Gender and the Employment Effects of Parental Health Shocks Across Countries*

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Abstract

Adverse parental health shocks often create sudden caregiving and financial needs, potentially affecting adult children's labor market outcomes. Using SHARE data and a quasi-experimental event-study design, we examine how parental health shocks differentially affect sons' and daughters' employment across European countries. We find that these shocks significantly widen the gender employment gap. However, this effect varies across countries: in Italy and Spain, where informal elder-care dominates, daughters reduce their employment; in Germany and Switzerland, with substantial private elder-care, sons increase their employment; and in countries with generous public elder-care systems (such as the Scandinavian countries), employment is unaffected. Effects are driven by mixed-sex sibling families, highlighting the role of gender norms in allocating caregiving and breadwinning responsibilities.

Keywords: population aging, (in)formal elder-care, health shocks, gender employment gap

JEL Codes: J14, J16, J22, I18

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Data availability: The data used in this article come from SHARE and can be obtained from the SHARE Research Data Center at https://share-eric.eu/data/data-access upon registration.

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1 Introduction

One of the central challenges faced by developed countries is rapid population aging. This demographic shift increases the caregiving and financial needs of aging parents, particularly when their health deteriorates, potentially shaping their adult children's labor market outcomes. Research on the effects of parents' health on their adult children's employment has produced mixed findings. Some studies indicate a negative impact, especially on daughters (Frimmel et al., 2025; Bergeot et al., 2024), while others report no effect (Rellstab et al., 2020; Ramirez Lizardi et al., 2024; Bergeot et al., 2024). Taken together, the existing evidence indicates that the effect of parental illness on daughters' and sons' employment is country-specific, implying that parental health deterioration impacts the gender employment gap differently across countries.

However, we know relatively little about what lies behind this cross-country variation. To address this gap in the literature, we examine the effects of parental health shocks on the employment of their daughters and sons across different countries. We examine the differences in the effect on the gender gap in employment, depending on how elder-care is primarily provided in each country, whether through informal family care, publicly funded services, or privately funded services.

To do so, we use data from the Survey of Health, Ageing and Retirement in Europe (SHARE), allowing us to observe health shocks experienced by parents in different years. We employ a quasi-experimental event-study design to examine the impact of parental health shocks on children's employment within various European countries. We find that after the parental health shock, daughters' employment falls, while sons' employment remains stable. This indicates that the employment gender gap between daughters and sons widens following a parental health shock. Borrowing from the child penalty literature (Kleven, Landais and Søgaard, 2019), we calculate the "parental health shock penalty," the impact of parental health shock on the employment of adult daughters relative to adult sons, and estimate it at 10% six years after the shock.

Notably, we find that the increase in the employment gap following a parental health shock varies across countries and emerges from two margins: in some countries, daughters reduce employment, and in others, sons increase employment. We further demonstrate that these cross-country differences depend on who primarily provides the care. Specifically, we find that the largest increase in the employment gap is found in Italy and Spain,

where elder-care is typically provided informally by the family. In these countries, we find that parents receive more support from their children and daughters' employment declines by 9.1% following a parental health shock. This suggests that daughters reallocate their time between family duties and employment. In these countries, we find no effect of parental health shocks on sons' employment.

In Germany and Switzerland, where elder-care services rely heavily on private funding, we find a smaller increase in the employment gap, which stems from a different margin. After experiencing a shock to their health, parents receive more professional help, and their healthcare expenditure increases. In line with the increasing financial needs, sons experience a 5.5% increase in employment, either to support their parents or to substitute for a decrease in parental support. In these countries, we find no effect of parental health shocks on the employment of daughters.

In Sweden, Denmark, Austria, Belgium, and France where elder-care services are mostly publicly funded, we find an increase in the use of professional help after a parental health shock, with no significant change in healthcare expenditure. Additionally, parents are more likely to receive health-related benefits after the shock, and there is no change in employment for either daughters or sons. This points to a prominent role of the formal welfare system in buffering the shock, without requiring adult children to adjust their employment.

The primary care provider is shaped by both elder-care policies and social norms, which are clearly interconnected. Distinguishing between the two is beyond the scope of this paper, as countries with low public provision of long-term care also tend to expect families to take on caregiving responsibilities, and countries with high public provision tend to accept institutional care as the norm. Our results are particularly interesting as they show that the direction and size of employment responses depend on the combination of child gender, social norms, and the elderly care policies, rather than on either dimension alone, a finding that helps explain why prior cross-country estimates have been mixed. In response to a parental health shock, daughters often assume care responsibilities in informal care settings and reduce their employment. Meanwhile, when the shock imposes a financial burden, sons assume greater breadwinning responsibilities and increase their employment. Interestingly, we find that the effects of parental health on adult children's employment are driven by families with mixed-sex siblings, suggesting that in these families, gender

differences are more salient. This highlights that caregiving and breadwinning norms are important factors in the impact of a parental health shock on the gender employment gap.

Our findings are consistent with previous evidence; Frimmel et al. (2025) show that parental health shocks reduce children's employment in Austria, an effect that is muted after opening the elder-care market to foreign workers (our study focuses on the latter period). In the Netherlands and Norway, where formal elder-care is publicly funded, no effect on children's employment is observed (Rellstab et al., 2020; Ramirez Lizardi et al., 2024). Bergeot et al. (2024) demonstrated no significant employment response to parental health shocks in pooled European data and a modest effect in the United States. Our results help reconcile these contradictory findings by relating children's employment responses to the institutional setting and elderly care norms in the country.[1] We observe employment declines in countries with limited public and private elder-care provision, whereas in countries with publicly funded formal care, no employment responses emerge. We extend this insight by showing that in countries that rely on privately funded formal elder-care, employment increases in response to the shock. Opposite-direction responses may offset each other, potentially explaining the attenuated effects observed when data from several countries are combined.

Another strand of work shows that spouses may reduce their labor supply in response to a partner's health shock (García-Gómez et al., 2013; Jeon and Pohl, 2017).[2] When spouses act as caregivers, the absence of a spouse can shift the caregiving burden to adult children. Consistent with this, we find that in Italy and Spain, the impact on employment is more pronounced for daughters of parents without a co-residing partner compared to daughters whose parents are partnered, possibly because the former rely more heavily on their children, particularly daughters, for informal care.

Conditional on adult children being caregivers, previous studies have documented

[1] Our focus on cross-country institutional differences also relates to a literature examining how specific policy shifts, such as the introduction of public Long-Term Care (LTC) insurance or reforms aimed at incentivizing informal care arrangements, alter the trade-off caregivers face between employment and caregiving (Fu et al., 2017; Geyer and Korfhage, 2018).

[2] Dobkin et al. (2018) and Macchioni Giaquinto et al. (2022) found no significant effect. Fadlon and Nielsen (2021) showed that fatal health shocks significantly increase the labor supply of surviving spouses, driven by families facing substantial income losses. Relatedly, Jensen and Zhang (2026) examine the labor market impacts on adult children following parental death, finding a decrease in the employment of both sons and daughters. However, this decline is not driven by elder-care demands, but rather by other mechanisms.

that providing care for aging parents is associated with declines in children's labor market outcomes, especially for daughters (McGarry, 1998; Bolin et al., 2008; Van Houtven et al., 2013; Bauer and Sousa-Poza, 2015; Schmitz and Westphal, 2017; Heger and Korfhage, 2020; Simard-Duplain, 2022; Maestas et al., 2024). By leveraging an exogenous parental health shock, we identify changes in both formal care and informal care provided by children across countries. This offers a broader perspective on how parental health shocks affect adult children's labor market outcomes, extending beyond caregiving duties to other channels, such as increased financial burdens on families (García-Gómez et al., 2013; Trevisan and Zantomio, 2016).

In this sense, our paper resonates with the literature estimating the effect of parenthood on parents' labor market outcomes. Similarly to the parental health shock examined in this paper, the birth of a child is a shock affecting parents' employment through various channels, including caregiving responsibilities and financial demands. Research on this topic repeatedly demonstrates a differential effect of childbirth on mothers and fathers, with mothers experiencing a decline in employment following motherhood (see, among others: Bertrand et al., 2010; Daniel et al., 2013; Goldin, 2014; Angelov et al., 2016; Kuziemko et al., 2018; Kleven, Landais and Søgaard, 2019; De La Vega, 2022). This mirrors our results showing that daughters reduce their employment when a parental health shock increases informal caregiving needs. Research also finds that fathers increase their employment after the first childbirth when taking on the breadwinner role in the family (De La Vega, 2022; Bonnet et al., 2025). We observe similar patterns at another stage in life, with sons' employment increasing when a parental health shock raises the family's financial burden.

This research makes three main contributions. First, we document that employment responses to parental health shocks depend on the combination of child gender and the country's elderly care policies and social norms. We utilize a cross-country survey, leveraging a unified empirical framework to reconcile previous findings and unpack some of the mechanisms underlying the cross-country heterogeneity in employment responses. In particular, we show that gendered caregiving and breadwinning roles interact with eldercare policies: in countries with limited public and private expenditures on long-term care services, daughters experience a decline in employment following a parental health shock. In countries that rely on private long-term care services, sons increase their employment

in response to the shock. When formal care is publicly funded, neither form of gendered response emerges, demonstrating the potential of public policy to reduce gender gaps in employment.

Second, we provide novel evidence on how parental health shocks impact adult children's allocation of time between paid employment and informal caregiving, across different countries. In countries where we identify a decline in employment among daughters, we also observe an increase in the support parents receive from their children, implying that daughters reallocate their time to provide care. In countries where a rise in parental out-of-pocket healthcare expenditures is observed, we also observe a corresponding increase in employment among sons.

Third, we offer novel insight into the gendered assignment of responsibilities within families by showing that the employment effects of a parental health shock vary systematically with siblings' gender composition. In mixed-sex sibling families, daughters disproportionately reduce employment when caregiving needs rise, while sons disproportionately increase employment when financial demands increase. These patterns are consistent with evidence from the child penalty literature, which demonstrates that the employment impact of first childbirth is mitigated in same-sex couples (Andresen and Nix, 2022). Analogously, our results highlight how gender composition within the family shapes labor market responses to parental illness.

The rest of the paper proceeds as follows. Section 2 describes the data and sample. Section 3 outlines the empirical strategy. Section 4 presents the impact of a parental health shock on children's gender employment gap in the pooled sample. Section 5 examines the impact on sons' and daughters' employment by country, and relates it to the formal and informal care their parents receive. Section 6 explores how these employment effects vary by siblings' gender composition. Sections 7 and 8 present heterogeneity and robustness checks, respectively. Finally, Section 9 concludes.

2 Data and sampling

Our analysis is based on longitudinal data collected from individuals aged 50 or older participating in the Survey of Health, Ageing and Retirement in Europe (SHARE) (Börsch-Supan et al., 2013). In our main sample, we use data from SHARE waves 1-2 and 4-6,

collected between 2004 and 2015, with an average two-year interval between each wave (SHARE-ERIC, 2024).[3] These waves provide comprehensive data on participants' social, economic, and health status, as well as information about their adult children, including employment. Appendix C provides a description of the variables used in this paper. In our sample, we focus on countries that participated in all waves of the SHARE: Austria, Belgium, Denmark, France, Germany, Italy, Spain, Sweden, and Switzerland.[4] Using these data, we construct a panel dataset tracking children's employment and their parents' health over time, based on parental reports.[5]

A key strength of this dataset is its ability to capture household-level dynamics and intra-household changes that are typically unavailable in administrative data, offering a more holistic view of children's responses to parental health. For instance, the data allow us to observe changes in whether parents receive personal care or assistance from their children. Additionally, the dataset includes multiple countries where all participants are asked the same questions, ensuring comparability across countries. However, as with most survey data, limitations include a relatively small sample size and reliance on self-reported information.

Our main analysis focuses exclusively on children whose parents experienced a *health shock* during the observation period. A "health shock" is defined as an event in which the parent of an individual reports being diagnosed with a new health condition for the first time, having indicated in previous waves that they had never been diagnosed with any of the health conditions. To identify the shock, we consider any of the following conditions: stroke, heart attack, cancer, Parkinson's disease, or chronic lung disease.[6] We do not consider Alzheimer's disease because it is not consistently available across all SHARE waves.[7]

These conditions were selected based on both their prevalence in the SHARE data and

[3] Waves 3 and 7, which focused on participants' childhood and life histories, did not include information on children and are therefore excluded. Waves 8 and 9 (2019–2021) are not used in the main analysis due to disruptions caused by the COVID-19 pandemic.

[4] In wave 6, SHARE used an experimental design in the Netherlands, omitting the child questionnaire, essential for our study; therefore, the Netherlands is excluded from our sample.

[5] Earlier versions of SHARE lacked consistent child identifiers across waves. In March 2024, SHARE introduced child ID, enabling precise and consistent longitudinal tracking of children across waves (SHARE Release Guide 9.0.0).

[6] The proportions of all SHARE participants diagnosed with a health shock in each country are as follows: 7.6% in Germany, 9.7% in Sweden, 11.1% in Spain, 9.1% in Italy, 10.2% in Denmark, 9.2% in Switzerland, 11.4% in Austria, 10.7% in France, and 9% in Belgium.

[7] A complete list of health conditions available in SHARE is provided in Appendix D.

the literature studying economic consequences of health shocks (e.g., Jeon and Pohl, 2017; Fadlon and Nielsen, 2021; Schiele and Schmitz, 2023; Bergeot et al., 2024). Importantly, we limit the sample to health conditions that are unlikely to be anticipated 0–2 years in advance, and we consider the first diagnosis in cases of multiple diagnoses to address concerns about anticipation and validate our identification strategy.

While the conditions specified differ in severity, predictability, and implications for care, they represent severe health events that are most likely to be the initial event triggering adjustments in caregiving needs. Since specific types of health shocks are rare in the sample, we follow previous studies and classify respondents as having experienced a health shock if they report any of the five conditions. Moreover, as shown in Subsection 8.4, the estimated employment effects are consistent across different conditions.

Parental health shocks are unlikely to be randomly distributed, meaning individuals whose parents did not experience such a shock differ systematically from those whose parents did. For this reason, we focus exclusively on families in which a parental health shock occurred, and we leverage variation in the timing of these shocks to identify their effects.

We further restrict our analysis to nonfatal shocks (i.e., parent observed at least once after the shock) for three reasons. First, since our interest lies in situations where children may provide care to their parents, fatal shocks are inherently incompatible with this framework. Second, our data rely on parents' self-reporting, meaning we cannot observe children in cases where the parent did not survive the shock. Third, research indicates that fatal and nonfatal shocks often lead to different labor market outcomes among family members (Fadlon and Nielsen, 2021). By focusing solely on nonfatal shocks, we provide clearer insights into this specific type of shock rather than combining two distinct cases.

To mitigate possible selection effects and to ensure the sample is as close as possible to a balanced panel, we restrict our sample to individuals who are observed: (1) at least twice, once before and once after the parental health shock; (2) in at least two consecutive waves, following the strategy used by Kleven, Landais, Posch, Steinhauer and Zweimüller (2019). This leaves a sample of 13,669 individuals (i.e., SHARE participants' children) and 44,269 individual-year observations. In addition, in Subsection 8.1 we conduct a robustness check using a balanced panel, and find results consistent with our main findings, suggesting that our results are not driven by sample selection.

2.1 Country types classification

Elder-care can be provided by the individual's family through home production, or by outsourcing it to professional services. When elder-care is outsourced, it can be covered by government schemes, or paid for out-of-pocket. Elder-care typically involves a combination of caregiving solutions, though the balance varies significantly across countries (Barczyk and Kredler, 2019). In some countries, individuals rely more heavily on publicly funded elder-care services, while in others, families or the market play a more dominant role. These differences are central to our analysis, as they likely shape the employment responses of adult children to a parental health shock. Because our sample size is limited, we group the nine countries in our sample by their Long-Term Care (LTC) system type rather than analyzing each country separately.[8] To do so, we build on the typology developed by Llena-Nozal et al. (2025), who provide a comprehensive comparison of LTC systems for adults aged 65 and older across 29 OECD countries. They identify four robust country clusters that differ systematically in the generosity of public funding and in the relative roles of the family and the market in providing care.[9]

We map our countries onto this typology, grouping countries into three types by which entity is the main provider of elder-care. The most generously funded cluster, with high formal-care coverage and strong public provision, forms our *publicly funded care* group (Austria, Belgium, Denmark, France, and Sweden). Germany is in the less generous cluster, where public spending is substantial but a larger share of each family's care bill is paid out of pocket; we classify it as *privately funded care*.[10] We place Italy and Spain in the same *family-based care* group because the typology characterizes both by formal-care coverage that reaches less than 30% of older individuals with LTC needs, combined with a heavy reliance on informal family care.[11]

[8] LTC is a range of services for individuals with physical or cognitive limitations who require ongoing assistance with daily activities, such as bathing, getting out of bed, and dressing. It also includes basic medical support, health monitoring, and tasks like housework and transportation (Fujisawa and Colombo, 2009).

[9] Their typology integrates five dimensions of LTC provision simultaneously: access, availability, funding, governance, and quality. The clusters are obtained by applying dimension-reduction techniques followed by four distinct clustering algorithms that all converge on the same partition.

[10] This is further supported by Gruber and McGarry (2025): in their comparison of ten developed economies, Germany stands out as an outlier that pairs a high overall level of long-term care spending with a high *private* share.

[11] Although Llena-Nozal et al. (2025) place Italy and Spain in different clusters, the difference is only in *how* each country limits formal care (Italy through strict eligibility rules, Spain through low and fragmented funding) not in *whether* it does. In both, the family remains the main provider of care.

Because Switzerland is not included in either study, we draw on Lussi et al. (2024), who compare it with Germany, Italy, Norway, and the United Kingdom. They find that Switzerland has the highest out-of-pocket LTC expenditure and the highest share of people receiving formal care. This combination of heavy formal-care use and private financing places Switzerland in our *private* group, alongside Germany.

Appendix Table A.1 lists the countries in each group and the number of individuals in each. Because the public group contains more countries than the others, pooling all countries together may give it disproportionate weight. To address this, in analyses that pool all countries together, we restrict the public group to Denmark and Sweden, the two countries with the highest public expenditure, leaving two countries in each type. In addition, we repeat the analysis by country-type using these six countries instead of all nine, and the results remain robust.

2.2 Summary statistics

Appendix Table A.2 presents summary statistics for the pooled sample (column 1) and by country type (columns 2–4). Panel A reports parents' statistics, and Panel B reports children's statistics. In the pooled sample, parents are 71.5 years old and have 2.5 children on average at the time of the health shock. Approximately 22% of parents have attained education beyond high school. At the time of the health shock, 11% of mothers and 14% of fathers were employed. Given that most parents in this age group were retired, we do not analyze the impact of a health shock on parental employment. Children are on average 43 years old and have 1.2 children of their own. 43% have more than a high school education, and their pre-shock employment rates are 73% for daughters and 84% for sons.

As shown in Appendix Table A.2, parents from family-based care countries tend to be older than those from other country types, which aligns with the higher life expectancy in Italy and Spain.[12] However, the children in our sample are of similar average age at the time of the health shock, ranging from 42 to 44, suggesting they are at comparable life stages in terms of family and career. Hence, age differences are not likely to drive our results.[13]

[12] OECD (2010), Life expectancy by age and sex, https://data-explorer.oecd.org.

[13] To ensure that our results are not driven by age differences, we conduct the analysis described in Appendix Eq. (5), restricting the sample to individuals aged 25–34, who are at comparable early-career

Another key observation from the table is that the percentage of parents with more than a high school education in family-based care countries is relatively low, at 7%. This reflects the proportion of individuals within the same cohort with a high school education or more in Italy and Spain.[14] The table further demonstrates that the pre-shock employment of daughters is lower than that of sons across all country types. In addition, the pre-shock employment of daughters in family-based care countries is relatively low, at 62%. This corresponds to the low female employment rate of this age group in Spain and Italy.[15]

Differences in pre-shock daughters' employment across country types do not bias our cross-country comparison, unless there are trends in daughters' employment in periods adjacent to the parental health shock. In order to assess differences in pre-trend employment patterns between types of countries, Appendix Figure B.2 illustrates the employment rates of children 2-8 years before a parental health shock. Across all types of countries, the employment trends for sons and daughters in the years before a parental health shock are similar. Sons maintain a stable employment rate throughout the entire period. Although daughters have different employment levels, no systematic pre-trends in employment are observed across countries.

3 Methodology

We employ an event-study methodology to examine the short- and medium-run changes associated with a parental health shock. Consider a panel of i =1...N individuals from j =1...J households, in which the variables are observed for a subset of p =1...P periods, measured in years, with increments of two years. In this setup, every unit receives treatment (i.e., a parental health shock) in some period E_i within the sample and stays treated forever.[16] Let $k_{ip} = p - E_i$ be the "relative time," the number of years relative to the parental health shock (the event), and let the letter t denote the event time.

Using an event-study approach, we examine the impact of a parental health shock

stages. The results, presented in Appendix Table A.16, are consistent with those from the full sample.

[14]Eurostat data: https://ec.europa.eu/eurostat/databrowser/explore/all/all_themes.

[15]OECD (2010), Employment and unemployment by five-year age group and sex, https://data-explorer.oecd.org.

[16]Our main analysis focuses only on households that experienced a health shock, as using "never treated" individuals could be problematic. This is because individuals whose parents experience a health shock differ systematically from those whose parents do not.

on the employment of their daughters (d) and sons (s). Specifically, we estimate the following model separately by gender g=[d,s]:

$$y^g_{ijcpt} = c_i + \gamma^g_{cp} + \sum_{\substack{k=-6 \\ k\neq -2}}^{6} \beta^g_k I[k = t] + \epsilon_{ijcpt} \tag{1}$$

The third term on the right-hand side includes event-time dummies. We omit the event-time dummy at $t = -2$ since the data are observed at two-year intervals, implying the event-time coefficients β^g_k measure the impact of the parental health shock relative to the two years before the shock; c_i and γ^g_{cp} are child-level individual and calendar year×country fixed effects (FE), respectively. The individual FE control for time-invariant characteristics specific to each individual, such as education, number of children, and siblings (when these remain constant). The interaction of year and country allows us to absorb country-specific time trends, such as changes in employment rates and business cycles, without introducing multicollinearity with the individual FE. We also introduce an alternative specification in which we replace the individual FE with a full set of age-group dummies. Standard errors are clustered at the parental household level because siblings are affected by the same parental health shock (Abadie et al., 2023).[17]

Following the methodology of Kleven, Landais and Søgaard (2019), we scale our estimates relative to the counterfactual employment levels (i.e., in the absence of a shock) by defining the following equation:

$$\widetilde{y}^g_{ijcpt} = \hat{y}^g_{ijcpt} - \sum_{k\neq -2} \hat{\beta}^g_k I\left[k = t\right] = \hat{c}_i + \hat{\gamma}^g_{cp} \tag{2}$$

where $\widetilde{y}^g_{ijcpt}$ is the predicted employment when the contribution of the event time dummies is omitted.

We then calculate the effect of the parental health shock in relative year t as a percentage of the counterfactual outcome, the absence of parental health shock, by:

$$e^g_t = \frac{\hat{\beta}^g_t}{E\left[\widetilde{y}^g_{ijcpt}|t\right]} \tag{3}$$

[17] In some of the analyses, to allow estimation when the sample size is relatively small, we also examine differences in the impacts of parental health shock on the outcome of interest within a static staggered difference-in-differences specification instead of the full dynamic event-study design. For details, see Appendix E.

Having estimated the impacts of parental health shock on daughters and sons separately, following Kleven, Landais and Søgaard (2019) we define a "parental health shock penalty" on daughters (d) relative to sons (s) at event time t as:

$$parental\ health\ shock\ penalty_{\ t} = \frac{\hat{\beta}_t^s - \hat{\beta}_t^d}{E\left[\widetilde{y}_{ijcpt}^d | t\right]} \tag{4}$$

This *parental health shock penalty* measures the percentage by which daughters' employment falls behind sons' due to the parental health shock at event time t.

Our approach focuses only on households that experienced a similar unexpected health shock during our sample period. Hence, the treatment effect is identified solely based on the timing of the event. The validity of our identification strategy relies on the parental health shock being exogenous to their adult children's employment, conditional on year×country and individual FE. A violation of this would occur if there is anticipation of the parent's health deterioration and, in response, their adult children adjust their employment before a formal diagnosis.

To address this concern, as explained in Section 2, we limit our analysis to health conditions that are unlikely to be anticipated 0-2 years in advance. In Subsection 8.3 we further validate that the parent's health deterioration constitutes a significant and unanticipated health shock. In addition, in Subsection 8.4, we assess heterogeneity across conditions, some of which may be more anticipated than others, and find consistent employment impacts. Finally, in Subsection 2.2 we present estimates of trends in employment before the parental health shock across all countries in our sample, showing that sons' and daughters' employment rates remained stable and exhibited no cross-country differential patterns in the two to eight years prior to the shock.

Complementing the no-anticipation assumption, the event-study approach further requires that the parallel trends assumption holds. This implies that, in the absence of a parental health shock, the employment trajectories of treated and comparison individuals would have evolved similarly over time. In our context, this means that, conditional on year×country and individual FE, the employment of adult children whose parents experienced a health shock in year p would have followed the same trend as those whose parents experienced the shock in a different year, had the shock not occurred.

Under this identification assumption, our empirical strategy enables us to estimate

the causal effect of a parental health shock on the employment of their adult children, assuming homogeneous treatment effects across treated groups and over time. As parents in our sample experience health shocks at different points in time, and given the recent literature showing that dynamic estimators may be unreliable when treatment effects vary across groups and time, it is essential to account for this potential heterogeneity (De Chaisemartin and d'Haultfoeuille, 2020; Callaway and Sant'Anna, 2021; Goodman-Bacon, 2021; Sun and Abraham, 2021; Borusyak et al., 2024). In addition, recent work highlights that dynamic responses to such events may depend on individuals' position in the life cycle, including the age at which the shock occurs (Gallen et al., 2026). These issues are addressed through a set of robustness checks presented in the following section.

4 Employment

Figure 1 shows the impact of the parental health shock on children's employment by gender, based on the event-time coefficients estimated by Eq. (1) expressed as a percentage of the counterfactual outcome defined in Eq. (3). The figure shows that in the first period following the parental health shock, daughters' employment declines by 5%, while there is no change in sons' employment relative to two years before the shock. This decline in daughters' employment persists over the following six years, ranging from 5% to 12%. The coefficients for the years preceding the parental health shock are close to zero, indicating no evidence of pre-existing trends.[18] The long-run parental health shock penalty, which represents the percentage by which daughters' employment falls behind that of sons due to the parental health shock six years after the shock, is 10%. Overall, our results show a gendered response to parental health shocks: when their parents fall ill, daughters reduce their employment, increasing the gender employment gap.

To account for heterogeneity in treatment effects across units treated at different points in time, Appendix Figure B.1 presents dynamic TWFE estimates obtained using the alternative estimators introduced in Sun and Abraham (2021), Callaway and Sant'Anna (2021), and Borusyak et al. (2024). In our baseline specification, we control for child-level individual FE rather than for the child's age in each event-time period. To account for differences in age composition across event-time periods, as well as for the possibility

[18] If a trend exists for daughters between periods -6 and -4, it is minor and not statistically significant and runs in the opposite direction of the parental health shock effect, hence, it is less of a concern.



Figure 1: Parental health shock impacts on children's employment.

Notes: This figure shows the impacts of parental health shock on children's employment, separated by gender, in the pooled sample of six countries. The time variable represents periods relative to the parental health shock, and the outcome variable is the child employment indicator. The figure shows the event-time coefficients estimated by Eq. (1) expressed as a percentage of the counterfactual outcome defined in Eq. (3). Bootstrapped 95% confidence intervals from 500 replications are shown; standard errors are clustered at the parental household level. The figure also reports the long-run "parental health shock penalty," the percentage by which daughters' employment falls behind sons' employment following the parental health shock, defined by Eq. (4) and measured at event time 6.

that treatment effects vary with the age at which the shock occurs, Appendix Figure B.1 also includes dynamic TWFE OLS estimates based on Eq. (1) in which we replace the individual FE with a full set of age-group dummies. The results for daughters (sons) are presented in Panel A (B) of the figure. Overall, the estimates are highly consistent across specifications and closely mirror our baseline results: following the shock, daughters experience a decline in employment, whereas sons' employment remains unchanged. Across specifications, pre-shock coefficients are close to zero, suggesting no pre-trends and supporting the parallel trends assumption.

5 Results by country type

In Section 4, we observe a clear gendered pattern: parental illness widens the gender employment gap. This divergence aligns with Frimmel et al. (2025) and Bergeot et al. (2024), who document a disproportionately negative impact of parental health shocks on daughters' employment in Austria and the US, respectively. Conversely, evidence from other countries suggests that parental illness has no effect on the employment of either sons or daughters (Rellstab et al., 2020; Bergeot et al., 2024; Ramirez Lizardi et al., 2024). To account for this heterogeneity, we now examine how the employment responses of sons and daughters vary across countries, using the country typologies described in Subsection 2.1. Given that countries vary by how care is provided, we then examine the association between parental health shocks and the formal and informal care parents receive across these country types.

5.1 Employment

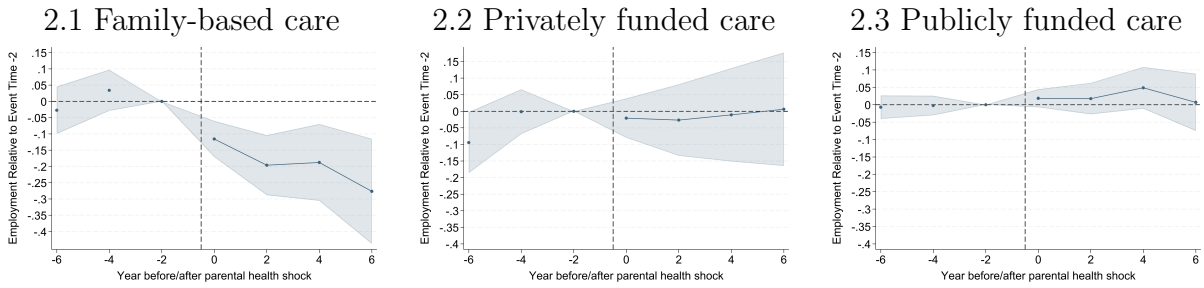
In Figure 2, we present the impacts of the parental health shock on children's employment by country types based on event-time coefficients estimated by Eq. (1) expressed as a percentage of the counterfactual outcome defined in Eq. (3). The results for daughters are presented in Panel A of the figure. We find that in family-based care countries, when parents fall ill, daughters' employment decreases. In the first period following the parental health shock, there is a 9.6% reduction in daughters' employment relative to their pre-shock employment rate. In the two to six years following the health shock, the decrease in daughters' employment persists, showing a sustained reduction of 16% to 22.4%. In contrast, we do not find an impact of the parental health shock on daughters' employment in privately funded and publicly funded care countries.

The results for sons are presented in Panel B of Figure 2. We find that following a parental health shock, sons in privately funded care countries experience a 4.7% increase in employment. This effect persists in the short run, reaching a 7% increase two years after the shock, and diminishes over time. While the coefficient for sons in family-based care countries is positive and statistically significant at $t = -4$, the magnitude of the effect is relatively small compared to the larger decline in employment for daughters after the shock, the remaining pre-shock coefficients are indistinguishable from zero, and it

is therefore not indicative of a systematic pre-trend. We do not find an effect on sons' employment in family-based and publicly funded care countries following a parental health shock.

To complement these results, we present the average parental health shock impacts on children's employment in Table 1, where we present the employment β^g coefficients estimated from Eq. (5), separately for each country type and gender. The table also reports the average number of pre- and post-shock periods observed for each individual, as well as p-values from joint Wald tests of whether parental health shock effects differ across country types. As in our event-time analysis, daughters' employment decreases in family-based care countries by 9.1% on average over the 0-6 years following their parents' illness. For sons in privately funded care countries, we find an average increase of 5.5% in employment.[19]

Panel A - Daughters' employment



Panel B - Sons' employment

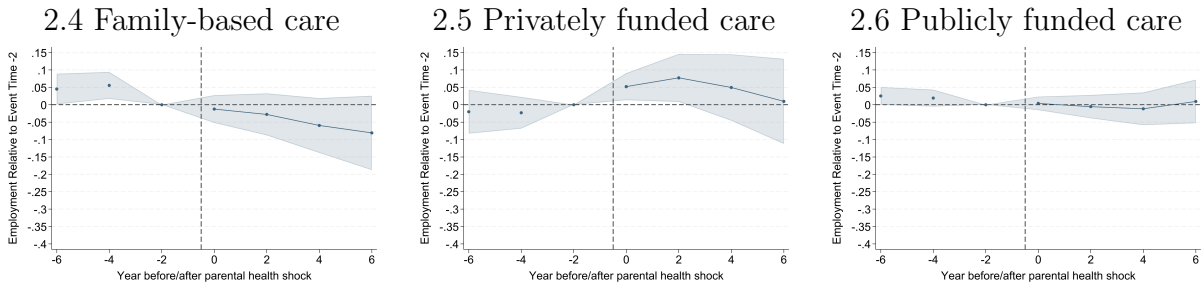


Figure 2: Parental health shock impacts on children's employment by country type.

Notes: This figure shows the impacts of parental health shock on children's employment, separated by country type and gender. The time variable represents periods relative to the parental health shock, and the outcome variable is the child employment indicator. Panel A presents the impacts on daughters' employment, and Panel B on sons' employment. Each subfigure shows the event-study coefficients estimated from Eq. (1) expressed as a percentage of the counterfactual outcome defined in Eq. (3). Bootstrapped 95% confidence intervals from 500 replications are shown; standard errors are clustered at the parental household level.

[19] As a robustness check, Appendix Table A.3 reports these results restricted to the six countries used in the pooled analysis.

Table 1: Parental health shock impacts by country type

	Daughters			Sons		
	(1) Family	(2) Private	(3) Public	(4) Family	(5) Private	(6) Public
Employment	-0.058***	-0.020	0.013	-0.008	0.046***	0.001
	(0.019)	(0.024)	(0.010)	(0.015)	(0.017)	(0.009)
Mean	*0.633*	*0.726*	*0.795*	*0.847*	*0.837*	*0.850*
Effect as % of mean	-9.1%	-2.8%	1.7%	-0.9%	5.5%	0.1%
P-value (joint test)	0.004			0.029		
Number of observations	5,657	3,247	11,962	6,171	3,214	12,719
Number of individuals	1,708	1,062	3,696	1,869	1,058	3,934
Average number of:						
Pre-shock observations	1.61	1.52	1.60	1.60	1.54	1.58
Post-shock observations	1.76	1.60	1.70	1.77	1.57	1.72

Notes: This table shows the impacts of parental health shock on children's employment by country type based on Appendix Eq. (5). Columns (1)-(3) present the impact on daughters' employment in family-based, privately funded, and publicly funded care countries, respectively. Columns (4)-(6) present the impact on sons' employment in family-based, privately funded, and publicly funded care countries, respectively. The p-value reports a joint Wald test of whether parental health shock effects differ across country types. The average number of pre-shock and post-shock observations reports the average number of periods each individual is observed before and after the parental health shock, respectively. Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

5.2 Formal and informal care

In this subsection, we examine the relationship between parental health shocks and children's informal care, professional or paid help, healthcare expenditure, and health-related benefits using Eq. (5).[20] The variables in this subsection are reported at the parental level and describe parents' own outcomes; therefore, the analysis represents results for parents of both daughters and sons.

In Panel A of Appendix Table A.4, we examine the correlation between a parental health shock and help received by their children. Our analysis relies on parents' responses to whether they received help from their children in the past year. Before the health shock, the share of parents receiving help from their children is similar across all types

[20]Note that the identification assumptions enable us to estimate the causal effect of a parental health shock on the employment of their adult children. However, these assumptions may not hold for the outcome variables discussed in this subsection. Consequently, we interpret the results as indicating a correlation between a parental health shock and formal and informal care, while refraining from making definitive causal claims.

of countries, at about 12%. After the shock, this share rises by 6.5 percentage points (53%) in family-based care countries. No such increase is observed in privately funded and publicly funded care countries.

In Panel B, we show the association between a parental health shock and the formal care received by parents. We use parents' reports on whether they had received professional or paid help with domestic tasks they were unable to perform themselves due to health problems in the past year. After a health shock, the use of professional or paid help increases by 4.6 percentage points (181.5%) in privately funded care countries and 2.6 percentage points (46%) in publicly funded care countries. No significant change is observed in family-based care countries. It is worth mentioning that the question wording does not distinguish whether the help was paid out-of-pocket or publicly covered. To explore differences in the type of formal care in these countries, we examine changes in healthcare expenditure and health-related benefits.

In Panel C, we present the association between a parental health shock and annual healthcare expenditure, serving as a proxy for reliance on market solutions. Privately funded care countries exhibit the largest rise, with an average increase of EUR 312 per year in healthcare expenditure, a 98.6% increase, highlighting the reliance on out-of-pocket health care spending in these countries.[21] In contrast, family-based care countries show a smaller, statistically insignificant increase of EUR 147 (49.8%), while publicly funded care countries show the smallest rise of EUR 98 (32.9%).

In Panel D, we examine the association between a parental health shock and health-related benefits received by the parents, which we use as a proxy for reliance on publicly funded elder-care services. We classify a parent as receiving a health-related benefit if they report any public long-term care, disability, or sickness benefit. The table shows a greater likelihood of receiving health-related benefits after a health shock in publicly funded care countries, with an increase of 3.3 percentage points, compared to a more modest 1.7 percentage points in privately funded care countries. The increase in privately funded care countries represents a 71% rise. This high percentage change is due to the low pre-shock benefit-receiving rate in these countries, which is 2.4%. Despite this significant increase, the share of people receiving health-related benefits in privately funded care countries remains the lowest among all country types. In contrast, the pre- and post-shock rate of

[21] In 2015 German prices.

health-related benefit receipt is highest in the publicly funded care countries.

The analyses presented in Appendix Table A.4 correspond to the LTC system typologies described in Subsection 2.1.[22] Following a health shock, parents in family-based care countries tend to rely on informal support from their adult children. In privately funded care countries, parents turn to paid professional services. In publicly funded care countries, parents rely more on care that is primarily covered by government schemes.

5.3 Discussion

Our results indicate that caregiving dynamics and labor market outcomes diverge by gender, and that this gender divergence varies systematically across elder-care systems. The differential effects on children's employment may be attributable to differences in how elder-care is organized. In family-based care countries, a shock to parents' health is associated with an increase in the share of parents who receive informal care from their children and a decrease in daughters' employment. This suggests that daughters reduce their employment to provide this care. In privately funded care countries, a shock to parents' health is associated with increased use of paid professional care, higher healthcare expenditure, and an increase in sons' employment. This suggests that sons increase their employment in response to the growing financial needs following the shock. In publicly funded care countries, a shock to parents' health is associated with increased use of professional care, a higher likelihood of receiving health-related benefits, and no change in the employment of daughters or sons. As formal elder-care services are mainly provided by the government, neither daughters nor sons need to respond to the shock through employment.

Who provides care is jointly determined by elder-care policy and care responsibility norms, two forces that are difficult to disentangle. Limited public provision of long-term care coexists with strong norms of family responsibility, whereas generous public provision aligns with a societal view of institutional care as the norm (see Appendix F for supporting survey evidence). Separating the role of policy from that of care responsibility norms

[22] Appendix Table A.5 presents results restricting the sample to the six countries used in the pooled analysis. In addition, Appendix Table A.6 restricts the sample to individuals who answered all four questions in at least one wave. This approach ensures that the same individuals are considered for the different outcomes. The results of this analysis remain consistent with our findings. Note that restricting the sample to individuals who answered all questions in all waves results in a sample that is too small for the analysis.

is beyond the scope of this paper. Instead, our results show that within a framework in which caregiving or financial responsibilities fall to the family, these obligations are clearly divided between sons and daughters. This gendered division of responsibilities can be viewed through the lens of the "separate spheres" concept rooted in the work of Lundberg and Pollak (1993). According to their model, in the absence of a single, unified decision-making process, family members specialize along socially prescribed gender lines rather than according to pure economic efficiency. Applied to elder-care, this implies that daughters specialize in providing time and hands-on care, while sons specialize in financial support.[23] Ho and McGarry (2025) formalize this idea, modeling support for older parents as operating in separate spheres based on the child's gender.

We contribute to this literature by showing that the country's elder-care system determines which sphere a parental health shock activates. Where care for ill parents is primarily provided by the family, the shock raises the demand for the daughter's time, and she reduces her employment to provide it. Where care is purchased in the market, the shock raises the family's financial burden, and the son increases his employment to meet it. Where care is publicly funded, neither sphere is called upon, and the employment of both daughters and sons is unaffected.

6 Siblings' gender composition

So far, we have shown that a parental health shock reduces daughters' employment where care falls to the family and raises sons' employment where care is purchased privately, and we have interpreted this gendered response through the separate-spheres framework, in which daughters specialize in care and sons in financial support. This framework makes a sharp prediction within the individual family. Because the two spheres are gendered, with daughters providing care and sons financial support, a household can divide responsibilities along traditional lines only when it contains children of both genders. The employment response to a parental health shock should therefore be concentrated in families with mixed-sex siblings and muted in families with same-sex siblings. We test this by examining how the effect varies with the gender composition of an individual's

[23]The assumption that elder-care is not chosen through a single, cooperative process is supported empirically: Bergeot (2024) and Knoef and Kooreman (2011) find that adult siblings tend to act non-cooperatively when providing care to their parents.

siblings.

Following the literature that models support to parents in two-child families (Ho and McGarry, 2025; Bergeot, 2024), we restrict this analysis to families with exactly two children.[24] This restriction also addresses the finding of Angrist and Evans (1996) that parents with two same-sex children are more likely to have a third, so that family size is systematically related to siblings' gender composition and could otherwise bias comparisons across families.

Appendix Table A.7 reports the results for daughters in family-based countries. Column 1 shows the effect for all daughters with one sibling, which is close to the estimate for the full sample. Columns 2 and 3 split them by the sibling's gender: daughters whose sibling is a sister (same-sex) and those whose sibling is a brother (mixed-sex). Daughters with a sister show no significant effect (if anything, the estimate is positive), whereas daughters with a brother experience a decline in employment following the shock that is larger than in the full sample, a decrease of about 8 percentage points, or 12.6%. The reduction is thus driven by daughters with a brother, exactly as the separate-spheres prediction implies. The full sibling sample, which includes families of all sizes, yields the same pattern (Appendix Table A.8).

Sons mirror this pattern (Appendix Table A.9). The pooled effect for sons with one sibling (Column 1) is even larger than the full-sample estimate. Sons whose sibling is a brother (same-sex) show an effect that is opposite in sign and statistically insignificant, whereas sons whose sibling is a sister (mixed-sex) show a significant increase in employment (an increase of about 12.5 percentage points, or 15.2%). The rise in sons' employment in privately funded countries is thus driven by sons with a sister, again as the separate-spheres prediction implies; the full sibling sample yields the same pattern (Appendix Table A.10).

A possible explanation for the mitigated effect in same-sex families is that same-gender siblings share caregiving and financial responsibilities among themselves, reducing individual burdens and limiting the impact on employment. For instance, when a daughter has a sister, caregiving time can be split between them, allowing both to remain employed. To test this, we use the full sibling sample, which includes families in which a daughter can have both a brother and a sister, and compare daughters (sons) who have only broth-

[24] Linking biological siblings requires information from wave 3; we therefore limit this analysis to respondents who participated in that wave.

ers (sisters) with those who also have at least one sister (brother). The presence of a same-gender sibling does not alter the effect, providing no support for this explanation (Appendix Tables A.11 and A.12).

The concentration of the effect in mixed-sex families instead points to gender norms: the presence of an opposite-gender sibling activates the traditional division of caregiving and financial roles. This interpretation is supported by evidence that growing up with an opposite-gender sibling strengthens traditional gender-role attitudes, with men who grow up with sisters adopting more conservative views and women with brothers facing more traditional expectations (Healy and Malhotra, 2013; Rao and Chatterjee, 2018); among women, this internalization of traditional norms further carries over into worse labor-market outcomes (Brenøe, 2018). A close parallel comes from Andresen and Nix (2022), who find that child caregiving is divided less equally in mixed-sex than in same-sex couples; by analogy, in families with mixed-sex siblings the caregiving and financial roles are more likely to fall along traditional gender lines.

Taken together, the gendered employment response is concentrated in families that include a sibling of the opposite gender, whose presence makes the traditional division of roles salient. This is consistent with our interpretation: the elder-care system, itself shaped by both policy and norms about family responsibility, determines whether a parental health shock calls for care or financial support, while gender norms assign caregiving to daughters and financial support to sons.

7 Heterogeneity by demographic characteristics

In this section, we assess the impact of parental health shocks on daughters' employment in family-based care countries, taking into account pre-shock personal characteristics of both parents and daughters. We are particularly interested in identifying differences based on parental gender, marital status, income (proxied by education), and voluntary insurance coverage. Additionally, we examine whether a parental health shock has different effects on daughters' employment depending on whether they have children of their own and whether they live near their parents.

We expect the effects to be more pronounced for daughters of unmarried parents, as married parents have a partner to rely on in addition to their daughters' help. We

also expect the effect to be stronger for children of parents with low incomes and no voluntary medical insurance, as these parents may rely more heavily on family support in the absence of alternative resources. Since most of the parents are already retired, a direct comparison of their earnings would be problematic; therefore, we examine whether the results differ based on the parents' education and whether the parents have voluntary insurance coverage. To test whether daughters take on more caregiving responsibility for their mothers, we analyze if this effect varies depending on whether the mother or the father experiences a health shock.

As for daughters' personal characteristics, the impact is expected to be more pronounced for those who lived closer to their parents before the health shock. There is no clear prediction about how having children affects a daughter's response to a parental health shock. On the one hand, childcare responsibilities may constrain a daughter's availability, potentially leading to a greater reduction in employment when caring for her parents. In addition, in family-oriented settings, a parent's health shock may lead the daughter to reduce employment if her parent previously provided childcare for her children. On the other hand, daughters who are already working less due to motherhood may have greater flexibility to care for their parents without further reducing employment.

Appendix Table A.13 presents the impacts of a parental health shock on daughters' employment in family-based care countries, stratifying the sample by the parent's gender and marital status two years prior to the health shock. The results indicate that the impact of a parental health shock on daughters' employment is the same, regardless of the parent's gender. As expected, daughters of unmarried parents (i.e., widowed, divorced, separated, or never married) experience a greater impact of a parental health shock on their employment compared to those whose parents are married. This may be because unmarried parents are more likely to rely on their daughters for care.

Appendix Table A.14 shows the effects of a parental health shock on daughters' employment, dividing the sample based on parents' education level (high school or less, or more than high school) and whether the parents had voluntary insurance coverage two years before the health shock. The findings show the observed effect is associated with children of parents who have lower levels of education. This may be because these parents cannot afford alternative formal care, unlike parents with higher levels of education. Furthermore, for those with private insurance, no negative effect on daughters' employment

is observed, as the insurance may cover the cost of alternative formal care.

As shown in Appendix Table A.15, the effect of a parental health shock on daughters' employment is negative and significant regardless of whether the daughter has children of her own pre-shock. However, the effect is negative and significant only if the daughter lived within 100 kilometers of her parents two years before the health shock; in contrast, if she lived farther away, the impact is smaller and not statistically significant.[25] This suggests that daughters living closer to their parents before the shock are more likely to provide support and assistance during health crises, hence impacting their employment. The coefficient remains negative and significant when excluding daughters residing in the same household two years before the health shock, indicating that the employment response is not merely driven by co-residence.[26]

Our analysis reveals that parental health shocks have a significant impact on daughters' employment, with the extent of this impact influenced by several factors. Daughters of unmarried parents, those whose parents have lower education levels or lack voluntary insurance, and those living within 100 kilometers of their parents face greater employment disruptions. The heterogeneity analysis is consistent with the claim that, in family-based care countries, daughters reduce their employment to provide care for their parents following a parental health shock.

8 Robustness

8.1 Balanced panel

All surveys face challenges related to attrition and non-response, and event-study designs are particularly sensitive to changes in sample composition over time. A key concern in our context is that individuals observed at later periods may differ systematically from those observed earlier, particularly if healthier individuals are more likely to remain in the sample. This could lead to biased estimates if changes in employment reflect shifts in who is observed rather than the true effects of the parental health shock.

To address this concern and enhance the credibility of our findings, we conduct an

[25] Distance to children is measured using parents' responses to the question "where does your child live?", which is reported in nine categorical distance brackets. To ensure comparability across waves, we aligned the category cut-offs and defined our indicator consistently as living less than 100 km away.

[26] Note that the subsample of co-residing daughters is too small to estimate the effect separately.

analysis using a balanced panel. Specifically, we restrict the sample to individuals who are observed both at event time *t=-2* and at *t=0*, and include only observations from these two periods. By doing so, we ensure that the effect of the parental health shock is estimated over a sample with a fixed composition. The results, presented in Appendix Table A.17, are consistent with our main findings, indicating that our results are not biased due to selective attrition.

8.2 Immigration and the 2008 financial crisis

One factor that could bias our results is the possibility that parents may relocate based on their anticipated health status. For example, parents can move from family-based or privately funded care countries to publicly funded care countries to make use of the public social support systems. Such behavior would introduce self-selection, whereby individuals choose the country they live in based on their health. To address this, we estimate the coefficients from Appendix Eq. (5) using a sample excluding the children of immigrant parents. The results, shown in Appendix Table A.18, remain unchanged, indicating that migration does not drive the results.

Another concern is that part of the observed effect may stem from the 2008 financial crisis, as different parents experienced the shock in different years, with some facing a health shock during the crisis. Given that countries like Italy and Spain were hit particularly hard by the crisis, the observed decrease in daughters' employment in these countries might be attributed to the crisis rather than to the health shock. We address this concern by estimating the coefficients from Appendix Eq. (5) using a sample that excludes individuals whose parents experienced a health shock in 2007, the year prior to the crisis. This sample thus excludes daughters who might have reduced their employment due to the crisis. The results in Appendix Table A.19 remain unchanged, indicating that the crisis does not drive the results.

8.3 Significant health shock

To validate that the selected conditions constitute a significant health shock, we examine the impact of the shock on two indicators of parents' health status. The first indicator is a dummy variable equaling 1 if a parent reported their health as at least good (i.e., good, very good, or excellent) and 0 otherwise. The second indicator is a dummy variable

equaling 1 if a parent reported taking medication at least once a week and 0 otherwise. We analyze the shock's impact on these indicators using the event-time coefficients estimated from Eq. (1), expressed as a percentage of the counterfactual outcome defined in Eq. (3).

Appendix Figure B.3 presents the results, showing that parents across all country types are significantly less likely to report good health and more likely to take medication regularly following a health shock. The absence of a gradual trend preceding the shock, combined with the sharp deterioration in health reporting afterward, confirms that the conditions considered in this study represent a significant and unanticipated deterioration in health.

Interestingly, while parents' health indicators show gradual recovery over the following six years, the decline in daughters' employment remains persistent (Figure 1). This divergence may be explained by state dependence in unemployment: even as parental health improves, the prolonged caregiving period may have reduced daughters' re-employment probability due to human capital depreciation or signaling effects (Kroft et al., 2013; Mueller et al., 2021; Alvarez et al., 2024).

8.4 Various health conditions

One potential concern is that the results may be driven by a specific health condition. A straightforward way to test for this would be to estimate the coefficients from Appendix Eq. (5) separately for each sample of individuals whose parents were diagnosed with the same condition. However, analyzing each condition separately is not feasible due to the limited sample size. Instead, we group conditions based on their similarities in disease progression and caregiving needs. Specifically, we categorize them into three groups: (1) heart attack and stroke, (2) Parkinson's and lung disease, and (3) cancer.

Appendix Table A.20 presents the impact of a parental health shock on children's employment by health condition, focusing on daughters' employment in family-based care countries and sons' employment in privately funded care countries. For daughters' employment in family-based care countries, the coefficients across all conditions are negative, suggesting that a parental health shock consistently reduces daughters' employment regardless of the specific condition. In privately funded care countries, the coefficients for sons' employment are all positive and similar in magnitude, albeit not all statistically significant. This indicates a consistent employment effect across different conditions, sug-

gesting that no single health condition drives the results.

9 Conclusion

In this study, we analyze the impact of parental health deterioration on children's employment. We find that in the pooled sample after a parental health shock, daughters' employment falls, while sons' employment remains stable. Borrowing from the child penalty literature, we calculate the "parental health shock penalty," referring to the effect of parental health deterioration on the labor market outcomes of adult daughters compared to adult sons. We show that a parental health shock widens the gender employment gap, with a long-run parental health shock penalty of 10%. We further demonstrate that this widening gender employment gap stems from two distinct margins. In countries where parents rely on informal care from relatives, daughters typically assume the caregiving role and reduce their employment. In countries where care is primarily paid for privately, sons often increase their employment in response to the rising financial burden.

This study makes several key contributions. First, we show that employment responses to parental health shocks depend on the combination of child gender and the country's elder-care policies and social norms, reconciling the mixed findings in prior work. Second, we link the employment effect of a parental health shock to changes in informal and formal care provided to parents. This provides new evidence on how the division of elder-care shapes adult children's allocation of time between paid work and caregiving. Finally, we show that the employment effects of a parental health shock vary systematically with siblings' gender composition, reflecting the gendered division of caregiving and financial responsibilities within families.

We find that in family-based care countries, namely Italy and Spain, following a health shock parents do not receive additional professional care. Instead, their children step in to meet the growing care needs. To balance family duties and work after their parents experience a health shock, daughters significantly reduce their employment by 9.1%. Sons' employment, however, is unaffected by the parental health shock in these countries. These findings align with the literature on child penalties. In comparison, this reduction is equivalent to a quarter of the mothers' *child penalty*, estimated at a 35% decrease in employment in Italy and Spain (Kleven et al., 2023).

In privately funded care countries, namely Germany and Switzerland, there is an increase in the use of formal professional care and in parents' healthcare expenditure following a health shock. In these countries, sons' employment increases by 5.5% following their parents' diagnosis. This suggests that sons increase their employment to adjust to the increasing healthcare expenditure. In contrast, a parental health shock does not affect daughters' employment in these countries.

In publicly funded care countries, namely Sweden and Denmark, where the government finances a large share of healthcare services, parents increase their use of professional care without a significant corresponding rise in healthcare expenditures. In addition, there is an increase in the probability of receiving health-related benefits and no increase in the likelihood of parents receiving help from their children. In these countries, we find no effect of a parental health shock on children's employment. This implies that when elder-care is predominantly publicly funded, children do not need to adjust their employment when their parents fall ill.

We find that the adverse effects for daughters and the positive effects for sons are driven by families with mixed-sex siblings. Our results suggest that the presence of both sons and daughters within the family amplifies traditional gender roles, leading to a more gendered division of caregiving and financial responsibilities, whereas such roles are less pronounced in families with only same-sex siblings.

Our findings demonstrate that where caregiving and breadwinning roles are strongly gendered, elder-care policies play a central role in reinforcing the gender employment gap: policies relying on family-based care primarily affect women, as they tend to take on the caregiver role. In contrast, in countries that rely on privately funded elder-care, the obligation to pay for these services primarily falls on men, who are more likely to fulfill the breadwinner role. Taken together, these results highlight how elder-care policies and norms about family caregiving obligations interact with gender norms to widen the employment gap between sons and daughters when parents fall ill.

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Appendix

A Tables

Table A.1: Number of individuals by country

Country	(1) Parents	(2) Children
Family-based		
Spain	764	2,089
Italy	633	1,559
Subtotal	*1,397*	*3,648*
Privately funded		
Germany	560	1,285
Switzerland	349	891
Subtotal	*909*	*2,176*
Publicly funded		
Sweden	556	1,431
Denmark	515	1,267
Belgium	735	1,845
Austria	574	1,412
France	756	1,890
Subtotal	*3,136*	*7,845*
Total	**5,442**	**13,669**

Notes: This table shows the number of parents and children by country and caregiving type.

Table A.2: Summary statistics

		By caregiving type		
	(1) Full sample	(2) Family-based	(3) Privately funded	(4) Publicly funded
Panel A: Parents				
Female	0.52	0.50	0.51	0.53
	(0.50)	(0.50)	(0.50)	(0.50)
Age at the time of shock	71.47	73.20	69.95	71.13
	(9.76)	(9.53)	(9.47)	(9.84)
More than high school	0.22	0.07	0.28	0.27
	(0.41)	(0.25)	(0.45)	(0.44)
Number of children	2.53	2.66	2.42	2.50
	(1.35)	(1.47)	(1.31)	(1.30)
Pre-shock employment (female)	0.11	0.06	0.21	0.11
	(0.32)	(0.24)	(0.41)	(0.31)
Pre-shock employment (male)	0.14	0.10	0.17	0.14
	(0.35)	(0.30)	(0.38)	(0.35)
Individuals	5,442	1,397	909	3,136
Panel B: Children				
Female	0.49	0.48	0.50	0.48
	(0.50)	(0.50)	(0.50)	(0.50)
Age at the time of shock	43.26	43.86	41.84	43.38
	(10.38)	(9.93)	(10.29)	(10.58)
More than high school	0.43	0.28	0.44	0.49
	(0.49)	(0.45)	(0.50)	(0.50)
Number of children	1.20	1.09	1.05	1.29
	(1.24)	(1.15)	(1.16)	(1.29)
Pre-shock employment (female)	0.73	0.62	0.72	0.79
	(0.44)	(0.48)	(0.45)	(0.41)
Pre-shock employment (male)	0.84	0.85	0.83	0.84
	(0.36)	(0.36)	(0.37)	(0.36)
Individuals	13,669	3,648	2,176	7,845

Notes: Averages during health shock (*t=0*). Standard deviations are in parentheses.

Table A.3: Parental health shock impacts by country type (six-country sample)

	Daughters			Sons		
	(1) Family	(2) Private	(3) Public	(4) Family	(5) Private	(6) Public
Employment	-0.058***	-0.020	0.013	-0.008	0.046***	-0.014
	(0.019)	(0.024)	(0.019)	(0.015)	(0.017)	(0.014)
Mean	*0.633*	*0.726*	*0.802*	*0.847*	*0.837*	*0.850*
Effect as % of mean	-9.1%	-2.8%	1.6%	-0.9%	5.5%	-1.7%
P-value (joint test)	0.032			0.011		
Number of observations	5,657	3,247	4,095	6,171	3,214	4,587
Number of individuals	1,708	1,062	1,253	1,869	1,058	1,386
Average number of:						
Pre-shock observations	1.61	1.52	1.60	1.60	1.54	1.55
Post-shock observations	1.76	1.60	1.73	1.77	1.57	1.81

Notes: This table shows the impacts of parental health shock on children's employment by country type based on Appendix Eq. (5), estimated on a six-country subsample. Columns (1)-(3) present the impact on daughters' employment in family-based, privately funded, and publicly funded care countries, respectively. Columns (4)-(6) present the impact on sons' employment in family-based, privately funded, and publicly funded care countries, respectively. The p-value reports a joint Wald test of whether parental health shock effects differ across country types. The average number of pre-shock and post-shock observations reports the average number of periods each individual is observed before and after the parental health shock, respectively. Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.4: Parental health shock and formal and informal care by country

	(1) Family-based	(2) Privately funded	(3) Publicly funded
Panel A: Help from children	0.065***	0.006	0.016
	(0.024)	(0.032)	(0.015)
Mean	*0.123*	*0.112*	*0.123*
Effect as % of mean	53.1%	5.5%	12.7%
Observations	10,890	5,875	22,661
# individuals	3,251	1,894	6,896
Panel B: Professional or paid help	0.009	0.046*	0.026*
	(0.019)	(0.027)	(0.014)
Mean	*0.039*	*0.025*	*0.058*
Effect as % of mean	23.5%	181.5%	46.0%
Observations	9,275	4,644	19,203
# individuals	2,848	1,547	5,903
Panel C: Healthcare expenditure	147	312**	98**
	(92)	(153)	(48)
Mean	*295*	*317*	*297*
Effect as % of mean	49.8%	98.6%	32.9%
Observations	9,315	5,157	19,442
# individuals	3,612	2,159	7,745
Panel D: Health-related benefits	0.009	0.017*	0.033***
	(0.012)	(0.010)	(0.008)
Mean	*0.052*	*0.024*	*0.067*
Effect as % of mean	16.5%	71.0%	48.5%
Observations	12,108	6,697	25,442
# individuals	3,618	2,170	7,752

Notes: This table shows the association between the parental health shock and children's help, professional care, healthcare expenditure, and health-related benefits, based on Appendix Eq. (5), using parent FE instead of child FE. The dependent variable in Panel A equals one if the parent indicates one of their children helps or provides them with personal care, and 0 otherwise. The dependent variable in Panel B equals one if the parent indicated they have received professional or paid help with domestic tasks, and 0 otherwise. The dependent variable in Panel C is the annual amount paid on healthcare in Euros in terms of Germany's prices in 2015. The dependent variable in Panel D equals one if a parent indicated they had received any LTC, disability, or sickness benefit from a public source, and 0 otherwise. Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.5: Parental health shock and formal and informal care by country (six-country sample)

	(1) Family-based	(2) Privately funded	(3) Publicly funded
Panel A: Help from children	0.065***	0.006	0.027
	(0.024)	(0.032)	(0.026)
Mean	*0.123*	*0.112*	*0.126*
Effect as % of mean	53.1%	5.5%	21.5%
Observations	10,890	5,875	7,717
# individuals	3,244	1,909	2,292
Panel B: Professional or paid help	0.009	0.046*	0.029*
	(0.019)	(0.027)	(0.017)
Mean	*0.039*	*0.025*	*0.031*
Effect as % of mean	23.5%	181.5%	93.5%
Observations	9,275	4,644	7,135
# individuals	2,765	1,553	2,175
Panel C: Healthcare expenditure	147	312**	51
	(92)	(153)	(37)
Mean	*295*	*317*	*260*
Effect as % of mean	49.8%	98.6%	19.6%
Observations	9,315	5,157	7,211
# individuals	3,612	2,159	2,677
Panel D: Health-related benefits	0.009	0.017*	0.054***
	(0.012)	(0.010)	(0.015)
Mean	*0.052*	*0.024*	*0.112*
Effect as % of mean	16.5%	71.0%	47.9%
Observations	12,108	6,697	8,938
# individuals	3,620	2,170	2,679

Notes: This table shows the association between the parental health shock and children's help, professional care, healthcare expenditure, and health-related benefits, based on Appendix Eq. (5), estimated on a six-country subsample. The dependent variable in Panel A equals one if the parent indicates one of their children helps or provides them with personal care, and 0 otherwise. The dependent variable in Panel B equals one if the parent indicated they have received professional or paid help with domestic tasks, and 0 otherwise. The dependent variable in Panel C is the annual amount paid on healthcare in Euros in terms of Germany's prices in 2015. The dependent variable in Panel D equals one if a parent indicated they had received any LTC, disability, or sickness benefit from a public source, and 0 otherwise. Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.6: Parental health shock and care for individuals who answered all questions

	(1) Family-based	(2) Privately funded	(3) Publicly funded
Panel A: Help from children	0.066***	0.007	0.016
	(0.024)	(0.034)	(0.015)
Mean	*0.124*	*0.108*	*0.122*
Effect as % of mean	53.2%	6.6%	12.9%
Observations	10,834	5,673	22,424
Panel B: Professional or paid help	0.010	0.046*	0.027*
	(0.019)	(0.027)	(0.014)
Mean	*0.039*	*0.026*	*0.058*
Effect as % of mean	27.2%	177.7%	45.7%
Observations	9,141	4,545	18,866
Panel C: Healthcare expenditure	146	314*	100**
	(93)	(169)	(48)
Mean	*298*	*321*	*299*
Effect as % of mean	49.1%	98.0%	33.4%
Observations	9,174	4,918	19,056
Panel D: Health-related benefits	0.009	0.016	0.031***
	(0.012)	(0.010)	(0.009)
Mean	*0.053*	*0.024*	*0.068*
Effect as % of mean	17.5%	63.5%	45.7%
Observations	11,883	6,349	24,799
# individuals	3,539	2,025	7,535

Notes: This table shows the association between the parental health shock and children's help, professional care, healthcare expenditure, and health-related benefits, based on Appendix Eq. (5) for individuals who answered all four questions in at least one year, using parent FE instead of child FE. The dependent variable in Panel A equals one if the parent indicates one of their children helps or provides them with personal care, and 0 otherwise. The dependent variable in Panel B equals one if the parent indicated they have received professional or paid help with domestic tasks, and 0 otherwise. The dependent variable in Panel C is the annual amount paid on healthcare in Euros in terms of Germany's prices in 2015. The dependent variable in Panel D equals one if a parent indicated they had received any LTC, disability, or sickness benefit from a public source, and 0 otherwise. Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.7: Parental health shock by gender of daughters' siblings, family-based countries (two-child families)

	(1) Has siblings	(2) Same-sex siblings	(3) Mixed-sex siblings
Employment	-0.045	0.104	-0.080**
	(0.036)	(0.066)	(0.040)
Mean	*0.641*	*0.678*	*0.631*
Effect as %	-7.1%	15.3%	-12.6%
Observations	1,121	231	890
# individuals	296	62	234

Notes: This table shows the impacts of parental health shock on daughters' employment in family-based care countries by gender of daughters' siblings based on Appendix Eq. (5). The analysis is restricted to daughters from two-child families. Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.8: Parental health shock by gender of daughters' siblings, family-based care countries

	(1) Has siblings	(2) Same-sex siblings	(3) Mixed-sex siblings
Employment	-0.058***	0.048	-0.081***
	(0.022)	(0.041)	(0.026)
Mean	*0.641*	*0.678*	*0.631*
Effect as %	-9.1%	7.0%	-12.9%
Observations	3,504	783	2,721
# individuals	920	204	716

Notes: This table shows the impacts of parental health shock on daughters' employment in family-based care countries by gender of daughters' siblings based on Appendix Eq. (5). Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.9: Parental health shock by gender of the sons' siblings, privately funded care countries (two-child families)

	(1) Has siblings	(2) Same-sex siblings	(3) Mixed-sex siblings
Employment	0.079**	-0.036	0.125***
	(0.033)	(0.025)	(0.043)
Mean	*0.838*	*0.876*	*0.821*
Effect as %	9.4%	-4.1%	15.2%
Observations	617	158	459
# individuals	165	42	123

Notes: This table shows the impacts of parental health shock on sons' employment in privately funded care countries by gender of sons' siblings based on Appendix Eq. (5). The analysis is restricted to sons from two-child families. Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.10: Parental health shock by gender of sons' siblings, privately funded care countries

	(1) Has siblings	(2) Same-sex siblings	(3) Mixed-sex siblings
Employment	0.048**	0.014	0.062**
	(0.019)	(0.021)	(0.025)
Mean	*0.838*	*0.876*	*0.821*
Effect as %	5.7%	1.6%	7.5%
Observations	1,692	521	1,171
# individuals	459	143	316

Notes: This table shows the impacts of parental health shock on sons' employment in privately funded care countries by gender of sons' siblings based on Appendix Eq. (5). Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.11: Parental health shock by gender of daughters' siblings, family-based care countries (brothers only vs. a sister present)

	(1) Has siblings	(2) Only brothers	(3) Has a sister
Employment	-0.058***	-0.061	-0.058**
	(0.022)	(0.041)	(0.026)
Mean	*0.641*	*0.608*	*0.655*
Effect as %	-9.1%	-10.0%	-8.9%
Observations	3,504	1,011	2,493
# individuals	920	269	651

Notes: This table shows the impacts of parental health shock on daughters' employment in family-based care countries by gender of daughters' siblings: brothers only vs. a sister present, based on Appendix Eq. (5). Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.12: Parental health shock by gender of sons' siblings, privately funded care countries (sisters only vs. a brother present)

	(1) Has siblings	(2) Only sisters	(3) Has a brother
Employment	0.048**	0.044	0.048**
	(0.019)	(0.034)	(0.022)
Mean	*0.838*	*0.832*	*0.840*
Effect as %	5.7%	5.3%	5.7%
Observations	1,692	531	1,161
# individuals	459	141	318

Notes: This table shows the impacts of parental health shock on sons' employment in privately funded care countries by gender of sons' siblings: sisters only vs. a brother present, based on Appendix Eq. (5). Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.13: Parental health shock impacts by parents' gender and marital status, family-based care countries

	Parent's gender		Parent's marital status	
	(1) Father	(2) Mother	(3) Married	(4) Unmarried
Employment	-0.065**	-0.061**	-0.043**	-0.101**
	(0.032)	(0.025)	(0.021)	(0.040)
Mean	*0.669*	*0.601*	*0.643*	*0.587*
Effect as % of mean	-9.8%	-10.1%	-6.7%	-17.2%
Observations	2,650	3,005	4,416	1,135
# individuals	812	894	1,327	346

Notes: This table shows the impacts of parental health shock on daughters' employment in family-based care countries by parents' gender and pre-shock marital status based on Appendix Eq. (5). Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.14: Parental health shock impacts by parents' education and insurance status, family-based care countries

	Parent's education		Parent's insurance status	
	(1) HS and less	(2) More than HS	(3) No voluntary insur.	(4) Voluntary insur.
Employment	-0.067***	0.094	-0.066***	0.044
	(0.020)	(0.067)	(0.024)	(0.063)
Mean	*0.631*	*0.638*	*0.626*	*0.641*
Effect as % of mean	-10.7%	14.7%	-10.5%	6.8%
Observations	5,216	324	3,014	556
# individuals	1,546	105	790	175

Notes: This table shows the impacts of parental health shock on daughters' employment in family-based care countries by pre-shock parents' education and insurance status based on Appendix Eq. (5). Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.15: Parental health shock impacts by daughter's fertility and residential distance, family-based care countries

	Daughter's fertility		Daughter's distance from parents		
	(1) Has children	(2) No children	(3) $\geq$ 100 km	(4) $<$ 100 km	(5) $<$ 100 km Not same HH
Employment	-0.064***	-0.045*	0.019	-0.079***	-0.090***
	(0.024)	(0.027)	(0.069)	(0.026)	(0.029)
Mean	*0.613*	*0.670*	*0.735*	*0.627*	*0.650*
Effect as % of mean	-10.4%	-6.8%	2.6%	-12.7%	-13.9%
Observations	3,791	1,903	387	3,285	2,677
# individuals	1,126	550	119	1,030	842

Notes: This table shows the impacts of parental health shock on daughters' employment in family-based care countries by pre-shock daughter's fertility and pre-shock residential distance based on Appendix Eq. (5). Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.16: Parental health shock impacts, individuals aged 25-34

	Daughters			Sons		
	(1) Family	(2) Private	(3) Public	(4) Family	(5) Private	(6) Public
Employment	-0.057**	0.007	0.007	0.004	0.051***	0.003
	(0.027)	(0.035)	(0.014)	(0.019)	(0.018)	(0.012)
Mean	*0.659*	*0.742*	*0.807*	*0.841*	*0.827*	*0.851*
Effect as % of mean	-8.6%	0.9%	0.8%	0.5%	6.2%	0.3%
Observations	3,144	1,749	6,343	3,440	1,894	7,013
# individuals	937	563	1,939	1,028	614	2,162

Notes: This table shows the impacts of parental health shock on children's employment by type of country based on Appendix Eq. (5), for individuals aged 25-34. Columns (1)-(3) present the impact on daughters' employment in family-based care, privately funded care, and publicly funded care countries, respectively. Columns (4)-(6) present the impact on sons' employment in family-based care, privately funded care, and publicly funded care countries, respectively. Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.17: Parental health shock impacts, balanced panel

	Daughters			Sons		
	(1) Family	(2) Private	(3) Public	(4) Family	(5) Private	(6) Public
Employment	-0.077*	-0.009	0.014	0.008	0.083**	-0.002
	(0.043)	(0.044)	(0.022)	(0.031)	(0.033)	(0.018)
Mean	*0.643*	*0.763*	*0.802*	*0.826*	*0.849*	*0.848*
Effect as % of mean	-11.9%	-1.2%	1.7%	1.0%	9.8%	-0.3%
Observations	1,546	1,194	3,658	1,754	1,196	3,926
# individuals	773	597	1,829	877	598	1,963

Notes: This table shows the impacts of parental health shock on children's employment by type of country based on Appendix Eq. (5). The sample is restricted to individuals who are observed both at *t=-2* and *t=0*, and includes only observations from these two periods, replacing individual fixed effects with a set of controls: age, parental gender, parental education level, number of siblings, and calendar year. Columns (1)-(3) present the impact on daughters' employment in family-based, privately funded, and publicly funded care countries, respectively. Columns (4)-(6) present the impact on sons' employment in family-based, privately funded, and publicly funded care countries, respectively. Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.18: Parental health shock impacts, excluding immigrants

	Daughters			Sons		
	(1) Family	(2) Private	(3) Public	(4) Family	(5) Private	(6) Public
Employment	-0.060***	-0.010	0.014	-0.005	0.045**	-0.004
	(0.020)	(0.025)	(0.011)	(0.015)	(0.019)	(0.009)
Mean	*0.634*	*0.727*	*0.801*	*0.847*	*0.843*	*0.858*
Effect as % of mean	-9.4%	-1.4%	1.8%	-0.6%	5.3%	-0.5%
Observations	5,506	2,729	10,781	6,035	2,637	11,383
# individuals	1,658	888	3,301	1,822	867	3,486

Notes: This table shows the impacts of parental health shock on children's employment by type of country based on Appendix Eq. (5), excluding children whose parents immigrated to their country of residence. Columns (1)-(3) present the impact on daughters' employment in family-based, privately funded, and publicly funded care countries, respectively. Columns (4)-(6) present the impact on sons' employment in family-based, privately funded, and publicly funded care countries, respectively. Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.19: Parental health shock impacts, excluding the year 2007

	Daughters			Sons		
	(1) Family	(2) Private	(3) Public	(4) Family	(5) Private	(6) Public
Employment	-0.062***	-0.020	0.009	-0.010	0.035*	0.005
	(0.023)	(0.027)	(0.012)	(0.018)	(0.019)	(0.011)
Mean	*0.637*	*0.721*	*0.798*	*0.844*	*0.834*	*0.851*
Effect as % of mean	-9.7%	-2.7%	1.1%	-1.2%	4.2%	0.6%
Observations	4,740	2,740	10,102	5,083	2,767	10,659
# individuals	1,429	891	3,095	1,539	893	3,259

Notes: This table shows the impacts of parental health shock on children's employment by type of country based on Appendix Eq. (5), excluding children whose parents experienced a health shock in the year 2007. Columns (1)-(3) present the impact on daughters' employment in family-based, privately funded, and publicly funded care countries, respectively. Columns (4)-(6) present the impact on sons' employment in family-based, privately funded, and publicly funded care countries, respectively. Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

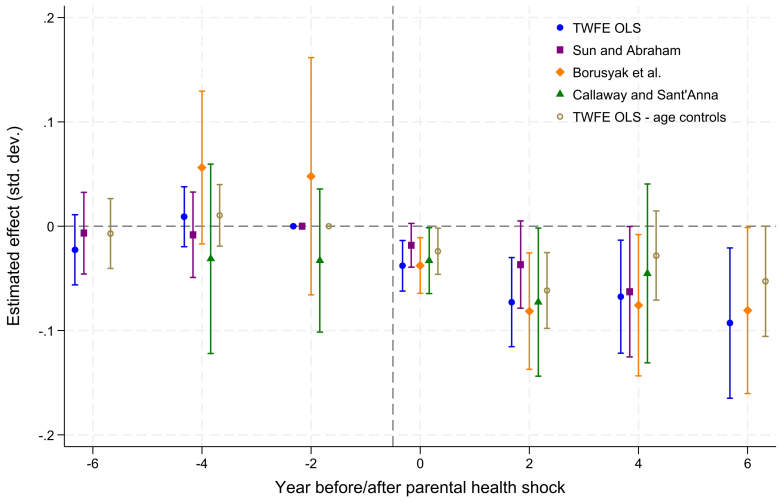
Table A.20: Parental health shock impacts by health condition

	Daughters, family-based			Sons, privately funded		
	(1) Heart attack & Stroke	(2) Parkinson's & Lung disease	(3) Cancer	(4) Heart attack & Stroke	(5) Parkinson's & Lung disease	(6) Cancer
Employment	-0.070***	-0.062*	-0.098**	0.047**	0.063**	0.029
	(0.023)	(0.037)	(0.044)	(0.023)	(0.029)	(0.030)
Mean	*0.756*	*0.722*	*0.734*	*0.792*	*0.758*	*0.780*
Effect as %	-9.3%	-8.6%	-13.3%	5.9%	8.4%	3.7%
Observations	3,184	1,967	887	1,615	974	799
# individuals	954	602	277	525	329	258

Notes: This table shows the impacts of parental health shock on children's employment by health condition based on Appendix Eq. (5). Columns (1)-(3) present the impact on daughters' employment in family-based care countries. Columns (4)-(6) present the impact on sons' employment in privately funded care countries. Standard errors are clustered at the parental household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

B Figures

Panel A - Daughters' employment



Panel B - Sons' employment

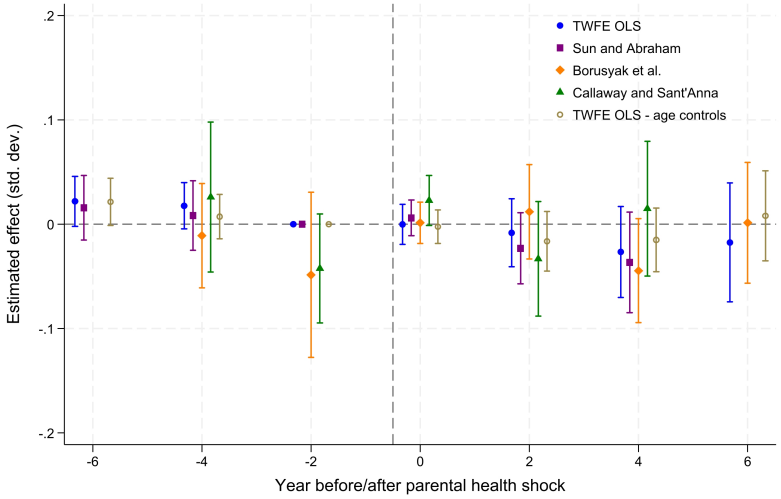
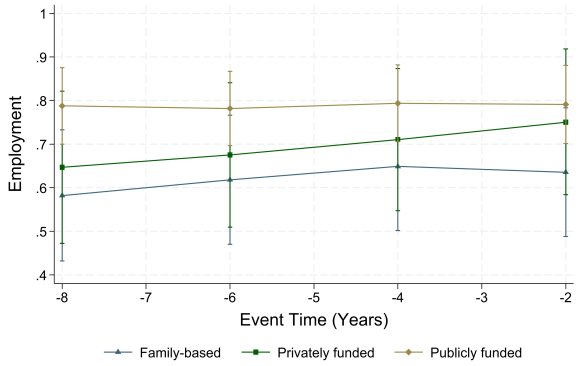


Figure B.1: Parental health shock impacts on children's employment: alternative estimators.

Notes: This figure presents event-study estimates of the impact of a parental health shock on children's employment, separated by gender, in the pooled sample of six countries. The time variable represents periods relative to the parental health shock, and the outcome variable is the child employment indicator. Panel A shows results for daughters, and Panel B for sons. We overlay estimates obtained using five different approaches: TWFE OLS model estimated by Eq. (1) (blue circles), Sun and Abraham (2021) (purple squares), Borusyak et al. (2024) (orange diamonds), Callaway and Sant'Anna (2021) (green triangles), and TWFE OLS using age group FE defined in five-year age intervals (brown hollow circles). Bars indicate 95% confidence intervals, and standard errors are clustered at the parental household level. Some specifications do not allow for separate identification of early or late event-time periods due to the absence of an appropriate comparison group (for example, at $t = -6$, all individuals belong to the not-yet-treated group). In the Sun and Abraham (2021) estimator we use a group of children whose parents experienced a health shock in 2019 as a control group, to allow for the estimation at $t = 4$. We include two pre-treatment periods when applying the Borusyak et al. (2024) estimator to balance the trade-off between adding more leads and maintaining precision.

B.2.1 Daughters' employment



B.2.2 Sons' employment

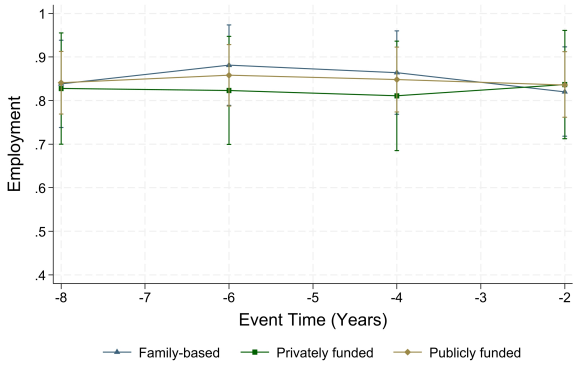
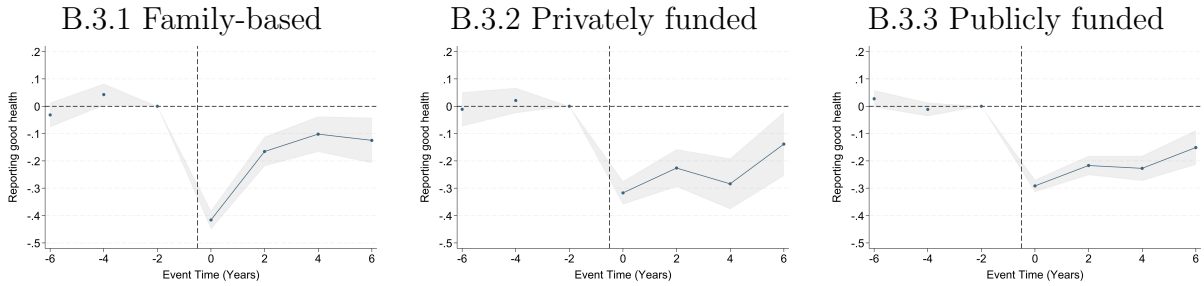


Figure B.2: Employment prior to parental health shock.

Notes: These figures examine the trend in child employment before their parents' health shock by type of country. Subfigure B.2.1 pertains to daughters' employment, while Subfigure B.2.2 pertains to sons' employment. All estimates control for country, calendar year, and year of birth fixed effects. Including 95 percent confidence intervals, with standard errors clustered at the parental household level.

Panel A - Reporting good health



Panel B - Taking medications

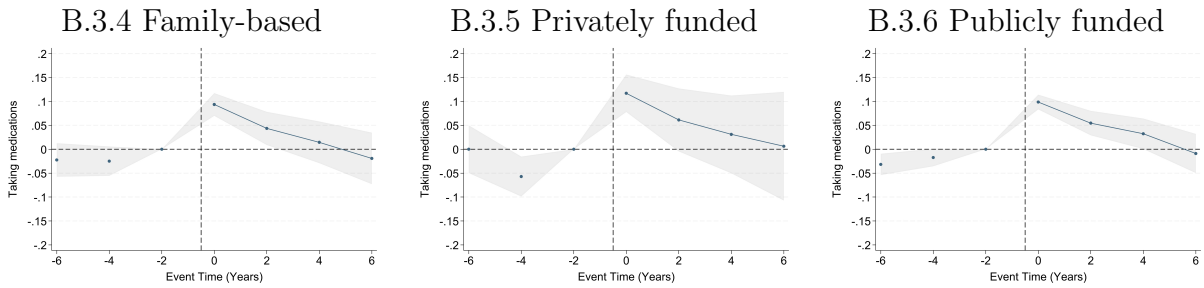


Figure B.3: Parental health shock impacts on parents' health indicators.

Notes: This figure shows the impacts of parental health shock on parents' health indicators by type of country. Panel A presents the impacts on the probability of reporting good health, and Panel B on the probability of taking medications at least once a week. Each subfigure shows the event-study coefficients estimated from Eq. (1) expressed as a percentage of the counterfactual outcome defined in Eq. (3). Bootstrapped 95% confidence intervals from 500 replications are shown; standard errors are clustered at the parental household level.

C Variable definitions

Variable	Description
Help from children	Equals 1 if the parent indicated a child had provided them with help or personal care in the last 12 months, 0 otherwise.
Professional or paid help	Equals 1 if the parent indicated they had received professional or paid help with domestic tasks in the last 12 months, 0 otherwise.
Healthcare expenditure	Parents' out-of-pocket expenditure in the last 12 months for inpatient care, nursing home, outpatient care and medications. In euros, in terms of Germany's prices in 2015.
Health-related benefits	Equals 1 if a parent reported they received any public LTC, disability, or sickness benefit in the last 12 months, 0 otherwise.
Age at the time of shock	The age of the parent/child in years at the year the parent indicated they were diagnosed with a health condition.
More than high school	Equals 1 if the parent/child has more than a high school diploma, 0 otherwise.
Number of children	The number of children the parent/child has.
Employment	Equals 1 if the parent/child is employed full-time, part-time, self-emp or working for their family business, and 0 otherwise.
Event time	The number of years relative to the parental health shock.
Reporting good health	Equals 1 if the parent reports excellent, very good, or good health, 0 otherwise (fair or poor health).
Taking medications	Equals 1 if the parent indicated they currently take any medication at least once a week for a health condition, 0 otherwise.
Child's distance from parents	Equals 1 if the parent indicated their child resides less than 100 km away, 0 otherwise.
Married	Equals 1 if the parent/child is married, living together with a spouse or in a registered partnership, 0 otherwise (including: widowed, divorced, never married, or married but living separated).
Voluntary insurance	Equals 1 if the parent has any voluntary, supplementary or private health insurance, 0 otherwise.

D List of health conditions available in SHARE

- A heart attack, including myocardial infarction or coronary thrombosis, or any other heart problem including congestive heart failure
- High blood pressure or hypertension
- High blood cholesterol
- A stroke or cerebral vascular disease
- Diabetes or high blood sugar
- Chronic lung disease such as chronic bronchitis or emphysema
- Asthma
- Arthritis, including osteoarthritis, or rheumatism
- Osteoporosis
- Cancer or malignant tumor, including leukemia or lymphoma, but excluding minor skin cancers
- Stomach or duodenal ulcer, peptic ulcer
- Parkinson's disease
- Cataracts

E Static staggered DiD specification

In some analyses, to address limited sample sizes and maximize statistical power, we estimate a static staggered difference-in-differences (DiD) specification rather than the full dynamic event-study design. Specifically, we take the event-study equation (Eq. (1)) and collapse the individual event-time year dummies into a single indicator capturing the entire post-event period ($Post\,Shock_{ip}$). Formally, we estimate the following two-way fixed effects (TWFE) model:

$$y^g_{ijcp} = c_i + \gamma^g_{cp} + \beta^g Post\,Shock_{ip} + \epsilon_{ijcp} \tag{5}$$

Where $Post\,Shock_{ip} = 1$ if in year p individual i is observed after the parental health shock (k $\geq$ 0). All other variables are previously defined. Standard errors are clustered at the parental household level.

F Caregiving norms

We examine attitudes on whether the children or the government hold the responsibility for caring for ill parents using the joint World Values Survey (WVS) and European Values Study (EVS) Wave 7, conducted from 2017 to 2022. In these surveys, subjects were asked how much they agreed with the statements "Adult children have the duty to provide long-term care for their parents" and "The government should take more responsibility to ensure that everyone is provided for."

We construct dummy variables equal to 1 if the respondent agrees or strongly agrees with each statement, and 0 otherwise. Figure F.1 illustrates the percentage of respondents who agree with each statement in each type of country. The figure demonstrates significant differences in views across country types. Agreement with the statement about the duty of children to care for parents is highest in family-based care countries (67%), followed by privately funded (39%) and publicly funded care countries (22%). The reverse holds for support of government responsibility: 72% agree in publicly funded care countries, compared to 63% and 46% in privately funded and family-based care countries, respectively. These results show that caregiving values in these countries align with the division of elder-care between the family and the government.

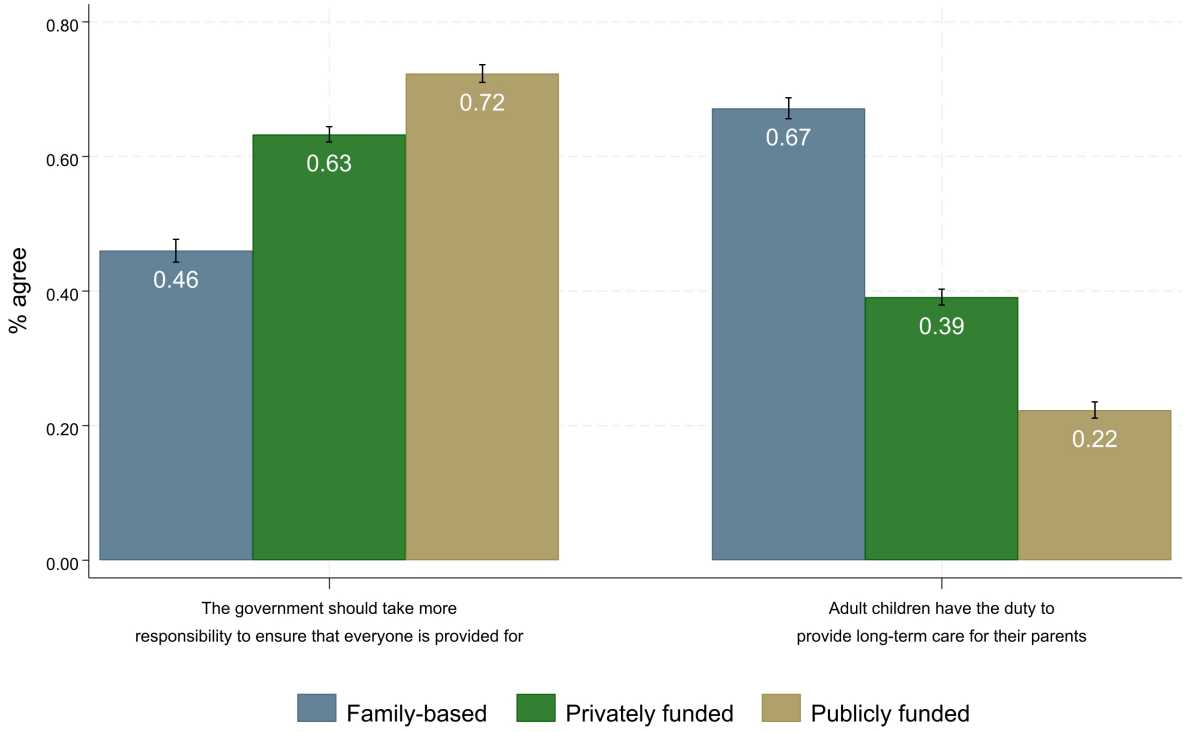


Figure F.1: Views on caregiving roles by country type.

Notes: This figure displays the percentage of respondents in each type of country who answered either "agree" or "agree strongly" to the question indicated at the bottom. *Source:* Authors' calculations, data from the joint World Values Survey and European Values Study Wave 7 (2017-2022) available at https://search.gesis.org/research_data.