Risk of Parental Death Across the Life Course

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SEHSD Working Paper 2020-21

SIPP Working Paper 294

Abstract

Relatively little is known about the risk of parental death across the life course, despite its importance for multiple aspects of wellbeing. Demographic research has documented the ways in which parental transfers to adult children (and from adult children to their parents) affect economic circumstances, as well as physical and mental health. This research, however, has not considered the risk of a child having a parent alive–and, reciprocally, the risk of parental death–across adulthood. Additionally, socioeconomic differences in mortality and fertility across race/origin, educational attainment, and poverty status likely mean that patterns of parental death vary across the U.S. population in ways that could reproduce inequality. In this paper, we fill this gap in the literature and estimate the risk of parental death across the life course using data from the 2014 Survey of Income and Program Participation (SIPP). We pay particular attention to differences in this life course pattern across key social and demographic groups. In general, we find that, at a given age, the risk of having experienced paternal death is higher than that of maternal death, and that those in poverty or with lower educational attainment are at higher risk of parental death across the life course.

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[2] The U.S. Census Bureau reviewed this data product for unauthorized disclosure of confidential information and approved the disclosure avoidance practices applied to this release: CBDRB-FY20-POP001-0084. This paper is released to inform interested parties of research and evaluation and to encourage discussion. The views expressed on statistical, measurement, or methodological issues are those of the authors and not necessarily those of the U.S. Census Bureau. All data are subject to error arising from a variety of sources, including sampling error, non-sampling error, model error, and any other sources of error. For further information on SIPP statistical standards and accuracy, go to <www.census.gov/programs-surveys/sipp/tech-documentation/source-accuracy-statements.html>.

Introduction

Parental relationships remain important throughout the life course, not only during childhood. Many parents provide monetary and nonmonetary support to their adult children after they have left the home. For example, parents may directly transfer money to their adult children, which improves the current standard of living and employment outcomes for those receiving the resources (Semyonov & Lewin-Epstein, 2001). As the number of single-parent families and maternal employment has risen in recent decades, many adults have also enlisted the support of their parents in providing childcare in order to continue working (Goodfellow & Laverty, 2003). Parents can also provide emotional support to their children (Conney & Uhlenberg, 1992; Rossi & Rossi, 1990).

Parental relationships also involve both financial and nonfinancial transfers from adult children to their parents. Adult children may provide (or receive) monetary transfers to (or from) their parents to help pay expenses (e.g., Couch, Daly, & Wolf, 1999), and they may engage in caretaking for an aging parent (Friedman & Seltzer, 2010; Levitsky, 2014). As the U.S. population continues to age, the number of adult children providing assistance to their parents is expected to grow (Folbre 2012).

As a result, the loss of one or both parents can profoundly affect a person's life. Studies have found that the loss of a parent during adulthood can lead to increases in psychological distress and alcohol consumption, as well as declines in overall physical health (Umberson & Chen, 1994).

Despite the potential consequences of parental death across the life course, the demography of parental death remains underexplored. Indeed, there is a dearth of recent research in the United States that examines the risk of parental death across the life course (not just during childhood) and the ways in which this risk varies across demographic and socioeconomic characteristics (including race, Hispanic origin, educational attainment, and poverty status). In this paper, we use data from the 2014 Survey of Income and Program Participation (SIPP) to examine the risk of parental death.

Previous Research

Few sources of nationally representative data in the United States contain information about parental mortality. Research in Scandinavian countries has sought to establish intergenerational patterns in mortality outcomes (e.g., Martikainen & Moustgaard, 2009). However, other than clinical research conducted with small samples (e.g., Birtchnell, 1975), much of the existing research regarding parental mortality in the United States has relied on the National Survey of Families and Households (NSFH), which was conducted between 1987 and 1993 with a sample of roughly 13,000 adults (Marks, Jun, & Song, 2007). Research using these data has tended to focus principally on the emotional consequences of parental loss, rather than broadly describing differences in the age at which individuals lose one or both parents, or the sociodemographic and economic factors that might be associated with the timing of parental death.

Only a limited amount of information about parental loss in the recent U.S. content exists. The nation's population has continued to age, and parents' age at childbirth has continued to increase, leading to a larger age gap between parents and children (Lesthaeghe, 2010). These changes have increased the importance of understanding the risk of parental death across the life course. More recent efforts to study this topic have included research by Umberson and colleagues (2017), who used the National Longitudinal Survey of Youth (NLSY) and Health and Retirement Study (HRS) in their analysis and focused specifically on differences in the risk of parental death between Whites and Blacks. However, these cohorts and their parents have experienced particular historical events, such as world wars and the Great Depression, and have different fertility patterns (e.g., the Baby Boom), meaning that they may have different risks of parental death than the recent U.S. population overall.

Demographic and Socioeconomic Variation

Both fertility and mortality patterns vary across key groups. About 18 percent of women with biological children have their first child after turning 30, compared with roughly 31 percent of men (Monte, 2017). There are also race- and Hispanic origin-based differences in the timing of first birth. In 2016, maternal age at first birth was 24.7 years for Hispanic women, 24.8 years for non-Hispanic black women, and 27.4 years for non-Hispanic white women (Martin et al., 2018). Women with higher educational attainment also tend to have children at older ages than their less educated counterparts (Preston & Hartnett, 2008). Given that these differences in fertility patterns would lead to some groups having older parents than others into adulthood, we would expect these fertility patterns to influence differences in the timing of maternal and paternal death, as well as socioeconomic and demographic variation in age at parental death.

Moreover, disparities in mortality exist with respect to sex, race, and socioeconomic status. For example, in 2014, life expectancy for females was 81.3 years, while life expectancy for males was 76.5 years (Arias, Heron, & Xu, 2017). Until the oldest ages, black adults have higher mortality rates than white adults (Hummer, 1996; Basaran, Sahin & Heiland, 2017). Research over the last half century has also documented that more educated people tend to have lower mortality risk across the life course (e.g., Kitagawa & Hauser, 1973; Hummer & Lariscy, 2011). More recent research has captured how this relationship has continued to evolve, mostly increasing, over time (Sasson, 2016; Hendi, 2017). Similarly, people with more income tend to have lower mortality risk than those with less income (Glymour et al., 2014). As with fertility patterns, demographic and socioeconomic variation in life expectancy and mortality risk is likely to manifest itself in the timing of parental loss.

In this paper, we examine the risk of parental death across the life course. Building on our earlier analyses (Scherer & Kreider, 2019), we start by describing the risk of maternal death, paternal death, the loss of a first parent, and the loss of both parents for the U.S. population overall. We then turn to population heterogeneity, specifically, to differences by race/origin, educational attainment, and poverty status.

Although our primary motivation is to address these substantive questions, we pay close attention to data quality, including the quality of respondent data and the relative merits of different imputation strategies. This examination helps to evaluate the robustness of our results and to inform future efforts to collect parental death information in major social surveys.

Data and Methods

Data

SIPP is a nationally representative panel survey administered by the U.S. Census Bureau that collects information on a variety of socioeconomic factors.[3] The 2014 panel followed households for four years, gathering information on an annual basis from an initial sample of roughly 30,000 interviewed households regarding a variety of topics relating to economic wellbeing, family dynamics, education, and wealth. We use data from the first wave of the 2014 SIPP panel. As few parental deaths occur in later adulthood, estimates of the probability of parental death are relatively noisy after age 65; therefore, we limit our analyses to persons aged 65 and under.

[3] As SIPP is a survey, estimates are subject to error. For more information about SIPP sampling error, visit https://www.census.gov/programs-surveys/sipp/methodology/sampling-error.html

Respondents were asked a series of questions regarding parental mortality, including whether their biological parents were still alive at the time of the survey, and, if not, the month and year in which they died.[4] In this analysis, we use responses to questions regarding the parental mortality status, year of parental death, and socioeconomic and demographic characteristics of the respondents. We focus on differences by race/origin, educational attainment, and poverty status.

To address cases in which respondents did not report when their parent(s) died, we use a range of strategies to examine the sensitivity of our results to alternative imputation procedures.[5] First, we use imputed data available in the restricted-use and public-use versions of the 2014 SIPP. In these files, variables are fully allocated and imputed using response information from individuals with similar characteristics through hotdeck procedures (see U.S. Census Bureau, 2018 and Andridge & Little, 2010). As a result, every in-universe individual has a value for these variables.

Second, we use a maximum likelihood approach to handle missing parental death data. As parental death is our dependent variable, this approach reduces to listwise deletion (Allison 2012).[6] That is, in these models, we exclude individuals who did not report their mother's year of death in analyses of maternal death; exclude individuals who did not report their father's year of death in analyses of paternal death; and exclude individuals who did not report both their

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[4] Individuals with adoptive parents or stepparents were still asked these questions about their biological parents. It is not possible to limit our analysis to those individuals with two known biological parents, as SIPP does not gather this information.

[5] While data for questions regarding the year of parental death were collected during each year of the 2014 SIPP Panel, and released for the first interview (wave) of the panel, they were not released in subsequent waves due to concerns surrounding data quality stemming from high rates of nonresponse. For more information, see https://www.census.gov/programs-surveys/sipp/techdocumentation/user-notes/2014-usernotes/2014w1-parent-mortality.html

[6] This approach assumes that the data are missing at random (MAR). Although missingness for parental death information likely violates the MAR assumption, the other imputation strategies appropriate for our data and analytic strategy also rely on this relatively strong assumption.

mother's and their father's years of death in analyses of the death of the first parent and the death of both parents.

Third, we re-impute these missing values through a multiple imputation framework (Little & Rubin, 2002). This approach takes into account the uncertainty related to imputed values of missing data by imputing multiple values for age of parental death and using Rubin rules to calculate their standard errors (Rubin, 2004). In this version of the analyses, we include five datasets.[7]

Variables

Our central focus is an individual's age at the time of biological parental death, specifically the *age at maternal death*, *age at paternal death*, *age at first parental death,* and *age at which both parents die*.[8] We construct these measures by subtracting the individual's year of birth from the year of parental death.

Due to misreport, incorrect assumptions during imputation, and/or disclosure avoidance practices, the age at parental death is negative for some respondents.[9] In our initial models, we recode these values as deaths occurring at the time of birth, thereby effectively removing them from the denominator. In multiply imputed models, we also treat these values as missing.

We examine variation in age at parental death across a number of key sociodemographic and economic characteristics. These include *race and Hispanic origin* (non-Hispanic white; non-Hispanic black; non-Hispanic other race; Hispanic any race), *educational attainment* (less than

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[7] Future versions of this paper will examine the sensitivity of these results to additional imputed datasets. Our models based on multiply imputed results do not use replicate weights in this version, as they are fairly computationally intensive.

[8] SIPP only collects data about the timing of biological parents' deaths. Accordingly, all uses of 'parent,' 'mother,' and 'father' refer to respondents' biological parents.

[9] With the originally imputed data, the number of cases with parents who died before or at the time of birth ranges between 118 for maternal death and 454 for paternal death.

high school graduate; high school graduate (or equivalent) or some college; bachelor's degree or higher), and *poverty status* (household income-to-poverty ratio (IPR) less than 1.00; greater than or equal to 1.00).

Survival analyses also include a number of additional covariates associated with both age at parental death and these individual characteristics. Covariates include *nativity* (foreign-born; native-born), *region* (Northeast; Midwest; South; West), *region of birth* (South; not South). Models examining the age at first parental death and both parental deaths also account for the *disparity between parental ages* (paternal birth year is more than five years before the maternal birth year; paternal birth year is less than five years before the maternal birth year or after the maternal birth year). Each of these variables is associated with mortality and/or fertility (e.g., Barclay & Myrskylä, 2016; Choi, 2013; Fenelon, 2013; Goldman, 2016). Our multiple imputation models add three additional variables to better predict values for missing data: *maternal age at birth* (less than 20 years; 20-34 years; 35 years or older), *paternal age at birth* (less than 20 years; 20-34 years; 35 years or older), and individuals' *health status* (fair/poor; good/very good/excellent).

Analytic Strategy

This paper employs a number of estimation strategies to capture the risk of parental death across age. We start with a nonparametric approach to examine, separately, the risk of maternal death, paternal death, death of the first parents, and death of both parents. We plot separate Kaplan-Meier curves across age for each of these four outcomes for the U.S. population as a whole, and for sub-populations for the sociodemographic and economic characteristics described above (race/origin, educational attainment, and poverty status).

We then turn to semiparametric piecewise exponential models that allow us to estimate the hazard function. These models allow the hazard to vary across *a priori* specified age intervals, but assume that the baseline hazard is constant within each of these age intervals. Specifically, this model takes the following form:

$$\lambda_{ij} = \lambda_j exp\{\mathbf{X}_{ij}\beta\}$$

Where λ_{ij} is the i^{th} individual's hazard during interval j, λ_j is the baseline hazard in interval j (assumed to be constant), and $\mathbf{X}_{ij}$ is a vector of covariates.[10] As we have sufficient sample size (e.g., we observe at least 10 parental deaths for each age), we include one-year wide age intervals.[11] However, results are also robust to two-year- and five-year-wide age intervals, as well as age intervals based on Social Security Administration (SSA) standards. We also estimate all four parental mortality outcomes with Cox proportional hazards models and complementary log-log models as a robustness check. These alternative specifications do not substantively affect our findings.

Our primary models include all people in the sample as of December of the year prior to interview (i.e. December 2013), except for foster children.[12] Unless otherwise specified, models include the use of replicate weights to account for the complex sampling design of SIPP.

[10] As the U.S. Census Bureau only released data regarding year of parental death for the first wave of SIPP, all covariates will be time-invariant.

[11] In this version of the paper, we keep piecewise exponential model specifications consistent across the four parental mortality outcomes. Future versions may allow specifications to vary across outcomes.

[12] Foster children are not in the poverty universe and, therefore, do not have poverty information. Moreover, foster children, or the foster parents reporting for them, may be less likely to have information about their biological parents' mortality status.

Results

Descriptive Statistics

[Table 1 here]

Table 1 describes selected social and demographic characteristics of the sample that we use in our analyses. As noted above, this sample is nationally representative of the civilian, non-institutionalized United States population as of December 2013.

By the time of interview, 42 percent experienced the death of at least one biological parent: 28 percent with a mother who had died and 38 percent with a father who had died. For about 24 percent of people, both biological parents were deceased. As we measure the respondents' birth year and parental death year(s) in years, our analytic sample is measured in person-years. Our unweighted sample sizes for the originally imputed data range from 2,091,165 person-years in models of first parental death to 2,521,951 person-years in models of the death of both parents.

Risk of Parental Death by Age

Using Kaplan-Meier estimation, Figure 1 shows survival functions for the originally imputed sample for each of four parental mortality outcomes: maternal death, paternal death, death of a first parent, and death of both parents across 'child' age. [13] Each line corresponds to the survival probability, or likelihood that a child lives a given number of years before experiencing parental death. Due to the small number of events that occur in later adulthood, estimates of the probability of parental death are relatively noisy after age 65; therefore, all parental death events are censored at that age.

[13] Throughout this analysis, we refer to 'children,' regardless of age at the time of parental death, to distinguish them from their parents, whose death is being studied.

[Figure 1 here]

Three key results stand out in this figure. First, the probability of experiencing parental death increases with age. For example, 25 percent of people have at least one biological parent who died by age 33; by age 46, 50 percent of people have experienced at least one parental death (panel c). Only 16 percent have two living biological parents by age 60. Second, following the pattern identified in our prior research (Scherer and Kreider 2019), a person is more likely to experience paternal death (panel b) earlier in their life than maternal death (panel a). For example, 25 percent of people have experienced the death of their father by age 37, while this is true of mothers by age 47. Third, 25 percent of people have experienced the death of both of their biological parents by age 52, and, by age 60, half of all people have lost both of their parents.

Differences by Imputation Status

These estimates are based on the public-use SIPP file, which, like other Census Bureau data sets, includes allocated values for all missing biological parental death information. However, due to inherent challenges with imputing the year in which someone's parent died, the results described in Figure 1 may be sensitive to the imputation strategy employed. As a result, we evaluate whether estimates depend on the imputation strategy used.[14]

Figure 2 presents estimates stratified by the imputation status of information about the timing of parental death. That is, these plots distinguish between those individuals with reported responses, and those with allocated responses, as allocated in the public-use dataset. Doing so

[14] We will continue to refine imputation approaches in future versions. See the Discussion section for additional details.

allows us to see if the shape of the survival curve estimated from imputed data affects the shape of the survival curve estimated from the full sample.

[Figure 2 here]

These stratified analyses reveal a number of differences between survival probabilities for cases with reported and imputed parental death data. For example, across all four parental mortality outcomes, for people in their twenties and early-to-mid thirties, the imputed data yield lower estimated probabilities of paternal death than the non-imputed cases.[15]

Differences between these groups are not necessarily problematic. We would expect some (unconditional) differences, especially as the estimates do not include any covariates and that all imputed cases have experienced parental death. People who do not know when their mother and/or father died (or refuse to provide this information) likely systematically differ from the population that knows this information. Table A1 in the Appendix describes how the population with reported data differs from the population with imputed data with respect to a number of social and demographic characteristics.

Systematic differences between reported and imputed data, however, likely cannot be fully explained by (observed) differences between groups. Most notably, we observe heaping in the imputed values that yields precipitous drops in the survival function at certain ages (for example, 65 years old for fathers). There is no conceptual basis on which to expect such heaping, and this pattern is not observed for reported parental death data. Because of these systematic differences, we pursue alternative strategies for dealing with missing data and evaluate their

[15] All comparative statements have undergone statistical testing and are significant at the 90 percent confidence level unless otherwise indicated.

impact on data quality. We focus on two alternatives in this paper: listwise deletion and multiple imputation.

For the sake of space and clarity, we primarily focus on listwise-deleted results in the remainder of the results section; however, we present estimates from analyses with the original SIPP data and with a multiply imputed sample. Broad substantive implications are largely consistent across models (unless otherwise noted), and we will unpack differences across models in future versions of this paper.

Risk of Parental Death by Socioeconomic Characteristics

Moving beyond broad trends in the risk of parental death, we then examine population heterogeneity by socioeconomic resources (poverty and education) and by race and Hispanic origin. As noted earlier, variation in the timing of fertility and mortality by socioeconomic status and race may lead to heterogeneous patterns of parental death across the life course. Therefore, we also present stratified Kaplan-Meier plots (Figures 3-5).[16]

Educational Attainment

We begin by considering differences in the risk of each of the four instances of parental death based on educational attainment, as shown in Figure 3.[17]

[Figure 3 here]

Across each of the four outcomes, those with higher levels of educational attainment are less likely to have experienced parental loss by a given age than those with lower levels of educational attainment.[18] For example, by age 40, about 20 percent of people with less than high

[16] In the appendix, we present the results from the other strategies for handling missing data.
[17] Persons under aged 25 and younger are excluded from this figure, as younger individuals may not have completed their education and may attain additional years of schooling.
[18] Educational attainment is defined by a person's education at the time of interview, not at the time of parental death.

school education have lost their mother, 15 percent of those who completed high school (or equivalent), and 12 percent of those who have a bachelor's degree or above. Meanwhile, turning to paternal death: by age 40, paternal loss has been experienced by 35 percent, 30 percent, and 25 percent of people in each of the three education groups, respectively.

Poverty Status

We see a higher risk of parental death (across all four outcomes) among those living below the poverty line than among those living at or above it (Figure 4). Differences in the maternal death rates of at least two percentage-points first appear for individuals in their mid-thirties, and appear later for paternal death and the death of both parents.

[Figure 4 here]

By age 40, those living under the poverty line have an 18 percent likelihood of having lost their mother, compared to a 14 percent likelihood for those living above the poverty line. Additionally, by age 40, the likelihood of losing a first parent is 41 percent for those living under the poverty line, compared to 36 percent for those living above it. Finally, turning to the loss of both parents, the risk of this outcome by age 40 is nine percent for those living under the poverty line, compared to seven percent for those living above it.

Race / Hispanic Origin

The final characteristic that we consider is race and Hispanic origin, as displayed in Figure 5, which plots survival functions for each outcome of interest among four distinct race/origin groups: non-Hispanic White-alone; non-Hispanic Black-alone; non-Hispanic all other races and race combinations[19]; and Hispanic (any race).

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[19] Because the Asian population is not accounted for separately in the development of the weights for SIPP, we do not consider it as a separate group in our analysis.

[Figure 5 here]

The risk of both maternal and paternal death for Hispanics is about as low as or lower than it is for other race/origin groups. Meanwhile, turning to risk of parental death for non-Hispanic Blacks, we see that risk of maternal death and paternal death is about as high or higher among non-Hispanic Blacks as it is for the non-Hispanic other race groups.

Clear differences can also be identified in the risk of losing a first parent. For example, by age 40, 42 percent of non-Hispanic Blacks have lost a first parent, compared to 37 percent for non-Hispanic Whites, 35 percent of those identifying as some other race or race combination, and 32 percent of Hispanics.[20]

However, these differences do not persist when we look at the risk of having lost both parents by a given age. For this outcome, among older age groups, we observe a divergence in which risk of death for non-Hispanic Blacks is not significantly higher than that for non-Hispanic Whites. For example, by age 60, the likelihood of having lost both parents among non-Hispanic Blacks is 53 percent, compared to 54 percent for non-Hispanic Whites. We posit potential explanations for this counterintuitive finding below. Notably, the contrast for Hispanics persists when the outcome of interest is the death of both parents, with 44 percent of Hispanics having lost both parents by age 60.

Piecewise Exponential Results

To further assess the association between socioeconomic factors and the risk of parental death across the life course, we estimate a series of piecewise exponential regression models. These models allow us to examine the social and economic characteristics in a multivariate

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[20] The difference between the risk for non-Hispanic Whites and those identifying as some other race or race combination is not significant.

framework to see if, net of demographic characteristics and each other, these characteristics are associated with a higher risk of parental mortality. We estimate separate models for each of the four outcomes of interest (age at maternal death, age at paternal death, age at first parental death, and age at which both parents die) for each of the missing data approaches (using the originally imputed values present on the 2014 public-use dataset; using listwise deletion; and using multiple imputation).[21]

[Table 2 here]

One advantage of piecewise exponential models over alternative semi-parametric approaches (e.g., Cox proportional hazards models) is that they allow us to explicitly model the baseline hazard function. As expected, across models and outcomes of interest, a person's risk of experiencing the death of a parent broadly increases across the life course, as presented in the one-year age intervals in Table 2. Although the magnitude and significance of the change in risk for a certain ages varies across models, the general shape of the increase is broadly similar. The risk of parental death increases fairly linearly across most ages until it appears to slow down in late middle adulthood. We also see large drops at key ages in the model estimated from the originally allocated (hotdecked) data, even after accounting for socioeconomic and demographic characteristics. These drops are not present in estimates based on the listwise-deleted or multiply imputed data.

Maternal and Paternal Death

We first look at the models for maternal death and paternal death. Even after accounting for social and demographic characteristics, those in poverty are more likely than those not in poverty

[21] Future versions will also consider variation in the baseline hazard by stratifying models by each of the social and demographic characteristics.

to have experienced maternal death or paternal death by a given age in both the originally-imputed and listwise-deleted models. Similarly, those at higher levels of educational attainment are at a lower relative risk of experiencing one of these events than those at lower levels of attainment.

For both outcomes, the risk for non-Hispanic Blacks is significantly higher than for non-Hispanic Whites in the originally-imputed model, but not in the listwise-deleted model. Meanwhile, for both maternal and paternal death, Hispanics are at less risk of experiencing parental loss in both the publically released (allocated) and listwise-deleted models. Finally, turning to regional variation, those in the West are at lower risk of either of these outcomes across each strategy for handling the missing data.

Age at First Parental Death

The patterns identified in the models for maternal death and paternal death are also largely present when examining the age at which an individual first experiences the death of a parent. For example, we see that socioeconomic disadvantage is associated with increased risk of parental death. People living in poverty have higher risks of parental mortality than people with higher family-income-to-poverty ratios in both the originally imputed and listwise-deleted models. People with lower levels of educational attainment also have higher risk of this outcome compared to those with higher levels of educational attainment.

Turning to race and origin, non-Hispanic Blacks are more likely to experience the death of a first parent by a given age than non-Hispanic Whites. Like with maternal and paternal death, the first-parental-death models show that differences between non-Hispanic Whites and non-Hispanic Blacks were not statistically significant in the listwise-deleted model, but were significant with the other two imputation strategies. Once again, we see that the underlying hazard of parental death is lower for Hispanics compared with non-Hispanic whites with all three imputation strategies.

Finally, in this model, we account for the age gap between parents. We observe that those people with a father that is more than five years older than their biological mother are more likely to have experienced the loss of a first parent by a given age than those in which the father was less than five years older (or younger) than the mother.

<u>Age at which Both Parents Die</u>

Overall, the patterns observed in the survival models are consistent with earlier results predicting the risk of having lost both parents by a given age. Being in poverty is a substantively strong and statistically significant predictor of having an increased risk of having lost both parents by a given age in both the originally imputed and listwise-deleted models, as is having a father who is at least five years older than the mother. Meanwhile the risk is lower for Hispanics, as well as those living in the West.

Notably, unlike in the previous three models, there is no statistically significant difference in the likelihood that non-Hispanic Blacks will have lost both parents by a given age compared to non-Hispanic Whites in the pre-imputed and listwise-deleted models.

Discussion

Having a living biological parent—or parents—can play a key role across the entire life course, and their death(s) can negatively affect psychological and economic wellbeing (e.g., Kim et al., 2018; Schafer, 2009; Weaver, 2019). Despite the importance of understanding when parents die, relatively little is known about broad trends in the present-day United States. Our results fill this gap, documenting the risk of losing parents from birth to age 65 and highlighting the ways in which this pattern varies by race/origin, educational attainment, and poverty status.

As expected, our analyses document an increasing risk of parental death across the life course, whether measured by age at maternal death, age at paternal death, age at first parental death, or age at which both parents die. This probability of parental death increases at the fastest rate during middle age and then appears to taper.

The risk of parental death and the median age at death differ by parental sex: we observe that individuals are more likely to experience paternal death earlier in life than maternal death. This finding is likely reflective of the way in which differences in life expectancy and fertility patterns between men and women manifest themselves in terms of the risk of parental death across the life course – men tend to have children later in life and live for a shorter period of time than women (Arias et al., 2017; Monte, 2017).

We also observe heterogeneity based on sociodemographic and economic characteristics. People living in poverty are more likely to lose a parent at all ages, even after controlling for other social characteristics. This relationship also remains significant across different methods of handling missing data. Similarly, those at lower levels of educational attainment are at a higher risk than those at higher levels of educational attainment. These patterns are reflective of the way in which socioeconomic inequality can be reproduced across generations. Differences in the risk of parental death across the life course vary by socioeconomic characteristics, and parental absence can reduce intergenerational transfers, thereby contributing to socioeconomic inequality.

Turning to racial heterogeneity, we observe some differences in the risk of parental death between non-Hispanic Blacks and non-Hispanic Whites, with non-Hispanic Blacks being more likely than non-Hispanic Whites to have experienced maternal death, paternal death, or the loss of a first parent by a given age in the publically released data.[22] However, this difference does not persist for the risk of having lost both parents by a given age. One explanation for this difference may be mortality selection, with the notion being that the parents of those who are able to 'survive' a higher risk of parental death earlier in life may have longer lifespans overall (Zajacova & Burgard, 2013), an outcome partially reflected in longer life expectancies for non-Hispanic Blacks among the oldest age groups (Arias et al. 2017). Another possibility is that, as a sample, SIPP may disproportionately capture the Black population with the lowest mortality rates and lower risk of losing one or both parents early in the life course. While sample weights account for this potentially differential sampling, they may not completely address it (see U.S. Census Bureau, 2020).

These findings build on earlier work by Umberson and colleagues (2017), who use data from three surveys (Add Health, Health and Retirement Survey, and National Longitudinal Survey of Youth) to examine the cumulative risk of the death of a family member, including parental death. They too find that parental death tends to increase over the life course and that, across most ages, there are marked black-white differences. We show that this pattern holds when looking at a broader range of cohorts than captured by the HRS (which only captures older cohorts) or NLSY (which only captures parents who tend to be Baby Boomers). Our results speak to a wider range of experiences in the twenty-first century United States. Perhaps as a result, we see more evidence of black-white mortality crossover in later ages (Lynch, Brown, & Harmsen, 2003).

[22] Assuming that the data are missing at random, the standard errors for the publically released data will likely be downwardly biased and the standard errors for the listwise deletion will be upwardly biased.

Our analyses expand on Umberson and colleagues' work by also considering Hispanic origin alongside race. We observe that Hispanics are less likely than non-Hispanic Whites to have experienced parental loss at most ages. For example, at age 20, Hispanics were 5 percentage points less likely to have experienced the death of at least one parent than non-Hispanic Whites. This finding is likely attributable to longer life expectancies for Hispanics, sometimes known as the "Hispanic mortality advantage" (Goldman 2016), as well as lower ages at first birth for Hispanic mothers (Martin et al. 2018, Monte 2017).

Other findings highlight the ways in which fertility and mortality shape whether an individual's parents are alive and can transfer resources. For example, we find that the risk of parental death depends on where a person lives. Consistent with prior work in social epidemiology, our research offers evidence of regional differences in health behaviors, health, and mortality (Berchick & Lynch, 2017; Fenelon, 2013; Pickle et al., 1997).

Theoretically, individuals from impoverished backgrounds, those with lower educational attainment, and those from communities that experience lower life expectancy would benefit most from parental support. However, to the extent that our findings offer evidence of sociodemographic and economic heterogeneity in the timing of parental loss, individuals most in need of the transfers described above would be least able to leverage them, and most likely to suffer the psychological and material consequences that often accompany parental loss earlier in life.

Prior work has shown that, while most young adults have a relationship with their biological parents, many of those who do not have such a relationship find themselves in this position due to parental death. For example, using data from the National Longitudinal Study on Adolescent Health (Add Health), Hartnett and colleagues (2018), find that 94 percent of young adults have a relationship with their mother; most of the remainder do not due to maternal death. A smaller percentage of young adults have a relationship with their father (80 percent), with a combination of paternal death and early paternal absence explaining why 20 percent of young adults do not have such a relationship with their father. In other words, absent parental death, most children (even as adults) may receive financial and non-financial transfers from their parents.

Our results also highlight the importance of considerations of missing data and the imputation of data. While patterns across age are similar across imputation strategies (with a handful of exceptions, including at age 65), the magnitude, direction, and significance of coefficients for socioeconomic and demographic characteristics varies across approaches. As a result, considerations of the ways in which the timing of parental death contributes to the production and reproduction of inequality (Umberson et al. 2017) must also consider data quality.

Limitations

Our analyses have a few limitations that warrant consideration. First, our approaches for addressing missing data do not attempt to take into account other household roster information. This includes whether a respondent's biological parent(s) may have been in the household earlier in the reference year. Our imputation and analytic models also do not account for other (full) siblings who may be in the household. As a result, the standard errors for individuals may be clustered.

Second, the SIPP data do not allow us to fully observe whether a person interacts with living parents, or if they interacted with now-deceased parents when they were alive. Persons who are adopted or the children of absent parents likely do not receive financial or time transfers from their biological mother or father. In this case, the age when a biological parent dies does not affect the social (dis)advantage of the child.

Third, our estimates are based on survey reports of living respondents. Persons may incorrectly report the timing of their parent's (or parents') death(s). This is especially important if there is differential recall bias across socioeconomic and/or racial/Hispanic origin groups. Selective mortality for respondents means that our sample might not capture respondents who died before the time of the survey and, to the extent that causes of mortality are correlated across generations, experienced parental death early in their life course. In addition, sometimes one adult may report for everyone in their household, and may not know the exact timing of the death of the parents of their spouse, cohabiting partner, or housemate.

Next Steps

Future versions of this paper will also further test the sensitivity of our results to other imputation strategies. First, we will refine our multiple imputation models to include more covariates and to explicitly model missingness on additional variables. We will also use indirect methods for determining parental age when it is not reported by the respondent. SIPP asks respondents to report their biological parents' year of birth. We will combine these data with estimates from the National Health Interview Survey Linked Mortality File (NHIS-LMF) and/or National Longitudinal Mortality Study (NLMS) and Centers for Disease Control (CDC) mortality data to create a cohort-by-sex-by-race-by-education-specific estimate of age at death for parents. We will then use this information to construct an estimated age at death, which would be added to the parent's birth year to assign a year of parental death.

Additionally, future versions of this paper will allow the hazard of the different sociodemographic and economic characteristics to be age-varying in an effort to better evaluate the mortality selection hypothesis posited above.[23]

As a robustness check, in future versions, we will also estimate additional models in which we randomly select one individual from sets of biological siblings that live in the same household and adjust the SIPP person weight by the inverse of the individual's probability of selection to produce better estimates.

Taken in combination with the research presented here, these efforts will further our understanding of the implications of heterogeneity in the risk of parental death across the life course.

Conclusion

Throughout childhood, parents invest time and resources in their offspring; even after a child transitions into adulthood, his or her parents may offer financial, emotional, and material support. This paper deepens our understanding of how parental death is experienced in the recent United States context, as well as how it varies across the life course and across populations.

[23] That is, we plan to include interaction terms between age categories and poverty status. These additional models may also allow other socioeconomic resources to vary by age. However, while these models provide suggestive evidence, these models cannot fully highlight the role of mortality selection (as Wave 1 of the 2014 SIPP is a single cross-sectional snapshot).

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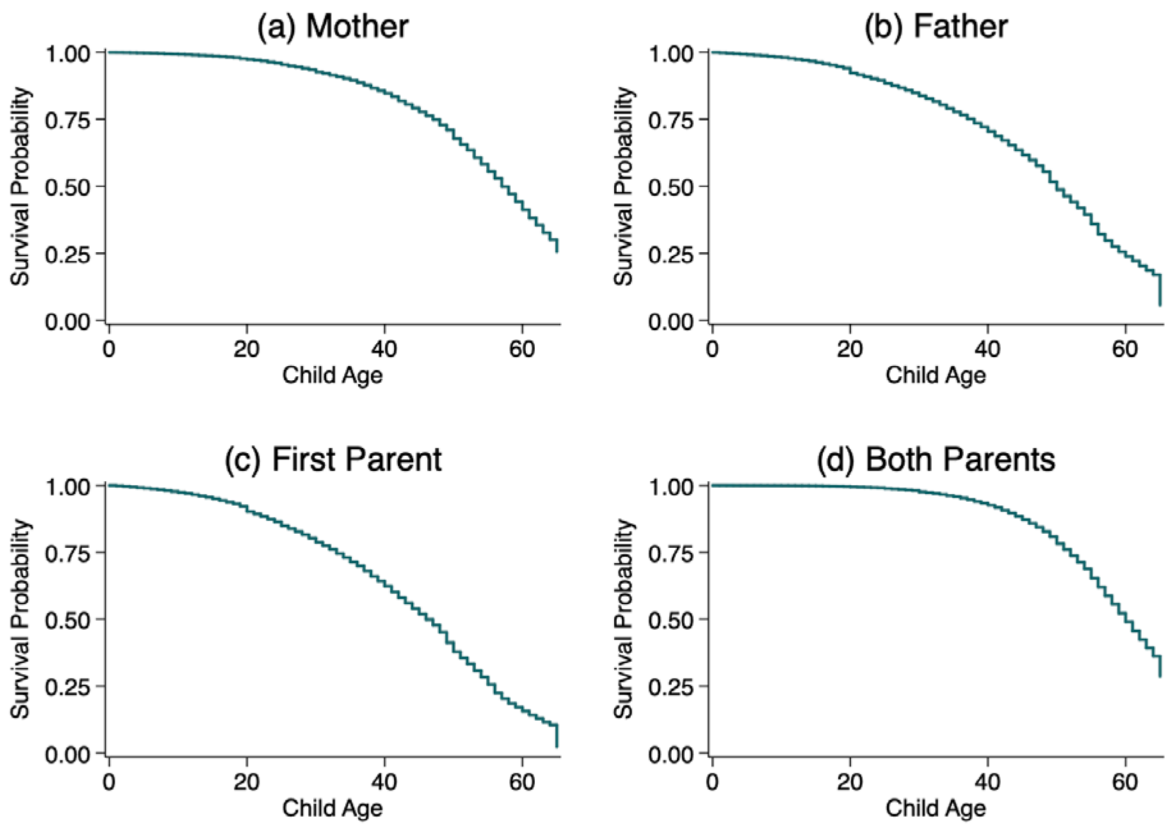
Tables and Figures

Table 1. Percents and Means for Key Social and Demographic Characteristics

Characteristic	Percent or Mean	Standard Error
Biological mother dead (%)	28.4	0.135
Respondent's age at death (years)	45.9	0.118
Person-years of observation[1]	2,413,644	---
Biological father dead (%)	37.7	0.144
Respondent's age at death (years)	38.5	0.127
Person-years of observation[1]	2,199,472	---
At least one biological parent dead (%)	42.2	0.149
Respondent's age at death (years)	35.8	0.111
Person-years of observation[1]	2,091,165	---
Both biological parents dead (%)	23.9	0.122
Respondent's age at death (years)	52.0	0.112
Person-years of observation[1]	2,521,951	---
Age (years)	38.1	0.008
Female (%)	51.1	0.003
Race (%)		
Non-Hispanic White	62.0	0.078
Non-Hispanic Black	12.3	0.052
Non-Hispanic Other Race	8.4	0.063
Hispanic, Any Race	17.3	0.004
In Poverty (%)	13.8	0.247
Educational attainment (%)		
Aged 25 or under	19.2	0.024
Less than high school	13.5	0.142
High school or some college[2]	44.8	0.193
Bachelor's degree or higher	22.6	0.183
Foreign born (%)	14.6	0.181
Region (%)		
Northeast	17.7	0.021
Midwest	21.4	0.018
South	37.4	0.025
West	23.6	0.016
Born in South (%)	29.0	0.175

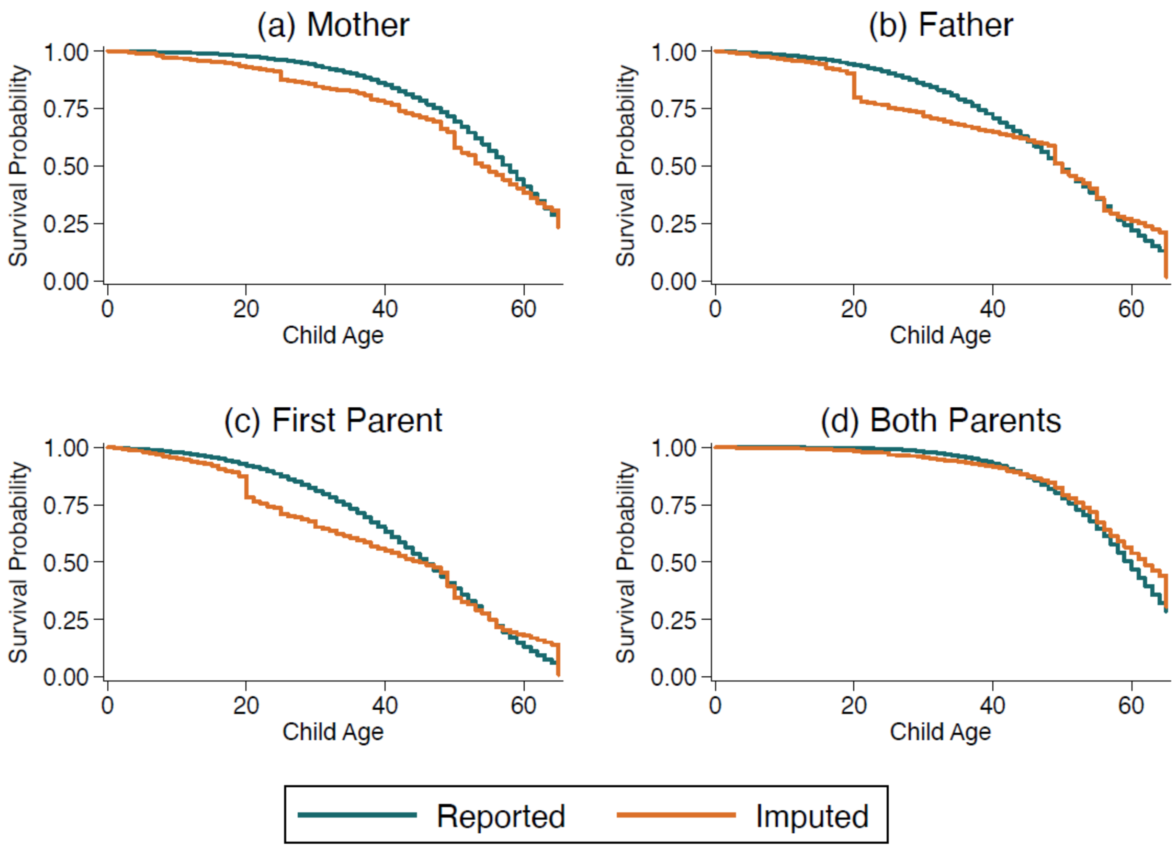
Source: U.S. Census Bureau, 2014 Survey of Income and Program Participation, Wave 1 Public-Use File
[1] Unweighted; for models using pre-imputed data. [2]Includes high school equivalents and associate's degrees.

Figure 1. Kaplan-Meier Plots of the Probability of Parental Survival, by Parental Death Outcome



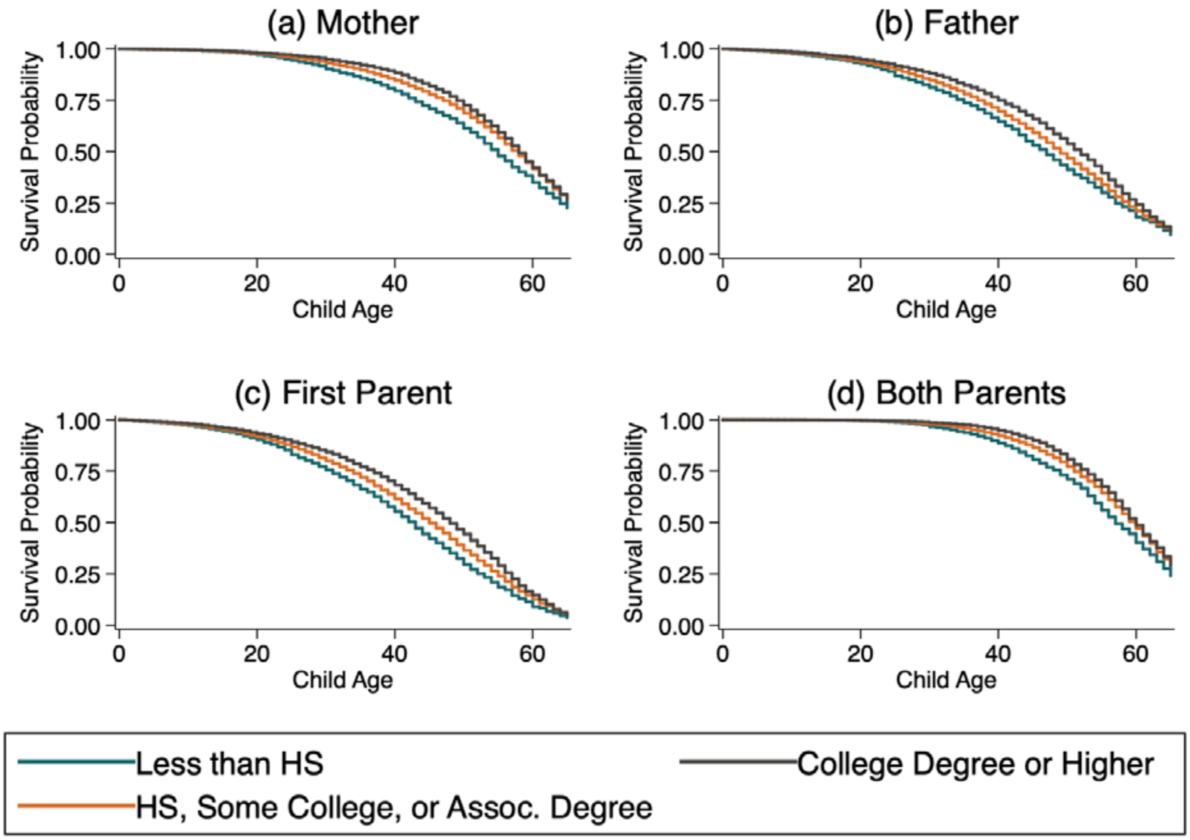
Source: U.S. Census Bureau, 2014 Survey of Income and Program Participation, Wave 1 Public-Use File. Parental deaths censored at age 65 in all models.

Figure 2. Kaplan-Meier Plots of the Probability of Parental Survival, by Parental Death Outcome and Imputation Status



Source: U.S. Census Bureau, 2014 Survey of Income and Program Participation, Wave 1 Public-Use File. Parental deaths censored at age 65 in all models.

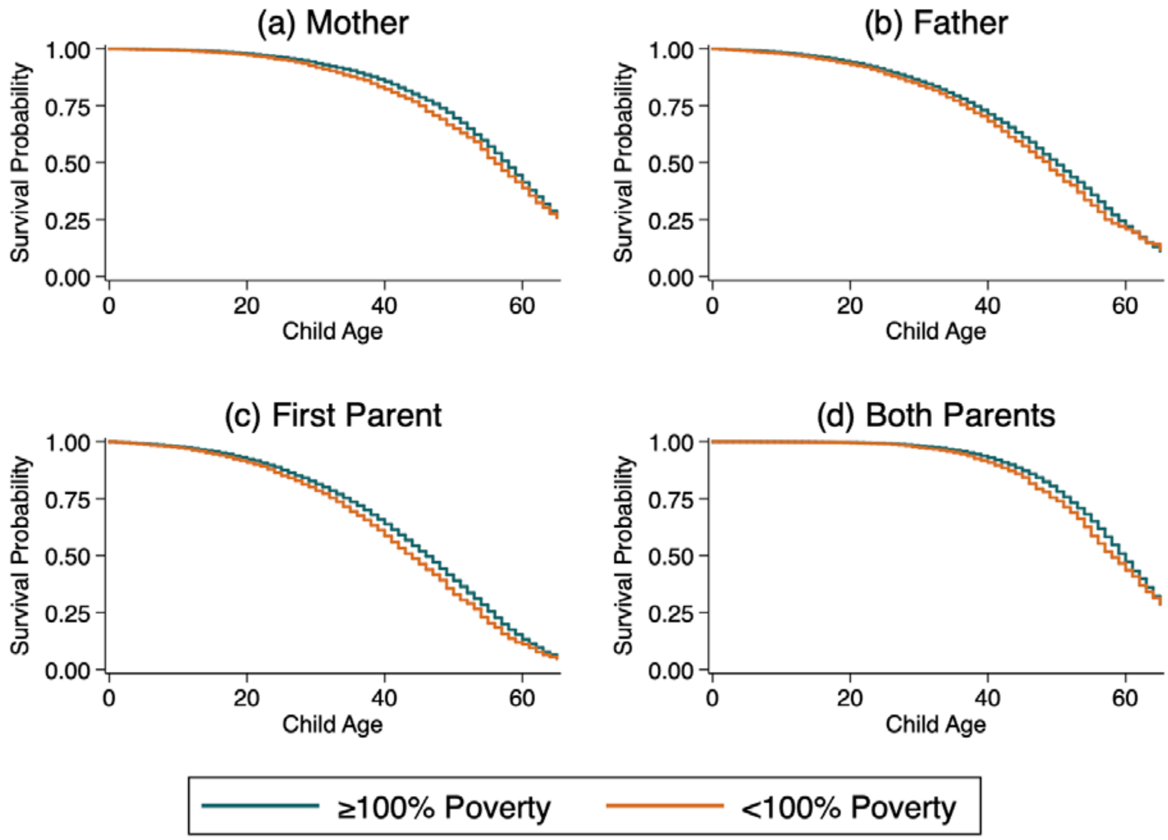
Figure 3. Kaplan-Meier Plots of the Probability of Parental Survival, by Parental Death Outcome and Educational Attainment



Note: Persons aged 25 and younger at the time of interview are excluded from this figure, as they may not have completed schooling.

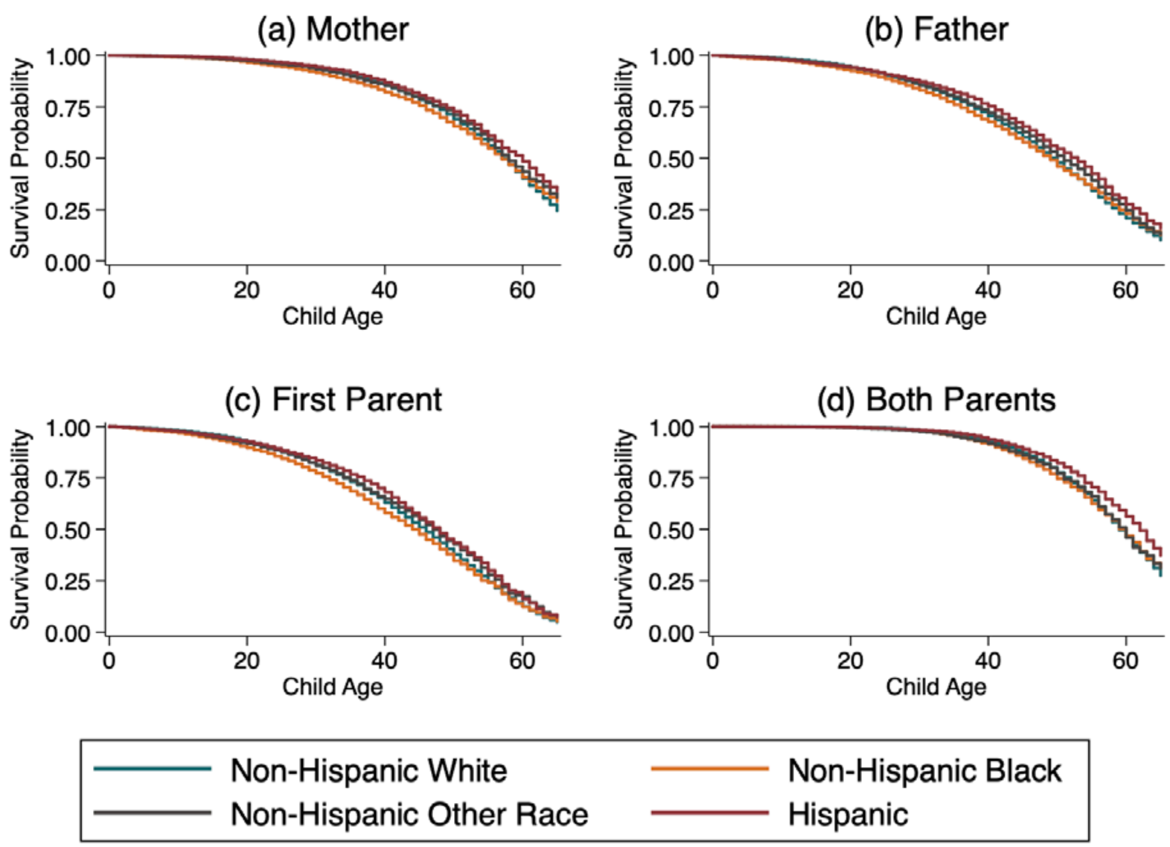
Source: U.S. Census Bureau, 2014 Survey of Income and Program Participation, Wave 1 Public-Use File. Parental deaths censored at age 65 in all models.

Figure 4. Kaplan-Meier Plots of the Probability of Parental Survival, by Parental Death Outcome and Poverty Status



Source: U.S. Census Bureau, 2014 Survey of Income and Program Participation, Wave 1 Public-Use File. Parental deaths censored at age 65 in all models.

Figure 5. Kaplan-Meier Plots of the Probability of Parental Survival, by Parental Death Outcome and Race/Hispanic Origin



Source: U.S. Census Bureau, 2014 Survey of Income and Program Participation, Wave 1 Public-Use File. Parental deaths censored at age 65 in all models.

Table 2. Coefficients (and Standard Errors) from Piecewise-Exponential Models, by Type of Parental Death and Method to Address Missingness

	Mother Death			Father Death			First Parent Death			Both Parent Death		
	Public-Use Allocation	Listwise Deletion	Multiple Imputation†	Public-Use Allocation	Listwise Deletion	Multiple Imputation†	Public-Use Allocation	Listwise Deletion	Multiple Imputation†	Public-Use Allocation	Listwise Deletion	Multiple Imputation†
Age (Ref. = Age 0)												
Age 1	0.110	-0.147	-0.086	0.164	0.278	0.272	0.162	0.199	0.216	-0.117	-0.717	-0.684
	(0.333)	(0.351)	(0.354)	(0.145)	(0.160)	(0.164)	(0.122)	(0.122)	(0.150)	(0.764)	(1.100)	(1.101)
Age 2	0.357	0.011	0.080	0.167	0.218	0.227	0.179	0.150	0.198	0.846	-0.251	0.165
	(0.280)	(0.324)	(0.333)	(0.137)	(0.161)	(0.161)	(0.137)	(0.142)	(0.149)	(0.604)	(0.981)	(1.054)
Age 3	0.611*	0.519	0.569	0.321*	0.418**	0.423**	0.383**	0.416**	0.447**	0.541	0.559	0.950
	(0.266)	(0.294)	(0.310)	(0.134)	(0.158)	(0.157)	(0.129)	(0.140)	(0.142)	(0.638)	(0.916)	(0.905)
Age 4	0.407	0.391	0.437	0.157	0.036	0.062	0.236*	0.137	0.166	-0.781	-21.395***	-8.788
	(0.292)	(0.322)	(0.313)	(0.142)	(0.172)	(0.179)	(0.112)	(0.129)	(0.161)	(1.120)	(0.702)	(12.736)
Age 5	0.683**	0.707*	0.763*	0.259	0.265	0.315	0.357**	0.351*	0.412**	0.53	0.976	1.246
	(0.259)	(0.273)	(0.298)	(0.140)	(0.166)	(0.166)	(0.127)	(0.143)	(0.148)	(0.643)	(0.861)	(0.868)
Age 6	0.977**	0.576	0.661*	0.174	0.255	0.300	0.407**	0.310*	0.377*	0.206	0.792	1.081
	(0.295)	(0.333)	(0.307)	(0.137)	(0.154)	(0.169)	(0.137)	(0.130)	(0.152)	(0.746)	(0.957)	(0.948)
Age 7	1.274***	0.765**	0.842**	0.500***	0.561***	0.624***	0.716***	0.581***	0.679***	0.765	0.206	0.628
	(0.265)	(0.294)	(0.286)	(0.134)	(0.149)	(0.152)	(0.124)	(0.134)	(0.135)	(0.605)	(0.919)	(0.955)
Age 8	0.819**	0.821**	0.913**	0.455**	0.535***	0.608***	0.563***	0.557***	0.678***	-0.019	0.516	1.105
	(0.285)	(0.298)	(0.300)	(0.142)	(0.158)	(0.163)	(0.130)	(0.139)	(0.143)	(0.701)	(0.926)	(0.938)
Age 9	0.962***	0.984***	1.066***	0.548***	0.641***	0.719***	0.656***	0.709***	0.806***	0.61	0.458	0.977
	(0.263)	(0.287)	(0.291)	(0.133)	(0.152)	(0.150)	(0.134)	(0.145)	(0.134)	(0.667)	(0.961)	(0.971)
Age 10	0.900**	0.724*	0.847**	0.719***	0.856***	0.919***	0.767***	0.798***	0.897***	0.756	1.054	1.550
	(0.295)	(0.321)	(0.297)	(0.134)	(0.147)	(0.149)	(0.135)	(0.147)	(0.134)	(0.620)	(0.848)	(0.873)
Age 11	1.458***	1.409***	1.537***	0.772***	0.925***	1.020***	0.956***	1.017***	1.140***	1.206*	1.477	2.161*
	(0.266)	(0.282)	(0.282)	(0.125)	(0.143)	(0.146)	(0.129)	(0.129)	(0.130)	(0.584)	(0.776)	(0.844)
Age 12	1.155***	1.150***	1.282***	0.845***	0.993***	1.112***	0.953***	1.027***	1.163***	-0.142	-0.345	0.724
	(0.265)	(0.291)	(0.287)	(0.133)	(0.152)	(0.153)	(0.113)	(0.113)	(0.134)	(0.704)	(0.999)	(1.049)
Age 13	1.238***	1.233***	1.376***	0.972***	1.070***	1.193***	1.030***	1.075***	1.208***	1.401*	1.886*	2.629**
	(0.280)	(0.291)	(0.291)	(0.120)	(0.141)	(0.144)	(0.130)	(0.137)	(0.132)	(0.575)	(0.759)	(0.817)
Age 14	1.324***	1.341***	1.476***	1.039***	1.208***	1.331***	1.106***	1.158***	1.341***	1.414*	1.929*	2.730***
	(0.260)	(0.279)	(0.290)	(0.128)	(0.141)	(0.143)	(0.137)	(0.140)	(0.131)	(0.572)	(0.751)	(0.807)
Age 15	1.538***	1.613***	1.778***	1.359***	1.165***	1.314***	1.374***	1.256***	1.425***	2.133***	1.763*	2.549**
	(0.250)	(0.271)	(0.281)	(0.110)	(0.139)	(0.145)	(0.106)	(0.110)	(0.131)	(0.531)	(0.746)	(0.824)
Age 16	1.630***	1.688***	1.828***	1.027***	1.157***	1.277***	1.149***	1.225***	1.376***	2.073***	2.524***	3.304***
	(0.247)	(0.264)	(0.273)	(0.122)	(0.143)	(0.145)	(0.116)	(0.117)	(0.130)	(0.538)	(0.717)	(0.777)
Age 17	1.731***	1.784***	1.908***	1.406***	1.563***	1.683***	1.471***	1.576***	1.711***	2.132***	2.550***	3.299***
	(0.251)	(0.271)	(0.276)	(0.121)	(0.137)	(0.138)	(0.108)	(0.113)	(0.126)	(0.533)	(0.714)	(0.775)
Age 18	2.224***	2.073***	2.194***	1.392***	1.427***	1.572***	1.622***	1.567***	1.710***	2.290***	2.756***	3.511***
	(0.245)	(0.264)	(0.269)	(0.121)	(0.142)	(0.141)	(0.126)	(0.136)	(0.128)	(0.528)	(0.709)	(0.773)
Age 19	1.986***	2.020***	2.159***	2.544***	1.574***	1.733***	2.461***	1.616***	1.795***	2.892***	3.095***	3.814***
	(0.247)	(0.267)	(0.269)	(0.110)	(0.133)	(0.146)	(0.102)	(0.116)	(0.131)	(0.517)	(0.702)	(0.765)
Age 20	2.028***	2.080***	2.193***	1.645***	1.495***	1.655***	1.721***	1.574***	1.741***	2.602***	3.185***	3.917***
	(0.255)	(0.269)	(0.271)	(0.115)	(0.137)	(0.146)	(0.113)	(0.119)	(0.131)	(0.520)	(0.697)	(0.761)
Age 21	2.167***	2.178***	2.312***	1.570***	1.768***	1.917***	1.711***	1.806***	1.980***	2.635***	3.212***	3.939***
	(0.247)	(0.269)	(0.267)	(0.119)	(0.138)	(0.138)	(0.123)	(0.121)	(0.125)	(0.522)	(0.698)	(0.760)
Age 22	2.330***	2.411***	2.518***	1.636***	1.810***	1.963***	1.822***	1.895***	2.071***	2.655***	3.360***	4.144***
	(0.245)	(0.263)	(0.264)	(0.117)	(0.134)	(0.138)	(0.106)	(0.109)	(0.123)	(0.521)	(0.695)	(0.758)
Age 23	2.268***	2.323***	2.448***	1.627***	1.840***	2.014***	1.805***	1.931***	2.116***	2.578***	3.064***	3.824***
	(0.242)	(0.255)	(0.265)	(0.121)	(0.137)	(0.136)	(0.117)	(0.119)	(0.122)	(0.520)	(0.698)	(0.762)
Age 24	2.851***	2.359***	2.476***	2.107***	2.227***	2.356***	2.275***	2.192***	2.367***	3.524***	3.396***	4.181***
	(0.243)	(0.260)	(0.265)	(0.115)	(0.133)	(0.134)	(0.105)	(0.107)	(0.121)	(0.508)	(0.695)	(0.759)
Age 25	2.465***	2.569***	2.692***	1.751***	1.968***	2.182***	1.902***	2.046***	2.244***	3.245***	3.994***	4.719***
	(0.245)	(0.260)	(0.265)	(0.117)	(0.139)	(0.145)	(0.110)	(0.112)	(0.131)	(0.511)	(0.686)	(0.753)
Age 26	2.474***	2.540***	2.655***	1.845***	2.086***	2.290***	1.988***	2.155***	2.336***	3.200***	3.839***	4.611***

	(0.248)	(0.263)	(0.267)	(0.115)	(0.133)	(0.134)	(0.123)	(0.125)	(0.120)	(0.512)	(0.688)	(0.752)
Age 27	2.542***	2.641***	2.772***	1.928***	2.118***	2.358***	2.036***	2.144***	2.383***	3.486***	4.259***	4.961***
	(0.244)	(0.260)	(0.266)	(0.121)	(0.137)	(0.133)	(0.125)	(0.119)	(0.123)	(0.509)	(0.684)	(0.747)
Age 28	2.652***	2.736***	2.862***	2.027***	2.257***	2.480***	2.164***	2.318***	2.513***	3.473***	4.261***	4.995***
	(0.240)	(0.255)	(0.263)	(0.119)	(0.136)	(0.133)	(0.118)	(0.120)	(0.119)	(0.510)	(0.684)	(0.749)
Age 29	3.210***	3.248***	3.346***	2.166***	2.172***	2.461***	2.366***	2.316***	2.600***	4.247***	4.782***	5.554***
	(0.239)	(0.255)	(0.262)	(0.114)	(0.132)	(0.140)	(0.117)	(0.121)	(0.124)	(0.504)	(0.681)	(0.745)
Age 30	2.718***	2.804***	2.942***	2.048***	2.222***	2.518***	2.172***	2.308***	2.562***	3.723***	4.335***	5.123***
	(0.249)	(0.268)	(0.264)	(0.115)	(0.135)	(0.138)	(0.102)	(0.105)	(0.122)	(0.508)	(0.684)	(0.747)
Age 31	2.919***	3.019***	3.161***	2.136***	2.379***	2.692***	2.298***	2.474***	2.735***	3.894***	4.625***	5.425***
	(0.242)	(0.260)	(0.267)	(0.117)	(0.136)	(0.130)	(0.120)	(0.118)	(0.119)	(0.506)	(0.682)	(0.745)
Age 32	2.814***	2.919***	3.090***	2.343***	2.500***	2.770***	2.401***	2.529***	2.780***	3.998***	4.592***	5.420***
	(0.236)	(0.250)	(0.262)	(0.118)	(0.137)	(0.131)	(0.119)	(0.124)	(0.119)	(0.506)	(0.682)	(0.746)
Age 33	2.896***	3.016***	3.175***	2.367***	2.585***	2.898***	2.422***	2.578***	2.865***	4.146***	4.967***	5.697***
	(0.237)	(0.255)	(0.264)	(0.110)	(0.129)	(0.137)	(0.097)	(0.096)	(0.123)	(0.505)	(0.680)	(0.743)
Age 34	3.045***	3.176***	3.343***	2.378***	2.618***	2.959***	2.517***	2.686***	2.991***	4.092***	4.848***	5.676***
	(0.244)	(0.262)	(0.263)	(0.113)	(0.132)	(0.141)	(0.122)	(0.126)	(0.127)	(0.505)	(0.681)	(0.745)
Age 35	3.162***	3.274***	3.457***	2.308***	2.545***	2.928***	2.453***	2.620***	2.956***	4.346***	5.115***	5.932***
	(0.238)	(0.258)	(0.259)	(0.117)	(0.137)	(0.136)	(0.123)	(0.127)	(0.122)	(0.504)	(0.680)	(0.746)
Age 36	3.343***	3.408***	3.593***	2.538***	2.794***	3.149***	2.664***	2.855***	3.170***	4.572***	5.255***	6.072***
	(0.236)	(0.250)	(0.264)	(0.108)	(0.125)	(0.129)	(0.101)	(0.109)	(0.118)	(0.503)	(0.679)	(0.743)
Age 37	3.457***	3.396***	3.600***	2.635***	2.859***	3.235***	2.805***	2.897***	3.232***	4.590***	5.341***	6.153***
	(0.243)	(0.266)	(0.266)	(0.111)	(0.133)	(0.137)	(0.102)	(0.104)	(0.125)	(0.503)	(0.679)	(0.743)
Age 38	3.392***	3.532***	3.761***	2.579***	2.856***	3.247***	2.705***	2.939***	3.283***	4.672***	5.468***	6.284***
	(0.235)	(0.250)	(0.255)	(0.112)	(0.134)	(0.133)	(0.112)	(0.114)	(0.119)	(0.502)	(0.678)	(0.743)
Age 39	3.430***	3.524***	3.762***	2.691***	2.972***	3.361***	2.795***	3.014***	3.366***	4.754***	5.529***	6.362***
	(0.233)	(0.250)	(0.258)	(0.112)	(0.127)	(0.129)	(0.104)	(0.105)	(0.118)	(0.502)	(0.678)	(0.743)
Age 40	3.632***	3.733***	3.977***	2.823***	3.096***	3.465***	2.952***	3.173***	3.508***	4.943***	5.708***	6.539***
	(0.245)	(0.258)	(0.255)	(0.114)	(0.134)	(0.130)	(0.111)	(0.117)	(0.117)	(0.502)	(0.678)	(0.741)
Age 41	3.883***	3.870***	4.135***	2.679***	2.994***	3.436***	2.924***	3.123***	3.514***	5.138***	5.844***	6.709***
	(0.238)	(0.252)	(0.259)	(0.114)	(0.134)	(0.133)	(0.116)	(0.114)	(0.123)	(0.501)	(0.677)	(0.742)
Age 42	3.744***	3.821***	4.116***	2.857***	3.137***	3.571***	3.002***	3.221***	3.612***	5.089***	5.843***	6.754***
	(0.241)	(0.258)	(0.260)	(0.111)	(0.132)	(0.134)	(0.102)	(0.109)	(0.121)	(0.501)	(0.678)	(0.741)
Age 43	3.746***	3.884***	4.215***	2.959***	3.281***	3.690***	3.014***	3.282***	3.699***	5.255***	6.045***	6.943***
	(0.239)	(0.255)	(0.255)	(0.112)	(0.132)	(0.133)	(0.103)	(0.103)	(0.122)	(0.501)	(0.677)	(0.742)
Age 44	3.826***	3.943***	4.266***	2.922***	3.254***	3.708***	2.985***	3.276***	3.712***	5.344***	6.123***	7.026***
	(0.242)	(0.260)	(0.263)	(0.114)	(0.132)	(0.130)	(0.115)	(0.114)	(0.120)	(0.501)	(0.677)	(0.740)
Age 45	3.912***	4.030***	4.385***	3.007***	3.312***	3.762***	3.074***	3.354***	3.786***	5.434***	6.206***	7.140***
	(0.244)	(0.260)	(0.257)	(0.109)	(0.128)	(0.134)	(0.110)	(0.107)	(0.125)	(0.500)	(0.677)	(0.742)
Age 46	3.896***	4.038***	4.453***	3.159***	3.515***	3.920***	3.147***	3.461***	3.898***	5.532***	6.364***	7.292***
	(0.240)	(0.258)	(0.258)	(0.110)	(0.129)	(0.136)	(0.101)	(0.096)	(0.126)	(0.500)	(0.677)	(0.740)
Age 47	4.237***	4.192***	4.552***	3.230***	3.590***	3.980***	3.429***	3.597***	3.990***	5.598***	6.406***	7.361***
	(0.234)	(0.253)	(0.256)	(0.110)	(0.129)	(0.137)	(0.111)	(0.111)	(0.122)	(0.500)	(0.677)	(0.744)
Age 48	4.233***	4.350***	4.700***	3.812***	3.573***	4.001***	3.843***	3.644***	4.052***	5.840***	6.518***	7.482***
	(0.237)	(0.255)	(0.258)	(0.103)	(0.134)	(0.132)	(0.109)	(0.113)	(0.123)	(0.500)	(0.677)	(0.741)
Age 49	4.741***	4.512***	4.857***	3.588***	3.590***	4.010***	3.823***	3.659***	4.068***	6.138***	6.751***	7.657***
	(0.230)	(0.248)	(0.254)	(0.109)	(0.134)	(0.131)	(0.108)	(0.120)	(0.122)	(0.50)	(0.68)	(0.741)
Age 50	4.418***	4.488***	4.891***	3.470***	3.749***	4.126***	3.534***	3.738***	4.135***	6.015***	6.803***	7.754***
	(0.239)	(0.255)	(0.259)	(0.111)	(0.132)	(0.130)	(0.102)	(0.112)	(0.127)	(0.50)	(0.68)	(0.740)
Age 51	4.455***	4.611***	4.996***	3.483***	3.748***	4.130***	3.521***	3.831***	4.202***	6.085***	6.854***	7.812***
	(0.230)	(0.249)	(0.257)	(0.114)	(0.135)	(0.131)	(0.110)	(0.119)	(0.125)	(0.50)	(0.68)	(0.742)
Age 52	4.726***	4.685***	5.072***	3.468***	3.716***	4.129***	3.726***	3.847***	4.234***	6.165***	6.882***	7.876***
	(0.239)	(0.262)	(0.255)	(0.113)	(0.132)	(0.139)	(0.108)	(0.120)	(0.125)	(0.50)	(0.68)	(0.743)
Age 53	4.625***	4.759***	5.142***	3.669***	3.925***	4.323***	3.754***	4.008***	4.383***	6.234***	7.030***	8.001***
	(0.239)	(0.255)	(0.258)	(0.116)	(0.137)	(0.136)	(0.116)	(0.137)	(0.125)	(0.50)	(0.68)	(0.741)
Age 54	4.811***	4.925***	5.299***	4.052***	4.068***	4.421***	3.980***	4.150***	4.494***	6.589***	7.198***	8.161***
	(0.233)	(0.254)	(0.262)	(0.111)	(0.138)	(0.136)	(0.117)	(0.123)	(0.122)	(0.50)	(0.68)	(0.741)

Age 55	4.790***	4.941***	5.332***	4.259***	4.184***	4.520***	4.191***	4.209***	4.552***	6.616***	7.294***	8.240***
	(0.241)	(0.257)	(0.252)	(0.104)	(0.132)	(0.136)	(0.113)	(0.118)	(0.128)	(0.50)	(0.68)	(0.744)
Age 56	5.011***	5.148***	5.469***	3.872***	4.243***	4.574***	3.948***	4.345***	4.646***	6.643***	7.450***	8.358***
	(0.233)	(0.253)	(0.256)	(0.107)	(0.130)	(0.134)	(0.100)	(0.112)	(0.127)	(0.499)	(0.676)	(0.741)
Age 57	4.966***	5.090***	5.464***	3.878***	4.279***	4.615***	3.904***	4.337***	4.647***	6.641***	7.432***	8.393***
	(0.236)	(0.255)	(0.256)	(0.114)	(0.139)	(0.137)	(0.113)	(0.116)	(0.135)	(0.500)	(0.677)	(0.742)
Age 58	5.087***	5.271***	5.602***	3.825***	4.266***	4.584***	3.753***	4.308***	4.617***	6.791***	7.636***	8.518***
	(0.240)	(0.259)	(0.259)	(0.118)	(0.142)	(0.143)	(0.125)	(0.135)	(0.141)	(0.500)	(0.676)	(0.740)
Age 59	5.140***	5.285***	5.637***	3.808***	4.314***	4.646***	3.832***	4.424***	4.755***	6.795***	7.605***	8.536***
	(0.239)	(0.257)	(0.257)	(0.128)	(0.147)	(0.141)	(0.123)	(0.122)	(0.134)	(0.500)	(0.677)	(0.741)
Age 60	5.272***	5.429***	5.738***	3.864***	4.426***	4.722***	3.894***	4.496***	4.788***	6.919***	7.781***	8.663***
	(0.233)	(0.253)	(0.259)	(0.127)	(0.159)	(0.142)	(0.112)	(0.126)	(0.146)	(0.500)	(0.677)	(0.741)
Age 61	5.207***	5.348***	5.682***	3.969***	4.479***	4.770***	3.882***	4.543***	4.822***	6.928***	7.763***	8.635***
	(0.241)	(0.258)	(0.261)	(0.122)	(0.147)	(0.143)	(0.127)	(0.142)	(0.145)	(0.500)	(0.677)	(0.740)
Age 62	5.298***	5.543***	5.863***	4.014***	4.599***	4.872***	4.011***	4.824***	5.063***	6.975***	7.906***	8.768***
	(0.236)	(0.255)	(0.256)	(0.125)	(0.144)	(0.148)	(0.110)	(0.132)	(0.140)	(0.500)	(0.677)	(0.741)
Age 63	5.312***	5.595***	5.889***	4.012***	4.592***	4.881***	3.906***	4.619***	4.912***	7.031***	8.003***	8.850***
	(0.236)	(0.259)	(0.261)	(0.123)	(0.151)	(0.152)	(0.127)	(0.168)	(0.165)	(0.500)	(0.677)	(0.741)
Age 64	7.571***	7.432***	7.680***	6.343***	6.173***	6.441***	6.229***	6.028***	6.326***	9.306***	9.821***	10.635***
	(0.232)	(0.249)	(0.254)	(0.102)	(0.124)	(0.128)	(0.103)	(0.114)	(0.120)	(0.498)	(0.675)	(0.739)
Female	0.032*	0.060***	0.046**	-0.007	0.032*	0.024	0.007	0.042**	0.031*	-0.055**	-0.069**	0.050**
	(0.014)	(0.016)	(0.015)	(0.013)	(0.014)	(0.014)	(0.011)	(0.013)	(0.013)	(0.020)	(0.024)	(0.016)
Region (Ref. = South)												
Northeast	0.001	0.013	0.023	-0.035	-0.012	-0.005	-0.023	0.004	0.010	-0.006	0.016	0.018
	(0.023)	(0.028)	(0.027)	(0.024)	(0.030)	(0.024)	(0.021)	(0.026)	(0.023)	(0.026)	(0.033)	(0.029)
Midwest	-0.016	-0.014	-0.014	-0.002	-0.000	-0.007	-0.004	-0.001	-0.005	-0.007	0.002	-0.009
	(0.022)	(0.025)	(0.023)	(0.022)	(0.026)	(0.022)	(0.022)	(0.026)	(0.020)	(0.023)	(0.029)	(0.026)
West	-0.072**	-0.070*	-0.076**	-0.058**	-0.070**	-0.074***	-0.055*	-0.069**	-0.071***	-0.076**	-0.060*	-0.079**
	(0.025)	(0.027)	(0.024)	(0.022)	(0.026)	(0.021)	(0.021)	(0.023)	(0.020)	(0.024)	(0.030)	(0.026)
Born in South	-0.030	-0.020	-0.011	-0.017	0.008	0.003	-0.007	0.018	0.012	-0.038	-0.022	-0.015
	(0.018)	(0.022)	(0.022)	(0.019)	(0.024)	(0.020)	(0.017)	(0.021)	(0.019)	(0.022)	(0.028)	(0.024)
In poverty	0.111***	0.079**	0.088***	0.100***	0.071*	0.094***	0.111***	0.099***	0.107***	0.109***	0.097**	0.077**
	(0.023)	(0.028)	(0.026)	(0.023)	(0.028)	(0.022)	(0.021)	(0.025)	(0.020)	(0.027)	(0.035)	(0.029)
Education (Ref. = Less than high school)												
Age <26	-0.763***	-0.695**	0.035	-0.506***	-0.606***	0.076	-0.575***	-0.638***	0.002	-2.415*	-1.781	1.236**
	(0.202)	(0.219)	(0.143)	(0.122)	(0.124)	(0.084)	(0.117)	(0.117)	(0.074)	(1.000)	(0.994)	(0.445)
HS/Some College	-0.165***	-0.257***	-0.252***	-0.054**	-0.191***	-0.226***	-0.111***	-0.219***	-0.244***	-0.126***	-0.257***	-0.274***
	(0.022)	(0.025)	(0.023)	(0.019)	(0.025)	(0.021)	(0.018)	(0.022)	(0.020)	(0.023)	(0.031)	(0.026)
College or Higher	-0.262***	-0.364***	-0.371***	-0.201***	-0.362***	-0.415***	-0.264***	-0.393***	-0.431***	-0.220***	-0.367***	-0.403***
	(0.025)	(0.029)	(0.026)	(0.023)	(0.029)	(0.024)	(0.019)	(0.026)	(0.023)	(0.026)	(0.034)	(0.029)
Race and Hispanic Origin (Ref. = Non-Hispanic White)	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Non-Hispanic Black	0.085**	0.012	0.062*	0.060*	0.012	0.110***	0.092***	0.054	0.112***	0.033	-0.016	0.035
	(0.026)	(0.030)	(0.026)	(0.024)	(0.030)	(0.023)	(0.022)	(0.030)	(0.021)	(0.026)	(0.035)	(0.029)
Non-Hispanic Other Race	-0.008	-0.036	0.028	-0.045	-0.061	0.028	-0.067*	-0.058	0.011	0.017	0.033	0.043
	(0.034)	(0.040)	(0.037)	(0.035)	(0.039)	(0.032)	(0.033)	(0.038)	(0.030)	(0.038)	(0.049)	(0.042)
Hispanic	-0.145***	-0.236***	-0.143***	-0.107***	-0.256***	-0.120***	-0.121***	-0.239***	-0.130***	-0.189***	-0.302***	-0.199***
	(0.025)	(0.032)	(0.031)	(0.026)	(0.032)	(0.027)	(0.025)	(0.029)	(0.025)	(0.032)	(0.043)	(0.035)
Foreign-born	-0.022	-0.049	0.001	0.032	0.009	0.025	0.027	0.009	0.021	-0.014	-0.063	0.008
	(0.026)	(0.031)	(0.028)	(0.025)	(0.031)	(0.026)	(0.027)	(0.031)	(0.025)	(0.033)	(0.040)	(0.031)
Dad at least 5 years older than mother	---	---	---	---	---	---	0.498***	0.525***	0.502***	0.447***	0.439***	0.331***
							(0.038)	(0.049)	(0.034)	(0.044)	(0.052)	(0.041)
Constant	-7.679***	-7.670***	-7.863***	-6.375***	-6.402***	-6.580***	-6.173***	-6.181***	-6.364***	-9.440***	-10.015***	-10.808***
	(0.231)	(0.249)	(0.253)	(0.102)	(0.123)	(0.128)	(0.099)	(0.102)	(0.117)	(0.498)	(0.675)	(0.740)
Observations	2414336	2197255	2416910	2200668	1894615	2194032	2092275	1768839	2102621	2522624	2095082	2508282

Standard errors in parentheses. † Standard errors for multiply imputed models do not reflect the use of replicate weights.

Source: U.S. Census Bureau, 2014 Survey of Income and Program Participation, Wave 1 Public-Use File

* p<0.05, ** p<0.01, *** p <0.001

Table A1. Coefficients (and Standard Errors) for Logistic Regression of Missing Parental Death Information

	Full Sample			Sample with Parental Death		
	Maternal death year missing	Paternal death year missing	Either death year missing	Maternal death year missing	Paternal death year missing	Either death year missing
Age	0.085**	0.096***	0.106***	-0.029	-0.016	-0.044
	(0.029)	(0.019)	(0.017)	(0.037)	(0.027)	(0.024)
Age-squared	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
Age-cubed	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Female	-0.100**	-0.046	-0.068*	-0.127**	-0.033	-0.071*
	(0.038)	(0.027)	(0.027)	(0.039)	(0.030)	(0.030)
Region (Ref. = South)						
Northeast	0.126	0.057	0.088	0.168*	0.090	0.118*
	(0.069)	(0.053)	(0.053)	(0.070)	(0.059)	(0.056)
Midwest	-0.068	-0.140**	-0.097	-0.053	-0.149**	-0.100*
	(0.062)	(0.052)	(0.049)	(0.064)	(0.052)	(0.048)
West	-0.161*	-0.108*	-0.069	-0.113	-0.071	-0.030
	(0.067)	(0.054)	(0.052)	(0.069)	(0.057)	(0.053)
Born in South	0.069	-0.012	0.020	0.095	0.010	0.035
	(0.055)	(0.050)	(0.048)	(0.056)	(0.052)	(0.049)
Poverty	0.070	0.167**	0.132**	0.015	0.083	0.046
	(0.064)	(0.050)	(0.047)	(0.067)	(0.055)	(0.050)
Education (Ref = Less than HS)						
Age <26	0.342	0.193	0.142	0.505	0.224	0.049
	(0.358)	(0.210)	(0.180)	(0.507)	(0.285)	(0.252)
HS/Some College	-0.273***	-0.330***	-0.360***	-0.183***	-0.272***	-0.289***
	(0.053)	(0.044)	(0.043)	(0.053)	(0.044)	(0.042)
College or Higher	-0.583***	-0.701***	-0.762***	-0.413***	-0.531***	-0.587***
	(0.065)	(0.055)	(0.052)	(0.066)	(0.057)	(0.054)
Race and Hispanic Origin (Ref. = Non-Hispanic White)						
Non-Hispanic Black	0.520***	0.842***	0.816***	0.462***	0.745***	0.721***
	(0.070)	(0.050)	(0.048)	(0.075)	(0.051)	(0.049)
Non-Hispanic Other Race	0.447***	0.521***	0.503***	0.431***	0.499***	0.487***
	(0.085)	(0.069)	(0.065)	(0.092)	(0.070)	(0.065)
Hispanic	0.269***	0.418***	0.380***	0.393***	0.487***	0.439***
	(0.078)	(0.060)	(0.058)	(0.080)	(0.064)	(0.059)
Foreign-born	0.354***	0.316***	0.306***	0.378***	0.319***	0.323***
	(0.065)	(0.056)	(0.052)	(0.068)	(0.061)	(0.055)
Fair/Poor health	0.126*	0.139***	0.145***	0.056	0.103**	0.102**
	(0.049)	(0.037)	(0.036)	(0.048)	(0.039)	(0.037)
Mother's age at birth (Ref. = Aged 20-34)						
Aged < 20	-2.056***	-0.281**	-0.439***	-1.952***	-0.302**	-0.423***
	(0.209)	(0.099)	(0.096)	(0.215)	(0.104)	(0.099)
Aged > 34	-0.726***	-0.103	-0.223*	-0.971***	-0.292**	-0.385***
	(0.176)	(0.097)	(0.091)	(0.177)	(0.103)	(0.093)
Father's age at birth (Ref. = Aged 20-34)						
Aged < 20	-0.463	-1.930***	-1.472***	-0.460	-1.760***	-1.364***
	(0.263)	(0.249)	(0.187)	(0.263)	(0.246)	(0.182)
Aged > 34	-1.634***	-2.103***	-1.849***	-1.823***	-2.356***	-2.032***
	(0.097)	(0.091)	(0.077)	(0.098)	(0.089)	(0.077)
Father at least 5 years older than mother	-1.251***	0.487***	0.390***	-1.424***	0.223**	0.154*
	(0.142)	(0.074)	(0.071)	(0.147)	(0.076)	(0.073)
Constant	-6.805***	-5.681***	-5.520***	-0.178	-0.174	0.132
	(0.520)	(0.331)	(0.298)	(0.651)	(0.454)	(0.406)

Standard errors in parentheses. Standard errors do NOT reflect the use of replicate weights.

Source: U.S. Census Bureau, 2014 Survey of Income and Program Participation, Wave 1 Public-Use File

* p<0.05, ** p<0.01, *** p <0.001

Table A2. Coefficients and Standard Errors from Models Stratified by Selected Characteristics, Maternal Death

	Educational Attainment						Poverty Status				Race and Hispanic Origin							
	Originally Imputed			Listwise Deleted			Originally Imputed		Listwise Deleted		Originally Imputed				Listwise Deleted			
	Less than HS	HS or Some College	College +	Less than HS	HS or Some College	College +	Not in Poverty	<100% Poverty	Not in Poverty	<100% Poverty	Non-Hispanic White	Non-Hispanic Black	Non-Hispanic Other Race	Hispanic	Non-Hispanic White	Non-Hispanic Black	Non-Hispanic Other Race	Hispanic
Age (Ref. = Aged 0-4)																		
Aged 5-9	0.352	0.600***	0.814**	0.503*	0.493**	0.652*	0.778***	-0.041	0.670***	0.173	0.910***	0.141	-0.045	0.789**	0.738***	0.538	-0.019	0.496
	(0.210)	(0.141)	(0.259)	(0.247)	(0.165)	(0.291)	(0.116)	(0.236)	(0.133)	(0.276)	(0.148)	(0.221)	(0.365)	(0.245)	(0.162)	(0.287)	(0.406)	(0.281)
Aged 10-14	0.697***	0.843***	1.151***	0.946***	0.906***	1.210***	0.979***	0.636**	1.008***	1.010***	1.149***	0.535*	0.895**	0.636*	1.142***	1.006***	0.774*	0.646*
	(0.203)	(0.137)	(0.246)	(0.237)	(0.157)	(0.265)	(0.116)	(0.215)	(0.130)	(0.243)	(0.146)	(0.210)	(0.305)	(0.259)	(0.156)	(0.277)	(0.338)	(0.290)
Aged 15-19	1.475***	1.438***	1.717***	1.715***	1.570***	1.714***	1.628***	1.084***	1.715***	1.367***	1.674***	1.184***	1.586***	1.532***	1.731***	1.752***	1.228***	1.601***
	(0.187)	(0.127)	(0.231)	(0.221)	(0.146)	(0.250)	(0.108)	(0.201)	(0.123)	(0.234)	(0.139)	(0.194)	(0.278)	(0.231)	(0.149)	(0.264)	(0.318)	(0.258)
Aged 20-24	2.109***	1.990***	2.082***	2.340***	2.011***	2.010***	2.133***	1.666***	2.139***	1.832***	2.377***	1.437***	1.458***	2.006***	2.274***	1.951***	1.521***	1.897***
	(0.179)	(0.122)	(0.225)	(0.213)	(0.142)	(0.245)	(0.105)	(0.193)	(0.119)	(0.228)	(0.133)	(0.191)	(0.289)	(0.222)	(0.144)	(0.262)	(0.314)	(0.251)
Aged 25-29	2.488***	2.308***	2.448***	2.813***	2.497***	2.567***	2.468***	2.042***	2.629***	2.406***	2.750***	1.714***	1.936***	2.164***	2.835***	2.273***	1.917***	2.302***
	(0.176)	(0.121)	(0.222)	(0.208)	(0.140)	(0.240)	(0.103)	(0.191)	(0.117)	(0.221)	(0.132)	(0.188)	(0.276)	(0.222)	(0.142)	(0.259)	(0.302)	(0.246)
Aged 30-34	2.546***	2.491***	2.698***	2.955***	2.702***	2.847***	2.649***	2.208***	2.849***	2.596***	2.884***	2.063***	2.131***	2.392***	2.980***	2.695***	2.319***	2.602***
	(0.176)	(0.120)	(0.221)	(0.208)	(0.139)	(0.239)	(0.103)	(0.190)	(0.117)	(0.221)	(0.132)	(0.186)	(0.276)	(0.222)	(0.141)	(0.256)	(0.297)	(0.245)
Aged 35-39	2.887***	3.011***	3.154***	3.310***	3.167***	3.265***	3.140***	2.588***	3.296***	2.962***	3.351***	2.629***	2.450***	2.917***	3.442***	2.990***	2.581***	3.166***
	(0.174)	(0.118)	(0.219)	(0.206)	(0.138)	(0.236)	(0.102)	(0.188)	(0.116)	(0.220)	(0.130)	(0.180)	(0.275)	(0.218)	(0.140)	(0.254)	(0.298)	(0.240)
Aged 40-44	3.311***	3.348***	3.715***	3.746***	3.511***	3.839***	3.558***	2.925***	3.724***	3.320***	3.811***	2.760***	2.811***	3.366***	3.894***	3.268***	3.025***	3.516***
	(0.171)	(0.118)	(0.217)	(0.203)	(0.137)	(0.234)	(0.101)	(0.187)	(0.115)	(0.218)	(0.129)	(0.182)	(0.271)	(0.215)	(0.139)	(0.254)	(0.294)	(0.240)
Aged 45-49	3.635***	3.814***	4.235***	3.923***	3.908***	4.266***	4.008***	3.487***	4.095***	3.760***	4.258***	3.186***	3.663***	3.719***	4.264***	3.794***	3.342***	3.808***
	(0.171)	(0.117)	(0.215)	(0.204)	(0.136)	(0.234)	(0.100)	(0.183)	(0.114)	(0.216)	(0.129)	(0.179)	(0.262)	(0.215)	(0.139)	(0.251)	(0.296)	(0.241)
Aged 50-54	4.054***	4.154***	4.655***	4.450***	4.319***	4.790***	4.385***	3.826***	4.563***	4.128***	4.644***	3.593***	3.666***	4.205***	4.740***	3.997***	3.885***	4.345***
	(0.170)	(0.117)	(0.215)	(0.203)	(0.136)	(0.233)	(0.100)	(0.184)	(0.114)	(0.216)	(0.129)	(0.179)	(0.269)	(0.215)	(0.138)	(0.253)	(0.292)	(0.241)
Aged 55-59	4.180***	4.564***	5.118***	4.669***	4.794***	5.278***	4.793***	3.969***	5.023***	4.432***	5.073***	3.711***	4.108***	4.421***	5.198***	4.465***	4.400***	4.606***
	(0.172)	(0.117)	(0.215)	(0.205)	(0.136)	(0.233)	(0.100)	(0.190)	(0.114)	(0.223)	(0.129)	(0.184)	(0.271)	(0.218)	(0.138)	(0.255)	(0.294)	(0.245)
Aged 60-64	5.479***	5.727***	6.131***	5.656***	5.784***	6.120***	5.922***	5.144***	5.967***	5.296***	6.184***	4.897***	5.298***	5.713***	6.153***	5.252***	5.138***	5.684***
	(0.16)	(0.11)	(0.21)	(0.20)	(0.13)	(0.23)	(0.10)	(0.18)	(0.11)	(0.22)	(0.13)	(0.17)	(0.25)	(0.21)	(0.14)	(0.25)	(0.29)	(0.24)
Female	0.097**	0.048*	-0.015	0.166***	0.086***	-0.022	0.028	0.089*	0.050**	0.172**	0.019	0.158***	-0.065	0.061	0.041*	0.218***	-0.064	0.122*
	(0.034)	(0.019)	(0.029)	(0.042)	(0.022)	(0.033)	(0.015)	(0.045)	(0.017)	(0.053)	(0.017)	(0.043)	(0.060)	(0.046)	(0.019)	(0.051)	(0.073)	(0.056)
Region (Ref. = South)																		
Northeast	0.021	0.026	-0.014	0.04	0.042	-0.015	0.022	-0.105	0.034	-0.134	0.036	-0.034	-0.085	-0.011	0.043	-0.04	0.015	-0.118
	(0.063)	(0.033)	(0.047)	(0.081)	(0.039)	(0.053)	(0.026)	(0.078)	(0.031)	(0.093)	(0.030)	(0.069)	(0.102)	(0.079)	(0.034)	(0.086)	(0.128)	(0.107)
Midwest	0.05	-0.016	-0.038	0.087	-0.007	-0.049	-0.005	-0.082	0.002	-0.132	-0.009	-0.096	0.128	0.036	-0.01	-0.066	0.171	-0.042
	(0.054)	(0.029)	(0.043)	(0.068)	(0.033)	(0.048)	(0.023)	(0.071)	(0.026)	(0.085)	(0.026)	(0.061)	(0.100)	(0.088)	(0.029)	(0.075)	(0.122)	(0.108)
West	0.011	-0.087**	-0.064	-0.013	-0.072*	-0.063	-0.059*	-0.139*	-0.053	-0.158	-0.069*	-0.209*	-0.099	0.035	-0.070*	-0.243*	-0.121	0.092
	(0.055)	(0.030)	(0.043)	(0.069)	(0.035)	(0.048)	(0.024)	(0.070)	(0.028)	(0.081)	(0.028)	(0.092)	(0.083)	(0.057)	(0.032)	(0.109)	(0.104)	(0.068)
Born in South	0.034	-0.026	-0.045	0.08	-0.018	-0.046	-0.026	-0.008	-0.012	-0.054	-0.032	0.02	0.034	-0.01	-0.036	0.062	0.064	0.064
	(0.055)	(0.027)	(0.041)	(0.069)	(0.032)	(0.046)	(0.022)	(0.068)	(0.025)	(0.080)	(0.025)	(0.058)	(0.114)	(0.084)	(0.028)	(0.071)	(0.133)	(0.099)
Poverty	0.044	0.104**	0.167*	0.003	0.072	0.164*	---	---	---	---	0.078*	0.120*	0.256**	0.067	0.026	0.096	0.285**	0.112
	(0.043)	(0.032)	(0.071)	(0.052)	(0.037)	(0.079)					(0.033)	(0.056)	(0.082)	(0.062)	(0.037)	(0.066)	(0.105)	(0.075)
Race and Hispanic Origin (Ref. = Non-Hispanic White)																		
Non-Hispanic Black	0.043	0.108***	0.041	-0.041	0.033	-0.017	0.073**	0.143*	-0.003	0.094	---	---	---	---	---	---	---	---
	(0.055)	(0.031)	(0.059)	(0.069)	(0.037)	(0.066)	(0.027)	(0.061)	(0.032)	(0.071)								
Non-Hispanic Other Race	-0.202**	0.036	0.026	-0.229*	-0.004	-0.012	-0.032	0.128	-0.066	0.118	---	---	---	---	---	---	---	---
	(0.078)	(0.049)	(0.066)	(0.106)	(0.057)	(0.075)	(0.038)	(0.087)	(0.045)	(0.107)								
Hispanic	-0.230***	-0.120**	-0.151	-0.300***	-0.212***	-0.249**	-0.150***	-0.152*	-0.251***	-0.213*	---	---	---	---	---	---	---	---
	(0.056)	(0.039)	(0.079)	(0.069)	(0.047)	(0.089)	(0.032)	(0.077)	(0.038)	(0.089)								
Foreign-born	0.026	-0.074*	0.051	-0.013	-0.103*	0.021	-0.011	-0.021	-0.049	-0.019	0.03	-0.137	0.066	-0.031	0.018	-0.232*	0.031	-0.049
	(0.058)	(0.037)	(0.052)	(0.072)	(0.045)	(0.059)	(0.028)	(0.072)	(0.034)	(0.082)	(0.039)	(0.088)	(0.075)	(0.058)	(0.045)	(0.109)	(0.089)	(0.070)
Education (Ref. = Less than HS)																		
Age <26	---	---	---	---	---	---	-0.721***	-1.158**	-0.704***	-0.920*	-0.561*	-0.915**	-1.151	-1.352***	-0.588*	-0.582	-1.932*	-1.073**
							(0.183)	(0.370)	(0.191)	(0.371)	(0.219)	(0.348)	(0.700)	(0.392)	(0.231)	(0.354)	(0.828)	(0.400)
HS/Some College	---	---	---	---	---	---	-0.185***	-0.155**	-0.276***	-0.219***	-0.213***	-0.161**	-0.021	-0.175***	-0.300***	-0.231***	-0.083	-0.239***
							(0.023)	(0.051)	(0.028)	(0.060)	(0.027)	(0.055)	(0.082)	(0.051)	(0.032)	(0.069)	(0.111)	(0.063)
College or Higher	---	---	---	---	---	---	-0.293***	-0.194*	-0.392***	-0.240**	-0.318***	-0.355***	-0.082	-0.267**	-0.414***	-0.409***	-0.16	-0.340***
							(0.026)	(0.078)	(0.031)	(0.089)	(0.030)	(0.073)	(0.088)	(0.082)	(0.035)	(0.087)	(0.116)	(0.096)
Constant	-7.185***	-7.451***	-7.883***	-7.539***	-7.638***	-7.980***	-7.449***	-6.804***	-7.528***	-7.149***	-7.667***	-6.651***	-7.061***	-7.426***	-7.657***	-7.258***	-7.101***	-7.645***
	(0.168)	(0.117)	(0.214)	(0.203)	(0.137)	(0.232)	(0.102)	(0.187)	(0.116)	(0.223)	(0.130)	(0.183)	(0.276)	(0.214)	(0.140)	(0.263)	(0.305)	(0.241)
Observations	76833	279939	126492	66119	254273	118371	444092	66979	404935	61592	339093	66248	33401	72329	309796	59489	30269	66973

Standard errors in parentheses. Standard errors do NOT reflect the use of replicate weights.

Source: U.S. Census Bureau, 2014 Survey of Income and Program Participation, Wave 1 Public-Use File

* p<0.05, ** p<0.01, *** p <0.001

Table A3. Coefficients and Standard Errors from Models Stratified by Selected Characteristics, Paternal Death

	Educational Attainment						Poverty Status				Race and Hispanic Origin							
	Originally Imputed			Listwise Deleted			Originally Imputed		Listwise Deleted		Originally Imputed				Listwise Deleted			
	Less than HS	HS or Some College	College +	Less than HS	HS or Some College	College +	Not in Poverty	<100% Poverty	Not in Poverty	<100% Poverty	Non-Hispanic White	Non-Hispanic Black	Non-Hispanic Other Race	Hispanic	Non-Hispanic White	Non-Hispanic Black	Non-Hispanic Other Race	Hispanic
Age (Ref. = Aged 0-4)																		
Aged 5-9	0.259*	0.239**	0.276	0.316*	0.232*	0.424**	0.246***	0.149	0.268***	0.216	0.351***	-0.163	0.480*	0.171	0.368***	-0.221	0.688**	0.174
	(0.126)	(0.086)	(0.146)	(0.149)	(0.096)	(0.158)	(0.067)	(0.135)	(0.075)	(0.152)	(0.084)	(0.136)	(0.213)	(0.135)	(0.091)	(0.159)	(0.248)	(0.155)
Aged 10-14	0.600***	0.719***	0.833***	0.777***	0.800***	1.004***	0.751***	0.472***	0.843***	0.638***	0.875***	0.425***	0.835***	0.481***	0.953***	0.460**	1.070***	0.609***
	(0.118)	(0.078)	(0.134)	(0.137)	(0.086)	(0.146)	(0.063)	(0.129)	(0.069)	(0.143)	(0.078)	(0.123)	(0.202)	(0.131)	(0.083)	(0.141)	(0.236)	(0.146)
Aged 15-19	1.479***	1.562***	1.562***	1.071***	1.205***	1.323***	1.563***	1.292***	1.221***	0.966***	1.741***	1.022***	1.192***	1.490***	1.460***	0.713***	1.098***	0.652***
	(0.109)	(0.070)	(0.122)	(0.140)	(0.082)	(0.139)	(0.057)	(0.117)	(0.066)	(0.140)	(0.071)	(0.113)	(0.197)	(0.115)	(0.079)	(0.139)	(0.242)	(0.151)
Aged 20-24	1.616***	1.588***	1.615***	1.901***	1.600***	1.740***	1.604***	1.355***	1.671***	1.484***	1.897***	0.946***	1.405***	1.114***	1.910***	1.082***	1.602***	1.223***
	(0.111)	(0.071)	(0.122)	(0.130)	(0.080)	(0.134)	(0.057)	(0.122)	(0.064)	(0.137)	(0.071)	(0.119)	(0.195)	(0.125)	(0.077)	(0.136)	(0.229)	(0.142)
Aged 25-29	1.563***	1.878***	1.809***	1.920***	1.969***	1.946***	1.836***	1.444***	1.955***	1.675***	2.050***	1.560***	1.782***	1.115***	2.165***	1.497***	2.108***	1.326***
	(0.114)	(0.070)	(0.121)	(0.132)	(0.078)	(0.134)	(0.057)	(0.124)	(0.063)	(0.138)	(0.071)	(0.112)	(0.189)	(0.129)	(0.076)	(0.131)	(0.222)	(0.144)
Aged 30-34	1.924***	2.117***	2.244***	2.299***	2.252***	2.395***	2.135***	1.837***	2.296***	2.028***	2.406***	1.510***	2.139***	1.550***	2.527***	1.784***	2.246***	1.727***
	(0.110)	(0.070)	(0.119)	(0.129)	(0.078)	(0.131)	(0.056)	(0.120)	(0.062)	(0.135)	(0.070)	(0.116)	(0.187)	(0.123)	(0.075)	(0.131)	(0.224)	(0.139)
Aged 35-39	2.156***	2.411***	2.571***	2.581***	2.595***	2.762***	2.430***	2.136***	2.632***	2.436***	2.724***	1.792***	2.247***	1.809***	2.867***	2.093***	2.668***	2.074***
	(0.110)	(0.069)	(0.118)	(0.128)	(0.077)	(0.131)	(0.056)	(0.120)	(0.061)	(0.134)	(0.069)	(0.115)	(0.190)	(0.124)	(0.074)	(0.131)	(0.222)	(0.139)
Aged 40-44	2.437***	2.722***	2.839***	2.970***	2.949***	3.062***	2.727***	2.418***	2.975***	2.783***	3.013***	1.978***	2.509***	2.264***	3.202***	2.390***	2.937***	2.573***
	(0.109)	(0.069)	(0.118)	(0.127)	(0.076)	(0.131)	(0.056)	(0.120)	(0.061)	(0.134)	(0.069)	(0.116)	(0.190)	(0.122)	(0.074)	(0.131)	(0.224)	(0.137)
Aged 45-49	2.920***	3.256***	3.382***	3.193***	3.300***	3.497***	3.255***	2.960***	3.340***	3.108***	3.520***	2.376***	3.403***	2.835***	3.578***	2.708***	3.320***	2.826***
	(0.106)	(0.068)	(0.117)	(0.129)	(0.077)	(0.130)	(0.055)	(0.115)	(0.061)	(0.135)	(0.068)	(0.114)	(0.178)	(0.118)	(0.074)	(0.133)	(0.223)	(0.143)
Aged 50-54	3.015***	3.493***	3.727***	3.405***	3.593***	3.895***	3.494***	3.302***	3.656***	3.449***	3.737***	3.224***	3.046***	2.960***	3.922***	2.852***	3.549***	3.090***
	(0.110)	(0.068)	(0.117)	(0.136)	(0.078)	(0.131)	(0.055)	(0.117)	(0.062)	(0.139)	(0.069)	(0.105)	(0.200)	(0.125)	(0.075)	(0.142)	(0.233)	(0.149)
Aged 55-59	3.215***	3.821***	4.190***	3.828***	3.980***	4.369***	3.867***	3.364***	4.091***	3.647***	4.191***	2.856***	3.467***	3.258***	4.314***	3.320***	4.116***	3.667***
	(0.114)	(0.071)	(0.119)	(0.139)	(0.080)	(0.133)	(0.057)	(0.132)	(0.064)	(0.160)	(0.070)	(0.127)	(0.203)	(0.133)	(0.077)	(0.148)	(0.240)	(0.156)
Aged 60-64	4.408***	4.718***	5.018***	4.427***	4.667***	5.081***	4.771***	4.368***	4.770***	4.348***	5.021***	4.130***	4.699***	4.323***	4.981***	4.197***	4.886***	4.213***
	(0.096)	(0.065)	(0.113)	(0.129)	(0.078)	(0.131)	(0.052)	(0.106)	(0.062)	(0.145)	(0.066)	(0.099)	(0.171)	(0.107)	(0.075)	(0.133)	(0.240)	(0.157)
Female	0.035	0.007	-0.029	0.132**	0.060**	-0.049	-0.009	0.035	0.028	0.085	-0.005	0	-0.009	0.003	0.034	-0.003	0.054	0.055
	(0.031)	(0.017)	(0.026)	(0.041)	(0.020)	(0.029)	(0.014)	(0.038)	(0.016)	(0.047)	(0.015)	(0.036)	(0.053)	(0.038)	(0.018)	(0.047)	(0.065)	(0.049)
Region (Ref. = South)																		
Northeast	0.074	-0.025	-0.069	0.157*	-0.004	-0.074	-0.025	-0.077	-0.006	-0.081	0.007	-0.165**	-0.111	-0.036	-0.007	-0.142	0.022	-0.059
	(0.055)	(0.030)	(0.041)	(0.075)	(0.036)	(0.047)	(0.023)	(0.069)	(0.028)	(0.087)	(0.027)	(0.060)	(0.088)	(0.066)	(0.031)	(0.083)	(0.113)	(0.093)
Midwest	0.031	0.012	-0.052	0.121	0.015	-0.08	0.001	-0.042	0.002	-0.047	-0.012	0.013	0.062	0.085	-0.035	0.124	0.107	0.107
	(0.049)	(0.026)	(0.038)	(0.067)	(0.031)	(0.043)	(0.021)	(0.060)	(0.025)	(0.074)	(0.024)	(0.054)	(0.090)	(0.067)	(0.027)	(0.072)	(0.114)	(0.084)
West	0.083	-0.054*	-0.115**	0.105	-0.055	-0.149***	-0.059**	-0.028	-0.075**	-0.018	-0.088***	0.002	0.022	0.054	-0.119***	0.037	0.019	0.075
	(0.049)	(0.027)	(0.038)	(0.065)	(0.033)	(0.043)	(0.021)	(0.060)	(0.026)	(0.072)	(0.025)	(0.070)	(0.070)	(0.047)	(0.030)	(0.092)	(0.090)	(0.060)
Born in South	0.061	0.007	-0.095**	0.157*	0.041	-0.116**	-0.015	-0.013	0.01	-0.008	-0.015	-0.049	0.058	0.083	-0.027	0.121	0.107	0.135
	(0.049)	(0.025)	(0.037)	(0.065)	(0.030)	(0.042)	(0.020)	(0.059)	(0.024)	(0.070)	(0.022)	(0.049)	(0.097)	(0.067)	(0.026)	(0.066)	(0.116)	(0.084)
Poverty	0.115**	0.069*	0.089	0.07	0.038	0.113	---	---	---	---	0.096***	0.120**	0.037	0.078	0.044	0.091	0.107	0.129*
	(0.037)	(0.027)	(0.060)	(0.048)	(0.033)	(0.070)					(0.028)	(0.046)	(0.072)	(0.049)	(0.033)	(0.061)	(0.095)	(0.062)
Race and Hispanic Origin (Ref. = Non-Hispanic White)																		
Non-Hispanic Black	0.01	0.05	0.125*	-0.016	-0.021	0.077	0.056*	0.098	0.001	0.068	---	---	---	---	---	---	---	---
	(0.048)	(0.026)	(0.049)	(0.067)	(0.033)	(0.059)	(0.023)	(0.051)	(0.029)	(0.064)								
Non-Hispanic Other Race	-0.186**	-0.002	-0.026	-0.1	-0.039	-0.089	-0.04	-0.08	-0.068	-0.033	---	---	---	---	---	---	---	---
	(0.069)	(0.042)	(0.058)	(0.090)	(0.051)	(0.067)	(0.033)	(0.077)	(0.040)	(0.095)								
Hispanic	-0.210***	-0.107***	0.031	-0.358***	-0.231***	-0.116	-0.105***	-0.125*	-0.260***	-0.255**	---	---	---	---	---	---	---	---
	(0.050)	(0.033)	(0.064)	(0.069)	(0.040)	(0.074)	(0.027)	(0.063)	(0.034)	(0.081)								
Foreign-born	0.014	0.068*	0.023	-0.078	0.06	0.016	0.048	-0.027	0.012	-0.01	0.005	0.07	0.131*	0.120*	0.016	0.118	0.160*	0.033
	(0.051)	(0.033)	(0.046)	(0.072)	(0.040)	(0.053)	(0.025)	(0.060)	(0.031)	(0.076)	(0.037)	(0.072)	(0.066)	(0.047)	(0.043)	(0.098)	(0.080)	(0.060)
Education (Ref. = Less than HS)																		
Age <26	---	---	---	---	---	---	-0.575***	-0.510**	-0.736***	-0.401*	-0.428***	-0.596**	-1.013**	-0.749***	-0.596***	-0.664**	-1.096**	-0.795***
							(0.110)	(0.167)	(0.117)	(0.171)	(0.130)	(0.196)	(0.360)	(0.200)	(0.134)	(0.208)	(0.379)	(0.213)
HS/Some College	---	---	---	---	---	---	-0.046*	-0.128**	-0.190***	-0.215***	-0.111***	-0.081	0.084	0.003	-0.264***	-0.252***	-0.082	-0.018
							(0.022)	(0.044)	(0.028)	(0.055)	(0.026)	(0.047)	(0.073)	(0.043)	(0.032)	(0.066)	(0.098)	(0.057)
College or Higher	---	---	---	---	---	---	-0.200***	-0.241***	-0.369***	-0.308***	-0.269***	-0.193**	-0.138	-0.028	-0.445***	-0.367***	-0.351***	-0.078
							(0.024)	(0.066)	(0.030)	(0.079)	(0.029)	(0.061)	(0.078)	(0.065)	(0.034)	(0.081)	(0.103)	(0.081)
Constant	-6.023***	-6.317***	-6.538***	-6.290***	-6.412***	-6.628***	-6.262***	-5.821***	-6.226***	-5.957***	-6.450***	-5.583***	-6.352***	-6.091***	-6.355***	-5.705***	-6.548***	-6.261***
	-0.103	-0.067	-0.114	-0.126	-0.076	-0.128	-0.057	-0.123	-0.064	-0.141	-0.071	-0.115	-0.194	-0.119	-0.078	-0.139	-0.234	-0.142
Observations	70334	254463	116343	55254	217787	104946	406814	61970	352010	53471	309624	60625	31151	67384	271113	48936	26523	58909

Standard errors in parentheses. Standard errors do NOT reflect the use of replicate weights.

Source: U.S. Census Bureau, 2014 Survey of Income and Program Participation, Wave 1 Public-Use File

* p<0.05, ** p<0.01, *** p <0.001

Table A4. Coefficients and Standard Errors from Models Stratified by Selected Characteristics, First Parental Death

	Educational Attainment						Poverty Status				Race and Hispanic Origin									
	Originally Imputed			Listwise Deleted			Originally Imputed		Listwise Deleted		Originally Imputed				Listwise Deleted					
	Less than HS	HS or Some College	College +	Less than HS	HS or Some College	College +	Not in Poverty	<100% Poverty	Not in Poverty	<100% Poverty	Non-Hispanic White	Non-Hispanic Black	Non-Hispanic Other Race	Hispanic	Non-Hispanic White	Non-Hispanic Black	Non-Hispanic Other Race	Hispanic
Age (Ref. = Aged 0-4)																		
Aged 5-9	0.308**	0.356***	0.391**	0.312*	0.299***	0.413**	0.390***	0.145	0.338***	0.229	0.503***	-0.038	0.315	0.319**	0.467***	-0.079	0.440*	0.189
	(0.111)	(0.074)	(0.128)	(0.133)	(0.085)	(0.141)	(0.059)	(0.120)	(0.066)	(0.139)	(0.073)	(0.119)	(0.187)	(0.119)	(0.081)	(0.140)	(0.214)	(0.139)
Aged 10-14	0.675***	0.755***	0.890***	0.799***	0.781***	1.030***	0.805***	0.576***	0.840***	0.769***	0.942***	0.491***	0.835***	0.519***	0.987***	0.532***	0.938***	0.562***
	(0.105)	(0.069)	(0.118)	(0.123)	(0.078)	(0.129)	(0.056)	(0.114)	(0.062)	(0.128)	(0.070)	(0.110)	(0.172)	(0.119)	(0.076)	(0.129)	(0.198)	(0.134)
Aged 15-19	1.505***	1.514***	1.572***	1.206***	1.258***	1.365***	1.559***	1.280***	1.292***	1.100***	1.706***	1.110***	1.301***	1.469***	1.508***	0.956***	1.067***	0.804***
	(0.097)	(0.063)	(0.109)	(0.123)	(0.073)	(0.123)	(0.051)	(0.105)	(0.060)	(0.125)	(0.064)	(0.101)	(0.164)	(0.105)	(0.072)	(0.125)	(0.200)	(0.133)
Aged 20-24	1.763***	1.686***	1.698***	1.920***	1.648***	1.763***	1.722***	1.482***	1.715***	1.607***	1.999***	1.147***	1.365***	1.288***	1.964***	1.240***	1.460***	1.293***
	(0.098)	(0.063)	(0.108)	(0.116)	(0.071)	(0.119)	(0.051)	(0.107)	(0.058)	(0.123)	(0.063)	(0.104)	(0.167)	(0.111)	(0.070)	(0.124)	(0.192)	(0.127)
Aged 25-29	1.815***	1.948***	1.901***	2.016***	2.031***	2.011***	1.949***	1.598***	2.030***	1.842***	2.174***	1.602***	1.739***	1.361***	2.266***	1.606***	1.925***	1.453***
	(0.099)	(0.062)	(0.108)	(0.118)	(0.070)	(0.118)	(0.051)	(0.108)	(0.057)	(0.123)	(0.063)	(0.101)	(0.162)	(0.114)	(0.069)	(0.122)	(0.186)	(0.128)
Aged 30-34	2.066***	2.150***	2.305***	2.361***	2.288***	2.443***	2.198***	1.991***	2.339***	2.238***	2.462***	1.656***	2.035***	1.712***	2.580***	1.941***	2.117***	1.864***
	(0.098)	(0.062)	(0.106)	(0.116)	(0.070)	(0.116)	(0.051)	(0.106)	(0.056)	(0.121)	(0.063)	(0.104)	(0.162)	(0.111)	(0.069)	(0.121)	(0.188)	(0.125)
Aged 35-39	2.288***	2.510***	2.601***	2.664***	2.663***	2.757***	2.531***	2.241***	2.693***	2.551***	2.792***	2.085***	2.175***	1.972***	2.935***	2.255***	2.472***	2.198***
	(0.098)	(0.062)	(0.105)	(0.116)	(0.070)	(0.116)	(0.050)	(0.107)	(0.056)	(0.122)	(0.062)	(0.101)	(0.165)	(0.112)	(0.068)	(0.121)	(0.188)	(0.126)
Aged 40-44	2.594***	2.766***	2.948***	3.065***	2.983***	3.137***	2.826***	2.475***	3.042***	2.886***	3.100***	2.086***	2.378***	2.448***	3.282***	2.429***	2.734***	2.740***
	(0.098)	(0.062)	(0.105)	(0.116)	(0.070)	(0.116)	(0.050)	(0.109)	(0.056)	(0.124)	(0.062)	(0.106)	(0.167)	(0.111)	(0.068)	(0.125)	(0.191)	(0.124)
Aged 45-49	3.061***	3.291***	3.423***	3.287***	3.316***	3.473***	3.324***	3.019***	3.363***	3.214***	3.579***	2.514***	3.230***	2.987***	3.608***	2.860***	3.082***	2.922***
	(0.096)	(0.061)	(0.104)	(0.120)	(0.070)	(0.117)	(0.049)	(0.104)	(0.056)	(0.125)	(0.062)	(0.104)	(0.155)	(0.107)	(0.069)	(0.126)	(0.195)	(0.132)
Aged 50-54	3.097***	3.472***	3.774***	3.547***	3.624***	3.955***	3.529***	3.319***	3.729***	3.521***	3.780***	3.126***	3.052***	3.120***	3.980***	3.027***	3.562***	3.278***
	(0.102)	(0.062)	(0.106)	(0.128)	(0.072)	(0.117)	(0.051)	(0.109)	(0.057)	(0.133)	(0.063)	(0.101)	(0.175)	(0.116)	(0.069)	(0.139)	(0.199)	(0.139)
Aged 55-59	3.158***	3.740***	4.175***	3.921***	4.010***	4.430***	3.827***	3.344***	4.151***	3.826***	4.143***	2.924***	3.175***	3.278***	4.384***	3.586***	3.780***	3.811***
	(0.111)	(0.066)	(0.109)	(0.137)	(0.076)	(0.121)	(0.053)	(0.131)	(0.061)	(0.158)	(0.065)	(0.126)	(0.192)	(0.131)	(0.072)	(0.150)	(0.232)	(0.153)
Aged 60-64	4.318***	4.570***	4.888***	4.447***	4.614***	5.010***	4.648***	4.254***	4.726***	4.484***	4.900***	3.975***	4.394***	4.273***	4.971***	4.130***	4.473***	4.294***
	(0.086)	(0.058)	(0.102)	(0.130)	(0.076)	(0.124)	(0.047)	(0.096)	(0.061)	(0.159)	(0.060)	(0.091)	(0.147)	(0.098)	(0.073)	(0.146)	(0.241)	(0.168)
Female	0.070*	0.029	-0.046	0.140***	0.087***	-0.070*	0.005	0.039	0.039*	0.077	-0.006	0.077*	-0.009	0.032	0.029	0.102*	0.055	0.078
	(0.030)	(0.016)	(0.025)	(0.039)	(0.019)	(0.028)	(0.013)	(0.036)	(0.016)	(0.043)	(0.015)	(0.035)	(0.050)	(0.036)	(0.017)	(0.045)	(0.063)	(0.045)
Region (Ref. = South)																		
Northeast	0.031	-0.009	-0.045	0.083	0.020	-0.036	-0.008	-0.123	0.020	-0.143	0.006	-0.147*	-0.033	-0.010	0.011	-0.156	0.077	-0.036
	(0.056)	(0.029)	(0.040)	(0.075)	(0.035)	(0.045)	(0.023)	(0.065)	(0.027)	(0.080)	(0.026)	(0.060)	(0.084)	(0.062)	(0.030)	(0.082)	(0.106)	(0.087)
Midwest	0.044	0.001	-0.043	0.090	0.018	-0.076	0.007	-0.096	0.011	-0.113	-0.019	-0.004	0.119	0.076	-0.035	0.093	0.164	0.077
	(0.048)	(0.025)	(0.037)	(0.065)	(0.030)	(0.041)	(0.020)	(0.057)	(0.024)	(0.073)	(0.023)	(0.053)	(0.085)	(0.063)	(0.027)	(0.069)	(0.108)	(0.082)
West	0.065	-0.058*	-0.093*	0.059	-0.055	-0.132**	-0.051*	-0.075	-0.069**	-0.063	-0.086***	-0.027	-0.002	0.069	-0.110***	-0.058	-0.049	0.109
	(0.048)	(0.026)	(0.037)	(0.062)	(0.032)	(0.042)	(0.021)	(0.057)	(0.025)	(0.068)	(0.025)	(0.071)	(0.068)	(0.044)	(0.029)	(0.092)	(0.087)	(0.056)
Born in South	0.068	0.004	-0.049	0.160*	0.035	-0.061	-0.002	-0.023	0.025	-0.029	-0.020	-0.005	0.126	0.081	-0.020	0.093	0.186	0.162*
	(0.048)	(0.024)	(0.035)	(0.064)	(0.029)	(0.040)	(0.019)	(0.056)	(0.023)	(0.068)	(0.022)	(0.048)	(0.092)	(0.064)	(0.025)	(0.063)	(0.110)	(0.080)
Poverty	0.125***	0.073**	0.141*	0.107*	0.057	0.150*	---	---	---	---	0.119***	0.110*	0.034	0.085	0.073*	0.108	0.089	0.154**
	(0.036)	(0.026)	(0.057)	(0.046)	(0.031)	(0.064)					(0.027)	(0.044)	(0.069)	(0.046)	(0.031)	(0.057)	(0.087)	(0.057)
Race and Hispanic Origin (Ref. = Non-Hispanic White)																		
Non-Hispanic Black	0.053	0.094***	0.115*	0.040	0.054	0.022	0.089***	0.106*	0.042	0.109	---	---	---	---	---	---	---	---
	(0.049)	(0.025)	(0.047)	(0.068)	(0.032)	(0.056)	(0.022)	(0.049)	(0.028)	(0.061)								
Non-Hispanic Other Race	-0.259***	-0.028	-0.009	-0.124	-0.035	-0.067	-0.051	-0.164*	-0.055	-0.089	---	---	---	---	---	---	---	---
	(0.070)	(0.041)	(0.055)	(0.096)	(0.049)	(0.063)	(0.032)	(0.076)	(0.039)	(0.091)								
Hispanic	-0.203***	-0.115***	-0.056	-0.292***	-0.219***	-0.187**	-0.114***	-0.179**	-0.241***	-0.260***	---	---	---	---	---	---	---	---
	(0.048)	(0.030)	(0.062)	(0.064)	(0.037)	(0.071)	(0.026)	(0.059)	(0.032)	(0.074)								
Foreign-born	0.045	0.033	0.033	-0.029	0.025	0.028	0.035	0.018	0.007	0.023	0.033	-0.002	0.109	0.114**	0.035	-0.057	0.156*	0.073
	(0.051)	(0.031)	(0.044)	(0.069)	(0.038)	(0.050)	(0.024)	(0.058)	(0.030)	(0.070)	(0.035)	(0.071)	(0.063)	(0.044)	(0.041)	(0.096)	(0.077)	(0.056)
Education (Ref. = Less than HS)																		
Age <26	---	---	---	---	---	---	-0.614***	-0.619***	-0.732***	-0.488**	-0.468***	-0.659***	-1.100**	-0.851***	-0.575***	-0.664***	-1.391***	-0.850***
							(0.095)	(0.152)	(0.101)	(0.156)	(0.112)	(0.172)	(0.341)	(0.179)	(0.117)	(0.183)	(0.368)	(0.190)
HS/Some College	---	---	---	---	---	---	-0.097***	-0.188***	-0.212***	-0.252***	-0.157***	-0.133**	0.065	-0.078	-0.270***	-0.247***	-0.089	-0.106*
							(0.022)	(0.042)	(0.027)	(0.051)	(0.026)	(0.048)	(0.073)	(0.040)	(0.031)	(0.065)	(0.101)	(0.052)
College or Higher	---	---	---	---	---	---	-0.257***	-0.276***	-0.393***	-0.345***	-0.319***	-0.288***	-0.097	-0.162*	-0.446***	-0.453***	-0.315**	-0.212**
							(0.024)	(0.063)	(0.029)	(0.075)	(0.028)	(0.060)	(0.077)	(0.063)	(0.032)	(0.079)	(0.106)	(0.077)
Father at least 5 years older than mother	0.547***	0.444***	0.560***	0.531***	0.491***	0.628***	0.485***	0.528***	0.507***	0.612***	0.489***	0.469***	0.510***	0.498***	0.495***	0.574***	0.469*	0.565***
	(0.068)	(0.041)	(0.075)	(0.090)	(0.052)	(0.089)	(0.035)	(0.078)	(0.045)	(0.095)	(0.044)	(0.068)	(0.139)	(0.066)	(0.054)	(0.084)	(0.193)	(0.084)
Constant	-5.879***	-6.101***	-6.340***	-6.109***	-6.214***	-6.404***	-6.037***	-5.543***	-6.018***	-5.735***	-6.200***	-5.397***	-6.046***	-5.925***	-6.157***	-5.546***	-6.129***	-6.085***
	(0.093)	(0.061)	(0.102)	(0.114)	(0.070)	(0.114)	(0.052)	(0.110)	(0.059)	(0.128)	(0.065)	(0.106)	(0.171)	(0.109)	(0.072)	(0.133)	(0.201)	(0.129)
Observations	66095	242103	111655	50703	202655	99337	388300	59135	329878	50218	295635	57077	29827	64896	254145	45170	24930	55851

Standard errors in parentheses. Standard errors do NOT reflect the use of replicate weights.

Source: U.S. Census Bureau, 2014 Survey of Income and Program Participation, Wave 1 Public-Use File

* p<0.05, ** p<0.01, *** p <0.001

Table A5. Coefficients and Standard Errors from Models Stratified by Selected Characteristics, Both Parents' Death

	Educational Attainment						Poverty Status				Race and Hispanic Origin							
	Originally Imputed			Listwise Deleted			Originally Imputed		Listwise Deleted		Originally Imputed				Listwise Deleted			
	Less than HS	HS or Some College	College +	Less than HS	HS or Some College	College +	Not in Poverty	<100% Poverty	Not in Poverty	<100% Poverty	Non-Hispanic White	Non-Hispanic Black	Non-Hispanic Other Race	Hispanic	Non-Hispanic White	Non-Hispanic Black	Non-Hispanic Other Race	Hispanic
Age (Ref. Aged 0-4)																		
Aged 5-9	-0.038	0.014	1.783	1.552	0.039	X	0.526	-0.524	0.757	1.086	0.680	-0.579	1.005	0.250	0.072	0.244	1.573	1.860
	(0.466)	(0.398)	(1.090)	(0.898)	(0.589)	X	(0.348)	(0.517)	(0.519)	(0.857)	(0.470)	(0.507)	(0.846)	(0.675)	(0.698)	(0.990)	(1.096)	(0.969)
Aged 10-14	-0.067	0.959**	2.263*	1.495	1.510**	1.097	1.181***	-0.125	1.747***	1.385	1.370**	0.168	1.509*	0.602	1.646**	1.553	2.039*	1.452
	(0.464)	(0.339)	(1.053)	(0.897)	(0.484)	(0.665)	(0.315)	(0.454)	(0.442)	(0.815)	(0.434)	(0.401)	(0.769)	(0.651)	(0.547)	(0.900)	(0.954)	(1.010)
Aged 15-19	1.518***	2.268***	3.221**	2.895***	2.636***	2.120***	2.480***	1.084**	2.947***	2.330**	2.814***	0.952**	2.328**	2.321***	2.908***	2.166*	2.814**	3.164***
	(0.381)	(0.299)	(1.019)	(0.812)	(0.446)	(0.588)	(0.283)	(0.369)	(0.408)	(0.749)	(0.387)	(0.361)	(0.707)	(0.539)	(0.498)	(0.872)	(0.879)	(0.890)
Aged 20-24	2.363***	2.697***	3.767***	4.149***	3.236***	2.484***	2.983***	1.712***	3.596***	2.904***	3.481***	1.303***	2.772***	2.625***	3.573***	2.951***	3.421***	3.664***
	(0.363)	(0.293)	(1.011)	(0.792)	(0.437)	(0.573)	(0.278)	(0.355)	(0.400)	(0.740)	(0.380)	(0.351)	(0.697)	(0.532)	(0.490)	(0.853)	(0.854)	(0.876)
Aged 25-29	2.998***	3.437***	4.571***	5.088***	4.236***	3.642***	3.707***	2.501***	4.575***	4.200***	4.295***	2.265***	3.508***	2.764***	4.728***	3.891***	4.199***	4.238***
	(0.354)	(0.288)	(1.005)	(0.783)	(0.431)	(0.550)	(0.274)	(0.343)	(0.395)	(0.720)	(0.376)	(0.328)	(0.683)	(0.530)	(0.484)	(0.840)	(0.838)	(0.867)
Aged 30-34	3.278***	3.863***	4.894***	5.379***	4.710***	4.001***	4.131***	2.572***	5.040***	4.302***	4.646***	2.645***	3.946***	3.262***	5.098***	4.509***	4.697***	4.704***
	(0.350)	(0.287)	(1.005)	(0.781)	(0.430)	(0.548)	(0.273)	(0.341)	(0.394)	(0.718)	(0.375)	(0.324)	(0.678)	(0.526)	(0.483)	(0.835)	(0.833)	(0.863)
Aged 35-39	3.787***	4.427***	5.710***	5.985***	5.282***	4.898***	4.729***	3.309***	5.675***	5.136***	5.283***	3.143***	4.332***	4.050***	5.766***	5.031***	5.183***	5.583***
	(0.347)	(0.285)	(1.002)	(0.779)	(0.429)	(0.543)	(0.272)	(0.336)	(0.393)	(0.715)	(0.374)	(0.319)	(0.678)	(0.520)	(0.482)	(0.834)	(0.831)	(0.857)
Aged 40-44	4.281***	4.997***	6.307***	6.503***	5.843***	5.507***	5.298***	3.844***	6.255***	5.613***	5.867***	3.689***	4.873***	4.536***	6.342***	5.668***	5.752***	6.032***
	(0.345)	(0.284)	(1.002)	(0.777)	(0.428)	(0.542)	(0.271)	(0.332)	(0.392)	(0.713)	(0.373)	(0.316)	(0.673)	(0.518)	(0.481)	(0.832)	(0.827)	(0.857)
Aged 45-49	4.668***	5.537***	7.031***	6.768***	6.356***	6.206***	5.860***	4.453***	6.789***	6.170***	6.433***	4.126***	5.814***	4.967***	6.911***	6.053***	6.232***	6.453***
	(0.344)	(0.283)	(1.001)	(0.777)	(0.427)	(0.540)	(0.270)	(0.329)	(0.392)	(0.712)	(0.372)	(0.314)	(0.668)	(0.518)	(0.481)	(0.831)	(0.826)	(0.857)
Aged 50-54	5.205***	6.023***	7.524***	7.353***	6.825***	6.719***	6.358***	4.921***	7.283***	6.686***	6.922***	4.889***	5.680***	5.592***	7.413***	6.423***	6.602***	7.105***
	(0.343)	(0.283)	(1.001)	(0.777)	(0.427)	(0.540)	(0.270)	(0.328)	(0.392)	(0.712)	(0.372)	(0.312)	(0.673)	(0.516)	(0.480)	(0.831)	(0.826)	(0.856)
Aged 55-59	5.439***	6.502***	8.099***	7.678***	7.358***	7.298***	6.854***	5.124***	7.829***	6.952***	7.461***	4.813***	6.366***	5.978***	7.936***	6.884***	7.420***	7.480***
	(0.343)	(0.283)	(1.001)	(0.777)	(0.427)	(0.540)	(0.270)	(0.331)	(0.392)	(0.714)	(0.372)	(0.315)	(0.672)	(0.517)	(0.480)	(0.832)	(0.825)	(0.857)
Aged 60-64	6.743***	7.672***	9.163***	8.683***	8.372***	8.225***	8.004***	6.331***	8.814***	7.879***	8.579***	6.147***	7.568***	7.288***	8.917***	7.869***	8.153***	8.661***
	(0.340)	(0.282)	(1.000)	(0.775)	(0.427)	(0.539)	(0.269)	(0.325)	(0.391)	(0.711)	(0.372)	(0.309)	(0.666)	(0.513)	(0.480)	(0.830)	(0.824)	(0.853)
Female	0.063	0.034	0.003	0.135**	0.065**	0.001	0.017	0.099*	0.041*	0.142*	0.025	0.069	-0.084	0.042	0.047*	0.106	-0.042	0.071
	(0.035)	(0.020)	(0.031)	(0.050)	(0.024)	(0.036)	(0.016)	(0.049)	(0.019)	(0.064)	(0.017)	(0.045)	(0.065)	(0.050)	(0.021)	(0.063)	(0.087)	(0.070)
Region (Ref. South)																		
Northeast	0.086	0.018	-0.045	0.090	0.042	-0.026	0.011	-0.056	0.035	-0.137	0.041	-0.034	-0.190	-0.041	0.048	-0.110	0.030	-0.299*
	(0.062)	(0.034)	(0.049)	(0.093)	(0.043)	(0.058)	(0.027)	(0.083)	(0.034)	(0.112)	(0.031)	(0.070)	(0.107)	(0.086)	(0.037)	(0.104)	(0.157)	(0.143)
Midwest	0.041	0.013	-0.060	0.095	0.040	-0.078	-0.004	-0.027	0.014	-0.102	0.003	-0.080	0.042	0.083	-0.009	0.019	0.217	0.155
	(0.054)	(0.030)	(0.045)	(0.082)	(0.037)	(0.052)	(0.024)	(0.075)	(0.029)	(0.099)	(0.026)	(0.064)	(0.112)	(0.096)	(0.032)	(0.090)	(0.150)	(0.134)
West	0.047	-0.084**	-0.092*	0.063	-0.052	-0.086	-0.067**	-0.098	-0.046	-0.129	-0.075**	-0.207*	-0.066	0.039	-0.079*	-0.173	0.029	0.115
	(0.056)	(0.032)	(0.045)	(0.081)	(0.040)	(0.052)	(0.025)	(0.075)	(0.031)	(0.094)	(0.029)	(0.092)	(0.088)	(0.063)	(0.034)	(0.121)	(0.123)	(0.086)
Born in South	0.045	-0.016	-0.117**	0.070	0.012	-0.128*	-0.039	0.007	-0.015	-0.099	-0.033	-0.007	-0.040	-0.006	-0.041	0.063	0.077	0.067
	(0.055)	(0.028)	(0.043)	(0.080)	(0.036)	(0.051)	(0.023)	(0.072)	(0.028)	(0.093)	(0.025)	(0.062)	(0.119)	(0.090)	(0.031)	(0.087)	(0.152)	(0.121)
Poverty	0.041	0.107**	0.143	0.015	0.091*	0.165	---	---	---	---	0.063	0.147*	0.309***	0.045	0.040	0.105	0.312*	0.208*
	(0.044)	(0.036)	(0.077)	(0.062)	(0.045)	(0.094)					(0.035)	(0.060)	(0.089)	(0.070)	(0.043)	(0.085)	(0.131)	(0.095)
Race and Hispanic Origin (ref. non-Hispanic White)																		
Non-Hispanic Black	-0.017	0.042	0.055	-0.012	-0.023	-0.035	0.022	0.115	-0.032	0.077	---	---	---	---	---	---	---	---
	(0.055)	(0.033)	(0.062)	(0.081)	(0.043)	(0.078)	(0.028)	(0.066)	(0.037)	(0.089)								
Non-Hispanic Other Race	-0.170*	0.082	0.013	-0.045	0.086	-0.057	-0.023	0.251**	-0.018	0.297*	---	---	---	---	---	---	---	---
	(0.079)	(0.052)	(0.071)	(0.122)	(0.066)	(0.086)	(0.040)	(0.093)	(0.052)	(0.125)								
Hispanic	-0.298***	-0.161***	-0.128	-0.410***	-0.244***	-0.284**	-0.197***	-0.158	-0.336***	-0.177	---	---	---	---	---	---	---	---
	(0.058)	(0.043)	(0.088)	(0.088)	(0.056)	(0.104)	(0.034)	(0.084)	(0.046)	(0.113)								
Foreign-born	-0.007	-0.035	0.048	-0.127	-0.064	0.051	0.008	-0.087	-0.024	-0.185	0.007	-0.045	0.118	-0.038	-0.005	-0.112	0.132	-0.098
	(0.060)	(0.039)	(0.056)	(0.091)	(0.051)	(0.067)	(0.030)	(0.077)	(0.039)	(0.101)	(0.040)	(0.094)	(0.081)	(0.064)	(0.049)	(0.139)	(0.108)	(0.090)
Education (ref. Less than HS)																		
Age <26	---	---	---	---	---	---	-2.022*	-23.447***	-1.468	-22.297***	-22.347***	-21.712***	-0.435	-22.070***	-22.152***	-20.787***	-0.241	-21.186***
							(1.001)	(0.244)	(0.995)	(0.341)	(0.186)	(0.228)	(1.008)	(0.308)	(0.248)	(0.388)	(0.995)	(0.369)
HS/Some College	---	---	---	---	---	---	-0.155***	-0.120*	-0.276***	-0.217**	-0.194***	-0.138*	0.026	-0.105	-0.307***	-0.303***	-0.111	-0.101
							(0.024)	(0.055)	(0.033)	(0.073)	(0.028)	(0.056)	(0.086)	(0.056)	(0.037)	(0.084)	(0.133)	(0.082)
College or Higher	---	---	---	---	---	---	-0.264***	-0.165*	-0.399***	-0.245*	-0.300***	-0.275***	-0.120	-0.146	-0.419***	-0.479***	-0.337*	-0.196
							(0.027)	(0.083)	(0.036)	(0.105)	(0.031)	(0.074)	(0.093)	(0.090)	(0.039)	(0.104)	(0.139)	(0.117)
Dad at least 5 years older than mother	0.250**	0.395***	0.359***	0.224*	0.433***	0.452***	0.359***	0.319**	0.383***	0.395**	0.360***	0.329***	0.190	0.409***	0.368***	0.502***	0.135	0.419**
	(0.078)	(0.049)	(0.089)	(0.108)	(0.062)	(0.111)	(0.042)	(0.101)	(0.054)	(0.131)	(0.049)	(0.085)	(0.182)	(0.098)	(0.062)	(0.119)	(0.254)	(0.133)
Constant	-8.446***	-9.418***	-10.900***	-10.485***	-10.226***	-10.021***	-9.561***	-8.048***	-10.342***	-9.618***	-10.108***	-7.857***	-9.330***	-9.074***	-10.409***	-9.618***	-10.070***	-10.623***
	(0.343)	(0.284)	(1.001)	(0.779)	(0.428)	(0.542)	(0.271)	(0.336)	(0.393)	(0.718)	(0.373)	(0.317)	(0.684)	(0.519)	(0.481)	(0.835)	(0.830)	(0.860)
Observations	81079	292325	131203	60184	241005	115805	462645	69845	386930	57627	353115	69803	34751	74821	300624	53292	28365	62276

Standard errors in parentheses. Standard errors do NOT reflect the use of replicate weights.

Source: U.S. Census Bureau, 2014 Survey of Income and Program Participation, Wave 1 Public-Use File

* p<0.05, ** p<0.01, *** p <0.001