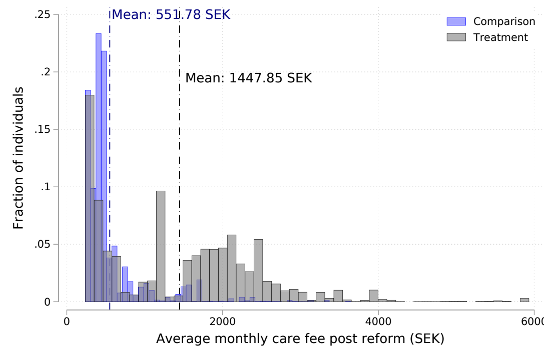
Note: The figure shows the correlation of the individual-level DiD for a matched sample of child-parent pairs. We construct the individual-level response by subtracting the control mean and pre-reform mean from the treatment group. This gives a distribution of DiD responses where the mean of the distribution is the estimated pooled DiD effect. We show the correlation between the children's earnings response and the parent's hospitalization response.

Figure A.14: Cross-sectional Variation of Fees Before and After the Reform

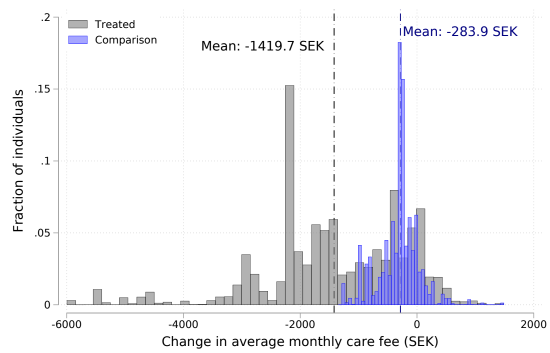
(a) Pre average fees



(b) Post average fees

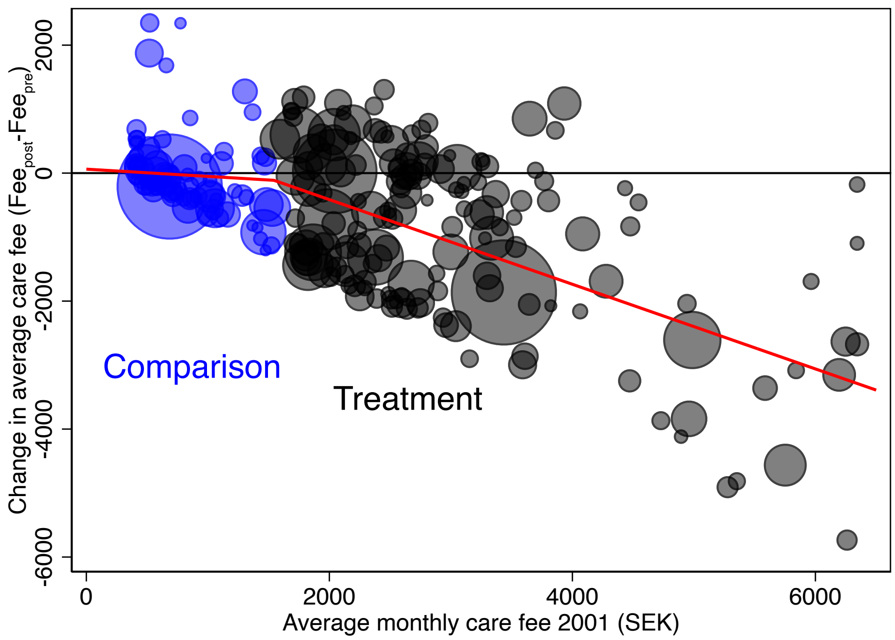


(c) Difference in pre- and post-fees



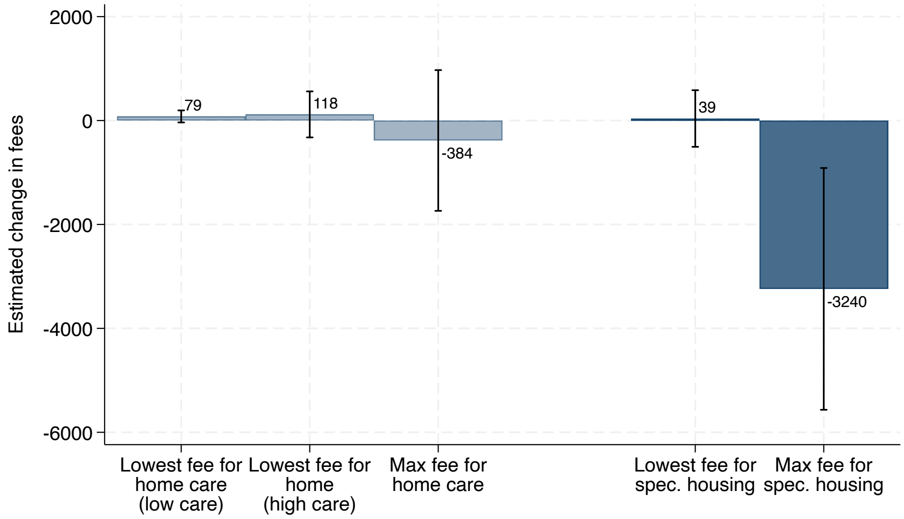
Note: Panels A.14a and A.14b show the cross-sectional variation in fees before and after the reform, respectively. Panel A.14c shows the cross-sectional variation in the change in fees caused by the reform. The figures are based on the *senior sample* which includes the 682,193 individuals that are alive and at least of age 75 in the year 1996. The treatment is at the municipality level, i.e., a senior is treated if he/she lives in a municipality that has a fee above 1,544 SEK per month before the reform in 2002. In the pre-period, the individual fee is equal to the average municipal fee in 2001. For the post-reform period, we use the minimum of the average municipality fee over the years 2003-2010. Fees are winsorized at the 5th and 99th percentile.

Figure A.15: Price of Elderly Care Before and After the Reform



Note: This figure displays the elder care fee changes in response to the reform. It is scatter plot of municipalities showing the average change in elder care fees by pre-reform fee level for treated and comparison municipalities. The size of each dot indicates the relative number of individuals aged 80+. We fit a line using a linear weighted regression on each side of the fee cap of 1544 SEK. A municipality is classified as *treated* if the pre-reform fees exceed the cap of 1,544 SEK per month. The figure is based on municipality-level data featuring 245 municipalities. We winsorize fees at the 5th and 99th percentile and deflate all prices to the 2003 year price level.

Figure A.16: Validating High- and Low fee municipalities

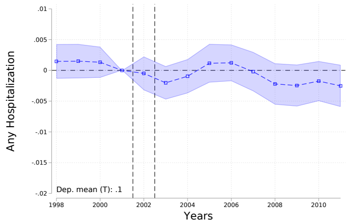


Note: The figure reports the treatment effect of the reform on an alternative fee measure using Equation 2. The survey is conducted by Socialstyrelsen (The National Board of Health and Welfare in Sweden) for one year prior and one year post reform.

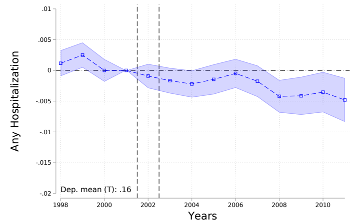
Figure A.17: Seniors' Healthcare Utilization for Different Age Groups

Any Hospitalization

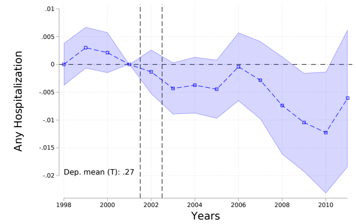
(a) Age 64−



(b) Age 65 − 79

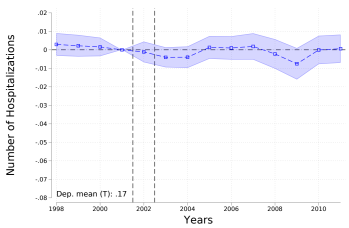


(c) Age 80+

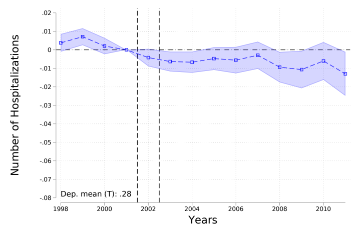


Number of Hospitalizations

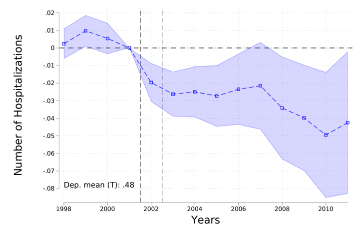
(d) Age 64−



(e) Age 65 − 79

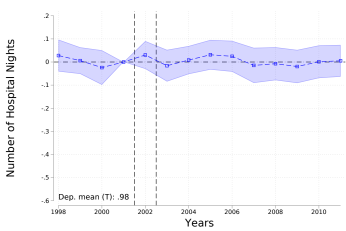


(f) Age 80+

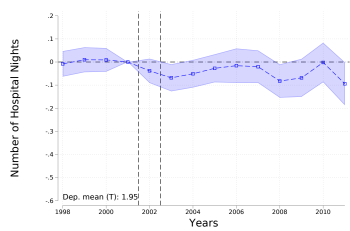


Number of Hospital Nights

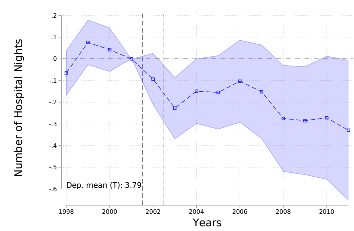
(g) Age 64−



(h) Age 65 − 79

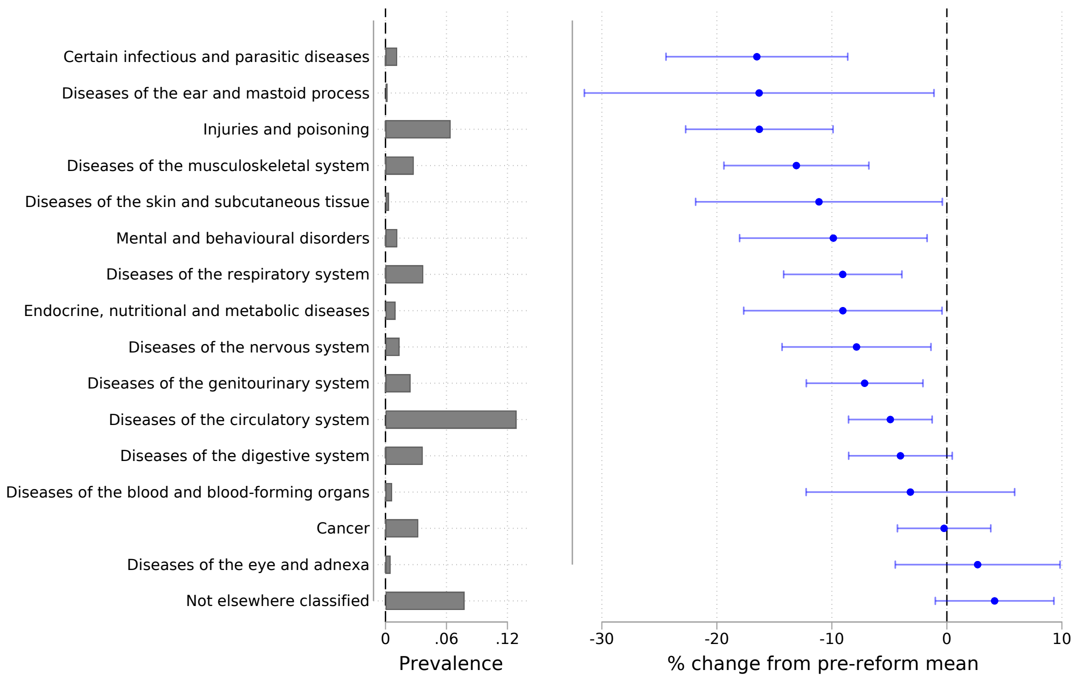


(i) Age 80+



Note: These figures plot the estimated treatment effects using Equation (1) when the outcome is the number of inpatient nights (top row), number of inpatient events (middle row), and an indicator for having at least one inpatient stay in during a quarter (bottom row). Each column represents an age group. To the left, we use our main *senior sample*. The middle column includes individuals aged 70 to 79. The right column includes individuals aged 55 to 60. The shaded areas indicate the 95% confidence intervals. Standard errors are clustered at the municipality level. The regressions include baseline covariates (gender, education, age, number of kids, and municipality FEs). Data on inpatient data is available between 1998 and 2010.

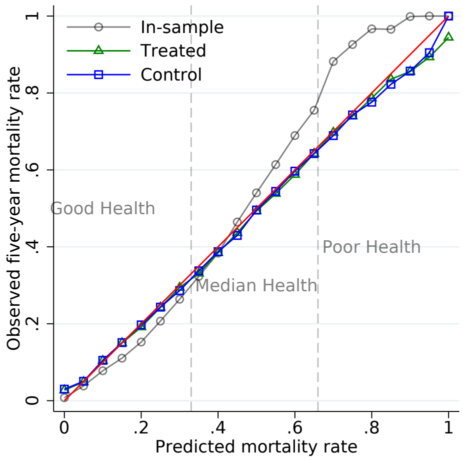
Figure A.18: Number of hospitalization events by cause of hospital admission



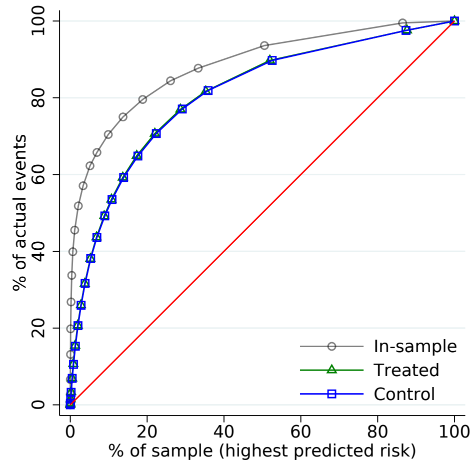
Note: The figure shows the pre-reform prevalence (share of treated with at least one visit) and the estimated treatment effects using Equation (2), with each line representing a separate estimation when the outcome is the number of inpatient visits per year when the diagnosis is listed as the primary cause for admission. The estimated coefficients are scaled by the pre-reform mean. The capped bars indicate the 95% confidence intervals. Standard errors are clustered at the municipality level. The regressions include baseline covariates (indicators for gender, year of birth, having a spouse, and number of children). The figure is based on the *senior sample*. An individual is considered treated if she lives in a municipality where the average elderly care fee is above the cap of 1,544 SEK/month (2003 price) in the year 2001. Inpatient hospitalization data are available between 1998 and 2010.

Figure A.19: Five-year mortality risk prediction calibration and capture

(a) Actual event rate

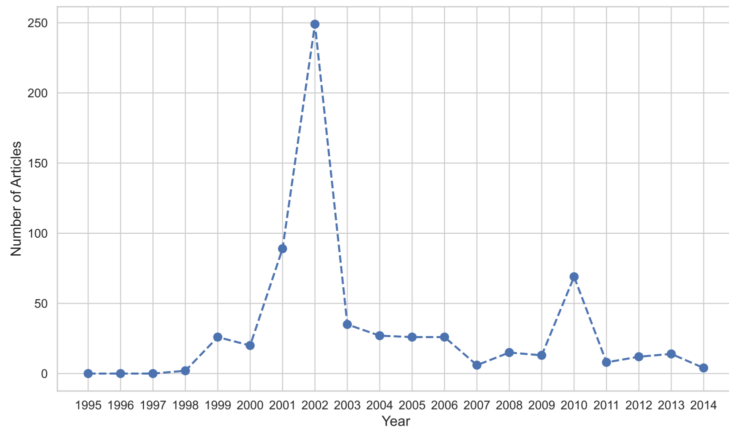


(b) Cumulative percent of actual events



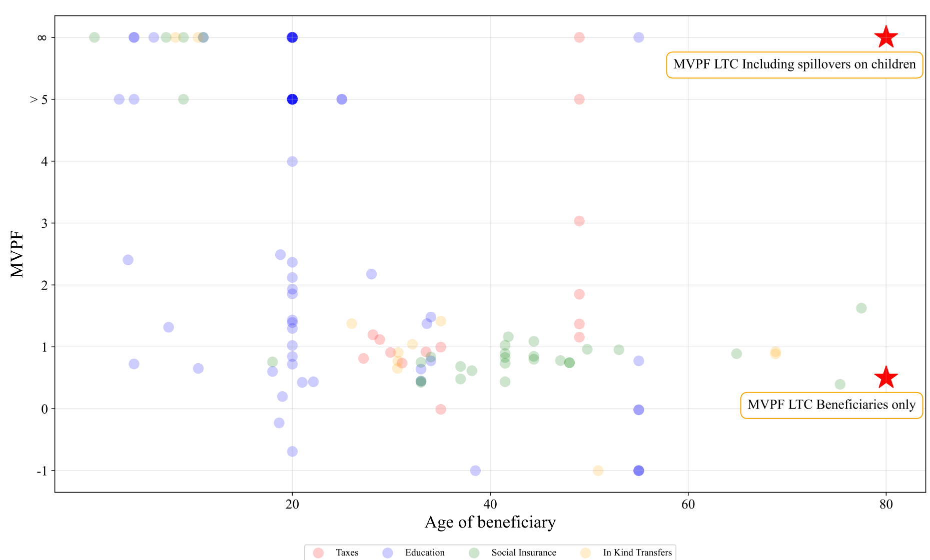
Note: Panel A plots the five-year mortality rate by predicted mortality risk and treatment status for individuals who are alive in 2001. Panel B plots the cumulative percent of actual five-year mortality rates captured by each successive predicted mortality risk and treatment status. An individual is considered as treated if he/she lives in a municipality with an average elderly care fee above the cap of 1,544 SEK/month (2003 price) in the year 2001. The predictions come from a machine learning model consisting of an ensemble of two predictors, a LASSO and a random forest. Both models are fitted on a training sample made up of a random 20% sub-sample of seniors. The feature space includes demographic information (age, education, civil status, and pension income) measured in 2001 and healthcare utilization (indicators for 3-digit ICD-10 codes and the sum of inpatient nights for each 3-digit ICD-10 code) for the period 1998 to 2001. The ensemble predictor is then generated in a separate random 10% sub-sample, where we perform a no-intercept OLS of five-year mortality to create a weighted average, the final output of the model, used to generate predictions in the remaining 70% of the sample.

Figure A.20: Anticipation Test: Number of Swedish Articles reporting on the Reform



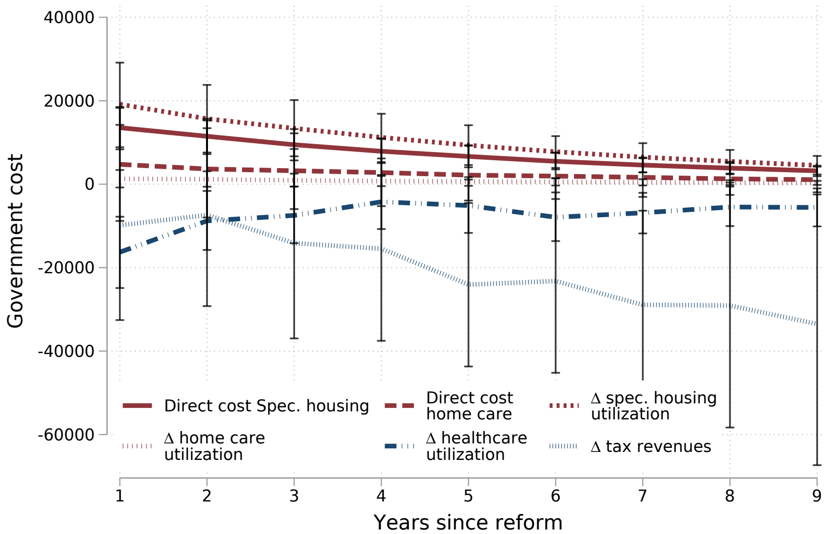
Note: This figure represents the number of articles featuring the words "elder care" and "maximum fee" (in Swedish: "äldreomsorgen" and "maxtaxa") between the years 1995 to 2014. The data stems from the media archive *Retriever Research* which collects articles from the Swedish media (both print and online) from 1995 onwards.

Figure A.21: Comparing Subsidizing Elder Care in Sweden to Other Policies: MVPF Comparison



Note: This figure is based on Hendren and Sprung-Keyser (2020)'s MVPF calculations for 133 policy changes over the five decades in the US. The estimates of the MVPF are freely available for download at `https://www.policyinsights.org`. Each MVPF estimate can be interpreted as how much benefit is created by each USD spent on the respective policy. The red stars indicate the MVPF calculations of the reform subsidizing formal elder care in Sweden.

Figure A.22: Government Cost Components Over Time



Note: More details on the calculation of the cost components can be found in Appendix C.4.

B Data and Variable Definitions

- **Ambulatory Care Sensitive Conditions** (ACSC) are defined following Socialstyrelsen (2014): they describe avoidable inpatient care and include diagnoses for diabetes, atrial fibrillation, heart failure, vascular convulsions, pneumonia, and urinary tract infections. The measure captures diagnoses that are influenceable by the type of care. The value of 1 indicates an avoidable hospital admission. This indicator is designed for the population above the age of 65 in Sweden.

- **Urgency indicator.** This index measures the urgency of a hospital admission. The index ranges from 0, elective care, to 1, emergency care. The index is taken from Krämer et al. (2019) who use supervised machine learning based on physician-expert judgments to classify ICD10 codes into urgent vs. elective care.

- **Nursing Home Avoidable Conditions** (ANHAC) captures admissions to the hospital that can be prevented through treatment in a nursing home or more professional care. For example, this includes managing infections, skin and wound care, medication services, and diet control. It describes an indicator that switches to 1 if the condition is treatable or preventable through access to formal care. This indicator is created from diagnosis codes including, for example, conditions such as injuries or poisoning, dehydration, or nutritional deficit (see Serrano-Alarcón et al., 2022; Spector et al., 2013, for more details).

- **Mortality** We define mortality as an indicator variable that takes the value one if the individual dies in the following year. This is equivalent to running a survival analysis (for details, see Jenkins, 2005).

- **AKM fixed effects** We define *working in a high-paying firm* using the AKM framework (Abowd et al., 1999). Specifically, we regress log-earnings on individual fixed effects and firm fixed effects using the largest connected set of firms in the Swedish working population between the years 1985 to 2018. Following Card et al. (2013), we control for a polynomial of experience (age - years of education), gender, and year-fixed effects. Then, we define a worker *working in a relatively higher paying* firm if the individual works in a firm with a higher estimated firm fixed effect.

- **Hours worked** We use the number of contracted hours as our primary measure of hours worked. Contracted monthly hours are reported by the employer in September of each year. They report the number as a share of full-time employment. Hours worked stem from the Wage structure survey (*Lonestatistik*) which covers above half of the Swedish population fom 1997 to 2020. The survey is stratified based on firm size, industry, leading to an overrepresentation of public and large firms. As the distribution of hours is bimodal, we focus on a dummy for part-time work as our primary measure of hours as defined below.

- **Working part-time** Following OECD's definition we define *part-time employment* as working less than 30 hours per week in the main job (van Bastelaer et al., 1997). This corresponds to working less than 75 percent of contracted full-time hours.

- **Occupation flexibility** We define a continuous measure of *occupation flexibility* as the leave-one-out share of individuals working part-time in the given occupation. We define this measure in the Swedish population for which we have the hours survey. We use 3-digit occupations.

- **Firm flexibility** We define a continuous measure of *firm flexibility* as the leave-one-out share of individuals working part-time in the given firm within detailed education groups. We define education group as the interaction of the highest education level (e.g, high school diploma, bachelor, etc.) and the education field (e.g., medical training, pedagogy, etc.). We rely on detailed education groups rather than occupation directly to avoid the issue of selection. Education groups can be seen as getting access to a fixed set of potential occupations. There are unique 98 education groups. We define this measure in the Swedish population for which we have the hours survey.

C Stylized Model Details

This section provides details of the stylized model used to derive the welfare implications. We first provide the details on the calculations of the theoretical solution in Section C.1 to C.3. Then, in Section C.4 we describe in details how we choose and estimate the sufficient statistics coming out of the model.

C.1 Laissez-Faire Solution

The agent chooses f, l, m but does not take public benefits into account. We can set $\tau = 0$ and $\sigma = 0$. We assume throughout that $\psi(l, h) = \psi(l + h)$. The individual solves:

$$\begin{aligned} \max_{l,f,m} U &= (1-\beta)u(c) - (1-\beta)[\pi \cdot \psi(l) + (1-\pi)\psi(l+h)] \\ &\quad + \beta[\pi u(c_H) + (1-\pi)(u(c_S) - \phi(m))] \\ \text{s.t. } c &= (w-\tau)l \\ c_H &= a \\ c_S &= a - (p-\sigma)f \\ h &= H^P - f - m \end{aligned} \tag{14}$$

FOC:

$$\frac{\partial U}{\partial l} : u'(c)(w-\tau) = \pi \cdot \psi'(l) + (1-\pi)\psi'(l+h) \tag{15}$$

$$\frac{\partial U}{\partial f} : (1-\beta)\psi'(l+h) = \beta u'(c_s)(p-\sigma) \tag{16}$$

$$\frac{\partial U}{\partial m} : (1-\beta)\psi'(l+h) = \beta\phi'(m) \tag{17}$$

Combining $\frac{\partial U}{\partial m}$ and $\frac{\partial U}{\partial f}$:

$$\phi'(m) = u'(c_s)(p-\sigma) \tag{18}$$

Combining $\frac{\partial U}{\partial l}$ and $\frac{\partial U}{\partial f}$:

$$\begin{aligned} u'(c)(w-\tau) - \pi \cdot \psi'(l) &= \beta u'(c_s)(p-\sigma)\frac{(1-\pi)}{1-\beta} \\ \Leftrightarrow u'(c)(w-\tau) - \frac{\beta}{1-\beta}(1-\pi)u'(c_s)(p-\sigma) &= \pi\psi'(l) \end{aligned} \tag{19}$$

C.2 First Best Solution

In the first best there is total consumption smoothing across states. The planner maximizes utility under a joint budget constrained allowing to freely relocate resources across states.

$$
\begin{aligned}
\max_{c,c_H,c_S,f,h,m} U = &(1-\beta)u(c) \\
&-(1-\beta)[\pi\cdot\psi(l)+(1-\pi)\psi(l+h)] \\
&+\beta[\pi u(c_H)+(1-\pi)(u(c_S)-\phi(m))] \\
\text{s.t.} \qquad \pi c_H+(1-\pi)c_S+c = &\pi a+(1-\pi)(a-(p-\sigma)f)+(w-\tau)l \\
h = &H^P-f-m
\end{aligned}
\tag{20}
$$

Giving the Lagrangian:

$$
\begin{aligned}
\mathcal{L} = &(1-\beta)u(c)-(1-\beta)[\pi\cdot\psi(l)+(1-\pi)\psi(l+h)] \\
&+\beta[\pi u(c_H)+(1-\pi)(u(c_S)-\phi(m))] \\
&-\lambda[\pi c_H+(1-\pi)c_S+c-a+(1-\pi)(p-\sigma)f-(w-\tau)l]
\end{aligned}
\tag{21}
$$

FOC:

$$\frac{\partial U}{\partial l}:(1-\beta)\pi\psi'(l)+(1-\beta)(1-\pi)\psi'(l+h)=\lambda(w-\tau) \tag{22}$$

$$\frac{\partial U}{\partial f}:(1-\beta)(1-\pi)\psi'(l+h)=\lambda(p-\sigma)(1-\pi) \tag{23}$$

$$\frac{\partial U}{\partial m}:(1-\beta)\psi'(l+h)=\beta\phi'(m) \tag{24}$$

$$\frac{\partial U}{\partial c}:(1-\beta)u'(c)=\lambda \tag{25}$$

$$\frac{\partial U}{\partial c_H}:\beta u'(c_H)=\lambda \tag{26}$$

$$\frac{\partial U}{\partial c_S}:\beta u'(c_S)=\lambda \tag{27}$$

Yielding total consumption smoothing of the parent across states:

$$\beta u'(c_S)=\beta u'(c_H)\Leftrightarrow c_S=c_H \tag{28}$$

And setting the MRS between children and parents equal to the relative bargaining weights:

$$\frac{u'(c)}{u'(c_S)} = \frac{u'(c)}{u'(c_H)} = \frac{\beta}{1-\beta} \tag{29}$$

And combining $\frac{\partial U}{\partial l}$ and $\frac{\partial U}{\partial f}$ we further get:

$$\begin{aligned} (1-\beta)[\pi\psi'(l) + (1-\pi)\lambda\frac{p-\sigma}{1-\beta}] &= \lambda(w-\tau) \\ (w-\tau)u'(c) - \frac{\beta}{1-\beta}(1-\pi)(p-\sigma)u'(c_S) &= \pi\psi'(l) \end{aligned} \tag{30}$$

And combining $\frac{\partial U}{\partial m}$ and $\frac{\partial U}{\partial f}$:

$$\begin{aligned} &\frac{\lambda(p-\sigma)}{\beta(1-\pi)} = \phi'(m) \\ &\Rightarrow u'(c_S) = \phi'(m)\frac{1}{(p-\sigma)} \end{aligned} \tag{31}$$

Discussion Laissez-faire and first-best would be the same iff $\lambda = \lambda_S = \lambda_H$. As individuals are optimizing the Lagrangian multiplier captures the utility-valuation of relaxing the budget constraint in the sick and healthy state (when spent on consumption), respectfully. As empirically shown in Finkelstein et al. (2009), both utility and budget constrained are likely to be state-dependent, as it is also the case in this setting. Hence, we have that $\lambda_S \neq \lambda_H$ which implies that the Laissez-faire differs from the first-best solution. The first best solution is welfare improving.

C.3 Second Best Solution

This section provides the details of Proposition 1. The Planner chooses τ and σ. Assume that the planner cannot observe c, h,f, m,c_H,c_S, and l directly but takes their optimization into account. Then, the social planner then maximizes

$$
\begin{aligned}
V(\sigma,\tau) = \max_{c,c_H,c_S,l,f,m,\lambda,\lambda_S,\lambda_H} & (1-\beta)u(c) - (1-\beta)[\pi\cdot\psi(l) + (1-\pi)\psi(l+h)] \\
& + \beta[\pi u(c_H) + (1-\pi)(u(c_S) - \phi(m))] \\
& - \lambda[(w-\tau)l - c] \\
& - \lambda_S[a - (p-\sigma)f - c_S] \\
& - \lambda_H[a - c_H] \\
\text{s.t.} \quad & l\tau = (1-\pi)\sigma f + (1-\pi)m \\
& h = H^P - f - m
\end{aligned} \tag{32}
$$

where $\lambda, \lambda_S, \lambda_H$ are the Lagrangian multipliers. Note that the function has already been optimally solved over the variables $\{c, c_H, c_S, l, f, m, \lambda, \lambda_S, \lambda_H\}$. Applying the Envelop theorem thus means that they have no first order effects on V. Hence, we compute

$$
\begin{aligned}
\frac{\partial V}{\partial \sigma} : V_\sigma + V_\tau \cdot \frac{\partial \tau}{\partial \sigma} = 0 \\
\Leftrightarrow \lambda_S f = \lambda l \frac{\partial \tau}{\partial \sigma}
\end{aligned} \tag{33}
$$

Optimizing agents implies that the lagrangian multipliers capture the marginal utility of consumption:

$$\lambda = (1-\beta)u'(c) \tag{34}$$

$$\lambda_s = \beta(1-\pi)u'(c_S) \tag{35}$$

From the government budget constrained, we get

$$
\begin{aligned}
\frac{\partial \tau}{\partial \sigma} &= \frac{[f + \sigma\frac{\partial f}{\partial \sigma}](1-\pi)l - ((1-\pi)\sigma f)\frac{\partial l}{\partial \sigma}}{l^2} + \frac{(1-\pi)\frac{\partial m}{\partial \sigma} l - (1-\pi)\frac{\partial l}{\partial \sigma} m}{l^2} \\
\Leftrightarrow \frac{\partial \tau}{\partial \sigma} &= (1-\pi)\frac{[f + \sigma\frac{\partial f}{\partial \sigma}]l - \sigma f\frac{\partial l}{\partial \sigma} + \frac{\partial m}{\partial \sigma} l - \frac{\partial l}{\partial \sigma} m}{l^2} \\
\Leftrightarrow \frac{\partial \tau}{\partial \sigma} &= (1-\pi)\frac{[f + \sigma\frac{\partial f}{\partial \sigma}]l + \frac{\partial m}{\partial \sigma} l - \frac{\partial l}{\partial \sigma}(\sigma f + m)}{l^2} \\
\Leftrightarrow \frac{\partial \tau}{\partial \sigma} &= (1-\pi)[\frac{f}{l} + \frac{f}{l}\underbrace{\frac{\sigma}{f}\frac{\partial f}{\partial \sigma}}_{=\epsilon_f} + \frac{m}{\sigma l}\underbrace{\frac{\sigma}{m}\frac{\partial m}{\partial \sigma}}_{=\epsilon_m} - \frac{(\sigma f + m)}{l\sigma}\underbrace{\frac{\sigma}{l}\frac{\partial l}{\partial \sigma}}_{\epsilon_l}]
\end{aligned} \tag{36}
$$

Substituting this into the FOC, we get

$$
\begin{aligned}
\frac{\beta(1-\pi)u'(c_S)f}{(1-\beta)u'(c)l} &= (1-\pi)[\frac{f}{l}+\frac{f}{l}\underbrace{\frac{\sigma}{f}\frac{\partial f}{\partial\sigma}}_{=\epsilon_f}+\frac{m}{\sigma l}\underbrace{\frac{\sigma}{m}\frac{\partial m}{\partial\sigma}}_{=\epsilon_m}-\frac{(\sigma f+m)}{l\sigma}\underbrace{\frac{\sigma}{l}\frac{\partial l}{\partial\sigma}}_{\epsilon_l}] \\
\Leftrightarrow \frac{\beta u'(c_S)}{(1-\beta)u'(c)} &= 1+\underbrace{\frac{\sigma}{f}\frac{\partial f}{\partial\sigma}}_{=\epsilon_f}+\frac{m}{\sigma f}\underbrace{\frac{\sigma}{m}\frac{\partial m}{\partial\sigma}}_{=\epsilon_m}-\frac{(\sigma f+m)}{f\sigma}\underbrace{\frac{\sigma}{l}\frac{\partial l}{\partial\sigma}}_{\epsilon_l} \\
\Leftrightarrow \frac{\beta}{1-\beta}u'(c_S) &= u'(c)+\frac{(\sigma f+m)}{f\sigma}\left(\frac{f\sigma}{(\sigma f+m)}\underbrace{\frac{\sigma}{f}\frac{\partial f}{\partial\sigma}}_{\epsilon_f>0}+\frac{m}{(\sigma f+m)}\underbrace{\frac{\sigma}{m}\frac{\partial m}{\partial\sigma}}_{\epsilon_m<0}-\underbrace{\frac{\sigma}{l}\frac{\partial l}{\partial\sigma}}_{\epsilon_l>0}\right)u'(c) \\
\Leftrightarrow \underbrace{\frac{\beta}{1-\beta}\frac{u'(c_S)}{u'(c)}}_{\text{Value of insurance}} &= \underbrace{1}_{\text{Direct Cost}}+\underbrace{\frac{(\sigma f+m)}{f\sigma}\left(\frac{f\sigma}{(\sigma f+m)}\underbrace{\frac{\sigma}{f}\frac{\partial f}{\partial\sigma}}_{=\epsilon_f}+\frac{m}{(\sigma f+m)}\underbrace{\frac{\sigma}{m}\frac{\partial m}{\partial\sigma}}_{=\epsilon_m}-\underbrace{\frac{\sigma}{l}\frac{\partial l}{\partial\sigma}}_{=\epsilon_l}\right)}_{\text{Fiscal Externality/Behavioral Response}}
\end{aligned}
\tag{37}
$$

which concludes Proposition 1.

C.4 Calculating the Components of Benefits and Costs

In this Appendix, we provide details on the calculation of components of Equation 13. The LHS describes the insurance value of the policy or in other words the willingness to pay (WTP). The RHS captures the cots. Formally, repeating the equation:

$$
\underbrace{\frac{\beta}{(1-\beta)}\frac{u'(\boldsymbol{c_S})}{u'(\boldsymbol{c})}}_{\text{Value of insurance}} = \underbrace{1}_{\text{Direct Cost}} + \underbrace{\frac{(\sigma f+m)}{f\sigma}\left(\frac{f\sigma}{(\sigma f+m)}\boldsymbol{\varepsilon_{f,\sigma}}+\frac{m}{(\sigma f+m)}\boldsymbol{\varepsilon_{m,\sigma}}-\boldsymbol{\varepsilon_{l,\sigma}}\right)}_{\text{Fiscal Externality / Behavioral Response}}
$$

The costs of providing the subsidy can be divided into a direct or mechanical cost and a term that denotes the indirect cost stemming from behavioral changes due to the policy, i.e., the (estimated) fiscal externalities. Intuitively, if the benefits created by increasing the subsidy by 1 SEK are larger than the costs of taxing children's income the policy is welfare improving. The RHS of the formula resembles the more general formula of the *marginal value of public funds* (MVPF) framework (Finkelstein and Hendren, 2020; Hendren and Sprung-Keyser, 2020). It differs in closing the government's budget constraint through increasing taxes to finance the policy as well as in the measure of the willingness to pay for the policy.

We follow the outline of Hendren and Sprung-Keyser (2020) in estimating the cost side of the policy. Below we provide details of how we estimate each component.

C.4.1 Costs

We begin by calculating the net costs of subsidizing elderly care through children's income taxes which corresponds to the RHS of Equation 13. In particular, the direct cost captures the change in subsidy for individuals directly affected by the reform in the absence of any behavioral changes ("infra-marginal individuals"). The second cost term describes the fiscal externalities induced by behavioral changes of the marginal individual.

Direct cost $\Delta\sigma$ Each senior that already utilizes elder care before the reform is getting access to the change in the subsidy. We calculate the change in the subsidy as the change in out-of-pocket costs. Given that costs per user of providing care in nursing homes did not change with the reform (see in Figure A.3a), the change in out-of-pocket costs per user reflects the subsidy of the government, i.e., the mechanical costs of providing the subsidy.

Figure A.14c shows that the average annual fee for nursing homes is reduced by $13,632$ SEK. In Figure A.14c, we show that treated individuals experience an average fee change per person of $1,136$ SEK per year relative to the comparison group. Multiplying this by 12 to get the annual equivalent, we get a change in spending of $1,136 \cdot 12 = 13,632$ SEK per year per person. Aggregating the effect over 9 years, we discount by 3% and account for the probability of dying in the sample estimated as 0.09. We get $13,632 + \frac{13{,}632 \cdot 0.91}{(1.03)} + \frac{13{,}632 \cdot (0.91)^2}{(1.03)^2} + ... + \frac{13{,}632 \cdot (0.91)^8}{(1.03)^8} = 78,633$ SEK per user over nine years.

Equivalently, we estimate the average per month fee change in home care to 384 SEK per user, or $4,608$ SEK per user and year. Following the above reasoning, the 9-year discounted direct cost for home care is $4,608 + \frac{4{,}608 \cdot 0.91}{(1.03)} + \frac{4{,}608 \cdot (0.91)^2}{(1.03)^2} + ... + \frac{4{,}608 \cdot (0.91)^8}{(1.03)^8} = 26,580$ SEK per user.

Next, we turn to the fiscal externalities which captures the indirect costs stemming from the behavioral response of the marginal individuals. We start by documenting the change in the government's budget due to behavioral changes in the utilization of nursing homes, home care, seniors' health outcomes, and children's labor market responses.

Fiscal Externality: Seniors' utilization nursing homes and home care $\varepsilon_{f,\sigma}$ Treated individuals are 1.22 percentage points more likely to live in nursing after the reform which corresponds to 4.5% change from the baseline of 27.28 percent (see Table 1).

The average municipality cost for nursing home care is 37,500 SEK per month in the year before the reform (see Figure A.3a). Thus, on average the government pays an additional $0.045 \cdot (37,500 - 1,544) \cdot 12 = 19,416$ SEK per year on the marginal individual. Assuming that the relative fee change is constant over time, the estimated cumulative cost for the increases in nursing home utilization is $19,416 + \frac{19{,}416 \cdot 0.91}{(1.03)} + \frac{19{,}416 \cdot (0.91)^2}{(1.03)^2} + ... + \frac{19{,}416 \cdot (0.91)^8}{(1.03)^8} = 111,304$ SEK after nine years, after adjusted for the average mortality rates of 0.09 and a using a discount factor of 0.03.

There is no increase in home care on the extensive margin, but an 0.72 increase in hours on the intensive margin (Table 1). The average municipality cost for one hour of care in 2001 is 260 SEK while the average hourly price is 106 (reference?). Thus, on average the government pays $0,73 \cdot (260 - 106) * 12$ SEK $= 1,349$ SEK/year for the additional hours of care. Aggregating over nine years after accounting for mortality and the discount factor yields $4,608 + \frac{1{,}349 \cdot 0.91}{(1.03)} + \frac{1{,}349 \cdot (0.91)^2}{(1.03)^2} + ... + \frac{1{,}349 \cdot (0.91)^8}{(1.03)^8} = 7,782$ SEK.

Fiscal Externality: Seniors' hospitalization $\varepsilon_{m,\sigma} \cdot m$ In order to estimate the changes in the government's budget due to changes in seniors' hospitalizations, we calculate the average cost per hospital night and user as follows. Given that individuals of the senior sample are on average 82 years old and 79% female, the average annual cost of inpatient care per user is 12,726 SEK/year for the age group 80-84 in Sweden (Wimo and Jönsson, 2001).[35] We assume that this cost is fully financed by the government.[36] In Table A.6, we document that an individual in the senior sample spends on average 3.84 nights per year. Thus, the average cost per night is calculated as $-12,725/3.9 = -3,262.9$ SEK/night. We use the dynamic (year-by-year) effects from estimating equation (1) and scale these intention-to-treat effects by 0.045 to capture the effect among the treated. Finally, we estimate the cumulative effect on the government's budget by $\mu_{2003}^{hosp} \cdot -3,263/0.045 + \frac{(\mu_{2004}^{hosp} \cdot -3{,}263/0.045) \cdot 0{,}88}{(1.03)} + \frac{(\mu_{2005}^{hosp} \cdot -3{,}263/0.045) \cdot (0{,}88)^2}{(1.03)^2} + ... + \frac{(\mu_{2011}^{hosp} \cdot -3{,}263/0.045) \cdot (0{,}88)^8}{(1.03)^8} = 84,844$ SEK for nine years.

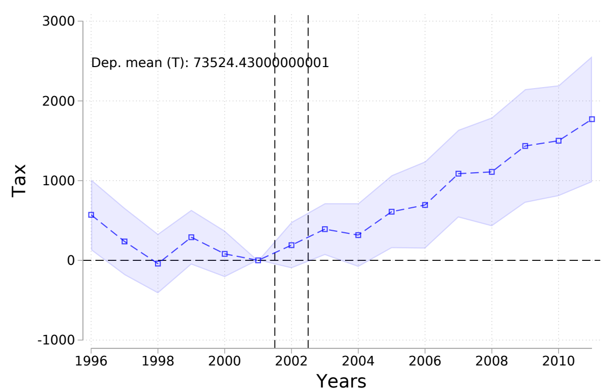
Fiscal Externality: Senior's mortality As we do not find a significant change in mortality, we set the fiscal externality to zero.

[35] Annual costs are on average 15,380 for men and 12,020 for women (Wimo and Jönsson, 2001). We compute the weighted average by using the share of females in our sample, i.e., $15380 \cdot 0.21 + 12020 \cdot 0.79$.

[36] Note that health expenditures are fully covered by the government from the age of 85 onwards. Hence, assuming full public compensation before the age of 85 might overstate the effect on the government's budget.

Fiscal Externality: Children's labor earnings $\varepsilon_{l,\sigma} \cdot l\tau$ Treated children of parents that are alive in 2001 increase annual earnings by on average 1.1 percent during the following 9 years (see Figure 5). The pre-reform average of earnings of the treatment group is 210, 621 SEK/year. Instead of assuming a linear average labor tax of approximately 30%, we run our DiD design of the reform directly on the individual-level labor taxes (see Figure below). We get an additional tax revenue of on average 802 SEK per year. Results are similar if we assume an average tax rate of 30%.

Figure C.1: Effect on Income Tax



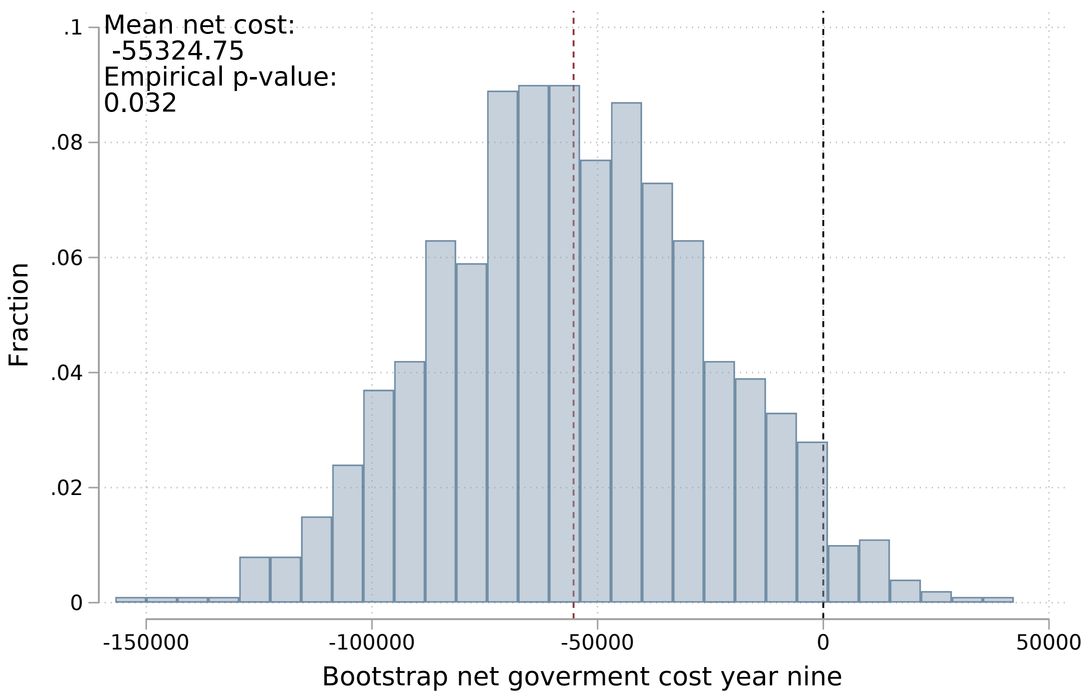
Next, we generate the expected value of the government by scaling the estimates by the properties of being a senior in the children's sample. That is, we multiply by the probability of being alive in the year 2001 (88.49%), the probability of a senior having at least one child (P(Having at least one child) =80.31%), divide by the average number of alive parents among the children (1.4), and multiply by the average number of children conditional on the senior having at least one child (2.25). Assuming these factors stay constant over the next 9 years, the nine-year discounted additional tax revenue is $(\mu^{tax}_{2002} \cdot 0.91 \cdot 0.8 \cdot 2.25)/1.4 + \frac{(\mu^{tax}_{2003} \cdot 0.91 \cdot 0.8 \cdot 2.25)/1.4}{(1.03)} + ... + \frac{(\mu^{tax}_{2011} \cdot 0.91 \cdot 0.8 \cdot 2.25)/1.4}{(1.03)^8} = 195,512$ SEK.

C.4.2 Calculating confidence intervals

We calculate the confidence intervals of our cost-benefit calculations using a bootstrap based on Hendren and Sprung-Keyser (2020). In particular, we assume that our estimates of the different cost components are normally distributed, centered at the true cost values, with standard deviations corresponding to the estimated standard errors. We allow the estimates to be perfectly correlated, which is a conservative measure of confidence intervals. We draw 1000 bootstrap estimates for each year and cost component from its assumed distribution.

We then calculate the cumulative net government cost in year nine within each bootstrap draw and plot the distribution below. The result shows that almost 95% of the bootstrap draws indicate a negative net government cost.

Figure C.2: Test of statistical significance



Note: The figure evaluates the statistical significance of the estimated cumulated net government cost after nine years. To produce the figure, we follow Hendren and Sprung-Keyser (2020) and assume that our estimates of the different cost components are normally distributed, centered at the true cost values, with standard deviations corresponding to the reported standard errors. We allow the estimates to be perfectly correlated, which is a conservative measure of confidence intervals. We draw 1000 bootstrap estimates for each year and cost component from its assumed distribution. We then calculate the cumulative net government cost in year nine within each bootstrap draw and plot the distribution. The result shows that almost 95 % of the bootstrap draws indicate a negative net government cost.