DARK PASSAGE

Mental Health Consequences of Parental Death

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ABSTRACT
We study the effects of parental death on children's mental health. Combining nationwide administrative data for Finnish citizens born between 1971 and 1986, we utilize an event study methodology to analyze hospitalization for mental health–related reasons by the age of 30. We find no clear evidence of increased hospitalization following the death of a parent of a different sex, but there are significant effects for boys losing their fathers and, to a lesser extent, girls losing their mothers. We analyze the effects in a country that has committed substantial financial resources to implement school health care for all pupils. In countries where such policies do not exist or where the coverage of primary health-care services in schools is not universal, the negative effects on mental health may arguably be even larger.

KEYWORDS: parental death, mental health, hospitalization
JEL CLASSIFICATION: I10, I12, J12, J13

I. Introduction

Children face many challenges in their path to adulthood. Probably the most difficult situation a child faces is the death of a parent, which is often the first time a child deals with death, sorrow, and ordeal. At this critical point in life, children are forced to encounter and overcome a loss of parental guidance and social support, a likely reduction in family income and economic resources, and other shortfalls that other children do not have to face. The traumatic event likely leaves scars across a host of outcomes, such as future educational outcomes, labor-market outcomes, family formation, and health.

Mental health is an increasingly important determinant of overall health and well-being in all developed countries (Layard 2013), with depression being the largest contributor to the disease burden weighted by disability years attributable to nonfatal health outcomes (Whiteford et al. 2013). Mental disorders at young ages have an enduring impact on individuals' well-being and economic prosperity later in life. Consequently, early mental

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health–related problems often accumulate into negative health and non-health consequences in adulthood. For example, mental health problems may lead to poor physical health (Sareen et al. 2006) as well as work-related losses, such as lower work performance and increased absenteeism (Bubonya, Cobb-Clark, and Wooden 2017). Finally, individuals with severe mental illnesses, defined as psychotic disorders, such as schizophrenia, bipolar disorder, or depression, have substantially shorter life expectancies of 10–20 years (Liu et al. 2017).

Despite the increasing importance of mental health, economic research has only rarely analyzed the effects of parental death on a child's mental health. We contribute to the literature by estimating the dynamic effects of mental health–related hospitalizations. Mental health–related hospitalizations potentially lead to significant educational and labor-market consequences due to disruptions in schooling and the accumulation of human capital in critical years of learning. Missing in-person learning in a normal school environment implies that inpatient hospitalization is a particularly relevant outcome for children and adolescents.[1] Our analysis is based on nationwide register-based data from Finland for individuals born between 1971 and 1986 to measure hospitalization through the age of 30. Population-based data are free from health-related selection and nonparticipation biases.

For identification in a dynamic setting, our baseline specification is an event study framework akin to the model used by Kleven, Landais, and Egholt Søgaard (2019) and Kristiansen (2021), in which we follow individuals before and after a parental death at ages 10–20. The results from the specification test recommended by Borusyak, Jaravel, and Spiess (2021) show no evidence that the "parallel trends" assumption is violated in our setting. In other words, we cannot reject the assumption that there is no trend in hospitalization prior to parental death. To examine the robustness of our results, we also consider several other models, such as including an extensive set of control variables or family fixed effects instead of individual fixed effects.

Because the event study compares outcomes before and after parental death, the outcome measure must be comparable across a wide range of ages, from early ages until age 30, in our analysis. Because Finnish physicians have to follow national clinical guidelines as they decide whether to admit a person to a hospital for mental health–related reasons, our measure of hospitalization is comparable across age ranges. Mental health medication, one of the outcomes in Kristiansen (2021), is not an appropriate outcome in our setting, as the national clinical guidelines in Finland over the study period generally recommended against prescribing mental health medication for children and adolescents.[2]

In accordance with previous work, often in public health based on cross-sectional analysis, we find a negative relationship between parental death and children's mental health by focusing on the dynamic effects. Strikingly, we find that losing a parent of one's own sex has a much more profound negative effect on mental health than losing a parent of the opposite sex. For males, the pre-death hospitalization rate doubles after the loss of the father. The effect remains quantitatively and statistically significant several years after death. The effect

1 Recently, the COVID-19 pandemic has highlighted the importance of in-person learning for educational outcomes (Grewenig et al. 2021).

2 Nevertheless, there has been a notable increase in the use of antidepressant medication for those under 18 also in Finland during the past 10 years.

of the mother's death on females is also significant, but it diminishes in later years. We find no clear evidence that adverse mental health outcomes are associated with the mother's death for males or the father's death for females. To gain additional insight, we also relate our findings to noneconomic literature that has highlighted that emotional attachment is potentially stronger when parents and children have the same sex.

The paper proceeds as follows. Section II provides an overview of the empirical literature. Section III describes the relevant institutional setting. Section IV introduces the administrative data. Section V discusses the empirical specifications. Section VI documents the baseline results and robustness checks. Section VII provides a discussion and conclusion.

II. Relationship to Previous Work

Table 1 summarizes the economics literature on parental death. To provide a concise overview, we exclude studies that use parental deaths as a means to an end, such as studies like Corak (2001) that use parental death to study the effects of parental absence, as well as studies like Kalil et al. (2016) and Gould, Simhon, and Weinberg (2020) that investigate how parental death changes the relationship between parental schooling and children's education outcomes. We also restrict the overview to studies that focus on developed Western countries.

Our paper is most closely related to Kristiansen (2021),[3] who examines the effect of parental health shocks, including deaths, on the likelihood of two mental health–related outcomes: therapy and antidepressant medication. She studies health shocks for children aged 14 to 18 at the time of the shock using Danish register data. Based on the event study framework for children born up to 1998, she finds that parental death leads to short-run increases in both outcomes, with therapy more likely among higher-income families and antidepressants among lower-income families. In the long run, antidepressant use is correlated with lower education, whereas no such association is evident for therapy.

We contribute to the literature by analyzing the causal relationship between parental death and mental health–related hospitalizations. We differ from previous work, particularly from Kristiansen's (2021) analysis of parental death in Denmark, which studies therapy and antidepressant medication as outcomes, in five ways. First, we focus on mental health–related hospitalization. Second, to identify the explicitly exogenous causes of death, we apply the approaches of Espinosa and Evans (2008) and Gimenez et al. (2013), which permit us to estimate the causal effects using deaths not correlated with parental socioeconomic status (i.e., income and education). Third, we present results using family fixed effects, accounting for the time-invariant characteristics of parental or family backgrounds. Fourth, we provide a second event study analysis, using a difference-in-differences framework, by including a comparison group of individuals without parental death. Fifth, we formally test the underlying assumption of parallel trends using data from the pretreatment period, as proposed by Borusyak, Jaravel, and Spiess (2021).

3 Less closely related, but still relevant, is the work by Persson and Rossin-Slater (2018), who report the adverse mental health consequences for children whose mothers experienced a death in the family while pregnant.

TABLE 1. Economics literature on parental death, developed Western countries

Author(s) and publication year	Country	Age at parental death	Identification	Dependent variables	Parental death result—preferred model
Parental death					
Kristiansen (2021)	Denmark	14–18	Event study	Therapy, antidepressant use, test score	Parental death increases antidepressant use and therapy among the affected children. The effects on mental health tend to be larger for girls; the reduction in test scores is larger for boys.
Dupraz and Ferrara (2021)	US	0–20	OLS and IV	Occupational status, income, marriage	Paternal death reduced sons' incomes and, to a lesser extent, occupational status.
Rosenbaum-Feldbrügge (2019)	The Netherlands	0–16	OLS	Occupational status	Maternal death has a negative effect on occupational status; paternal death is not significant.
Gimenez et al. (2013)	Taiwan	0–19	OLS—exogenous causes of death	Education, marriage, employment, military enrollment	Parental death, particularly of the mother, has adverse effects on education.
Adda, Björklund, and Holmlund (2011)	Sweden	0–18	Selection correction	Skills and labor-market outcomes	After accounting for selection, parental death has no detectable effect on any outcome.
Chen, Chen, and Liu (2009)	Taiwan	n/a	Family fixed effects	College enrollment	Maternal death has a negative effect on college enrollment.
Parental death and divorce					
Steele, Sigle-Rushton, and Kravdal (2009)	Norway	0–16	Simultaneous equations	Educational attainment	Lower education levels for children with parental death; similar for boys and girls.
Fronstin, Greenberg, and Robins (2001)	UK	0–22	OLS	Education, earnings, employment	Lower education levels for females after father's death; no consistent effects on employment or wages.
Lang and Zargosky (2001)	US	0–17	OLS	Test score, income, marriage, net worth	Negative effects of mother's absence on girls' test score and father's absence on boys' marriage.

Our study is also connected to earlier empirical studies in economics that have focused on the potentially negative effects of parental death on education and labor-market outcomes, such as college enrollment, test scores, and earnings trajectories (Table 1).[4] The negative educational and labor-market effects in adulthood may plausibly be driven by poor mental health in childhood, which often leads to missing in-person learning in a normal school environment.

A substantial body of literature on the effects of parental death exists outside economics, mainly using cross-sectional estimation strategies that do not permit causal inferences about estimated relationships. However, reviewing that literature is beyond the scope of the current work. Instead, we encourage interested readers to consult the following articles: Appel et al. (2013) for epidemiology; Berg, Rostila, and Hjern (2016) for psychology; and McKay et al. (2021) for public health.

III. Institutional Background

This section describes the institutional context in which we evaluate the effects of parental death on a child's mental health.[5] The role of class supervisors and school nurses is pivotal for detecting the early signs of mental health problems because almost all children aged 10–20 are in school. In addition, regular meetings between parents and teachers in the Finnish comprehensive school system disseminate information regarding the issues (including parental death) that are relevant for children's well-being and development. The minimum school leaving age in Finland is 16, and almost all children continue their studies to the secondary level of education, following an academic or vocational track. Based on the law, each school in Finland has an appointed public health nurse (having tertiary education) and a doctor. School health care is organized by the municipalities (as of 2020, there are 310 municipalities in Finland) in which the schools are located. Local authorities follow the national guidelines set by the Ministry of Social Affairs and Health.

The purpose of a public health nurse and a doctor in school is to provide comprehensive primary health-care services (including mental health services) for pupils. They are also responsible for conducting regular health checks. All primary health-care services at schools are offered free of charge for pupils. Naturally, public health nurses also have discussions with surviving parent(s) if the children are younger than 18 years of age. After their evaluation, school nurses consult general practitioners, who are typically doctors appointed to the school. Finally, a child's mental condition is evaluated by a psychiatrist who is professionally qualified to make a decision regarding admission to a hospital.[6] A common reason for admission to a hospital for mental health–related reasons is that there is an elevated risk of self-harm. In essence, in these cases, hospitalization implies hospital-based crisis

4 A recent study from the noneconomic literature based on Finnish data utilizes family fixed-effects models and finds negative impacts of early parental death on children's university education (Kailaheimo-Lönnqvist and Erola 2020).

5 Keskimäki et al. (2019) provide a comprehensive account of the Finnish health-care system.

6 Basic medical education in Finland lasts for a minimum of six years. Specialized physicians, such as psychiatrists, have a doctoral degree with additional education that takes five or six years.

intervention. Regarding the treatment of a child's mental health disorders in a hospital setting, major emphasis is placed on various forms of therapy to make it possible for a child to return to a normal school environment. Rehabilitation psychotherapy is provided by the Social Insurance Institution of Finland (Kela) in close cooperation with health centers and hospitals. Most of the services are provided free of charge (without copayment) and are covered by the universal health-care system available to all Finnish citizens.

IV. Administrative Data Sets

Our empirical analysis is based on nationwide administrative data sources. We begin by describing health registers and then proceed to characterize the census data. Finally, we provide key descriptive information on parental death.

A. HEALTH REGISTERS

We use data from the comprehensive death certificates compiled by Statistics Finland to identify the cause and date of death over the period 1970–2016. All diagnoses for the causes of death pass a routine validation conducted by Statistics Finland, and unclear cases are judged by a panel (Lahti and Penttilä 2001).[7]

The main source of mental health data is the Discharge Register from the Finnish Institute for Health and Welfare, which identifies all inpatient discharges in specialized public health care for the Finnish population from 1970 to 2016, with minimal censoring of ongoing spells. In typical cases, several diagnostic procedures have contributed to the diagnosis, including an additional structured clinical interview in some cases. Diagnoses for mental health disorders are usually established by several treating doctors. Because Finland's national health insurance system covers all citizens, almost all hospitalizations are in the public sector. The private Finnish health-care system is small and almost exclusively provides only outpatient care and occupational health care.

The main outcome is a dummy variable, measured annually, equal to 1 for individuals who had at least one (inpatient) hospitalization spell due to mental health–related disorders (ICD-10: F, ICD-8 and ICD-9: 290–319). Secondary outcomes include cause-specific hospitalizations, which are described in more detail by Böckerman, Haapanen, and Jepsen (2021).

We focus on hospitalization as the outcome in our analysis for four reasons.[8] First, the treatment costs of mental health–related hospitalizations are considerable in the universal health-care system. Hospital entry is part of the treatment and can reduce the need for health-care use later in life. Second, hospitalizations cause substantial indirect economic costs for affected individuals. Earlier Finnish evidence based on nationwide register data

7 The statistics on causes of death include all deaths in Finland or abroad of persons permanently resident in Finland at the time of their death.

8 Note that obtaining statistically significant effects at the intensive margin of adjustment (i.e., for the length of hospitalization spells among hospitalized) is not feasible based on an event study framework because the likelihood of having a positive number of days spent as an inpatient is a relatively rare outcome in the data and most of the spells are short.

shows clearly that mental health–related hospitalization between ages 15 and 25 is associated with economically meaningful employment and earnings losses in adulthood (Hakulinen et al. 2019). Mental disorders are also nowadays the leading cause of disability pensions in Finland. Third, the overall reliability of hospitalization data for empirical research is well established, and the measurement error is very small (Sund 2012). Fourth, nationwide data are available for an extensive period from 1970 onwards, facilitating the use of the event study framework to analyze dynamic effects.

B. CENSUS DATA

These health registers are linked[9] to the census data on the population of Finland, available from Statistics Finland. The census files, available at five-year intervals from 1970 to 1985 and annually from 1987 to 2016, provide comprehensive information on the parents and their children, including data on family composition, education, earnings, occupation, and the region of residence.

Given that Finland has a current population of approximately 5.5 million, we use data for an extended time period, for both parents and children, to improve the precision of the estimates. Specifically, we follow Finnish individuals born between 1971 and 1986, by which we have data on approximately one million individuals who have reached at least the age of 30 (in 2016). Missing parental information is caused mainly by parents who have been born and permanently live outside Finland. We exclude children born outside of Finland or whose parents were born outside of Finland.

C. DESCRIPTIVE INFORMATION ON PARENTAL DEATH AND HOSPITALIZATION

Parental death during childhood and early adulthood is relatively rare in all developed countries. In our data, approximately 15 percent of individuals experience a parental death before they turn 31 (Table 2).[10] We observe two additional patterns. First, parental death experiences in childhood and early adulthood are skewed toward the death of the father. Less than 5 percent of individuals experience the death of their mother before they turn 31, compared with nearly 12 percent for the death of their father. This pattern presumably leads to less precise estimates of the impact of maternal deaths. Second, the likelihood of parental death increases substantially with the individual's age, from under 1 percent for a parental death before age 5 to 4.7 percent when the individual is between 26 and 30 years old.

9 As the linkage between data sources is done based on a unique person identifier akin to the Social Security number in the United States, the data—as in other Nordic countries—are of very high quality.

10 In our data, it is very rare that a child experiences a simultaneous death of both parents when the child is between 10 and 20 years old. As shown in Online Appendix Table A7, the share of individuals dropped from the analysis because both parents died simultaneously ranges from 0.5 percent to 1.7 percent for children aged 10–20. In Finland, foster care is not typical in these cases. Hence, it is much more common that children who have lost both of their parents at early ages are raised within the extended family such as with deceased parents' sisters. This policy aims to mitigate the detrimental effects of losing a parent. Our results are robust to dropping children (1) whose both parents die at the same year (Online Appendix Table A7) or (2) whose only known parent dies (Online Appendix Table A8).

TABLE 2. Age of individual upon parent's death

Age when parent died	Death of father		Death of mother		Death of parent	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
0–5	5,402	0.57	1,420	0.15	6,776	0.70
6–10	11,312	1.19	3,462	0.36	14,565	1.51
11–15	14,109	1.49	4,853	0.51	18,500	1.92
16–20	19,728	2.08	7,378	0.77	26,059	2.70
21–25	26,633	2.81	10,434	1.09	34,898	3.62
26–30	35,096	3.70	14,293	1.49	45,212	4.69
No death by age 31	836,725	88.17	917,778	95.64	818,923	84.87
Total	949,005	100	959,618	100	964,933	100

Note: The number of observations is smaller for fathers because it is more common that the link between parent and child is missing for the father (1.7 percent) than for the mother (0.6 percent).

Table A1 in the Online Appendix shows mental health–related hospitalization rates to be higher for males than for females after parental death (i.e., a bit over 1 percent for males and approximately 0.7 percent for females) (see also Online Appendix Figure A1). This gender difference is consistent with earlier evidence using Finnish administrative data (Mäkikyrö et al. 1998). Table A1 also provides summary statistics about the causes of parental death, outcome variables, and background characteristics.

V. Methods

A. BASELINE EVENT STUDY SPECIFICATION

To allow the relationship between parental death and children's mental health outcomes to vary with time since parental death, our main results are based on an event study specification analogous to the model estimated by Kleven, Landais, and Egholt Søgaard (2019) for the effect of children on gender inequality.[11] This approach allows for the analysis of dynamics and adaptation to the shock, with an emphasis on the length of the effects detected on mental health.

Equation 1 depicts the event study specification:

$$Y_{ist} = \sum_{j \neq -1} \alpha_j \cdot I[t = j] + \sum_k \beta_k \cdot I[age_{is} = k] + \sum_y \tau_y \cdot I[s = y] + \theta_i + \varepsilon_{ist} \qquad (1).$$

11 In preliminary work, we also estimated a cross-sectional model for various economic outcomes, such as educational attainment and labor income in adulthood. See Böckerman, Haapanen, and Jepsen (2021) for details on the cross-sectional model, as well as the results from that model. In accordance with the earlier results of economic literature summarized in Table 1, we find a negative relationship between parental death and economic outcomes in adulthood also in our data.

The outcome Y_{ist} is a dummy variable that equals 1 for person i being hospitalized for a mental health–related condition at age s in time t (year relative to parental death).[12] The first set of coefficients (α_j) captures the effect of parental death at time $t = j$. Specifically, we include fixed effects for each year from 8 years before parental death until 10 years after parental death. The second set of coefficients (β_k) controls for the effects of the age of the child, thereby capturing age-specific vulnerability to mental health problems leading to hospitalization. The third set of coefficients (τ_y) accounts for calendar year effects. The baseline model also includes individual fixed effects (θ_i) that account for time-invariant unobservables at the individual level. To identify the potential heterogeneity in the effects, we estimate separate event study models for male and female children, as well as for maternal and paternal death.

This event study model is estimated only for individuals who had experienced a parental death. In fact, to allow for effects up to 8 years prior to and 10 years after parental death, the sample for the event study models is limited to individuals who were 10 to 20 years old when a parent died.[13] To infer a causal effect from an event study model, children who experience parental death should not have any notable trends in pre-parental-death hospitalization. Following Borusyak, Jaravel, and Spiess (2021), we examine this key identification assumption by conducting formal statistical tests of the pre-parental-death trends using data from the pretreatment periods. The results reported in Online Appendix Table B1a do not show evidence of significant pre-trends (based on a joint significance F-test).

B. ROBUSTNESS CHECKS

The literature on parental death has addressed potential endogeneity in different ways. Rather than choosing among these methods, we check whether our results are robust to other relevant methods suggested in this literature, as well as techniques used more broadly in event studies.

We start by estimating the baseline model without individual fixed effects, which is the most parsimonious specification in our research setting. If the parallel trends assumption holds, and parental deaths are unrelated to children's hospitalization trends, then the event study model should identify the causal effect of parental death without the inclusion of any additional control variables. The inclusion of covariates might improve precision but should not affect the size or sign of the coefficients of interest. The second set of robustness tests addresses this assumption by including additional covariates, such as parental mental health (columns 3 and 6 of Online Appendix Table A6a–A6b; the covariates are described in Online Appendix Table A1).

Our third model is a difference-in-differences event study specification, based on Kleven, Landais, and Egholt Søgaard (2019), where we create an explicit control group

12 See Table A2 and Figure A1 in the Online Appendix for the hospitalization rates before and after the parental death in the treatment groups.

13 In Kristiansen (2021), the age range is 14 to 18, and the time period is from four years prior to and five years after the parental health shock. In the baseline model we use a wider age range to have a larger sample of parental deaths, thereby generating more precise estimates.

of individuals who did not experience a parental death by assigning pseudo-death years for their father (and mother). Online Appendix B provides details on our implementation of this technique.

We also examine the robustness of our baseline results using the multistep imputation estimator proposed by Borusyak, Jaravel, and Spiess (2021).[14] In the first step, the authors estimate individual and time fixed effects using pretreatment observations so that, by construction, these fixed-effects estimates cannot be biased by the treatment. Then, the authors use these fixed effects to impute the unobserved potential outcomes for the treated observations and estimate the treatment effects. Finally, their estimator is a weighted average of these treatment effects to address the potentially heterogeneous treatment effects (see Online Appendix B).[15]

Next, we follow the approach introduced in Espinosa and Evans (2008) and adopted later by Gimenez et al. (2013) to classify the causes of death into two groups: (1) deaths strongly correlated with measures of parental socioeconomic status (i.e., informative causes of death [ICOD]) and (2) deaths driven by likely random causes and not correlated with socioeconomic status (i.e., uninformative causes of death [UCOD]).[16] This classification implies that UCOD are, by construction, unrelated to parental socioeconomic characteristics and provide a clean source of exogenous variation in parental death. Thus, to check the robustness of our baseline findings, we estimate event study models separately for UCOD and ICOD. The empirical implementation of this approach is described in Online Appendix C.

The second approach to address the potential endogeneity of parental death is a family fixed-effects model, as in Chen, Chen, and Liu (2009):

$$Y_{ifst} = \sum_{j \neq -1} \alpha_j \cdot I[t = j] + \sum_k \beta_k \cdot I[age_{is} = k] + \sum_y \tau_y \cdot I[s = y] + \gamma_f + \varepsilon_{ifst} \quad (2),$$

where γ_f captures the fixed effects for family *f*. By comparing the outcomes of same-family children—and, in some cases, the same sex—who lose their parents at a younger versus older age, we evaluate the effect of parental death, eliminating time-invariant characteristics of the the parental or family background. Parental death is arguably more harmful the younger the children are, as parental influence is likely to diminish over time (e.g., Kailaheimo-Lönnqvist and Erola 2020). In addition, parents may, at least to some extent, self-select into the increased likelihood of premature death by engaging in risky behaviors, such as excessive alcohol consumption and tobacco smoking, due to genetic and environmental factors that may also be correlated with a child's mental health–related disorders.

14 See Von Bismarck-Osten, Borusyak, and Schönberg (2022) for an application of the method.

15 Besides the method proposed by Borusyak, Jaravel, and Spiess (2021), there are also other methods to address the potentially heterogeneous treatment effects in the event study framework. However, the results in Freyaldenhoven et al. (2021, 32) suggest that these methods tend to produce largely similar time profiles for the effects. Borusyak, Jaravel, and Spiess (2021) document efficiency gains from using the imputation estimator relative to alternative robust estimators.

16 Earlier empirical research in public health literature generally regards *all* parental deaths as exogenous. In economics, the exogeneity of *all* parental deaths has been debated, and the method to identify (strictly) exogenous parental deaths has been proposed.

All the event studies are based on linear probability models, even though the outcome in the event studies is a binary hospitalization measure. These models facilitate the interpretation of the estimated coefficients and are less sensitive to distributional assumptions.

VI. Results

A. BASELINE EVENT STUDY ESTIMATES

We begin our analysis by presenting the estimates from the event study model based on equation 1 that accounts for individual fixed effects. The results from this model are shown graphically in Figure 1, and the estimates are reported in Online Appendix Table A4. This model uses panel data for individuals who had a parental death when they were between 10 and 20 years of age, with yearly observations from 8 years before the death up to 10 years after the death (i.e., up to 19 observations per person). The dependent variable is a dummy variable equal to 1 for individuals who are hospitalized due to a mental health condition in the year. The reference period is the year prior to parental death, when the average

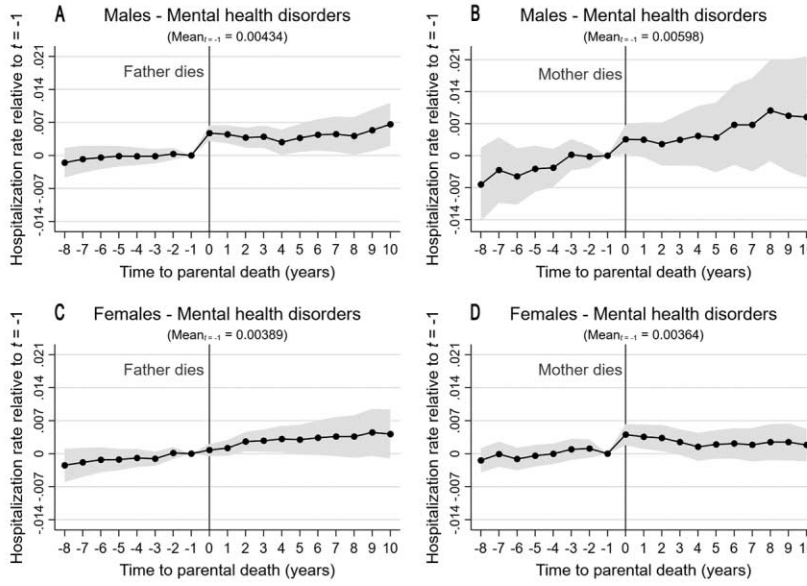

FIGURE 1. Baseline event study results using hospitalization for males and females. The figures plot the coefficient estimates from the event study regressions with individual fixed effects, together with 95 percent confidence intervals (standard errors clustered at the individual level); see equation 1. The dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Panels on the left show estimates for father's death, and those on the right show estimates for mother's death.

hospitalization rate was between 0.004 and 0.006. The figure plots the change in the likelihood of hospitalization relative to the year before parental death.

Figure 1 shows that males and females have a large increase of 0.004 in the likelihood of hospitalization for mental health conditions in the year the parent of the same sex dies compared with the year prior to parental death. For females, the effect of maternal death declines to 0.0036, 0.0033, and 0.0025 in the next three years, respectively. Thereafter, these coefficients are not statistically significant from zero at the 10 percent level in a two-sided test.

For males, the coefficients for paternal death remain quantitatively and statistically significant several years after death. Of the 11 coefficients after death, five are significant at the 1 percent level, and the remaining coefficients are significant at the 5 percent level (all tests are two-sided). In other words, the effect of a paternal death for a male aged 10 to 20 is sizable, and it persists in the long term.

By comparison, the effect of a parent of a different sex dying is much less pronounced. For males, the effect of maternal death is 0.0036 in the year of death (p-value < 0.05), followed by a marginally statistically coefficient of 0.0035 in the year after death. After that, the coefficients are generally close to zero, but exhibit a mostly upward trend, which is not statistically significant. For females experiencing paternal death, the estimated effects are negligible in the first two years after the death. After that, the coefficients are approximately 0.003 in magnitude (and smaller than for males experiencing paternal death). Online Appendix Table A5 compares the significance of short-term effects across parental and child sexes.

Past studies focusing on educational and labor-market outcomes have generally found that the largest effects are from maternal death (Rosenbaum-Feldbrügge 2019; Chen, Chen, and Liu 2009). Although we find short-term effects of maternal death for females, we find short-run and long-run effects on mental health for males experiencing a paternal death. This result is consistent with multiple findings: the lower probability of marriage among males experiencing a paternal death, found by Lang and Zagorsky (2001), larger negative effects of paternal death on noncognitive outcomes, as stated in a study by Adda, Björklund, and Holmlund (2011), or because mental health predicts marriage.[17]

The social science literature on gender preferences and role models is helpful for providing additional interpretation for our main finding that the strongest effects are for the death of a father among boys. Fathers may invest more economic and noneconomic resources in boys than in daughters.[18] In addition, emotional attachment may be stronger

17 An earlier Finnish study supports the view that boys are more vulnerable to shocks at young ages in terms of mental health. Using the separations that took place during World War II when Finnish children were voluntarily evacuated unaccompanied by their parents to temporary foster care abroad, Räikkönen et al. (2011) show that the separated men showed a higher risk of any mental and substance use disorders than the non-separated men later in life. In contrast, separated and non-separated women did not differ from each other in the risk of mental disorders.

18 The evidence from Finland regarding parental gender preferences shows that in the 1970s and early 1980s, there was a parental boy preference in the families (Saarela and Finnäs 2014). However, parental boy preference has been practically nonexistent since the 1990s.

if the parent and child have the same sex. For example, the psychological literature has provided evidence that fathers tend to spend more shared time with their sons than with daughters (Raley and Bianchi 2006), which arguably strengthens emotional attachment between fathers and sons.

Other elements of the broader social science literature provide additional interpretations to explain why the death of a parent of a different sex has much less prevalent effects on hospitalization. First, a child of the same sex might be expected to take on the lost parent's role in the family. Unexpected additional responsibilities at young ages could lead to a substantial amount of mental strain and stress (e.g., after the death of a mother, the daughter may be forced to do more of the housework and take care of the mental well-being of younger siblings in the family). Second, the parent of the same sex is arguably an important role model for the development of a child's personality traits and the provider of social support for the child (e.g., Wiese and Freund 2011; Bokhorst, Sumter, and Westenberg 2010). For example, a lack of social support may cause difficulties in school. A stable parent or guardian figure can be particularly important during puberty for boys. Based on these insights, the negative mental effects are plausibly larger when the parent of the same sex dies.

A direct comparison of our baseline results with Kristiansen (2021), the paper most similar to ours, is not straightforward because our outcome variable (i.e., mental health–related hospitalization) differs from the ones used in Kristiansen (2021). Kristiansen (2021) finds that parental death leads to short-run increases in therapy and antidepressant medication in Denmark (Table 1). In addition, many of the estimates in Kristiansen (2021) do not differentiate gender, and her results do not show consistent differences between girls and boys. In principle, the negative effects that we find for boys after losing a father and for girls losing a mother are in agreement with the results of Kristiansen (2021), as increases in therapy and antidepressant medication are alternative indicators of poor mental health.

B. ROBUSTNESS CHECKS OF THE BASELINE EVENT STUDY ESTIMATES

Next, we evaluate the robustness of the baseline event study results to alternative specifications. In addition to the results for our baseline event study model that includes individual fixed effects accounting for time-invariant unobservables at the individual level (columns 1 and 4), Tables A6a–A6b report the results for a parsimonious specification without individual fixed effects (columns 2 and 5).[19] These tables also report a model with additional time-invariant control variables, including parental mental health (columns 3 and 6). The time-invariant control variables are described in panel C of Online Appendix Table A1. The findings are quite consistent across the three models for males. Similarly, Online Appendix Figure B2 shows the similarity of the results when using the imputation estimator proposed by Borusyak, Jaravel, and Spiess (2021), a more flexible event study framework that allows for heterogeneous treatment effects.

19 The specification without individual fixed effects can be augmented with the family fixed effects or additional time-invariant control variables, but this is not feasible with the model that already contains individual fixed effects.

Our second model is a difference-in-differences event study, in which we compare individuals with a parental death with a control group of individuals without a parental death using the event study framework. Online Appendix Figure B1 illustrates the results from these models for males and females separately; the results for the control group are presented in Online Appendix Table B3.[20] As expected, the control group—where no parental death occurred—had no observable change in hospitalization.[21] Both event study specifications show that individuals who experience the death of a parent of the same sex have dramatically higher hospitalization rates compared with the control group, but by four years after parental death, we cannot detect any significant differences in the coefficients between the treatment and control groups.[22]

Next, we estimate event study specifications separately for uninformative and informative causes of death (Figure 2; Online Appendix Tables C3a–C3b), based on the technique in Gimenez et al. (2013).[23] The results for UCODs show no evidence that the parallel trends assumption is violated, an expected result given that uninformative causes of death, by construction, are unrelated to parental socioeconomic status. These results reveal two key findings. First, we observe that our baseline conclusions remain intact while using only uninformative causes of death that are likely driven by random causes.[24] Second, we find that the effects on hospitalization tend to be quantitatively (although not statistically significantly) larger using UCOD vis-à-vis ICOD.

We have also estimated specifications that incorporate family fixed effects. This model holds all the time-invariant parental characteristics, such as mental health and occupational status, as constant. Figure 3 and Online Appendix Table A10a show, once again, that significant short-run effects on mental health prevail for boys losing their fathers and for girls losing their mothers. We have also estimated family fixed-effects regressions for the subset of families where the number of same-sex siblings is at least two (Figure A3 and Table A10b in the Online Appendix). This model eliminates sibling-invariant observed and unobserved confounding characteristics, including potential genetic and environmental influences. We find increased hospitalization following the death of a parent of the same sex, as in the baseline results.

20 Note that the model and results for the treatment group remain unchanged.

21 Because the estimated effects are negligible (zero) for the control group, the estimated effects for the difference-in-differences event model are almost identical (in size) compared with the results without the control group.

22 These conclusions also hold when we use the imputation estimator for the treatment and control groups (Online Appendix Figures B2–B3).

23 See Online Appendix C for more details on the classification of deaths into UCODs and ICODs.

24 For females, the effect of maternal death is positive but no longer significant because of a low number of maternal UCODs. A plausible interpretation for the result that the findings remain largely intact while focusing on UCODs is that the potential endogeneity of *all* parental deaths (with respect to child mental health) is not a major concern for identification in our setting. Parental death may be more strongly correlated with parental socioeconomic status in countries such as the United States that do not have a universal health-care system that covers all citizens regardless of their socioeconomic status.

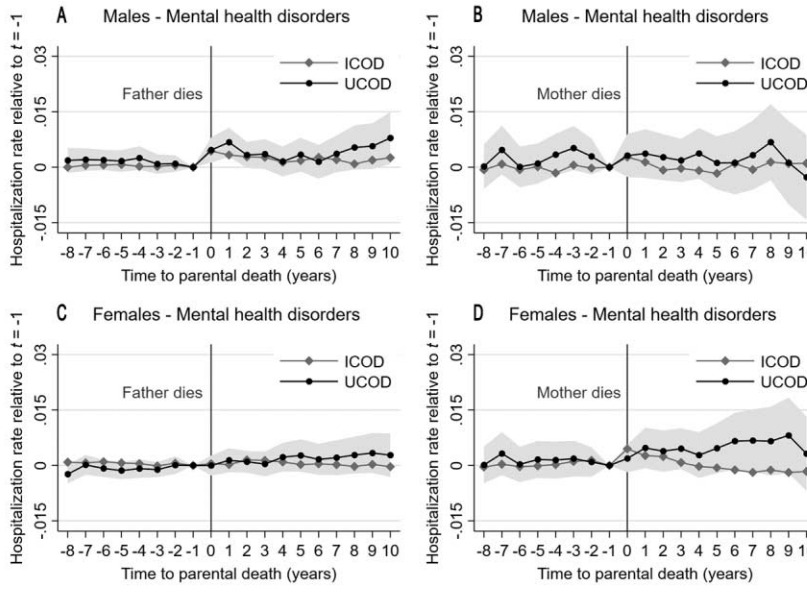

FIGURE 2. Event study coefficients for hospitalization, ICOD vs. UCOD of a parent, males, and females. The figures plot the coefficient estimates from the event study regressions. The dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. The models were run separately for informative and uninformative parental deaths (ICOD vs. UCOD). For clarity, only 95 percent confidence intervals are shown for the UCODs (standard errors clustered at the individual level). Panels on the left show estimates for father's death, and those on the right show estimates for mother's death.

C. HETEROGENEITY ANALYSES

Because mental health encompasses a diverse set of conditions, we examine whether the effects of parental death vary across different causes of hospitalization. Online Appendix Tables A11a–A11d present the results by cause (see also Online Appendix Figures A4a–A4c). In each table, the first column reports the result for all causes for comparison, and the remaining columns present the results for a specific cause of hospitalization: (2) depression, (3) stress and adjustment disorders, (4) substance abuse, and (5) intentional self-harm (including suicide attempts).[25] For males experiencing paternal death, the coefficients are largest for depression and stress in the first seven years after death. However, the results for stress may not be causal, given the significant pre-death trends. For males

25 This list of mental health disorders is not exhaustive. For brevity, we have not included results for schizophrenia or other rare mental health conditions. For example, the prevalence of schizophrenia is very low in the population (~1 percent), making it difficult to identify statistically significant effects; further, it is largely driven by genetic factors.

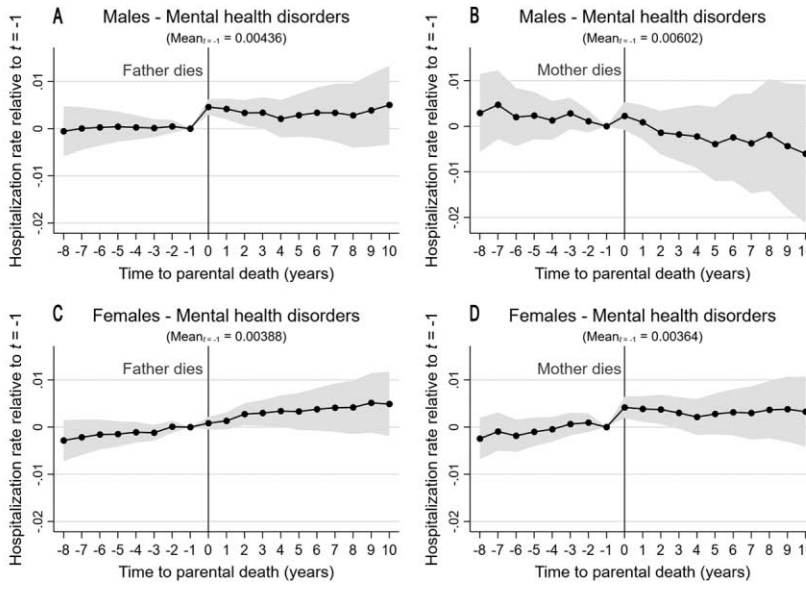

FIGURE 3. Event study results, family fixed-effects regressions. The figures plot the coefficient estimates from the event study regressions with family fixed effects, together with 95 percent confidence intervals (standard errors clustered at the individual level). The dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Panels on the left show estimates for father's death, and those on the right show estimates for mother's death.

experiencing a maternal death, the estimated post-parental-death coefficients are imprecise and nearly always indistinguishable from zero.

For females, the most pronounced short-run effects of maternal death are associated with intentional self-harm, depression, and stress. At the same time, there are marginally significant effects six to seven years before death, suggesting some caution in attributing much emphasis to the post-death effects. For females experiencing paternal death, the estimated coefficients are mostly small and statistically insignificant. For males and females, the results in Online Appendix Tables A11a–A11d should be interpreted as suggestive rather than conclusive, as these hospitalization outcomes are quite rare, and some pre-parental-death coefficients are statistically significant.

In our main specifications, we use the age range from 10 to 20 because of statistical power reasons, given the low parental death rates at earlier ages (Table 1), but also because we measure mental health outcomes up to eight years before parental death, and control for age-fixed effects to account for age-specific vulnerability to mental health problems. Thus, this approach estimates the average impact of parental loss across a rather broad age range of the child. To examine this issue further, we investigate the potential heterogeneity of the effects by child age and present the effects between ages 10 and 15 compared

with ages 16 to 20. The two main findings, shown in Online Appendix Figure A5a and Online Appendix Tables A12a–A12b, hold for both age groups: (1) more pronounced effects for a parental death of a different sex and (2) the longer duration of the effect for a paternal effect. Given that we cannot reject the hypothesis that the coefficient for ages 10 to 15 is equal to the coefficient for ages 16 to 20, we maintain that pooling the results for the two age groups is appropriate in our context.[26]

Crucially, both intervals (ages 10 to 15 and ages 16 to 20) belong to the teenage years. For this reason, we have also investigated the effects of parental death in early adulthood at ages 21 to 30 (Figure A5b and Table A12d in the Online Appendix). These results reveal two patterns. First, the effect of maternal death is much more important at an adult age than the death of a father, illustrating that another potential explanation for differences across studies is the difference in age range. Second, there seem to be significant anticipation effects (i.e., there is an increase in the likelihood of mental health–related hospitalization before the actual death of a parent).

Because Kristiansen (2021) documents differences in mental health treatment by socioeconomic status, we estimate the baseline event study models by parental income and education. This constitutes an approach to isolate the impact of the loss of parental resources. We do not find any noticeable differences in the results by parental income or education (Figures A6–A7 and Tables A13a–A14b in the Online Appendix).

VII. Conclusion

Parental death is a traumatic life event that has a major impact on many life domains. We provide evidence of the causal effect of parental death on mental health outcomes in the teenage years, with a focus on mental health–related hospitalization. Given the empirical literature in other disciplines (mostly in public health) on the adverse effects of parental death on mental health, our analysis is a starting point for economists.

Using nationwide register-based data and studying the dynamic effects of parental death, our results extend the empirical literature in several ways. We find robust evidence that parental death has the most adverse outcomes when the parent and child are of the same sex. For males, the likelihood of hospitalization for mental health reasons roughly doubles—from a very low base of less than 0.01—in the year of the father's death, and the effect is large and remains significant several years after death. Females experiencing maternal death also have a doubling of the (very low) likelihood of hospitalization in the year of death and the following year, but the effect diminishes in later years. In contrast, we generally cannot reject the possibility of no change in hospitalization rates for males experiencing maternal death or females experiencing paternal death.

The main findings are robust across multiple econometric techniques. Our baseline event study method illustrates the short-run and medium-run outcomes year by year. Although the model requires substantial assumptions about exogeneity, these concerns are

26 As an additional robustness check, we estimated the baseline results using the age range of 14 to 18, as in Kristiansen (2021). Our findings remain intact (see Online Appendix Table A12c).

mitigated by the similarity of results across several dimensions: (1) between models with and without extensive set of control variables such as parental mental health, (2) with and without a control group of individuals who did not experience a parental death, (3) an imputation estimator to allow for heterogeneous treatment effects (Borusyak, Jaravel, and Spiess 2021), (4) sample restricted to plausibly exogenous causes of death that are not correlated with parental socioeconomic characteristics, as in Espinosa and Evans (2008) and Gimenez et al. (2013), and (5) family fixed effects to account for time-invariant differences between families. Although each econometric technique has its own limitations and assumptions, consistency across these methods supports a causal effect. Because parental death is a rare event, and the population of Finland—and other Northern European countries with nationwide registry data—is moderate, most subgroup analyses are imprecise.

In general, the economics literature on parental death, with a focus on educational and labor-market outcomes, tends to find stronger effects for maternal death than paternal death. Although the economics literature does not find strong effects for paternal death, even among males, for educational and labor-market outcomes, past work has found a relationship between paternal death and other outcomes, such as marriage (Lang and Zargosky 2001) and psychological profile and health (Adda, Björklund, and Holmlund 2011). Taken collectively, the literature suggests that parental death has a heterogeneous effect on a diverse set of outcomes.

Our findings provide practical guidance for setting policies. Many of the interventions (e.g., the provision of effective mental health services and social support) would need to occur in the school environment, which is central to a child's social and psychological development. Currently, the supply of in-school services and support is limited because not all municipalities have sufficient economic resources to provide them. In addition to school-based interventions, there may also be a need to enhance and develop community outpatient programs. Based on our results, to mitigate the negative effects on mental health, teachers and school nurses should pay particular attention to boys who have lost their fathers in their teenage years. In Finland, schools already allocate disproportional amounts of resources to disadvantaged pupils and provide additional support to them. The goal of these policies is to equalize opportunities and outcomes among pupils, especially in comprehensive schools. Despite the paternalistic policy toward children in Finnish society, we still find substantial negative effects on mental health. In countries where such policies do not exist and local variation in school resources is substantial or where the coverage of primary health-care services in schools is not universal across the socioeconomic spectrum, the negative effects on mental health may arguably be even larger.

A deeper understanding of the exact mechanisms through which parental death affects mental health, as well as the heterogeneous effects of parental death, are important topics for future empirical research. Although our results are consistent with mechanisms identified in the broader social sciences, we cannot identify the direct mechanisms at play because nationwide register data are not suitable for examining social interactions (including social support) and the degree of emotional attachment within families. Identifying the exact mechanisms is also hampered because of the lack of suitable survey data and the limited earlier evidence on social connections in families using Finnish data.

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"Dark Passage: Mental Health Consequences of Parental Death."
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Dark Passage: Mental Health Consequences of Parental Death

SUPPLEMENTARY ONLINE APPENDIX (NOT FOR PRINT)

CONTENT

Supplemental Material (not copyedited or formatted) for: Petri Böckerman, Mika Haapanen, Christopher Jepsen. 2023.
"Dark Passage: Mental Health Consequences of Parental Death."
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APPENDIX A. RESULTS FROM EVENT STUDY DESIGNS

Table A1: Mean Values, By Sex of Individual and by Parental Death

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
A) Causes of Parental Death				
Ischaemic heart diseases (0/1)	0.196	0.0378	0.193	0.0339
Suicides (0/1)	0.141	0.103	0.151	0.102
Alcohol-related diseases and accidental poisoning by alcohol (0/1)	0.130	0.0852	0.125	0.0832
Malignant neoplasm of breast (0/1)	-	0.155	-	0.172
Cerebrovascular diseases (0/1)	0.0550	0.0778	0.0526	0.0757
Malignant neoplasm of larynx, trachea, bronchus, and lung (0/1)	0.0388	0.0259	0.0357	0.0273
Land traffic accidents (0/1)	0.0296	0.0374	0.0331	0.0367
Other causes of death (0/1)	0.409	0.478	0.410	0.469
Uninformative causes of death (0/1)	0.147	0.0856	0.145	0.0848
B) Child Hospitalization Outcomes[a]				
Mental health disorders [0–1]	0.01070	0.01120	0.00596	0.00834
Depression [0–1]	0.00173	0.00136	0.00175	0.00326
Stress [0–1]	0.00358	0.00363	0.00108	0.00155
Substance-use disorders [0–1]	0.00230	0.00217	0.00091	0.00096
Intentional self-harm [0–1]	0.00074	0.00076	0.00130	0.00171
C) Background Characteristics[b]				
Female (0/1)	0	0	1	1
Language Finnish (0/1)	0.962	0.956	0.961	0.958
Language Swedish (0/1)	0.0372	0.0436	0.0388	0.0401
Other Language (0/1)	0.0012	0.0009	0.0007	0.0016
Lived with father at childhood (0/1)	0.846	0.822	0.843	0.816
Lived with mother at childhood (0/1)	0.920	0.940	0.926	0.940
Father has only basic education (0/1)	0.513	0.485	0.510	0.485
Father has upper secondary educ. (0/1)	0.323	0.317	0.327	0.320
Father has tertiary education (0/1)	0.164	0.198	0.163	0.194
Mother has only basic education (0/1)	0.504	0.475	0.500	0.473
Mother has upper secondary educ. (0/1)	0.332	0.343	0.342	0.331
Mother has tertiary education (0/1)	0.164	0.181	0.158	0.196
Father completed high school (0/1)	0.096	0.133	0.095	0.133
Mother completed high school (0/1)	0.168	0.168	0.162	0.188
Father's taxable income percentile (0–1)	0.554	0.553	0.556	0.556
Mother's taxable income percentile (0–1)	0.536	0.551	0.536	0.558
Father has been hospitalized due to mental health disorder (0/1)	0.163	0.0741	0.168	0.0637
Father has been hospitalized due to WAAC (0/1)	0.118	0.0475	0.123	0.0388
Mother has been hospitalized due to mental health disorder (0/1)	0.0488	0.136	0.051	0.133
Mother has been hospitalized due to WAAC (0/1)	0.0156	0.0583	0.0155	0.0567
Mother's age at childbirth (0/1)	28.73	29.35	28.61	29.34
No. of siblings w/ same mother (0/1)	1.907	2.067	1.934	2.076
Number of individuals	18,272	6,676	17,798	6,299

Notes: [a] Child hospitalization outcomes are measured as annual average over the post-parental death period t = 0, 1, 2. See Table A2 for comparison of child hospitalization outcomes before and after parental death.
[b] Parents' income has been measured in 1970 & 1975 if the birth year is 1971–75, in 1975 & 1980 if it is 1976–81, and 1980 & 1985 if it is 1981–86. Parents' hospitalization measured by child's age at 9. WAAC = Wholly alcohol-attributable conditions. In addition to these background characteristics, we also utilize following control variables: indicators for unknown father, unknown mother, occupational status (8), birth year (16), and birth

region (19). Parent's occupation is measured in 1970 (1975, 1980, 1985) if the birth year is 1971-74 (1975-79, 1980-84, 1985-86). Controls for income level are based on dummies for taxable income quartiles for mother and father (2 × 4). Sample is limited to individuals with a parental death at ages 10-20.

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Table A2: Mean Child Hospitalization Outcomes Before and After Parental Death

Panel A: Father died at t = 0

	Males			Females		
Outcome/Period	*t* = -3,..,-1	*t* = 0, 1, 2	Difference	*t* = -3,..,-1	*t* = 0, 1, 2	Difference
Mental health disorders	0.00388	0.01070	0.00682***	0.00346	0.00596	0.00250***
Depression	0.00042	0.00173	0.00131***	0.00081	0.00175	0.00095***
Stress	0.00110	0.00358	0.00249***	0.00068	0.00108	0.00040*
Substance-use disorders	0.00057	0.00230	0.00173***	0.00038	0.00091	0.00053***
Intentional self-harm	0.00018	0.00074	0.00055***	0.00064	0.00130	0.00066***
Observations	54,601	54,401	109,002	53,197	53,019	106,216

Panel B: Mother died at t = 0

	Males			Females		
Outcome/Period	*t* = -3,..,-1	*t* = 0, 1, 2	Difference	*t* = -3,..,-1	*t* = 0, 1, 2	Difference
Mental health disorders	0.00593	0.01119	0.00526***	0.00415	0.00834	0.00419***
Depression	0.00055	0.00136	0.00081**	0.00090	0.00326	0.00236***
Stress	0.00151	0.00363	0.00212***	0.00043	0.00155	0.00112***
Substance-use disorders	0.00075	0.00217	0.00141***	0.00037	0.00096	0.00059*
Intentional self-harm	0.00030	0.00076	0.00045*	0.00011	0.00171	0.00160***
Observations	19,909	19,838	39,747	18,797	18,711	37,508

Notes: Annual averages for the pre-parental death period (*t* = -3,…,-1) and the post-parental death period (*t* = 0, 1, 2) are reported. Column 'Difference' reports the two-sample t-test of the significance of the difference. See Table A3 for changes in the number of days spent in the hospital. * p<0.05, ** p<0.01, *** p<0.001. Sample is limited to individuals with a parental death at ages 10-20.

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Table A3: Average Number of Days Spent in Hospital Before and After Parental Death

Panel A: Father died at t = 0

	Males			Females		
Outcome/Period	t = -3,..,-1	t = 0, 1, 2	Difference	t = -3,..,-1	t = 0, 1, 2	Difference
Number of days spent in hospital	0.278	0.575	0.296***	0.301	0.381	0.079
Observations	54,601	54,401	109,002	53,197	53,019	106,216
Number of days spent in hospital | Conditional on being hospitalized	71.69	53.73	-17.96	87.13	63.88	-23.24
Observations	212	582	794	184	316	500

Panel B: Mother died at t = 0

	Males			Females		
Outcome/Period	t = -3,..,-1	t = 0, 1, 2	Difference	t = -3,..,-1	t = 0, 1, 2	Difference
Number of days spent in hospital	0.415	0.746	0.331*	0.288	0.589	0.302*
Observations	19,909	19,838	39,747	18,797	18,711	37,508
Number of days spent in hospital | Conditional on being hospitalized	70.03	66.67	-3.36	69.29	70.68	1.38
Observations	118	222	340	78	156	234

Notes: The main reason for hospitalization is mental health disorders. Annual averages for hospitalization spells that begin in the pre-parental death period (t = -3,…,-1) and the post-parental death period (t = 0, 1, 2) are reported. Column 'Difference' reports the two-sample t-test of the significance of the difference.
* p<0.05, ** p<0.01, *** p<0.001. Sample is limited to individuals with a parental death at ages 10-20.

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Table A4: Event Study Coefficients for Hospitalization, By Sex of Individual and by Parental Death

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
8 years before death	-0.0015	-0.0063	-0.0025	-0.0014
	(0.0016)	(0.0041)	(0.0018)	(0.0013)
7 years before death	-0.0008	-0.0032	-0.0018	-0.0001
	(0.0015)	(0.0037)	(0.0016)	(0.0014)
6 years before death	-0.0004	-0.0045	-0.0013	-0.0011
	(0.0013)	(0.0031)	(0.0013)	(0.0012)
5 years before death	-0.0001	-0.0029	-0.0013	-0.0004
	(0.0011)	(0.0026)	(0.0011)	(0.0012)
4 years before death	-0.0002	-0.0026	-0.0009	-0.0000
	(0.0010)	(0.0021)	(0.0010)	(0.0011)
3 years before death	-0.0002	0.0002	-0.0011	0.0009
	(0.0008)	(0.0017)	(0.0008)	(0.0011)
2 years before death	0.0003	-0.0002	0.0001	0.0011
	(0.0007)	(0.0013)	(0.0007)	(0.0010)
Year of death	0.0047***	0.0036**	0.0008	0.0040***
	(0.0009)	(0.0016)	(0.0007)	(0.0012)
1 year after death	0.0045***	0.0035*	0.0012	0.0036***
	(0.0010)	(0.0019)	(0.0009)	(0.0013)
2 years after death	0.0038***	0.0025	0.0026**	0.0033**
	(0.0011)	(0.0024)	(0.0010)	(0.0014)
3 years after death	0.0040***	0.0035	0.0028**	0.0025*
	(0.0012)	(0.0029)	(0.0012)	(0.0014)
4 years after death	0.0028**	0.0043	0.0031**	0.0015
	(0.0014)	(0.0034)	(0.0014)	(0.0015)
5 years after death	0.0037**	0.0040	0.0030*	0.0020
	(0.0015)	(0.0039)	(0.0016)	(0.0015)
6 years after death	0.0044**	0.0067	0.0034*	0.0022
	(0.0017)	(0.0045)	(0.0019)	(0.0016)
7 years after death	0.0045**	0.0067	0.0036*	0.0019
	(0.0019)	(0.0052)	(0.0021)	(0.0018)
8 years after death	0.0041**	0.0099*	0.0036	0.0025
	(0.0020)	(0.0056)	(0.0023)	(0.0019)
9 years after death	0.0054**	0.0087	0.0045*	0.0025
	(0.0023)	(0.0062)	(0.0026)	(0.0020)
10 years after death	0.0066***	0.0084	0.0042	0.0018
	(0.0023)	(0.0068)	(0.0027)	(0.0018)
Observations	343,600	125,187	334,878	118,081
Number of individuals	18,272	6,676	17,798	6,299
R-squared	0.1480	0.1637	0.1599	0.1710
Age fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Individual fixed effects	YES	YES	YES	YES
Additional controls	NO	NO	NO	NO
Mean $Y_{t=-1}$	0.0045	0.0062	0.0039	0.0037

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 10–20. Table A5a shows the test results for the significance of the differences by sex of child and by sex of parent.

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Table A5a: Testing Differences in the Treatment Effects (Sex of Child or Parent): Model with Individual Fixed Effects

Sample selection	Fathers	Mothers	Males	Females
Testing for the significance of the differences between	Males vs Females (1)	Males vs Females (2)	Father vs Mother dies (3)	Father vs Mother dies (4)
A) Significant differences at the following time periods relative to parental death (t):				
○ p-value < 0.10	$t = 0$ & 1	–	–	$t = 0$ & 1
○ p-value < 0.05	$t = 0$ & 1	–	–	$t = 0$
○ p-value < 0.01	$t = 0$	–	–	$t = 0$
B) Testing the joint significance of the differences at $t = 0,\ldots, 3$	F = 4.306 ($p = 0.002$)	F = 0.194 ($p = 0.942$)	F = 0.275 ($p = 0.895$)	F = 2.182 ($p = 0.068$)
C) Testing the joint significance of the differences at $t = 0,\ldots, 10$	F = 1.205 ($p = 0.282$)	F = 0.488 ($p = 0.899$)	F = 0.813 ($p = 0.616$)	F = 0.544 ($p = 0.860$)
Observations	678,478	243,268	468,787	452,959

Notes: We report test results that are based on four linear regression models that include: (1) All children whose father dies; (2) All children whose mother dies; (3) All male children whose parent dies; and (4) All female children whose parent dies. Models correspond to those reported in Figure 1 and Table A4 except that they have been estimated using a full set of interactions between time, age, and year fixed effects by sex of child (columns 1–2) or by sex of dying parent (columns 3–4). The dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Standard errors are clustered at the individual level. A) Results are based on t-tests on the significance of the individual differences in the treatment effects. B) and C) F-tests report the joint significance of the differences in the treatment effects.

Table A5b: Testing Differences in the Treatment Effects (Sex of Child or Parent): Model without Individual Fixed Effects

Sample selection	Fathers	Mothers	Males	Females
Testing for the significance of the differences between	Males vs Females (1)	Males vs Females (2)	Father vs Mother dies (3)	Father vs Mother dies (4)
A) Significant differences at the following time periods relative to parental death (t):				
○ p-value < 0.05	$t = 0$ & 1	–	–	$t = 0$ & 1
○ p-value < 0.01	$t = 0$ & 1	–	–	$t = 0$
B) Testing the joint significance of the differences at $t = 0,\ldots, 3$	F = 4.879 ($p = 0.001$)	F = 0.454 ($p = 0.770$)	F = 0.868 ($p = 0.482$)	F = 2.391 ($p = 0.048$)
C) Testing the joint significance of the differences at $t = 0,\ldots, 10$	F = 1.312 ($p = 0.217$)	F = 0.409 ($p = 0.943$)	F = 0.858 ($p = 0.572$)	F = 0.577 ($p = 0.834$)
Observations	678,478	243,268	468,787	452,959

Notes: See notes to Table A5a.

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Table A6a: Additional Event Study Models, By Parental Death, Males

	Father	Father	Father	Mother	Mother	Mother
	(1)	(2)	(3)	(4)	(5)	(6)
8 years before death	-0.0015	0.0003	0.0007	-0.0063	-0.0006	0.0006
	(0.0016)	(0.0008)	(0.0008)	(0.0041)	(0.0015)	(0.0015)
7 years before death	-0.0008	0.0008	0.0012	-0.0032	0.0017	0.0027*
	(0.0015)	(0.0008)	(0.0008)	(0.0037)	(0.0015)	(0.0015)
6 years before death	-0.0004	0.0008	0.0012*	-0.0045	-0.0006	0.0002
	(0.0013)	(0.0007)	(0.0007)	(0.0031)	(0.0014)	(0.0014)
5 years before death	-0.0001	0.0009	0.0012*	-0.0029	0.0002	0.0009
	(0.0011)	(0.0007)	(0.0007)	(0.0026)	(0.0013)	(0.0013)
4 years before death	-0.0002	0.0006	0.0006	-0.0026	-0.0003	0.0002
	(0.0010)	(0.0007)	(0.0007)	(0.0021)	(0.0012)	(0.0012)
3 years before death	-0.0002	0.0003	0.0003	0.0002	0.0018	0.0021
	(0.0008)	(0.0006)	(0.0006)	(0.0017)	(0.0013)	(0.0013)
2 years before death	0.0003	0.0006	0.0006	-0.0002	0.0006	0.0007
	(0.0007)	(0.0006)	(0.0006)	(0.0013)	(0.0011)	(0.0011)
Year of death	0.0047***	0.0044***	0.0042***	0.0036**	0.0028*	0.0026*
	(0.0009)	(0.0008)	(0.0008)	(0.0016)	(0.0015)	(0.0015)
1 year after death	0.0045***	0.0039***	0.0036***	0.0035*	0.0020	0.0016
	(0.0010)	(0.0009)	(0.0009)	(0.0019)	(0.0015)	(0.0015)
2 years after death	0.0038***	0.0029***	0.0024***	0.0025	0.0001	-0.0004
	(0.0011)	(0.0009)	(0.0009)	(0.0024)	(0.0015)	(0.0015)
3 years after death	0.0040***	0.0029***	0.0026***	0.0035	0.0002	-0.0004
	(0.0012)	(0.0010)	(0.0010)	(0.0029)	(0.0016)	(0.0016)
4 years after death	0.0028**	0.0014	0.0012	0.0043	0.0003	-0.0005
	(0.0014)	(0.0010)	(0.0010)	(0.0034)	(0.0017)	(0.0017)
5 years after death	0.0037**	0.0021**	0.0016	0.0040	-0.0008	-0.0019
	(0.0015)	(0.0010)	(0.0010)	(0.0039)	(0.0018)	(0.0018)
6 years after death	0.0044**	0.0025**	0.0018*	0.0067	0.0012	0.0000
	(0.0017)	(0.0011)	(0.0011)	(0.0045)	(0.0021)	(0.0021)
7 years after death	0.0045**	0.0023*	0.0021*	0.0067	0.0006	-0.0008
	(0.0019)	(0.0012)	(0.0012)	(0.0052)	(0.0022)	(0.0022)
8 years after death	0.0041**	0.0017	0.0016	0.0099*	0.0030	0.0015
	(0.0020)	(0.0014)	(0.0013)	(0.0056)	(0.0024)	(0.0025)
9 years after death	0.0054**	0.0025*	0.0022	0.0087	0.0012	-0.0005
	(0.0023)	(0.0015)	(0.0015)	(0.0062)	(0.0027)	(0.0028)
10 years after death	0.0066***	0.0035**	0.0027	0.0084	0.0004	-0.0015
	(0.0023)	(0.0017)	(0.0017)	(0.0068)	(0.0030)	(0.0030)
Observations	343,600	343,600	330,905	125,187	125,187	125,187
No of individuals	18,272	18,272	17,485	6,676	6,676	6,676
R-squared	0.1480	0.0038	0.0066	0.1637	0.0044	0.0113
Age fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Individual fixed effects	YES	NO	NO	YES	NO	NO
Additional controls	NO	NO	YES	NO	NO	YES
Mean $Y_{t=-1}$	0.0045	0.0045	0.0042	0.0062	0.0062	0.0062

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 10–20. The set of additional controls is described in Table A1, Panel C and notes.

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Table A6b: Additional Event Study Models, By Parental Death, Females

	Father (1)	Father (2)	Father (3)	Mother (4)	Mother (5)	Mother (6)
8 years before death	-0.0025	0.0004	0.0008	-0.0014	-0.0003	0.0000
	(0.0018)	(0.0006)	(0.0006)	(0.0013)	(0.0012)	(0.0012)
7 years before death	-0.0018	0.0006	0.0010	-0.0001	0.0010	0.0013
	(0.0016)	(0.0006)	(0.0006)	(0.0014)	(0.0012)	(0.0012)
6 years before death	-0.0013	0.0007	0.0010	-0.0011	-0.0002	0.0000
	(0.0013)	(0.0006)	(0.0006)	(0.0012)	(0.0011)	(0.0011)
5 years before death	-0.0013	0.0003	0.0005	-0.0004	0.0003	0.0005
	(0.0011)	(0.0006)	(0.0006)	(0.0012)	(0.0011)	(0.0011)
4 years before death	-0.0009	0.0003	0.0005	-0.0000	0.0005	0.0007
	(0.0010)	(0.0006)	(0.0006)	(0.0011)	(0.0011)	(0.0011)
3 years before death	-0.0011	-0.0003	-0.0002	0.0009	0.0013	0.0014
	(0.0008)	(0.0006)	(0.0006)	(0.0011)	(0.0011)	(0.0011)
2 years before death	0.0001	0.0005	0.0007	0.0011	0.0013	0.0013
	(0.0007)	(0.0006)	(0.0006)	(0.0010)	(0.0010)	(0.0010)
Year of death	0.0008	0.0004	0.0003	0.0040***	0.0039***	0.0038***
	(0.0007)	(0.0006)	(0.0006)	(0.0012)	(0.0011)	(0.0011)
1 year after death	0.0012	0.0004	0.0005	0.0036***	0.0033***	0.0032**
	(0.0009)	(0.0007)	(0.0007)	(0.0013)	(0.0013)	(0.0013)
2 years after death	0.0026**	0.0014*	0.0012	0.0033**	0.0028**	0.0027**
	(0.0010)	(0.0008)	(0.0008)	(0.0014)	(0.0014)	(0.0014)
3 years after death	0.0028**	0.0012	0.0011	0.0025*	0.0018	0.0016
	(0.0012)	(0.0008)	(0.0008)	(0.0014)	(0.0014)	(0.0014)
4 years after death	0.0031**	0.0012	0.0007	0.0015	0.0006	0.0004
	(0.0014)	(0.0009)	(0.0009)	(0.0015)	(0.0015)	(0.0015)
5 years after death	0.0030*	0.0007	0.0006	0.0020	0.0008	0.0006
	(0.0016)	(0.0010)	(0.0010)	(0.0015)	(0.0016)	(0.0016)
6 years after death	0.0034*	0.0006	0.0006	0.0022	0.0009	0.0006
	(0.0019)	(0.0010)	(0.0010)	(0.0016)	(0.0018)	(0.0018)
7 years after death	0.0036*	0.0005	0.0001	0.0019	0.0004	0.0001
	(0.0021)	(0.0011)	(0.0011)	(0.0018)	(0.0019)	(0.0019)
8 years after death	0.0036	0.0002	-0.0001	0.0025	0.0009	0.0006
	(0.0023)	(0.0012)	(0.0012)	(0.0019)	(0.0021)	(0.0021)
9 years after death	0.0045*	0.0008	0.0006	0.0025	0.0008	0.0004
	(0.0026)	(0.0012)	(0.0013)	(0.0020)	(0.0023)	(0.0023)
10 years after death	0.0042	0.0002	0.0001	0.0018	-0.0002	-0.0006
	(0.0027)	(0.0014)	(0.0014)	(0.0018)	(0.0025)	(0.0025)
Observations	334,878	334,878	324,440	118,081	118,081	118,081
Number of individuals	17,798	17,798	17,157	6,299	6,299	6,299
R-squared	0.1599	0.0028	0.0053	0.1710	0.0037	0.0082
Age fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Individual fixed effects	YES	NO	NO	YES	NO	NO
Additional controls	NO	NO	YES	NO	NO	YES
Mean $Y_{t=-1}$	0.0039	0.0039	0.0039	0.0037	0.0037	0.0037

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 10–20. The set of additional controls is described in Table A1, Panel C and notes.

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Table A7: Event Study Coefficients for Hospitalization, By Sex of Individual and by Parental Death, Dropping Cases where both Parents Die at $t = 0$

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
8 years before death	0.0004	-0.0005	0.0004	-0.0003
	(0.0008)	(0.0015)	(0.0006)	(0.0012)
7 years before death	0.0008	0.0018	0.0006	0.0010
	(0.0008)	(0.0016)	(0.0006)	(0.0012)
6 years before death	0.0008	-0.0007	0.0007	-0.0002
	(0.0007)	(0.0014)	(0.0006)	(0.0011)
5 years before death	0.0010	0.0004	0.0003	0.0003
	(0.0007)	(0.0013)	(0.0006)	(0.0011)
4 years before death	0.0007	-0.0001	0.0003	0.0005
	(0.0007)	(0.0012)	(0.0006)	(0.0011)
3 years before death	0.0004	0.0020	-0.0003	0.0013
	(0.0006)	(0.0013)	(0.0006)	(0.0011)
2 years before death	0.0006	0.0007	0.0005	0.0013
	(0.0006)	(0.0011)	(0.0006)	(0.0010)
Year of death	0.0046***	0.0032**	0.0003	0.0036***
	(0.0008)	(0.0015)	(0.0006)	(0.0011)
1 year after death	0.0040***	0.0021	0.0003	0.0029**
	(0.0009)	(0.0015)	(0.0007)	(0.0013)
2 years after death	0.0030***	0.0002	0.0014*	0.0028**
	(0.0009)	(0.0015)	(0.0008)	(0.0014)
3 years after death	0.0028***	0.0001	0.0012	0.0018
	(0.0009)	(0.0015)	(0.0008)	(0.0014)
4 years after death	0.0015	0.0004	0.0012	0.0006
	(0.0010)	(0.0017)	(0.0009)	(0.0015)
5 years after death	0.0020*	-0.0010	0.0006	0.0008
	(0.0011)	(0.0018)	(0.0010)	(0.0016)
6 years after death	0.0026**	0.0016	0.0006	0.0009
	(0.0011)	(0.0021)	(0.0010)	(0.0018)
7 years after death	0.0024*	0.0006	0.0005	0.0003
	(0.0012)	(0.0022)	(0.0011)	(0.0019)
8 years after death	0.0017	0.0031	0.0002	0.0010
	(0.0014)	(0.0024)	(0.0012)	(0.0021)
9 years after death	0.0026*	0.0015	0.0008	0.0008
	(0.0015)	(0.0027)	(0.0013)	(0.0023)
10 years after death	0.0034**	0.0001	0.0001	-0.0004
	(0.0017)	(0.0029)	(0.0014)	(0.0026)
Observations	341,643	123,230	333,276	116,479
Number of individuals	18,162	6,566	17,709	6,210
Share of individuals dropped	0.00605	0.0166	0.00503	0.0142
R-squared	0.0038	0.0044	0.0028	0.0037
Mean $Y_{t=-1}$	0.00437	0.00598	0.00391	0.00372

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals whose both parents are known. All models contain year and age fixed effects.

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Table A8: Event Study Coefficients for Hospitalization, By Sex of Individual and by Parental Death, Dropping Cases where the Only Known Parent Dies at $t = 0$

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
8 years before death	0.0002	-0.0003	0.0005	0.0000
	(0.0008)	(0.0015)	(0.0006)	(0.0011)
7 years before death	0.0007	0.0011	0.0007	0.0009
	(0.0008)	(0.0015)	(0.0006)	(0.0011)
6 years before death	0.0008	-0.0008	0.0008	0.0001
	(0.0007)	(0.0013)	(0.0006)	(0.0010)
5 years before death	0.0009	0.0000	0.0004	0.0005
	(0.0007)	(0.0013)	(0.0006)	(0.0010)
4 years before death	0.0005	-0.0004	0.0004	0.0006
	(0.0007)	(0.0012)	(0.0006)	(0.0010)
3 years before death	0.0002	0.0016	-0.0002	0.0014
	(0.0006)	(0.0013)	(0.0006)	(0.0011)
2 years before death	0.0006	0.0007	0.0006	0.0013
	(0.0006)	(0.0011)	(0.0006)	(0.0010)
Year of death	0.0043***	0.0027*	0.0004	0.0033***
	(0.0008)	(0.0015)	(0.0006)	(0.0011)
1 year after death	0.0038***	0.0023	0.0006	0.0024*
	(0.0009)	(0.0015)	(0.0007)	(0.0013)
2 years after death	0.0027***	-0.0004	0.0013*	0.0019
	(0.0009)	(0.0015)	(0.0008)	(0.0013)
3 years after death	0.0029***	-0.0002	0.0012	0.0009
	(0.0009)	(0.0015)	(0.0008)	(0.0014)
4 years after death	0.0016*	0.0004	0.0009	0.0003
	(0.0010)	(0.0017)	(0.0009)	(0.0015)
5 years after death	0.0020**	-0.0013	0.0008	0.0005
	(0.0010)	(0.0017)	(0.0010)	(0.0016)
6 years after death	0.0024**	0.0017	0.0008	0.0003
	(0.0011)	(0.0020)	(0.0010)	(0.0017)
7 years after death	0.0028**	0.0018	0.0004	0.0003
	(0.0012)	(0.0022)	(0.0011)	(0.0019)
8 years after death	0.0023*	0.0032	0.0003	0.0012
	(0.0013)	(0.0024)	(0.0012)	(0.0021)
9 years after death	0.0029**	0.0014	0.0010	0.0015
	(0.0015)	(0.0027)	(0.0013)	(0.0023)
10 years after death	0.0036**	0.0003	0.0005	0.0006
	(0.0017)	(0.0030)	(0.0014)	(0.0025)
Observations	331,208	118,455	324,626	111,512
Number of individuals	17,534	6,290	17,188	5,921
Share of individuals dropped	0.0406	0.0582	0.0344	0.0604
R-squared	0.0034	0.0040	0.0027	0.0038
Mean $Y_{t=-1}$	0.00424	0.00576	0.00386	0.00357

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals whose both parents are known. All models contain year and age fixed effects.

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Table A9: Event Study Coefficients for Hospitalization, By Sex of Individual and by Parental Death, Reference Time Is 4 Years Before Parental Death

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
8 years before death	-0.0003	-0.0003	0.0001	-0.0008
	(0.0007)	(0.0012)	(0.0005)	(0.0009)
7 years before death	0.0002	0.0020	0.0003	0.0005
	(0.0007)	(0.0014)	(0.0005)	(0.0009)
6 years before death	0.0002	-0.0003	0.0004	-0.0007
	(0.0006)	(0.0012)	(0.0005)	(0.0008)
5 years before death	0.0003	0.0005	0.0001	-0.0002
	(0.0006)	(0.0010)	(0.0005)	(0.0007)
3 years before death	-0.0003	0.0021*	-0.0006	0.0008
	(0.0006)	(0.0011)	(0.0005)	(0.0009)
2 years before death	-0.0000	0.0009	0.0003	0.0007
	(0.0006)	(0.0011)	(0.0006)	(0.0010)
1 years before death	-0.0006	0.0003	-0.0003	-0.0005
	(0.0007)	(0.0012)	(0.0006)	(0.0011)
Year of death	0.0038***	0.0031**	0.0001	0.0033**
	(0.0009)	(0.0014)	(0.0007)	(0.0014)
1 year after death	0.0033***	0.0023	0.0002	0.0027*
	(0.0009)	(0.0015)	(0.0007)	(0.0014)
2 years after death	0.0023**	0.0005	0.0011	0.0023
	(0.0009)	(0.0015)	(0.0008)	(0.0015)
3 years after death	0.0022**	0.0006	0.0009	0.0013
	(0.0010)	(0.0015)	(0.0009)	(0.0016)
4 years after death	0.0008	0.0007	0.0009	0.0001
	(0.0010)	(0.0017)	(0.0009)	(0.0017)
5 years after death	0.0015	-0.0005	0.0004	0.0003
	(0.0011)	(0.0018)	(0.0010)	(0.0018)
6 years after death	0.0019	0.0016	0.0003	0.0004
	(0.0012)	(0.0022)	(0.0011)	(0.0020)
7 years after death	0.0017	0.0009	0.0002	-0.0001
	(0.0013)	(0.0023)	(0.0012)	(0.0021)
8 years after death	0.0011	0.0033	-0.0001	0.0004
	(0.0014)	(0.0025)	(0.0013)	(0.0023)
9 years after death	0.0019	0.0016	0.0005	0.0003
	(0.0016)	(0.0028)	(0.0013)	(0.0025)
10 years after death	0.0029*	0.0008	-0.0001	-0.0008
	(0.0017)	(0.0030)	(0.0014)	(0.0028)
Observations	343,600	125,187	334,878	118,081
Number of individuals	18,272	6,676	17,798	6,299
R-squared	0.0038	0.0044	0.0028	0.0037
Mean $Y_{t=-4}$	0.00384	0.00421	0.00276	0.00303

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 10–20. Note that reference time is 4 years before parental death (t = -4) instead of one year before parental death (t = -1). All models contain year and age fixed effects.

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Table A10a: Event Study Coefficients for Hospitalization, By Sex of Individual and by Parental Death, Family Fixed Effects Regressions

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
8 years before death	-0.0006	0.0029	-0.0028	-0.0024
	(0.0023)	(0.0038)	(0.0021)	(0.0019)
7 years before death	0.0000	0.0047	-0.0021	-0.0009
	(0.0020)	(0.0034)	(0.0018)	(0.0018)
6 years before death	0.0003	0.0020	-0.0016	-0.0018
	(0.0017)	(0.0029)	(0.0015)	(0.0015)
5 years before death	0.0004	0.0023	-0.0015	-0.0010
	(0.0015)	(0.0024)	(0.0013)	(0.0014)
4 years before death	0.0003	0.0013	-0.0011	-0.0005
	(0.0012)	(0.0020)	(0.0011)	(0.0013)
3 years before death	0.0001	0.0028*	-0.0012	0.0006
	(0.0009)	(0.0017)	(0.0008)	(0.0012)
2 years before death	0.0005	0.0011	0.0001	0.0009
	(0.0007)	(0.0012)	(0.0007)	(0.0010)
Year of death	0.0046***	0.0023	0.0008	0.0042***
	(0.0009)	(0.0016)	(0.0007)	(0.0012)
1 year after death	0.0042***	0.0009	0.0013	0.0039***
	(0.0011)	(0.0018)	(0.0009)	(0.0014)
2 years after death	0.0033***	-0.0014	0.0028**	0.0037**
	(0.0013)	(0.0023)	(0.0011)	(0.0015)
3 years after death	0.0034**	-0.0018	0.0030**	0.0030*
	(0.0015)	(0.0027)	(0.0013)	(0.0016)
4 years after death	0.0021	-0.0022	0.0034**	0.0021
	(0.0018)	(0.0032)	(0.0016)	(0.0018)
5 years after death	0.0028	-0.0039	0.0033*	0.0028
	(0.0020)	(0.0037)	(0.0019)	(0.0020)
6 years after death	0.0034	-0.0025	0.0038*	0.0031
	(0.0024)	(0.0043)	(0.0021)	(0.0022)
7 years after death	0.0034	-0.0038	0.0041*	0.0030
	(0.0027)	(0.0049)	(0.0025)	(0.0025)
8 years after death	0.0028	-0.0019	0.0042	0.0037
	(0.0030)	(0.0055)	(0.0027)	(0.0027)
9 years after death	0.0039	-0.0044	0.0051*	0.0038
	(0.0034)	(0.0061)	(0.0030)	(0.0030)
10 years after death	0.0050	-0.0060	0.0049	0.0033
	(0.0036)	(0.0068)	(0.0032)	(0.0032)
Observations	343,596	125,186	334,870	118,077
Number of individuals	18,268	6,675	17,790	6,295
R-squared	0.1303	0.1449	0.1413	0.1591
Age fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Parent fixed effects	YES	YES	YES	YES
Additional controls	NO	NO	NO	NO
Mean $Y_{t=-1}$	0.00445	0.00618	0.00389	0.00367

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 10–20. Parent fixed effect refers to the parent who has died at time 0.

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Table A10b: Event Study Coefficients for Hospitalization, By Sex of Individual and by Parental Death, Family Fixed Effects Regressions, Number of Same-Sex Siblings is at least Two

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
8 years before death	-0.0005	0.0017	-0.0012	-0.0030
	(0.0023)	(0.0034)	(0.0014)	(0.0027)
7 years before death	-0.0013	0.0035	0.0004	-0.0020
	(0.0019)	(0.0034)	(0.0012)	(0.0027)
6 years before death	0.0004	0.0027	0.0008	-0.0038*
	(0.0018)	(0.0029)	(0.0012)	(0.0020)
5 years before death	0.0008	0.0026	0.0005	-0.0016
	(0.0017)	(0.0026)	(0.0012)	(0.0021)
4 years before death	0.0006	0.0020	0.0003	-0.0001
	(0.0016)	(0.0025)	(0.0011)	(0.0021)
3 years before death	0.0001	0.0041	0.0011	0.0030
	(0.0013)	(0.0026)	(0.0011)	(0.0023)
2 years before death	0.0002	0.0005	0.0022*	0.0018
	(0.0012)	(0.0022)	(0.0011)	(0.0020)
Year of death	0.0033**	0.0005	0.0015	0.0046**
	(0.0015)	(0.0021)	(0.0011)	(0.0019)
1 year after death	0.0044***	0.0051*	0.0027**	0.0035*
	(0.0017)	(0.0027)	(0.0013)	(0.0020)
2 years after death	0.0027	-0.0006	0.0041***	0.0065***
	(0.0017)	(0.0027)	(0.0015)	(0.0025)
3 years after death	0.0058***	-0.0023	0.0049***	0.0071***
	(0.0020)	(0.0031)	(0.0015)	(0.0026)
4 years after death	-0.0017	0.0051	0.0055***	0.0083***
	(0.0019)	(0.0039)	(0.0017)	(0.0027)
5 years after death	0.0021	-0.0003	0.0052***	0.0055**
	(0.0022)	(0.0039)	(0.0018)	(0.0028)
6 years after death	-0.0004	0.0002	0.0084***	0.0062**
	(0.0023)	(0.0044)	(0.0020)	(0.0030)
7 years after death	0.0001	-0.0003	0.0087***	0.0088***
	(0.0027)	(0.0047)	(0.0021)	(0.0034)
8 years after death	0.0016	0.0062	0.0062***	0.0085**
	(0.0029)	(0.0055)	(0.0023)	(0.0034)
9 years after death	0.0014	-0.0020	0.0092***	0.0060
	(0.0033)	(0.0058)	(0.0024)	(0.0038)
10 years after death	0.0035	-0.0034	0.0110***	0.0093**
	(0.0035)	(0.0063)	(0.0027)	(0.0040)
Observations	87,127	31,871	85,982	30,716
Number of individuals	4,621	1,693	4,560	1,628
R-squared	0.0743	0.0888	0.0902	0.1025
Age fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Parent fixed effects	YES	YES	YES	YES
Additional controls	NO	NO	NO	NO
Mean $Y_{t=-1}$	0.00433	0.00414	0.00241	0.00184

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 10–20. Parent fixed effect refers to the parent who has died at time 0.

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Table A11a: Event Study Models by Cause of Hospitalization, Paternal Death, Males

	All	Depression	Stress	Substance	Self-harm
	(1)	(2)	(3)	(4)	(5)
8 years before death	0.0003	0.0001	0.0005	-0.0000	0.0001
	(0.0008)	(0.0002)	(0.0004)	(0.0002)	(0.0001)
7 years before death	0.0008	0.0000	0.0006*	0.0000	0.0001
	(0.0008)	(0.0002)	(0.0004)	(0.0002)	(0.0001)
6 years before death	0.0008	-0.0000	0.0009**	0.0000	0.0000
	(0.0007)	(0.0002)	(0.0004)	(0.0002)	(0.0001)
5 years before death	0.0009	0.0001	0.0003	-0.0001	0.0001
	(0.0007)	(0.0002)	(0.0003)	(0.0002)	(0.0001)
4 years before death	0.0006	0.0003	0.0006*	-0.0001	0.0002
	(0.0007)	(0.0003)	(0.0003)	(0.0002)	(0.0002)
3 years before death	0.0003	0.0000	0.0010***	0.0001	0.0001
	(0.0006)	(0.0002)	(0.0003)	(0.0003)	(0.0001)
2 years before death	0.0006	-0.0000	0.0013***	-0.0002	0.0001
	(0.0006)	(0.0002)	(0.0003)	(0.0003)	(0.0002)
Year of death	0.0044***	0.0008**	0.0022***	0.0005	0.0002
	(0.0008)	(0.0003)	(0.0005)	(0.0003)	(0.0002)
1 year after death	0.0039***	0.0010***	0.0018***	0.0008*	0.0002
	(0.0009)	(0.0003)	(0.0005)	(0.0004)	(0.0002)
2 years after death	0.0029***	0.0009**	0.0008*	0.0004	0.0005**
	(0.0009)	(0.0004)	(0.0004)	(0.0004)	(0.0002)
3 years after death	0.0029***	0.0005	0.0012**	-0.0000	0.0004
	(0.0010)	(0.0003)	(0.0005)	(0.0004)	(0.0003)
4 years after death	0.0014	-0.0001	0.0006	-0.0004	0.0002
	(0.0010)	(0.0003)	(0.0005)	(0.0005)	(0.0002)
5 years after death	0.0021**	0.0003	0.0008	0.0002	0.0006**
	(0.0010)	(0.0004)	(0.0005)	(0.0005)	(0.0003)
6 years after death	0.0025**	0.0001	0.0008	0.0001	0.0004
	(0.0011)	(0.0003)	(0.0005)	(0.0006)	(0.0003)
7 years after death	0.0023*	0.0007*	0.0009*	-0.0000	0.0004
	(0.0012)	(0.0004)	(0.0005)	(0.0006)	(0.0003)
8 years after death	0.0017	-0.0002	0.0012**	0.0002	0.0006*
	(0.0014)	(0.0004)	(0.0006)	(0.0007)	(0.0004)
9 years after death	0.0025*	0.0002	0.0011*	0.0001	0.0007*
	(0.0015)	(0.0005)	(0.0006)	(0.0008)	(0.0004)
10 years after death	0.0035**	0.0003	0.0016**	0.0005	0.0006
	(0.0017)	(0.0005)	(0.0007)	(0.0009)	(0.0004)
Observations	343,600	343,600	343,600	343,600	343,600
No of individuals	18,272	18,272	18,272	18,272	18,272
R-squared	0.0038	0.0009	0.0037	0.0023	0.0008
Mean $Y_{t=-1}$	0.0045	0.00083	0.00022	0.00088	0.00022

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 10–20. All models contain year and age fixed effects.

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Table A11b: Event Study Models by Cause of Hospitalization, Maternal Death, Males

	All	Depression	Stress	Substance	Self-harm
	(1)	(2)	(3)	(4)	(5)
8 years before death	-0.0006	0.0004	0.0003	0.0003	-0.0000
	(0.0015)	(0.0005)	(0.0007)	(0.0004)	(0.0002)
7 years before death	0.0017	0.0003	0.0008	0.0001	-0.0001
	(0.0015)	(0.0005)	(0.0008)	(0.0004)	(0.0002)
6 years before death	-0.0006	-0.0001	0.0006	0.0001	-0.0001
	(0.0014)	(0.0004)	(0.0007)	(0.0004)	(0.0002)
5 years before death	0.0002	-0.0003	0.0004	0.0001	-0.0002
	(0.0013)	(0.0004)	(0.0007)	(0.0004)	(0.0002)
4 years before death	-0.0003	-0.0004	0.0003	0.0001	0.0001
	(0.0012)	(0.0004)	(0.0006)	(0.0004)	(0.0003)
3 years before death	0.0018	-0.0004	0.0006	0.0004	-0.0001
	(0.0013)	(0.0004)	(0.0007)	(0.0004)	(0.0003)
2 years before death	0.0006	-0.0003	0.0008	0.0004	0.0003
	(0.0011)	(0.0004)	(0.0006)	(0.0005)	(0.0003)
Year of death	0.0028*	0.0000	0.0021**	0.0003	0.0002
	(0.0015)	(0.0006)	(0.0009)	(0.0006)	(0.0004)
1 year after death	0.0020	0.0006	0.0012	0.0005	0.0002
	(0.0015)	(0.0006)	(0.0009)	(0.0006)	(0.0004)
2 years after death	0.0001	-0.0008	-0.0000	0.0003	0.0004
	(0.0015)	(0.0005)	(0.0008)	(0.0007)	(0.0004)
3 years after death	0.0002	-0.0004	-0.0005	0.0002	0.0003
	(0.0016)	(0.0006)	(0.0007)	(0.0007)	(0.0004)
4 years after death	0.0003	-0.0001	-0.0000	0.0005	-0.0002
	(0.0017)	(0.0007)	(0.0008)	(0.0008)	(0.0004)
5 years after death	-0.0008	0.0003	-0.0006	0.0005	0.0003
	(0.0018)	(0.0007)	(0.0008)	(0.0008)	(0.0005)
6 years after death	0.0012	-0.0003	0.0012	0.0002	0.0001
	(0.0021)	(0.0007)	(0.0010)	(0.0009)	(0.0006)
7 years after death	0.0006	0.0005	0.0008	0.0007	0.0005
	(0.0022)	(0.0008)	(0.0010)	(0.0011)	(0.0006)
8 years after death	0.0030	-0.0002	0.0012	0.0027**	0.0000
	(0.0024)	(0.0008)	(0.0011)	(0.0012)	(0.0006)
9 years after death	0.0012	-0.0005	-0.0006	0.0009	0.0001
	(0.0027)	(0.0008)	(0.0010)	(0.0013)	(0.0007)
10 years after death	0.0004	0.0001	-0.0005	0.0005	-0.0001
	(0.0030)	(0.0010)	(0.0009)	(0.0014)	(0.0007)
Observations	125,187	125,187	125,187	125,187	125,187
No of individuals	6,676	6,676	6,676	6,676	6,676
R-squared	0.0044	0.0012	0.0029	0.0031	0.0014
Mean $Y_{t=-1}$	0.0062	0.00090	0.00151	0.00075	0.00030

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 10–20. All models contain year and age fixed effects.

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Table A11c: Event Study Models by Cause of Hospitalization, Paternal Death, Females

	All	Depression	Stress	Substance	Self-harm
	(1)	(2)	(3)	(4)	(5)
8 years before death	0.0004	0.0002	0.0000	-0.0000	0.0001
	(0.0006)	(0.0003)	(0.0002)	(0.0002)	(0.0002)
7 years before death	0.0006	0.0001	0.0002	-0.0000	0.0001
	(0.0006)	(0.0003)	(0.0003)	(0.0002)	(0.0002)
6 years before death	0.0007	0.0001	0.0000	0.0000	0.0000
	(0.0006)	(0.0003)	(0.0003)	(0.0002)	(0.0002)
5 years before death	0.0003	0.0003	-0.0000	0.0000	0.0002
	(0.0006)	(0.0003)	(0.0003)	(0.0002)	(0.0003)
4 years before death	0.0003	0.0001	0.0001	0.0001	0.0003
	(0.0006)	(0.0003)	(0.0003)	(0.0002)	(0.0003)
3 years before death	-0.0003	-0.0001	-0.0000	-0.0001	-0.0000
	(0.0006)	(0.0003)	(0.0002)	(0.0002)	(0.0003)
2 years before death	0.0005	0.0000	0.0002	0.0000	-0.0000
	(0.0006)	(0.0003)	(0.0003)	(0.0002)	(0.0003)
Year of death	0.0004	-0.0004	0.0004	-0.0002	0.0001
	(0.0006)	(0.0003)	(0.0003)	(0.0002)	(0.0003)
1 year after death	0.0004	0.0004	0.0002	0.0003	-0.0001
	(0.0007)	(0.0004)	(0.0003)	(0.0003)	(0.0003)
2 years after death	0.0014*	0.0007	0.0003	0.0003	0.0000
	(0.0008)	(0.0005)	(0.0003)	(0.0003)	(0.0004)
3 years after death	0.0012	0.0006	-0.0000	-0.0000	-0.0001
	(0.0008)	(0.0005)	(0.0003)	(0.0003)	(0.0004)
4 years after death	0.0012	0.0004	0.0005	0.0008**	-0.0005
	(0.0009)	(0.0005)	(0.0004)	(0.0004)	(0.0004)
5 years after death	0.0007	0.0000	0.0003	0.0002	-0.0007*
	(0.0010)	(0.0005)	(0.0004)	(0.0004)	(0.0004)
6 years after death	0.0006	-0.0000	0.0004	-0.0001	-0.0006
	(0.0010)	(0.0005)	(0.0004)	(0.0004)	(0.0004)
7 years after death	0.0005	0.0002	0.0001	0.0003	-0.0009**
	(0.0011)	(0.0006)	(0.0004)	(0.0005)	(0.0004)
8 years after death	0.0002	0.0002	0.0002	0.0000	-0.0003
	(0.0012)	(0.0006)	(0.0004)	(0.0005)	(0.0005)
9 years after death	0.0008	0.0008	0.0004	0.0002	-0.0007
	(0.0012)	(0.0006)	(0.0004)	(0.0005)	(0.0005)
10 years after death	0.0002	0.0002	-0.0000	0.0004	-0.0006
	(0.0014)	(0.0007)	(0.0004)	(0.0006)	(0.0005)
Observations	334,878	334,878	334,878	334,878	334,878
No of individuals	17,798	17,798	17,798	17,798	17,798
R-squared	0.0028	0.0020	0.0005	0.0012	0.0010
Mean $Y_{t=-1}$	0.00389	0.00107	0.00068	0.00051	0.00085

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 10–20. All models contain year and age fixed effects.

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Table A11d: Event Study Models by Cause of Hospitalization, Maternal Death, Females

	All	Depression	Stress	Substance	Self-harm
	(1)	(2)	(3)	(4)	(5)
8 years before death	-0.0003	0.0006	0.0001	0.0001	0.0003
	(0.0012)	(0.0004)	(0.0006)	(0.0002)	(0.0002)
7 years before death	0.0010	0.0006*	0.0002	0.0001	0.0003*
	(0.0012)	(0.0003)	(0.0005)	(0.0002)	(0.0002)
6 years before death	-0.0002	0.0007*	0.0004	0.0001	0.0002
	(0.0011)	(0.0004)	(0.0006)	(0.0002)	(0.0002)
5 years before death	0.0003	0.0005	0.0002	0.0002	0.0004
	(0.0011)	(0.0004)	(0.0005)	(0.0003)	(0.0003)
4 years before death	0.0005	0.0005	0.0002	0.0000	0.0002
	(0.0011)	(0.0004)	(0.0005)	(0.0003)	(0.0002)
3 years before death	0.0013	0.0007	0.0005	0.0000	-0.0001
	(0.0011)	(0.0005)	(0.0006)	(0.0003)	(0.0002)
2 years before death	0.0013	0.0002	-0.0000	0.0004	0.0000
	(0.0010)	(0.0004)	(0.0005)	(0.0004)	(0.0002)
Year of death	0.0039***	0.0011*	0.0013**	0.0003	0.0013**
	(0.0011)	(0.0006)	(0.0007)	(0.0004)	(0.0005)
1 year after death	0.0033***	0.0021***	0.0022***	0.0006	0.0018***
	(0.0013)	(0.0008)	(0.0008)	(0.0004)	(0.0006)
2 years after death	0.0028**	0.0016**	0.0018**	0.0004	0.0006
	(0.0014)	(0.0008)	(0.0008)	(0.0004)	(0.0005)
3 years after death	0.0018	0.0013	0.0013	0.0004	0.0007
	(0.0014)	(0.0009)	(0.0009)	(0.0004)	(0.0005)
4 years after death	0.0006	-0.0003	-0.0001	-0.0002	0.0009
	(0.0015)	(0.0008)	(0.0008)	(0.0004)	(0.0006)
5 years after death	0.0008	-0.0010	-0.0009	-0.0001	0.0004
	(0.0016)	(0.0008)	(0.0008)	(0.0006)	(0.0006)
6 years after death	0.0009	-0.0003	-0.0002	0.0010	0.0003
	(0.0018)	(0.0009)	(0.0009)	(0.0008)	(0.0006)
7 years after death	0.0004	-0.0001	0.0000	0.0005	-0.0002
	(0.0019)	(0.0010)	(0.0010)	(0.0008)	(0.0006)
8 years after death	0.0009	-0.0004	-0.0003	0.0002	0.0002
	(0.0021)	(0.0012)	(0.0012)	(0.0008)	(0.0007)
9 years after death	0.0008	0.0008	0.0009	0.0005	0.0001
	(0.0023)	(0.0013)	(0.0013)	(0.0010)	(0.0007)
10 years after death	-0.0002	-0.0003	-0.0002	0.0000	0.0011
	(0.0025)	(0.0013)	(0.0013)	(0.0011)	(0.0009)
Observations	118,081	118,081	118,081	118,081	118,081
No of individuals	6,299	6,299	6,299	6,299	6,299
R-squared	0.0037	0.0023	0.0022	0.0015	0.0016
Mean $Y_{t=-1}$	0.00367	0.00080	0.00096	0.00032	0.00016

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 10–20. All models contain year and age fixed effects.

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Table A12a: Event Study Coefficients for Hospitalization, By Sex of Individual and by Parental Death, Parental Death at Ages 10–15

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
8 years before death	0.0031*	0.0032	0.0015	-0.0013
	(0.0019)	(0.0033)	(0.0011)	(0.0028)
7 years before death	0.0031*	0.0039	0.0015	0.0007
	(0.0017)	(0.0030)	(0.0010)	(0.0027)
6 years before death	0.0033**	0.0007	0.0012	-0.0015
	(0.0015)	(0.0026)	(0.0010)	(0.0023)
5 years before death	0.0015	0.0022	0.0004	-0.0010
	(0.0013)	(0.0024)	(0.0009)	(0.0019)
4 years before death	0.0013	0.0012	-0.0005	0.0009
	(0.0012)	(0.0022)	(0.0008)	(0.0018)
3 years before death	0.0012	0.0030	-0.0005	0.0024
	(0.0010)	(0.0022)	(0.0007)	(0.0016)
2 years before death	0.0012	-0.0013	-0.0000	0.0017
	(0.0009)	(0.0016)	(0.0007)	(0.0012)
Year of death	0.0040***	-0.0003	0.0004	0.0017
	(0.0010)	(0.0019)	(0.0007)	(0.0011)
1 year after death	0.0047***	0.0004	-0.0000	0.0032**
	(0.0011)	(0.0022)	(0.0008)	(0.0016)
2 years after death	0.0035***	-0.0045**	0.0010	0.0040**
	(0.0012)	(0.0020)	(0.0009)	(0.0020)
3 years after death	0.0034**	-0.0030	0.0009	0.0023
	(0.0014)	(0.0023)	(0.0011)	(0.0019)
4 years after death	0.0010	-0.0010	0.0010	0.0006
	(0.0015)	(0.0026)	(0.0013)	(0.0025)
5 years after death	0.0015	-0.0049	0.0016	0.0005
	(0.0018)	(0.0030)	(0.0015)	(0.0029)
6 years after death	0.0018	-0.0003	0.0011	0.0019
	(0.0020)	(0.0033)	(0.0016)	(0.0031)
7 years after death	0.0024	-0.0012	0.0019	-0.0014
	(0.0022)	(0.0036)	(0.0019)	(0.0036)
8 years after death	0.0019	-0.0013	0.0013	0.0001
	(0.0025)	(0.0044)	(0.0021)	(0.0041)
9 years after death	0.0028	-0.0010	0.0003	-0.0022
	(0.0029)	(0.0052)	(0.0023)	(0.0046)
10 years after death	0.0027	-0.0015	-0.0003	-0.0078
	(0.0032)	(0.0054)	(0.0025)	(0.0050)
Observations	155,805	53,561	152,659	51,734
Number of individuals	8,271	2,854	8,097	2,757
R-squared	0.0040	0.0046	0.0032	0.0052
Mean $Y_{t=-1}$	0.00231	0.00565	0.00211	0.00146

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 10–15. All models contain year and age fixed effects.

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Table A12b: Event Study Coefficients for Hospitalization, By Sex of Individual and by Parental Death, Parental Death at Ages 16–20

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
8 years before death	0.0022	-0.0013	-0.0010	0.0026
	(0.0016)	(0.0032)	(0.0015)	(0.0029)
7 years before death	0.0019	0.0015	-0.0006	0.0029
	(0.0015)	(0.0029)	(0.0014)	(0.0029)
6 years before death	0.0013	-0.0008	-0.0003	0.0026
	(0.0013)	(0.0026)	(0.0014)	(0.0027)
5 years before death	0.0025**	-0.0013	-0.0006	0.0026
	(0.0013)	(0.0021)	(0.0014)	(0.0026)
4 years before death	0.0015	-0.0016	0.0001	0.0011
	(0.0011)	(0.0020)	(0.0013)	(0.0024)
3 years before death	0.0006	0.0010	-0.0008	0.0010
	(0.0010)	(0.0018)	(0.0011)	(0.0022)
2 years before death	0.0006	0.0021	0.0004	0.0018
	(0.0009)	(0.0016)	(0.0010)	(0.0018)
Year of death	0.0038***	0.0052**	0.0012	0.0046**
	(0.0012)	(0.0022)	(0.0010)	(0.0018)
1 year after death	0.0014	0.0032	0.0023*	0.0019
	(0.0015)	(0.0025)	(0.0014)	(0.0019)
2 years after death	-0.0001	0.0032	0.0040**	0.0009
	(0.0018)	(0.0031)	(0.0016)	(0.0024)
3 years after death	-0.0005	0.0020	0.0047**	-0.0003
	(0.0023)	(0.0035)	(0.0020)	(0.0029)
4 years after death	-0.0016	0.0009	0.0053**	-0.0012
	(0.0025)	(0.0039)	(0.0024)	(0.0035)
5 years after death	-0.0014	0.0022	0.0045	-0.0000
	(0.0027)	(0.0044)	(0.0028)	(0.0042)
6 years after death	-0.0013	0.0033	0.0056*	-0.0010
	(0.0030)	(0.0052)	(0.0031)	(0.0046)
7 years after death	-0.0027	0.0036	0.0056*	-0.0002
	(0.0033)	(0.0057)	(0.0034)	(0.0051)
8 years after death	-0.0045	0.0083	0.0062*	-0.0007
	(0.0037)	(0.0064)	(0.0037)	(0.0058)
9 years after death	-0.0043	0.0061	0.0084**	0.0001
	(0.0041)	(0.0071)	(0.0039)	(0.0066)
10 years after death	-0.0042	0.0051	0.0088**	0.0013
	(0.0046)	(0.0080)	(0.0043)	(0.0075)
Observations	187,795	71,626	182,219	66,347
Number of individuals	10,001	3,822	9,701	3,542
R-squared	0.0040	0.0046	0.0026	0.0035
Mean $Y_{t=-1}$	0.00622	0.00657	0.00539	0.00539

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 16–20. All models contain year and age fixed effects.

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Table A12c: Event Study Coefficients for Hospitalization, By Sex of Individual and by Parental Death, Parental Death at Ages 14–18

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
8 years before death	-0.0020	-0.0065*	0.0024*	-0.0040**
	(0.0016)	(0.0037)	(0.0014)	(0.0020)
7 years before death	-0.0014	-0.0029	0.0024*	-0.0028
	(0.0015)	(0.0036)	(0.0013)	(0.0018)
6 years before death	-0.0011	-0.0051	0.0025**	-0.0026
	(0.0013)	(0.0032)	(0.0012)	(0.0018)
5 years before death	-0.0004	-0.0041	0.0016	-0.0025
	(0.0011)	(0.0028)	(0.0011)	(0.0017)
4 years before death	0.0001	-0.0040**	0.0020*	-0.0015
	(0.0010)	(0.0021)	(0.0011)	(0.0013)
3 years before death	-0.0005	-0.0007	0.0015	-0.0010
	(0.0008)	(0.0019)	(0.0010)	(0.0014)
2 years before death	-0.0004	-0.0001	0.0018*	-0.0009
	(0.0007)	(0.0017)	(0.0010)	(0.0012)
Year of death	0.0036***	-0.0009	0.0011	0.0034*
	(0.0010)	(0.0018)	(0.0010)	(0.0019)
1 year after death	0.0045***	-0.0019	0.0002	0.0023
	(0.0014)	(0.0023)	(0.0012)	(0.0025)
2 years after death	0.0022	-0.0011	0.0019	0.0019
	(0.0016)	(0.0030)	(0.0014)	(0.0027)
3 years after death	0.0040**	-0.0031	0.0013	0.0004
	(0.0020)	(0.0035)	(0.0017)	(0.0028)
4 years after death	0.0017	-0.0064	0.0017	-0.0015
	(0.0024)	(0.0045)	(0.0021)	(0.0034)
5 years after death	0.0007	-0.0111**	0.0011	-0.0009
	(0.0027)	(0.0053)	(0.0023)	(0.0038)
6 years after death	0.0018	-0.0075	0.0021	-0.0018
	(0.0030)	(0.0061)	(0.0027)	(0.0045)
7 years after death	0.0007	-0.0076	0.0013	-0.0007
	(0.0033)	(0.0070)	(0.0030)	(0.0050)
8 years after death	0.0002	-0.0052	0.0008	0.0004
	(0.0037)	(0.0075)	(0.0033)	(0.0058)
9 years after death	0.0023	-0.0108	0.0020	-0.0005
	(0.0039)	(0.0080)	(0.0036)	(0.0063)
10 years after death	0.0046	-0.0080	0.0025	-0.0011
	(0.0044)	(0.0091)	(0.0040)	(0.0070)
Observations	164,914	60,574	161,181	56,410
Number of individuals	8,774	3,233	8,570	3,012
R-squared	0.0036	0.0045	0.0026	0.0055
Mean $Y_{t=-1}$	0.00309	0.00653	0.00363	0.00434

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 14–18. This age range is the same as in Kristiansen (2021). All models contain year and age fixed effects.

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Table A12d: Event Study Coefficients for Hospitalization, By Sex of Individual and by Parental Death, Parental Death at Ages 21–30

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
8 years before death	-0.0024***	-0.0008	-0.0007	-0.0011
	(0.0008)	(0.0014)	(0.0007)	(0.0012)
7 years before death	-0.0017**	-0.0005	-0.0000	0.0001
	(0.0008)	(0.0014)	(0.0006)	(0.0011)
6 years before death	-0.0016**	0.0003	-0.0003	0.0010
	(0.0008)	(0.0013)	(0.0006)	(0.0010)
5 years before death	-0.0012*	-0.0008	0.0007	-0.0001
	(0.0007)	(0.0012)	(0.0006)	(0.0009)
3 years before death	0.0001	-0.0007	0.0013**	0.0031***
	(0.0007)	(0.0012)	(0.0006)	(0.0010)
2 years before death	0.0016*	0.0017	0.0006	0.0033***
	(0.0008)	(0.0014)	(0.0006)	(0.0011)
1 years before death	0.0005	0.0029**	0.0015**	0.0038***
	(0.0009)	(0.0015)	(0.0007)	(0.0012)
Year of death	0.0020**	0.0058***	0.0022***	0.0052***
	(0.0009)	(0.0016)	(0.0008)	(0.0013)
1 year after death	0.0013	0.0044**	0.0019**	0.0047***
	(0.0010)	(0.0017)	(0.0008)	(0.0015)
2 years after death	0.0027**	0.0055***	0.0020**	0.0046***
	(0.0011)	(0.0019)	(0.0009)	(0.0015)
3 years after death	0.0026**	0.0053**	0.0021**	0.0051***
	(0.0012)	(0.0021)	(0.0010)	(0.0017)
4 years after death	0.0027**	0.0050**	0.0023**	0.0045**
	(0.0013)	(0.0022)	(0.0011)	(0.0019)
5 years after death	0.0010	0.0043*	0.0032***	0.0058***
	(0.0014)	(0.0024)	(0.0012)	(0.0020)
6 years after death	0.0021	0.0019	0.0027**	0.0055**
	(0.0015)	(0.0026)	(0.0013)	(0.0023)
7 years after death	0.0026	0.0044	0.0038***	0.0048*
	(0.0017)	(0.0029)	(0.0015)	(0.0024)
8 years after death	0.0039**	0.0048	0.0037**	0.0051*
	(0.0019)	(0.0032)	(0.0016)	(0.0027)
9 years after death	0.0000	0.0060	0.0038**	0.0047
	(0.0020)	(0.0039)	(0.0019)	(0.0031)
10 years after death	0.0019	0.0018	0.0008	0.0064
	(0.0027)	(0.0047)	(0.0021)	(0.0046)
Observations	434,948	173,341	415,711	165,289
Number of individuals	31,454	12,611	30,081	12,037
R-squared	0.0013	0.0016	0.0005	0.0010
Mean $Y_{t=-4}$	0.0112	0.0123	0.00639	0.00695

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is individuals with a parental death at ages 21–30. All models contain year and age fixed effects. Reference time is 4 years before parental death (t = -4) because of the significant pre-treatment effects.

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Table A13a: Event Study Coefficients for Hospitalization, By Sex of Individual and by Parental Death, Parents' Income Below Median

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
8 years before death	0.0006	-0.0032	0.0001	-0.0043**
	(0.0013)	(0.0025)	(0.0010)	(0.0020)
7 years before death	0.0010	-0.0002	0.0008	-0.0013
	(0.0013)	(0.0026)	(0.0010)	(0.0019)
6 years before death	0.0005	-0.0033	-0.0001	-0.0026
	(0.0012)	(0.0023)	(0.0010)	(0.0018)
5 years before death	0.0011	-0.0008	0.0007	-0.0013
	(0.0012)	(0.0023)	(0.0011)	(0.0018)
4 years before death	0.0005	-0.0013	0.0004	0.0004
	(0.0011)	(0.0023)	(0.0010)	(0.0019)
3 years before death	0.0006	0.0025	-0.0003	0.0014
	(0.0011)	(0.0024)	(0.0009)	(0.0019)
2 years before death	0.0005	-0.0009	0.0002	0.0026
	(0.0010)	(0.0020)	(0.0009)	(0.0017)
Year of death	0.0056***	0.0011	-0.0001	0.0035*
	(0.0013)	(0.0024)	(0.0009)	(0.0019)
1 year after death	0.0053***	0.0015	0.0012	0.0032
	(0.0014)	(0.0025)	(0.0011)	(0.0020)
2 years after death	0.0035**	-0.0025	0.0018	0.0043*
	(0.0015)	(0.0025)	(0.0012)	(0.0023)
3 years after death	0.0028*	0.0012	0.0020	0.0032
	(0.0015)	(0.0027)	(0.0013)	(0.0023)
4 years after death	-0.0009	0.0007	0.0021	0.0027
	(0.0015)	(0.0030)	(0.0014)	(0.0027)
5 years after death	0.0019	0.0004	0.0035**	0.0025
	(0.0017)	(0.0031)	(0.0016)	(0.0029)
6 years after death	0.0026	0.0013	0.0031*	0.0033
	(0.0019)	(0.0036)	(0.0016)	(0.0033)
7 years after death	0.0022	0.0004	0.0022	-0.0016
	(0.0021)	(0.0039)	(0.0018)	(0.0033)
8 years after death	0.0011	0.0039	0.0031	0.0013
	(0.0023)	(0.0042)	(0.0020)	(0.0038)
9 years after death	0.0020	-0.0009	0.0019	0.0017
	(0.0025)	(0.0048)	(0.0020)	(0.0044)
10 years after death	0.0033	-0.0055	0.0021	0.0017
	(0.0029)	(0.0049)	(0.0021)	(0.0048)
Observations	155,768	54,566	150,793	50,460
Number of individuals	8,286	2,913	8,022	2,694
R-squared	0.0046	0.0059	0.0034	0.0050
Mean $Y_{t=-1}$	0.00570	0.00865	0.00426	0.00486

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 10–20 and parents' taxable income below median (see Table A1). All models contain year and age fixed effects.

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Table A13b: Event Study Coefficients for Hospitalization, By Sex of Individual and by Parental Death, Parents' Income Above Median

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
8 years before death	0.0002	0.0015	0.0007	0.0027*
	(0.0010)	(0.0018)	(0.0008)	(0.0014)
7 years before death	0.0006	0.0033*	0.0006	0.0028*
	(0.0009)	(0.0018)	(0.0007)	(0.0014)
6 years before death	0.0011	0.0016	0.0014*	0.0017
	(0.0008)	(0.0016)	(0.0008)	(0.0013)
5 years before death	0.0007	0.0011	0.0001	0.0015
	(0.0009)	(0.0015)	(0.0007)	(0.0013)
4 years before death	0.0007	0.0005	0.0002	0.0005
	(0.0008)	(0.0012)	(0.0008)	(0.0012)
3 years before death	0.0001	0.0012	-0.0003	0.0012
	(0.0007)	(0.0014)	(0.0007)	(0.0013)
2 years before death	0.0007	0.0017	0.0008	0.0003
	(0.0007)	(0.0012)	(0.0008)	(0.0012)
Year of death	0.0034***	0.0041**	0.0007	0.0041***
	(0.0010)	(0.0018)	(0.0008)	(0.0014)
1 year after death	0.0026**	0.0022	-0.0002	0.0033**
	(0.0010)	(0.0018)	(0.0009)	(0.0016)
2 years after death	0.0024**	0.0021	0.0010	0.0017
	(0.0011)	(0.0019)	(0.0009)	(0.0016)
3 years after death	0.0028**	-0.0006	0.0005	0.0007
	(0.0012)	(0.0017)	(0.0011)	(0.0016)
4 years after death	0.0031**	-0.0001	0.0004	-0.0010
	(0.0012)	(0.0019)	(0.0011)	(0.0016)
5 years after death	0.0020	-0.0019	-0.0018	-0.0005
	(0.0013)	(0.0022)	(0.0012)	(0.0018)
6 years after death	0.0022	0.0010	-0.0015	-0.0008
	(0.0014)	(0.0025)	(0.0013)	(0.0019)
7 years after death	0.0022	0.0006	-0.0010	0.0020
	(0.0015)	(0.0025)	(0.0014)	(0.0021)
8 years after death	0.0018	0.0021	-0.0023	0.0008
	(0.0016)	(0.0029)	(0.0015)	(0.0023)
9 years after death	0.0026	0.0024	-0.0003	0.0004
	(0.0018)	(0.0031)	(0.0016)	(0.0023)
10 years after death	0.0032	0.0046	-0.0016	-0.0016
	(0.0020)	(0.0036)	(0.0018)	(0.0026)
Observations	187,832	70,621	184,085	67,621
Number of individuals	9,986	3,763	9,776	3,605
R-squared	0.0037	0.0049	0.0028	0.0037
Mean $Y_{t=-1}$	0.00342	0.00427	0.00359	0.00279

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 10–20 and parents' taxable income above median (see Table A1). All models contain year and age fixed effects.

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Table A14a: Event Study Coefficients for Hospitalization, By Sex of Individual and by Parental Death, Parent without Post-Compulsory Education

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
8 years before death	0.0019	-0.0003	0.0003	-0.0028
	(0.0012)	(0.0025)	(0.0009)	(0.0021)
7 years before death	0.0023*	0.0018	0.0012	0.0003
	(0.0012)	(0.0024)	(0.0009)	(0.0022)
6 years before death	0.0023**	-0.0021	0.0007	-0.0020
	(0.0011)	(0.0021)	(0.0009)	(0.0020)
5 years before death	0.0012	0.0000	-0.0002	-0.0011
	(0.0011)	(0.0020)	(0.0009)	(0.0019)
4 years before death	0.0004	-0.0010	0.0009	0.0001
	(0.0010)	(0.0020)	(0.0010)	(0.0019)
3 years before death	0.0011	0.0005	0.0004	0.0005
	(0.0010)	(0.0020)	(0.0009)	(0.0019)
2 years before death	0.0007	0.0000	0.0003	0.0009
	(0.0009)	(0.0019)	(0.0009)	(0.0018)
Year of death	0.0043***	0.0042*	0.0006	0.0039**
	(0.0012)	(0.0024)	(0.0009)	(0.0018)
1 year after death	0.0045***	0.0024	-0.0003	0.0025
	(0.0013)	(0.0024)	(0.0010)	(0.0019)
2 years after death	0.0050***	0.0018	0.0014	0.0043*
	(0.0014)	(0.0023)	(0.0011)	(0.0023)
3 years after death	0.0027*	0.0021	-0.0004	0.0017
	(0.0014)	(0.0025)	(0.0011)	(0.0022)
4 years after death	0.0026*	0.0018	0.0006	0.0006
	(0.0015)	(0.0029)	(0.0012)	(0.0024)
5 years after death	0.0019	0.0006	0.0004	-0.0003
	(0.0015)	(0.0029)	(0.0014)	(0.0027)
6 years after death	0.0025	0.0043	0.0004	-0.0009
	(0.0017)	(0.0034)	(0.0015)	(0.0029)
7 years after death	0.0012	0.0033	-0.0007	-0.0020
	(0.0018)	(0.0035)	(0.0016)	(0.0030)
8 years after death	0.0006	0.0032	-0.0013	-0.0020
	(0.0021)	(0.0038)	(0.0017)	(0.0033)
9 years after death	0.0020	0.0038	-0.0013	0.0011
	(0.0023)	(0.0043)	(0.0018)	(0.0039)
10 years after death	0.0029	-0.0006	-0.0009	-0.0021
	(0.0026)	(0.0046)	(0.0019)	(0.0043)
Observations	176,381	59,598	170,822	55,997
Number of individuals	9,382	3,178	9,077	2,981
R-squared	0.0039	0.0061	0.0032	0.0046
Mean $Y_{t=-1}$	0.00503	0.00729	0.00443	0.00540

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 10–20, where parents are without post-compulsory education. All models contain year and age fixed effects.

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Table A14b: Event Study Coefficients for Hospitalization, By Sex of Individual and by Parental Death, Parent with Post-Compulsory Education

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
8 years before death	-0.0012	-0.0010	0.0004	0.0019
	(0.0010)	(0.0018)	(0.0008)	(0.0012)
7 years before death	-0.0007	0.0016	0.0000	0.0015
	(0.0010)	(0.0019)	(0.0007)	(0.0011)
6 years before death	-0.0007	0.0008	0.0008	0.0014
	(0.0009)	(0.0018)	(0.0008)	(0.0010)
5 years before death	0.0005	0.0004	0.0009	0.0016
	(0.0010)	(0.0016)	(0.0009)	(0.0011)
4 years before death	0.0008	0.0003	-0.0004	0.0008
	(0.0009)	(0.0014)	(0.0008)	(0.0011)
3 years before death	-0.0004	0.0030*	-0.0009	0.0019
	(0.0008)	(0.0018)	(0.0007)	(0.0012)
2 years before death	0.0005	0.0011	0.0008	0.0016
	(0.0008)	(0.0013)	(0.0008)	(0.0010)
Year of death	0.0045***	0.0016	0.0001	0.0039***
	(0.0011)	(0.0017)	(0.0008)	(0.0013)
1 year after death	0.0032***	0.0016	0.0012	0.0039**
	(0.0011)	(0.0019)	(0.0010)	(0.0017)
2 years after death	0.0007	-0.0013	0.0014	0.0015
	(0.0011)	(0.0020)	(0.0011)	(0.0016)
3 years after death	0.0029**	-0.0014	0.0028**	0.0019
	(0.0012)	(0.0019)	(0.0012)	(0.0017)
4 years after death	0.0001	-0.0011	0.0017	0.0007
	(0.0013)	(0.0020)	(0.0013)	(0.0018)
5 years after death	0.0021	-0.0021	0.0009	0.0018
	(0.0014)	(0.0022)	(0.0013)	(0.0018)
6 years after death	0.0023	-0.0017	0.0008	0.0027
	(0.0015)	(0.0026)	(0.0014)	(0.0021)
7 years after death	0.0034**	-0.0020	0.0017	0.0027
	(0.0017)	(0.0028)	(0.0016)	(0.0023)
8 years after death	0.0026	0.0027	0.0017	0.0038
	(0.0018)	(0.0031)	(0.0017)	(0.0026)
9 years after death	0.0030	-0.0013	0.0029*	0.0007
	(0.0020)	(0.0034)	(0.0018)	(0.0026)
10 years after death	0.0039*	0.0008	0.0013	0.0016
	(0.0022)	(0.0039)	(0.0020)	(0.0028)
Observations	167,219	65,589	164,056	62,084
Number of individuals	8,890	3,498	8,721	3,318
R-squared	0.0042	0.0047	0.0030	0.0044
Mean $Y_{t=-1}$	0.00384	0.00517	0.00334	0.00212

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 10–20, where parents have post-compulsory education. All models contain year and age fixed effects.

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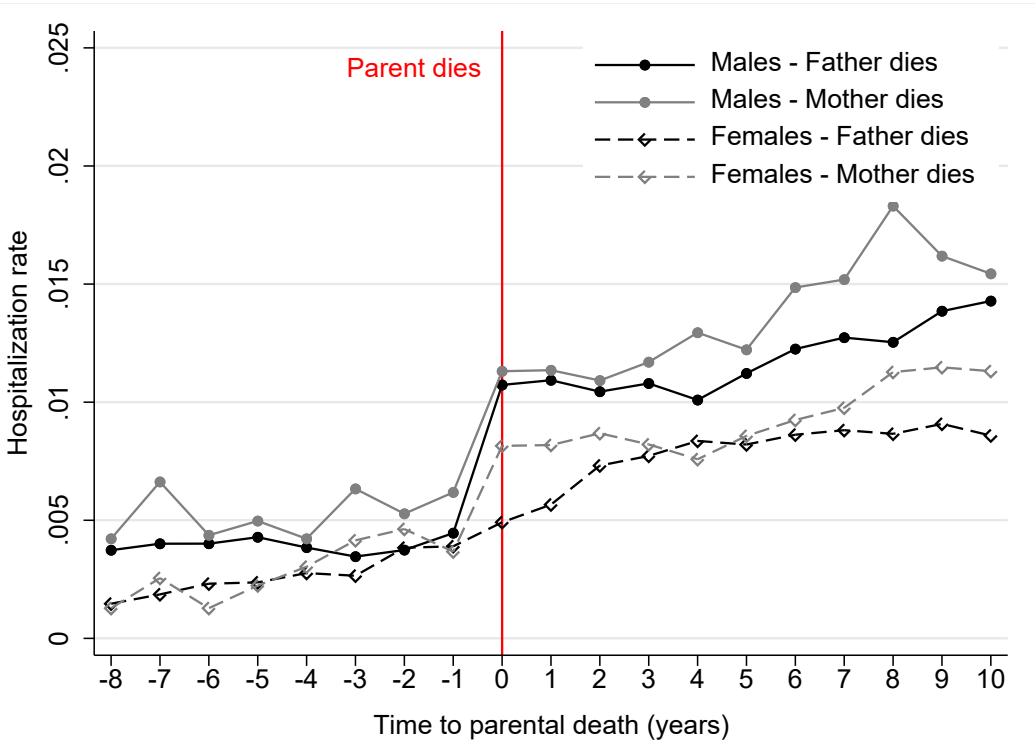
Figure A1: Hospitalization Rate Before and After the Parental Death in the Treatment Groups, Raw Data



Notes: Figure shows the annual child hospitalization rates due to mental health disorders before and after parental death at time 0. Figures are given separately for male and female children and by sex of the deceased parent.

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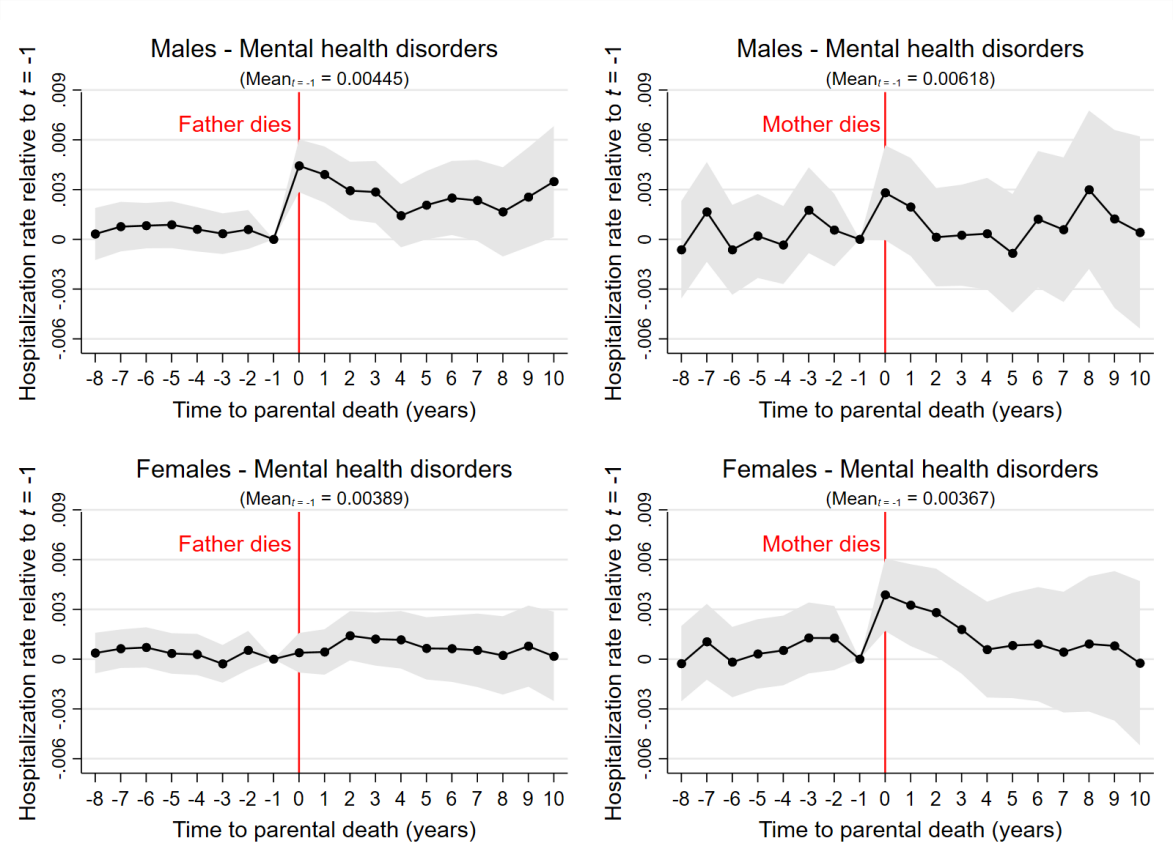
Figure A2: Event Study Results, Without Individual Fixed Effects



Notes: The figures plot the coefficient estimates from the event study regressions without individual fixed effects, together with 95% confidence intervals (standard errors clustered at the individual level). The dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Panels on the left show estimates for father's death and those on the right show estimates for mother's death. See Tables A6a–A6b for tabulation of estimation results and further details.

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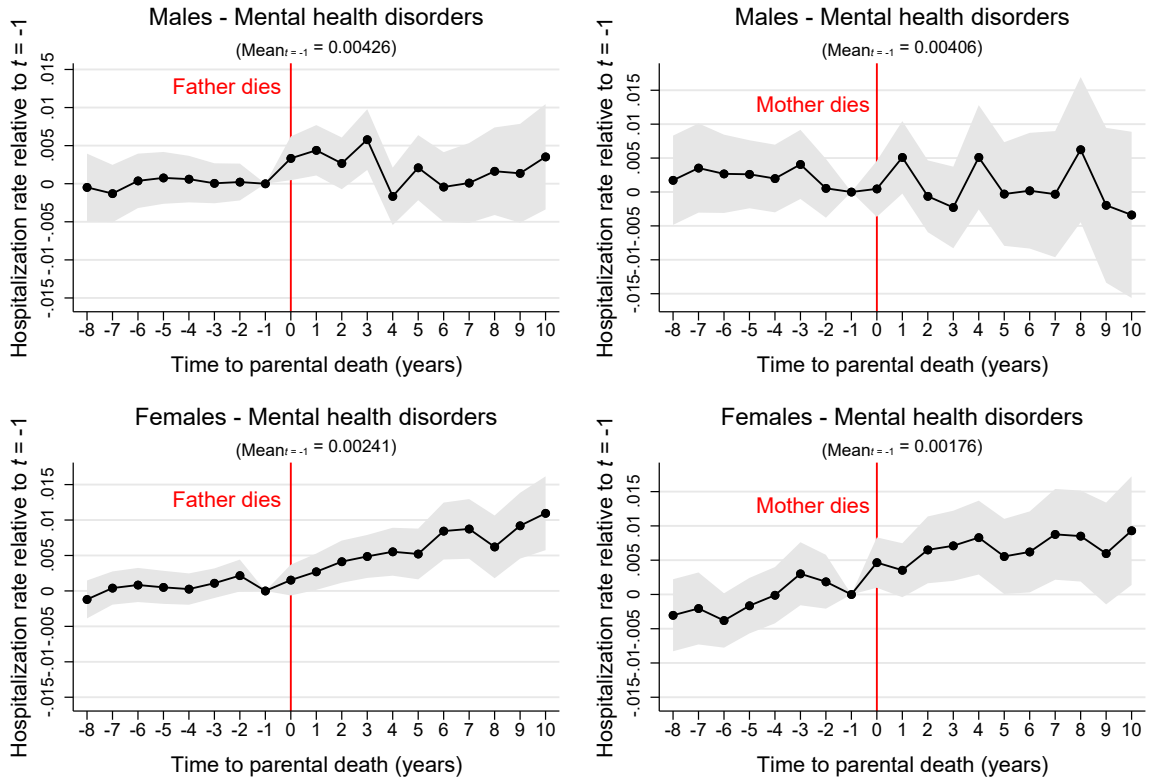
Figure A3: Event Study Results, Family Fixed Effects Regressions, Number of Same-Sex Siblings is At Least Two



Notes: The figures plot the coefficient estimates from the event study regressions, together with 95% confidence intervals (standard errors clustered at the individual level). The dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Panels on the left show estimates for father's death and those on the right show estimates for mother's death. Parent fixed effect refers to the parent who has died at time 0. See Table A10b for tabulation of estimation results and further details.

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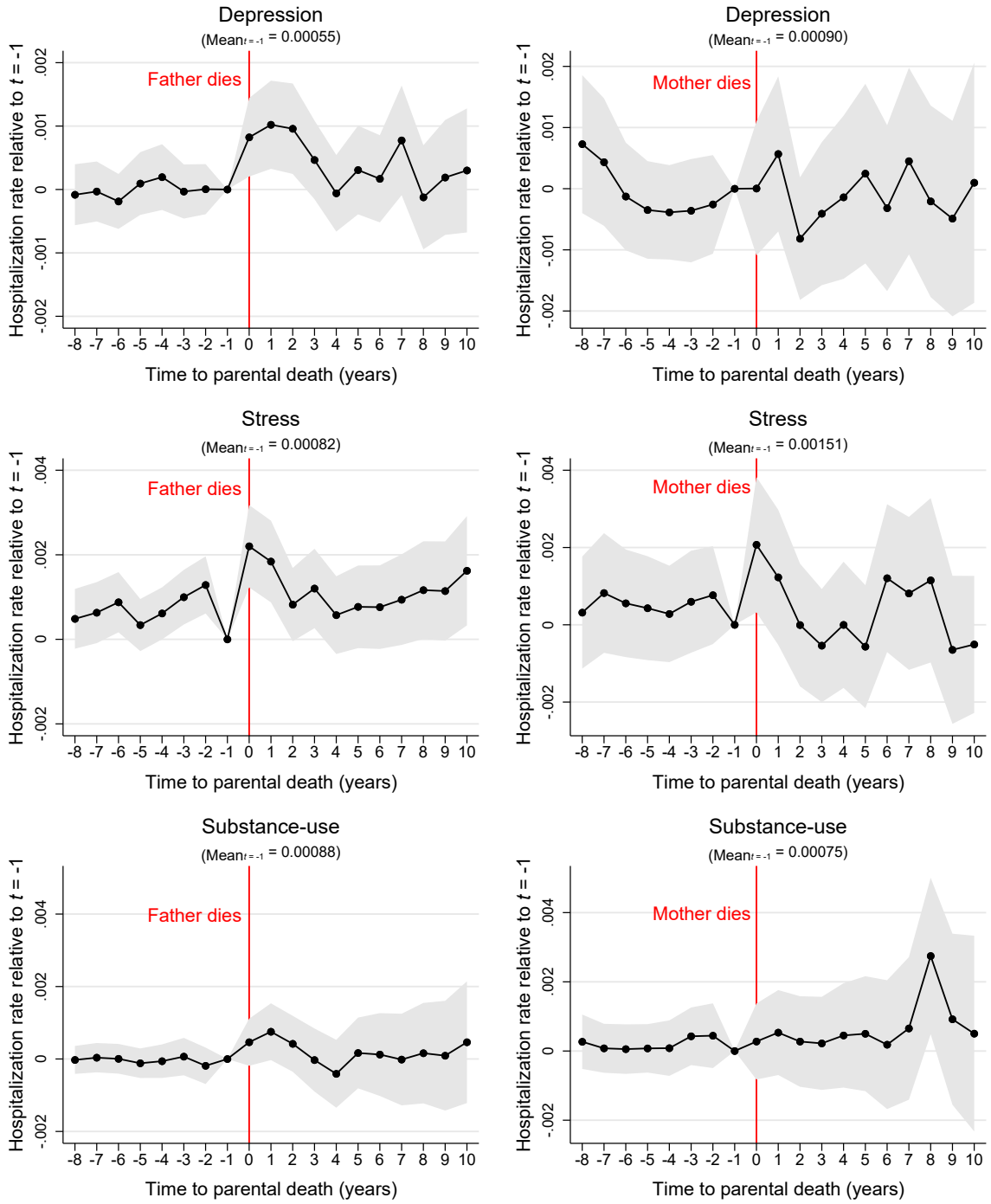
Figure A4a: Event Study Results by Cause of Hospitalization, Males



Notes: The figures plot the coefficient estimates from the event study regressions together with 95% confidence intervals (standard errors clustered at the individual level). See Tables A11a–A11b for tabulation of estimation results and further details.

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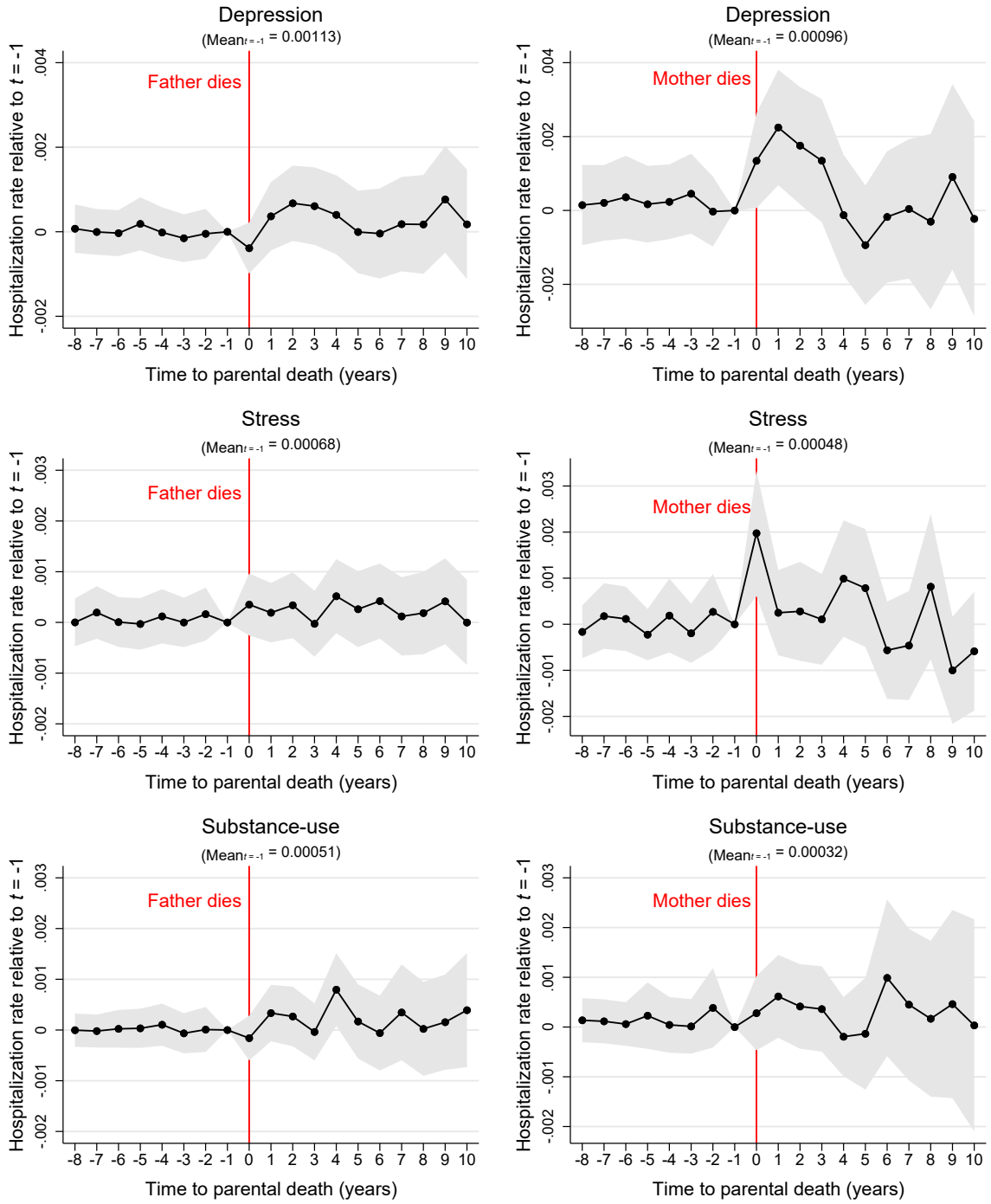
Figure A4b: Event Study Results by Cause of Hospitalization, Females



Notes: The figures plot the coefficient estimates from the event study regressions together with 95% confidence intervals (standard errors clustered at the individual level). See Tables A11c–A11d for tabulation of estimation results and further details.

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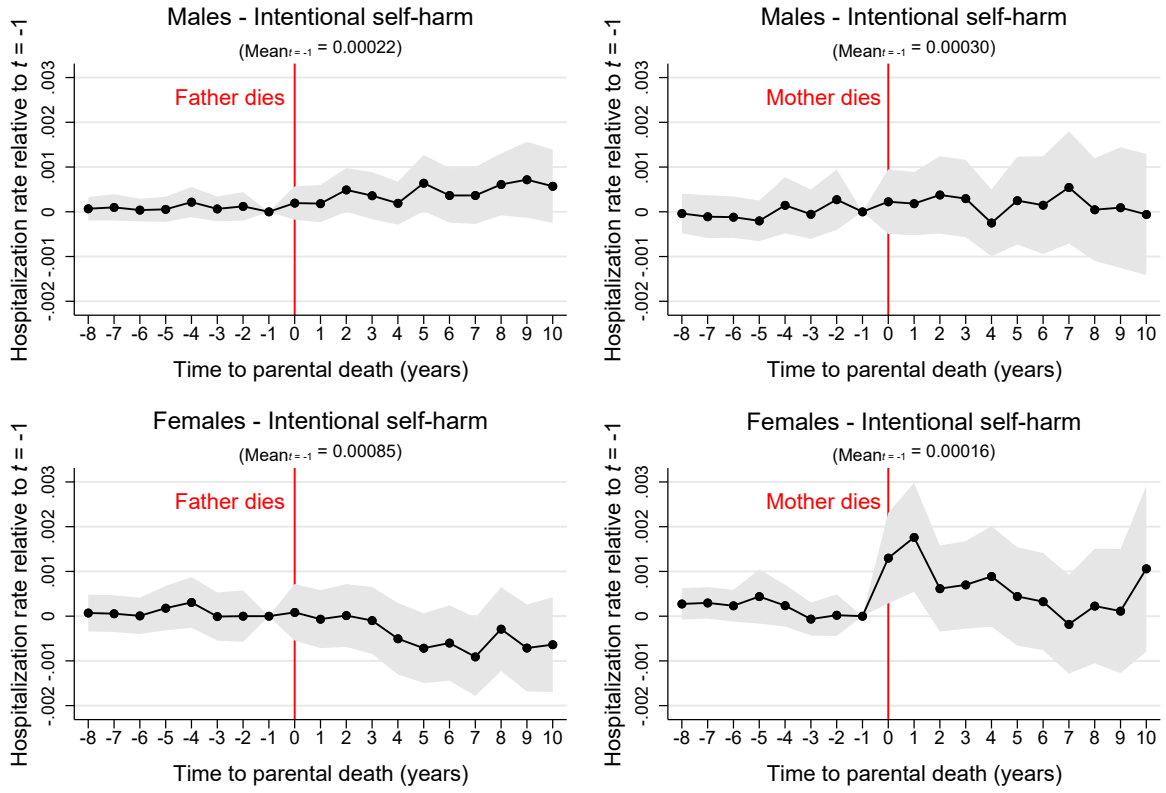
Figure A4c: Event Study Results, Intentional Self-Harm, Males and Females



Notes: The figures plot the coefficient estimates from the event study regressions together with 95% confidence intervals (standard errors clustered at the individual level). See Tables A11a–A11d for tabulation of estimation results and further details.

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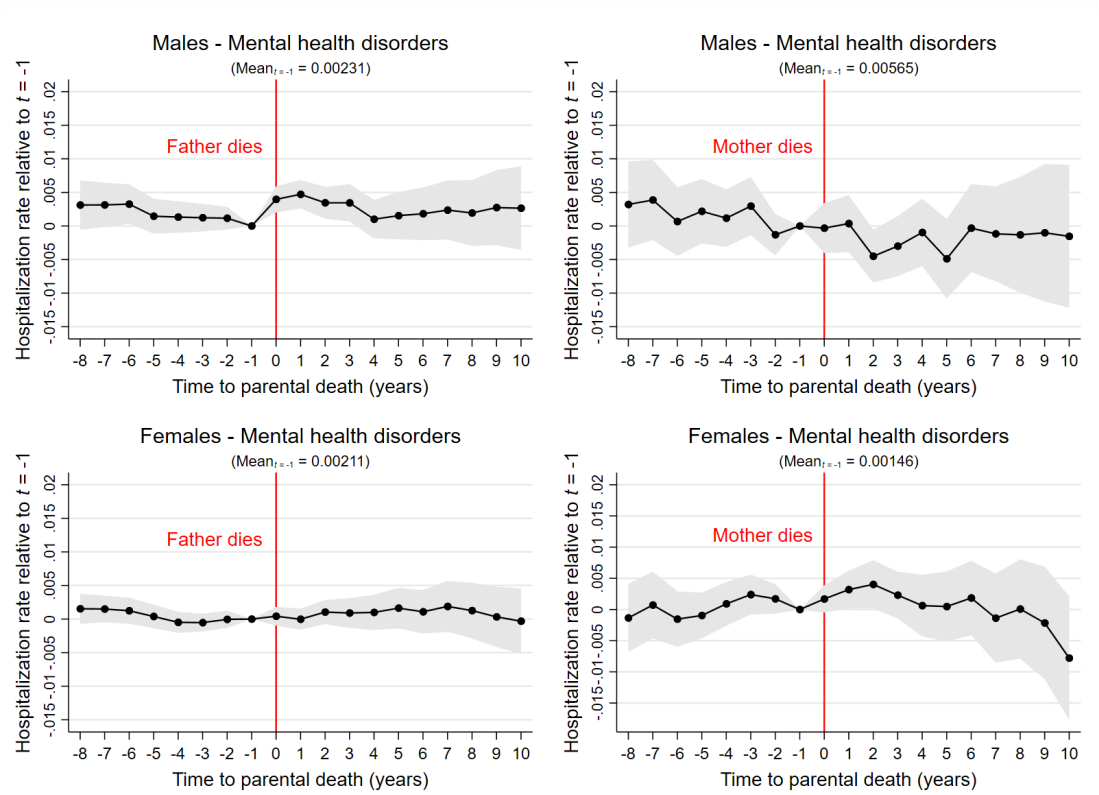
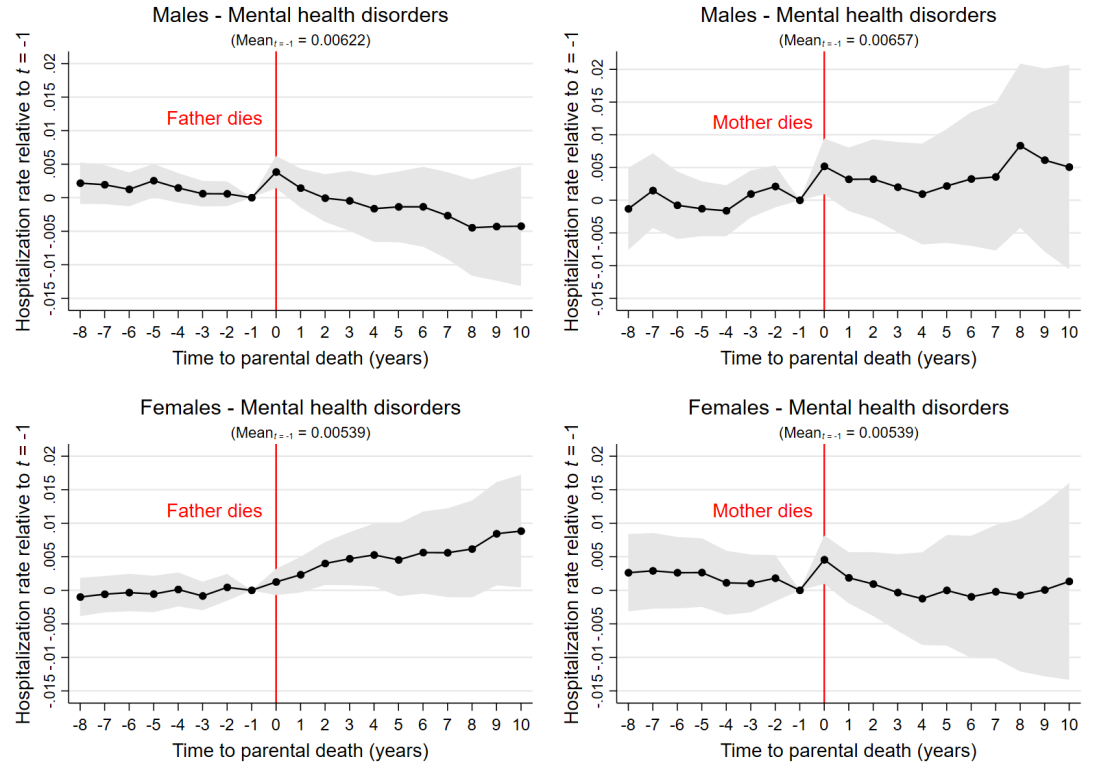
Figure A5a: Event Study Results by Age Group at Parental Death

Panel A: Parental death at ages 10–15



Panel B: Parental death at ages 16–20



Notes: The figures plot the coefficient estimates from the event study regressions, together with 95% confidence intervals (standard errors clustered at the individual level). The dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Panels on the left show estimates for father's death and those on the right show estimates for mother's death.

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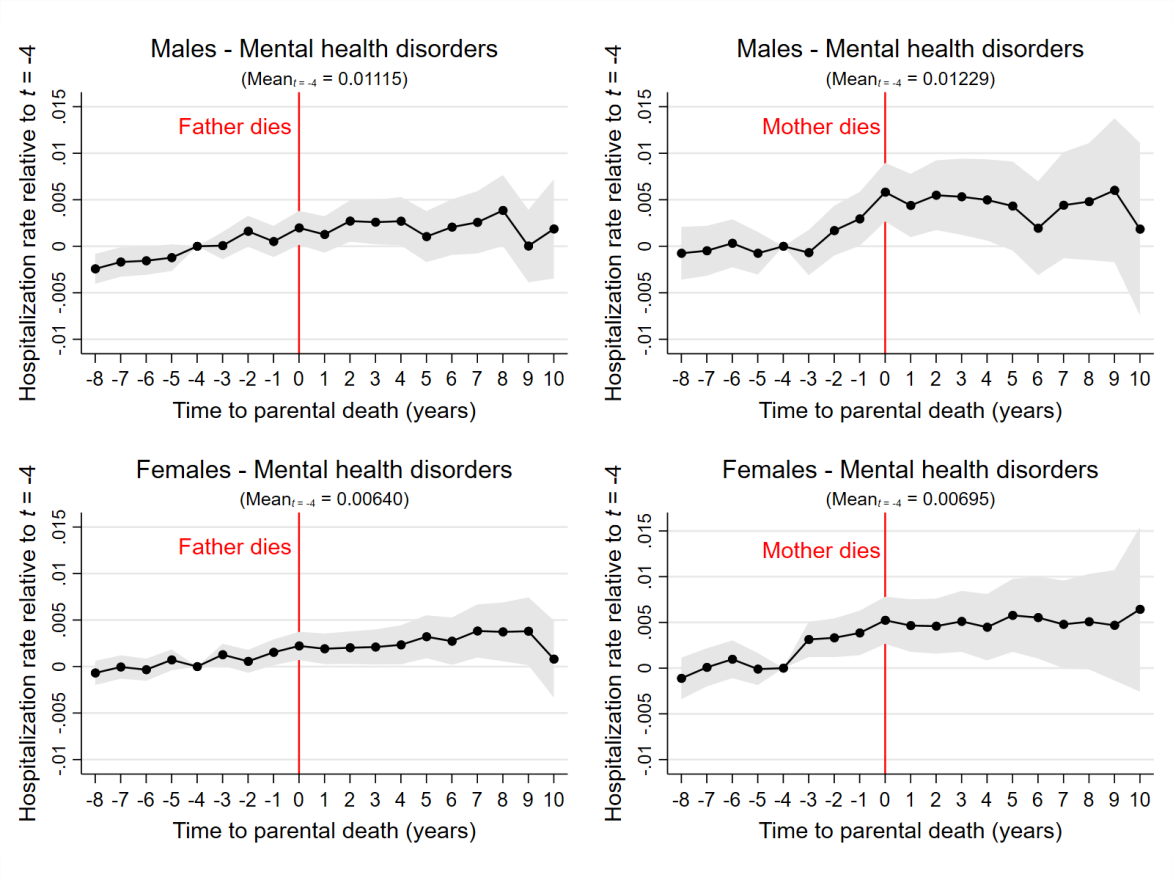
Figure A5b: Event Study Results for Individuals with Parental Death at Ages 21–30



Notes: The estimates are reported for the individuals experiencing parental death at ages 21–30. Due to significant anticipation effects, the reference point is set at t = -4. The figures plot the coefficient estimates from the event study regressions, together with 95% confidence intervals (standard errors clustered at the individual level). The dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Panels on the left show estimates for father's death and those on the right show estimates for mother's death.

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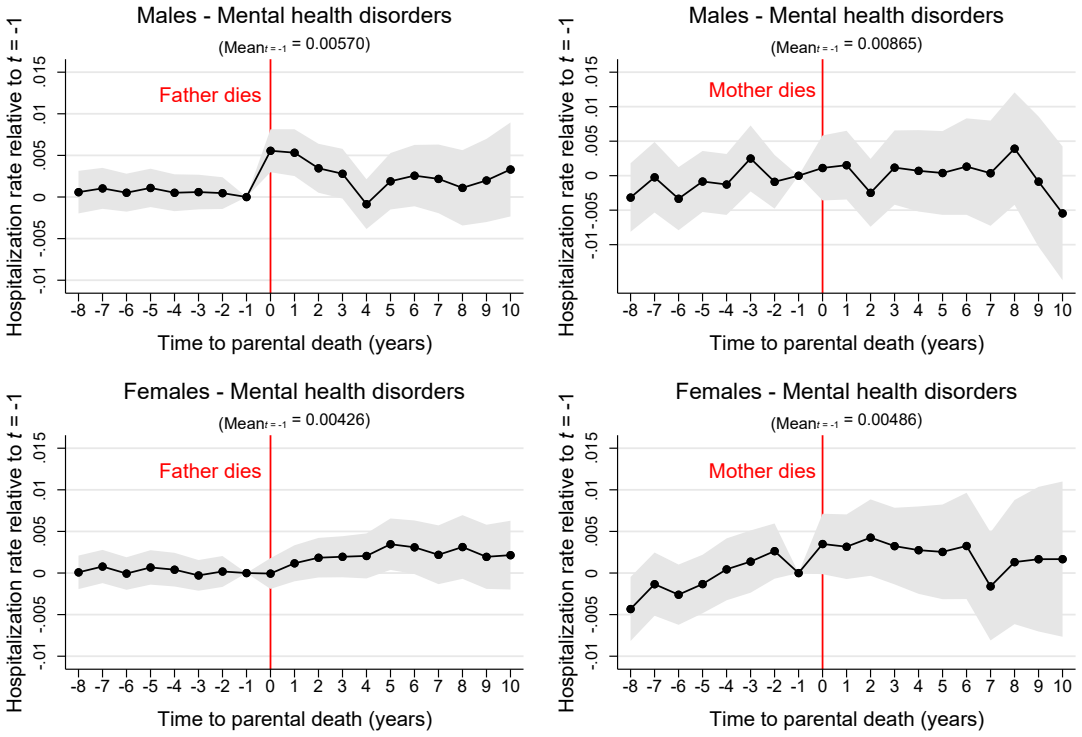
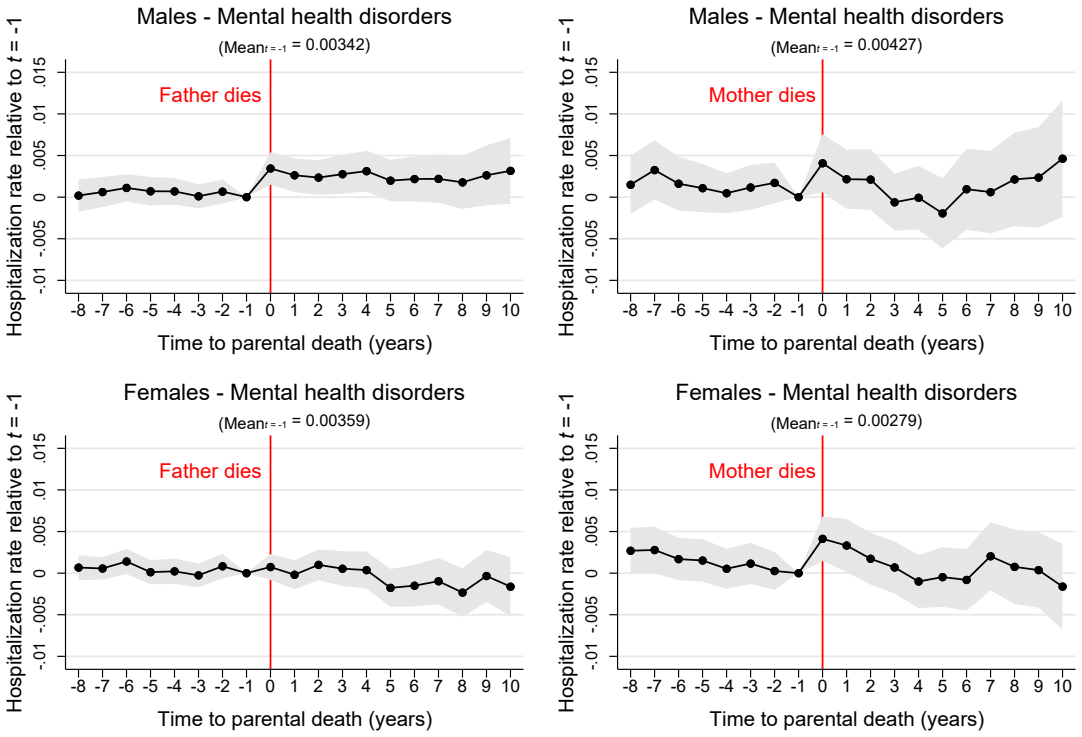
Figure A6: Event Study Results by Parental Income

Panel A: Parents' income is below median



Panel B: Parents' income is above median



Notes: The figures plot the coefficient estimates from the event study regressions, together with 95% confidence intervals (standard errors clustered at the individual level). The dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Panels on the left show estimates for father's death and those on the right show estimates for mother's death.

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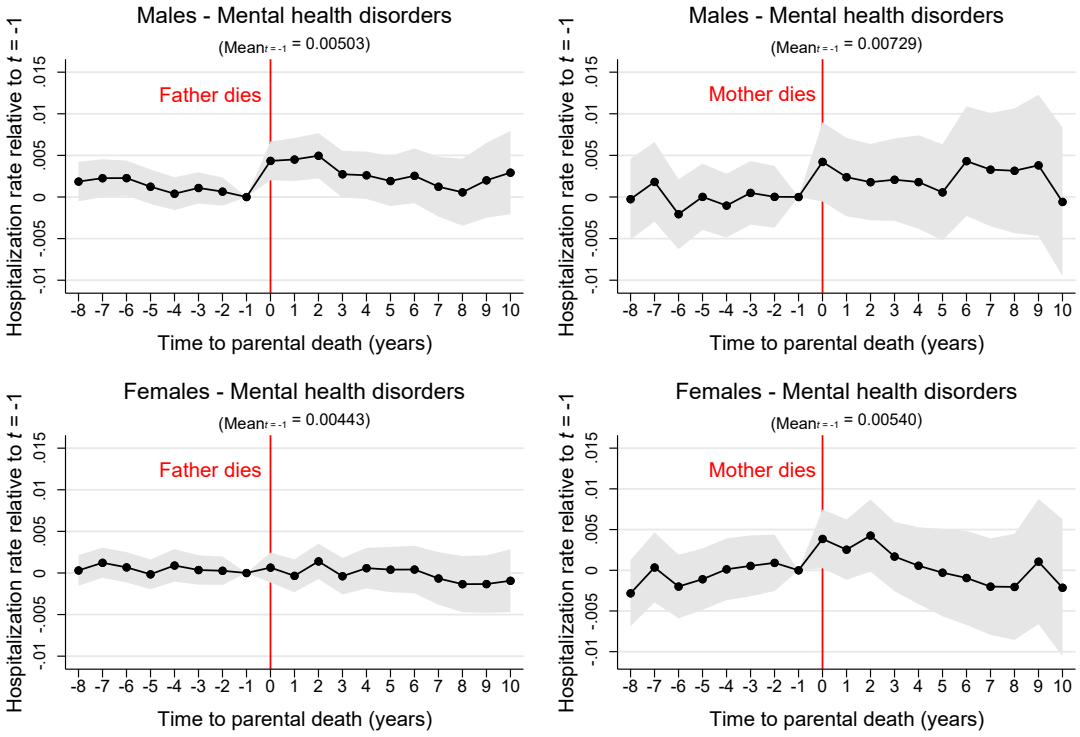
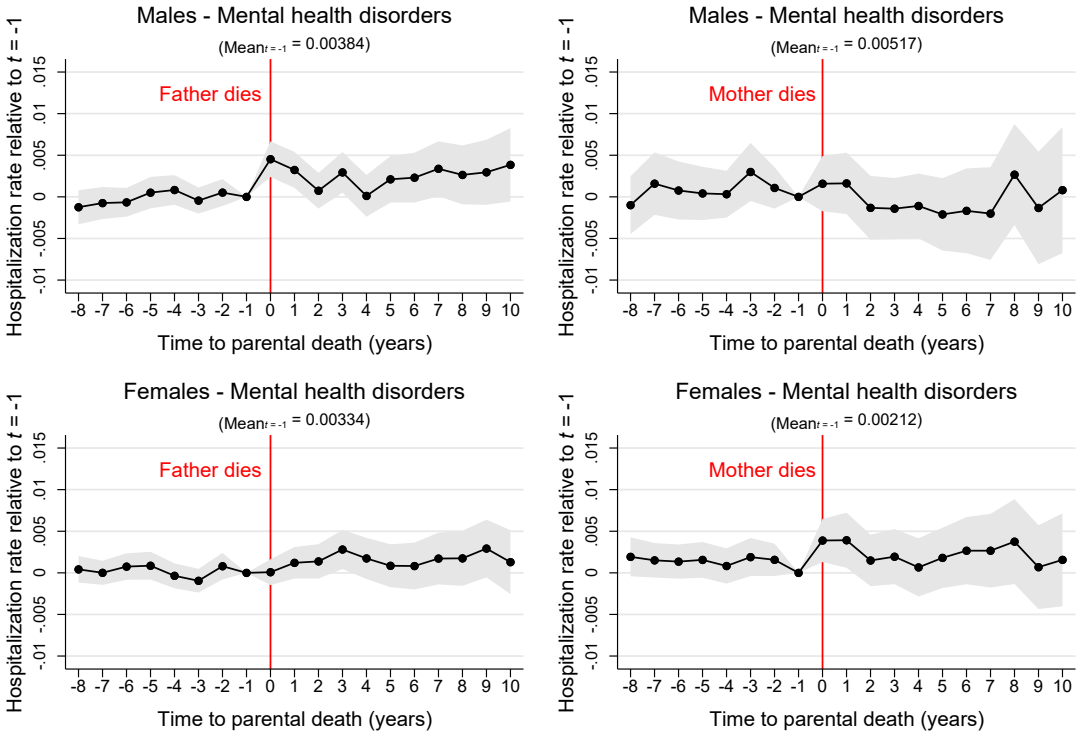
Figure A7: Event Study Results by Parental Education

Panel A: Without post-compulsory education



Panel B: With post-compulsory education



Notes: The figures plot the coefficient estimates from the event study regressions, together with 95% confidence intervals (standard errors clustered at the individual level). The dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Panels on the left show estimates for father's death and those on the right show estimates for mother's death. Parental education refers to the education level of the parent who has died at time 0.

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APPENDIX B. PRE-TREND TESTING AND ALTERNATE EVENT STUDY MODELS

Pre-Trend Testing

To investigate the validity of the parallel trend assumption of the baseline event study approach, we follow Borusyak et al. (2021) and estimate our model using the set of observations prior to treatment:

$$Y_{ist} = \sum_{j=-7}^{-1} \gamma_j \cdot I[t = j] + \sum_k \beta_k \cdot I[age_{is} = k] + \sum_y \tau_y \cdot I[s = y] + \theta_i + \varepsilon_{ist},$$

where $I[t = j]$ are indicator variables of being treated 1 to 7 years later, the comparison group consisting of those experiencing the parental death eight years later. After estimation of the model, the joint statistical significance of the γ_j's is tested using an F-test. Furthermore, the individual pre-trend coefficients can reveal possible anticipation effects to parental death that would violate the identification assumption of our model. As explained by Borusyak et al. (2021), the key advantage of this test approach is that it separates the validation of the parallel trend assumption from the estimation, given the event study design. The results reported in Table B1a do not reveal evidence of significant pre-trends based on a joint significance F-test. Also estimating the model without individual fixed effects, we do not find evidence of significant pre-trends (Table B1b).

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Table B1a: Pre-Trend Testing for the Baseline Event Study Approach, Treatment Group, with Individual Fixed Effects

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
7 years before death	0.00092	0.00273**	0.00077	0.00111
	(0.00063)	(0.00117)	(0.00055)	(0.00077)
6 years before death	0.00147*	0.00099	0.00136	0.00001
	(0.00084)	(0.00152)	(0.00084)	(0.00062)
5 years before death	0.00204*	0.00218	0.00136	0.00063
	(0.00105)	(0.00181)	(0.00113)	(0.00070)
4 years before death	0.00213*	0.00180	0.00182	0.00100
	(0.00127)	(0.00222)	(0.00144)	(0.00078)
3 years before death	0.00230	0.00435*	0.00180	0.00172*
	(0.00152)	(0.00263)	(0.00179)	(0.00100)
2 years before death	0.00271	0.00357	0.00306	0.00168
	(0.00177)	(0.00300)	(0.00216)	(0.00107)
1 years before death	0.00291	0.00448	0.00313	0.00127
	(0.00200)	(0.00338)	(0.00238)	(0.00078)
Observations	145,711	53,130	141,907	50,140
Number of individuals	18,259	6,669	17,788	6,289
R-squared	0.238	0.247	0.216	0.252
Age fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Individual fixed effects	YES	YES	YES	YES
F-test value	0.591	1.487	0.748	0.943
F-test p-value	0.764	0.167	0.631	0.472

Notes: The dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Standard errors clustered at the individual level are given in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Comparison group is the 8th year before parental death. Pre-trend coefficients are estimated using OLS on the pre-treatment observations only. F-test reports the joint significance of the pre-treatment coefficients (-7, …, -1). Sample includes individuals with a parental death between ages 10-20, but only for time periods 1 to 8 years before the parental death.

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Table B1b: Pre-Trend Testing for the Baseline Event Study Approach, Treatment Group, without Individual Fixed Effects

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
7 years before death	0.0004	0.0022**	0.0003	0.0012
	(0.0006)	(0.0010)	(0.0004)	(0.0007)
6 years before death	0.0004	0.0000	0.0003	0.0001
	(0.0006)	(0.0011)	(0.0005)	(0.0006)
5 years before death	0.0006	0.0009	-0.0002	0.0007
	(0.0007)	(0.0012)	(0.0005)	(0.0008)
4 years before death	0.0003	0.0003	-0.0002	0.0010
	(0.0007)	(0.0012)	(0.0005)	(0.0009)
3 years before death	0.0000	0.0026*	-0.0007	0.0016
	(0.0007)	(0.0015)	(0.0005)	(0.0011)
2 years before death	-0.0000	0.0016	0.0002	0.0013
	(0.0007)	(0.0014)	(0.0006)	(0.0012)
1 years before death	-0.0003	0.0022	-0.0001	0.0005
	(0.0008)	(0.0015)	(0.0007)	(0.0012)
Observations	145,711	53,130	141,907	50,140
Number of individuals	18,259	6,669	17,788	6,289
R-squared	0.0013	0.0014	0.0021	0.0021
Age fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Individual fixed effects	NO	NO	NO	NO
F-test value	0.319	1.547	0.740	0.691
F-test p-value	0.946	0.147	0.638	0.680

Notes: See notes to Table B1a.

Difference-in-Difference Event Study Specification

Our second event study is a difference-in-differences framework, as estimated by Kleven et al. (2019). Specifically, we create a control group of individuals who did not experience parental death by assigning pseudo death years for their father (and mother) in such a way that it follows the same (conditional) discrete distribution (for the age of death) as deaths in the treatment group. Separate event study regressions, as described in Equation (1), are estimated for the treatment and control groups, in addition to separate models by parental death and sex of the child. Here, the assumptions required for causal inference are that the trends in pre-parental-death hospitalization are similar between children who experienced a parental death and those who did not. Table B2 reports the corresponding pre-trend results for the control group used in our difference-in-differences design. Again, we do not find evidence of significant pre-trends.

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Table B2: Pre-Trend Testing for the Event Study Approach, Control Group

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
7 years before death	-0.0001	-0.0001	-0.0001	-0.0002
	(0.0002)	(0.0002)	(0.0001)	(0.0001)
6 years before death	-0.0001	0.0002	-0.0002	-0.0001
	(0.0002)	(0.0002)	(0.0001)	(0.0001)
5 years before death	0.0001	0.0001	0.0000	-0.0001
	(0.0002)	(0.0002)	(0.0001)	(0.0001)
4 years before death	0.0001	0.0001	-0.0001	-0.0002
	(0.0002)	(0.0002)	(0.0002)	(0.0001)
3 years before death	0.0000	0.0002	-0.0001	-0.0003*
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
2 years before death	0.0003	-0.0000	-0.0001	-0.0002
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
1 years before death	0.0001	0.0004*	-0.0002	-0.0001
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Observations	1,101,859	1,166,978	1,044,562	1,112,535
Number of individuals	138,021	146,217	130,820	139,398
R-squared	0.0006	0.0006	0.0007	0.0007
Age fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Individual fixed effects	NO	NO	NO	NO
F-test value	0.671	1.588	0.660	0.728
F-test p-value	0.697	0.134	0.707	0.649

Notes: Sample includes control individuals without a parental death by age 30. The dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Standard errors clustered at the individual level are given in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Comparison group is the 8th year before pseudo parental death. Pre-trend coefficients that have been estimated using OLS on the pre-treatment observations only. F-test reports the joint significance of the pre-treatment coefficients (-7, …, -1).

Table B3 reports the regression results for the control group. Again, the reported effects are the change in hospitalization rates relative to the year before parental death. Figure B1 illustrates the results of the difference-in-difference model. For each figure, the top panel compares individuals with a paternal death to individuals of the same sex without a paternal death, whereas the bottom panel compares maternal deaths. Each line is the coefficient from a separate event study regression, unlike a more traditional difference-in-differences model with an interaction between the two 'differences.'

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Table B3: Difference-in-Differences Event Study Models, Control Group

	Males		Females	
	Father Dies	Mother Dies	Father Dies	Mother Dies
	(1)	(2)	(3)	(4)
8 years before death	0.0000	-0.0004	0.0002	0.0000
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
7 years before death	-0.0001	-0.0004**	0.0002	-0.0001
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
6 years before death	-0.0001	-0.0002	0.0001	-0.0000
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
5 years before death	0.0001	-0.0003	0.0002	-0.0001
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
4 years before death	0.0001	-0.0002	0.0001	-0.0002
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
3 years before death	0.0001	-0.0001	0.0001	-0.0003
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
2 years before death	0.0003*	-0.0003*	0.0002	-0.0002
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Year of death	0.0001	-0.0001	0.0003	-0.0002
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
1 year after death	0.0002	-0.0002	-0.0000	0.0000
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
2 years after death	0.0004*	-0.0001	0.0004*	-0.0002
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
3 years after death	0.0002	0.0001	0.0002	0.0001
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
4 years after death	0.0004*	0.0000	0.0004*	0.0003
	(0.0003)	(0.0003)	(0.0002)	(0.0002)
5 years after death	0.0003	-0.0000	0.0009***	0.0002
	(0.0003)	(0.0003)	(0.0003)	(0.0003)
6 years after death	0.0003	0.0001	0.0006**	0.0003
	(0.0003)	(0.0003)	(0.0003)	(0.0003)
7 years after death	0.0008**	-0.0005	0.0004	0.0003
	(0.0003)	(0.0003)	(0.0003)	(0.0003)
8 years after death	0.0003	0.0003	0.0008**	0.0004
	(0.0003)	(0.0004)	(0.0003)	(0.0003)
9 years after death	0.0004	-0.0002	0.0003	0.0002
	(0.0004)	(0.0004)	(0.0004)	(0.0004)
10 years after death	0.0005	-0.0004	0.0002	0.0003
	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Observations	2,614,608	2,769,002	2,475,950	2,636,944
Number of individuals	138,094	146,318	130,887	139,468
R-squared	0.0022	0.0022	0.0015	0.0014
Mean $Y_{t=-1}$	0.0027	0.0033	0.0021	0.0026

Notes: Sample includes control individuals without a parental death by age 30. Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. All models contain year and age fixed effects.

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The results in Figure B1 display the same basic pattern as the single-difference event study models in Figure 1. Males who experience a paternal death have a drastic increase in the likelihood of hospitalization in the year of death and in the following three years, and this difference is statistically different from the hospitalization pattern for males who did not experience a paternal death. Otherwise, any increase in hospitalization due to parental death—maternal or paternal—is indistinguishable from the control group.

With respect to females, we can never distinguish the difference in hospitalization between those experiencing a paternal death and others, similar to previous models. We detect a noticeably higher likelihood of hospitalization in the year of a maternal death and the following year. However, by year 2, the standard error of the treatment group coefficient is so wide that we cannot rule out the possibility (at the 95% confidence interval) that the likelihood of hospitalization is the same for the treatment and control groups. This finding, coupled with a similar result for four or more years after experiencing a paternal death for males, is the only instance where the event study (Figure 1) and the difference-in-differences event study (Figure B1) differ notably.

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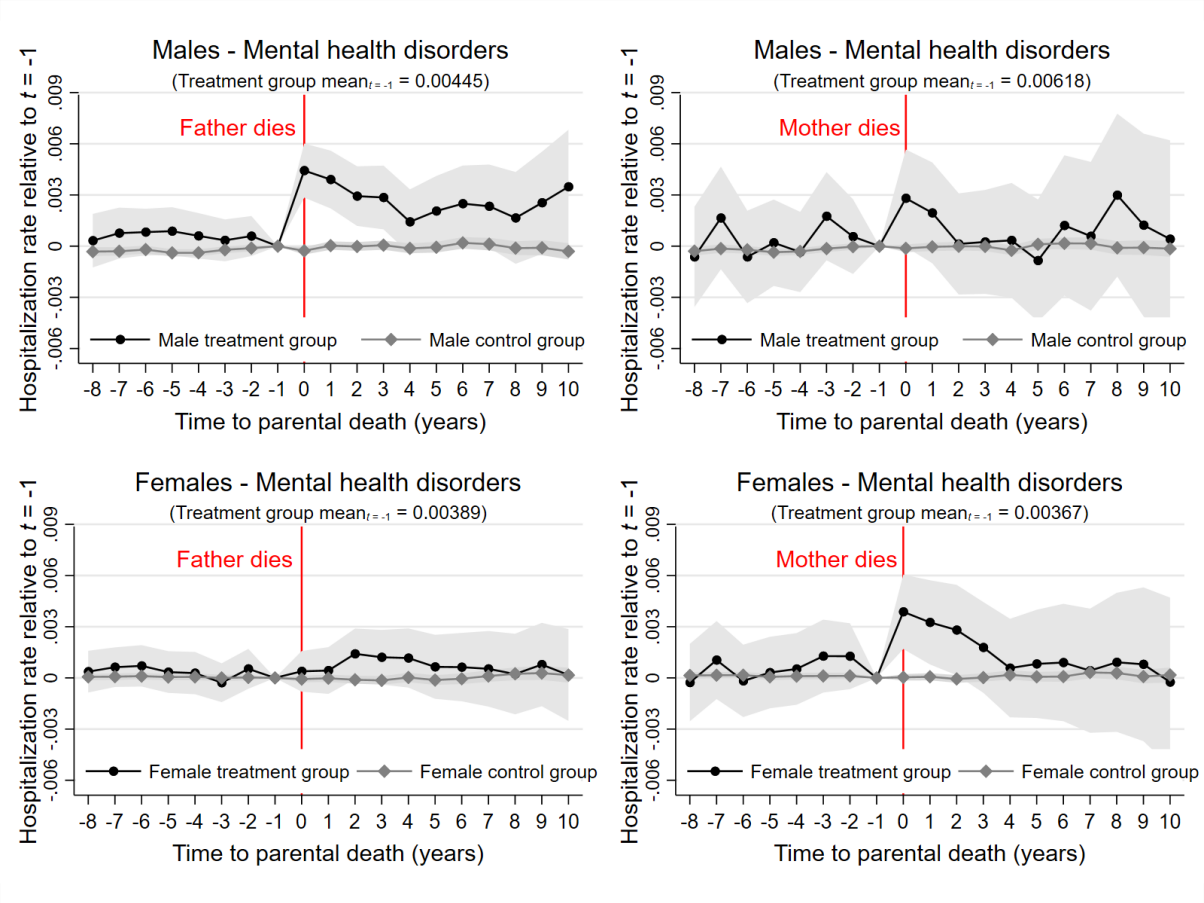
Figure B1: Difference-in-Differences Event Study Results for Males and Females



Notes: The figures plot the coefficient estimates from difference-in-differences event study regressions, together with 95% confidence intervals (standard errors clustered at the individual level). The dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year.

Imputation Estimator Results

We also examine the robustness of our baseline model to difference-in-differences design with staggered adoption of the treatment (see Borusyak et al., 2021, and an application by von Bismarck-Osten et al., 2022). The design assumes that the true causal model for individual *i* in year *t* is:

$$Y_{it} = \alpha_i + \beta_t + \tau_{it} \cdot I[t \geq E_i] + \varepsilon_{it},$$

where α_i are individual fixed effects, β_t are the age fixed effects, E_i is the individual's age when a parent dies (i.e., treatment), and $I[t \geq E_i]$ is the indicator for the post-treatment periods. Here, τ_{it} captures the heterogeneous treatment effects, for instance, the effects of the death of the father (or mother) on mental health-related hospitalizations.

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The treatment effects can be estimated using the imputation estimator proposed by Borusyak et al. (2021). The imputation estimator is based on the parallel trends assumption, but, contrary to the fixed effects OLS regression with lags and leads of treatment, it produces estimates that are robust even in the presence of heterogeneous treatment effects. The imputation estimator with a particular horizon h (i.e., h years after treatment) leverages all difference-in-differences contrasts between individual i in period $E_i + h$ relative to all periods before treatment, $t < E_i$, and relative to other individuals who have not been treated by $E_i + h$.

To validate the assumptions of the imputation estimator, Figure B1 reports the estimated pre-trend coefficients first, together with their 95% confidence intervals (depicted in red). The pre-trend coefficients have been estimated using OLS with individual and age fixed effects because the imputation estimator utilizes individual fixed effects rather than year fixed effects. Thus, these pre-trend estimates in Figure B1 differ slightly from those reported in Table B1.[1] However, the conclusion remains intact: the pre-trend coefficients are small and statistically insignificant, which provides support for the parallel trend assumption (and for the use of pretreatment periods as the comparison group in the imputation estimation).

In Figure B2, the treatment effects of parental death have been estimated using the imputation estimator (depicted in blue). In all cases, the estimated effects are similar to the baseline results reported in Figure 1. The pre-trend and imputation estimation results for the control group are shown in Figure B3. They are similar to those reported in Figure B1.

[1] When individual fixed effects are used, we need to drop two time effects from the model for identification.

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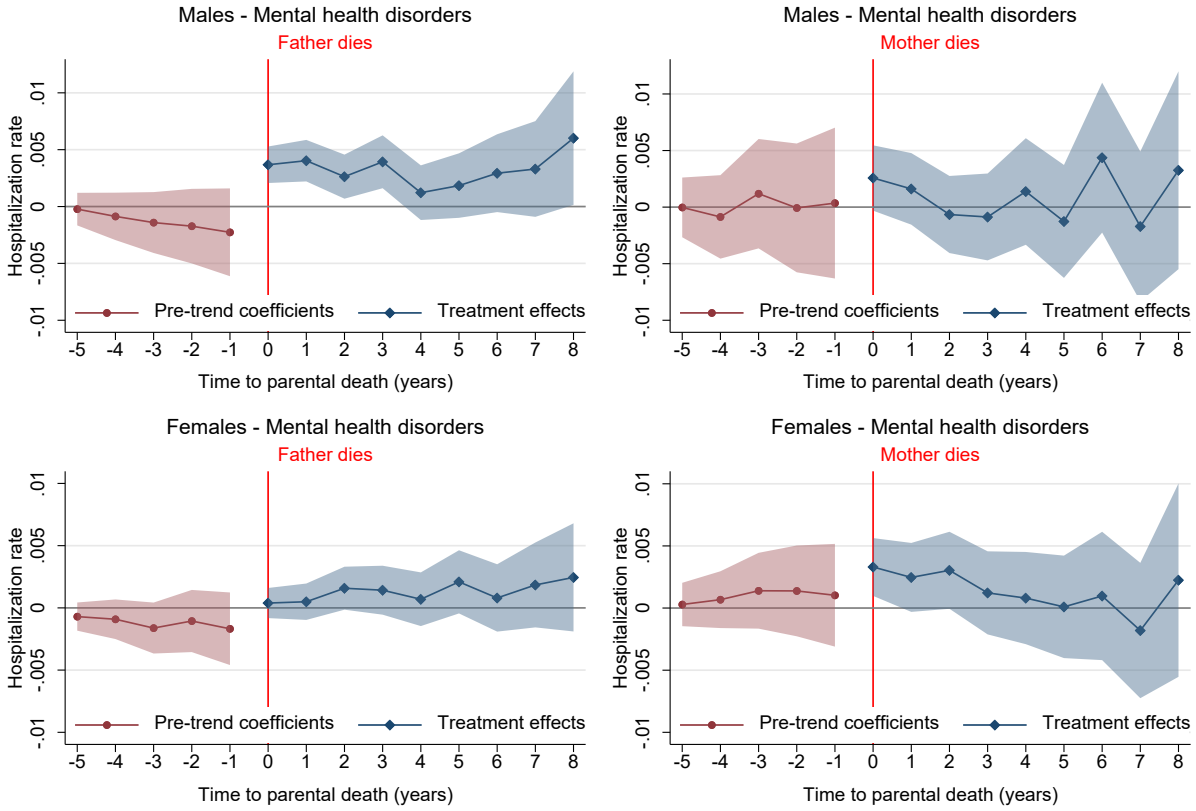
Figure B2: Pre-Trend Coefficients and Treatment Estimates, Treatment Group



Notes: The dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. The OLS estimates depicted in red report pre-trend coefficients estimated using pre-treatment observations only. This model includes individual and age fixed effects, and it assumes zero effects 6–8 years prior to parental death. The treatment effects for years 0–8 depicted in blue have been estimated using the imputation estimator of Borusyak et al. (2021) that includes individual and age fixed effects. 95% confidence intervals are reported, based on standard errors clustered at the individual level.

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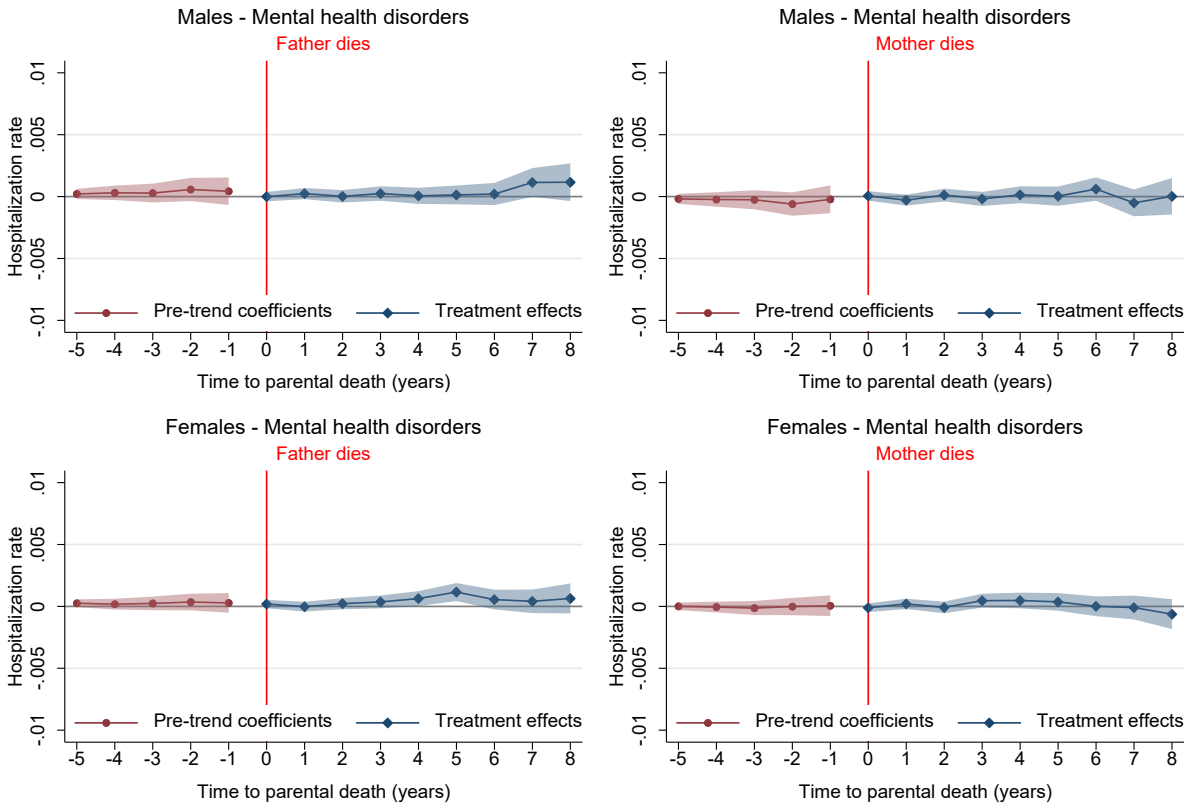
Figure B3: Pre-Trend Coefficients and Treatment Estimates, Control Group



Notes: Sample includes control individuals without a parental death by age 30. The dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. The OLS estimates depicted in red report pre-trend coefficients estimated using pre-treatment observations only. This model includes individual and age fixed effects and assumes zero effects 6–8 years prior to parental death. The treatment effects for years 0–8 depicted in blue have been estimated using the imputation estimator of Borusyak et al. (2021) that includes individual and age fixed effects. 95% confidence intervals are reported, based on standard errors clustered at the individual level.

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APPENDIX C. UNINFORMATIVE VS. INFORMATIVE PARENTAL DEATHS

To identify the explicitly exogenous causes of death (COD), we use the approach introduced by Espinosa and Evans (2008) and adopted later by Gimenez et al. (2013). The basic idea of this approach is to classify COD into two non-overlapping groups: i) deaths strongly correlated with measures of parental SES (i.e., ICOD) and ii) deaths driven by likely random causes and not correlated with SES (i.e., UCOD).

In our data, the causes of deaths are recorded using the International Classification of Diseases (ICD-8 in 1969–1986, ICD-9 in 1987–1995, and ICD-10 since 1996). To identify the deaths that are informative and uninformative, we first regroup the causes of deaths according to Statistics Finland's classification of deaths into 54 subgroups (COD). We then use OLS estimation to categorize each COD group according to its degree of correlation with family socioeconomic status (income and education).

Following Gimenez et al. (2013), we estimate linear probability models for each of the 54 COD groups:

$$COD_{irt}^{d} = \alpha^{d} + \sum_{k=2}^{4} \beta_{k}^{d} \cdot I\left[INC(k)_{irt}^{d} = 1\right] + \sum_{k=2}^{4} \gamma_{k}^{d} \cdot I\left[EDU(k)_{irt}^{d} = 1\right] + \sum_{k=2}^{4} \eta_{k}^{d} \cdot I\left[EDUS(k)_{irt}^{d} = 1\right] + \delta_{r}^{d} + \tau_{t}^{d} + X_{irt}^{d}\theta^{d} + \varepsilon_{irt}^{d},$$

where COD_{irt}^{d} is 1 for parent i who resided in region r and died from cause of death d in year t (and 0 otherwise). For example, variable COD_{irt}^{6} equals 1 if a parent i died from a malignant neoplasm of the stomach 10–20 years after the child's birth, and 0 if the cause of death is different. $I\left[INC(k)_{irt}^{d} = 1\right]$ equals 1 if the family income of parent i is in the kth income quartile; $I\left[EDU(k)_{irt}^{d} = 1\right]$ and $I\left[EDUS(k)_{irt}^{d} = 1\right]$ represent four indicator variables for the education level k attained by the deceased parent i and attained by his/her spouse, respectively. δ_{r}^{d} and τ_{t}^{d} represent region and year-of-death fixed effects, respectively. X_{irt}^{d} contains four dummies of age (quartiles) at the time of death. The models are estimated separately for fathers and mothers.

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For each regression, we conducted four F-tests: i) whether the coefficient estimates for the income level, ii) the education indicators for the deceased, iii) the education indicators for the spouse of the deceased, and iv) all three sets—income, own education, and spousal education indicators—are jointly zero. If we can reject any of the four null hypotheses at the 5% confidence level, then the cause of death COD^d is considered to be informative (ICOD); otherwise, the COD^d is considered to be uninformative (UCOD).

Table C1 summarizes the results of the regressions for the top five ICODs and UCODs for fathers and mothers. Overall, approximately 16% of the father's deaths were classified as UCODs. The corresponding figure for the mothers is 25%. Table C2 reports the age distributions upon parent's death separately for ICODs and UCODs. The age distributions are similar between the ICODs and UCODs.

To evaluate the robustness of our baseline findings, we estimate separate effects for UCOD and ICOD using event study models (see Figure 2 and Tables C3a–C3b). UCOD can potentially be correlated with noncognitive or emotional and mental health issues. For instance, traffic accidents are the most important uninformative cause of maternal deaths and might be correlated with maternal emotional and mental health stress. If so, they may not be exogenous to children's mental health due to intergenerational transmission. We find that there is a positive correlation of UCODs with parental mental health. We note three points. First, parents with mental health disorders have an approximately 3 percentage points higher probability of dying from UCODs than parents with no mental health disorders. Second, we use a large dataset. Hence, even small pairwise correlations tend to be statistically significant. Third, we have estimated additional specifications controlling for parental mental health, and our findings remain intact (Tables A6a–A6b).

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Table C1: Leading Informative and Uninformative Causes of Death

Informative Causes of Death (ICOD)		P-value on F-test that the estimates are jointly zero			
	Mortality rate	Father education	Mother education	Family income	All
Death of a Father					
Ischaemic heart diseases	9.406	0.000	0.000	0.070	0.000
Suicides	7.056	0.000	0.501	0.018	0.000
Alcohol-related diseases and accidental poisoning by alcohol	6.141	0.029	0.396	0.536	0.104
Malignant neoplasm of larynx, trachea, bronchus and lung	1.798	0.000	0.637	0.986	0.000
Other malignant neoplasms	1.710	0.000	0.001	0.006	0.000
Death of a Mother					
Malignant neoplasm of breast	2.848	0.000	0.000	0.000	0.000
Alcohol-related diseases and accidental poisoning by alcohol	1.481	0.681	0.000	0.001	0.000
Other malignant neoplasms	1.427	0.353	0.000	0.127	0.000
Cerebrovascular diseases	1.338	0.007	0.018	0.556	0.000
Ischaemic heart diseases	0.629	0.175	0.000	0.122	0.000

Uninformative Causes of Death (UCOD)		P-value on F-test that the estimates are jointly zero			
	Mortality rate	Father education	Mother education	Family income	All
Death of a Father					
Cerebrovascular diseases	2.607	0.518	0.908	0.715	0.832
Other heart diseases excl. rheumatic and alcohol-related	1.517	0.468	0.161	0.892	0.421
Malignant neoplasm of stomach	0.788	0.105	0.209	0.252	0.158
Water transport accidents	0.622	0.053	0.250	0.983	0.135
Diabetes mellitus	0.587	0.511	0.628	0.171	0.433
Death of a Mother					
Suicides	1.791	0.220	0.726	0.104	0.136
Land traffic accidents	0.652	0.973	0.663	0.068	0.323
Malignant neoplasm of pancreas	0.320	0.306	0.868	0.175	0.230
Other heart diseases, excluding rheumatic and alcohol-related	0.283	0.203	0.871	0.505	0.277
Other accidents and sequelae of accidents	0.266	0.519	0.400	0.227	0.466

Notes: The top five CODs' mortality rates are given. Mortality rate is measured as a number of deaths per 1,000 individuals.

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Table C2: Age of Individual upon Parent's Death – Separately for ICOD and UCOD

Age When	Death of Father		Death of Mother		Death of Parent	
Parent Died	Freq.	Percent	Freq.	Percent	Freq.	Percent
A) Only Informative Causes of Death (ICOD)						
0–5	4,566	4.9	812	2.5	5,468	4.6
6–10	9,664	10.4	2,339	7.3	12,105	10.1
11–15	11,829	12.7	3,567	11.2	15,290	12.8
16–20	16,564	17.8	5,605	17.6	21,632	18.0
21–25	21,996	23.6	8,232	25.8	28,726	23.9
26–30	28,557	30.7	11,366	35.6	36,702	30.6
Total (ICOD)	93,176	100.0	31,921	100.0	119,923	100.0
B) Only Uninformative Causes of Death (UCOD)						
0–5	836	4.4	608	6.1	1,525	5.3
6–10	1,648	8.6	1,123	11.3	2,932	10.2
11–15	2,280	11.9	1,286	13.0	3,748	13.1
16–20	3,164	16.6	1,773	17.9	5,032	17.5
21–25	4,637	24.3	2,202	22.2	6,691	23.3
26–30	6,539	34.2	2,927	29.5	8,796	30.6
Total (UCOD)	19,104	100.0	9,919	100.0	28,724	100.0

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Table C3a: Event Study Coefficients for Hospitalization, By Sex of Individual and by Parental Death, Only Uninformative Causes of Death (UCOD)

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
8 years before death	0.0018	0.0002	-0.0024*	0.0001
	(0.0017)	(0.0031)	(0.0013)	(0.0025)
7 years before death	0.0020	0.0047	0.0002	0.0032
	(0.0016)	(0.0034)	(0.0014)	(0.0030)
6 years before death	0.0019	0.0001	-0.0008	0.0003
	(0.0014)	(0.0028)	(0.0012)	(0.0024)
5 years before death	0.0017	0.0010	-0.0014	0.0016
	(0.0015)	(0.0028)	(0.0012)	(0.0026)
4 years before death	0.0025	0.0034	-0.0009	0.0015
	(0.0016)	(0.0029)	(0.0013)	(0.0025)
3 years before death	0.0009	0.0052*	-0.0011	0.0019
	(0.0013)	(0.0030)	(0.0010)	(0.0025)
2 years before death	0.0010	0.0029	0.0001	0.0009
	(0.0011)	(0.0025)	(0.0012)	(0.0020)
Year of death	0.0046***	0.0032	-0.0000	0.0019
	(0.0017)	(0.0030)	(0.0014)	(0.0019)
1 year after death	0.0067***	0.0037	0.0014	0.0047*
	(0.0020)	(0.0034)	(0.0017)	(0.0028)
2 years after death	0.0033*	0.0027	0.0010	0.0039
	(0.0018)	(0.0032)	(0.0015)	(0.0028)
3 years after death	0.0035*	0.0018	0.0004	0.0045
	(0.0021)	(0.0030)	(0.0017)	(0.0028)
4 years after death	0.0015	0.0037	0.0022	0.0028
	(0.0021)	(0.0035)	(0.0020)	(0.0032)
5 years after death	0.0034	0.0012	0.0027	0.0046
	(0.0023)	(0.0037)	(0.0022)	(0.0034)
6 years after death	0.0015	0.0012	0.0017	0.0066*
	(0.0023)	(0.0044)	(0.0021)	(0.0039)
7 years after death	0.0036	0.0033	0.0021	0.0067
	(0.0025)	(0.0048)	(0.0024)	(0.0043)
8 years after death	0.0054*	0.0068	0.0028	0.0066
	(0.0031)	(0.0053)	(0.0025)	(0.0047)
9 years after death	0.0057*	0.0012	0.0034	0.0081
	(0.0032)	(0.0058)	(0.0028)	(0.0052)
10 years after death	0.0079**	-0.0027	0.0028	0.0032
	(0.0036)	(0.0059)	(0.0030)	(0.0051)
Observations	55,315	32,092	53,301	29,495
Number of individuals	2,943	1,714	2,831	1,575
R-squared	0.0040	0.0069	0.0027	0.0056
Mean $Y_{t=-1}$	0.00273	0.00587	0.00284	0.00383

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 10–20 and uninformative causes of death. All models contain year and age fixed effects.

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Table C3b: Event Study Coefficients for Hospitalization, By Sex of Individual and by Parental Death, Only Informative Causes of Death (ICOD)

	Males, Father (1)	Males, Mother (2)	Females, Father (3)	Females, Mother (4)
8 years before death	0.0000	-0.0007	0.0009	-0.0004
	(0.0009)	(0.0017)	(0.0007)	(0.0013)
7 years before death	0.0005	0.0009	0.0007	0.0003
	(0.0009)	(0.0017)	(0.0007)	(0.0012)
6 years before death	0.0006	-0.0007	0.0010	-0.0003
	(0.0008)	(0.0016)	(0.0007)	(0.0012)
5 years before death	0.0007	0.0001	0.0007	-0.0001
	(0.0008)	(0.0015)	(0.0007)	(0.0011)
4 years before death	0.0002	-0.0015	0.0005	0.0002
	(0.0007)	(0.0013)	(0.0007)	(0.0011)
3 years before death	0.0002	0.0006	-0.0001	0.0011
	(0.0007)	(0.0014)	(0.0007)	(0.0012)
2 years before death	0.0005	-0.0002	0.0006	0.0014
	(0.0007)	(0.0012)	(0.0007)	(0.0011)
Year of death	0.0044***	0.0027*	0.0005	0.0045***
	(0.0009)	(0.0017)	(0.0007)	(0.0013)
1 year after death	0.0033***	0.0014	0.0002	0.0027*
	(0.0010)	(0.0017)	(0.0008)	(0.0014)
2 years after death	0.0028***	-0.0008	0.0015*	0.0024
	(0.0010)	(0.0017)	(0.0009)	(0.0015)
3 years after death	0.0027**	-0.0003	0.0014	0.0008
	(0.0011)	(0.0018)	(0.0009)	(0.0015)
4 years after death	0.0014	-0.0009	0.0009	-0.0003
	(0.0011)	(0.0020)	(0.0010)	(0.0016)
5 years after death	0.0018	-0.0017	0.0003	-0.0006
	(0.0012)	(0.0021)	(0.0011)	(0.0018)
6 years after death	0.0027**	0.0010	0.0004	-0.0012
	(0.0013)	(0.0024)	(0.0011)	(0.0019)
7 years after death	0.0020	-0.0006	0.0002	-0.0019
	(0.0014)	(0.0025)	(0.0013)	(0.0020)
8 years after death	0.0009	0.0014	-0.0003	-0.0013
	(0.0015)	(0.0027)	(0.0013)	(0.0022)
9 years after death	0.0019	0.0010	0.0003	-0.0019
	(0.0017)	(0.0031)	(0.0014)	(0.0025)
10 years after death	0.0026	0.0011	-0.0003	-0.0016
	(0.0019)	(0.0034)	(0.0015)	(0.0029)
Observations	288,285	93,095	281,577	88,586
Number of individuals	15,329	4,962	14,967	4,724
R-squared	0.0040	0.0044	0.0030	0.0039
Mean $Y_{t=-1}$	0.00478	0.00629	0.00409	0.00362

Notes: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column is from a separate linear probability model where the dependent variable is a dummy variable equal to 1 for being hospitalized for a mental health condition in that year. Sample is limited to individuals with a parental death at ages 10–20 and informative causes of death. All models contain year and age fixed effects.