Family Spillover Effects of Shocks in Parental Caregiving *

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Abstract

I use difference-in-differences and event-study methods to estimate the effects of older adults' falls on their adult children's labor supply and caregiving. Falls significantly increase both overall caregiving received by parents and caregiving provided by adult children. Adult children whose parents lack caregiving substitutes are less likely to work after a parental fall. Although women provide more care before and in response to a fall, men are more likely to stop working after a fall. These differences appear to be driven partially by gender differences in the type of care provided to parents after a fall.

1 Introduction

Both adverse health shocks and long-term care are a large source of financial risk for older adults. However, while many older adults are protected against the risk posed by most adverse health shocks through health insurance, long-term care is one of the largest uninsured financial risks for older adults; the average American turning 65 is expected to incur over $100,000 in future long-term care costs (Brown and Finkelstein, 2011; Favreault and Dey, 2015). Given the high financial costs of institution-based caregiving, one potential substitute is informal caregiving provided by family members. However, by substituting their paid labor for informal care, adult children may experience worse labor market outcomes, including decreases in the likelihood of working and lower wages (Carmichael and Charles, 2003; Van Houtven et al., 2013).

I use an event study approach to examine the short and medium-term labor market impacts of a shock in the caregiving required by an elderly parent, which I identify using a fall. Falls in older adults are an important area of study due to their prevalence and cost. In 2020, 14 million (27.6%) older adults reported falling in the previous year. Unintentional falls are also the leading cause of injury and injury death among older adults (Kakara, 2023). Unlike other health shocks, falls are likely to increase the caregiving needs of older adults, potentially indefinitely, making them well-suited to analyze the effect of parental caregiving needs on adult children's labor market outcomes. First, I use 20 years of the Health and Retirement Study (HRS) to analyze the impact of a fall in an elderly parent on their caregiving needs, confirming that falls increase parental caregiving needs. Second, I estimate the effect of this event on the labor market supply of their adult children, with a focus on the presence of viable caregiving alternatives for the parent who fell. Third, I estimate the effect of a parental fall on a child's caregiving supply to test the extent to which any change

in labor market outcomes is driven by changes in a child's caregiving supply. Finally, I explore potential reasons for differences in labor and caregiving supplies between men and women.

Consistent with the existing literature, I find that falls increase parental caregiving needs. However, while help provided by family members and adult children increases, there is no corresponding increase in help provided by non-family members, indicating the important role adult children play in providing care after a fall.

I find a statistically significant increase in the likelihood of not working for men, but not women, who experience a parental fall. We would expect that children of parents who are widowed or divorced may be expected to provide more care, while children of parents who have long-term care insurance (LTCI) or are sufficiently wealthy to self-insure may provide little to no additional care following a parental fall. Consistent with these expectations, I find that children of parents who are widowed or divorced are 3.4 percentage points less likely to be working following a parental fall. There are no statistically significant labor market effects of a parental fall on children of parents with LTCI or above-median wealth; however, men whose parents do not have LTCI or have below-median wealth experience a 4.2 and 6.2 percentage point decrease in the likelihood of working, respectively.

I next verify that the decreases in labor market outcomes correspond to observed increases in children's individual caregiving supply. Although the caregiving variables are noisy, I find that the decreases in labor market outcomes generally coincide with an increase in caregiving on the extensive margin. Additionally, I provide evidence that although there are no statistically significant effects on women's labor market outcomes, women also adjust their caregiving supply following a parental fall.

Finally, I provide suggestive evidence that the differences in outcomes between men and women are partially driven by the kinds of care provided to their parents. I argue that women provide daily, "maintenance" care to their parents both before

and in response to a fall, while a small proportion of men provide care in response to an "emergency." As a result, this population of men experiences large increases in caregiving relative to their baseline caregiving, therefore incurring higher marginal costs relative to women which lead to the observed decreases in the likelihood of working.

This paper is organized as follows. Section 2 provides a literature review, and includes the existing empirical support for using falls as an event that increases older adults caregiving needs. Section 3 describes my data and Section 4 outlines my identification strategy. Section 5 presents differences-in-differences estimates of several caregiving quantities following a fall, thereby motivating the remainder of my paper. Section 6 contains the event study and difference-in-differences estimates of the effect of a parental fall on adult children's labor market outcomes. Section 7 provides event study and difference-in-differences estimates of the effect of a parental fall on adult children's caregiving supply, on both the extensive and intensive margins. Section 8 analyzes the differences in outcomes by gender and Section 9 conducts additional robustness checks. Section 10 provides discussion and concludes.

2 Literature Review

My research builds on three main areas in the literature. The first focuses on the effects of falling on older adult's health and the immediate financial costs of falling. The second examines the consequences of adverse health shocks on individuals and the spillover effects on family members. The third is how informal care is allocated within a household as respondents require increased assistance with common activities of daily living (ADLs), and the costs of this caregiving. Few economic studies studying the impacts of adverse health shocks have used falling as their shock, and most studies studying the effect of falls in older adults focus on the impact of a fall

on an individual's health and expenditures. My research bridges this gap by using falling as a health shock to examine outcomes beyond the immediate health and economic consequences of falling. In doing so, I contribute to the third area from which my research draws– the literature on informal care– which has employed numerous instrumental variable strategies to study long-term care, but to my knowledge, has not used an exogenous health shock to identify the effect of caregiving on family members.

There is a substantial literature studying the economic costs and negative health outcomes associated with falling. Falling poses a large health risk for older adults; 30-50% of falls result in minor injuries, while 5-10% lead to major injuries (Goldacre et al., 2002). Falls also play a large role in nursing home admissions (Alexander et al., 1992), for which most people have limited health insurance. Florence et al. (2018) and Hoffman et al. (2017) also find that falls cost both health insurance providers and individuals significant amounts of money, with long-care stay costs driving a large portion of this spending. However, despite the numerous studies on falling, the vast majority of these studies focus only on the health outcomes of the individual and the economic costs incurred. My research contributes to the literature on the consequences of falling by examining the spillover effects on older adults' adult children.

Numerous economic studies have also examined the spillover effects of adverse health shocks on individuals' family members, particularly with a focus on spousal labor supply (Coile, 2004; Dobkin et al., 2018; Fadlon and Nielsen, 2021). Given that both Dobkin et al. (2018) and Fadlon and Nielsen (2021) find nonfatal health shocks do not affect spousal labor supply, I limit my focus to the labor market outcomes of adult children. Although falls may change spousal caregiving, they are unlikely to change spousal labor supply given that my sample is predominately over 65 and retired. Therefore, I focus on the spillover effects for older adults' adult children.

The literature examining the effects of parental health shocks on adult children is more limited. While Fadlon and Nielsen (2019) consider the effect of health shocks on both adult children and spouses, they focus on health behaviors, rather than labor market adjustments. However, as the literature on caregiving indicates, adult children play an important role in the caregiving needs of their parents. It is therefore essential to consider the role of any adult children when studying how families adjust their caregiving in response to a health shock.

My research also contributes to the literature on adverse health shocks by using falls as my adverse health shock. Previous studies have used events such as hospital admissions (Dobkin et al., 2018) and heart problems (Fadlon and Nielsen, 2021). The choice of falls is well suited to understanding how families respond to changes in caregiving needs, since falls are more likely to increase caregiving needs than previously studied health shocks.

In addition to the literature on falling and the spillover effects of adverse health shocks, I also contribute to the literature on a household's allocation of caregiving needs. Numerous studies examine the role of adult children in providing informal care for their parents. Although Mellor (2001) found no evidence that such care provides a substitute for formal care, Charles and Sevak (2005), Mommaerts (2018), and Coe et al. (2023) all find that informal care provided by adult children is a substitute for formal assistance. Additionally, a large body of literature documents the gender discrepancy in caregiving, with daughters being more likely to provide care than sons (McGarry, 1998; Wolf et al., 1997; Carmichael and Charles, 2003). In general, previous research has found that caregiving causes moderate decreases in labor supply on the extensive margin (Ettner, 1995; Bolin et al., 2008). Additionally, Carmichael and Charles (2003) and Van Houtven et al. (2013) find modest decreases in the likelihood of working for male caregivers and that female caregivers who remain working decrease their formal labor supply and receive a lower wage, indicating there

may be heterogeneous labor market responses to caregiving. My research builds on the previous literature focused on gendered differences in caregiving by using an event-study approach to examine heterogeneity in children's labor market outcomes after a shock in parental caregiving. In doing so, I also identify a potential area for further research. Previous studies focus on the effects of expected and continual caregiving using instrumental variable approaches. My identification strategy recognizes that caregiving needs may be dynamic and subject to sudden increases, and identifies the effects of one such increase on the labor market and caregiving supplies of adult children.

3 Data and Sample

In this section, I describe my data sources, my sample selection, and key variables.

3.1 Data

Data for this project comes from the Health and Retirement Survey (HRS), a nationally representative panel survey of older adults in the United States.[1] This project uses both the RAND HRS Longitudinal File 2020 (V1) and the RAND HRS Family Data 2018 (V2) public use datasets. A select number of variables also rely on the raw HRS files. The HRS is well-suited to analyze the effect of health shocks in older adults on their children's caregiving and labor market supply as it contains information on both older adults, whom I refer to as parents, and their adult children, allowing me to estimate the effect of a parental fall on adult children's labor market outcomes.

[1]The HRS (Health and Retirement Study) is sponsored by the National Institute on Aging (grant number NIA U01AG009740) and is conducted by the University of Michigan.

3.2 Sample

I analyze eleven biannual survey waves from 1998 to 2018 of the HRS. I exclude 2020 given the disruption COVID-19 caused both nursing home admissions and labor markets. I restrict my initial sample of parents to adults who have children and who reported whether or not they fell. Although the HRS surveys adults over 50 and their partners, after 2000, it only asks whether or not a respondent falls if they are 65 or older. For each parent, I define the event as the first instance for which they report a fall. All subsequent time-periods are considered treated.

Given that the HRS recruits new participants each year, a balanced panel would allow me to identify only the effect of a fall on respondents who were in the first observed survey (1998) and their adult children. Instead, I take only the treated respondents for whom I observe the two periods before a fall and the two periods after a fall, for a total of 5 observations per respondent across ten years. This process removes respondents who die immediately after a parental fall, ensuring sufficient post-period observations. I leave all observations for the untreated respondents. This provides my primary sample of 10,540 individuals, of whom 3,186 are ever treated, with a total of 41,527 observations, which I use to construct my sample of adult children. Note that I include never-treated older adults in my initial sample.

Additionally, I construct a second sample of older adults to analyze the effect of a fall on an older adult's caregiving needs. In this sample, I take only the respondents for whom I observe the two periods before a fall and the two periods after a fall. However, I extend the sample window to allow for a more compelling parallel trends argument at the parental level; using five observations only allowed for estimation in the period immediately after a fall is first observed. In this sample, 3,186 respondents are ever-treated, with a total of 24,913 observations.

Summary statistics for my primary sample across all observations are reported in

Table 1. While the untreated and not-yet-treated samples are similar on a number of dimensions (including age, children, and relationship status), there are some key differences. Both treated groups contain more women, which is consistent with the literature that suggests older women experience more falls and fall-related injuries than older men. Additionally, the raw means indicate that the untreated group utilizes more care than the not-yet-treated group and less care than the treated group. However, this is to be expected. If we expect that caregiving is increasing in age, splitting even the same sample in half by age would lead to the younger sample utilizing less care and the older sample utilizing more care than the original sample, even in the absence of a fall. Further evidence for the comparability of these groups and the necessary parallel trends argument are presented in Sections 4, as well as with my results.

My primary sample of adult children is the set of adult children for whom all living parents report whether or not they fell (i.e., I remove observations of adult children that occur before we observe whether or not they had a parent who fell). For each adult child, I define the event as the first instance for which either parent reports a fall. I take only the treated children for whom I observe the two periods before a parental fall and the two periods after a parental fall, for a total of 5 observations per treated adult child. I leave all observations for the untreated adult children. This selection removes all of a child's observations following the death of the parent who fell in order to avoid confounding a parental fall with a parental death.[2] This provides an initial sample of 11,471 adult children, of whom 3,682 are ever treated, representing 1,288 parental falls. Summary statistics are reported by treatment status across all observations in Table 2. The untreated and not-yet-treated samples of adult children are similar on a number of dimensions, including gender, age, and number of children. While there are small differences in relationship status, days helping

[2]If both parents first fell in the same year, I remove all observations after the first parent dies.

Table 1: Older Adult Summary Statistics

Variable	Untreated	Treated
Age	69.11 (6.32)	71.99 (5.79)
Percent Female	0.50 (0.50)	0.59 (0.49)
No. Kids	3.49 (2.15)	3.67 (2.09)
No. Sons	1.74 (1.40)	1.87 (1.42)
No. Daughters	1.74 (1.44)	1.81 (1.43)
Married	0.65 (0.48)	0.67 (0.47)
Partnered	0.04 (0.19)	0.02 (0.13)
Separated	0.11 (0.32)	0.08 (0.27)
Widowed	0.18 (0.38)	0.22 (0.42)
Non Housing Assets	279511.33 (949995.37)	318849.79 (928674.61)
Has LTCI	0.11 (0.31)	0.14 (0.35)
Total Days Got Help	2.16 (9.73)	1.21 (6.53)
Days with Children's Help	0.88 (5.24)	0.41 (3.56)
Days with Family Help	1.88 (8.79)	1.11 (6.14)
Days with Non-Family Help	0.30 (2.86)	0.10 (1.63)
Days with Paid Help	0.40 (3.37)	0.10 (1.78)
Days with Unpaid Help	1.80 (8.40)	1.11 (6.09)
Amount Paid for Help	5.10 (101.88)	0.62 (33.70)
Living in Nursing Home	0.01 (0.12)	0.00 (0.06)
Ever in Nursing Home	0.03 (0.16)	0.01 (0.11)
Nights in Nursing Home	7.63 (73.52)	1.94 (35.95)
No. Individuals	7354	3186

Note: This table reports summary statistics for the never-treated and not-yet-treated older adults. Values are taken from the first year in which each individual is observed. N = 41,527

a parent, and working status, these can again be attributed to the distribution of ages in the untreated and not-yet-treated samples. I provide further evidence for the comparability of these groups and the necessary parallel trends argument in Section 6.

I also conduct several heterogeneity analyses using subsamples of this initial sample. First, I split the sample into women and men. To explore the role of external

Table 2: Adult Children's Summary Statistics — Primary Sample

Variable	Untreated	Treated
Percent Female	0.51 (0.50)	0.51 (0.50)
Age	42.96 (8.73)	44.63 (7.53)
No. Kids	1.90 (1.59)	1.88 (1.49)
Married	0.56 (0.50)	0.65 (0.48)
Partnered	0.06 (0.25)	0.04 (0.18)
Single	0.37 (0.48)	0.31 (0.46)
Is Helper	0.03 (0.17)	0.02 (0.12)
Days Helping Parent	15.91 (12.59)	11.75 (11.48)
Working Full-time	0.73 (0.45)	0.77 (0.42)
Working Part-time	0.07 (0.26)	0.07 (0.25)
Not Working	0.20 (0.40)	0.16 (0.37)
No. Individuals	7789	3682

Note: This table reports summary statistics for the never-treated and not-yet-treated adult children adults. Values are taken from the first year in which each individual is observed. N = 40,298

sources of care, or the lack thereof, I also consider the impact of a parental fall on children whose parents are widowed or divorced, whose parents do and do not have long-term care insurance (LTCI) and those whose parents have above or below median levels of household wealth. I discuss sample construction in greater detail and present summary statistics for each subsample of adult children in Appendix C.

Outcome Variables My analysis focuses on two sets of outcome variables: caregiving and labor market supply provided by adult children. At the parental level, I use a range of caregiving variables, including total days one received help, days with paid and unpaid help, and days with family and non-family help. Baseline values are reported in Table 1. Since individuals may receive more than one kind of care per day, averages may not add up to the total.

At the child level, I measure caregiving provided by adult children using the number of days in the previous month a respondent reports their child(ren) helping them. I use this variable to create an indicator variable for whether or not each child has helped to capture caregiving on the extensive margin. Unfortunately, there are no variables capturing the amount of help each adult child provided over the previous two years. Therefore, my estimates using these caregiving variables likely underestimate the effect of a parental fall on caregiving. I also measure labor market supply using a set of binary variables indicating whether a given adult child is working full-time, part-time, or not at all. However, it is important to note that not working encompasses both adult children who are unemployed, as well as those who are not working due to retirement, homemaking, or other reasons. Baseline values are reported in Table 2.

4 Econometric Model

My empirical strategy aims to identify the causal effects of a parental fall on adult children's caregiving and labor market supply. I begin by using a difference-in-differences model, aggregating years before and after a fall:

$$y_{iht} = \beta \times Post_{it} + \gamma_t + \eta_g + \theta \mathbf{X}_{it} + \epsilon_{iht} \tag{1}$$

where $Post_{it}$ is an indicator that is 1 if the observation occurs at or after relative time 0, γ_t are time fixed effects, η_g are group fixed effects, and $\mathbf{X}_{it}$ is a vector of controls.[3] Standard errors are clustered at the household level.

I next use an event study model following Callaway and Sant'Anna (2021) to

[3] $\mathbf{X}_{it}$ includes a term for gender, linear and quadratic terms for age, and controls for either the number of daughters and sons (at the parental level) or the number of sisters and brothers (at the child level). For children, controls also a quadratic term for their parent's age and the child's physical distance from their parent.

assess the effects relative to the time of the fall. For an outcome y for individual i in household h at time t, I estimate:

$$y_{iht} = \sum_{r \neq -2} \beta_r \mathbb{1}[s = r] + \gamma_t + \eta_g + \theta \mathbf{X}_{it} + \epsilon_{iht} \tag{2}$$

where the set of β_r are the coefficients of interest corresponding to event-time. I estimate these coefficients using the *did* package (Callaway and Sant'Anna, 2021), which accounts for the panel structure of my data. I allow for an unbalanced panel in order to account for the fact that new survey respondents are recruited in each wave. Sample selection is described in further detail in Section 3.2. All standard errors are clustered at the household level. Since the HRS is a biannual survey, $r = -2$ is the time period observed immediately before the first fall occurs.

Given my choice of falling as an event, I argue that the no anticipation assumption is satisfied because older adults and their family members generally do not anticipate falling. Additionally, while some older adults may anticipate their increasing risk of falling, they and their family members are unlikely to ascertain the exact timing of when a fall will occur. We might also expect that the exact timing of a fall is somewhat random (e.g., whether due to weather or fatigue due to illness). This is further supported by the event study plots in Section 5, which show evidence for no anticipation across multiple caregiving variables.

I also argue that conditional on demographic controls, my quasi-experimental design satisfies the parallel trends assumption. In Section 5, I determine the effect of a fall on an older adult's caregiving utilization. I use the not-yet-treated older adults (i.e., those who will fall in the future) as my comparison group. We would expect that older adults who first report a fall in time t are similar to those who first report a fall in time $t + k$. The parallel trends argument at the parental level are further supported by the pre-tests for parallel trends.

In Sections 6 and 7, I identify the effect of a parental fall on an adult child's labor market outcomes and caregiving, respectively. I use the never treated and not-yet-treated adult children as my control group. As in the parental level analysis, we would expect that the children of adults who first fall in time t are similar to those whose parents first fall in time $t+k$. Moreover, since falls occur at the parental level, I argue that in the absence of a fall, the adult children of older adults who fall would evolve similarly to the adult children of adults who never fall. Table 2 shows that adult children of adults who fall are similar to adult children of adults who never fall. Given that these two groups are similar at baseline, we would expect them to evolve similarly in the absence of a parental fall. Additionally, for each of my primary results, I provide the p-value for the pre-test of the parallel trends assumption in Table B1.

One potential concern would be if the never-treated group evolves systematically differently from children whose parents ever experience a fall. I provide further evidence of parallel trends between the never-treated adult children and the ever-treated adult children in Figures A1, A2, A3, and A4, each of which plot the employment levels across time. The never-treated levels over time are fairly similar in the overall sample, shown in Figures A1 and A2. Although the gender-specific levels in Figures A3 and A4 exhibit more changes, they are not indicative of any systematic differences in trends between the never-treated and not-yet-treated observations. While there are small differences between the never-treated and not-yet-treated groups, in order for my estimates to be unbiased, I need conditional parallel trends to hold. These figures show levels conditional only on gender. As Table B1, conditional on my covariates, the pre-tests for parallel trends do not suggest violations of my parallel trends argument. Finally, we might be concerned that the never-treated men appear to have a sharp decrease in not-working in the final observed wave. I account for this by conducting a set of supplemental analyses in which I drop these observations, reported in Section 9.

Table 3: DiD Estimates of Caregiving

Variable	Estimate	Std. Error	Pre-Treatment Mean
Total Days Got Help	1.571	0.563	1.336
Days with Children's Help	0.617	0.257	0.443
Days with Family Help	1.291	0.472	1.234
Days with Non-Family Help	0.314	0.192	0.109
Days with Paid Help	0.430	0.159	0.100
Days with Unpaid Help	1.119	0.499	1.238
Amount Paid for Help	17.583	6.455	0.949
Living in Nursing Home	0.028	0.005	0.003
Ever in Nursing Home	0.045	0.008	0.011
Nights in Nursing Home	13.897	3.295	1.678

Note: This table reports the ATT of a parental fall on each of the listed outcome variables, as well as standard errors and the pre-treatment means. Each variable corresponds to its own specification with linear and quadratic controls for age, and controls for gender, the number of daughters, and the number of sons each respondent has. All estimates are clustered at the household level.

5 Impact on Parental Caregiving Needs

I begin by motivating my analysis with a set of difference-in-differences models, which show that a fall increases the amount of care provided by family members, including adult children. I use my second sample of older adults, which contains all respondents who are ever-treated if we observe the four years before and after their fall. Estimates are shown in Table 3, following Equation 1. Event study plots following Equation 2 are shown in Figures 1 and A5.

As the literature suggests, after a fall there is an increase in the amount of caregiving an older adult receives. In the DiD estimates, this is true for all selected caregiving variables except for non-family help. There are large and statistically significant increases in help provided by family members and help provided by adult children specifically. Additionally, there is a significant increase in the likelihood that

a respondent is living in a nursing home or has lived in a nursing home in the previous two years.

The event study estimates shown in Figures 1 and A5 indicate that the sources of care are not uniformly distributed in the post-period. Care provided by adult children is statistically significant only immediately after a fall. Furthermore, as seen in Figures 1 and A5, the likelihood of having been in a nursing home in the previous two years or currently living in a nursing home are increasing, albeit noisily, in the post-periods. This result is consistent with the literature; falls not only require a short-term increase in caregiving, but often require continual and increasing caregiving in order to provide assistance for deteriorating health. Although some of the caregiving variables suggest some anticipation, the care provided by adult children does not. I provide further evidence in support of no anticipation at the child level in Section 6.

The changes in caregiving an older adult receives after a fall suggest two potential pathways for their adult children's labor market outcomes. Under the assumption that formal and informal caregiving are substitutes, an older adult may receive caregiving from their adult child(ren), increasing their child's caregiving supply and potentially decreasing their labor market supply. Alternatively, adult children may choose to pay for their parents' caregiving needs, potentially leading to substitution towards *more* labor. Additionally, if formal and informal caregiving are instead complements, adult children's labor market supply may also decrease. The allocation of adult children's informal caregiving and labor supply may also vary over time; adult children may provide more informal care to their parents if the need for care is unexpected, as in the case of a fall, or if the caregiving needs of a parent are relatively low. Given these disparate pathways, I next analyze the effects of a parent's fall on their adult children's labor market outcomes.

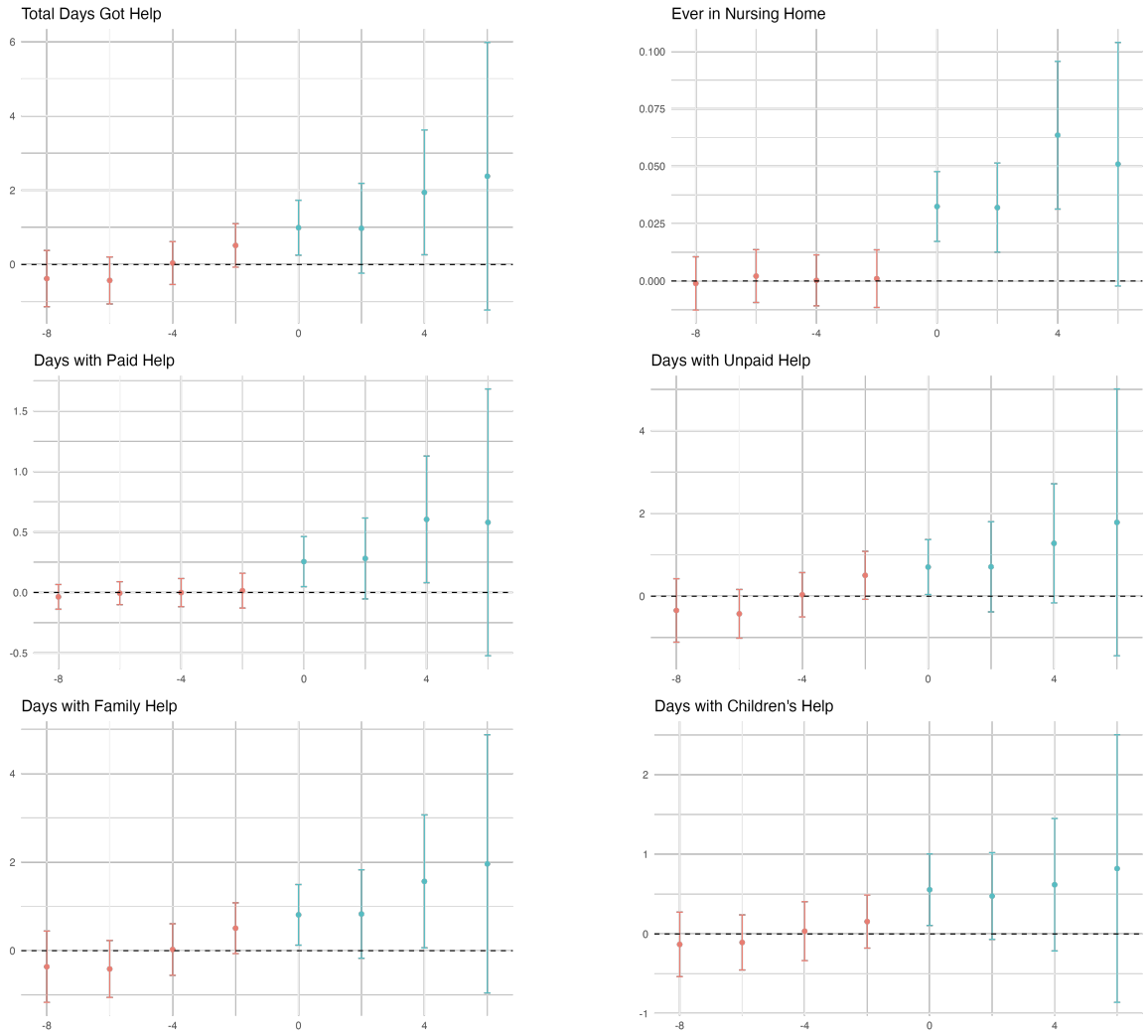

Figure 1: Event Study Plots of Key Caregiving Variables

Note: Selected event-study plots following Equation 2. Outcome variables correspond to the sub-figure titles. Additional plots can be found in Figure A5. $N = 24,913$

6 Impact on Adult Children's Labor Supply

I next estimate the effect of a parental fall on an adult child's labor market outcomes using Equation 2. I find modest decreases in the likelihood of men working after a parental fall, as well as for adult children whose parents are widowed or divorced,

and adult children whose parents have below median levels of wealth. My findings indicate the availability of alternative sources of caregiving plays an important role in determining adult children's labor market trajectories after a parental fall.

Consistent with Van Houtven et al. (2013), I find no effect of a parental fall in the aggregate or for women on the extensive margin, but I find modest decreases in the likelihood of men working after a parental fall. Event-study estimates are reported in Table B2, with aggregated DiD estimates at the top. Additionally, while I find no evidence of an effect of parental falls on women's labor market outcomes, I find that men who experience a parental fall are 3.1 percentage points more likely to not be working after a parental fall. Event-study estimates for the likelihood of not working by gender are shown in Figure 2, with corresponding estimates reported in Tables B3 and B4. These findings are consistent with Van Houtven et al. (2013), who find that men who help their parents with ADLs are 2.4 percentage points less likely to work for pay.

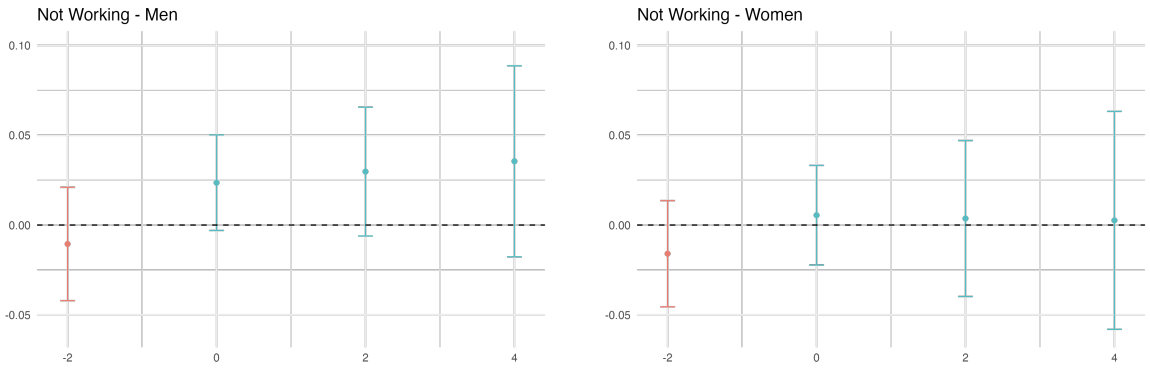

Figure 2: Effect on Not Working by Gender

Note: Event study estimates of the effect of a parental fall on not working by child's gender. Men's sample $N = 19,731$ and women's sample $N = 20,567$.

Finally, women experience an economically small and statistically insignificant increase in the likelihood of not working. While it is possible that parental falls do not impact women's labor market supply, I estimate changes only on the extensive

margin; several studies have found that women decrease their labor supply on the intensive, but not extensive margins, especially when parental caregiving needs are relatively minimal (Ettner, 1995; Van Houtven et al., 2013). Additionally, as seen in Table C1, only about one fifth of men are not working while one quarter of women are not working. Therefore, while a parental fall causes a modest decrease in the likelihood of men working, they are overall still more likely to be working than women. I discuss these gender differences further in Section 8.

6.1 The Role of Spousal Caregiving

An important factor to consider in an adult child's labor market outcomes following a parental fall is the availability of other sources of caregiving. One potential substitute for caregiving provided by an adult child is the care provided by a spouse. However, in the absence of a spouse (e.g., due to disability, divorce, or death), adult children may be required to provide more caregiving to their parents.

Restricting my sample to only adult children whose parents are either widowed or divorced, I find a 3.6 percentage point decrease in the likelihood of an adult child working after a parental fall when their parent is widowed or divorced. Event study plots are shown in Figure 3 and estimates are reported in Table B5. In the absence of spousal caregiving, we see that the likelihood of working both full-time and part-time decreases, albeit insignificantly, while the likelihood of not working increases in the post-period.

This effect is statistically significant for sons but not daughters. The corresponding event-study estimates for the likelihood of not working are shown in Figure 4. Sons are 6.2 percentage points more likely to not be working (SE = 0.03) after a parental fall, while daughters experience smaller and statistically insignificant changes in their likelihood of not working (2.3 pp, SE = 0.02). Unlike in the overall sample, we see

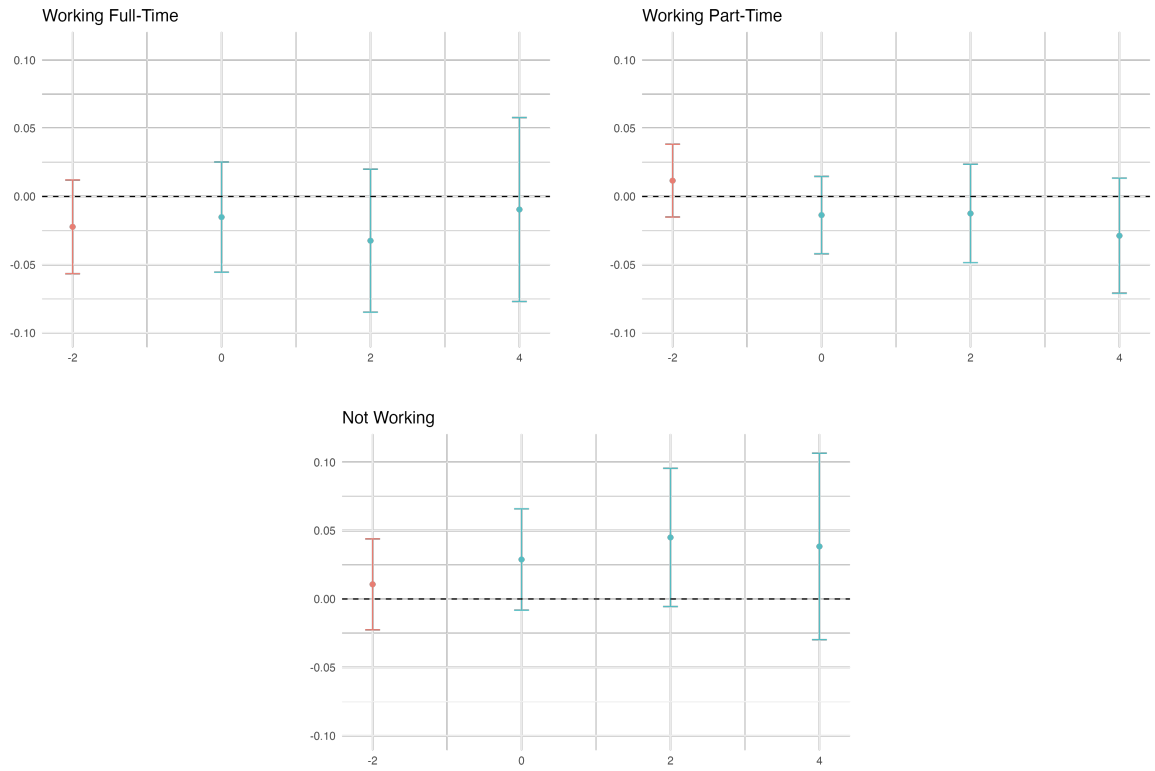

Figure 3: Single Parental Falls' Impacts on Children's Labor Market Outcomes

Note: Event study estimates of the effect of a parental fall on children's labor market outcomes if the parent is widowed or divorced. All adult children whose parents are widowed or divorced are included in this sample. This sample contains 5,960 adult children of whom 1,583 experience parental falls ($N = 20,592$).

that daughters whose parents lack a source of spousal caregiving are less likely to work after a parental fall, although this change is statistically insignificant. The increased likelihood of not working across all adult children of widowed and divorced older adults indicates that the availability of caregiving substitutes may play a large role in adult children's labor market outcomes following a parental shock in caregiving.

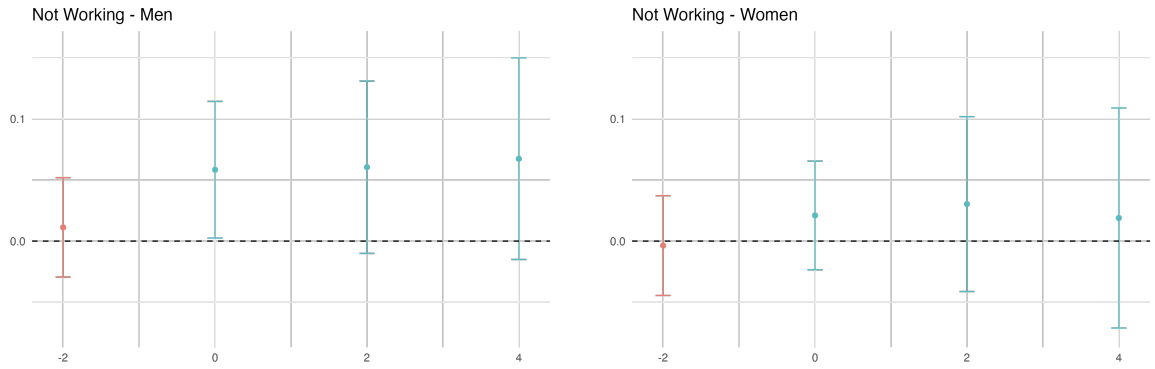

Figure 4: Changes in Labor Market Outcomes After a Single Parental Fall

Note: Event study estimates of the effect of a parental fall on the likelihood of not working by child's gender. These samples contain 2,938 men of whom 763 experience a parental fall (N = 10,112) and 3,030 women of whom 820 experience a parental fall (N = 10,480).

6.2 The Role of Parental Insurance

Parents may insure their long-term care needs either directly through long-term care insurance (LTCI), or indirectly with sufficient assets. In this section, I consider the role of both LTCI and parental assets in determining the effect of a parental fall on children's labor market outcomes.

Long-Term Care Insurance - Under the assumption that parents with long-term care insurance (LTCI) use it to access paid caregiving, we would expect that the effects of a parental fall on adult children whose parents have LTCI would be smaller than the effects for children whose parents do not have LTCI, providing a placebo test

Table 4: DiD Estimates by Parental LTCI Status

Sample	Full-time	Part-time	No Work
Has Insurance - Full Sample	0.007	0.015	-0.018
	(0.044)	(0.032)	(0.036)
Men	-0.026	0.034	-0.008
	(0.048)	(0.029)	(0.038)
Women	-0.015	0.005	0.01
	(0.059)	(0.048)	(0.055)
No Insurance - Full Sample	-0.014	-0.011	0.024
	(0.015)	(0.01)	(0.014)
Men	-0.022	-0.015	0.037
	(0.02)	(0.009)	(0.017)
Women	-0.005	-0.005	0.01
	(0.02)	(0.014)	(0.02)

Note: This table reports the ATTs of a parental fall on each of the three work outcomes by parental LTCI status. Standard errors are reported in parentheses. Each cell reports the ATT where each row corresponds to a different sample and each column corresponds to a different outcome variable.

for my previous findings. I report the aggregated coefficients and the coefficients by gender in Table 4. As expected, the estimates of the effect of parental falls on adult children's labor market outcomes are not indicative of any substitution away from working and are statistically insignificant when parents are insured. However, men whose parents are uninsured are more likely to not be working than in the full sample of men (3.7 pp vs 3.1 pp). Additionally, as seen in Figure 5, this increase is statistically significant in the period immediately after the fall and appears to be increasing, albeit noisily, in the subsequent periods. We see little, if any, effects on women's likelihood of not working. These results are indicative that the change in men's labor market outcomes are driven by changes in caregiving following a parental fall.

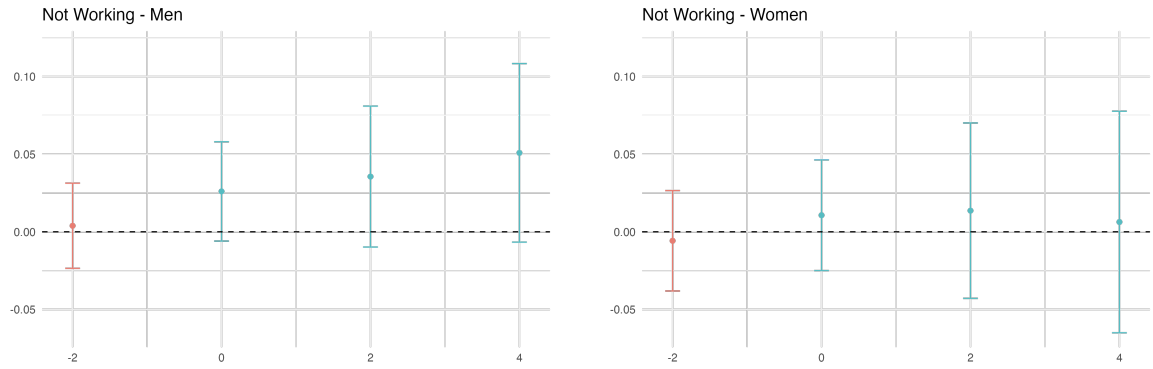

Figure 5: Changes in Likelihood of Working After Uninsured Parental Fall by Gender

Note: Event study estimates of the effect of an uninsured parental fall on children's likelihood of not working by gender. All adult children whose parents do not have LTCI are included in this sample.

Parental Assets - While the estimates from the children of parents with and without LTCI are compelling, another concern is that LTCI confounds insurance with parental wealth. To account for this, I conduct a second analysis using non-housing assets at the parental level. I choose non-housing assets, rather than total assets, for my primary asset-level analysis since non-housing assets are more liquid and are therefore better positioned to respond to any shock in caregiving after a parental fall. I find that children of parents who have below median non-housing assets experience large increases in the likelihood of not working. However, these appear to be driven entirely by children whose parents do not have LTCI. I find similar results using total assets.

I first split my sample into families for which parents have above median and below median levels of non-housing assets. Sample selection and summary statistics for this subsample are reported in Appendix C. DiD estimates for this analysis are reported in Table 5. In the DiD estimates, adult children whose parents have below median wealth are overall 4.1 pp less likely to be working. They are also 4.6 pp less likely to be working in the period immediately after a parental fall. There are no effects for

adult children whose parents have above median wealth. This pattern holds when considering all assets; adult children whose parents have below median wealth are 4.3 pp more likely to be not working while there is no effect for adult children whose parents have above median wealth.

Table 5: DiD Estimates by Wealth and LTCI Status

Sample	Full-Time	Part-Time	No Work
Below Median - Full Sample	-0.021	-0.017	0.041
	(0.017)	(0.011)	(0.016)
Has Insurance	0.019	0.067	-0.086
	(0.083)	(0.042)	(0.075)
No Insurance	-0.029	-0.022	0.048
	(0.018)	(0.011)	(0.018)
Above Median - Full Sample	-0.002	0.004	-0.002
	(0.018)	(0.012)	(0.017)
Has Insurance	0.002	0.009	-0.024
	(0.048)	(0.028)	(0.045)
No Insurance	0.005	0.003	-0.002
	(0.022)	(0.014)	(0.021)

Note: This table reports the ATTs of a parental fall on each of the three work outcomes by parental wealth and LTCI status. Standard errors are reported in parentheses. Each cell reports the ATT where each row corresponds to a different sample and each column corresponds to a different outcome variable.

I next split these samples according to parental LTCI status, also in Table 5. There is no effect on labor market outcomes for both groups of children whose parents have LTCI. These estimates are not only statistically insignificant, which we might expect due to the smaller sample sizes and larger standard errors of insured households, but the point-wise estimates for the likelihood of not working are negative. This provides further confirmation that any decrease in the likelihood of working is not being driven by children of parents who have LTCI.

Adult children whose parents have below median wealth and no LTCI are more

likely to be not working and are less likely to be working part-time, although the estimate for the decrease in working part-time indicates there may be some violations of the parallel trends argument. The corresponding event study plots are shown in Figure 6. The likelihood of working part-time is decreasing in the post-period while the likelihood of not working is increasing in the post-period and is statistically significant immediately after and up to two years after a parental fall. These findings suggest that for families without the resources, whether via insurance or assets, to obtain other sources of caregiving, adult children may step in and face long-term consequences.

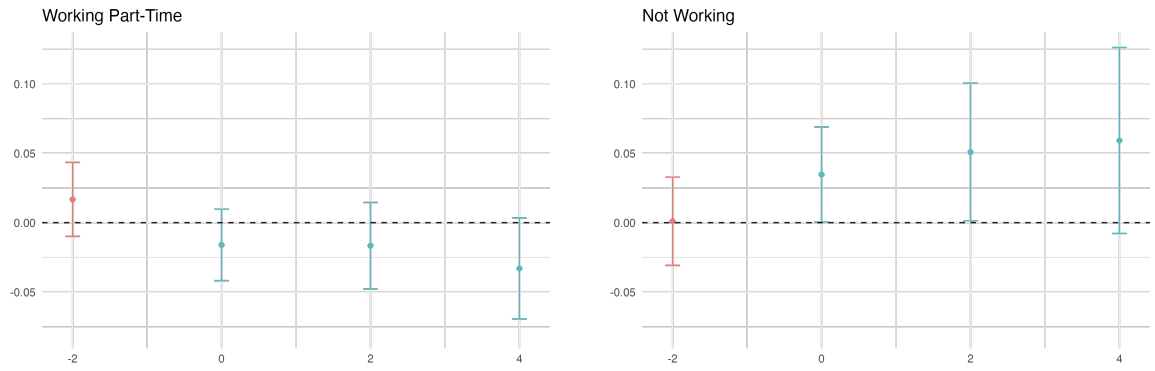

Figure 6: Changes in Labor Market Outcomes After a Dually Uninsured Parental Fall

Note: Event study estimates of the effect of a dually uninsured parental fall on children's labor market outcomes (i.e., parents have neither LTCI and are unlikely to have the liquid assets necessary to pay for LTC). Summary statistics are reported in columns 3 and 4 of Table C5.

This is not true for families with above median assets. There are no labor market effects for children whose parents have above median wealth but no LTCI. This is consistent with the LTCI literature, which suggests that part of the reason for low LTCI coverage is self-insurance, which is more likely for older adults who are wealthier.

I find similar results using all wealth, rather than non-housing wealth. There is no effect on labor market outcomes for both groups of children whose parents have

LTCI. Children whose parents have below median levels of all wealth and no LTCI experience a 4.4 pp increase in the likelihood of not working and a 1.8 pp decrease in the likelihood of working part-time; both changes are increasing in magnitude in the post-period. There are no effects for children whose parents have above-median levels of wealth.

Finally, I split this sample further by gender. Event study plots for the likelihood of not working for men and women whose parents have below median wealth and no LTCI are shown in Figure 7. I find that men whose parents are less wealthy and never have LTCI experience a 5.7 pp decrease in the likelihood of working after a parental fall. Consistent with the previous findings, this effect appears to be increasing slightly in the post-period. Additionally, I note this pattern holds for women, although the effect is not statistically significant. These effects are similar, although not statistically significant, when using total assets rather than non-housing assets.

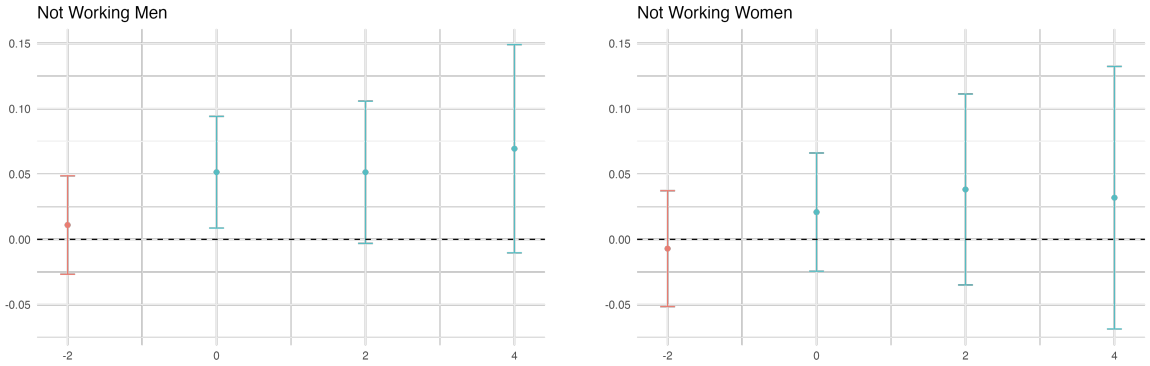

Figure 7: Changes in the Likelihood of Not Working After a Dually Uninsured Parental Fall by Gender

Note: Event study estimates of the effect of a dually uninsured parental fall on children's labor market outcomes by gender (i.e., parents have neither LTCI and are unlikely to have the liquid assets necessary to pay for LTC). The men's sample contains 2,108 individuals of whom 827 experience a parental fall (N = 9,107) and the women's sample contains 2,259 individuals of whom 913 experience a parental fall (N = 9,746).

6.3 The Role of Adult Children's Opportunity Costs

Finally, we might be concerned that the previous finding is reflective of the adult child's own income, rather than their parents' external sources of caregiving. If adult children prefer working to providing care to their parents, or if they make sufficient income to offset their parents' LTC costs, the previous findings may be driven by adult children's income, rather than the availability of caregiving substitutes for their parents. I address this by estimating the effects of a parental fall on children who are making above and below median incomes prior to a parental fall.[4] Estimates are reported in Table 6. Despite a weakly positive correlation between parental wealth and income bracket (0.14)- which would suggest lower income adult children would decrease their labor supply- a parental fall has no effect on adult children who make less than the median level of income before the fall. Additionally, we see that men who make above the median level of income are 3.6 percentage points more likely to not be working following a parental fall.

I supplement this analysis by considering the interactions of gender, income, and parental LTCI status. If the changes in men's labor market outcomes are indeed driven by the presence of other caregiving sources for their parents, we would expect that only the men who earn above the median income level and whose parents are uninsured would be affected by a parental fall. I report the estimates by parental LTCI status for men whose income is above the median in Table 7. My results are consistent with the presence of alternative parental caregiving sources determining children's labor market outcomes; only higher-earning men whose parents are uninsured experience an increased likelihood of not working. These results suggest that the presence of viable caregiving alternatives at the parental level is a key determinant

[4]Due to data limitations, I am unable to precisely identify the effects of a parental fall on children's income since income is only reported in every other wave. However, since I require two waves of observations before each parental fall, I am able to identify when children made above or below the median level of income.

Table 6: DiD Estimates by Income and Gender

Group	Full-Time	Part-Time	No Work
Below Median - Full Sample	0.005	-0.018	0.012
	(0.026)	(0.019)	(0.024)
Men	-0.001	-0.029	0.03
	(0.031)	(0.02)	(0.028)
Women	0.013	-0.007	-0.006
	(0.03)	(0.021)	(0.029)
Above Median - Full Sample	-0.012	-0.005	0.017
	(0.015)	(0.01)	(0.013)
Men	-0.034	-0.005	0.036
	(0.016)	(0.009)	(0.014)
Women	0	-0.006	0.006
	(0.022)	(0.016)	(0.019)

Note: This table reports the aggregated ATTs of a parental fall on full-time, part-time, and not working indicators by child's income bracket and by gender. Each regression contains linear and quadratic controls for age, a quadratic term for parental age, and controls for a child's distance from their parent. All standard errors are clustered at the household level.

in the effect of a parental fall on adult children's labor market outcomes.

Table 7: DiD Estimates by Parental LTCI Status - Higher Earning Men

Group	Full-Time	Part-Time	No Work
Insured	-0.039	0.026	0.007
	(0.042)	(0.026)	(0.037)
Uninsured	-0.033	-0.005	0.039
	(0.017)	(0.01)	(0.015)

Note: This table reports the ATTs of a parental fall on full-time, part-time, and not working indicators for men who make above the median income by parental insurance status. Each regression contains linear and quadratic controls for age, a quadratic term for parental age, and controls for a child's distance from their parent. All standard errors are clustered at the household level.

7 Impact on Adult Children's Caregiving Supply

Finally, a natural follow-up is determining if any of the populations who experienced a change in labor market outcomes changed their caregiving supply. Given that my analysis of adult children's income suggests that it is parental caregiving substitutes, rather than children's income driving changes in children's labor market outcomes, I restrict my caregiving analysis to my primary sample and the samples of children whose parents are widowed or divorced, do not have LTCI, and below median levels of non-household wealth. In general, I find suggestive but often statistically insignificant increases in caregiving in the populations whose likelihood of working decreased after a parental fall. I primarily attribute the lack of statistical significance to the way the help-related questions are asked in the HRS. The HRS asks respondents about help they are currently receiving, not help they received in the previous two years. Therefore, the caregiving variables reflect care the respondents are currently receiving or have received in the past month. As a result, we would expect that these estimates represent a lower bound on the amount of caregiving respondents received and adult children provided over the previous two years.

I report the DiD estimates in my main sample and by gender in Table 8. I find a marginally significant 1.4 pp increase in the likelihood of being a caregiver after a parental fall ($p < 0.06$). I also find a marginally significant increase in the likelihood of women being caregivers ($p < 0.08$). While the difference between men and women is statistically insignificant, the point estimates for the effect of a parental fall on women's caregiving are higher than those for men. I return to the gender differences in caregiving in Section 8.

Table 8: Caregiving Estimates by Gender

Variable	Full Sample	Men	Women
Helper Indicator	0.014	0.009	0.021
	(0.008)	(0.007)	(0.011)
Days Helped	0.132	0.038	0.232
	(0.126)	(0.111)	(0.188)

Note: This table reports the ATTs of a parental fall on the likelihood of caregiving and the days of caregiving provided in the previous month for my primary sample. Standard errors are in parentheses.

7.1 The Role of Spousal Caregiving

For children whose parents are widowed or divorced, I find a statistically significant increase in parental caregiving on both the extensive and intensive margins. Event-study plots are shown in Figure 8. A parental fall increases the overall likelihood of an adult child being a caregiver by 3.2 pp in the post-period. As shown in the left figure in Figure 8, this likelihood is increasing in the post-period and is statistically significant 4 years after a parental fall. The estimates of the intensive margin are noisier, but suggest some increases in caregiving in the post-period. I find that if a parent is widowed, a parental fall increases the number of days a child provides care by 0.37. While 0.37 days is relatively small, it is a large increase compared to the pre-treatment mean of 0.47 days (SD = 3.24).

I also focus on heterogeneity by gender. I find statistically significant effects for men but only marginally significant effects for women. Corresponding event study plots are shown in Figure 9. I find that men in the post-period are 2.6 pp more likely to be a caregiver, and this is increase is statistically significant 2 years after a parental fall. Women are 3.3 pp more likely to be a caregiver, but this is marginally significant ($p < 0.06$). As seen in the event study plots of the intensive margin, the changes in

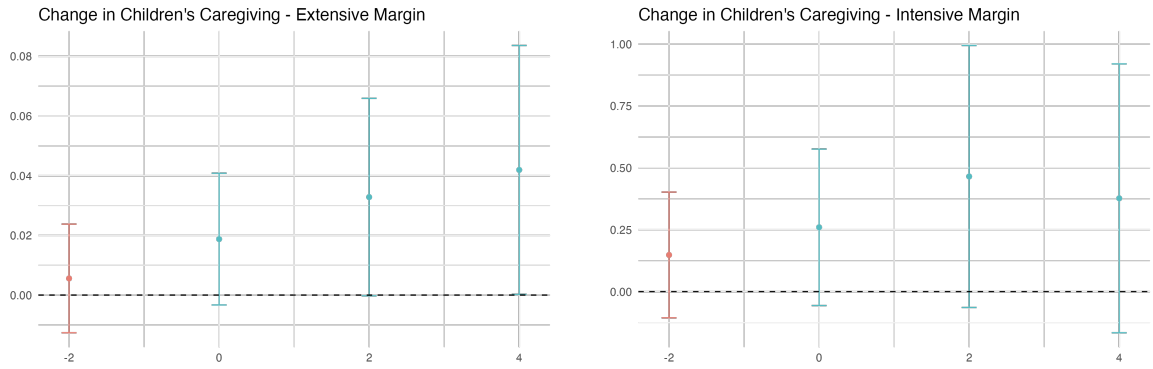

Figure 8: Event Study Plots of the Effect of a Parental Fall on Adult Children's Caregiving

Note: Event study estimates of the effect of a parental fall on children's caregiving provision if the parent is widowed or divorced. All adult children whose parents are widowed or divorced are included in this sample. This sample contains 5,956 adult children of whom 1,583 experience parental falls ($N = 20,591$). Controls include gender, a linear and quadratic age term, a quadratic term for parental age, distance from parent, and the number of sisters and brothers. All estimates are clustered at the household level.

caregiving on the intensive margin are too noisy to detect any effect of a parental fall on caregiving in these sub-populations. Additionally, although the effect on women's caregiving supply is only marginally significant, the point estimate for the effect on women's caregiving is higher. I discuss the implications of this further in Section 8.

7.2 The Role of Parental Insurance

Long-Term Care Insurance - I next consider the effect of a parental fall on children's caregiving supply for children whose parents do not have LTCI. Consistent with my labor market results, I do not find an effect on caregiving in the aggregate or for women. I find a marginally significant ($p < 0.06$) 1.6 pp increase in the likelihood of a man being a caregiver following a parental fall. Event study plots for the entire sample without LTCI and by gender are shown in Figure A6. These findings are consistent with the effects of a parental fall on men's labor market outcomes;

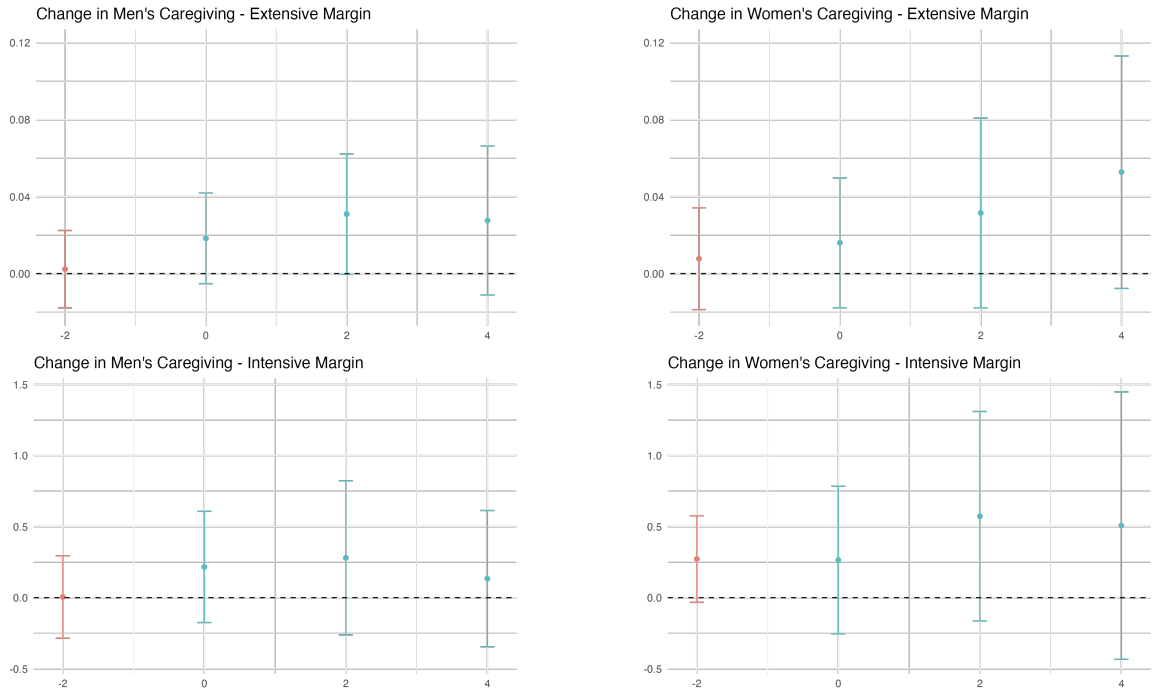

Figure 9: Changes in Caregiving by Gender for Single Parental Fall

Note: Event study estimates by gender of the effect of a parental fall on children's caregiving provision if the parent is widowed or divorced. Controls include a linear and quadratic age term, a quadratic term for parental age, distance from parent, and the number of sisters and brothers. All estimates are clustered at the household level. The men's sample include 2,938 men, of whom 763 are ever treated. The women's sample includes 3,030 women, of whom 820 are ever treated.

men increase their caregiving and decrease their labor supply when there are limited alternatives for parental care.

Parental Assets - Finally, I consider the role of parental assets on children's caregiving supply following a parental fall. In contrast to my labor market findings, I find no effect on caregiving supply for children whose parents have below median non-housing assets and a small yet statistically significant 1.4 pp increase in the likelihood of being a caregiver for children whose parents have above median non-housing assets.

However, when controlling for LTCI status in addition to parental wealth, the

caregiving results are similar to my labor market findings. Men whose parents have below median wealth and no LTCI experience a 3.2 pp increase in their likelihood of being a caregiver (SE = 0.13), which is consistent with my finding that men whose parents have below median wealth and no LTCI are less likely to be working after a parental fall. Women also experience a 3.2 pp increase in their likelihood of being a caregiver, but this effect is statistically insignificant (SE = 0.022). The increase in the likelihood of being a caregiver for children whose parents have above median non-housing assets is no longer significant after controlling for LTCI.

8 Gender Discrepancies in Outcomes

Given the baseline levels of women's parental caregiving and the point-wise estimates of the effect of a parental fall on women's caregiving are higher than men's, it may come as a surprise that men decrease their likelihood of working while women do not. I briefly describe potential alternative explanations before providing suggestive evidence that this discrepancy is driven partially by differences in the kinds of care men and women provide to their parents. Specifically, I provide evidence that women provide more of the day-to-day caregiving both before and in response to a parental fall, while a small proportion of men are more likely to provide care as an emergency response. As a result, I argue the marginal cost of elder care is very high for these men, leading to decreases in their likelihood of working.

First, it is important to note that my findings do not mean that parental falls do not have an impact on women's labor market outcomes, but rather that they do not have a significant effect on their decision of whether or not to work. Van Houtven et al. (2013) finds that although there is no effect of caregiving on women's labor market supply on the extensive margin, there is an effect on the intensive margin with a decrease of about 3 hours per week. However, the HRS defines working full-time as

working 30 hours or more. Therefore, I am unable to detect changes on the intensive margin that occur above or below this threshold, e.g., from 40 hours per week to 35 hours per week. While my results indicate that only men decrease their labor on the extensive margin, it is therefore possible that women also adjust their labor, but largely on the intensive margin. One potential explanation for this difference is that men's jobs may make it more difficult to balance unexpected parental caregiving needs with their paid job. This is further supported by Van Houtven et al. (2013)'s finding that men decrease their labor supply on the extensive margin while women decrease their labor supply on the intensive margin. Unfortunately, due to data limitations, I am unable to directly test either of these hypotheses.

Another potential explanation for the differences in labor market outcomes is the difference in the amount or kind of caregiving provided by men and women. If men provide more caregiving, or are more responsive to a parent's fall, this could explain why men are more affected than women. However, women consistently provide more care and have larger point-wise estimates for the effect of a parental fall on their caregiving supply. Therefore, it is unlikely that the decreased likelihood of men working is driven by men providing more care to their parents than women.

We might be concerned that a small sub-population of men provide more care than women, thereby driving the estimates for men's likelihood of not working upwards. Indeed, this is seen in Figure A7, where conditional on helping, a small number of men provide high amounts of care to their parents. However, in the aggregate, women still provide more care than men. Additionally, my results are robust to dropping these men (i.e., those who provided more than 10 days of care in the previous month) from my sample. In fact, my results are robust to dropping *all* children who provide care in the previous month. While it may seem concerning that dropping "all" caregivers from my sample results in similar estimates, recall my discussion in Section 7. The caregiving measure captures only care provided in the previous month. Therefore,

while this sample excludes all children who provided care in the previous month, it still contains all children who provided care in the previous two years but not in the last month, which helps to explain why my estimates are similar. I report these DiD estimates in Table B6, with corresponding event study plots in Figure A8. Taken together, this suggests that the decrease in labor market outcomes for men may be driven by temporary caregiving.

This provides a more consistent interpretation of my caregiving results. Although women provide more care before a fall and have greater point-wise estimates of the impact on caregiving after a fall, I argue that this care reflects daily "maintenance," while the care men provide "emergency" care. This is not to say that women anticipate a parental fall, but rather, that they provide care to maintain and support their parents' health, and therefore may be better prepared in the event of a parental fall. In other words, the marginal cost of the additional care after a parental fall is lower for women than it is for men. First, this is consistent with the point-wise estimates; women provide more regular care, meaning that in the previous month, they are more likely than men to have provided care as seen in Figure A7. If a parental fall increases the need for this kind of maintenance care, this would be reflected in the higher point-wise caregiving estimates for women. Second, if a small proportion of men provide a large amount of temporary care, we would not expect to fully capture this increase in care. That is, if some men are caring for their parents full-time after a fall, as Figure A7 suggests, but falls are distributed across the two-year window and caregiving is temporary, I would be unable to identify the impact of falls on care if the fall occurred near the beginning of the two-year period. Finally, if men are responding to a parental fall as an emergency, this helps to explain the moderate decrease in the likelihood of working, while other studies show that women decrease their labor on the intensive margin.

The inability to identify caregiving effects before the month in which an interview

takes place limits my ability to argue the gender differences are driven by maintenance versus emergency care. However, I can identify the kind of care provided in the past month. The HRS breaks down caregiving into 3 categories: activities of daily living (ADLs) (e.g., eating, bathing, etc.), instrumental activities of daily living (IADLs) (e.g., cooking, cleaning, etc.), and help with money. In the context of maintenance and emergency care, ADLs and IADLs correspond to maintenance care, while help with money may fall into either category. For each of my primary samples, I separate the effect of a fall into ADLs, IADLs, and help with money. DiD estimates for each sample are reported in Table 9. After a parental fall, women experience greater increases in helping with ADLs and IADLs than their male counterparts, although these differences are often statistically insignificant. However, sons provide about the same or more help with managing their parents' money after a parental fall as daughters, although many of these effects are statistically insignificant.

These findings also hold among the subset of children whose parents never report receiving their help in the previous month. Unlike the other caregiving variables, the HRS also asks "Who most often helps you manage your money?" allowing me to identify households for which parents never report help from their children in the previous month but report having received help from their children with money in the previous two years. I plot the event-study estimates for the likelihood of a parent having received financial help from their children in Figure 10, with DiD estimates in Table B7. While the parents of both men and women in this sample experience increases in the likelihood of help with financial matters after a fall, the DiD and point-wise estimates for men are slightly higher than for women, although the differences are not statistically significant. Moreover, these estimates provide the most compelling evidence that children provide care to their parents in the previous two year period, even when this care is not reported in the caregiving measures.

These results suggest the differences in outcomes between men and women are

Table 9: Heterogeneity in Caregiving

Sample	ADL	IADL	Money
Primary Sample	0.007	0.010	0.005
	(0.004)	(0.007)	(0.005)
Men	0.003	0.004	0.004
	(0.002)	(0.007)	(0.005)
Women	0.011	0.015	0.007
	(0.006)	(0.009)	(0.007)
Widowed or Divorced	0.013	0.023	0.016
	(0.006)	(0.010)	(0.008)
Men	0.008	0.011	0.017
	(0.005)	(0.010)	(0.007)
Women	0.016	0.033	0.014
	(0.010)	(0.013)	(0.010)
No LTCI	0.007	0.011	0.005
	(0.004)	(0.008)	(0.005)
Men	0.002	0.009	0.007
	(0.003)	(0.008)	(0.005)
Women	0.012	0.014	0.006
	(0.007)	(0.011)	(0.008)
Below Median Wealth	0.011	0.013	0.009
	(0.006)	(0.010)	(0.008)
Men	0.007	0.006	0.011
	(0.003)	(0.010)	(0.006)
Women	0.013	0.018	0.009
	(0.010)	(0.012)	(0.011)

Note: This table reports the ATTs of a parental fall on indicators for providing parents help with ADLs, IADLs, and with money for my primary samples. Standard errors are reported in parentheses. Each cell reports the ATT where each row corresponds to a different sample and each column corresponds to a different outcome variable.

partially driven by differences in the type of care provided. I provide evidence to suggest that men provide short-term "emergency" care while women provide "main-

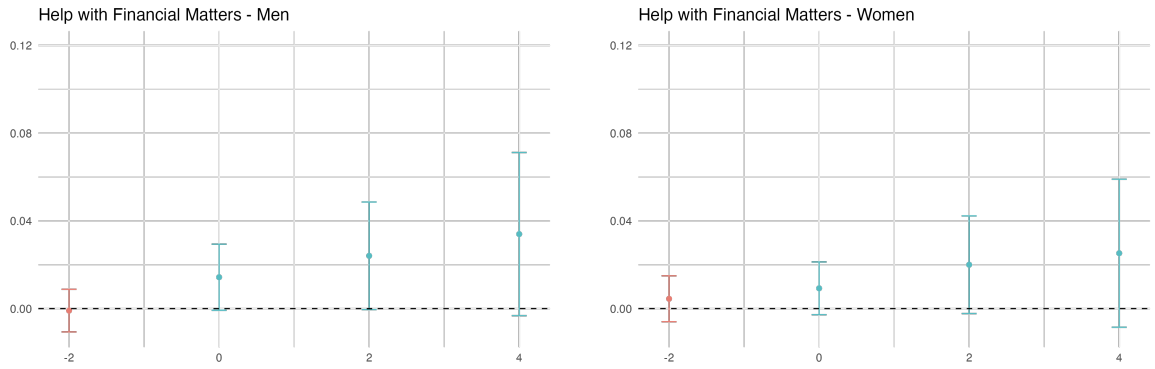

Figure 10

Note: Event study estimates of the likelihood of parents receiving help with financial matters by gender for children whose parents never report receiving help in the previous month. The men's sample contains 4,577 individuals of whom 1,415 experience a parental fall (N = 15,550) and the women's sample contains 4,653 individuals of whom 1,414 experience a parental fall (N = 15,645).

tenance" care, thereby explaining the discrepancies between caregiving supply and labor market outcomes. This does not necessarily mean that men provide more help overall, but rather that they experience higher costs in the face of unexpected caregiving. While there are other potential explanations, such as differences in occupation by gender, these findings are indicative of the role of the duration and intensity of parental care, as well as the kind of parental care, in determining children's labor market supply after a parental fall.

9 Robustness Checks

9.1 Robustness to Alternative Sample Selection

Given the relatively sharp decrease in the never-treated group's likelihood of not working in wave 12, I first conduct a robustness check dropping wave 12 from my sample for my main findings of the effect of a parental fall on adult children's likelihood of not working. I report the effects of a parental fall on the DiD estimates of the effect

on not working with my initial sample and dropping wave 12 in Table 10 with event study plots in Figure A9. As seen in both, this alternative sample does not appreciably change my main findings.

Table 10: DiD Estimates without Wave 12

Group	Original	Without Wave 12
General	0.035	0.035
	(0.016)	(0.015)
Widowed	0.041	0.039
	(0.019)	(0.020)
Widowed - Men	0.054	0.053
	(0.024)	(0.024)
No LTCI - Men	0.037	0.036
	(0.017)	(0.019)
Below Median Wealth	0.042	0.044
	(0.016)	(0.017)
Below Median Wealth - Men	0.068	0.071
	(0.022)	(0.023)

Note: This table reports the ATTs of a parental fall on indicators for the likelihood of not working for the cases where I found statistically significant results. Standard errors are reported in parentheses. Each cell reports the ATT where each row corresponds to a different sample.

9.2 Robustness to Anticipation

A common concern in event study settings is the degree to which the event is anticipated. We might be concerned that parents or their adult children did in fact anticipate a parental fall, thereby biasing my estimates. To account for this, I allow for anticipation in the period before a parental fall, using the *did* package. I plot the effects of a parental fall on the likelihood of not working with my original and anticipatory specification in Figure 11. Allowing for one period of anticipation does not change my findings.

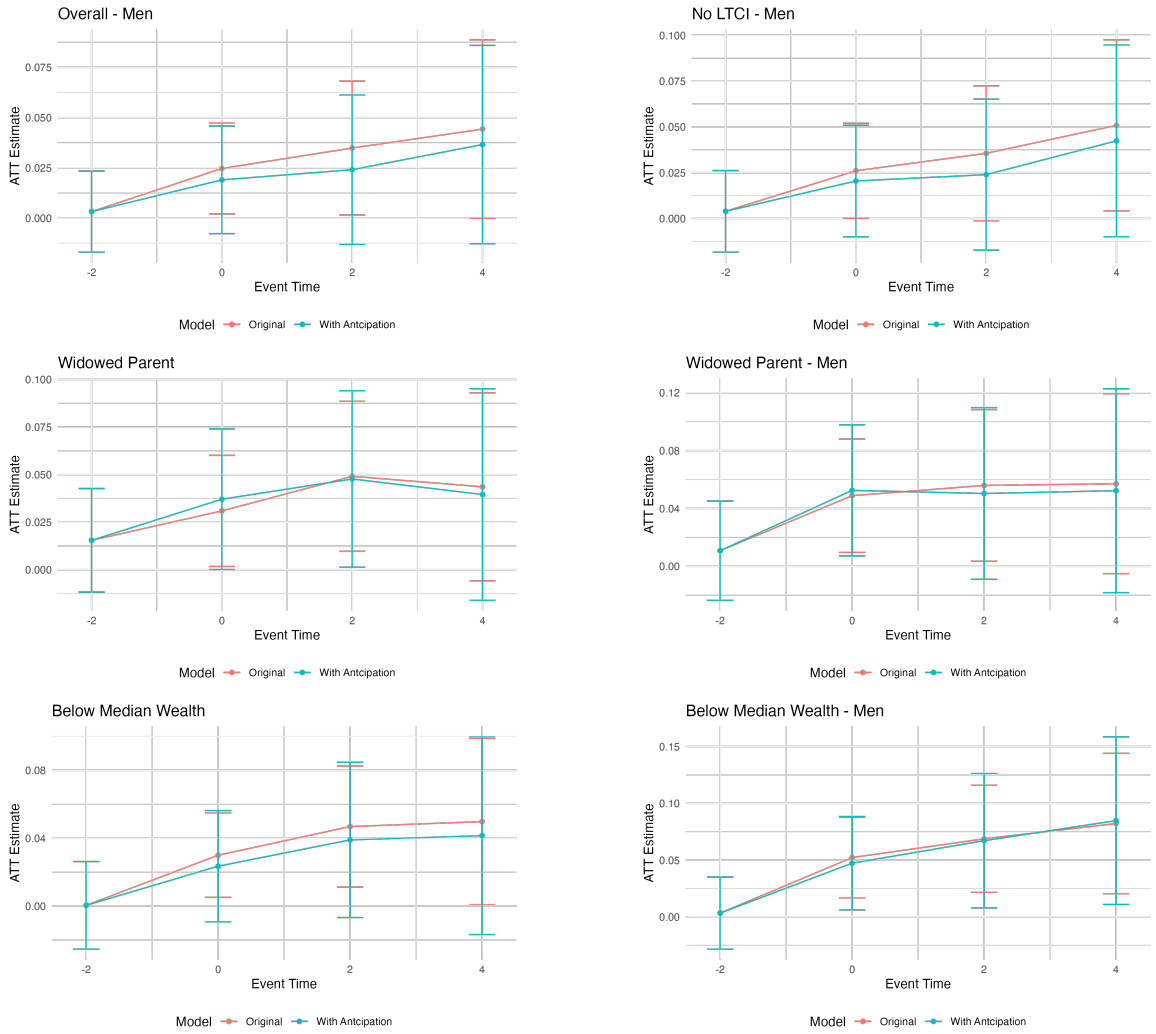

Figure 11: Event Study Plots of Original Event Study Estimates and Estimates with Anticipation

Note: Select event-study estimates of the effect of a parental fall on the likelihood of not working. Original estimates are plotted in red. Estimates with anticipation are plotted in blue.

My results are robust to dropping the period in which the never-treated group experiences modest increases in the likelihood of working, as well as to allowing anticipation in the period before a parental fall. Taken together, these robustness checks indicate that parental falls decrease the likelihood of working, particularly for

men and adult children whose parents have limited substitutes for their caregiving needs.

10 Discussion and Conclusion

This paper provides new evidence on adult children's caregiving and labor market responses to parental health shocks. Adult children whose parents have limited caregiving substitutes, whether due to the absence of a spouse, LTCI, or high levels of wealth, are less likely to work after a parental fall. This is particularly true for men, who experience moderate decreases in the likelihood of working after a parental fall. These decreases also correspond to, but are not fully explained by, an increased likelihood of providing care.

This paper also provides suggestive evidence of gender differences in adult children's supply of parental caregiving, both before and in response to a fall. Although women provide more care prior to a fall and the point-wise impacts of parental falls on women's caregiving are higher than for men, men are less likely to work after a fall. The evidence suggests this is driven by differences in both the intensity and kind of caregiving, with women providing more consistent, daily care and some men providing care temporarily, but with high intensity, in response to a parental fall. This is supported most strongly by the differences in the effects on caregiving between men and women; women provide more assistance with ADLs and IADLs while men provide similar amounts of, if not more, help with finances. However, given that the HRS primarily allows us to observe only recent caregiving, more research is needed to determine whether the causal mechanism decreasing men's likelihood of working are temporary, intense periods of caregiving in response to an unanticipated shock in parental caregiving.

This paper differs from previous research on caregiving by focusing on the effects

of an unanticipated, potentially short-term, increase in parental caregiving needs. This focus helps to explain why my estimates are on the lower end of the literature, although they are consistent with Carmichael and Charles (2003) and Van Houtven et al. (2013). Many of the studies that find large effects on labor market outcomes, particularly for women, find these effects for caregivers who consistently provided more than 10-15 hours of care per week. However, as seen in Figure A7, few adult children in my sample provide intensive caregiving in the previous month, even after a parental fall. This paper suggests that even temporary shocks in caregiving can lead to substitution away from the labor market.

One potential concern when interpreting these findings in the context of the literature on long-term care is the extent to which increases in older adults' caregiving needs are temporary and unanticipated. While there is relatively little research on the extent to which increases in caregiving needs are temporary and unanticipated, the prevalence and health risks posed by falls among older adults indicate that this is not an infrequent event. Taken at face value, this means that every year, the adult children of millions of older adults face tradeoffs between their caregiving and labor market supply. In the absence of viable caregiving alternatives, these children reduce their likelihood of working to help their parents.

Taken together, these results provide two important policy implications. First, long-term care insurance, whether through a health insurance policy or informally through a spouse or assets, provides tangible benefits not only for those receiving care, but also for their adult children. Additionally, strengthening family leave laws, particularly for elder care, may help to maintain employment and labor-force participation as more working-age adults help to take care of the aging U.S. population.

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A Appendix Figures

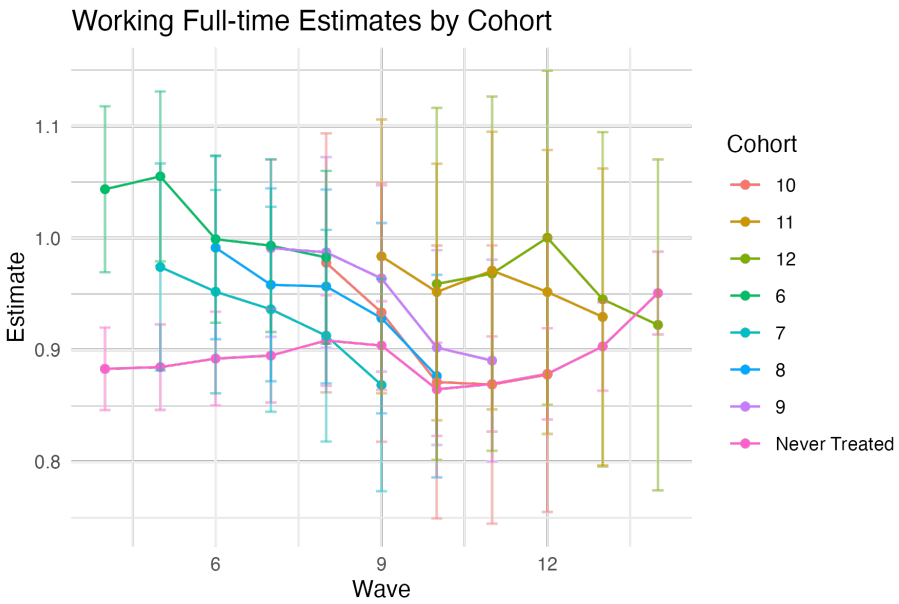

Figure A1: Level Plots of Children's Labor Supply by Treatment Group - Full-Time

Note: Estimates of labor-market supply by treatment group generated with a saturated regression, controlling for gender. $N = 40,298$

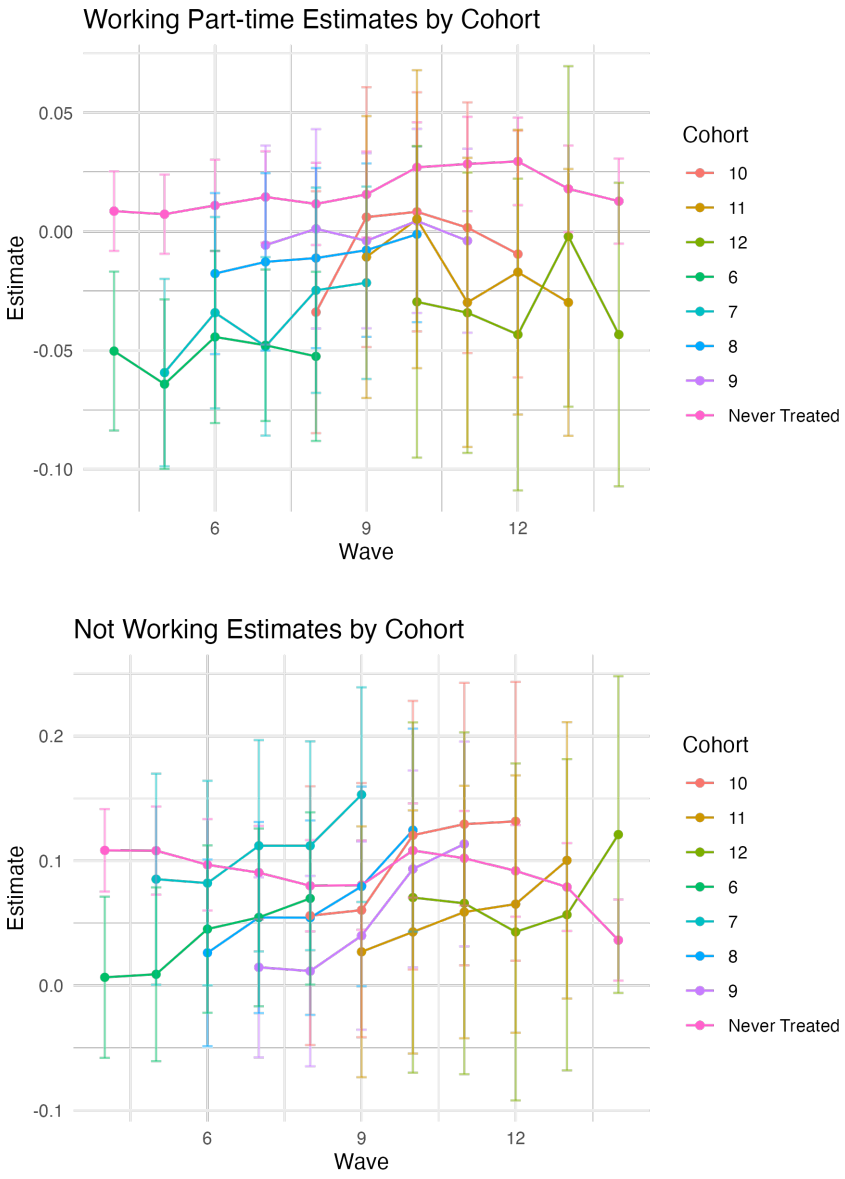

Figure A2: Level Plots of Children's Labor Supply by Treatment Group - Part-Time and Not-Working

Note: Estimates of labor-market supply by treatment group generated with a saturated regression, controlling for gender. $N = 40,298$

Figure A3: Level Plots of Children's Labor Supply by Treatment Group - Men

Note: Estimates of labor-market supply by treatment group generated with a saturated regression with no controls. $N = 19,731$

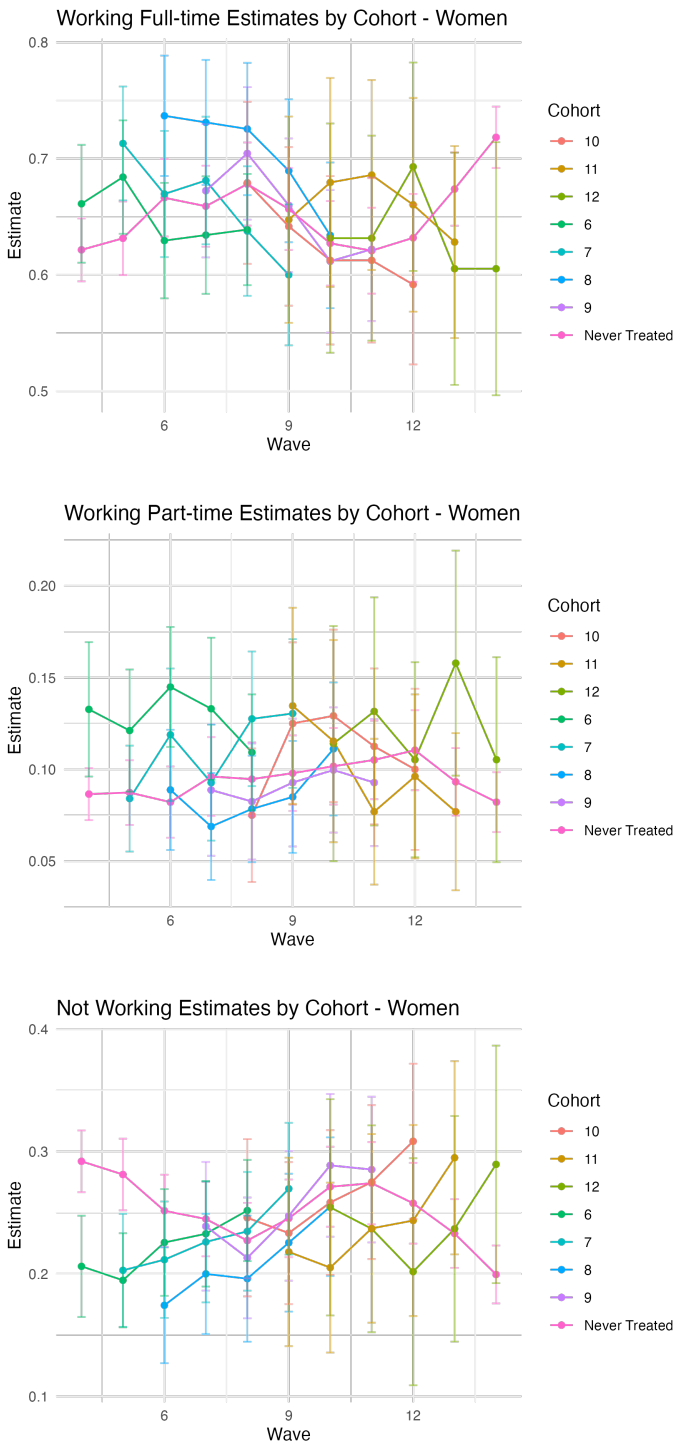

Figure A4: Level Plots of Children's Labor Supply by Treatment Group - Women

Note: Estimates of labor-market supply by treatment group generated with a saturated regression with no controls. $N = 20,567$

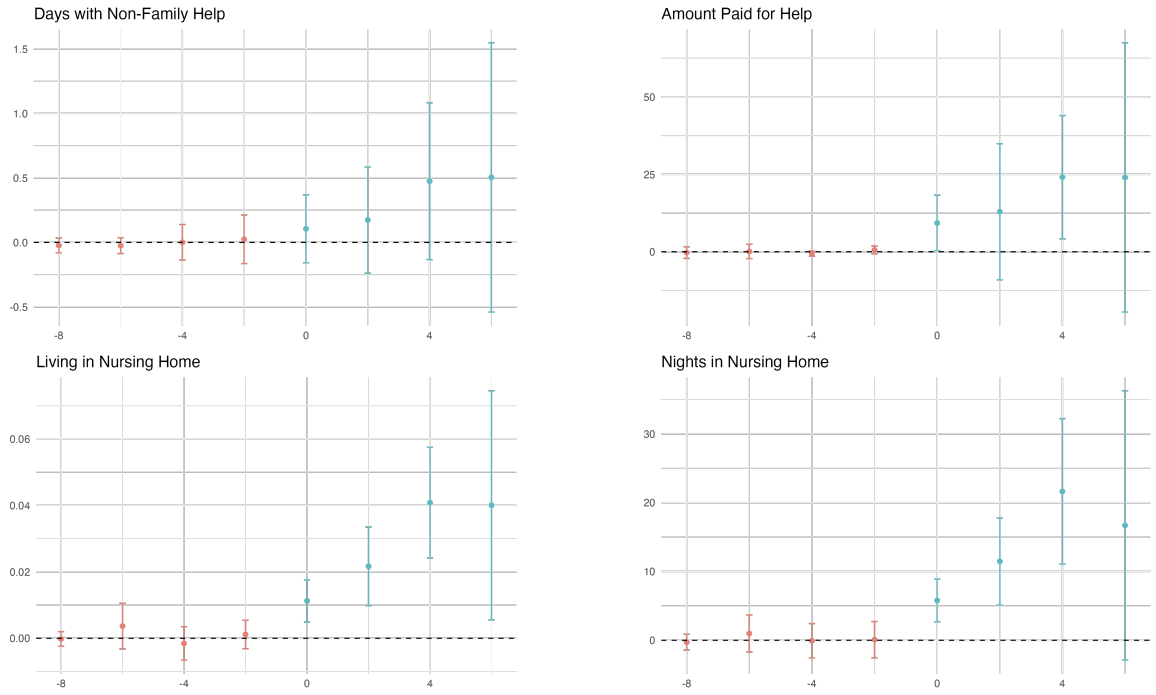

Figure A5: Additional Event Study Plots of Caregiving Variables

Note: Additional selected event-study plots following Equation 2. Outcome variables correspond to the sub-figure titles. $N = 24,913$

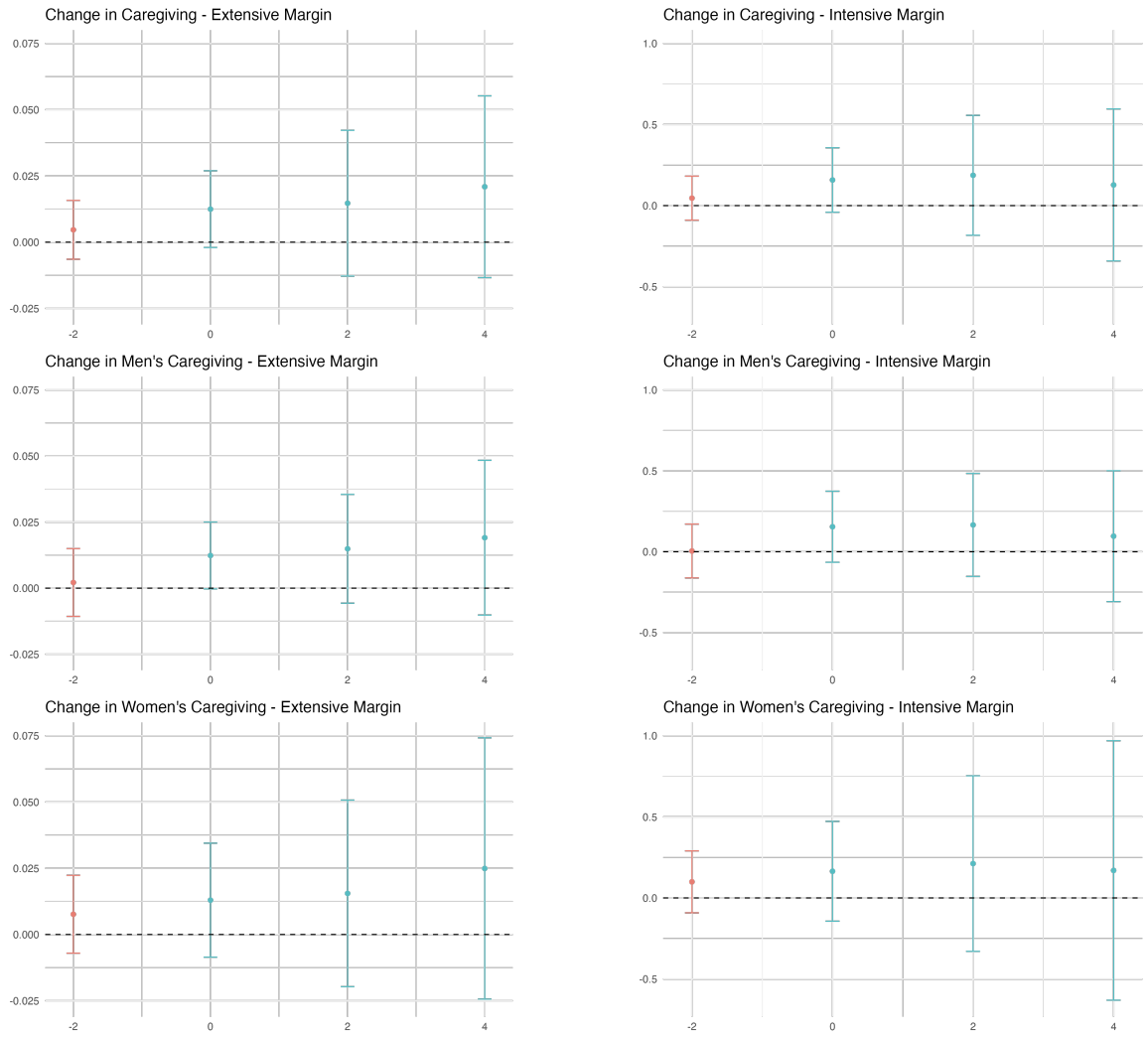

Figure A6: Event Study Plots of Children's Caregiving Supply after Uninsured Parental Fall

Note: Event study estimates by gender of the effect of a parental fall on children's caregiving provision if parent is Uninsured. Controls include a linear and quadratic age term, a quadratic term for parental age, distance from parent, and the number of sisters and brothers. All estimates are clustered at the household level.

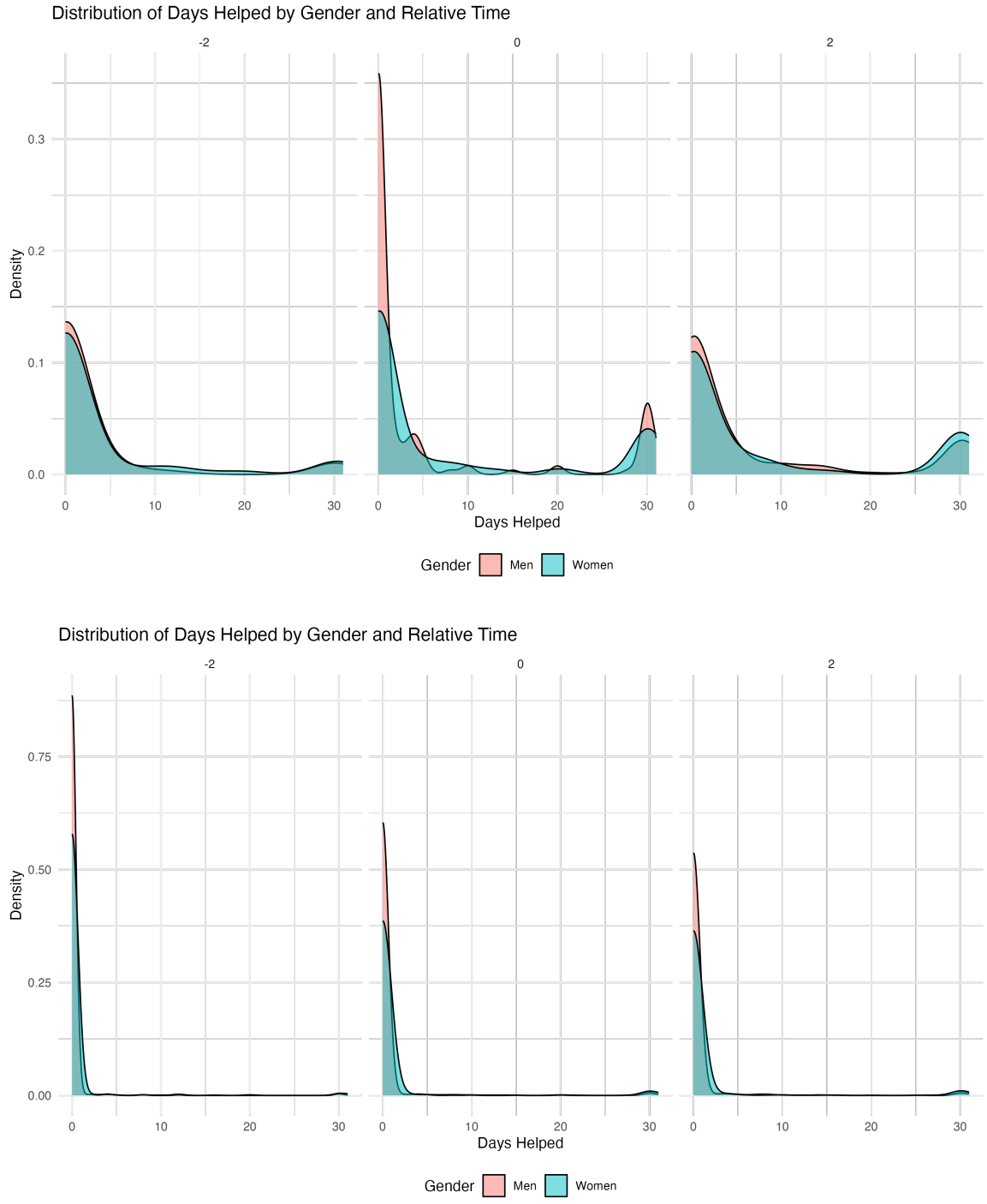

Figure A7: Caregiving Distributions

Note: Distributions of caregiving two years before a fall, at the time of a fall, and two years after a fall. Unconditional distributions are shown in the bottom figure. Distributions conditional on providing any care are shown in the top figure.

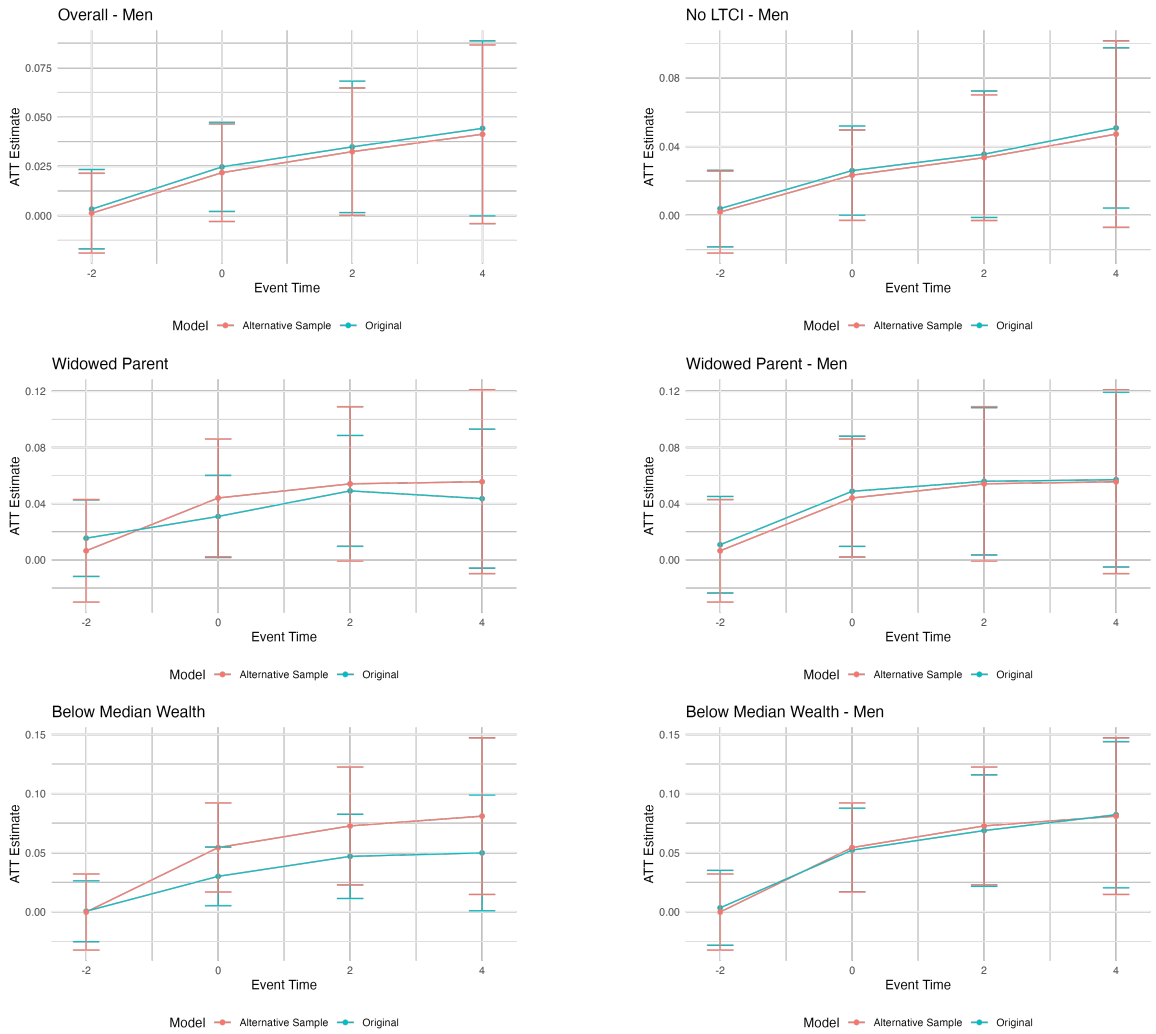

Figure A8: Event Study Plots of Original Estimates and Estimates without Adult Children who Provided Care in the Previous Month

Note: Select event-study estimates of the effect of a parental fall on the likelihood of not working. Original estimates are plotted in red. Estimates dropping adult children who provided care in the previous month are plotted in blue.

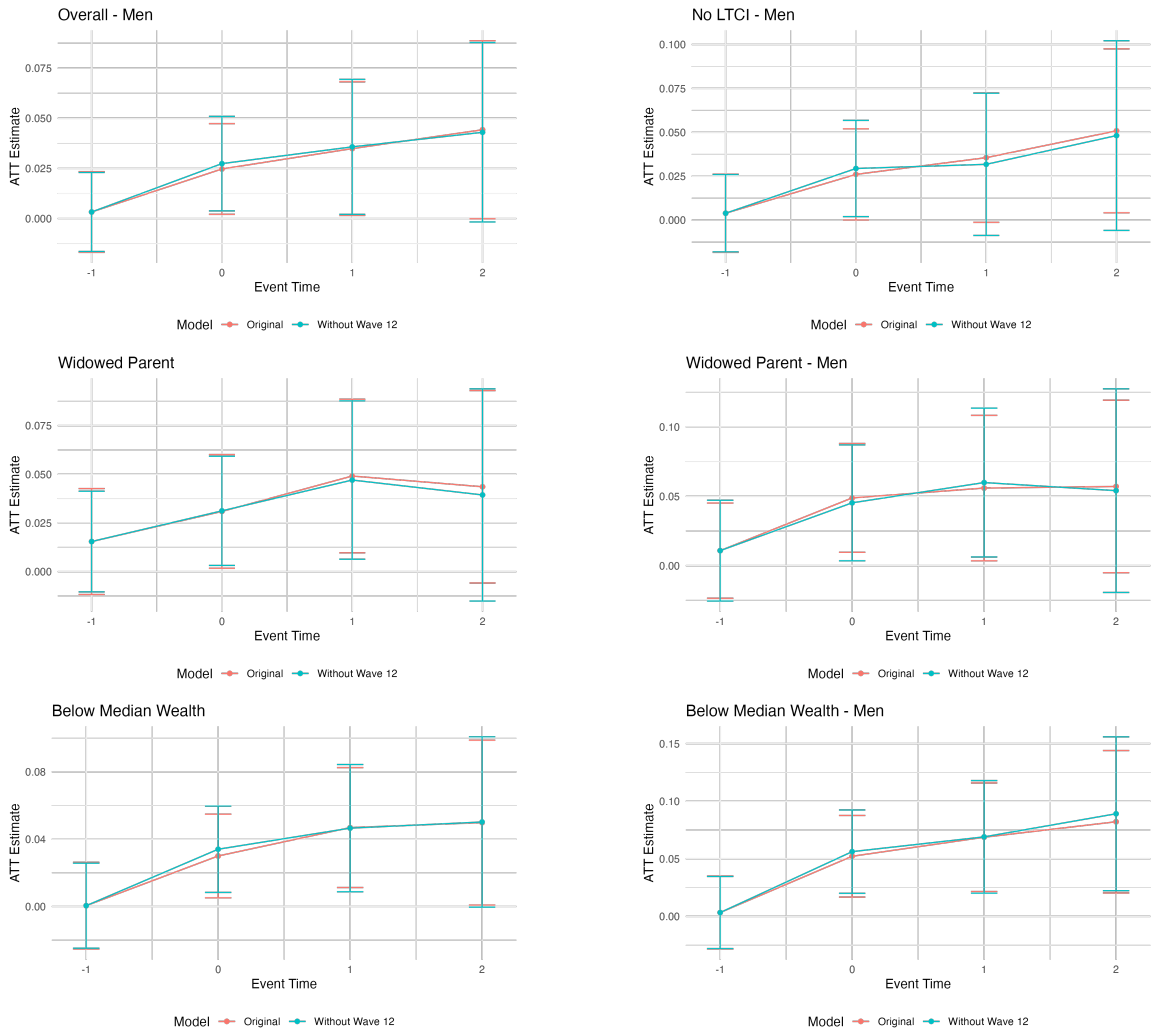

Figure A9: Event Study Plots of Original Estimates and Estimates without Wave 12

Note: Select event-study estimates of the effect of a parental fall on the likelihood of not working. Original estimates are plotted in red. Estimates dropping wave 12 are plotted in blue.

B Appendix Tables

Table B1: Pre-Treatment Trends Test Results

Outcome	**Sample**	**Pre-Trend Test p-value**
Work Outcomes		
Not Working	Full Sample - Men	0.561
Not Working	Widowed or Divorced	0.567
Not Working	Widowed or Divorced - Men	0.802
Not Working	Widowed or Divorced - Women	0.596
Not Working	No LTCI	0.893
Not Working	No LTCI - Men	0.217
Not Working	Below Median Non-Housing Assets	0.547
Not Working	Below Median Non-Housing Assets - No LTCI	0.581
Part-time	Below Median Non-Housing Assets - No LTCI	0.074
Not Working	Below Median All Assets - No LTCI	0.409
Part-time	Below Median All Assets - No LTCI	0.188
Not Working	Below Median NH Assets - No LTCI - Men	0.223
Not Working	Above Median Income - Men	0.865
Not Working	Above Median Income & No LTCI - Men	0.679
Caregiving Outcomes		
Is Helper	Full Sample	0.939
Is Helper	Full Sample - Men	0.526
Is Helper	Full Sample - Women	0.926
Is Helper	Widowed or Divorced	0.912
Days Helped	Widowed or Divorced	0.239
Is Helper	Widowed or Divorced - Men	0.949
Is Helper	Widowed or Divorced - Women	0.965
Is Helper	No LTCI - Men	0.964
Is Helper	Above Median Non-Housing Assets	0.541
Is Helper	Below Median - No LTCI - Men	0.907
Is Helper	Below Median - No LTCI - Women	0.736

Note: This table reports the p-values for the pre-trend test for parallel trends included in *did* for each of my statistically significant results.

Table B2: DiD and Event Study Estimates

	Full-Time		Part-Time		Not Working	
	Estimate	SE	Estimate	SE	Estimate	SE
Overall	-0.008	0.013	-0.009	0.008	0.017	0.013
-2	0.001	0.009	0.008	0.006	-0.009	0.008
0	-0.009	0.010	-0.007	0.007	0.015	0.009
2	-0.013	0.015	-0.004	0.009	0.016	0.013
4	-0.004	0.020	-0.015	0.011	0.020	0.018

Note: This table reports the event study and aggregated ATTs of a parental fall on full-time, part-time, and not working indicators. Each regression contains a control for child's gender, linear and quadratic controls for age, a quadratic term for parental age, and controls for a child's distance from their parent. All standard errors are clustered at the household level.

Table B3: DiD and Event Study Estimates - Men

	Full-Time		Part-Time		Not Working	
	Estimate	SE	Estimate	SE	Estimate	SE
Overall	-0.005	0.018	-0.013	0.009	0.031	0.015
-2	-0.007	0.012	0.012	0.008	0.000	0.010
0	-0.009	0.012	-0.010	0.008	0.022	0.011
2	-0.007	0.018	-0.013	0.010	0.032	0.015
4	0.001	0.023	-0.016	0.012	0.040	0.020

Note: This table reports the event study and aggregated ATTs of a parental fall on full-time, part-time, and not working indicators for men. Each regression linear and quadratic controls for age, a quadratic term for parental age, and controls for a child's distance from their parent. All standard errors are clustered at the household level. This sample contains 19,708 observations of 5,606 men, of whom 1,798 experience a parental fall.

Table B4: DiD and Event Study Estimates - Women

	Full-Time		Part-Time		Not Working	
	Estimate	SE	Estimate	SE	Estimate	SE
Overall	0.010	0.019	-0.003	0.013	0.003	0.017
-2	0.019	0.013	0.004	0.010	-0.017	0.012
0	0.002	0.014	-0.002	0.012	0.005	0.012
2	0.004	0.021	0.006	0.015	0.001	0.020
4	0.023	0.027	-0.013	0.017	0.002	0.025

Note: This table reports the event study and aggregated ATTs of a parental fall on full-time, part-time, and not working indicators for women. Each regression linear and quadratic controls for age, a quadratic term for parental age, and controls for a child's distance from their parent. All standard errors are clustered at the household level. This sample contains 20,506 observations of 5,872 women, of whom 1,873 experience a parental fall.

Table B5: DiD and Event Study Estimates for Children of Single Parents

	Full-Time		Part-Time		Not Working	
	Estimate	SE	Estimate	SE	Estimate	SE
Overall	-0.017	0.020	-0.019	0.012	0.036	0.018
-2	-0.023	0.014	0.012	0.010	0.011	0.013
0	-0.014	0.017	-0.013	0.012	0.028	0.014
2	-0.029	0.022	-0.014	0.015	0.044	0.020
4	-0.006	0.026	-0.029	0.016	0.036	0.023

Note: This table reports the event study and aggregated ATTs of a parental fall on full-time, part-time, and not working indicators for children of parents who are either divorced or separated. Each regression linear and quadratic controls for age, a quadratic term for parental age, and controls for a child's distance from their parent. All standard errors are clustered at the household level. This sample contains 20,591 observations of 5,956 children, of whom 1,583 experience a parental fall.

Table B6: DiD Estimates with Alternative Sample of Children

Group	Original	Anticipated
General	0.035	0.032
	(0.016)	(0.016)
Widowed or Divorced	0.041	0.051
	(0.019)	(0.023)
Widowed or Divorced - Men	0.054	0.051
	(0.024)	(0.023)
No LTCI	0.037	0.035
	(0.017)	(0.017)
Below Median Wealth	0.042	0.069
	(0.016)	(0.023)
Below Median Wealth - Men	0.068	0.069
	(0.022)	(0.023)

Note: This table reports the ATTs of a parental fall on indicators for the likelihood of not working for the cases where I found statistically significant results with an alternative sample including only adult children who did not provide care to their parents in the previous month. Standard errors are reported in parentheses. Each cell reports the ATT where each row corresponds to a different sample.

Table B7: Event Study Estimates of Financial Help for Never Caregivers

	Full Sample	Men	Women
Overall	0.021	0.024	0.018
	(0.010)	(0.010)	(0.009)
-2	0.002	-0.001	0.005
	(0.004)	(0.004)	(0.005)
0	0.011	0.014	0.009
	(0.005)	(0.006)	(0.005)
2	0.023	0.024	0.020
	(0.010)	(0.010)	(0.010)
4	0.028	0.034	0.025
	(0.014)	(0.016)	(0.015)

Note: This table reports the event study and aggregated ATTs of a parental fall on the likelihood a parent receives financial help from their children among the sample of adult children who never provide care in the previous month.

C Sample Construction

I conduct analyses in several subsamples to determine both the extent to which gender and alternative sources of parental care affect the labor market outcomes and caregiving supply of adult children. I first separate my sample into men and women and estimate the effects separately. Summary statistics for this sample are reported in Table C1.

Table C1: Children's Summary Statistics by Gender

Variable	Never Treated Men	Ever Treated Men	Never Treated Women	Ever Treated Women
Married	0.57 (0.5)	0.66 (0.47)	0.57 (0.49)	0.64 (0.48)
Partnered	0.08 (0.26)	0.06 (0.24)	0.05 (0.23)	0.05 (0.22)
Age	46.06 (8.81)	48.62 (7.57)	46.09 (9.02)	48.68 (7.47)
No. Kids	1.94 (1.71)	1.87 (1.58)	2.01 (1.55)	2.03 (1.46)
Days Helping Parent	0.33 (2.96)	0.16 (1.95)	0.62 (3.92)	0.19 (2.07)
Working Full-time	0.8 (0.4)	0.86 (0.34)	0.66 (0.47)	0.68 (0.46)
Working Part-time	0.05 (0.23)	0.03 (0.17)	0.09 (0.29)	0.1 (0.3)
Not Working	0.15 (0.35)	0.11 (0.31)	0.25 (0.43)	0.21 (0.41)
No. Individuals	3803	1797	3990	1874

This table reports summary statistics, with standard deviations in parentheses, by treatment group and gender for adult children, using the first observation for each child. The number of individuals per category is displayed at the bottom.

I next construct a sample of adult children whose parents are widowed or divorced. Older adults who are widowed or divorced are less likely to have caregiving from a romantic partner, thereby potentially increasing the caregiving burden for the adult children of these adults. In this sample, both the never-treated adult children and the ever-treated adult children have a parent who is either widowed or divorced. I require the parents of untreated children to be divorced or separated and require the parents of treated children to be divorced or separated at the time of the parental fall. Summary statistics are reported in Table C2.

I also consider both the role of parental LTCI and non-housing assets in determining children's outcomes. In order to ensure parents' LTCI status, in the "No LTCI"

Table C2: Children's Summary Statistics — Widowed/Separated Parents

Variable	Untreated	Treated
Percent Female	0.50 (0.50)	0.52 (0.50)
Age	44.97 (9.55)	46.84 (8.16)
No. Kids	1.96 (1.61)	1.92 (1.52)
Married	0.55 (0.50)	0.61 (0.49)
Partnered	0.05 (0.22)	0.04 (0.19)
Single	0.40 (0.49)	0.35 (0.48)
Is Helper	0.05 (0.21)	0.03 (0.17)
Days Helping Parent	15.63 (12.64)	10.43 (10.70)
Working Full-time	0.70 (0.46)	0.75 (0.43)
Working Part-time	0.07 (0.26)	0.06 (0.24)
Not Working	0.23 (0.42)	0.18 (0.39)
N	4377	1583

This table reports summary statistics, with standard deviations in parentheses, by treatment group for children of parents who are widowed or separated. The number of individuals per category is displayed at the bottom.

sample I require children's parents to never have LTCI. In the "Has LTCI" sample, I require children's parents to always have LTCI. Since some parents change their LTCI status over the course of the study, these sample populations do not add up to the total sample. Summary statistics are reported in Table C3.

Similarly, parental assets may change over the course of the study. To account for this, I categorize a household as having "Below Median Wealth" if for three or more waves, the household has below median wealth. I categorize a household as having "Above Median Wealth" if for three or more waves, the household has equal to or above median wealth. We might be concerned that this results in using the same households in both the "Below Median" and "Above Median" samples. However, only 260 households with 708 children are included in both samples. Dropping these households does not appreciably change my main estimates. Due to the smaller

sample sizes when dividing my sample by both parental wealth and LTCI status, I leave these observations in my primary sample. Summary statistics are reported in Table C4.

Finally, I take into account the interactions between LTCI and parental assets. The definitions of LTCI status and parental asset status are the same as the individual subsamples. Summary statistics are reported in Table C5.

Table C3: Children's Summary Statistics - LTCI Sample

	No LTCI		Has LTCI	
Variable	Untreated	Treated	Untreated	Treated
Percent Female	0.51	0.52	0.50	0.44
	(0.50)	(0.50)	(0.50)	(0.50)
Age	43.11	44.66	43.41	44.20
	(8.91)	(7.80)	(8.02)	(6.00)
No. Kids	1.91	1.87	1.94	1.98
	(1.59)	(1.48)	(1.61)	(1.30)
Married	0.55	0.64	0.59	0.79
	(0.50)	(0.48)	(0.49)	(0.41)
Partnered	0.07	0.04	0.05	0.02
	(0.25)	(0.19)	(0.22)	(0.13)
Single	0.37	0.31	0.35	0.19
	(0.48)	(0.46)	(0.48)	(0.39)
Is Helper	0.03	0.02	0.02	0.00
	(0.18)	(0.12)	(0.15)	(0.00)
Days Helping Parent	16.02	11.86	18.50	NaN
	(12.55)	(11.35)	(12.58)	(NA)
Working Full-time	0.72	0.77	0.76	0.82
	(0.45)	(0.42)	(0.43)	(0.39)
Working Part-time	0.07	0.07	0.07	0.08
	(0.26)	(0.25)	(0.25)	(0.27)
Not Working	0.20	0.17	0.17	0.10
	(0.40)	(0.37)	(0.38)	(0.30)
N	6500	2695	937	281

This table reports summary statistics, with standard deviations in parentheses, by treatment group for children of parents either have or do not have LTCI. The number of individuals per category is displayed at the bottom.

Table C4: Children's Summary Statistics - Assets Sample

	Below Median		Above Median	
Variable	Untreated	Treated	Untreated	Treated
Percent Female	0.52	0.52	0.49	0.50
	(0.50)	(0.50)	(0.50)	(0.50)
Age	42.89	45.29	41.64	44.00
	(8.58)	(8.13)	(7.34)	(7.12)
No. Kids	2.05	1.97	1.72	1.74
	(1.62)	(1.56)	(1.46)	(1.39)
Married	0.54	0.61	0.65	0.69
	(0.50)	(0.49)	(0.48)	(0.46)
Partnered	0.05	0.04	0.06	0.03
	(0.22)	(0.20)	(0.23)	(0.17)
Single	0.41	0.34	0.29	0.27
	(0.49)	(0.48)	(0.46)	(0.45)
Is Helper	0.03	0.02	0.01	0.00
	(0.18)	(0.15)	(0.08)	(0.06)
Days Helping Parent	14.70	11.82	11.36	10.38
	(12.83)	(11.70)	(12.36)	(9.65)
Working Full-time	0.71	0.76	0.80	0.79
	(0.46)	(0.43)	(0.40)	(0.41)
Working Part-time	0.07	0.06	0.08	0.08
	(0.26)	(0.23)	(0.27)	(0.26)
Not Working	0.22	0.19	0.12	0.13
	(0.42)	(0.39)	(0.33)	(0.34)
N	3225	2052	1803	2069

This table reports summary statistics, with standard deviations in parentheses, by treatment group for children whose parents have either below median or at or above median levels of non-housing assets. The number of individuals per category is displayed at the bottom.

	Below Med, No LTCI		Below Med, Has LTCI		Above Med, No LTCI		Above Med, Has LTCI	
Variable	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated
Percent Female	0.51	0.52	0.56	0.50	0.49	0.51	0.45	0.48
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)
Age	42.96	45.29	45.23	47.59	41.82	44.01	42.60	45.10
	(8.66)	(8.23)	(9.02)	(7.72)	(7.57)	(7.35)	(6.90)	(6.53)
No. Kids	2.08	1.99	2.04	2.08	1.73	1.67	1.75	1.91
	(1.63)	(1.58)	(1.72)	(1.57)	(1.45)	(1.29)	(1.44)	(1.63)
Married	0.53	0.61	0.53	0.56	0.65	0.68	0.64	0.73
	(0.50)	(0.49)	(0.50)	(0.50)	(0.48)	(0.47)	(0.48)	(0.44)
Partnered	0.05	0.04	0.05	0.07	0.06	0.03	0.04	0.03
	(0.23)	(0.20)	(0.21)	(0.26)	(0.24)	(0.18)	(0.20)	(0.17)
Single	0.41	0.34	0.42	0.36	0.29	0.29	0.31	0.23
	(0.49)	(0.48)	(0.49)	(0.48)	(0.45)	(0.45)	(0.46)	(0.42)
Is Helper	0.04	0.02	0.04	0.05	0.01	0.00	0.00	0.00
	(0.19)	(0.15)	(0.19)	(0.22)	(0.09)	(0.06)	(0.05)	(0.00)
Days Helping Parent	14.50	11.15	18.57	18.47	12.30	12.17	30.00	NaN
	(12.71)	(11.31)	(12.82)	(11.98)	(12.61)	(10.72)	(NA)	(NA)
Working Full-time	0.71	0.76	0.69	0.74	0.79	0.78	0.82	0.82
	(0.45)	(0.43)	(0.46)	(0.44)	(0.41)	(0.41)	(0.38)	(0.39)
Working Part-time	0.07	0.06	0.08	0.07	0.08	0.08	0.06	0.08
	(0.26)	(0.23)	(0.28)	(0.25)	(0.27)	(0.27)	(0.24)	(0.27)
Not Working	0.22	0.19	0.23	0.19	0.13	0.14	0.12	0.10
	(0.42)	(0.39)	(0.42)	(0.40)	(0.33)	(0.35)	(0.32)	(0.31)
N	2616	1740	385	303	1317	1524	414	559

Table C5: Children's Summary Statistics — LTCI & Assets Sample