The Career Costs of Children's Health Shocks

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Abstract

We provide novel evidence on the impact of a child's health shock on parental labor market outcomes. To identify the causal effect, we leverage long panels of high-quality Finnish and Norwegian administrative data and exploit variation in the timing of the health shock. We do this by comparing parents across families in similar parental and child age cohorts whose children experienced a health shock at different ages. We show that these families have very similar characteristics and were following parallel trends before the event. This allows us to use a simple difference-in-differences model: we construct counterfactuals for treated households with families who experience the same shock a few years later. We find a sharp break in parents' earnings trajectories that becomes visible just after the shock. The negative effect is persistent and stronger for mothers than for fathers. We also document a substantial impact on parents' mental well-being. Our results suggest that the effect on maternal labor earnings results from the combination of increased time needed to care for the child and the worsening of mothers' mental health.

Keywords: Children, health, mortality, parents, earnings, labor supply, mental health.

JEL Codes: I10, I12.

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1 Introduction

Economists have long been interested in understanding the relationship between income and health (Deaton, 2013). The detrimental effect of health shocks on an individual's own labor market outcomes is well documented.[1] However, we know much less about the potential spillover effects of children's health shocks on parents' labor market careers.

This is striking given that the hospitalization of a child is a situation faced by a relatively large number of families. For example, nearly one out of every six discharges from U.S. hospitals in 2012 was for children aged 17 years and younger (Witt et al., 2014). In Finland, if we follow one cohort over time, nearly 50% of children born in 1990 had at least one stay at the hospital before they turned 18. In addition, more than 10% of children from this cohort suffered their first hospitalization after they started school.

The illness of a child is a stressful event that can have major implications for the well-being of the whole household. Families can incur substantial costs when deciding how to best cope with these health shocks and their associated long-term burden. For example, parents may need to decrease their labor supply to increase the time spent caring for their child. Moreover, these shocks can also have significant gender inequality repercussions if women are more likely than men to take the bulk of caregiving responsibilities or carry the mental health burden in the household. Understanding the multifaceted ways in which parenthood disparately affects mothers compared to fathers in the labor market is critical. However, our knowledge of how children's health shocks (both non-fatal and fatal) impact the economic well-being of families is surprisingly limited.

This paper contributes to bridging this gap by providing new evidence on the causal impact of a child's health shock on parental outcomes. We examine the effects of both hospitalizations and fatal health shocks on parents by leveraging long panels of high-quality administrative data from Finland and Norway on families' health and labor market trajectories. We exploit variation in the timing of health shocks among families of otherwise healthy children who had a first health shock after school-starting age. Identification comes from comparisons of parents and children in the same respective age cohorts, but whose children experienced the health shock at different ages. In

[1] This includes, among others, papers by Bound et al. (1999); Cai et al. (2014); Dobkin et al. (2018); García-Gómez (2011); García-Gómez et al. (2013); Jones et al. (2019); Lindeboom et al. (2016); Lenhart (2019); Maczulskij and Böckerman (2019); Meyer and Mok (2019); Trevisan and Zantomio (2016); Wagstaff (2007).

particular, we use a difference-in-differences specification: we construct counterfactuals for treated households with families who experience the same shock a few years later. We show that these families have very similar characteristics and were following very similar trends before the shock. We also complement this approach by estimating a simple event study model with individual fixed effects.

With these data and design, we estimate parents' labor supply responses to children's hospitalization and mortality shocks. We first show that there is no indication that parents' outcomes follow different trends for the treatment and the control group before the health shock of the child. Sharp breaks in the trajectories become visible just after the event for all outcomes. Overall, we find that maternal earnings suffer a substantial and persistent drop after the hospitalization or death of a child. Interestingly, data from two countries allows us to document the strong robustness of our findings: the effect size is strikingly similar, three years after a hospitalization, maternal earnings are 4.6% lower in Finland and 4.7% lower in Norway, compared to two years before the shock. For fathers, the impact is insignificant, and the estimated coefficients are much smaller. For mortality shocks, we find that the mother's earnings drop by more than 20% three years after the shock, while for fathers, we again see no significant effect. The fact that we find almost identical results for all these outcomes in the context of two different countries that share a similar institutional context strengthens the robustness of our approach and the external validity of our findings.

We also analyze a critical question in this setting: are families insured against such health shocks hitting their children? We show that although transfers offset part of the negative impact, families are not fully insured against these shocks: the drop in income after taxes is only about 30 percent smaller than in the baseline case. Moreover, the insurance effect coming from child benefits fades over time, reducing the protective impact on mothers' careers. This result suggests that in the absence of a well-developed safety net, the impact on women's labor market outcomes could be even more substantial.

Crucially, we exploit the richness and complementarities of the data from both countries to explore several potential mechanisms. In Finland, we use occupational data to explore whether mothers adjust their labor supply by switching the type of firm they work for. We do not find evidence that mothers move to more family-friendly firms after the shock. We also do not observe changes in the risk of marital dissolution in either country. However, we find that children's health shocks have a substantial impact on the mental well-being of parents. The data from the Norwegian registry allows us to investigate the effect on primary care visits, while for Finland, we use data on specialist visits or hospital admissions. Additionally, we explore if the increased care burden drives the effect of hospitalizations. We show that the impact is stronger for health shocks that require substantial care, as measured by the number of hospital visits in the year after the shock. We also show that the adverse effects are more substantial if the grandparents do not live close to the family. Our results thus suggest that the impact of a child's hospitalization on maternal labor earnings might result from the combination of the increased time needed to care for the child and the worsening of parents' mental health. In contrast, we show that the mental health shock is the primary mechanism behind the large effects on maternal labor earnings for mortality shocks.

This paper contributes to several strands of the literature, including work studying the relationship between children's health and parents' labor market outcomes. Several previous studies find a negative association between childhood disability or illness and maternal employment (e.g, Wasi et al., 2012; Wolfe and Hill, 1995) (see Stabile and Allin (2012) for a review of these papers). A few papers make use of panel data and try to control for previous employment situation (Baydar et al., 2007; Burton et al., 2017; Kvist et al., 2013; Powers, 2003) or match treated and control children on observable characteristics (van den Berg et al., 2017; Eriksen et al., 2021)[2]. However, children's health status is unlikely to be randomly distributed across families, meaning that families whose children have poorer health are likely to be different from other families. This makes it difficult to distinguish between the effect of having a child with an illness and that of other confounding characteristics on maternal employment.

This paper advances the existing knowledge by providing credible causal evidence of the spillover effects of child health shocks by using high-quality administrative data covering the entire population of two different countries. We use a research design that allows us to exploit precisely and objectively identified health shocks and focus on a sample of similar families, differing only in the age at which their child suffered the health shock. Our study shows clear-cut results, and the fact that we use data from Finland and Norway allows us to demonstrate the robustness and magnitude

[2]Eriksen et al. (2021) is an exception in addressing the endogeneity issue. They focus on a restricted sample of health conditions: children diagnosed with Type 1 Diabetes. They match the treatment group to control children that do not develop diabetes, taking into account birthdate and gender, and use a differences-in-differences design. van den Berg et al. (2017) focus on mortality shocks and match parents whose child died in a non-intentional accident to parents who did not lose a child.

of the effect of this shock on mothers' labor market careers. Moreover, the richness of our data enables us to examine previously unexplored channels in the literature. We first explore what type of hospitalizations drive the negative impact on maternal labor earnings. We show that recurrent and high burden of care hospitalizations play a major role. We also provide novel evidence on the role of public insurance and the influence of the parent's mental health shock. Understating this is crucial to better design policies that can help mitigate the negative impacts of these disruptions. In addition, we also provide compelling evidence of the effects of health shocks broadly defined. This allows us to contrast the magnitude of the effects with the literature that has studied the impact of health shocks during adulthood on own labor supply.

More broadly, this paper contributes to the literature on the effects of adverse health shocks on labor market outcomes. Most studies focus on the impact of health shocks on the individual's own labor market outcomes (e.g, Bound et al., 1999; Cai et al., 2014; Dobkin et al., 2018; García-Gómez, 2011; García-Gómez et al., 2013; Jones et al., 2019; Lindeboom et al., 2016; Lenhart, 2019; Meyer and Mok, 2019; Trevisan and Zantomio, 2016; Wagstaff, 2007). Using an event study approach, Dobkin et al. (2018) examine the economic consequences of hospitalizations for adults in the US. They find that earnings drop by 20% three years after a hospitalization. Meyer and Mok (2019) use survey data from the US and estimate a similar drop in earnings ten years after the onset of a disability.

Other studies have examined the spillover effects of health shocks, with particular attention paid to how one spouse's health shock affects the other spouse's employment and earnings.[3] Fadlon and Nielsen (2017) analyze the impact of a spouse experiencing a fatal or severe non-fatal shock on household labor supply. Using administrative data from Denmark and exploiting event studies together with a dynamic difference-in-differences approach, they find that fatal health shocks lead to an increase in the labor supply of the surviving spouse. In contrast, they do not find any significant response following a non-fatal health shock.[4] García-Gómez et al. (2013) explore the spillover effects of an acute hospitalization using data from the Netherlands. They find gender asymmetries in the response to a spouse's health shock: while wives are more likely to continue—or even start—working when their husbands fall ill, husbands are more likely to withdraw from the

[3]See, for example, García-Gómez et al. (2013); Fadlon and Nielsen (2017); Jeon and Pohl (2017); Jiménez-Martín et al. (1999).

[4]In their study, heart attacks and strokes comprise severe non-fatal health shocks.

labor force when their wives fall ill. Jeon and Pohl (2017) use administrative data from Canada and observe a significant decline in the employment and earnings of individuals whose spouses are diagnosed with cancer.

Rellstab et al. (2019) instead examine the spillover effects of an older parent's unexpected hospitalization[5] on their children's labor supply. Utilizing a difference-in-differences model and administrative data from the Netherlands they do not find significant effects on either employment or earnings. Frimmel et al. (2020) focus on parental health shocks that increase care dependency abruptly and find a significant negative impact on the labor market activities of children.[6]

This study also speaks to the literature that investigates the impact of parenthood on family labor supply, which shows sizeable effects on mothers' labor supply and earnings.[7] The most recent studies estimate that women's earnings decrease considerably following the birth of their first child, and this effect is persistent. The so-called child penalty[8] amounts to around 20% over the long run in the Nordic countries (Kleven et al., 2019b; Sieppi and Pehkonen, 2019), between 30% and 45% in the United Kingdom and the United States, and as high as 50%-60% in Germany and Austria (Kleven et al., 2019a). In addition, Snaebjorn and Steingrimsdottir (2019) find that the child penalty is larger in families in which a child is born with a disability: affected mothers earn 13% less in the long run, while affected fathers earn 3% less.

We show here that even in two countries usually seen as leaders in gender equality and considered to have some of the most comprehensive gender and family policies in the OECD (OECD, 2018),[9] health shocks during middle childhood to adolescence still have a disproportionate effect on women's labor market outcomes compared to men. Moreover, the impact on women's labor earnings is substantial: it amounts to around 20% of the estimated drop in maternal earnings three years after childbirth in Finland (Sieppi and Pehkonen, 2019) and 23% in Norway (Andresen and Nix,

[5]They exploit diagnoses classified by physical expert opinion as being unexpected hospitalizations, and thus plausibly exogenous.

[6]Black et al. (2017) study the impact of having a sibling with a disability and find a negative spillover effect on children's test scores.

[7]This includes, among others, papers by Adda et al. (2017); Angrist and Evans (1998); Angelov et al. (2016); Benard et al. (2007); Bertrand et al. (2010); Bronars and Grogger (1994); Bütikofer et al. (2018); Fernández-Kranz et al. (2013); Hotz et al. (2005); Lundberg and Rose (2000); Lundborg et al. (2017); Paull (2008); Miller (2011); Sigle-Rushton and Waldfogel (2007); Waldfogel (1998).

[8]The earnings child penalty is defined as the percentage in earnings by which women fall behind relative to men due to having children.

[9]Information also available in the OECD brief at: https://www.oecd.org/els/emp/last-mile-longest-gender-nordic-countries-brief.pdf.

2021). These findings are policy-relevant and suggest that the disproportionate costs of children for women's careers do not end with childbirth.

The paper is structured as follows. Section 2 lays out the empirical strategy. Section 3 provides background information about the institutional context and introduces the data. Section 4 reports the main results. Section 5 presents additional evidence to support the main conclusions. Section 6 explores the mechanisms of the effects. The final section concludes.

2 Empirical Strategy

We aim to analyze the impact of a child's health shock on parents' labor market outcomes and well-being. Child hospitalizations are unlikely to be randomly distributed, meaning that the characteristics and trajectories of families whose child suffers a health shock may be different from other families. To illustrate this, Figure 1 plots the coefficients of regressing different family and child characteristics on a dummy equal to one if the child suffered a hospitalization.[10] Having a child who was hospitalized predicts almost all characteristics, suggesting that these families are very different from others. Therefore, comparisons between these groups of families are likely to yield biased estimates of the causal impact of children's health shocks.

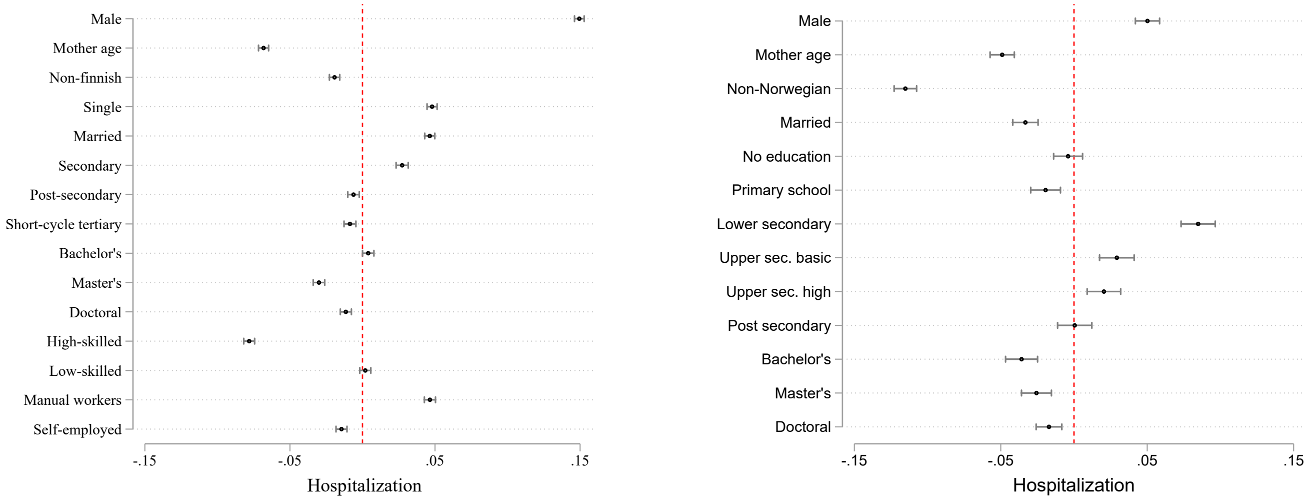
In order to overcome the potential endogeneity of children's health shocks, we leverage variation in their timing. Focusing on parents who have been exposed to a child's health shock at some point, we exploit variation in the age at which the child experienced the shock, conditional on the age of the parents and children. Importantly, we focus on families of relatively healthy children who experience a first shock after school-starting age.[11] With this sample, we use a simple difference-in-differences framework, by constructing counterfactuals for treated households with families who experience the same shock a few years later. This quasi-experimental design exploits the potential randomness of the timing of a shock within a short period of time, a strategy that has been laid out by Fadlon and Nielsen (2017, 2019). The treatment group is composed of families whose child experiences the shock at a given year τ. The control group is comprised of families from the same age cohorts[12] whose child experienced the same shock in $\tau + \Delta$ (4 years later in our main

[10] Figure A1 shows the same comparison for mortality.

[11] School-starting age is 6 and 7 years old in Norway and Finland, respectively.

[12] Families of the treatment and control groups are matched based on the child's and parents' years of birth. For control households, we assign a placebo "shock" at the age at which the children in the matched treatment group

Figure 1: Differences in Characteristics: Across Families

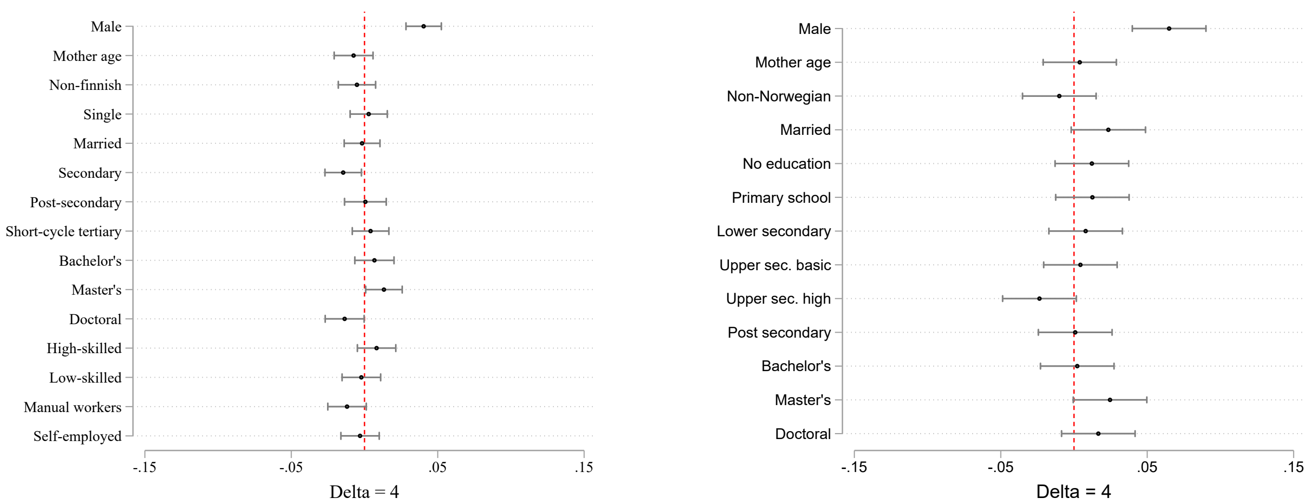


(a) Finland

(b) Norway

Notes: The figure shows the coefficients and 95% CI from separate regressions of each (standardized) variable on an indicator that takes a value of 1 if the child suffered at least one hospitalization from ages 0 to 18. Panel (a) shows the results for Finland, and panel (b) for Norway. All specifications include year-of-birth fixed effects. Standard errors are clustered at the mother level.

Figure 2: Differences in Characteristics: Within Affected Families



(a) Finland

(b) Norway

Notes: The figure shows the coefficients and 95% CI from separate regressions of each (standardized) variable on an indicator that takes a value of 1 if the family is in the treatment group, and 0 for the control group (the child experiences the shock 4 years later). Panel (a) shows the results for Finland, and panel (b) for Norway. All specifications include year-of-birth fixed effects. Standard errors are clustered at the mother level.

specification).[13] The treatment effect is identified from the change in the difference in outcomes (i.e., the difference-in-differences) across the two groups over time.

The identifying assumption in this setting is that, in absence of the shock, these two groups of families would have followed similar trends. We provide several pieces of evidence that support the validity of this assumption. First, Figure 2 compares these two groups of affected families and shows that all differences in observable pre-health shock characteristics disappear, in contrast to the previous comparison between affected and unaffected families (Figure 1).[14] The only exception is gender and we control for this in all our specifications.[15] This exercise provides reassuring evidence that families whose children experience a hospitalization at different ages have very similar pre-determined observable characteristics.

We further provide visually clear results of our estimation and show that there is no evidence that the treatment group was following a different trajectory in earnings (or in any other outcomes) before the event (Section 4). In Section 6, we also show that the effect of a health shock on maternal earnings is larger if the child requires substantial and persistent care after the first hospitalization, as measured by the number of specialist visits and later hospital admissions. Finally, we explore two plausibly exogenous health shocks that have very different implications in terms of the care burden imposed on parents. We show that parental earnings do not respond to a health shock that, in general, does not require additional treatment (appendicitis), while there is a substantial drop following a hospitalization due to a more serious condition (cancer).

More formally, the estimated equation is a dynamic (period-by-period) difference-in-differences specification that takes the following form:

$$Y_{is} = \alpha + \beta treat_i + \sum_{t \neq -2, t=-5}^{t=3} \gamma_t \times I_t + \sum_{t \neq -2, t=-5}^{t=3} \delta_t \times I_t \times treat_i + \lambda A_{is} + \phi CBY_i + \omega_s + \epsilon_{is} \quad (1)$$

Where Y_{is} denotes the outcome for parent i in calendar year s, $treat_i$ is an indicator for whether

undergo their respective shocks. Due to our sample size, fatal shocks are only matched on child's year of birth.

[13] There is a trade-off when choosing Δ, since a larger Δ increases the horizon over which the effect can be observed. However, a smaller Δ is likely to capture more similar households. In our main specification, Δ is equal to 4 years, allowing us to identify effects up to three years after the shock. After this period, the control group also undergoes a shock. In Table 4 we show that our results are robust to alternative choices of Δ.

[14] Similar results for the mortality sample can be found in Panel (b) of Figure A1.

[15] Boys and girls differ in the average age at which they experience a hospital admission. Our results are robust to controlling for the child's gender.

a family belongs to the treatment group, and I_t is an indicator variable for the time relative to the assigned treatment year ("event time"). This is the actual treatment year for the treatment group and a placebo treatment year for the control group. The parameter of interest is δ_t, which estimates the period t treatment effect relative to the period -2. A_{is} includes dummies for the age and educational level of both parents and a dummy for the child's gender.[16] CBY_i are child birth year fixed effects, and ω_s calendar-year fixed effects. Finally, we cluster standard errors at the parent level.

In addition, as a complementary estimation, we also use an event study approach. In particular, we estimate the coefficients of indicator variables for years relative to the event ("event time"). We construct a balanced panel of parents with observations dating from five years before and three years after the health shock and we run the following regressions for mothers and fathers separately:

$$Y_{is} = \alpha_i + \sum_{t \neq -2, t=-5}^{t=3} \gamma_t \times I_t + \omega_s + \epsilon_{is} \tag{2}$$

where Y_{is} is the outcome of interest for individual i in calendar year s, α_i are individual fixed effects, I_t are the event time dummies, and ω_s are calendar year dummies. Following Sun and Abraham (2020), we omit two event time dummies to avoid multicollinearity,[17] $t = -2$ and $t = -5$, meaning that the event time coefficients measure the impact of a child's health shock relative to these two periods. An important consideration is that under treatment effect heterogeneity, the two-way fixed effects regression can result in estimates with uninterpretable weights. To take care of this, we implement the interaction weighted (IW) estimator proposed by Sun and Abraham (2020).[18]

3 Institutional Setting and Data

This section describes the institutional context and administrative data for Finland and Norway.

[16] Due to sample limitations, we only match fatal shocks on a child's birth year, and we control for parent's age and level of education as well as the child's gender.

[17] According to Sun and Abraham (2020) and Borusyak et al. (2021): one multicollinearity comes from the relative period indicators summing to one for every unit, and the other multicollinearity comes from the linear relationship between two-way fixed effects and the relative period indicators.

[18] Sun and Abraham (2020) show that in settings with variation in treatment timing across units, the coefficient on a given lead or lag can be contaminated by effects from other periods. They illustrate this and discuss their alternative method via an empirical application that is closely similar to our setting. In particular, they estimate the dynamic effects of a hospitalization following Dobkin et al. (2018).

3.1 Institutional Setting

As shown in Table A1, Finland and Norway are similar in size, economic development, and inequality. Both countries also have very similar level of health care expenditure and health indicators (for example, life expectancy, incidence of low-birthweight babies, or child mortality). In terms of the organization of the health care system, Finland and Norway have universal public health coverage. Local authorities provide primary healthcare in health centers. General practitioners provide primary healthcare services, such as consultations, preventive care, and drug prescriptions. Specialized medical care consists of specialist examinations and treatment, and usually requires a physician's referral. Emergency medical services, which involve treating acute illnesses or injuries, are provided by hospitals. The private healthcare sector in Finland and Norway is relatively small but has gained importance in recent years. There are only a few such hospitals but the private provision of specialist outpatient care is much more common (OECD, 2017).

In terms of institutional support, Table A1 also shows the different subsidies that parents of ill children can receive. First, in both Finland and Norway, parents can be granted the Special Care Allowance during hospital treatment and subsequent care at home. To be granted this benefit, the attending physician must issue a statement confirming the severity of the illness and the need for the parent to participate in the child's care and treatment. This aid is intended to compensate for lost income while the child is undergoing medical treatment. Second, in Finland, for disabled or chronically ill children parents can be granted a disability allowance. Finally, in both countries, family members can also be granted an informal care allowance by their municipality if they take care of a severely disabled or chronically ill child at home.[19] The entitlement and the amount of the allowances are determined on the basis of the care, attention, and rehabilitation that the child requires. The payment period also depends on how long care is needed due to the illness or disability.

Families who face the death of a child are not entitled to receive any allowance in Finland. Survivors' pension only replaces lost income when a family wage earner dies. More in detail, the payment of child benefits ends with the child's death, and recipients need to return the benefits

[19] Information available at: https://www.kela.fi/web/en/if-a-child-gets-ill for Finland. Information for Norway can be accessed here: https://www.nav.no/en/home/benefits-and-services/relatert informasjon/attendance-benefit.

if they have been paid after one month of the child's death.[20] In Norway, parents are allowed to keep the Special Care Allowance up to 6 weeks after a child dies if they were already receiving this allowance (and up to 3 months if they have received 100% care allowance for more than three years).

The social security system of both countries also provides insurances to their population, such as retirement pension and unemployment insurance, and health-related insurances, such as sick pay and disability insurance.

The Nordic countries have long been portrayed as exemplars of gender equality. As shown in Table A1 three out of four women in these two countries participate in the labor force. However, despite having a generous system of social security transfers and progressive gender views that mitigate the unequal impact of parenthood between genders, the literature has found substantial child penalties of around 25% for Finland and 23% for Norway (Sieppi and Pehkonen, 2019; Andresen and Nix, 2021).

3.2 Data

We use rich individual-level administrative data from several sources to link family members, earnings trajectories and health shocks.

In Finland, we merge employer-employee data from the Finnish Longitudinal Survey (FLEED-FOLK) for the period 1988 to 2018, with birth register data to identify families. The FLEED-FOLK records provide information for the entire population (aged between 16 and 70) on year of birth, education level, annual labor earnings, and employment status. For health data, we use two different sources. The first is the Finnish Hospital Discharge Register, which contains information on diagnosed medical conditions and the exact date of diagnoses. This register contains all inpatient consultations in Finland from 1988 to 2017. From 1998 onwards, it also includes all outpatient visits to hospitals. In both countries, all diagnoses are recorded using the International Classification of Diseases (ICD) system. The second dataset is the Cause of Death Registry, which includes information on all death dates and causes between 1990 and 2018. The statistics on causes of death are compiled based on the 10th revision of the International Classification of Diseases (ICD-10).

For Norway, data on labor market outcomes comes from registers provided by Statistics Norway,

[20] Information available at https://www.kela.fi/web/en/death-of-a-child

which contain information on individual labor and capital income, as well as welfare benefits from 1993–2014. Individual characteristics, such as birth year, educational level and marital status are also available. For health data we use the Norwegian Patient Registry (NPR) from 2008 to 2014. It includes all hospital admissions, both inpatient and outpatient stays. In addition, in Norway we also observe primary health care services use from 2006 to 2014 in the Control and Distribution of Health Reimbursement database (KUHR).[21]

In each family, we focus on the first child that suffered a health shock. For hospitalizations in Finland, the sample includes families whose child suffered a first inpatient stay in an acute care hospital between ages seven and eighteen.[22] For fatal shocks, the sample consists of all families whose child died between ages seven and eighteen. In Norway, due to data availability,[23] we focus on the first hospitalization observable in the data after age six. We further restrict the sample to children that did not suffer any hospitalization in the year before the health shock. Figure A2 shows the number of observations by age between seven and eighteen. Hospitalizations and fatalities show considerable variation in the age at which they occur.

Tables A2 and A3 show summary statistics for the final samples used in the analysis. The matched sample for the difference-in-differences analysis consists of 48274 children who suffered their first inpatient admission between ages seven and eighteen during the period 1995 to 2014 in Finland (Column (1)).[24] We use mortality data from the Finnish administrative register. The final matched sample for the mortality analysis consists of 2369 children (Column (3) in Table A2). In Norway, the final matched sample includes 24316 children's hospitalizations (Column (1), Table A3).

[21]For each visit, this provides a report of procedures used and the main diagnosis codified using The International Classification of Primary Care (ICPC). It classifies the patient's reason for the visit and the related diagnosis, as well as the procedures done by the primary healthcare service.

[22]We focus on children that are relatively healthy and experience the health shock after school starting age. In Finland, children start school during the calendar year they turn seven years old. In Norway, they start at age six.

[23]In Norway, we only have data on hospitalizations from 2008–2014, we therefore do not have enough cohorts to use the same restriction as in the Finnish data. Instead, we exclude children who had a hospital visit at all in the year before the health shock, and all children that had a health shock before age six.

[24]Similarly to Fadlon and Nielsen (2019) the same household may appear both in the treatment and in the control group for earlier treated units (before they receive the treatment). We note, however, that a household is never used as a control to itself.

3.3 Incidence of health shocks

How common are these health shocks? In this subsection, we shed some light on this question and show that these shocks (particularly the hospitalization of a child) affect a considerable number of families.

We analyze first some descriptive statistics for a specific cohort in Finland that can be followed until adulthood: children born in 1990. In Figure A3, we show the percentage of children who suffered a hospitalization by age group. Around 50% of the children born in 1990 suffered the first hospitalization in their lives at or before turning 18. However, most hospitalizations are concentrated in the first years of life. If we focus on ages 7 to 18, 14% of children born in 1990 suffered their first hospitalization during this age range. In Panel (b) we observe that 0.9% of children born in 1990 suffered a fatal shock from ages 0 to 18. This corresponds to 9 deaths per 1,000 children. For ages 7 to 18, the numbers are 2.4 per 1,000 children or 0.24% of all children born in 1990.

In Panel (c) of Figure A3, we plot how many of these first hospitalizations were followed by at least another hospital stay by age. For all ages, at least around 50% of the children who suffered a first hospital stay had to be hospitalized again. Children who experienced an early hospitalization (ages 0-4) were most likely to experience a recurrent hospitalization, nearly 75% of those who had their first hospitalization at age 0 experienced recurrence. In Panel (d), we zoom in on the health shocks occurring after school starting age, and we calculate the number of future stays after the first hospitalization. Again, around 50% of the sample only suffered the first hospital stay. However, more than 20% of children suffered a second stay after the first one, and more than 10% of children had more than five stays.

In terms of the reasons for these hospitalizations, in Figure A4 we show for our main sample the number of observations by primary diagnosis (for Finland in Panel (a), and Norway in Panel (b)) and by mortality cause (in Panel (c)). In both Finland and Norway, the main category is injury, poisoning, and other external causes for hospitalizations. These are followed by diseases of the respiratory and digestive systems, and symptoms, signs, and abnormal clinical and laboratory findings. Similarly, for the mortality sample, the largest category is injuries and other external causes, followed by deaths due to neoplasms.

4 Results

4.1 Hospitalizations

Figure 3 presents the estimates for the impact of a child's hospital admission on maternal labor earnings from our difference-in-differences estimation. There is no indication that maternal earnings follow a different trend for the treatment group compared to the control group before the child's hospital admission. A sharp break in the trajectory becomes visible just after the event. Strikingly, the magnitude of the effects is very similar for Finland and Norway: just one year after the child experiences hospitalization maternal earnings drop by about 2.4% and 2.0%, respectively, compared to earnings in $t-2$. The negative effect is persistent and appears to become larger over time.

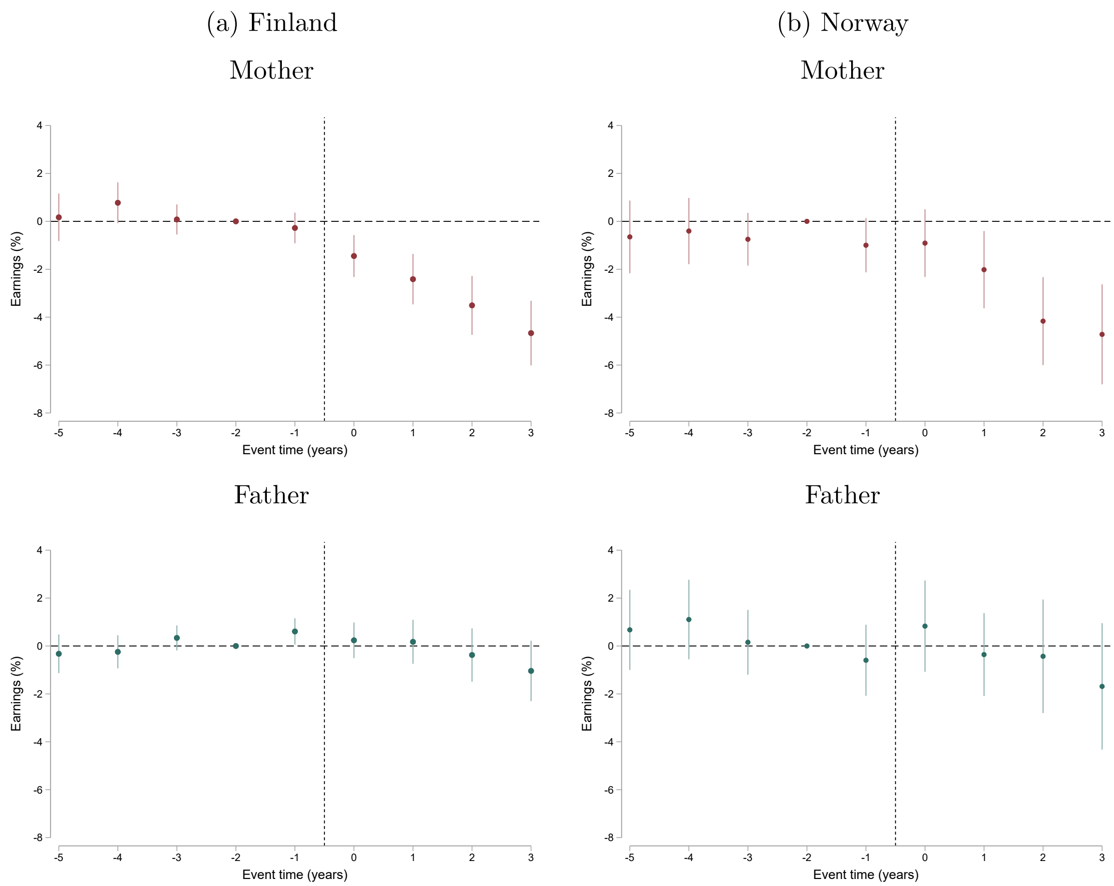
Table 1 provides further details about the estimates. One year after the shock mothers' earnings have dropped by more than €515 and €620 for Finland and Norway, respectively.[25] In Finland, three years after the shock mothers earn, on average, about €1000 less than two years before the event. In Norway, the drop in earnings is €1450.[26] This represents a drop of about 4.6% and 4.7% for Finland and Norway, respectively (Column (2)). Column (3) shows the results for the probability of employment. For Finland, the drop in the probability of working also becomes visible just after the shock occurs. For Norway, the estimates for one and two years after the shock are negative but not significant. Three years after the shock the probability of working is significantly lower in both countries: about 2 percentage points lower in Finland and about 1.4 percentage points lower in Norway. This amounts to a 2.2% and 1.6% decrease in a mother's working probability with respect to the mean level of employment before the event. Similar to the results for labor earnings, there is a snowball effect on employment: the probability of leaving the workforce seems to increase over time.

We apply the event study method as a complementary technique to estimate the impact of a child's hospitalization on maternal earnings (Table A4). In this case, we regress maternal earnings on the event time dummies, including individual and calendar year fixed effects and implement the IW estimator proposed by Sun and Abraham (2020) (see Equation 2). The results of this

[25]The estimate for $t-1$ in Norway is marginally significant and negative. This is likely to be driven by the less restrictive definition of health shocks for this country. See Section 3 for further details.

[26]We convert NOK to EUR using the yearly conversion rate provided by the Norwegian Central Bank (https://www.norges-bank.no/tema/Statistikk/valutakurser/?tab=currency&id=EUR).

Figure 3: Hospitalizations: Mothers' and Fathers' Labor Earnings



Notes: This figure shows the impact of a child's hospitalization on the mother's and father's labor earnings (as a percentage of their earnings in $t-2$). We plot the coefficients for the interaction between the event time dummies and the treat dummy in Equation (1), with the corresponding 95 percent confidence intervals. Panel (a) plots the results for Finland. Panel (b) plots the results for Norway. All specifications include controls for calendar year, child's year of birth, child's gender, and each parent's age and educational level. Standard errors are clustered at the parent level.

exercise are consistent with those obtained using the difference-in-differences approach. Although the coefficients are slightly smaller, the magnitude of the effects is very similar: we find that three years after a child's hospitalization maternal labor earnings have decreased by 3.1% to 3.8%. Moreover, for all periods, the confidence intervals for the event study estimation overlap with those from difference-in-differences. This finding strengthens our interpretation of the results and the validity of both approaches to estimate the impact of children's health shocks on parents' labor careers.

Table 1: Hospitalizations: Mothers' Labor Outcomes

	(1) Earnings (€)		(2) Earnings (%)		(3) Employment	
	Finland	Norway	Finland	Norway	Finland	Norway
-5	36.260	-199.724	0.169	-0.649	0.005	0.001
	(108.398)	(237.686)	(0.505)	(0.774)	(0.003)	(0.004)
-4	166.305*	-123.308	0.775*	-0.405	0.008***	0.002
	(93.366)	(216.523)	(0.435)	(0.705)	(0.003)	(0.004)
-3	17.047	-229.748	0.079	-0.748	-0.000	0.003
	(68.632)	(172.738)	(0.320)	(0.562)	(0.002)	(0.003)
-1	-59.126	-307.845*	-0.276	-0.997*	-0.002	0.005*
	(69.882)	(177.189)	(0.326)	(0.557)	(0.002)	(0.003)
0	-310.543***	-283.37	-1.448***	-0.909	-0.007**	0.002
	(95.867)	(221.354)	(0.447)	(0.72)	(0.003)	(0.003)
1	-517.681***	-620.884**	-2.413***	-2.017**	-0.011***	-0.003
	(115.358)	(252.637)	(0.538)	(0.822)	(0.003)	(0.004)
2	-752.394***	-1279.759***	-3.508***	-4.166***	-0.015***	-0.006
	(134.557)	(287.903)	(0.627)	(0.937)	(0.003)	(0.004)
3	-1000.763***	-1450.364***	-4.665***	-4.718***	-0.020***	-0.014***
	(147.714)	(327.171)	(0.689)	(1.065)	(0.003)	(0.004)
Observations	401787	212688	401787	212688	401787	212688
Controls	YES	YES	YES	YES	YES	YES
Mean Y_{t-2}	21450.555	30722.236	100	100	0.920	0.878

Notes: This table shows the impact of a child's hospitalization on maternal earnings (Euro) (in column (1)), maternal earnings as a % of mean earnings in $t-2$ (in column (2)), and maternal working probability (in column (3)), for both Finland and Norway, respectively. The table shows the estimated coefficients for the interaction between the event time dummies and the treat dummy in Equation 1. All specifications include controls for calendar year, child's year of birth, child's gender, and each parent's age and educational level. Standard errors are clustered at the parent level.

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

The results for fathers are presented in the second Panel of Figure 3. We do not observe any visible negative impact immediately after the shock in either country. However, there is some suggestive evidence that the situation deteriorates over time but the drop is not significant and the magnitude is small (see Column (1) in Table A5). Notably, the point estimates for mothers are more negative than for fathers in all periods after the event. We formally test if the effect on maternal earnings shown in Figure 3 is statistically different from the impact on fathers. For Finland, we can confidently reject the null hypothesis that the estimated effects for mothers are the same as those for fathers in all periods after the shock. The same pattern is visible in Norway, where we can reject the hypothesis of identical impact across gender for two and three years after the shock. This evidence suggests that health shocks which occur during middle childhood to teenage years also have a disproportionate effect on women's labor market outcomes compared to men.

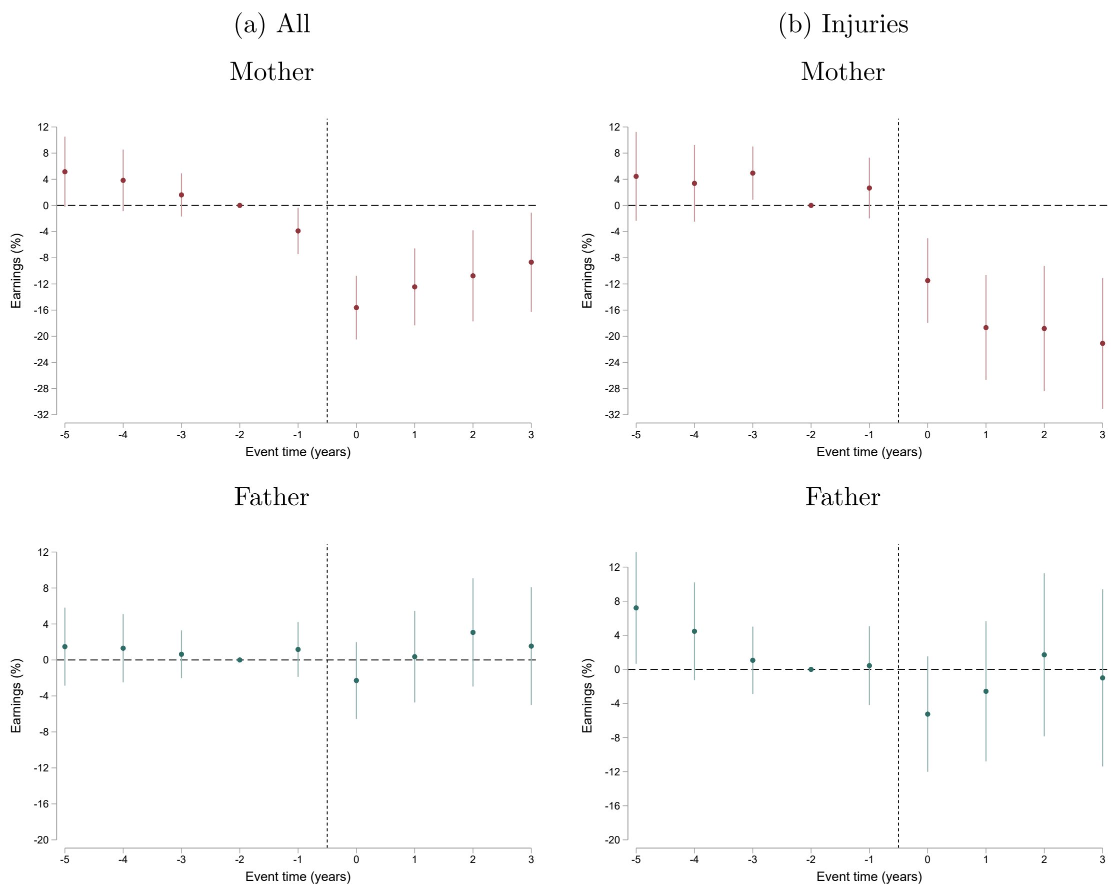
4.2 Mortality

Figure 4 presents the results for the impact of a child's fatal health shock on parents' labor earnings. In Panel (a), we include all fatal shocks, regardless of the cause of death. We again observe a decline in maternal earnings, but there is evidence of an anticipation effect in the case of these shocks. This is likely to be driven by the child's death being predated by a deterioration in their health. This anticipation effect means that the control group experiences a decrease in earnings the year before the shock, thus potentially biasing the effect towards zero for the last period. In spite of this, we observe a huge drop in maternal earnings after the fatal shock occurs. In particular, in the year of the shock maternal earnings drop by around 16%.

To reduce this anticipation effect, for the rest of the mortality analysis, we concentrate on fatal shocks due to injuries, poisonings, or other consequences of external causes (from now on referred to as "injuries").[27] The results using this sample of mortality shocks are displayed in Panel (b) of Figure 4. These shocks are less likely to be predated by a deterioration in the child's health. Consistent with this, we do not see any evidence of an anticipation effect when focusing on this mortality sample. Similar to the results based on all fatal shocks, we find that a child's death has an enormous and long-lasting impact on maternal earnings. The effect is much larger than that estimated after a hospitalization. In particular, one year after the fatal shock, the mother's earnings

[27] Codes S00-T88 from the 10th revision of the International Classification of Diseases (ICD-10).

Figure 4: Impact of a Child's Fatal Shock on Mothers' and Fathers' Labor Earnings



Notes: This figure shows the impact of a child's fatal shock on the mother's and father's labor earnings (as a % of their earnings in $t-2$). We plot the coefficients for the interaction between the event time dummies and the treat dummy in Equation 1, with the corresponding 95 percent confidence intervals. Panel (a) plots the results of all mortality shocks, regardless of the cause of death. Panel (b) restricts the sample to fatal shocks due to injuries, poisonings, or other consequences of external causes. All specifications include controls for calendar year, child's year of birth, child's gender, and one parent's age depending on the outcome variable. We use administrative data from Finland. Standard errors are clustered at the parent level.

Table 2: Mortality: Mothers' Labor Outcomes

	(1) Earnings (€)	(2) Earnings (%)	(3) Employment
-5	863.707	4.442	0.012
	(673.499)	(3.464)	(0.024)
-4	656.534	3.377	0.036*
	(580.610)	(2.986)	(0.021)
-3	961.383**	4.944**	0.025
	(403.634)	(2.076)	(0.016)
-1	518.002	2.664	0.012
	(460.415)	(2.368)	(0.017)
0	-2234.341***	-11.491***	-0.036*
	(642.672)	(3.305)	(0.020)
1	-3632.357***	-18.681***	-0.047**
	(796.163)	(4.095)	(0.023)
2	-3659.945***	-18.823***	-0.062**
	(949.352)	(4.883)	(0.027)
3	-4099.865***	-21.086***	-0.082***
	(991.618)	(5.100)	(0.027)
Observations	10562	10562	10562
Controls	YES	YES	YES
Mean Y_{t-2}	19443.969	100	0.859

Notes: This table shows the impact of a child's fatal shock on maternal earnings (Euro) (in column (1)), maternal earnings as a % of mean earnings in $t-2$ (in column (2)), and maternal working probability (in column (3)). The table shows the estimated coefficients for the interaction between the event time dummies and the treat dummy in Equation 1. We use administrative data from Finland, and the sample includes all fatal shocks due to injuries, poisonings, or other consequences of external causes. All specifications include controls for calendar year, child's year of birth, child's gender, and the mother's age. Standard errors are clustered at the parent level.

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

are more than €3,600 lower compared to her earnings two years before the shock (Table 2 column (1)). This represents a decrease of about 18%. Three years after the death of a child, mothers' earnings follow the same negative trend with a 21% reduction in labor earnings.[28] Moreover, mothers also have a higher probability of being out of employment, with a drop of 8.2 percentage points in their working probability (Table 2 column (3)). This is a 9.5% decrease in their working probability three years after the event.

The lower Panel of Figure 4 shows the results for fathers. We do not observe any effect on the father's labor earnings (more details on labor market outcomes in Table A6). The coefficients are insignificant, relatively small in magnitude (except the coefficient on the period of the shock), and for some periods even positive. In the case of mortality shocks, we can also reject the null hypothesis that the coefficients on maternal and on paternal labor earnings are equal for all periods after the shock.

4.3 Institutional Support

As discussed in Section 3, parents in Finland and Norway are entitled to different types of financial support when facing a child health shock. The critical question is, thus, whether families are fully insured against these shocks through the transfers and benefits from the public system. In the administrative data, we have three pieces of information that can help shed some light on this question. First, we have data on total income for both countries. This is a measure of disposable income consisting of earned income, entrepreneurial income, property income, current transfers, and tax-deductible expenses. Second, for both countries, we also have information on total transfers received.[29] Individuals receive transfers from the employment pension, social security payments, sickness benefits, unemployment benefits, etc. And third, for Finland, we also have information on the combined benefits received by families with underage children. This variable contains information on parental allowances, child home care allowances, child benefits, child's disability allowance and special care allowance (which includes care and rehabilitation allowance for a sick child).

[28]Comparing these estimates (Figure 4 Panel (b)) in the last periods with the estimates that include all fatal shocks (Panel (a)), we see that the effects are larger in the former. This is likely to be driven by the control group experiencing a decrease in labor earnings before the fatal shock when we do not restrict the sample of shocks.

[29]For Finland, this data is only available starting from 2000.

Table 3 shows the results for children's hospitalization shocks. In column (1) we show the results for mothers' disposable income. The estimates follow a very similar pattern to the results for maternal labor earnings. However, the magnitude of the effects is substantially smaller: three years after the hospitalization of a child the mother's disposable income is €663 and €1173 lower relative to two years before the shock, in Finland and Norway, respectively. This is a decrease of about 3% in both countries. It reveals that the impact of a shock on labor earnings is partly offset through transfers. In fact, compared to the decrease in maternal labor earnings, the drop in disposable income is around 33% smaller for Finland and 35% smaller in Norway.[30] This further highlights that the institutional support provided to these families in both countries is highly similar, as discussed in Section 3.

In column (2), we analyze the impact on total transfers and observe an increase in the transfers received. For Norway, however, the effect is only marginally significant three years after the shock. During this period families in Finland and Norway receive respectively 2.0% and 3.0% more in transfers. It is important to note that this variable includes unemployment benefits, and thus, unsurprisingly, the temporal pattern mirrors the results found for employment.

Finally, in column (3), we explore the impact on family allowances. Similarly, we find that families receive more child benefits after their child suffers a hospitalization. However, the effect is concentrated on the first two years: one year after the shock, mothers receive 89 additional euros to take care of their children. This means that around 17% of the drop on maternal labor earnings is insured solely through targeted child benefits and allowances. The relative magnitude of these benefits decreases over time, leaving mothers less protected and taking a greater toll by inducing adjustments in maternal labor supply.

Similar to the analysis on labor earnings, the impact of children's hospitalizations on fathers' disposable income is negligible (see results in Table A7 in the Appendix). We also do not observe any significant increase in the transfers or the child allowances received by fathers.

Overall, this analysis demonstrates that although transfers and other tax-deductible expenses offset part of the shock, families are not fully insured against child hospitalizations: the drop in mothers' disposable income is still significant and persistent over time. Moreover, the insurance effect of the child benefits fades over time, reducing the protective impact mothers' labor outcomes.

[30] For Finland: (1-((663/21194)/(1000/21450)))*100, for Norway: (1-((1173/38228)/(1450/30722)))*100.

Table 3: Hospitalizations: Mothers' Institutional Support

	(1) Total Income (€)		(2) Transfers (€)		(3) Allowance (€)
	Finland	Norway	Finland	Norway	Finland
-5	13.671	-304.463	-52.318	-65.245	-84.550**
	(67.071)	(226.201)	(48.505)	(105.393)	(37.304)
-4	41.720	-200.922	-52.697	-28.762	-65.364**
	(59.282)	(209.714)	(42.200)	(90.754)	(31.684)
-3	-8.043	-301.775*	-44.198	-19.306	-25.958
	(48.835)	(174.216)	(31.783)	(69.662)	(23.836)
-1	-58.770	-176.059	30.225	88.548	-8.497
	(50.418)	(178.192)	(31.929)	(69.37)	(22.524)
0	-183.979***	-114.822	64.824	149.765	23.610
	(62.706)	(213.227)	(41.094)	(92.728)	(27.511)
1	-314.978***	-406.394*	79.484*	170.53	89.325***
	(76.188)	(237.771)	(46.764)	(110.84)	(30.235)
2	-443.465***	-1080.690***	110.909**	189.983	60.078*
	(88.537)	(265.948)	(52.237)	(126.686)	(33.060)
3	-663.670***	-1173.405***	94.064*	235.845*	16.407
	(98.683)	(299.189)	(54.808)	(141.208)	(32.718)
Observations	376778	212688	376778	212688	376778
Controls	YES	YES	YES	YES	YES
Mean Y_{t-2}	21194.327	38228.001	4691.208	7884.261	3484.814

Notes: This table shows the impact of a child's hospitalization on maternal total income (in column (1)), transfers (in column (2)), and child allowances received (in column (3)) for both Finland and Norway, respectively. The table shows the estimated coefficients for the interaction between the event time dummies and the treat dummy in Equation 1. All specifications include controls for calendar year, child's year of birth, child's gender, and each parent's age and educational level. Standard errors are clustered at the parent level.

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

In Table A8, we carry out the same exercise for mortality shocks. Again, we find that the drop in the mother's total income is smaller than the impact on labor earnings, but follows the same pattern: three years after a child's death the mother's disposable income is approximately €2358 lower than her earnings two years before the shock. This represents an 11% reduction in maternal total income that is not compensated through transfers. The drop in maternal disposable income is only 47% smaller[31] than the drop in maternal labor earnings. We do not observe any significant increase in the transfers received, although all the coefficients are positive. We also do not observe any increase in child benefits. All the coefficients are negative after the child's fatal shock, suggesting that families lose their parental and child allowances after their child's death. These results are consistent with the lack of special bereavement support for families who lose a child.

5 Robustness Checks

In this section we perform a number of robustness checks to support the validity of the methodology and the required identification assumptions.

5.1 Delta Choice

In our main specification, Δ is equal to 4 years, allowing us to identify effects up to three years after the shock. After this period, the control group also undergoes a shock. Thus, there is a clear trade-off when choosing the control group: a bigger Δ increases the horizon over which the effect can be observed, while a smaller Δ is likely to capture more similar households. In Table 4 we explore the robustness of our results to different choices of the control group. In particular, we run the regression in Equation 1 again with the control group defined as families whose children suffered a hospitalization two years after (column (1) of Table 4), and three years after the treated group (column (2)). For comparison, column (3) shows the results of our main specification.

The results demonstrate that the coefficients are fairly similar across specifications. For example, if we focus on the results for Finland one year after the shock and select families who experience the shock two years later as a control group, mothers' earnings drop by €516 during the first year.

[31] For the mortality sample, we calculate this number as follows: (1-((2358/21411)/(4099/19443)))*100

Table 4: Hospitalizations: Choice of Delta

	(1) Delta = 2		(2) Delta = 3		(3) Delta = 4	
	Finland	Norway	Finland	Norway	Finland	Norway
-5	37.307	123.874	203.204*	210.56	36.260	-199.724
	(94.962)	(186.282)	(108.809)	(196.043)	(108.398)	(237.686)
-4	30.208	96.413	121.699	75.014	166.305*	-123.308
	(92.753)	(163.416)	(92.803)	(174.754)	(93.366)	(216.523)
-3	-17.188	12.901	2.054	79.000	17.047	-229.748
	(67.789)	(127.862)	(67.893)	(141.799)	(68.632)	(172.738)
-1	-50.592	-311.909**	-50.669	-278.272*	-59.126	-307.845*
	(70.318)	(128.051)	(69.396)	(147.504)	(69.882)	(177.189)
0	-370.240***	-317.334*	-282.300***	-375.721**	-310.543***	-283.37
	(96.892)	(171.04)	(97.142)	(184.823)	(95.867)	(221.354)
1	-516.395***	-583.371***	-516.768***	-829.064***	-517.681***	-620.884**
	(103.744)	(204.921)	(116.974)	(216.215)	(115.358)	(252.637)
2			-568.880***	-1157.167***	-752.394***	-1279.759***
			(125.884)	(248.281)	(134.557)	(287.903)
3					-1000.763***	-1450.364***
					(147.714)	(327.171)
Observations	349963	266679	383113	257816	401787	212688
Controls	YES	YES	YES	YES	YES	YES
Mean Y_{t-2}	22144.850	32867.623	21973.765	31580.188	21450.555	30722.236

Notes: This table shows the impact of a child's hospitalization on maternal labor earnings for different choices of control group. We show the estimation results when the control group consists of families who experienced a child's hospitalization two years later in column (1), three years later in column (2), and four years later in column (3) (our main specification). The table shows the estimated coefficients for the interaction between the event time dummies and the treat dummy in Equation 1. All specifications include controls for calendar year, child's year of birth, child's gender, and each parent's age and educational level. Standard errors are clustered at the parent level.

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

For the same time period following the shock the drop is €516 when Δ equals three years, and €517 in our main specification. Furthermore, all the estimates are contained within one another's confidence intervals.

The same holds for the mortality sample as displayed in Table A9. One year after the fatal shock mothers' earnings have dropped by €3632 in our main specification ($\Delta = 4$). The corresponding drop is €3538 for $\Delta = 2$, and €3704 for $\Delta = 3$. This evidence demonstrates that our results are very robust to different choices of the control group.

5.2 Mutual Shocks

One potential threat to the identification strategy could be simultaneous mutual shocks to both the parents and the child. This could potentially explain both the observed drop in maternal earnings and the child's health shock. Therefore, we re-estimate our main equation for both hospitalizations and fatal shocks excluding, first, child shocks where either of the parents were hospitalized one week before or one week after the child suffered the shock, and second, hospitalizations with a mutual shock one month before or after the child's shock.

Table 5 shows the results of this exercise for hospitalizations (Table A10 shows the same estimation for the mortality sample). The coefficients on the interactions between the event time dummies and the treat dummy remain unchanged across these specifications, suggesting that mutual shocks do not play any relevant role in explaining the drop in maternal earnings. In Section 6 we present additional evidence in favor of this interpretation. In particular, we explore cancer and appendicitis hospitalization shocks, because these two diagnoses cannot result from joint health shocks or be driven by a previous deterioration of parents' labor earnings.

6 Mechanisms

This section investigates potential mechanisms underpinning the observed impact of children's health shocks on maternal earnings. We exploit the same variation as before, following the estimation of Equation 1.

Table 5: Robustness: Mutual Shocks

	(1) +/− One Week		(2) +/− One Month	
	Finland	Norway	Finland	Norway
-5	22.692	-135.496	9.321	68.472
	(109.017)	(253.912)	(110.482)	(279.975)
-4	163.122*	-73.681	164.186*	85.144
	(93.856)	(229.186)	(95.130)	(254.027)
-3	17.345	-188.744	23.847	-42.156
	(69.107)	(186.834)	(69.963)	(207.989)
-1	-62.913	-342.518*	-53.478	-395.901*
	(70.266)	(191.927)	(71.267)	(214.007)
0	-320.750***	-229.829	-293.342***	-279.612
	(96.331)	(238.694)	(97.583)	(261.920)
1	-522.900***	-488.859*	-471.567***	-501.815*
	(115.956)	(270.702)	(117.412)	(293.500)
2	-748.929***	-1061.256***	-679.122***	-1027.623***
	(135.318)	(307.118)	(136.903)	(337.627)
3	-998.453***	-1106.534***	-930.772***	-1167.537***
	(148.558)	(346.15)	(150.421)	(379.817)
Observations	397321	190467	387718	163215
Controls	YES	YES	YES	YES
Mean Y_{t-2}	21453.994	31033.661	21486.049	31432.983

Notes: This table shows the impact of a child's hospitalization on maternal earnings (Euro) for both Finland and Norway. In column (1), we exclude child hospitalizations where parents were hospitalized or visited a specialist one week before or after the child's shock. In column (2), we do the same but for mutual shocks one month before or after the child's shock. The table shows the estimated coefficients for the interaction between the event time dummies and the treat dummy in Equation 1. All specifications include controls for calendar year, child's year of birth, child's gender, and each parent's age educational level. Standard errors are clustered at the parent level.

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

6.1 Burden of Care

If the reduction in labor earnings is partly due to the child's need for care, we would expect to find that the effect is stronger for hospitalizations that impose a substantial and persistent burden of care on family members. We investigate this question using information about the persistence of the shock as well as exploiting variation in the potential support for the caregiving activities from family members.[32]

6.1.1 Recurrent health shocks

We first analyze if the effect is driven by persistent hospitalizations that impose a high burden of care. To do this, we empirically estimate a child's need for care in the year of the shock, as measured by inpatient and outpatient visits to the hospital. This measure can also be interpreted as capturing the severity of the health shock.

Figure A5 plots the average number of hospital admissions or specialist visits for the period ranging from five years before to three years after a child's hospitalization. The number of visits jumps to over 4 in the year of the shock. We thus define high-burden hospitalizations as those requiring more visits in the year of the shock than this average over the entire sample (i.e., requiring a relatively high burden of care). Hospital admissions that require fewer visits in the year of the event are defined as low-burden hospitalizations. We estimate Equation 1 separately for these two distinct samples.

Column (1) of Table 6 present the results for maternal earnings. As expected, we find that health shocks that are more severe or invoke a higher burden of care have a larger negative impact on the mother's labor earnings. We can reject the null hypothesis that the effects of high-burden and low-burden hospitalizations are equal to each other two and three years after the shock.

6.1.2 By diagnosis: Appendicitis vs. Cancer

Another potential approach to exploring conditions with a different burden of care and severity implications is to exploit the exact diagnosis made by physicians during the hospitalization. In particular, we explore the impact of cancer and appendicitis diagnoses.[33] These two conditions

[32] We do this exercise for Finland, as the panel for Norway is significantly shorter and we lose precision.

[33] We use the following ICD10 diagnoses codes: C00-D49 Neoplasms, and K35 Acute appendicitis.

Table 6: Hospitalizations: Burden of Care and Severity

	(1) By Burden of Care		(2) By Diagnosis		(3) Grandparent's Region	
	High	Low	Cancer	Appendicitis	Different	Same
-5	14.095	-100.970			-39.398	-85.416
	(198.465)	(154.932)			(288.535)	(132.419)
-4	90.923	104.475	-323.940	-25.480	300.210	127.692
	(171.199)	(133.285)	(243.074)	(122.382)	(249.839)	(116.335)
-3	33.695	-3.124	-254.771	53.085	44.397	51.436
	(124.713)	(99.525)	(246.050)	(114.560)	(185.991)	(86.114)
-1	-126.287	70.800	490.506	218.289	-121.880	-72.678
	(125.793)	(103.795)	(329.757)	(132.953)	(185.119)	(86.227)
0	-425.527**	-197.838	-857.274*	181.453	-389.311	-324.248***
	(169.755)	(140.410)	(443.920)	(185.795)	(246.183)	(117.863)
1	-807.668***	-397.469**	-2066.025***	70.954	-798.413***	-501.652***
	(206.718)	(168.120)	(553.073)	(239.215)	(296.647)	(141.022)
2	-1202.056***	-569.476***	-875.728*	-84.173	-1057.042***	-635.629***
	(236.782)	(196.143)	(531.338)	(258.943)	(351.823)	(163.186)
3	-1617.022***	-864.166***	-601.313	-303.095	-1385.529***	-896.773***
	(267.394)	(216.230)	(535.201)	(242.887)	(402.765)	(180.412)
Observations	124781	178262	6030	29525	65589	248361
Controls	YES	YES	YES	YES	YES	YES
Mean Y_{t-2}	22140.138	20705.836	22119.608	20880.584	22408.158	19265.829

Notes: This table shows the impact of a child's hospitalization on maternal earnings (Euro) for different subsamples of hospitalizations. In column (1), we split the sample by burden of care, measured by the number of visits and hospitalizations in the year of the shock. In column (2), we analyze cancer and acute appendicitis hospitalizations. In column (3), we split the sample by whether the grandparents live close to the family or not. The table shows the estimated coefficients for the interaction between the event time dummies and the treat dummy in Equation 1 for columns (1) and (3), and the estimated coefficients for the event time dummies in Equation 2 for column (2). We use administrative data from Finland. All specifications include controls for calendar year, child's year of birth, child's gender, and each parent's and educational level. Standard errors are clustered at the parent level.

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

are interesting to study for two main reasons. First, the implications in terms of care are very different. While appendicitis is expected to generate a need for timely care, cancer is a condition with a much more complicated prognosis. According to the medical literature, in the case of cancer, the involvement of family caregivers is very relevant to ensure compliance with treatments, continuity of care, and social support (Glajchen, 2004). The second interesting feature is that these two health shocks cannot result from simultaneous shocks to the mother's earnings and the child's health. Indeed, cancer diagnoses have previously been used in the literature as exogenous health shocks (Gupta et al., 2017; Jeon and Pohl, 2017). Meanwhile, the causes and the epidemiology of appendicitis remain largely unknown (Bhangu et al., 2015; Gauderer et al., 2001).

Column (2) of Table 6 show the results for hospitalizations due to cancer or acute appendicitis. Due to sample limitations, we focus this part of the analysis on Finland and run the event study specification in Equation 2. As expected, mothers' earnings suffer a significant drop following a child's cancer diagnosis. In particular, one year after the hospitalization, the mother's earnings are more than €2,000 lower. However, we do not observe such a decline when focusing on hospitalizations caused by acute appendicitis.[34] We can reject the null hypothesis that the effects of hospitalizations due to cancer are equal to those of acute appendicitis one and two years after the shock. This evidence further suggests that the impact on maternal earnings is driven by severe and persistent conditions that require substantial care and support from caregivers. Moreover, the results of this exercise also show that our main findings are unlikely to be explained by mutual shocks or child hospitalizations brought about by a deterioration in maternal earnings.

6.1.3 Grandparents' support

Grandparents can play an essential role as caregivers for their grandchildren. For example, Frimmel et al. (2020) find that the first grandchild's birth increases the grandmother's probability of leaving the labor market. They also document that the effect is more substantial when grandmothers live close to their grandchild.

In Finland, we can link three generations and exploit the residence location information. We split the sample into two groups based on the grandparents living close to the family or not. The

[34]There is considerable heterogeneity within diagnosis code. Although most cases of acute appendicitis are non-severe, morbidity among children is relatively high, with an overall frequency of appendix perforation of 12.5–30% (Caruso et al., 2017). This can explain the (non-significant) negative coefficients.

results of this exercise are presented in Table 6. In line with aforementioned work, we find that the negative impact of a child hospitalization is stronger if the grandparents live in a different region suggesting that grandparents provide support to mothers, helping alleviate the impact of the increased burden of care derived from the shock.

6.2 Mental Health

Some studies find that parents of children with poor health or disabilities report higher stress levels and worse sleep quality. In particular, some of these papers have documented that maternal self-reported health is negatively associated with parenting a child with a severe disability or a chronic condition (Burton et al., 2008; Stabile and Allin, 2012). In contrast, they do not find the same association for fathers. Burton et al. (2008) hypothesize that the division of responsibilities according to traditional gender roles might be a factor behind this differential gender effect.

Additionally, mental health has been found to impact labor market outcomes. In particular, Biasi et al. (2018) use data from Denmark and find that there is a large drop in labor earnings after a depression diagnosis, and earnings never recover to pre-diagnosis levels. Two years after the diagnosis, people with depression earn 29 percent less compared with two years before the diagnosis. Salokangas (2021) also studies this relationship using Finnish administrative data and finds an association of similar size: relative to the healthy controls, those who are treated for any psychiatric reason earn 37 percent less during their lifetime.

We explore this potential mechanism by looking at the number of contacts with the health care system due to mental health conditions. We only observe visits to specialists or inpatient hospital admissions for Finland, thus capturing the most severe cases. In Norway, on the other hand, we observe diagnoses in primary care, which should include milder cases.[35]

Table 7 shows the results of the impact of a child's hospitalization on parents' medical visits with a mental health diagnosis. After the child's health shock, there is a substantial deterioration in the parents' mental well-being. Relative to two years before the shock, mothers visit specialists or hospitals at a higher rate for issues related to mental health conditions. For Finland, one year after the shock, the number of visits increases by over 55%.[36] For Norway, the estimated increase

[35]Note that for Norway we only have health data from 2006 to 2014, and thus, we cannot estimate all the event time dummies. For this reason, we exclude $t = -5$ from the estimation.

[36]The number of visits increases by 0.075, and the average number of visits two years before the shock is 0.135.

Table 7: Hospitalizations: Parents' Number of Mental Health Visits

	(1) Mother		(2) Father	
	Finland	Norway	Finland	Norway
-5	-0.019		-0.042*	
	(0.023)		(0.022)	
-4	-0.041*	0.000	-0.031*	-0.034
	(0.021)	(0.041)	(0.017)	(0.06)
-3	-0.019	0.031	-0.019	-0.015
	(0.016)	(0.027)	(0.014)	(0.028)
-1	0.014	-0.005	0.004	0.012
	(0.019)	(0.022)	(0.011)	(0.02)
0	0.059***	0.079***	0.026*	0.031
	(0.023)	(0.026)	(0.015)	(0.025)
1	0.075***	0.068**	0.016	0.013
	(0.026)	(0.027)	(0.018)	(0.025)
2	0.043	0.01	0.022	0.016
	(0.029)	(0.029)	(0.019)	(0.028)
3	0.031	0.014	0.018	0.02
	(0.029)	(0.029)	(0.020)	(0.027)
Observations	387856	162922	387856	162922
Controls	YES	YES	YES	YES
Mean Y_{t-2}	0.135	0.487	0.079	0.289

Notes: This table shows the impact of a child's hospitalization on the mother's (column (1)) and father's (column (2)) mental health, for both Finland and Norway, respectively. The outcome measures the number of mental-health related visits to a hospital or specialist (in Finland) or a primary care physician (in Norway). The table shows the estimated coefficients for the interaction between the event time dummies and the treatment dummy in Equation 1. All specifications include controls for calendar year, child's year of birth, child's gender, and each parent's age and educational level. Standard errors are clustered at the parent level.

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

in the number of visits is around 14%.[37] For fathers, we also observe an increase in their number of visits, marginally significant in the year of the shock for Finland. The coefficient for Norway is also positive but insignificant.[38] Table A11 shows the results on mental health for families whose child suffers a fatal shock. We observe a large and significant increase in mothers' number of visits with a mental health diagnosis for all periods after the shock. For fathers, only the coefficient for the year of the shock is large in magnitude and significant. Overall, our results suggest that this stressful event leaves parents, and especially mothers, in a vulnerable position in terms of mental health.

6.2.1 Mediation Analysis

To provide insights about how much of the effect on maternal labor earnings is driven by the mental health shock, we perform a mediation analysis in the spirit of Gelbach (2016) and Sorrenti et al. (2020). Given that we rely on a single source of exogenous variation, we lack specific variation to disentangle the impact of the mental health shock. Thus, the mediation analysis should be interpreted with caution. Despite this limitation, the analysis is still helpful to understand if this mechanism can explain the treatment effects.

We assume that the child's health shock has both direct and indirect effects on maternal labor market outcomes. The indirect effects run through the impact of the child's hospitalization or fatal shock on mental health, and are obtainable by decomposing the unconditional effect of the health shock δ_t (the period t treatment effect) in Equation (1) in the following way:

$$\frac{dY}{d(I_t \times treat)} = \frac{\partial Y}{\partial M} \frac{\partial M}{\partial (I_t \times treat)} + R_t, \tag{3}$$

where Y is maternal labor earnings, $I_t \times treat$ is the treatment indicator, M indicates if a mother experienced at least one mental health visit in a given calendar year, and R_t is the unexplained

Thus, the effect in percentage terms is $0.075/0.135 \cdot 100 = 55.5\%$.

[37]The coefficient is 0.068, and the mean two years before the shock is 0.487. The effect in percentage terms is $0.068/0.487 \cdot 100 = 14.0\%$.

[38]We can reject the null hypothesis that the estimated effects for mothers one year after the shock are the same as those for fathers.

part of the health shock effect. First, $\frac{\partial Y}{\partial M}$ is estimated by augmenting (1) with mediator M:

$$Y_{is} = \alpha + \beta treat_i + \sum_{t \neq -2, t=-5}^{t=3} \gamma_t \times I_t + \sum_{t \neq -2, t=-5}^{t=3} \delta_t^{m_1} \times I_t \times treat_i + \eta M_{is} + \lambda A_{is} + \phi CBY_i + \omega_s + \epsilon_{is}. \quad (4)$$

Next, we estimate the effect of a child's hospitalization or fatal shock on the probability of a mental health visit, $\frac{\partial M}{\partial (I_t \times treat)}$, as in section 6.2:

$$M_{is} = \alpha + \beta treat_i + \sum_{t \neq -2, t=-5}^{t=3} \gamma_t \times I_t + \sum_{t \neq -2, t=-5}^{t=3} \delta_t^{m_2} \times I_t \times treat_i + \lambda A_{is} + \phi CBY_i + \omega_s + \epsilon_{is}. \quad (5)$$

The contribution of M to the health shock effect in each period $t \in \{0, 1, 2, 3\}$ (i.e., during and after the health shock) is then calculated as the following ratio $\frac{\eta \times \delta_t^{m_2}}{\delta_t}$. The unexplained part, R_t, is subsequently computed as $R_t = 1 - \frac{\eta \times \delta_t^{m_2}}{\delta_t}$.

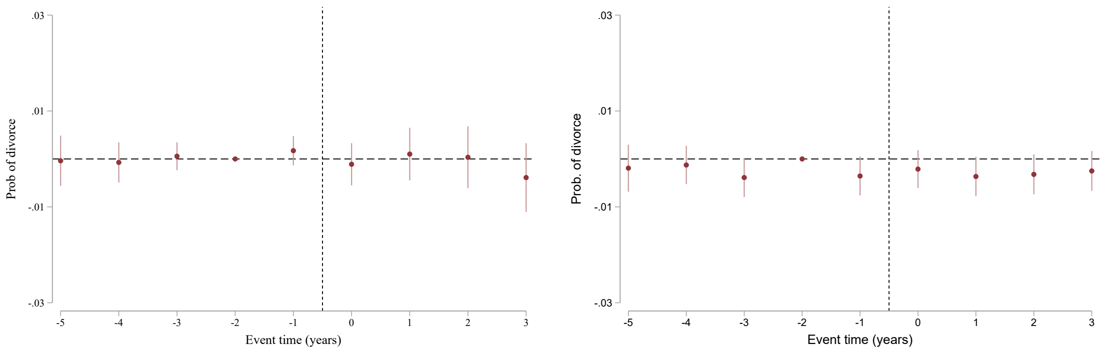
Results of this exercise are in Figure A6. Panel (a) shows the results for children's hospitalization shocks. We find that the mental health shock drives around 10% of the impact on maternal labor earnings. The explanatory power of this channel decreases over time, suggesting that other factors are playing a more critical role. For mortality shocks, the picture is very different: in the year of the shock, the impact on mental health can explain more than half of the drop in maternal labor earnings. This result suggests that the mechanisms behind the effects of non-fatal and fatal shocks are very different: while for fatal shocks, the mental health shock is the primary driver of the negative impact, for hospitalization shocks, it is more plausible that the decrease in earnings results from the combination of the increased time needed to care for the child (discussed in Section 6.1) and the worsening of maternal mental health.

6.3 Family Stability

Previous papers find that having a child with a disability is associated with a higher probability of relationship dissolution (Stabile and Allin, 2012). While marital dissolution is an outcome in itself, it may also affect parents' labor supply decisions (e.g, Ananat and Michaels, 2008; Bargain et al., 2012; Leopold, 2018; Page and Stevens, 2004). We have information on marital status for both countries. Figure 5 shows the results (in Panel (a) for Finland and Panel (b) for Norway). We do not find evidence of an increased risk of divorce after the child's hospitalization, suggesting that these types of shocks do not have a significant impact on family stability.

Figure 5: Hospitalizations: Probability of Divorce

(a) Finland (b) Norway

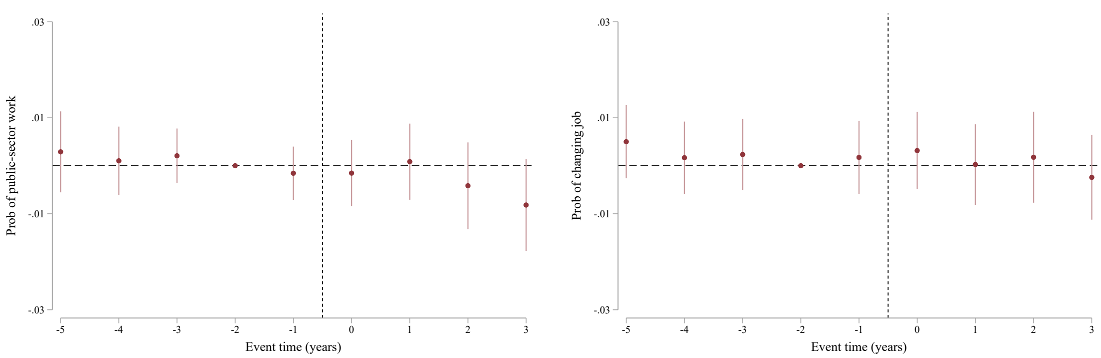


Notes: This figure shows the impact of a child's hospitalization on the probability of relationship dissolution. We plot the coefficients for the interaction between the event time dummies and the treat dummy in Equation 1, with the corresponding 95 percent confidence intervals. Panel (a) plots the results for Finland. Panel (b) plots the results for Norway. All specifications include controls for calendar year, child's year of birth, child's gender, and each parent's age and educational level. Standard errors are clustered at the parent level.

6.4 Choice of Work Environment

Figure 6: Hospitalizations: Choice of Work Environment

(a) Public-sector work (b) Changing jobs



Notes: This figure shows the impact of a child's hospitalization on the probability of working in the public sector (panel (a)) and the probability of switching jobs (panel (b)). We plot the coefficients for the interaction between the event time dummies and the treat dummy in Equation 1, with the corresponding 95 percent confidence intervals. We use administrative data from Finland. All specifications include controls for calendar year, child's year of birth, child's gender, and each parent's age and educational level. Standard errors are clustered at the parent level.

Other studies have indicated that after childbirth women prefer jobs that are more "family-friendly" (e.g, Goldin and Katz, 2016; Lundborg et al., 2017). In particular, Pertold-Gebicka et al. (2016) and Kleven et al. (2019b) find that mothers have a higher probability of moving to an occupation in the public sector following parenthood, which is known to have more flexible working conditions.

Similarly, after the hospitalization of a child, mothers may also seek a more family-friendly job in order to provide care. We take advantage of the availability of rich occupational data in Finland to explore this margin of adjustment. In Panel (a) of Figure 6, we examine whether mothers have a higher probability of working in the public sector after their child undergoes a health shock. We do not find this to be the case, which suggests that mothers do not adjust their labor supply in this manner. More generally, Panel (b) in Figure 6 looks at whether mothers have a higher probability of moving to a different job after their child's health shock. For each year, we define an indicator variable equal to one if the mother is not working in the same company as in the previous period. Again, we do not find evidence that mothers have a higher probability of switching to a different job after the health shock.

7 Conclusions

This paper provides new evidence on the impact of children's health shocks on parental labor market outcomes. To identify the causal effect, we compare families whose children are exposed to health shocks at varying ages, conditional on the parents' and children's ages. This allows us to focus on a sample of very similar families and abstract from differences across households who suffer the illness or death of a child and those who do not.

In particular, we use long panels of high-quality administrative data from two different countries, Finland and Norway, on family income and health trajectories. We construct counterfactuals for treated households through families who experience the same shock a few years later. Our analysis addresses both the impact of hospitalizations and fatal health shocks.

The results show that children's health shocks have a persistent negative impact on mothers' careers. We find that mothers' earnings are 4.6 and 4.7% lower three years after a hospitalization, while we do not find evidence of an effect for fathers. Additionally, we show that the impact is stronger for severe hospitalizations or health shocks that require substantial and persistent care after the event. To put the magnitude of the effects into context, the effect on maternal earnings is approximately one-fourth of the estimated impact of a health shock on an individual's own labor earnings (Dobkin et al., 2018; Meyer and Mok, 2019; Fadlon and Nielsen, 2017), and around 20% the estimated drop in maternal earnings 3 years after childbirth in Finland (Sieppi and Pehkonen, 2019), and 23% in Norway (Andresen and Nix, 2021). Our estimates are strikingly similar for Finland and Norway. These two Nordic countries share many characteristics in terms of institutional context, culture, and gender norms. The fact that we find almost identical results strengthens the robustness of our approach and the external validity of our findings.

In addition, we use data from Finland to study fatal shocks. The impact of losing a child on maternal labor earnings is much larger than for hospitalizations: three years after the death of a child mothers' earnings are about 20% lower than two years before the shock. For fathers, we do not find evidence of any significant impact.

We study if these families are insured through transfers and benefits linked to these shocks. We show that although transfers and other tax-deductible expenses offset part of the negative impact, families are not fully insured against these shocks. Moreover, the insurance effect of child benefits fades over time, reducing the protective effects on mothers' labor outcomes.

Children's health shocks also hurt parents' mental well-being, which we document using data on hospital and specialist diagnoses (from Finland), and data on primary care (from Norway). Our results suggest that this is the primary mechanism driving the impact of fatal shocks. In contrast, for non-fatal shocks, the results are more consistent with a combined effect of increased need for care and the deterioration of mothers' mental health.

Overall, our results point to the importance of assisting families whose child experiences a health shock, especially providing mental health support. Moreover, these results also have important implications with regard to gender equality. Our evidence shows that the disproportionate costs of children for women's labor market careers compared to that for men do not end with childbirth. We demonstrate that in two countries usually portrayed as exemplars of gender equality, and with very generous family policies, health shocks that occur during middle childhood to adolescence also have a disproportionate effect on women's labor market outcomes.

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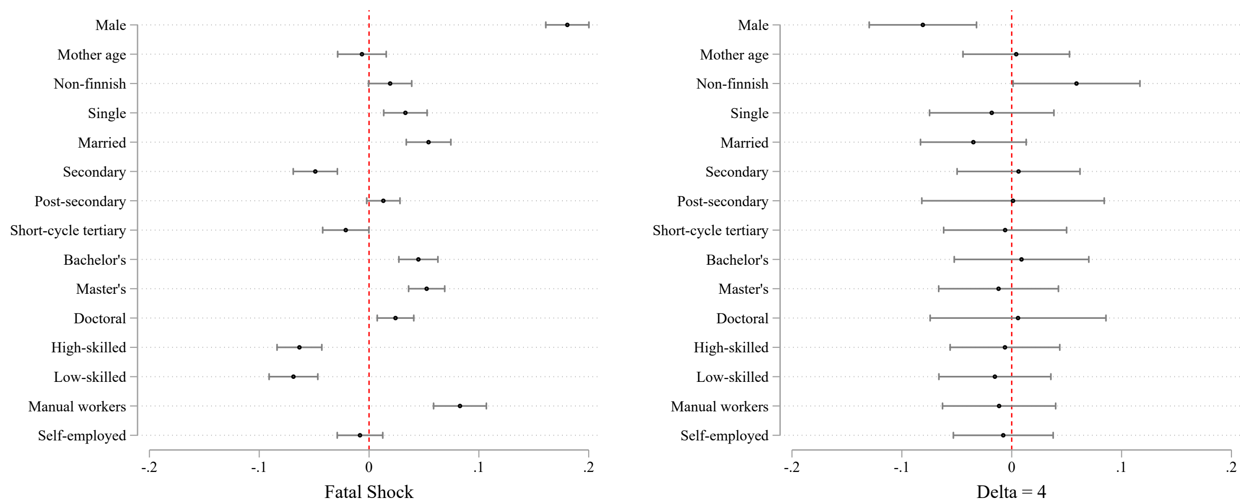
Appendix

Figure A1: Mortality: Differences in Characteristics



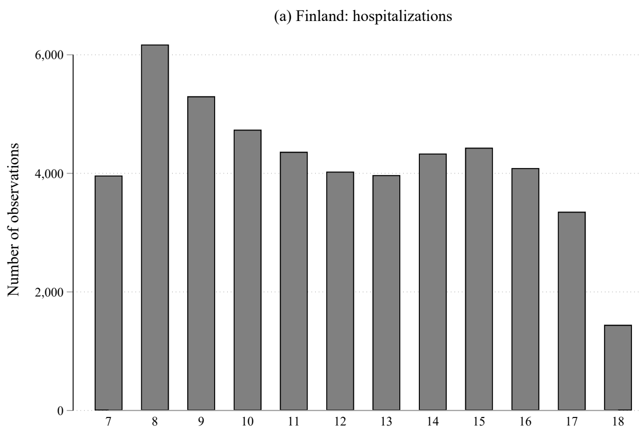
(a) Across Families

(b) Within Affected Families

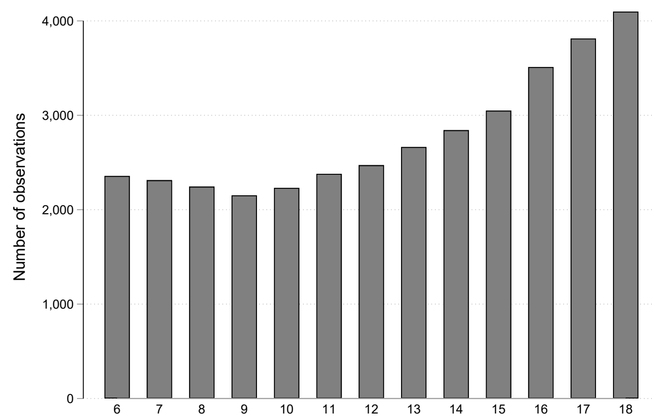
Notes: The figure shows the coefficients and 95% CI from separate regressions of each (standardized) variable. In panel (a), we regress the variables on an indicator that takes a value of 1 if the family suffered a fatal shock and 0 if not. In panel (b), we regress the same variables on an indicator that takes a value of 1 if the family is in the treatment group and 0 for the control group (the child experiences the shock 4 years later). To keep the scale of the graphs comparable, we exclude the results for gestational weeks and birth weight (large and significant coefficients in panel (a) and small and non-significant in panel (b)). All specifications include year-of-birth fixed effects. Standard errors are clustered at the mother level.

Figure A2: Number of Observations by Child's Age at Event Time

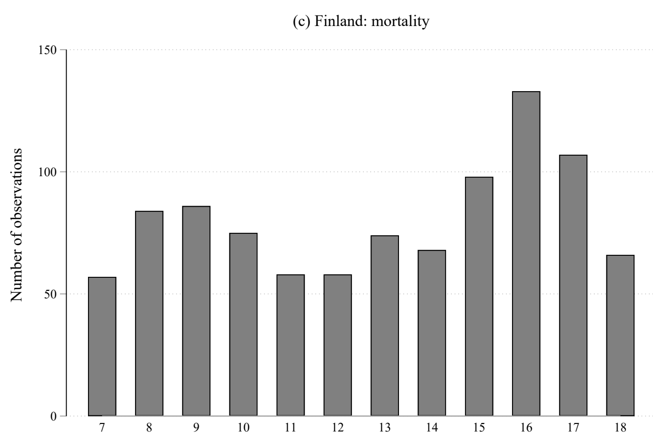
(a) Finland: hospitalizations



(b) Norway: hospitalizations



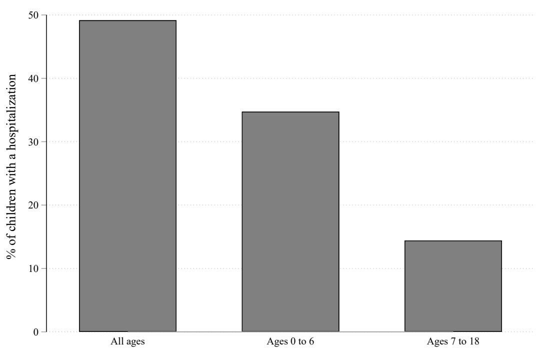
(c) Finland: mortality



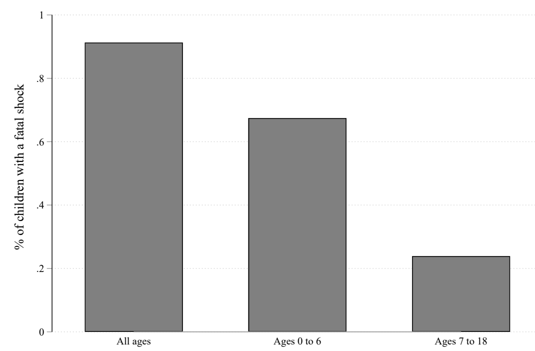
Notes: This figure shows the number of observations by the age of the child at hospital admission for Finland (panel (a)) and Norway (panel (b)). In panel (c), we show the number of observations by age of the child at the time of the fatal shock for Finland. The sample includes all children who suffered their first health shock between ages seven and eighteen in Finland. In Norway, we focus on the first hospitalization observable in the data after age six, restricting the sample to children that did not suffer any hospitalization in the year before the health shock.

Figure A3: Descriptive: children born in Finland in 1990

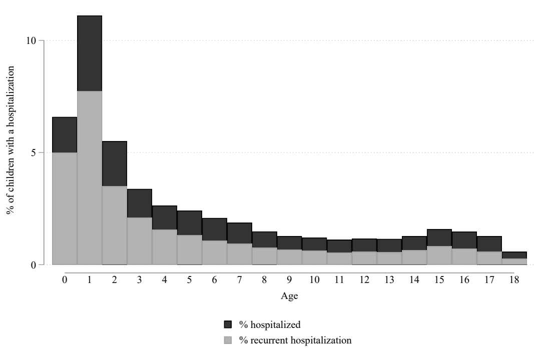
(a) Hospitalizations by age group



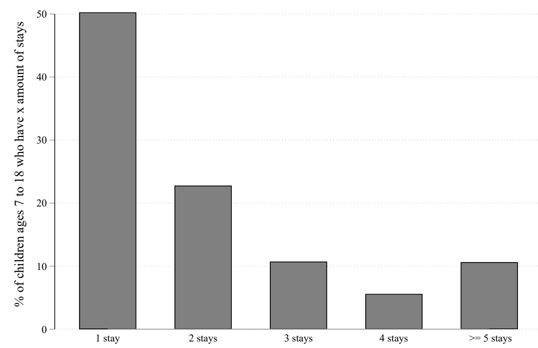
(b) Mortality by age group



(c) Hospitalization recurrence



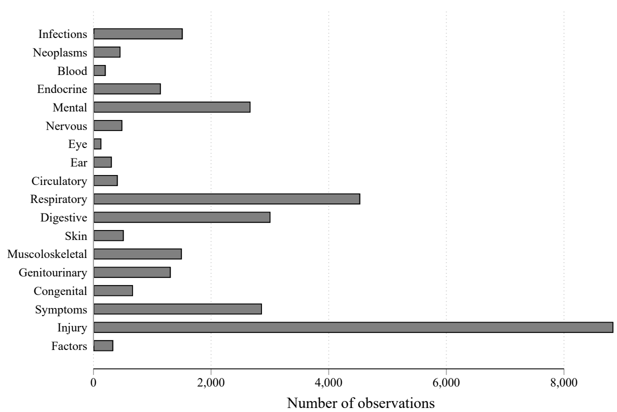
(d) Number of stays



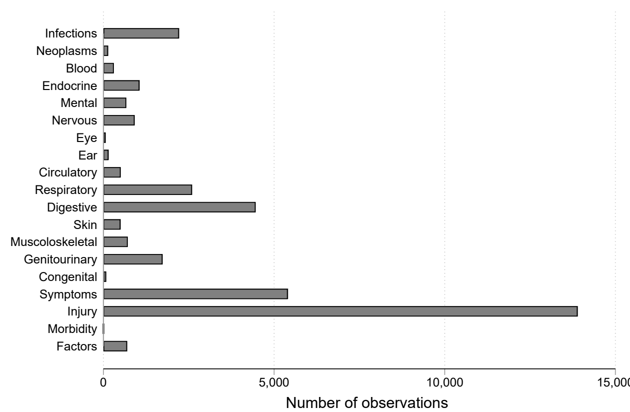
Notes: This figure provides different descriptive graphs for the sample of children born in 1990, in Finland. Panel (a) shows the percentage of children who suffered a hospitalization from ages 0 to 18 and then decomposed into two groups based on school starting age. Panel (b) plots the same information for mortality. Panel (c) shows the percentage of children who suffered a hospitalization by age, and the percentage of children who suffered recurring hospitalizations (defined by at least 2 hospital stays). Panel (d) shows the percentage of children with a given amount of hospital stays for the sample of children who suffered a hospitalization from ages 7 to 18.

Figure A4: Hospitalizations and Mortality Shocks by Main Diagnosis Group

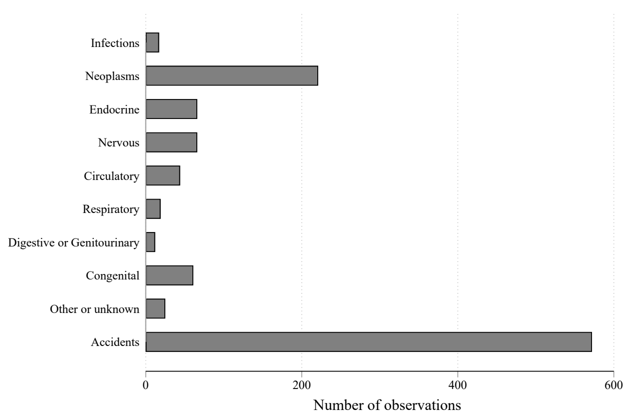
(a) Finland: hospitalizations



(b) Norway: hospitalizations

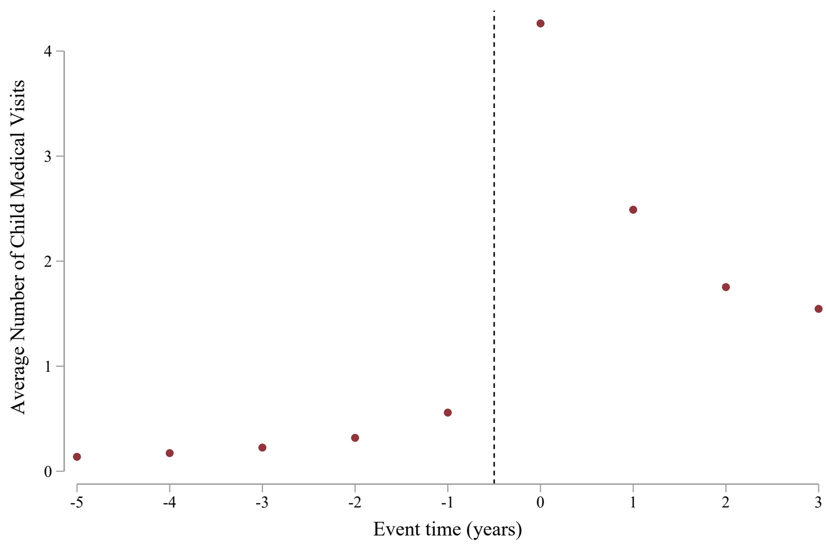


(c) Finland: mortality



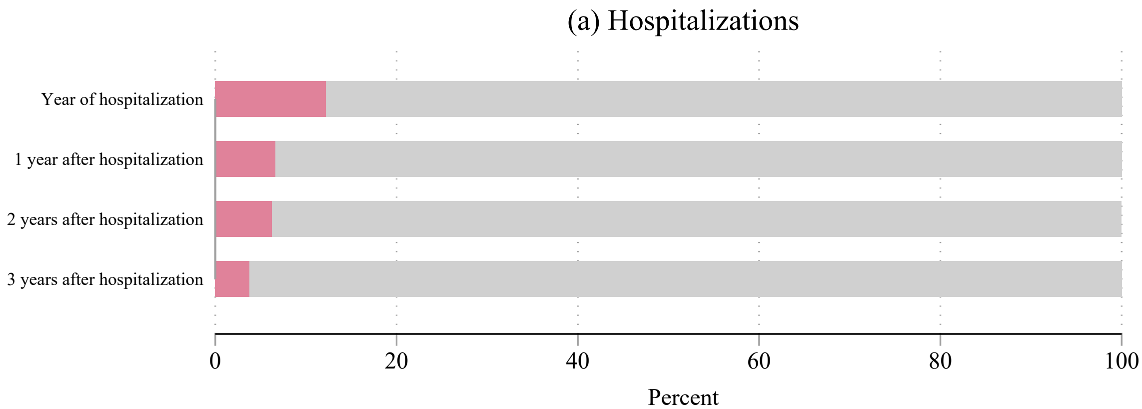
Notes: This figure shows the number of children who suffered a hospitalization by main diagnosis group (ICD-10 Chapters) for Finland (panel (a)) and for Norway (panel (b)). Panel (c) splits fatal shocks by cause of death. Categories include: Certain infectious and parasitic diseases, neoplasms, diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism, endocrine, nutritional and metabolic diseases, mental and behavioural disorders, diseases of the nervous system, diseases of the eye and adnexa, diseases of the ear and mastoid process, diseases of the circulatory system, diseases of the respiratory system, diseases of the digestive system, diseases of the skin and subcutaneous tissue, diseases of the musculoskeletal system and connective tissue, diseases of the genitourinary system, congenital malformations, symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified, injury, poisoning and certain other consequences of external causes, and factors influencing health status and contact with health services. All categories contain at least five observations.

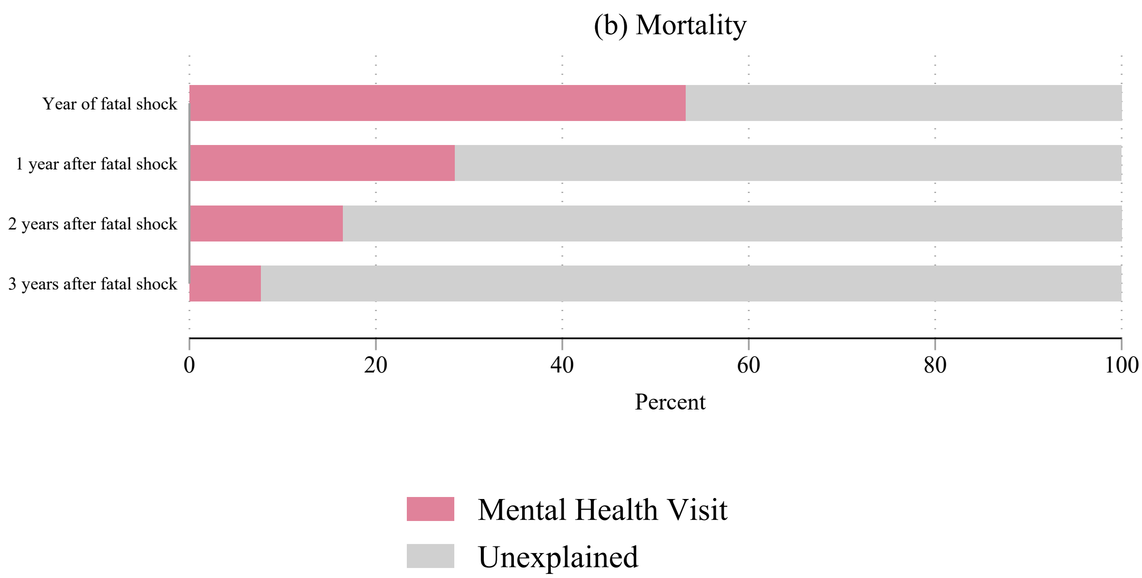
Figure A5: Hospitalizations: Children's Number of Visits



Notes: This figure shows the average number of children's inpatient and outpatient visits by event time (ranging from five years before to three years after their first hospitalization). We use administrative data from Finland.

Figure A6: Mental Health: Mediation Analysis





Notes: This figure shows the results of the mediation analysis presented in Equation 3. Panel (a) shows the percentage of the treatment effect of a child's hospitalization shock on maternal labor earnings explained by the deterioration of maternal mental health. Panel (b) shows the same results for mortality shocks. The former specification includes controls for calendar year, child's year of birth, child's gender, and each parent's age and educational level. The latter includes the same controls but considers only the mother's age and does not control for education. Standard errors are clustered at the mother level.

Table A1: Institutional Characteristics

	(1) Finland	(2) Norway
A. Countries Characteristics		
Population	5521606	5347896
GDP per Capita	$51556.526	$68345.069
GINI Index	27.3	27.6
Health Care Expenditure (% GDP)	9.037	10.049
Life Expectancy at Birth	81.785	82.907
Physicians (per 1,000 people)	3.812	2.698
Low-birthweight babies (% of births)	4.122	4.488
Mortality rate, under-5 (per 1,000 live births)	2.4	2.4
B. Institutional Support Characteristics		
Universal Public Health	Yes	Yes
Special Care Allowance	Yes	Yes
Disability Allowance	Yes	No
Informal Care Allowance	Yes	Yes
Survivor Pension for Parents	No	No
C. Gender Norms		
Labor force participation rate, female (%)	76.6	75.61
Child Penalty	25	23
"A job is alright but what most women really want is a home and children" (% Agree)	32.1	22.9
"A man's job is to earn money; a woman's job is to look after the home and family" (% Agree)	11.9	9.18
"All in all, family life suffers when the woman has a full-time job" (% Agree)	16.3	15.9

Notes: The statistics in panel (a) come from the World Bank website. All statistics reported correspond to 2019 data or the latest data available. The labor force participation rate, female is calculated as the % of female population ages 15-64. The numbers for the child penalty come from Sieppi and Pehkonen (2019) and Andresen and Nix (2021), respectively. Statistics in panel (c), on gender norms, come from own calculations using the European Value Study 2017. We report the percentage of respondents who agree or strongly agree with a given statement. For comparison, the respective numbers for Germany are 28.1, 13.5, and 44.9 and, for the UK, 32.2, 16.9, and 33.1.

Table A2: Finland- Summary Statistics

	Hospitalizations				Mortality			
	(1) DiD		(2) All		(3) DiD		(4) All	
	mean	sd	mean	sd	mean	sd	mean	sd
Child Characteristics								
Age at event time	13.271	3.802	11.875	3.224	15.331	3.967	12.910	3.439
Male	0.518	0.500	0.526	0.499	0.647	0.478	0.602	0.490
Mother Characteristics								
Mother's age	29.163	4.082	29.377	5.218	28.610	5.135	28.815	5.171
Age mother at admission	42.936	5.655	41.736	6.221	44.463	6.304	42.186	6.140
Finnish	0.985	0.121	0.977	0.149	0.982	0.131	0.975	0.155
Single	0.010	0.101	0.017	0.129	0.008	0.090	0.010	0.097
Married	0.210	0.407	0.270	0.444	0.262	0.440	0.263	0.441
Upper secondary	0.434	0.496	0.472	0.499	0.532	0.499	0.509	0.500
Post-secondary	0.007	0.082	0.008	0.088	0.010	0.098	0.006	0.079
Short-cycle tertiary	0.310	0.463	0.281	0.449	0.264	0.441	0.272	0.445
Bachelor's	0.096	0.295	0.100	0.300	0.088	0.284	0.094	0.291
Master's	0.142	0.349	0.130	0.336	0.099	0.299	0.110	0.313
Doctoral	0.011	0.103	0.010	0.099	0.007	0.081	0.009	0.093
High-skilled white collar	0.184	0.387	0.157	0.364	0.126	0.332	0.137	0.344
Low-skilled white collar	0.508	0.500	0.479	0.500	0.469	0.499	0.460	0.499
Manual workers	0.165	0.371	0.198	0.399	0.237	0.425	0.224	0.417
Self-employed	0.016	0.126	0.013	0.112	0.011	0.107	0.010	0.098
Earnings mother t=-2	21265.922	15020.591	20528.224	15721.872	17845.181	14731.818	18227.234	15868.393
Prob. working mother t=-2	0.919	0.273	0.885	0.319	0.827	0.378	0.812	0.391
Prob. unemployed mother t=-2	0.000	0.005	0.000	0.004	0.000	0.000	0.000	0.000
Total income mother t=-2	20676.556	9726.987	20764.401	10275.266	20323.934	9526.436	21298.852	10490.904
Prob. mental health visit mother t=-2	0.015	0.123	0.022	0.145	0.038	0.190	0.042	0.200
Prob. working in the public sector mother t=-2	0.414	0.492	0.378	0.485	0.390	0.488	0.398	0.490
Prob. changing job mother t=-2	0.110	0.312	0.119	0.323	0.124	0.330	0.138	0.345
Prob. divorced t=-2	0.116	0.320	0.142	0.349	0.168	0.374	0.167	0.373
Father Characteristics								
Age father at admission	43.011	5.541	44.116	6.866	44.823	6.549	44.688	6.667
Upper secondary	0.535	0.499	0.563	0.496	0.638	0.481	0.617	0.487
Post-secondary	0.009	0.092	0.010	0.101	0.011	0.105	0.015	0.121
Short-cycle tertiary	0.196	0.397	0.181	0.385	0.153	0.360	0.154	0.362
Bachelor's	0.107	0.309	0.104	0.305	0.092	0.289	0.096	0.295
Master's	0.136	0.342	0.124	0.330	0.086	0.280	0.095	0.293
Doctoral	0.017	0.130	0.018	0.132	0.021	0.142	0.023	0.150
Earnings father t=-2	33478.007	21834.650	30489.696	22726.303	27289.063	21592.623	28547.097	22255.169
Prob. working father t=-2	0.951	0.215	0.896	0.305	0.861	0.346	0.866	0.340
Prob. unemployed father t=-2	0.000	0.006	0.001	0.030	0.002	0.041	0.001	0.032
Total income father t=-2	26401.338	15282.171	25323.212	15753.136	23786.602	15066.965	25135.177	16148.476
Prob. mental health visit father t=-2	0.013	0.115	0.020	0.141	0.022	0.145	0.019	0.136
Prob. working in the public sector father t=-2	0.202	0.401	0.175	0.380	0.158	0.365	0.157	0.364
Prob. changing job father t=-2	0.137	0.344	0.136	0.343	0.128	0.334	0.126	0.332
Observations	48274		50172		2369		958	

Notes: This table reports the mean and the standard deviation for the variables exploited in the analysis using the Finnish administrative data. The first two columns are for hospitalization shocks: the sample used in the diff-in-diff analysis is shown in column (1) and the full sample of observations in column (2). The last two columns provide the same information for mortality shocks: for the diff-in-diff sample in column (3) and the full sample in column (4).

Table A3: Norway– Summary Statistics

	(1) DiD		(2) All	
	mean	sd	mean	sd
Child Characteristics				
Age at event time	12.414	3.374	12.754	3.828
Male	0.548	0.498	0.541	0.498
Mother Characteristics				
Mother's age at birth	28.810	4.437	28.690	5.260
Age mother at admission	41.224	5.320	41.444	6.079
Norwegian	0.849	0.358	0.830	0.375
Married	0.632	0.482	0.610	0.488
No education mother	0.003	0.051	0.005	0.072
Primary school mother	0.004	0.066	0.008	0.086
Lower secondary mother	0.172	0.377	0.208	0.406
Upper secondary, basic educ. level mother	0.077	0.266	0.089	0.285
Upper secondary, final year mother	0.294	0.456	0.278	0.448
Post-secondary non-tertiary mother	0.023	0.149	0.024	0.154
Bachelor's or equivalent level mother	0.344	0.475	0.307	0.461
Master's or equivalent level mother	0.062	0.241	0.056	0.231
Doctoral or equivalent level mother	0.005	0.074	0.005	0.069
Earnings mother t=-2	30722.236	24692.319	30599.858	24568.802
Prob. working mother t=-2	0.803	0.397	0.788	0.409
Total income mother t=-2	38228.001	22934.563	40085.750	21440.789
Total transfers mother t=-2	7884.261	8860.316	8437.732	9723.704
Prob. mental health visit mother t=-2	0.153	0.360	0.170	0.376
Prob. temporary DI mother t=-2	0.060	0.238	0.071	0.256
Prob. permanent DI mother t=-2	0.001	0.036	0.002	0.043
Prob. divorce mother t=-2	0.012	0.111	0.014	0.116
Father Characteristics				
Age father at admission	43.708	5.642	44.465	6.830
No education father	0.001	0.038	0.003	0.050
Primary school father	0.004	0.064	0.005	0.070
Lower secondary father	0.181	0.385	0.199	0.399
Upper secondary, basic educ. level father	0.070	0.255	0.086	0.281
Upper secondary, final year father	0.361	0.480	0.332	0.471
Post-secondary non-tertiary father	0.055	0.227	0.054	0.226
Bachelor's or equivalent level father	0.214	0.410	0.192	0.394
Master's or equivalent level father	0.087	0.282	0.078	0.268
Doctoral or equivalent level father	0.012	0.107	0.010	0.099
Earnings father t=-2	56370.670	47831.542	54576.941	46669.518
Prob. working father t=-2	0.897	0.304	0.872	0.334
Total income father t=-2	58315.070	46728.648	60295.908	44909.814
Total transfers father t=-2	2513.083	7618.839	3370.206	8917.984
Prob. mental health visit father t=-2	0.090	0.286	0.098	0.297
Prob. temporary DI father t=-2	0.032	0.176	0.038	0.191
Prob. permanent DI father t=-2	0.002	0.041	0.003	0.055
Prob. divorce father t=-2	0.012	0.109	0.013	0.113
Observations	24316		36125	

Notes: This table reports the mean and the standard deviation for the variables exploited in the analysis using the Norwegian administrative data. These descriptive statistics are for hospitalization shocks: the sample used in the diff-in-diff analysis is shown in column (1) and the full sample in column (2).

Table A4: Hospitalizations: DiD vs. Event Study with Individual Fixed Effects

	(1) Earnings DiD (€)		(2) Earnings FE (€)	
	Finland	Norway	Finland	Norway
-5	36.260	-199.724		
	(108.398)	(237.686)		
-4	166.305*	-123.308	-46.347	64.428
	(93.366)	(216.523)	(33.619)	(85.818)
-3	17.047	-229.748	50.174	-42.250
	(68.632)	(172.738)	(32.093)	(107.914)
-1	-59.126	-307.845*	76.981**	-278.010***
	(69.882)	(177.189)	(38.788)	(95.733)
0	-310.543***	-283.370	-70.867	-404.276***
	(95.867)	(221.354)	(51.292)	(148.209)
1	-517.681***	-620.884**	-299.647***	-612.802***
	(115.358)	(252.637)	(61.177)	(194.995)
2	-752.394***	-1279.759***	-408.690***	-990.905***
	(134.557)	(287.903)	(65.398)	(240.168)
3	-1000.763***	-1450.364***	-632.985***	-1150.603***
	(147.714)	(327.171)	(64.462)	(272.752)
Observations	401787	212688	398725	325125
Controls	YES	YES	YES	YES
Mean Y_{t-2}	21450.555	30722.236	20649.215	30599.858

Notes: This table shows the impact of a child's hospitalization on maternal earnings (Euro) using the difference-in-differences specification in Equation 1 (in column (1)) and the event study approach with individual fixed effects laid out in Equation (2) (in column (2)), for both Finland and Norway, respectively. For the event study, we implement the IW estimator proposed by Sun and Abraham (2020). In the DiD specification, we include the usual controls for calendar year, child's year of birth, child's gender, and each parent's age and educational level. In the event study, we include controls for calendar year and individual fixed effects. Standard errors are clustered at the parent level.

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

Table A5: Hospitalizations: Fathers' Labor Outcomes

	(1) Earnings (€)		(2) Earnings (%)		(3) Employment	
	Finland	Norway	Finland	Norway	Finland	Norway
-5	-109.915	377.702	-0.326	0.700	-0.002	0.007**
	(138.768)	(481.219)	(0.411)	(0.900)	(0.002)	(0.003)
-4	-82.649	621.514	-0.245	1.100	-0.000	0.004
	(119.201)	(477.208)	(0.353)	(0.800)	(0.002)	(0.003)
-3	113.819	85.978	0.337	0.200	-0.001	0.003
	(89.802)	(389.012)	(0.266)	(0.700)	(0.002)	(0.002)
-1	204.808**	-333.297	0.607**	-0.600	-0.004**	-0.000
	(94.586)	(426.918)	(0.280)	(0.800)	(0.002)	(0.002)
0	79.929	471.037	0.237	0.800	-0.005**	-0.001
	(128.229)	(548.662)	(0.380)	(1.000)	(0.002)	(0.003)
1	58.752	-197.917	0.174	-0.400	-0.005*	-0.005
	(158.391)	(497.685)	(0.469)	(0.900)	(0.002)	(0.003)
2	-126.972	-237.545	-0.376	-0.400	-0.006**	-0.007**
	(191.686)	(681.629)	(0.568)	(1.200)	(0.003)	(0.003)
3	-350.942	-944.994	-1.040	-1.700	-0.009***	-0.015***
	(217.156)	(759.326)	(0.643)	(1.300)	(0.003)	(0.004)
Observations	401787	212688	401787	212688	401787	212688
Controls	YES	YES	YES	YES	YES	YES
Mean Y_{t-2}	33750.607	56384.200	100.000	100.000	0.953	0.924

Notes: This table shows the impact of a child's hospitalization on the father's earnings (Euro) (in column (1)), earnings as a % of mean earnings in $t-2$ (in column (2)), and working probability (in column (3)). The table shows the estimated coefficients for the interaction between the event time dummies and the treat dummy in Equation 1. All specifications include controls for calendar year, child's year of birth, child's gender, and each parent's age and educational level. Standard errors are clustered at the parent level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A6: Mortality: Fathers' Labor Outcomes

	(1) Earnings (€)	(2) Earnings (%)	(3) Employment
-5	1904.739**	7.214**	0.018
	(882.862)	(3.344)	(0.019)
-4	1180.717	4.472	0.016
	(772.168)	(2.925)	(0.018)
-3	282.384	1.070	-0.004
	(532.206)	(2.016)	(0.015)
-1	115.981	0.439	-0.000
	(622.708)	(2.359)	(0.015)
0	-1385.598	-5.248	-0.038**
	(912.172)	(3.455)	(0.018)
1	-678.874	-2.571	-0.032
	(1107.780)	(4.196)	(0.022)
2	452.526	1.714	-0.040
	(1289.359)	(4.883)	(0.027)
3	-264.102	-1.000	-0.035
	(1400.067)	(5.303)	(0.028)
Observations	10562	10562	10562
Controls	YES	YES	YES
Mean Y_{t-2}	26402.652	100.000	0.845

Notes: This table shows the impact of a child's fatal shock on the father's earnings (Euro) (in column (1)), earnings as a % of mean earnings in $t-2$ (in column (2)), and working probability (in column (3)). We use administrative data from Finland, and the sample includes all fatal shocks due to injuries, poisonings, or other consequences of external causes. The table shows the estimated coefficients for the interaction between the event time dummies and the treat dummy in Equation 1. All specifications include controls for calendar year, child's year of birth, child's gender, and the father's age. Standard errors are clustered at the parent level.

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

Table A7: Hospitalizations: Fathers' Institutional Support

	(1) Total Income (€)		(2) Transfers (€)		(3) Allowance (€)
	Finland	Norway	Finland	Norway	Finland
-5	-95.875	349.714	-101.625***	-98.248	-57.899
	(101.248)	(482.345)	(38.853)	(90.336)	(39.377)
-4	-46.698	399.402	-41.656	-145.783*	-64.503*
	(92.092)	(481.477)	(34.609)	(77.892)	(33.666)
-3	38.212	-28.156	-44.605*	-129.122**	-15.151
	(78.558)	(401.289)	(26.790)	(61.935)	(25.479)
-1	-16.963	-374.205	-11.093	-42.749	-25.688
	(80.727)	(434.385)	(27.565)	(65.957)	(24.382)
0	-211.330**	419.878	-12.556	-76.723	-36.154
	(98.777)	(550.008)	(37.344)	(83.593)	(29.675)
1	-99.848	-145.111	-6.202	-50.502	45.208
	(116.763)	(492.318)	(45.254)	(107.94)	(32.234)
2	-75.582	-295.944	6.717	-52.663	25.916
	(142.478)	(662.701)	(53.500)	(129.524)	(35.813)
3	-128.305	-712.017	-5.437	106.282	13.329
	(154.366)	(756.929)	(58.726)	(134.262)	(35.797)
Observations	376778	212688	376778	212688	376778
Controls	YES	YES	YES	YES	YES
Mean Y_{t-2}	27198.223	58327.767	1312.107	2511.704	3151.868

Notes: This table shows the impact of a child's hospitalization on the father's total income (in column (1)), transfers (in column (2)), and child allowances received (in column (3)), for both Finland and Norway, respectively. The table shows the estimated coefficients for the interaction between the event time dummies and the treat dummy in Equation 1. All specifications include controls for calendar year, child's year of birth, child's gender, and each parent's age and educational level. Standard errors are clustered at the parent level.

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

Table A8: Mortality: Both Parents Institutional Support

	(1) Total Income(€)		(2) Transfers(€)		(3) Allowance(€)	
	Mother	Father	Mother	Father	Mother	Father
-5	-11.035	79.937	-303.099	-299.948	48.330	-383.019*
	(458.813)	(725.842)	(337.602)	(310.399)	(208.713)	(210.604)
-4	111.944	288.916	-87.970	-3.485	106.921	-222.579
	(403.449)	(670.456)	(289.537)	(268.428)	(173.219)	(180.216)
-3	121.151	-963.959*	-326.503	102.140	10.396	-103.318
	(311.884)	(573.427)	(224.459)	(214.819)	(124.739)	(136.512)
-1	124.216	423.844	-325.078	-114.463	65.030	-92.174
	(338.140)	(653.694)	(220.225)	(207.012)	(128.347)	(135.599)
0	-892.903**	549.016	353.788	114.749	-583.788***	-541.067***
	(405.085)	(816.898)	(321.728)	(314.794)	(170.576)	(169.708)
1	-1985.564***	459.212	233.968	281.564	-939.504***	-825.847***
	(493.897)	(810.728)	(395.258)	(372.919)	(209.467)	(188.353)
2	-2036.153***	659.872	390.051	456.989	-410.639*	-519.498**
	(622.576)	(1089.594)	(469.614)	(430.340)	(236.819)	(220.088)
3	-2358.474***	-478.217	260.984	1219.246**	-264.073	-422.580*
	(708.518)	(1072.182)	(508.304)	(479.830)	(248.118)	(236.879)
Observations	9529	9529	9529	9529	9529	9529
Controls	YES	YES	YES	YES	YES	YES
Mean Y_{t-2}	21411.819	24607.387	5957.317	2647.354	3782.243	2968.623

Notes: This table shows the impact of a child's fatal shock on total income (in column (1)), transfers (in column (2)), and child allowances received (in column (3)), for both mothers and fathers, respectively. The table shows the estimated coefficients for the interaction between the event time dummies and the treat dummy in Equation 1. We use administrative data from Finland, and the sample includes all fatal shocks due to injuries, poisonings, or other consequences of external causes. All specifications include controls for calendar year, child's year of birth, child's gender, and one parent's age depending on the outcome variable. Standard errors are clustered at the parent level.

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

Table A9: Mortality: Choice of Delta

	(1) Delta = 2	(2) Delta = 3	(3) Delta = 4
-5	980.588	981.180	863.707
	(616.542)	(667.822)	(673.499)
-4	-37.273	244.293	656.534
	(596.068)	(582.270)	(580.610)
-3	388.984	227.063	961.383**
	(434.429)	(394.335)	(403.634)
-1	-104.126	358.997	518.002
	(502.405)	(454.528)	(460.415)
0	-2160.274***	-2549.356***	-2234.341***
	(680.797)	(649.081)	(642.672)
1	-3704.958***	-3538.926***	-3632.357***
	(696.063)	(783.019)	(796.163)
2		-4007.194***	-3659.945***
		(832.569)	(949.352)
3			-4099.865***
			(991.618)
Observations	7549	9351	10562
Controls	YES	YES	YES
Mean Y_{t-2}	20016.450	19598.187	19443.969

Notes: This table shows the impact of a child's fatal shock on maternal labor earnings for different choices of control group. We show the estimation results when the control group consists of families whose child experienced a fatal shock two years later in column (1), three years later in column (2), and four years later in column (3) (our main specification). The table shows the estimated coefficients for the interaction between the event time dummies and the treat dummy in Equation 1. We use administrative data from Finland, and the sample includes all fatal shocks due to injuries, poisonings, or other consequences of external causes. All specifications include controls for calendar year, child's year of birth, child's gender, and the mother's age. Standard errors are clustered at the parent level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A10: Mortality: Mutual Shocks

	(1) +/− One Week	(2) +/− One Month
-5	425.749	270.705
	(696.151)	(731.373)
-4	457.553	565.984
	(606.320)	(638.150)
-3	849.114**	827.841*
	(421.921)	(446.064)
-1	500.835	430.467
	(479.298)	(482.776)
0	-1234.465**	-1422.215**
	(628.412)	(633.732)
1	-2611.367***	-2855.469***
	(790.615)	(807.632)
2	-2512.267***	-2665.291***
	(954.427)	(970.222)
3	-2705.384***	-2756.299***
	(998.594)	(1026.938)
Observations	9863	9234
Controls	YES	YES
Mean Y_{t-2}	19437.122	19468.168

Notes: This table shows the impact of a child's fatal shock on maternal labor earnings. In column (1), we exclude fatal shocks where parents were hospitalized or visited a specialist one week before or after the child's shock. In column (2), we do the same but for mutual shocks one month before or after the child's shock. The table shows the estimated coefficients for the interaction between the event time dummies and the treat dummy in Equation 1. We use administrative data from Finland, and the sample includes all fatal shocks due to injuries, poisonings, or other consequences of external causes. All specifications include controls for calendar year, child's year of birth, child's gender, and the mother's age. Standard errors are clustered at the parent level.

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

Table A11: Mortality: Parents' Number of Visits Mental Health

	(1) Mother Visits	(2) Father Visits
-5	0.648**	0.189
	(0.251)	(0.142)
-4	0.271*	0.233
	(0.158)	(0.144)
-3	0.181	0.152
	(0.140)	(0.097)
-1	0.237	0.101
	(0.160)	(0.121)
0	1.113***	0.479*
	(0.221)	(0.263)
1	1.564***	0.201
	(0.364)	(0.604)
2	1.004***	0.017
	(0.339)	(0.570)
3	0.739**	-0.043
	(0.340)	(0.557)
Observations	9472	9472
Controls	YES	YES
Mean Y_{t-2}	0.333	0.204

Notes: This table shows the impact of a child's fatal shock on the mother's (column (1)) and the father's mental health (column (2)). The table shows the estimated coefficients for the interaction between the event time dummies and the treat dummy in Equation 1. We use administrative data from Finland, and the sample includes all fatal shocks due to injuries, poisonings, or other consequences of external causes. All specifications include controls for calendar year, child's year of birth, child's gender, and one parent's age depending on the outcome variable. Standard errors are clustered at the parent level.

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