Parental Mortality and Outcomes among Minor and Adult Children

Author: David A. Weaver*
Affiliation: Congressional Budget Office, Washington, D.C.
Corresponding author/address: David A. Weaver, Congressional Budget Office, Washington, D.C.;
email: david.weaver@cbo.gov

Abstract

In this paper, I take advantage of newly available data in the Survey of Income and Program Participation (SIPP) to document outcomes among individuals with deceased parents. I focus first on minors and find that about 2 million children in the United States have a biological mother or father who is deceased. This is the first direct estimate of the size of the orphan population in the United States. Relative to children with both parents living, these maternal and paternal orphans have less favorable educational and health outcomes but similar levels of economic well-being. I find the Social Security program provides extensive (but not universal) support to the child survivor population, with participation in the program potentially affected by the earnings of deceased parents prior to death and by awareness of benefit eligibility by adult members in the child's household. Similar to outcomes for child survivors, I find adult respondents who have deceased parents at the time of the SIPP have less favorable educational and health outcomes. In contrast to child survivors, adults with deceased parents – across a wide range of age groups – are more likely to have low levels of economic well-being. I also find, by examining a past legislative change in Social Security student benefits that would have affected several cohorts in the SIPP, that financial resources available to young adult survivors have effects on educational attainment and effects on income much later in life.

Keywords

Mortality, orphans, social security, education, health, poverty

Introduction

Some of the earliest developments in social policy in the United States centered on children who had lost a parent due to death. Skocpol (1992) argues that pension policy for veterans and survivors following the Civil War constituted the first large-scale social policy in the United States – between 1880 and 1910, the federal government spent more than 25 percent of its budget on benefits for orphans, widows and veterans. In 1935, legislation was enacted that not only created a new social insurance program (Social Security), but also several other programs including the means-tested Aid to Dependent Children program (the forerunner of the current Temporary Assistance for Needy Families (TANF) program in the United States). In the early years of the Aid to Dependent Children program, a sizeable percentage of the children on the program (43 percent) had a deceased father (Advisory Council on Social Security 1938). The most expansive policy development with regard to children with a deceased parent, however, came with the 1939 Amendments to the Social Security Act. Family benefits were added to the Social Security program, including benefits for children of deceased workers. The importance of this policy development can be seen in historical figures from the Social Security Administration – since the program's inception, approximately 25 million children have been awarded benefits based on the death of a parent (Social Security Administration 2019: Table 6.A1).

The 1939 Amendments denoted a shift in policy with regard to children, namely, a desire by policymakers to address economic security of children with a deceased parent through a social insurance program rather than rely mainly on means-tested approaches. Benefits for child survivors depended on whether the deceased parent had worked in Social Security covered employment and the benefit levels depended on the amount of earnings of the deceased parent in covered employment. This shift frames economic security not only as providing benefits to prevent material hardship but also to ensure continuity of the family's standard of living following the death of a worker. The Social Security Act has been amended a number of times since 1939, but the basic structure of providing benefits for child survivors based on a parent's work in Social Security covered employment remains. Many other countries with long-standing social insurance programs also provide benefits to children with deceased parents (Social Security Administration 2018a). Even in the absence of social insurance programs, there have been concerted international efforts to support orphans in countries with high levels of adult mortality (United Nations Children's Fund 2004).

In addition to a long history of policy development designed to support children with a deceased parent, there has been an extensive research literature focused on how family disruptions affect child well-being. Much of this research has focused on how divorce affects child well-being along several dimensions, including success in school, emotional well-being and economic well-being. An extensive review of the literature by Amato (2010) found divorce was, on average, associated with lower levels of well-being among children and adults along a number of dimensions. Amato and Anthony (2014), using a sample that included a small number of survivors, found suggestive evidence that loss of a parent due to death had similar effects to divorce with regard to math scores and feelings of being in control. There are reasons, however, to believe that survivors would differ from children with divorced parents along other dimensions, such as economic well-being, because Social Security provides direct income support in many cases involving parental death. Evidence of the importance of Social Security income in mitigating negative outcomes has been examined in some studies. Tamborini and Cupito (2012) found sizeable effects of Social Security on reducing poverty among all child beneficiaries and found that Social Security, in particular,

was an important source of family income to beneficiaries with a deceased parent. Dynarski (2003) found that a previous provision of Social Security, which had provided survivor benefits to college age students, had large, positive effects on college attendance. Overall, the literature suggests child survivors may have negative outcomes along some dimensions but may have adequate income due to Social Security policy.

Effects of family disruption during childhood can continue into adulthood, but a study by Maier and Lachman (2000) found mixed effects. Using the Midlife Development in the US survey, they found that divorce, and not parental death, had important and negative effects on adult outcomes. Parental death, on the other hand, was not predictive of many outcomes and varied in whether its effects were positive or negative. While women who had lost a parent in childhood had a lower level of psychological well-being in terms of depression, similarly situated men were more likely to report higher levels of psychological well-being in terms of confidence or autonomy. Further, Tennant (1988) argues that death of a parent in childhood is unlikely to have negative psychological effects over the long-term. Umberson and Chen (1994) examine a somewhat different issue among adults, namely, whether death of a parent *after* a person has already reached adulthood affects the person's well-being. Examining adults in 1986 and 1989 from the Americans' Changing Lives Survey, they found adults who lost their parents during the three-year period between surveys were more likely to experience psychological distress, alcohol consumption and declines in physical health. The literature on adult children and parental death is small; the development of a larger literature may resolve whether parental death (and its timing) have consistent associations with a broad range of adult outcomes.

Both policy discussions and social science research regarding parental death have been hampered by a lack of data. A recent development, however, offers promise in terms of answering both policy and research questions. For the first time in United States history, a large, nationally representative survey has collected information on parental death. In 2014, the redesigned Survey of Income and Program Participation (SIPP) queried respondents about information on the death of their biological parents. The SIPP, which is fielded by the United States Census Bureau, also collected extensive information from respondents about family income, health, educational and social outcomes, and participation in government programs. When combined with responses on parental death, researchers and policymakers are now in a position to assess the circumstances of children with deceased parents and assess the effects of current government programs and potential changes in programs with regard to this population. More broadly, SIPP offers a chance for additional demographic research on adults with deceased parents. This is because information on parental death was not just captured for children but for all respondents, including adults, in SIPP.

This paper seeks to fill in some of the gaps in research and policy discussions using the new SIPP data that have been unaddressed due to the lack of data. One focus will be a detailed analysis of children in the United States by survival status of parents. The SIPP data allow for the direct estimation, for the first time, of the number of children in the United States with deceased parents. The data also allow for documenting how economic, social, and educational outcomes among children vary by survival status of parents. Further, this paper will examine the participation in government programs by children with a focus on the Social Security program. That analysis will provide researchers and policymakers with baseline information on whether parental death is uniformly associated with negative outcomes or whether there is variation depending on the type of outcome. For example, the Social Security program may effectively mitigate negative economic outcomes by providing cash benefits designed to replace the earnings of a deceased

parent. Non-economic outcomes (health and educational outcomes), however, may be less affected by family finances and may be rooted more deeply in the disruptive effects of a fundamental change in family structure. Examining the Social Security program will also help policymakers assess the effectiveness of government programs designed to serve children with deceased parents. One fundamental issue that has never been addressed to date, due to previous data limitations, is an assessment of participation in the Social Security program by children with deceased parents. Social insurance systems are often thought of as universal, but it is an important empirical question the extent to which children with deceased parents are covered under Social Security's current rules and participating in the program. Further, it is important to understand the characteristics and circumstances of children with deceased parents who are not receiving benefits from Social Security.

Another focus of this study will be to stimulate future research by providing an initial analysis of the circumstances of adults with deceased parents. Initially, I will examine issues from a broad and associational perspective. Specifically, I will examine a number of socioeconomic, economic, and health outcomes for adults with deceased parents, after controlling for the race/ethnicity, educational attainment, age, sex, and region of the adult. This analysis serves two purposes. First, it begins to clarify mixed findings in the literature about whether there are negative effects in adulthood from having a deceased parent. Second, this analysis will reveal possible mechanisms between parental death and well-being in adulthood. I then take a more granular step by examining the effect of parental death early in life versus later in life. The results suggest that early-in-life death may have stronger effects on adult outcomes. Finally, I test for direct causal effects by examining a natural experiment that occurred in the history of the Social Security program. Dynarski (2003) examined an abrupt change in Social Security that affected a narrow set of college-age adults in the late 1970s and early 1980s. She finds that the provision (end) of Social Security survivor benefits to college age students increased (decreased) college attendance. Using the SIPP, I extend Dynarski's work and determine the long-term implications of this policy change, namely, whether the effects on educational attainment affected household income of these cohorts now that they are in their 50s. Similar to Dynarski, I find evidence that this policy change affected educational attainment and, extending Dynarski's work, I find the change had sizeable effects on household income later in life.

For much of the analysis in this study, I will focus on minor or adult children who have one *or* both parents deceased, although in some analysis information will be provided for children with a father deceased, a mother deceased, and both parents deceased. With regard to terms, I will interchangeably use the following terms to refer to minors with one *or* both parents deceased: orphans, children with a deceased parent, or children with either parent deceased. Historically, the term orphan has often been used to describe a situation where both parents of a minor child are deceased, but I will follow a more recent definition (United Nations Children's Fund 2004) where orphans refer to minor children with one or both parents deceased. Finally, where applicable, I will refer to minor children who have lost a father as paternal orphans and those who have lost a mother as maternal orphans.

The structure of this paper is as follows. The next section will present descriptive statistics from the SIPP both for purposes of evaluating the quality of the data on parental mortality and for understanding the context for analysis. That will be followed by a methods section and a section identifying the limitations of the data and methods used in this study. A results section with the analysis will follow, and the paper will end with Discussion and Conclusion sections.

Data

Survey of Income and Program Participation
The Survey of Income and Program Participation (SIPP) is a major household survey of the United States population that is conducted by the United States Census Bureau. From its beginnings in 1983, the SIPP survey program has focused on accurate measurements of income and participation in government transfer programs (U.S. Census Bureau 2019). This study uses the first wave of the 2014 SIPP, which was fielded between February and June of 2014. After the application of survey weights, the sample of 53,000 households in the 2014 SIPP is representative of the civilian noninstitutionalized population in the 50 states and District of Columbia.[1]

The SIPP survey program has a long history of collecting information on income, program participation, demographics, and other key variables. Crucial to this study, however, is a special feature implemented in the 2014 SIPP: a section of the survey questionnaire devoted to parental mortality. Respondents were queried, for each biological parent, on whether the parent was living or deceased at the time of the survey. If the parent was deceased, the respondent was asked in what year the parent died. In a small percentage of cases, respondents did not provide survival status of the father or mother and the Census Bureau imputed this status. In the SIPP, for children, respondents reported the survival status of both the mother and father in 92.7 percent of the cases; in the remaining 7.3 percent of cases the Census Bureau imputed survival status for one or both parents. For adults ages 25 to 74, respondents reported survival status in 90.2 percent of the cases, with imputations for one or both parents occurring in the remaining 9.8 percent of cases. When the Census Bureau must impute survival status, it uses a "hot deck" procedure that fills in the missing survival status from a "donor" record; donors and recipients (those with missing values) are matched based on having similar background characteristics (U.S. Census Bureau 2016:122-127). The imputation rates are somewhat higher for year of death variables because a respondent may report, for example, a deceased father but may not recall when he died. Among adults, ages 25 to 74, where a father or mother is deceased based on a survey response *or* a Census Bureau imputation, 75.9 percent of the cases are ones in which the respondent reported the relevant year of death (mother, father, or both). In another 10.7 percent of the cases, the respondent knew something about the timing of the death (how old the respondent was when the parent died or whether the death occurred during the respondent's childhood) that allowed the Census Bureau to impute a year of death consistent with that information. For the remaining 13.4 percent of cases, the Census Bureau uses a "hot deck" procedure to assign year of death.

In general, I will use data as they appear in the SIPP file released by the Census Bureau, including values that the Census Bureau imputed.[2] This approach preserves a representative sample because I do not drop observations with imputed values and it takes advantage of information, albeit limited, that informed the Census Bureau's imputations. In the analysis that employs regression approaches, the effect of using the imputed values will tend to bias coefficients toward zero because random noise is introduced into the measurement of explanatory variables (Wallace and Silver 1988:252). Hence, when I find effects, they are

---

[1] Technical documentation for the 2014 SIPP is available at U.S. Census Bureau (2018).
[2] I exclude a small number of sample members in this study who have potentially erroneous information on parental death, namely, cases where a deceased mother has a year of death before the respondent's year of birth and cases where a deceased father has a year of death two years or more prior to a respondent's death.

likely to be conservative estimates. In some cases, I conduct robustness checks and examine results when observations with imputed values are dropped. Finally, I exploit the information on imputations to study the effects of respondent knowledge on participation in the Social Security program.

The Census Bureau prefers to interview all members of the SIPP household. In some cases, however, proxy interviews are conducted in which another member of the household provides information for a household member who is unavailable. With regard to children, interviews are generally proxy interviews with information gathered from the mother, father, or householder (the mother is the preferred source of information for children in the SIPP, if she is available). Nonsampling error occurs in all surveys, including errors due to incorrect recall regarding events or their timing. Thus, in addition to imputations, the data on parental death are subject to some error because some individuals or their proxies incorrectly reported fact or year of a parent's death.

In general, I view the data on fact of parental death to be of good quality because imputation rates are low due to the fact that a parent's death is a prominent event and, therefore, clear in the mind of a respondent, and because the data exhibit reasonable patterns (discussed below). I view the data on the year of a parent's death to be valuable and I use it in selected applications in this paper. In some applications, I place individuals in broad groups and thereby minimize the effect of minor errors in the reporting of the specific year of death. In one application, where I use year of death to identify a policy effect, I do a robustness check to determine if dropping observations with imputed values has any effect on the results. Finally, as discussed below, reported year of death from the SIPP, including imputed values, is consistent with data from the vital statistics system, suggesting it is of good quality.

Descriptive Statistics
Because SIPP data on parental mortality are a recent innovation, it is useful to examine descriptive statistics to check for plausible or reasonable patterns in the data. Figure 1 (*all figures and tables are in the Appendix to the present document*) shows parental death variables by age of respondent in the SIPP. About 2.7 percent of children (or about 2 million children) in the United States have at least one parent deceased. These children are most commonly paternal orphans (2.2 percent of children in the U.S. have a deceased father, compared to 0.6 percent of children with a deceased mother). A very small percentage of children in the U.S. (roughly 100,000 children or about 0.1 percent of the child population) are estimated to have lost both parents due to death. These are the first direct estimates of the size of the orphan population in the United States.

As expected, a strong pattern with regard to age is revealed in Figure 1. While only 2.7 percent of children have a deceased parent, 34.3 percent of individuals ages 35 to 44 have a deceased parent. For the oldest group of respondents (75+) parental death is nearly universal. Within age groups, I find higher percentages of respondents have lost a father as compared to a mother. This result is expected given the long history of higher death rates for men in the United States (Social Security Administration 2005). In Figure 2, I examine the percentage of persons with at least one parent deceased by income and age of respondent.[3] I find that individuals with family income in the lowest quartile in their age group have substantially higher

---

[3] For this purpose, I standardize income across families of different sizes by defining income as family income as a percentage of the appropriate United States poverty threshold. The poverty thresholds vary by family size and take account of household economies of scale.

rates of parental mortality than those in the highest quartile of income for their age group. For example, among individuals ages 35-44, 43 percent of low-income persons have at least one parent deceased; the corresponding figure for high-income persons is only 26 percent. To the extent that income of respondents mirrors the economic environment of their parents, these results are consistent with an extensive literature in the United States and elsewhere that mortality outcomes differ sharply across the income distribution (Chetty et al. 2016).

It also useful to compare SIPP results, where possible, to estimates from other surveys and to projections and data from actuaries at the Social Security Administration (SSA). Using life tables to estimate survival status of parents (indirect methods), SSA estimates about 3.1 percent of children in the Social Security Area population in 2014 are paternal or maternal orphans (Social Security Administration 2011:51). Indirect estimates for the Social Security Area Population, which include individuals in territories of the United States and certain individuals overseas, are not directly comparable to the SIPP-based numbers, but the estimate of 2.7 percent children with a deceased parent is roughly similar in magnitude to the 3.1 percent estimate from SSA. Turning to a comparison of SIPP with other surveys, I note that an older survey of youth (the National Longitudinal Survey of Youth fielded in 1979) indicates that by age 20, 8.1 percent of White children had a deceased father (Umberson et al. 2017). Using a more recent survey of a school-based sample (the ADD Health Survey) those authors found 4.3 percent of White children had a deceased father by age 20. From the SIPP, I tabulate that 4.8 percent of White children ages 18-22 have a deceased father. Differences in survey design and time period make direct comparisons difficult, but SIPP estimates are broadly in line with estimates for this age group from other survey sources.

Figures 1 and 2, and information from other sources, are helpful in assessing fact of death information on parents. To examine year of death information in the SIPP, I conduct comparisons to life tables produced by the Social Security Administration (2005) that are based on vital statistics data. Figure 3 shows results for four parent cohorts from SIPP: parents born in 1930, 1940, 1950 and 1960 (in addition to information on parental mortality, SIPP collects information on year of birth of parents). From the SIPP, for the 1940 parent cohort where fathers are deceased at the time of the SIPP, the average age of the father at his death is 59.9. Using life tables for men born in 1940 and assuming survival to 1960, the average age at death for deaths that occurred between 1960 and 2014 (time of the SIPP) is 59.5. The corresponding figures for women born in 1940 are 60.8 and 61.6.[4] The averages from the SIPP and vital statistics data for the other parent cohorts are also, in general, close.

Finally, to help assess SIPP data and to provide context for this study, I present in Tables 1-3 additional descriptive information from SIPP for two illustrative populations. Tables 1-2 provide information on children (under age 18), and Table 3 provides information on a middle age population (ages 35 to 54). About 2.4 percent of non-Hispanic White children have at least one parent deceased, but 4.3 percent of non-Hispanic Black children have at least one parent deceased (Table 1). These results are consistent with a large literature documenting less favorable mortality outcomes among Black individuals (see, for example, Kochanek, Arias, and Anderson (2013) and Umberson et al. (2017)). Hispanic children are slightly less likely than non-Hispanic White children to have a parent deceased (2.3 percent as compared to 2.4 percent) although the difference is not statistically significant. Although studies have found socioeconomic status

---

[4] For the life table calculations, I assume individuals who fathered a child or gave birth to a child survive to early adulthood and use age 20 as an approximation to represent early adulthood.

is lower among Hispanics, studies do not find less favorable mortality outcomes and a number of studies find more favorable outcomes for Hispanics (McDonald and Paulozzi 2019).

Table 2 reveals reasonable patterns with regard to Social Security participation among children. Based on SIPP, an estimated 45 percent of children with at least one parent deceased receive Social Security. Estimates from the Social Security Administration indicate about 49 percent of orphans in 2014 receive benefits.[5] Orphans with a deceased mother are less likely to participate in the Social Security program. Mothers may be more likely to have an intermittent history of earnings prior to death; survivors may be less likely to know they are eligible for benefits or may not be able to establish eligibility because the mother did not work enough in Social Security covered employment. Children with a deceased parent are somewhat more likely to participate in the Medicaid program, which provides free or low-cost healthcare, than children with neither parent deceased. The Supplemental Nutrition and Assistance Program (SNAP), which provides assistance to low-income families to purchase food, is an important program for children, although I do not observe differences between orphans and non-orphans (roughly 21 percent in each group receive SNAP assistance). Within the orphan population, however, children with a mother deceased are less likely to receive SNAP than children with a father deceased. Surviving fathers may be more likely to have higher earnings that preclude eligibility for means-tested nutrition assistance. Finally, I note that the Supplemental Security Income (SSI) program, which provides cash benefits to low-income families with disabled children, and the Temporary Assistance for Needy Families (TANF) program, which provides benefits for low-income families with children, affect only a small percentage of the orphan and non-orphan populations.

With regard to family structure, Table 2 indicates that children with a deceased parent are far more likely to be in a household where a grandparent is the householder than children with both parents living (about 20 percent compared to about 7 percent). In addition to collecting information on a parent's death, SIPP also collected other information on each biological parent, including whether each parent was born outside of the United States. This new data reveal that a substantial number of children in the United States (about 30 percent) have one or both parents who were born outside of the United States. While the percentage does not vary sharply by parental mortality status, this result has important implications, explored later in this study, for the participation by orphans in the Social Security program.

Table 3 presents statistics for middle age adults. I find strong patterns with regard to parental mortality, race, and educational attainment. Among non-Hispanic White individuals, 48.1 percent have a deceased parent. For non-Hispanic Black individuals, the percentage is 58.5 percent. These results are consistent with research that finds less favorable mortality outcomes for Black individuals (Umberson et al. 2017). For individuals who have one or more years of college education, 44.5 percent have a parent deceased; the figure for those with less education is about 12 percentage points higher (56.3 percent). Assuming educational attainment is correlated among parents and offspring these findings are consistent with research that finds less favorable mortality outcomes for those with limited educational attainment (Buckles et al. 2016).

---

[5] Using indirect methods, SSA estimates for 2014 that there are about 2.4 million orphans in the Social Security Area population. Further, the agency estimates, for that year, that there are about 1.2 million children under age 18 who are receiving survivor benefits (Social Security Administration 2011:51; Social Security Administration (2018b)).

Methods

I use three methods in the analysis sections of this paper: means, logistic regressions, and ordinary least squares (OLS) regression. Descriptive statistics, using means, provide an overview of the general circumstances of populations under study. Logistic regressions allow me to assess the effects of parental death on categorical outcomes after controlling for demographic and other factors. From these regressions, I report out odds ratios. Odds represent the ratio of the probability of an outcome occurring (for example, being in poverty) to the probability of the outcome not occurring (not being in poverty). The odds ratio, in turn, reflects the odds for one group relative to the odds of another group (Allison 2012). I use OLS regression in one case (when examining a policy change in Social Security) – that approach allows me to compare the results to a prior study (Dynarski 2003) that also used OLS.

With one exception, standard errors are calculated using replicate weights in the SIPP and Balanced Repeated Replication (BRR) methods. The BRR method is recommended by the Census Bureau (U.S. Census Bureau 2017:22-23) because it accounts for the complex survey design of SIPP. Replicate weights were produced by the Census Bureau and allow for 240 subsamples from the overall sample; variability from the subsamples is used to estimate standard errors and tests of statistical significance. The one exception to using the BRR method is for the OLS regression – that application is a linear probability model. Those models have heteroskedastic errors (Wooldridge 2003:244), and I calculate corrected standard errors using an approach developed by White (1980). I use SIPP survey weights in all estimates.

I employ several variables from SIPP in the analysis that follows, but outcome variables broadly fit into three categories: socioeconomic (including education), economic well-being, and health. For children, socioeconomic variables relate to success in school, participation in outside activities, and engagement with parents. Whether or not a child is successful in school is measured by whether he/she has been expelled or repeated a grade, whether he/she cares about school, and whether he/she is in a class for gifted students. Outside activities include participation in clubs, sports, or music programs and attending religious services. Engagement with parents is measured by how often during a week a parent has dinner with the child. For adults, socioeconomic variables capture educational attainment (less than one year of college), participation in the workforce (monthly earnings greater than $100), and marital status. Economic well-being for both children and adults is measured using official poverty (family income below the poverty threshold) and using different measures of material hardship. The latter measures include food insecurity – SIPP classifies individuals as having low or very low food security based on questions to the householder about whether food that was purchased did not last, if balanced meals could not be afforded, or meals were cut in size or skipped. Material hardship measures also include whether the householder reported being unable to pay the rent or mortgage or being unable to pay utility bills. Disability for children and adults is measured by the self-reported presence of at least one of six core disabilities (Hearing, Seeing, Cognitive, Ambulatory, Self-Care, Independent Living). For adults, I also assess health using self-reported health status (poor or fair health) and receipt of Social Security Disability Insurance.

In this study, I generally use data as of the time of the survey (2014) or for the month at the end of the SIPP reference period (December 2013). When measuring poverty status, I use total income across all months in the reference period (2013) to match the official measurement of poverty in the United States.

Finally, the analysis for children focuses generally on the population under age 18, but in some analysis I examine children ages 6 through 17. With regard to adults, I examine the population ages 25 to 74, but group respondents into tighter (10 year) age categories. The analysis in the paper applies to large segments of the 2014 United States population, including 73 million children under age 18 and 189 million adults ages 25 to 74.

Limitations

There are both data and methodological limitations associated with this study. While the evaluation of the survey data on parental death presented in the Data section leads me to conclude that it is of good quality, the Census Bureau does not have a long history of collecting this information as compared with other variables collected in the SIPP survey program. Further, while researchers have used data from the SIPP survey program for a number of studies, the parental death data are new. For these reasons, less is known about survey errors on the parental death data and the effects of errors on the measurement of respondent outcomes. In addition, the data on parental death are limited. Important aspects of death – such as cause of death – are not captured in the survey data. Such information would be valuable for two reasons: certain causes of death may sharply affect outcomes (for example, suicide of a parent) and certain causes of death (for example, accidents) would plausibly be exogenous and suitable for measuring causal effects of parental death. Finally, another data limitation is that, while SIPP captures a rich set of outcomes, it does not measure some important outcomes that have been used in the literature on parental mortality, such as alcohol use, psychological outcomes, self-assessed emotional outcomes, and test scores.

With regard to methodological limitations, this study, in general, seeks to describe outcomes or associations. While in many cases I control for a number of important variables, I can generally only discuss plausible causal pathways between parental death and outcomes. I use one "natural" experiment to identify a causal link between parental death, financial resources for college, and educational attainment and income later in life. That, however, is an exception to the general analysis in this study; future studies using this data may identify other methodological approaches or other natural experiments to better assess the causal mechanisms between parental death and outcomes.

Results

Outcomes for Minor Children
I first examine outcomes reflecting the economic well-being of children (Table 4). The estimates, very generally, suggest that children with deceased parents do not have high rates of poverty, near poverty, or material hardship relative to children whose parents are still living. For example, the estimated poverty rate among children with a deceased parent (22 percent) is roughly the same as the rate for children with neither parent deceased (23 percent). Similarly, estimates of material hardship (household has difficulty dealing with expenses related to housing, utilities, and food) are roughly comparable across the two groups. These findings may suggest government programs that provide cash or in-kind benefits mitigate the effects of lost income and resources due to a parent's death during the childhood years.

I explore this issue further using logistic regressions that control for race/ethnicity, sex, age, and region. Among all children (column 1, Table 5), those with either parent deceased do not have statistically different odds of poverty than those with neither parent deceased. Examining the role of Social Security, I restrict the population to children with either parent deceased (column 2, Table 5). The odds of a paternal or maternal orphan on Social Security being poor are 55 percent lower as compared to the odds for an orphan not on Social Security. I consider this at least suggestive evidence that Social Security limits poverty among children with a deceased parent through its provision of cash benefits to survivors. [6]

As there is some evidence that Social Security affects poverty outcomes and because only 45 percent of children with a deceased parent are participating in the program (from Table 2), it is useful to consider factors that affect participation in Social Security in more detail. Some survivor children may not receive Social Security because the deceased parent did not achieve currently or fully insured status under the Social Security program, which is a requirement for a child to be eligible for benefits. In general, insured status is achieved if the deceased parent had recent or extensive work in Social Security covered employment.[7] Other factors may also affect receipt of benefits. With fragmented family structures and a lack of knowledge about program rules, some eligible children likely miss their entitlement to benefits. For example, an unmarried mother who is no longer in contact with the child's father may not apply for benefits for the child because she may not know the father died or that his death makes the child eligible for Social Security.

To analyze participation in the Social Security program, I first restrict the sample to orphans where survival status of the mother and father were reported in the survey and not imputed. Thus, the sample is composed of cases where fact of death of a parent (but not necessarily year of death) is known by the SIPP respondent. My analysis (presented in Table 6, column 1) reveals several striking results. The odds of a child with a deceased parent who was born outside of the United States receiving Social Security are dramatically smaller (74 percent smaller) than the odds for orphans who do not have a deceased parent born outside the United States. This result is plausibly tied to limited earnings by such parents under the United States Social Security program and therefore a lack of insured status. The odds that non-Hispanic Black children receive Social Security are 59 percent lower than the odds that non-Hispanic White children draw benefits, which may reflect weaker attachment to the labor market by the deceased parent and a resultant lack of insured status. The point estimates suggest lower odds for Hispanic children and children where the mother is deceased, but these effects are not statistically significant.

The SIPP does not have direct information regarding knowledge of program eligibility, but I posit that children in extended family situations (for example, in the household of a grandparent) or where the SIPP

---

[6] As a robustness check for results in Table 5, I excluded from the sample individuals who had survival status of the mother or father imputed by the Census Bureau. Similar results were obtained: orphans did not have statistically different odds of poverty than non-orphans and, among orphans, Social Security beneficiaries had lower odds of poverty (p-value < 0.05).

[7] Technically, the deceased parent must be currently or fully insured. Currently insured status is achieved if the deceased parent worked in Social Security covered employment and earned at least six quarters of coverage in the 13 quarters prior to his or her death (for 2018, a quarter of coverage is earned for each $1,320 of earnings, up to a maximum of four quarters of coverage). Fully insured status is achieved, generally, by having at least one quarter of coverage for each calendar year after turning 21 and the year before death.

respondent is unaware of details about the death of the child's parent are situations where knowledge of a child's eligibility for Social Security may be more limited. Results in Table 6, column 1 indicate that children in households where a parent is not the householder and children where the SIPP respondent did not know the year of death of the child's parent have sharply lower odds of participating in the Social Security program (odds ratios of 0.31 and 0.25 respectively). I believe it is plausible, though not conclusive, that these variables reflect information gaps: individuals in these households may know less about the deceased's Social Security work history or eligibility flowing from such history.

As a robustness check, I next consider whether the variables that predict Social Security participation generally predict participation in government programs or whether they capture effects that are specific to the Social Security program. Columns 2 and 3 of Table 6 repeat the logistic regressions but measure participation in the Medicaid and SNAP programs. An important result is that the variables reflecting information gaps for the Social Security program are not statistically significant predictors of participation in these other programs; they appear to capture Social Security specific participation where knowledge of the key eligibility requirement involves knowledge about the deceased parent. Another important finding is that having a deceased parent born outside the United States does not affect participation in Medicaid or SNAP; its ability to predict participation in the Social Security program is thus plausibly tied to that program's rules on insured status requirements. Finally, non-Hispanic Black children are more likely to receive Medicaid and SNAP, but less likely to receive Social Security. This is consistent, again, with race reflecting a lack of insured status of the deceased parent under Social Security.

Moving to educational, health, and social outcomes (Table 7), I find some evidence of negative educational outcomes among children with deceased parents. Nineteen percent of such children have been expelled from school or held back a grade compared to 11.8 percent for children with neither parent deceased. Children with deceased parents are also somewhat less likely to be in gifted classes. In addition, the likelihood of disability is higher among children with a deceased parent as compared to children with both parents living. However, broadly speaking, social or other outcomes and activities are similar regardless of parental mortality, with large percentages of child survivors being active in family life, religious services, and clubs, sports or music.

Table 8 presents results indicating parental death affects educational and health outcomes even after controlling for race/ethnicity, sex, age, and region. For example, the odds of being expelled or repeating a grade for children with a deceased parent are 48 percent higher than the odds for children with both parents living. For orphans, the odds of being in a gifted class are 31 percent lower than the odds for children with both parents living. Finally, I find the odds of disability for paternal and maternal orphans to be 43 percent higher.[8] In logistic regressions that are not shown, I find that Social Security does not have statistically significant effects on the educational or disability outcomes among children with a deceased parent after controlling for race/ethnicity, sex, age, and region. Thus, while there is evidence that cash income from Social Security affects an economic outcome (poverty), I do not find evidence that it affects non-economic

---

[8] Similar results to those presented in Table 8 were found when I excluded from the sample individuals who had survival status of the mother or father imputed by the Census Bureau. In the three logistic regressions from that sample, I again found having a deceased parent was associated with higher odds of being expelled or repeating a grade (p-value < 0.01), lower odds of being in gifted class (p-value < 0.05), and higher odds of having a disability (p-value < 0.05).

outcomes among children. The non-economic outcomes may be more sensitive to the fundamental disruption to the family from the loss of a parent.

Outcomes for Adult Children

In this section, I turn to the adult population and examine whether having a deceased parent is associated with outcomes for the respondents along several socioeconomic and health dimensions. I place respondents in groups based on their ages and estimate probability models for each outcome measure and for each age group. In Table 9, I first display unadjusted odds ratios from 44 logistic regressions that measure the effect of having a deceased parent on a specified outcome for a given age group. I refer to these as unadjusted because no control variables are used in the logistic regressions. The odds ratios displayed in Table 9 reflect the ratio of the odds for individuals with a deceased parent to the odds of individuals with both parents living. Odds ratios in Table 9 that are greater than 1 indicate those with deceased parents have higher odds of experiencing the given outcome. For ease of exposition, I group outcomes into three broad sets: socioeconomic, economic well-being, and health. Further, outcomes in Table 9 are defined in terms of lower levels of socioeconomic status, economic well-being, and poorer health (for example, having educational attainment below one year of college, having income below poverty, and having fair or poor health). Thus, odds ratios greater than 1 indicate having a deceased parent is associated with a less favorable outcome. Very clear patterns emerge in Table 9. Nearly all odds ratios (41 of 44) are estimated to be greater than 1, meaning having a deceased parent is estimated to be associated with less favorable outcomes. Further, these associations are generally statistically significant across outcomes and age groups.

I next present adjusted odds ratios that control for single year of age, race/ethnicity, sex, and region (South) (Table 10). Because socioeconomic status has been found to be an important determinant of income and health outcomes, I also include education (having less than one year of college) as an additional control variable in 39 of the 44 logistic regressions (all regressions but the ones where education is the outcome variable). Even with these controls, I find the same pattern as with the unadjusted estimates. Nearly all odds ratios (41 out of 44) are greater than 1, indicating parental death is associated with less favorable outcomes. Further the estimates are generally statistically significant and the magnitudes are large.[9] Among persons ages 45-54, having a deceased parent results in odds for limited education, having income below poverty, and being in fair or poor health that are 59 percent, 34 percent, and 52 percent higher, respectively, than the odds for individuals with both parents living. Parental death is consistently found to have statistically significant effects across age groups with the exception of the oldest group (65-74) where parental death is a very general characteristic of the age group.

The health outcomes are of particular interest because the effects of parental death are large and are consistent across different types of health outcomes. Among persons ages 35 to 44, the odds of having "bad" health are 37 and 44 percent higher for persons with a deceased parent, depending on whether self-reported poor or fair health or presence of at least one core disability (Hearing, Seeing, Cognitive, Ambulatory, Self-Care, or Independent Living disability) is used to measure health outcomes. In addition to self-reported assessments of health, outcomes where an independent assessment of health is considered

---

[9] Similar results to those presented in Table 10 were found when I excluded from the sample individuals who had survival status of the mother or father imputed by the Census Bureau.

also reflect a strong association with having a deceased parent.   Respondents with a deceased parent, in all applicable age groups, are more likely to have met the Social Security Administration's (SSA's) definition of disability and receive Social Security Disability Insurance (SSDI) benefits. SSA defines disability as an inability to engage in substantial gainful activity due to a medically determinable physical or mental impairment expected to last at least 12 months or result in death.[10]   Among those at disability-prone ages (55-64), having a deceased parent increases the odds of receiving SSDI by 43 percent. The findings suggest parental death is predictive of health outcomes of offspring even when those offspring are in their adult years.   Such an association may reflect a shared physical environment that existed for many years and shared family health traits that directly tie a parent's health to his or her offspring.

I next explore the timing of parental death and its associations with different outcomes. Individuals who lose a parent before reaching adulthood may have less favorable outcomes because a disruptive event occurred during the formative years of childhood. On the other hand, when looking at any given age group in adulthood, those who have lost a parent after achieving adulthood will have lost a parent more recently and the recentness of the loss may be the more salient issue for current outcomes. In Table 11, I reproduce Table 10, but with the sample restricted to individuals who have a parent deceased and I define the parental death variable as having a parent die before the year the respondent reaches age 19.   Thus, the odds ratios reflect the effects of having a parent die early in life (before the respondent reached age 19) versus later in life (after age 19).   Overall, there is some evidence that parental death during a person's childhood (through age 18) has larger effects on outcomes than parental death once a person is an adult.   Estimated odds ratios are very generally greater than 1 (36 out of 44), but only some are statistically significant.   Among persons 55-64 with a deceased parent, the effects of early parental death are statistically significant using all three measures of health outcomes.   For this age group, the odds of "bad" health are 33 to 43 percent higher (depending on the measure) for those who lost a parent prior to age 19. In sum, Tables 10 and 11 indicate that parental death, regardless of timing, has important relationships with socioeconomic, economic well-being, and health outcomes and that there is some limited evidence that these effects are more pronounced if parental death occurred before a respondent turned 19.

The presence of parental death effects, even after controlling for several other factors, is suggestive of structural relationships between parental death and outcomes among their offspring. To more directly assess causal mechanisms, I examine a policy change first considered by Dynarski (2003). Under current law child benefits generally terminate at age 18 (or 19 if the child is in high school), but prior to a law change, effective in 1982, college students were also eligible for child benefits (that is, benefits on the work record of a parent).   Specifically, for students enrolled in college before May 1982, child benefits could be paid through age 21. I use parental death and the law change as exogenous variables to test whether financial resources (Social Security benefits) influenced whether high school seniors attended college. Following Dynarski (2003), I focus on paternal death among cohorts reaching the spring of their senior years in high school just before the change (1979, 1980, and 1981) and just after the change (1982 and 1983). I create three variables: *Before* (binary variable indicating whether the individual in the SIPP reached the spring of

---

[10] At the full retirement age, SSA converts disability beneficiaries to retirement beneficiaries and, for this reason, I do not display this outcome for the oldest group. SSDI receipt in the SIPP is likely reliable because the Census Bureau used matched records from the Social Security Administration to correct misreports of receipt among some respondents.

their high school senior year in 1979, 1980, or 1981), *Father Deceased* (father died in or before the year the individual reached the spring of their senior year) and *Before*Father Deceased* (an interaction term).[11]

In column 1 of Table 12, I present results from an Ordinary Least Squares (OLS) regression of the binary variable measuring college attendance on *Before*, *Father Deceased*, and *Before*Father Deceased*.[12] Because this specification has an interaction term, the effect of having a deceased father on college attendance depends on whether an individual is in the before group (before the end of student benefits). For those in the before group, the effect is measured by summing the two regression coefficients for *Father Deceased* and *Before*Father Deceased*. For the before group, having a deceased father lowered the estimated probability of attending college by only 3.1 percentage points (-3.1=-18.4+15.3). For the after group, the effect is measured by the coefficient on *Father Deceased* which indicates a deceased father lowered the probability of college attendance by 18.4 percent. Overall, the results indicate that, in the before period, persons with deceased fathers were only slightly less likely to attend college than those with living fathers. After the policy change (elimination of student benefits), however, those with deceased fathers were decidedly less likely to attend college than those with living fathers. The results suggest the elimination of student benefits made college attendance for young survivors less likely. My findings are comparable to those of Dynarski who used the National Longitudinal Survey of Youth (NLSY) (her estimates, also based on OLS, are shown in column 2 of Table 12).[13]

In the last column of Table 12, I present a similar specification to that in column 1 but apply it to income at the time of the SIPP, which allows me to test the long-run effects of the policy change. For this purpose, I standardize income across families of different sizes by defining income as the ratio of family income to the appropriate United States poverty threshold (the average ratio in this sample is 5.5). The poverty thresholds vary by family size and take account of household economies of scale. For the before group, having a deceased father is estimated to have lowered the income-to-poverty ratio by only 0.07 (-0.07 is equal to the sum of the two regression coefficients for *Father Deceased* and *Before*Father Deceased*). For the after group, the effect is measured by the coefficient on *Father Deceased* which indicates having a deceased father is estimated to have lowered the income-to poverty ratio by 1.41. Overall, the results indicate that, for the before group, income later in life (at the time of SIPP) is similar regardless of whether paternal death occurred by the senior year in high school or not. For the after group, early paternal death is

---

[11] I have selected an approach that is, in concept, similar to that of Dynarski. For example, I focus on paternal death because fathers in the late 1970s and early 1980s would be more likely to have insured status under Social Security. Also, Dynarski's measure of college attendance reflects a reasonably high level of commitment: being enrolled full time in college early in life (by age 23). In the SIPP, I classify individuals as having attended college if they have one or more years of college. This does not include individuals who report "some college credit but less than one year" as that may reflect a marginal commitment, especially in light of the 32-year period that elapsed between the law change and the fielding of the 2014 SIPP. Also, similar to Dynarski, I use the spring of the senior year to develop before and after policy cohorts, but because of data limitations I make a simplifying assumption that individuals reach the spring of their senior year 18 years from their year of birth. I include only respondents who completed the 12th grade.

[12] Similar results to those in Table 12 from the SIPP are found if I exclude from the sample individuals who had the survival status of the father imputed or the year of death of the father imputed by Census.

[13] Results in columns 1 and 2 of Table 12 are based on linear probability models because OLS is used, but in estimates not shown in Table 12 I also find similar and statistically significant results using a logistic regression: *Father Deceased* lowers the odds of attending college and *Before*Father Deceased* increases the odds of attending college.

associated with lower income later in life. Results from column 1 in Table 12 suggest the policy change affected college attendance which could affect future income through a variety a means, including career earnings, marriage, and other determinants.

Discussion

This study is the first to directly estimate the size and characteristics of the orphan population in the United States, which allows me to examine a number of unaddressed policy issues and research questions. With regard to policy, this study, in particular, informs discussions of the Social Security program. The United States has a long-standing policy through this program to provide income support to children who have lost a parent. In evaluating the program's effects, I find that Social Security benefits are associated with lower poverty among children with a deceased parent. However, I also find the program is not universal, in the sense that most children with a deceased parent are not receiving benefits from Social Security. The analysis in this study helps identify the factors likely affecting the lack of universal coverage.

A sizeable percentage of children with a deceased parent (about 27 percent) have parents who were born outside of the United States. Such children have much lower odds of participating in the Social Security program. This result is likely due to these parents not achieving insured status through work in Social Security covered employment. International policy, in some cases, can mitigate the insured status issue as some countries have negotiated international agreements with the United States that allow work of the parent in the home country and in the United States to be combined for purposes of achieving insured status. Of note, however, many countries that are important sources of immigration to the United States do not have such agreements in effect. For example, Mexico, countries in Central America, and many countries in South America have no such agreements with the United States (Social Security Administration 2019b). The insured status issue likely also affects the participation in the Social Security program by Black children. The odds of participation among these children was found to also be sharply lower, which is plausibly tied to lower workforce participation and earnings by their parents. In support of this conclusion, I note that Mitchell and Phillips (2001) found that Black men were less likely to be insured for Social Security disability benefits. In addition, Kestenbaum (1995) estimated that Black children with a deceased parent were less likely to be on Social Security than other children and, further, that detailed administrative records indicated for children in general that lack of insured status was an important factor in the formal denial of child benefits by the Social Security Administration.

Abstracting from specific populations, the policy issues regarding insured status touch on some general issues. To be insured for child survivor benefits, the parent must have worked extensively or recently in Social Security covered work. Some young and middle-aged workers die from sudden and unpredictable events (for example, car accidents), but others die after a period of declining health. During that period of declining health, extensive or recent work may not have been possible. In addition, some couples will make decisions about the division of labor where one participates to a greater extent in the formal workforce and the other to a greater extent in home production; the death of a person not in formal work will not establish eligibility for the children although the death will represent a decline in the family's resources. Current social policy in the United States reflects an approach toward orphans using a social insurance structure. Changes to public policy could be small in scale – for example, narrow changes that would alter the specific

rules that determine insured status under Social Security – or could be larger in scope through new programs that ensure some benefits for the broad orphan population. Any changes, however, would have cost implications and there would be different views among policymakers about whether tightly-defined social insurance programs are more likely to be viable in the long run politically, as opposed to programs not tied directly to significant work and payment of Social Security taxes.

Another important issue with regard to participation in the Social Security program involves knowledge of facts and program rules. I find that, when respondents know only some facts about a deceased parent (fact of death but not year of death), children are much less likely to be participating in the Social Security program. Further, when the householder is not the parent of the child (for example, a grandparent is the householder), I find the child is much less likely to be receiving Social Security. I consider this suggestive evidence that individuals in these households may know less about the deceased's Social Security work history or eligibility flowing from such history. Small scale administrative studies have found participation problems with regard to child benefits. For example, looking at only a single year application cohort, the Social Security Administration found at least 20,000 children had been listed on applications for benefits but had not been processed for payment on the record of a disabled parent (Social Security Administration 2018c:186). In another administrative study, the agency found approximately 28,000 children were on the Supplemental Security Income program but were eligible for benefits in the Social Security program (Social Security Administration 2018c:186). Federal programs are complex and, also, the start of the Social Security program in the 1930s predated a number of modern developments with regard to more fragmented family structures. It is plausible that a combination of complexity and limited information about the deceased worker affects participation by children in Social Security. Greater emphasis on administering the program to ensure eligible children enroll in Social Security, through outreach and tighter quality control, would offer the possibility of improving participation in the program even without changes in law.

With regard to Social Security policy, I also find that student benefits provided to college age survivors had effects on college attendance, a finding that is consistent with Dynarski (2003). I extend Dynarski's findings by showing there were also much longer-run effects of student benefits, with survivors who received benefits having higher income much later in life relative to survivors who did not receive benefits due to the policy change that ended the student benefit program. The findings with regard to student benefits are consistent with this study's general findings on the effect of parental death early in life. I find evidence, albeit somewhat limited, that children who lost a parent early in life (prior to age 19) have less favorable outcomes than those who lost a parent later in life.

In addition to informing policy debates, this study has addressed a number of issues in the social science literature. First, whether parental death has negative effects on outcomes in childhood depends on the type of outcome considered. With regard to economic outcomes, I find evidence that, in general, paternal and maternal orphans do not face higher rates of poverty or material hardship than other children. This result may, at first, appear surprising, but the United States has an extensive set of programs for children (Social Security, health insurance through Medicaid, and food and nutrition programs). These programs plausibly help buffer the economic shocks associated with a parent's death. However, I do find evidence of negative outcomes with regard to non-economic measures. Children with a deceased parent were more likely, other things equal, to have been expelled from school or to have repeated a grade. They were also less likely to be in classes for gifted children. Additionally, children with a deceased parent were more likely to have a

disability. The death of a parent during childhood likely has profound effects on many children apart from economic or financial consequences.

A number of programs in the United States are designed to support children, but those supports often end in adulthood where the expectation is that individuals will support themselves through work in the formal labor market. When I examine adults who have a deceased parent, I find negative associations across all outcomes: socioeconomic, economic well-being, and health. These associations exist even when I control for fundamental determinants of outcomes such as age, race/ethnicity, sex, education, and region of the country. I find some limited evidence that the timing of parental death matters, but the most general finding is that parental death regardless of timing has large and statistically significant associations with negative outcomes among adults. In particular, I find strong associations with health outcomes across age groups and using different measures of health. Parents and their offspring share a common biology and a common environment (for many years) and the health outcomes suggest a close link between parent's health and the health of their offspring. This connection is likely reinforced through other channels – a parent's death may influence a person's social or economic status which also affects his or her health. With regard to the literature on parental death and adult outcomes, the findings of this study are consistent, generally, with the work of Umberson and Chen (1994) who found parental death had strong associations with a number of negative outcomes among adult children.

These findings on adult outcomes have both practical and research implications. From a practical perspective, a parent's death will generally be a fact known by the adult child and, potentially, the health care provider of the adult child; it is potentially a signal for needed adjustments in health habits and treatment of underlying conditions. From a research perspective, it is a factor that may explain mortality patterns. That is, along with socioeconomic and other determinants, parental death may be a useful addition for studies of differential mortality. Bosworth and Zhang (2015) use earlier SIPP panels to document strong relationships between socioeconomic status and mortality. With the new SIPP panel, differential mortality studies could also measure the influence of fact and timing of parental death on mortality outcomes among SIPP respondents over time.

Conclusion

In this paper, I use newly available SIPP data to examine the prevalence of parental mortality in the United States and its association with several outcomes among minor and adult children. With regard to minor children, I find varied results depending on the type of outcome measure. The economic well-being of paternal and maternal orphans is roughly on par with other children, a result plausibly tied to Social Security and other government programs that mitigate adverse financial effects from the loss of a parent. These children, however, have less favorable schooling outcomes and less favorable health outcomes. Together, these findings suggest interventions to improve outcomes for orphans likely need to be targeted to specific outcomes, as general support for this population (for example, Social Security income) does not, on its own, necessarily alter specific educational and health outcomes for minor children.

With regard to adult children, I find the death of a parent is negatively associated with a broad range of socioeconomic, economic well-being, and health outcomes. These associations exist even after controlling for several fundamental predictors of such outcomes. The strength of these findings suggests structural

relationships between parental death and outcomes for adult children, in particular with regard to health outcomes. The common biology and shared physical environments of parents and their offspring plausibly explain much of this association. This finding has important implications in a number of areas as the fact of parental death, in effect, contains information on the underlying health status of adult offspring. I find some evidence that the association between parental death and health of their offspring is larger if the death occurred when the adult offspring were younger, but the effects of parental death are very general and not exclusively tied to the timing of the parent's death. In addition to health outcomes, parental death – particularly early parental death – plausibly affects educational attainment and income later in life. This could happen if early death limits the family's financial resources and lessens the ability of their offspring to pursue costly education and training in early adulthood. I use a natural experiment in the policy history of the Social Security program and find evidence that limited financial resources for college has a dampening effect on college attendance by young survivors and lowers their income later in life.

The 2014 SIPP panel is an important addition to the set of data that can be used to study parental mortality but additional data collection in future SIPP panels or other federal surveys would be beneficial. There is some evidence that respondents have difficulty recalling the specific year a parent died. Moving to future surveys, the use of ranges may improve the responses without loss of important content (for example, it may be useful to query respondents about whether a parent died when the respondent was in their 20s, 30s, 40s, and so forth). More broadly, SIPP does not capture the circumstances of the parent's death, but those circumstances likely have important effects. Probing for the causes of death would be a sensitive subject for many survey respondents but if successfully implemented in a future SIPP panel it would allow for the study of a number of important topics. Parental death in very adverse situations (death from suicide or from violence) would likely have sharp effects on outcomes of surviving children and would provide context for policymakers seeking to mitigate the effects of parental death in such situations.

Despite data limitations, the 2014 SIPP offers the possibility for additional research not covered in this study. First, the strong associations I find are suggestive of structural relationships between parental mortality and outcomes for their offspring. Future research that focuses on different empirical techniques or natural experiments may formally establish causal effects or help specify possible causal pathways. In this study, in one application, I examine a natural experiment in federal policy, but the SIPP also identifies the state of birth and current state of residence of respondents; variation in state policies may be another source of information to identify causal links between parental mortality and outcomes. With regard to topic areas, fact and timing of parental death could be an important addition to differential mortality studies of offspring; prior SIPP panels have been used to study differential mortality and the new data in the 2014 panel offers a natural way to extend those studies in a new direction. In addition, the connections found in this study with regard to social and economic outcomes suggest parental mortality may also be suitable for predictions of economic transitions, such as movements into poverty over time, among SIPP respondents.

Finally, this study illustrates how information on the parent "extends" the traditional survey household, which typically only contains information on members of a household living together at the time of a survey. While this study focuses on parents and their offspring, the information on household members in the survey could also be used to establish other relationships such as between grandchildren and grandparents. This is because children can generally be associated with one or both parents at the time of the SIPP survey and those parents will report important information in the SIPP on their parents (mortality information, year of

birth, and place of birth). A large literature exists on the effects that extended family members have on child outcomes and the new SIPP data offer an additional opportunity to draw connections between characteristics of extended family members and outcomes among children.

References

Advisory Council on Social Security (1938). Report of the 1938 Advisory Council on Social Security. Available at: https://www.ssa.gov/history/reports/38advise.html .

Allison, Paul D (2012). *Logistic Regression Using SAS: Theory and Application, Second Edition.* Cary, North Carolina: SAS Institute.

Amato, Paul R (2010). "Research on Divorce: Continuing Trends and New Developments." *Journal of Marriage and Family* 72:650-666.

Amato, Paul R. and Christopher J. Anthony. 2014. Estimating the Effects of Parental Divorce and Death with Fixed Effects Models. *Journal of Marriage and Family* 76:370-386.

Bosworth, Barry P. and Kan Zhang (2015). "Evidence of Increasing Differential Mortality: A Comparison of the HRS and SIPP." *Center for Retirement Research at Boston College Working Paper*. Available at: https://crr.bc.edu/wp-content/uploads/2015/06/wp_2015-13.pdf

Buckles, Kasey et al. (2016). "The Effect of College Education on Mortality." *Journal of Health Economics* 50:99-114.

Chetty, Raj et al. (2016). "The Association Between Income and Life Expectancy in the United States, 2001-2014." JAMA 315(16):1750-1766.

Dynarski, Susan M. (2003). "Does Aid Matter? Measuring the Effect of Student Aid on College Attendance and Completion." *American Economic Review* 93(1):279-288.

Kestenbaum, Bertram M. (1995). "Orphanhood in the United States." *Transactions of Society of Actuaries* 47:251-259.

Kochanek, Kenneth D., Elizabeth Arias, and Robert N. Anderson (2013). How Did Cause of Death Contribute to Racial Differences in Life Expectancy in the United States in 2010? NCHS Data Brief, No.125.

Maier, E. Hailey and Margie E. Lachman (2000). "Consequences of Early Parental Loss and Separation for Health and Well-Being in Midlife." *International Journal of Behavioral Development* 24(2):183-189.

McDonald, Jill Anne and Leonard Joseph Paulozzi (2019). "Parsing the Paradox: Hispanic Mortality in the US by Detailed Cause of Death." *Journal of Immigrant and Minority Health* 21: 237-245.

Mitchell, Olivia S. and John W.R. Phillips (2001). "Eligibility for Social Security Disability Insurance." Paper presented at the Annual Conference of the Retirement Research Consortium, May 17-18, 2001. Available at: http://projects.isr.umich.edu/mrrc-archive/publications/conference/pdf/cp01_mitchell.pdf .

Skocpol, Theda (1992). *Protecting Soldiers and Mothers*. Cambridge MA: Harvard University Press.

Social Security Administration (2005). Life Tables for the United States Social Security Area 1900-2100: Actuarial Study No. 120. Available at: https://www.ssa.gov/oact/NOTES/as120/LifeTables_Body.html

Social Security Administration (2011). Short-Range Actuarial Projections of the Old-Age, Survivors, and Disability Insurance Program, 2010. Available at: https://www.ssa.gov/oact/NOTES/pdf_studies/study121.pdf .

Social Security Administration (2018a). Social Security Programs throughout the World: Europe, 2018. Available at: https://www.ssa.gov/policy/docs/progdesc/ssptw/2018-2019/europe/index.htm

Social Security Administration (2018b). Social Security Beneficiary Statistics. Available at: https://www.ssa.gov/oact/STATS/SRVbenies.html

Social Security Administration (2018c). FY 2018 Agency Financial Report. Available at: https://www.ssa.gov/finance/2018/Full%20FY%202018%20AFR.pdf

Social Security Administration (2019). Annual Statistical Supplement to the Social Security Bulletin, 2018. Available at: https://www.ssa.gov/policy/docs/statcomps/supplement/2018/index.html

Social Security Administration (2019b). U.S. International Social Security Agreements. Available at: https://www.ssa.gov/international/agreements_overview.html

Tamborini, Christopher R. and Emily Cupito (2012). "Social Insurance and Children: The Relationship between Social Security, Economic Well-Being, and Family Context among Child Recipients." *Journal of Children and Poverty* 18(1):1-22.

Tennant, Christopher (1988). "Parental Loss in Childhood: Its Effect in Adult Life." *Archives of General Psychiatry* 45:1045-1050.

Umberson, Debra and Meichu D. Chen (1994). "Effects of a Parent's Death on Adult Children: Relationship Salience and Reaction to Loss." *American Sociological Review* 59:152-168.

Umberson et al. (2017). "Death of Family Members as an Overlooked Source of Racial Disadvantage in the United States." *Proceedings of the National Academy of Sciences of the United States of America* 114(5): 915-920. Available at: http://www.pnas.org/content/114/5/915.full .

United Nations Children's Fund (2004). Children on the Brink, 2004. Available at: https://www.unicef.org/publications/index_22212.html .

U.S. Census Bureau (2016). Survey of Income and Program Participation, 2014 Panel Users' Guide. Available at: https://www.census.gov/content/dam/Census/programs-surveys/sipp/methodology/2014-SIPP-Panel-Users-Guide.pdf .

U.S. Census Bureau (2017). Source and Accuracy Statement for 2014 Panel Wave. Available at: https://www.census.gov/programs-surveys/sipp/tech-documentation/source-accuracy-statements/source-accuracy-statements-2014.html .

U.S. Census Bureau (2018). Survey of Income and Program Participation: Complete Wave 1 Technical Documentation. Available at: https://www.census.gov/programs-surveys/sipp/data/2014-panel/wave-1.html .

U.S. Census Bureau (2019). SIPP Introduction & History. Available at: https://www.census.gov/programs-surveys/sipp/about/sipp-introduction-history.html

Wallace, T. Dudley and J. Lew Silver (1988). *Econometrics: An Introduction*. Reading, Massachusetts: Addison-Wesley.

White, Halbert (1980). "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity," *Econometrica* 48(4):817-838.

Wooldridge (2003). *Introductory Econometrics: A Modern Approach*. Mason, Ohio: Thomson South-Western.

Appendix

Figure 1. Percentage with Deceased Parents by Age of Respondent
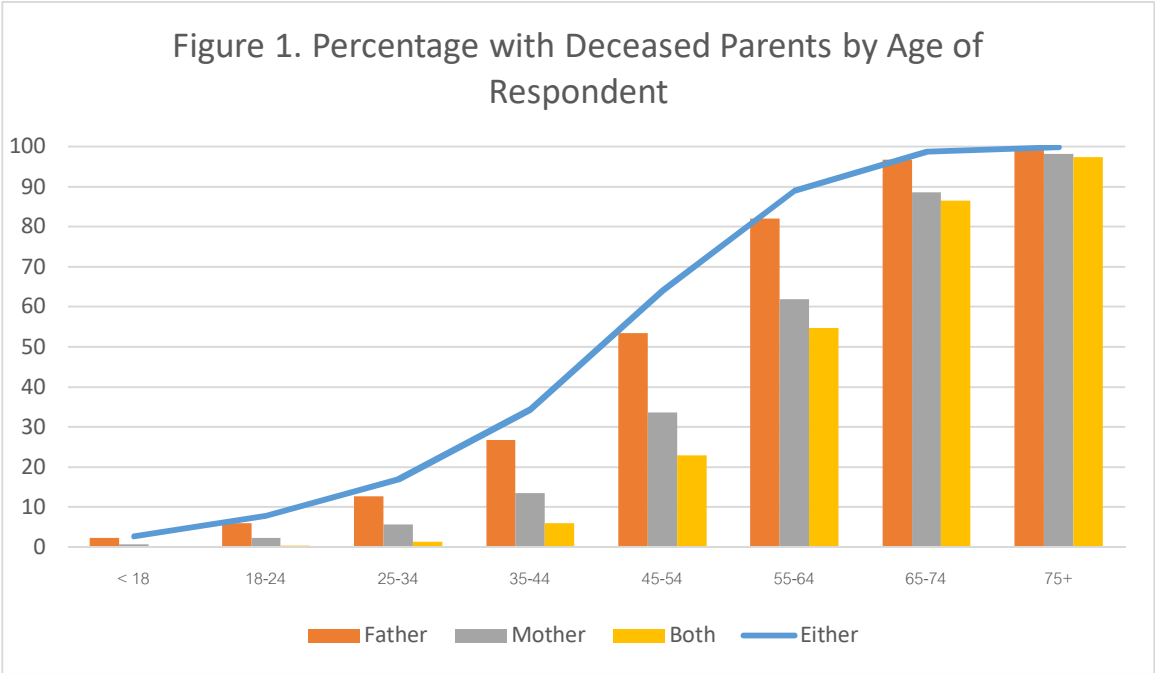
Figure 2. Percentage with Either Parent Deceased by Quartile of Family Income and Age of Respondent
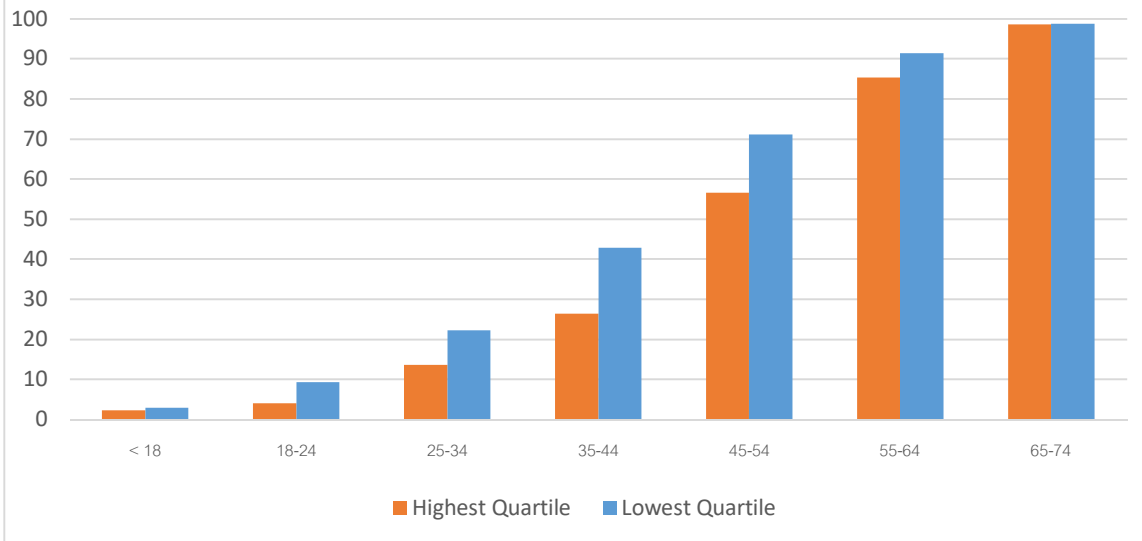
Figure 3. Average Age of Parent at His or Her Death, by Parent's Birth Cohort and Sex
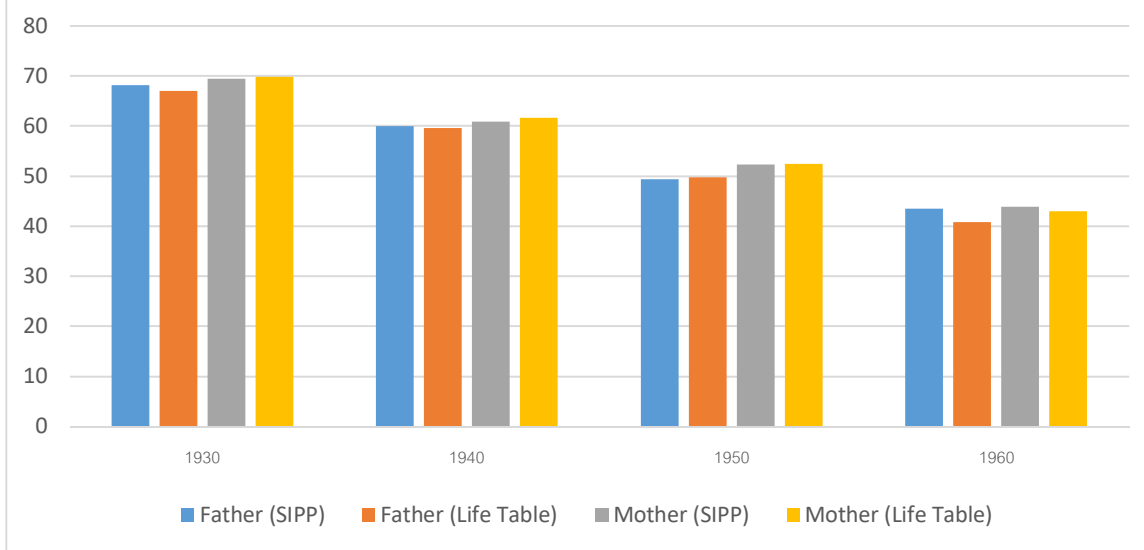
Table 1. Percentage of Children with Neither Parent Deceased, Either Parent Deceased, Father Deceased, and Mother Deceased

	Neither	Either	Father	Mother
Race / Ethnicity				
Non-Hispanic White	97.6 (0.23)	2.4 (0.23)	1.8 (0.21)	0.5 (0.10)
Non-Hispanic Black	95.7 (0.60)	4.3 (0.60)	3.4 (0.45)	1.0 (0.25)
Non-Hispanic Other Race	96.8 (0.58)	3.2 (0.58)	2.5 (0.53)	1.7 (0.43)
Hispanic	97.7 (0.30)	2.3 (0.30)	2.1 (0.30)	0.3 (0.11)
Sex				
Male	97.2 (0.24)	2.8 (0.24)	2.3 (0.21)	0.5 (0.10)
Female	97.4 (0.20)	2.6 (0.20)	2.0 (0.17)	0.8 (0.12)
Age				
Under Age 10	98.4 (0.16)	1.6 (0.16)	1.3 (0.15)	0.3 (0.08)
Age 10-17	95.9 (0.31)	4.1 (0.31)	3.3 (0.27)	1.0 (0.14)

Notes. 2014 SIPP. Percentages are row percentages. Standard errors in parentheses. Weighted population and (n) for Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other Race, and Hispanic: 37.7 million (8,892), 10.3 million (2,836), 7.5 million (1,635), and 17.9 million (4,478). Weighted population and (n) for Male, Female, Under Age 10, and Age 10-17: 37.4 million (9,080), 36.0 million (8,761), 40.4 million (9,800), and 33.1 million (8,041). Children who are Non-Hispanic Black are more likely than children who are Hispanic or Non-Hispanic White of having either parent deceased and children who are under age 10 are less likely to have either parent deceased than children ages 10-17 (significant at the 0.01 level).

Table 2. Percentage of Children in Programs and with Selected Characteristics for Mortality Status Groups

	Program Participation				
Mortality Status Group	Social Security	Medicaid	SNAP	SSI	TANF
Neither	4.6	36.4	20.9	1.4	2.4
	(0.31)	(0.58)	(0.52)	(0.10)	(0.19)
Either	44.9	45.3	21.3	2.3	3.8
	(3.38)	(3.27)	(2.58)	(0.68)	(1.05)
Father	45.8	45.3	23.4	2.5	4.3
	(3.79)	(3.46)	(2.97)	(0.73)	(1.24)
Mother	33.7	42.7	10.0	1.5	3.1
	(5.65)	(6.43)	(3.08)	(1.55)	(1.80)

	Family Size, Householder, and Parent's Place of Birth				
	Family Size under 3	Householder is Parent	Householder is Grandparent	Householder is Other	A Parent Not Born in the U.S.
Neither	8.2	88.9	7.3	3.8	29.9
	(0.23)	(0.36)	(0.29)	(0.24)	(0.46)
Either	16.0	69.5	19.9	10.6	27.3
	(1.82)	(2.83)	(2.60)	(1.56)	(3.08)
Father	14.1	72.6	18.1	9.3	29.6
	(2.01)	(3.10)	(2.76)	(1.83)	(3.50)
Mother	21.9	61.0	25.1	13.9	30.8
	(4.59)	(5.40)	(4.85)	(3.12)	(6.31)

Notes. 2014 SIPP. Percentages are row percentages. Standard errors in parentheses. Weighted Population and (n) for Neither, Either, Father and Mother: 71.4 million (17,320), 2.0 million (521), 1.6 million (411), and 0.5 million (130). Supplemental Nutrition and Assistance Program (SNAP); Supplemental Security Income (SSI); Temporary Assistance for Needy Families (TANF). Differences between children in the Neither category and Either category with regard to Social Security participation, Medicaid participation, family size, and relationship to householder (parent, grandparent, other) are statistically significant at the 0.01 level. Differences between children with a mother deceased and a father deceased with regard to Social Security participation, SNAP, and the householder being a parent are statistically significant at the 0.10 level.

Table 3. Percentage of Adults, Ages 35-54, with Neither Parent Deceased, Either Parent Deceased, Father Deceased, and Mother Deceased

	Neither	Either	Father	Mother
Race/Ethnicity				
Non-Hispanic White	51.9 (0.53)	48.1 (0.53)	38.7 (0.50)	23.4 (0.46)
Non-Hispanic Black	41.5 (1.1)	58.5 (1.1)	49.8 (1.2)	28.5 (1.1)
Non-Hispanic Other Race	51.3 (1.6)	48.7 (1.6)	40.1 (1.6)	23.3 (1.1)
Hispanic	50.0 (0.93)	50.0 (0.93)	40.8 (0.83)	22.7 (0.93)
Sex				
Male	50.4 (0.59)	49.6 (0.59)	40.3 (0.62)	23.7 (0.44)
Female	50.1 (0.50)	49.9 (0.50)	40.8 (0.52)	24.1 (0.43)
Education				
< 1 Year of College	43.7 (0.59)	56.3 (0.59)	46.6 (0.60)	27.8 (0.57)
1+Years of College	55.5 (0.57)	44.5 (0.57)	35.7 (0.56)	20.8 (0.41)
Region				
South	48.3 (0.66)	51.7 (0.66)	42.1 (0.67)	25.2 (0.51)
Non-South	51.4 (0.54)	48.6 (0.54)	39.6 (0.58)	23.1 (0.42)

Notes. 2014 SIPP. Percentages are row percentages. Standard errors in parentheses. Weighted population and (n) for Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other Race, and Hispanic: 51.5 million (11,473), 10.1 million (2,654), 6.8 million (1,321), and 14.2 million (3,154). Weighted population for Male, Female, < 1 Year of College, 1+ Years of College, South and Non-South: 40.4 million (8,875), 42.2 million (9,727), 37.0 million (9,082), 45.6 million (9,520), 31.2 million (8,220), and 51.5 million (10,382). Adults who are Non-Hispanic Black are more likely than adults from other race/ethnic groups of having either parent deceased (significant at the 0.01 level). Those with less than 1 year of college and those residing in the South are more likely to have either parent deceased compared to those with 1+ year of college and those residing outside of the South (significant at the 0.01 level).

Table 4. Economic Well-Being of Children by Mortality Status Group

Mortality Status Group	Total Persons (1000s)	Below 100 Percent of Poverty (%)	Below 200 Percent of Poverty (%)	Unable to pay rent or mortgage (%)	Unable to pay utilities (%)	Food Insecurity (%)
Neither	71,445	23.0	45.2	10.9	15.6	17.2
		(0.48)	(0.62)	(0.36)	(0.44)	(0.46)
Either	1,986	22.2	48.1	13.3	16.9	18.3
		(2.46)	(3.33)	(1.93)	(1.87)	(2.38)
Father	1,607	23.6	48.4	13.2	18.7	19.1
		(2.80)	(3.55)	(2.22)	(2.23)	(2.74)
Mother	476	13.5	41.7	11.0	7.2	13.5
		(3.55)	(6.33)	(3.32)	(2.41)	(3.31)

Notes. 2014 SIPP. Percentages are row percentages. Standard errors in parentheses. For Neither, Either, Father and Mother, n is: 17,320, 521, 411, and 130. Below 100 percent and 200 percent of poverty are calculated using family income and poverty thresholds for calendar year 2013 (some cases were excluded because of missing data).

Table 5. Odds Ratios from Binary Logistic Regressions for Poverty, All Children and All Orphans

	All Children	All Orphans
Either Parent Deceased	.96	_
Race/Ethnicity		
Non-Hispanic Black	3.24***	2.52*
Non-Hispanic Other Race	1.42**	.55
Hispanic	3.58***	2.12
Male	1.00	.84
Age	.97***	.97
South	1.18**	.84
Social Security	_	.45*
R-squared	0.064	0.068

Notes. 2014 SIPP. All Children (n=16,851); All Orphans (n=493). Orphans are individuals under the age of 18 with a father deceased and/or a mother deceased. Odds ratios are from a logistic regression where the dependent variable is 1 if child is in poverty and 0 otherwise. Independent variables, depending on specification, are binary (1,0) variables measuring whether either parent is deceased, race/ethnicity (reference group is non-Hispanic White), whether the child is male, whether the child resides in the South, and whether the child receives Social Security. Single year of the child's age is also an independent variable. Odds ratios should not be compared across columns because each column has a different sample. Below 100 percent of poverty is calculated using family income and poverty thresholds for calendar year 2013 (some cases were excluded because of missing data). *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. R-squared is the generalized R-squared for logistic regression (Allison 2012:68-69). Wald test that all coefficients are zero rejected for both logistic regressions ($p < 0.001$ for regression in column 1 and $p < 0.01$ for regression in column 2).

Table 6. Odds Ratios from Binary Logistic Regressions for Participating in Social Security, SNAP, and Medicaid (Orphans)

	Social Security	SNAP	Medicaid
Deceased Parent Not Born in U.S.	.26*	1.36	.91
Parent Not Householder	.31***	.76	1.57
R Does Not Know Year of Parent's Death	.25***	1.03	.64
Mother	.74	.27	.84
Race/Ethnicity			
Non-Hispanic Black	.41*	6.15***	3.31**
Non-Hispanic Other Race	1.04	.66	1.30
Hispanic	.81	2.14	1.52
Male	1.38	.95	1.27
Age	1.00	.91**	.90**
South	1.38	.45*	.79
R-squared	0.17	0.15	0.11

Notes. 2014 SIPP. n=390. Restricted to orphans where the fact of parental death is not imputed for either parent. Orphans are individuals under the age of 18 with a father deceased and/or a mother deceased. Participation in program for month of December 2013. Odds ratios are from logistic regressions where the dependent variable is 1 if child is participating in the program and 0 otherwise. Independent variables are binary (1,0) variables measuring whether the child has a deceased parent who was not born in the U.S., the child is in a household where the householder is not the child's parent, the SIPP respondent does not know the year of death of the deceased parent (if one parent deceased) or both years of death (if both parents deceased), mother is deceased, race/ethnicity (the reference group is Non-Hispanic White), the child is male, and the child resides in the South. Single year of the child's age is also an independent variable. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. R-squared is the generalized R-squared for logistic regression (Allison 2012:68-69). Wald test that all coefficients are zero rejected for each of the three logistic regressions ($p < 0.001$, $p < 0.01$, and $p < 0.01$ for regressions in columns 1-3 respectively).

Table 7. Educational, Social, and Health Outcomes Among Children by Mortality Status Group

Mortality Status Group	Total Persons (1000s)	Expelled or Repeated Grade (%)	In Gifted Class (%)	Child Cares About School All the Time (%)	Dines with Reference Parent every Night (%)	Active in Clubs, Sports or Music (%)	Attends Religious Services with Reference Parent (%)	Has a Disability (%)
Neither	47,600	11.8 (0.35)	22.3 (0.51)	60.2 (0.59)	67.4 (0.65)	62.0 (0.69)	75.2 (0.67)	9.1 (0.30)
Either	1,742	19.0 (2.04)	18.1 (2.31)	58.1 (2.87)	70.0 (3.13)	58.0 (3.31)	73.3 (3.38)	12.7 (1.71)
Father	1,395	19.4 (2.38)	18.7 (2.67)	60.3 (3.32)	70.6 (3.46)	60.5 (3.80)	73.4 (3.65)	11.7 (1.96)
Mother	439	19.3 (5.18)	13.6 (3.83)	53.6 (5.89)	64.5 (7.03)	53.1 (6.49)	70.0 (6.01)	16.2 (3.78)

Notes. 2014 SIPP. Sample is restricted to children age 6-17 in December 2013. Percentages are row percentages. Standard errors in parentheses. For Neither, Either, Father, and Mother, n is: 11,648, 453, 353, and 119. Reference parent is parent or householder. Differences between children in the Neither category and Either category with regard to expelled or repeated grade or has a disability are significant at the 0.05 level and the difference with regard to being in a gifted class is significant at the 0.10 level.

Table 8. Odds Ratios from Binary Logistic Regressions for Educational and Health Outcomes for Children

	Expelled or Repeated Grade	In Gifted Class	Has a Disability
Either Parent Deceased	1.48**	.69*	1.43*
Race/Ethnicity			
Non-Hispanic Black	2.04***	.72***	1.28*
Non-Hispanic Other Race	1.18	1.13	1.02
Hispanic	1.47***	.57***	.90
Male	1.86***	.79***	1.85***
Age	1.14***	1.14***	.98
South	1.36***	1.16*	1.05
R-squared	0.04	0.05	0.01

Notes. 2014 SIPP. n=12,101. Sample is restricted to children age 6-17 in December 2013. Odds ratios are from logistic regressions where the dependent variable is 1 if child has the educational or disability outcome and 0 otherwise. Independent variables are binary (1,0) variables measuring whether either parent is deceased, race/ethnicity (Non-Hispanic White is the reference group), whether the child is male, and whether the child resides in the South. Single year of the child's age is also an independent variable. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. R-squared is the generalized R-squared for logistic regression (Allison 2012:68-69). Wald test that all coefficients are zero rejected for each of the three logistic regressions ($p < 0.001$ for each regression).

Table 9. Unadjusted Odds Ratios: The Effect of Having a Deceased Parent on Selected Outcomes by Age Group

	25-34	35-44	45-54	55-64	65-74
	Socioeconomic Outcomes				
Less than One Year of College	1.34*** ȳ=0.411	1.54*** ȳ=0.424	1.63*** ȳ=0.471	1.35*** ȳ=0.476	1.66 ȳ=0.523
Not in the Workforce	1.17* ȳ=0.256	1.23*** ȳ=0.243	1.38*** ȳ=0.267	1.65*** ȳ=0.418	1.59 ȳ=0.771
Unmarried	1.04 ȳ=0.540	1.26*** ȳ=0.366	1.18** ȳ=0.359	1.22* ȳ=0.337	1.01 ȳ=0.350
	Economic Well-Being Outcomes				
In Poverty	1.61*** ȳ=0.169	1.60*** ȳ=0.138	1.53*** ȳ=0.121	1.51** ȳ=0.121	0.97 ȳ=0.067
Low or Very Low Food Security	1.41*** ȳ=0.145	1.46*** ȳ=0.142	1.48*** ȳ=0.139	1.09 ȳ=0.111	6.12 ȳ=0.073
Unable to Pay Rent/Mortgage or Utilities	1.34*** ȳ=0.148	1.44*** ȳ=0.161	1.48*** ȳ=0.140	0.97 ȳ=0.105	0.84 ȳ=0.063
	Health Outcomes				
Poor or Fair Self-Reported Health	1.49*** ȳ=0.069	1.60*** ȳ=0.114	1.78*** ȳ=0.177	1.49*** ȳ=0.239	1.88* ȳ=0.260
Has a Core Disability	1.31** ȳ=0.089	1.61*** ȳ=0.115	1.83*** ȳ=0.181	1.27** ȳ=0.258	1.41 ȳ=0.349
Receives Social Security Disability Insurance	2.91*** ȳ=0.009	1.95*** ȳ=0.023	1.76*** ȳ=0.050	1.72*** ȳ=0.092	N/A

Notes. 2014 SIPP. Average generalized R-squared for the 44 logistic regressions is 0.003. n for age groups (youngest to oldest): 8,979, 8,944, 9,658, 9,554, and 6,389. Odds ratios: odds of the outcome from having either parent deceased relative to odds of the outcome from having both parents living, with no controls for age, education, race/ethnicity, sex, and region. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. ȳ is the mean value of the outcome variable for a given age group.

Table 10. Adjusted Odds Ratios: The Effect of Having a Deceased Parent on Selected Outcomes by Age Group

	25-34	35-44	45-54	55-64	65-74
	Socioeconomic Outcomes				
Less than One Year of College	1.30*** ȳ=0.411	1.51*** ȳ=0.424	1.59*** ȳ=0.471	1.38*** ȳ=0.476	1.64 ȳ=0.523
Not in the Workforce	1.09 ȳ=0.256	1.15* ȳ=0.243	1.24*** ȳ=0.267	1.31*** ȳ=0.418	1.26 ȳ=0.771
Unmarried	1.10 ȳ=0.540	1.19*** ȳ=0.366	1.09 ȳ=0.359	1.18 ȳ=0.337	0.99 ȳ=0.350
	Economic Well-Being Outcomes				
In Poverty	1.48*** ȳ=0.169	1.42*** ȳ=0.138	1.34*** ȳ=0.121	1.42* ȳ=0.121	1.01 ȳ=0.067
Low or Very Low Food Security	1.30** ȳ=0.145	1.29*** ȳ=0.142	1.33*** ȳ=0.139	1.03 ȳ=0.111	6.24 ȳ=0.073
Unable to Pay Rent/Mortgage or Utilities	1.21* ȳ=0.148	1.30*** ȳ=0.161	1.36*** ȳ=0.140	0.95 ȳ=0.105	0.84 ȳ=0.063
	Health Outcomes				
Poor or Fair Self-Reported Health	1.30* ȳ=0.069	1.37*** ȳ=0.114	1.52*** ȳ=0.177	1.36** ȳ=0.239	1.82 ȳ=0.260
Has a Core Disability	1.27* ȳ=0.089	1.44*** ȳ=0.115	1.61*** ȳ=0.181	1.13 ȳ=0.258	1.22 ȳ=0.349
Receives Social Security Disability Insurance	2.50** ȳ=0.009	1.69*** ȳ=0.023	1.47** ȳ=0.050	1.43* ȳ=0.092	N/A

Notes. 2014 SIPP. Average generalized R-squared from the 44 logistic regressions is 0.04. n for age groups (youngest to oldest): 8,979, 8,944, 9,658, 9,554, and 6,389. Odds ratios: odds of the outcome from having a parent deceased relative to odds of the outcome from having both parents living, with controls for single year of age, race/ethnicity, sex, and region (South). Education (less than one year of college) is also a control for the Economic Well-Being and Health Outcomes. Odds ratios for control variables not shown. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. ȳ is the mean value of the outcome variable for a given age group.

Table 11. Adjusted Odds Ratios: The Effect of Having a Parent Die Before Age 19 Versus Dying Later on Selected Outcomes by Age Group

	25-34	35-44	45-54	55-64	65-74
	Socioeconomic Outcomes				
Less than One Year of College	1.12 $\bar{y}$=0.472	1.07 $\bar{y}$=0.493	1.24** $\bar{y}$=0.514	1.33*** $\bar{y}$=0.484	1.11 $\bar{y}$=0.525
Not in the Workforce	1.10 $\bar{y}$=0.281	1.04 $\bar{y}$=0.268	1.12 $\bar{y}$=0.289	1.04 $\bar{y}$=0.431	0.93 $\bar{y}$=0.772
Unmarried	0.99 $\bar{y}$=0.548	0.83 $\bar{y}$=0.402	1.13 $\bar{y}$=0.373	1.17 $\bar{y}$=0.342	0.94 $\bar{y}$=0.350
	Economic Well-Being Outcomes				
In Poverty	1.35* $\bar{y}$=0.230	1.08 $\bar{y}$=0.176	0.94 $\bar{y}$=0.137	1.16 $\bar{y}$=0.125	1.35 $\bar{y}$=0.067
Low or Very Low Food Security	1.18 $\bar{y}$=0.183	1.04 $\bar{y}$=0.173	1.10 $\bar{y}$=0.156	1.35** $\bar{y}$=0.112	0.97 $\bar{y}$=0.074
Unable to Pay Rent/Mortgage or Utilities	1.26 $\bar{y}$=0.180	1.08 $\bar{y}$=0.194	1.25* $\bar{y}$=0.156	1.11 $\bar{y}$=0.105	1.04 $\bar{y}$=0.063
	Health Outcomes				
Poor or Fair Self-Reported Health	1.00 $\bar{y}$=0.093	1.11 $\bar{y}$=0.147	1.01 $\bar{y}$=0.205	1.33*** $\bar{y}$=0.246	1.03 $\bar{y}$=0.261
Has a Core Disability	1.43 $\bar{y}$=0.108	1.29 $\bar{y}$=0.148	1.17 $\bar{y}$=0.211	1.43*** $\bar{y}$=0.263	0.99 $\bar{y}$=0.350
Receives Social Security Disability Insurance	1.97 $\bar{y}$=0.020	1.43 $\bar{y}$=0.033	1.11 $\bar{y}$=0.059	1.43** $\bar{y}$=0.096	N/A

Notes. 2014 SIPP. Restricted to respondents with at least one parent deceased. Average generalized R-squared for the 44 logistic regressions is 0.04. n for age groups (youngest to oldest): 1,599, 3,182, 6,328, 8,574, and 6,314. Odds ratios: odds of the outcome for respondents where a mother or a father died before the year the respondent turned 19 relative to odds of the outcome for all other respondents with a deceased parent, with controls for single year of age, race/ethnicity, sex, and region (South). Education (less than one year of college) is also a control for the Economic Well-Being and Health Outcomes. Odds ratios for control variables not shown. *** p < 0.001; ** p < 0.01; * p < 0.05. $\bar{y}$ is the mean value of the outcome variable for a given age group.

Table 12. Father Deceased Before Social Security Student Benefits Ended: Effects on College and Income

| | College | | Income |
	SIPP	NLSY (Dynarski)	SIPP
Before	-0.002	0.026	0.275
	(0.018)	(0.021)	(0.219)
Father Deceased	-0.184***	-0.123	-1.410***
	(0.053)	(0.083)	(0.342)
Before*Father Deceased	0.153*	0.182†	1.340*
	(0.066)	(0.096)	(0.566)
R-squared	0.004	0.002	0.002

Notes. Results under College are from an OLS regressions from the SIPP (dependent variable is a binary variable (1,0) measuring having one or more years of college) and from Table 2 of Dynarski (2003). Results under Income are from an OLS regression from the SIPP (dependent variable is the ratio of family income in 2013 to the poverty threshold). n=4,339. Standard errors are in parentheses. SIPP standard errors are White-corrected standard errors, which account for heteroskedasticity (White 1980). *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. † - Dynarski notes this coefficient estimate is significant at the 6-percent level. F-test that all coefficients are zero rejected for College (SIPP) regression ($p < 0.01$) and for the Income (SIPP) regression ($p < 0.001$).