Death of family members as an overlooked source of racial disadvantage in the United States

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Long-standing racial differences in US life expectancy suggest that black Americans would be exposed to significantly more family member deaths than white Americans from childhood through adulthood, which, given the health risks posed by grief and bereavement, would add to the disadvantages that they face. We analyze nationally representative US data from the National Longitudinal Study of Youth (n = 7,617) and the Health and Retirement Study (n = 34,757) to estimate racial differences in exposure to the death of family members at different ages, beginning in childhood. Results indicate that blacks are significantly more likely than whites to have experienced the death of a mother, a father, and a sibling from childhood through midlife. From young adulthood through later life, blacks are also more likely than whites to have experienced the death of a child and of a spouse. These results reveal an underappreciated layer of racial inequality in the United States, one that could contribute to the intergenerational transmission of health disadvantage. By calling attention to this heightened vulnerability of black Americans, our findings underscore the need to address the potential impact of more frequent and earlier exposure to family member deaths in the process of cumulative disadvantage.

race | life expectancy | bereavement | family | disparities

The evidence for racial disparities in life expectancy and mortality risk in the United States is long-standing and irrefutable (1–3), but the potentially substantial damage to surviving family members is a largely overlooked area of racial disadvantage. The death of a family member has well-documented adverse effects on health and other life outcomes, particularly when the death occurs "off time" or earlier than expected (4). However, no prior study has assessed racial disparities in exposure to the death of multiple family members over the life course. Doing so is important given that, despite a recent decline, the large mortality differential between blacks and whites persists today, especially at younger ages (3, 5, 6). These statistics lead us to hypothesize that the death of specific and multiple family members is more common among black than among white Americans from childhood through mid to later life.

We draw on fundamental cause theory and a life course perspective to argue that exposure to death is a unique source of adversity for black Americans that contributes to lifelong racial inequality. This approach emphasizes that strains and resources associated with stratified social conditions accumulate throughout the life course to produce advantages and disadvantages in wide-ranging life outcomes including socioeconomic status, the formation and quality of relationships, and mental and physical health (7–13). Indeed, stress experienced in childhood undermines health years and even decades later—a fact at the cornerstone of theoretical work on race and cumulative disadvantage across the life course (14–18). Geronimus et al. (5, 19) describe a process of "weathering" whereby repeated exposure to stressors associated with racial discrimination and disadvantage contribute to early-onset disability and death for black Americans, particularly from young adulthood to midlife. Loss of a family member could be central to this process of cumulative disadvantage, with each additional loss furthering the weathering process. Indeed, research shows that losing a child, spouse, or parent is the most stressful life event people experience and one that affects them for years (4, 20). That stress may be widely disruptive to life in ways that increase the likelihood of exposure to more stressful life events (e.g., residential disruption, divorce, job loss) and lead to chronic stressors (e.g., poverty, relationship strain) is well established (7–11). In these ways, a loss at one point in the life course can fuel cumulative disadvantage—and the weathering resulting from this disadvantage—over time (21). Surprisingly, although recent news reports and protests highlight the trauma of premature deaths of blacks in the United States, repeated and earlier exposure to loss of family members as a unique source of disadvantage and inequality for black Americans has never been documented.

There are many reasons to expect that the death of a family member is a powerful and unique type of adversity resulting from social inequality. Developmental psychologists emphasize that social connections are essential to human development (22, 23), and social epidemiologists have clearly established that social ties are fundamental to human health (24, 25). A substantial literature on bereavement shows that the death of even one family member (whether spouse, child, parent, or sibling) undermines physical health and increases mortality risk (4, 26, 27). Notably, not all losses have the same effects. A loss may be particularly consequential if it occurs earlier in the life course than expected (28–30). For example, the death of a parent in childhood is particularly likely to trigger biopsychosocial sequelae that undermine health (9, 29–32). Off-time losses in adulthood—such as losing a spouse as a young adult—may also have a more pronounced impact (4, 33). Such early or off-time

Significance

Due to historical racial inequalities in the United States, including poverty, inadequate health care, and criminal victimization, black Americans die at much higher rates than white Americans. How the consequences of these elevated rates reverberate across family networks warrants attention. If blacks die at higher rates and earlier in the life course than whites, then blacks lose more loved ones from childhood through adulthood. Through the damaging effects of grief and other mechanisms, such losses are likely to undermine multiple life course outcomes. By analyzing nationally representative datasets to compare black and white Americans on the likelihood of losing family members over the life course, this study documents an intergenerational process with corrosive effects on black families and communities.

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losses may trigger a cascade of adverse social consequences and maladaptive biopsychosocial responses that disrupt life course trajectories well after the losses occur. For example, one qualitative study suggests that death of a parent during childhood or adolescence may increase risk for residential instability and homelessness, putting young women's long-term futures at risk (34). Another qualitative study found that the murder of close friends and relatives—a common life course experience for young black men—was often a turning point in behaviors, relationships, and outlooks (35). Thus, if losing a family member is a disadvantage in the present in ways that disrupt the future, racial disparities in these losses over the life course is a tangible manifestation of racial inequality that needs to be systematically documented.

In this spirit, this study provides a population-based investigation of racial disparities in the extent and timing of life course exposure to the death of family members in the United States. Conducting survival analysis with nationally representative longitudinal datasets, we compare non-Hispanic blacks and whites on exposure to the death of biological mothers, biological fathers, siblings, children, and spouses while also considering the total number of such deaths experienced by different ages. In doing so, we draw attention to an underexplored racial disparity (i.e., exposure to death) that likely contributes to racial disadvantage in multiple and intersecting outcomes (e.g., health behaviors and health) at the heart of the weathering process over the life course.

Results

We estimated racial differences in exposure to family member deaths with data from two national datasets that are representative of an earlier birth cohort [Health and Retirement Study (HRS); born 1900–1965] and a later birth cohort [National Longitudinal Survey of Youth 1997 (NLSY-97); born 1980–1984]. We replicated results with two additional datasets that include an earlier birth cohort [National Longitudinal Survey of Youth 1979 (NLSY-79); born 1957–1965] and a later birth cohort [National Longitudinal Study of Adolescent to Adult Health (Add Health); born 1974–1984]. These two replication datasets yield patterns consistent with those based on the HRS and NLSY-97 reported below (Tables S1–S3 and Figs. S1–S4). *Description of Data and Measures* provides details on measurement of variables, including all control variables. In the HRS and NLSY-97 analyses (and in replication datasets), we consider deaths of mothers, fathers, siblings, spouses, and children. To take into account variability in risk of death exposures, we limit analyses of sibling deaths to respondents who report ever having a sibling, we restrict analyses of child death to respondents who report ever having a live birth, and we restrict analysis of spouse death to those who were ever married. Additionally, for mother and father death, we restrict the analysis to biological parents, including noncustodial parents. Measures of parental death were coded as missing if the respondent reported not knowing whether their parent was alive. We now turn to results from the HRS and NLSY-97.

Risk of Exposure to Specific Family Member Deaths. Our nonparametric life table approach compares blacks and whites on the cumulative risk of exposure to specific family member deaths at different ages. Table 1 presents the cumulative probabilities of family member loss at each age for blacks and whites; Fig. 1 summarizes ratios of cumulative risk for blacks compared with whites. Table 1 (NLSY-97) and Fig. 1*A* report on black/white comparisons with the NLSY-97 (n = 7,617); and Table 1 (HRS) and Fig. 1*B* show results from the HRS (n = 34,757).

Overall, the results suggest that, for each type of family member death and by each age considered, the cumulative risk of death exposure is greater for blacks than whites in both datasets. For example, in the younger NLSY-97 cohort (Fig. 1*A*), blacks were at three times greater risk than whites of losing a mother, more than twice the risk of losing a father, and 20% more likely to have lost a sibling by age 10. Blacks were also 2.5 times more likely to have lost a child by age 20. In the older HRS cohort (Fig. 1*B*), the patterns were similar. Blacks were at twice the risk of losing a mother and about 50% greater risk of losing a father by age 20. Blacks were also at much greater risk than whites of losing a child during mid to later life—about two times more likely to lose a child between the ages of 50 and 60, and over three times more likely to lose a child between the ages of 50 and 70. Blacks were also nearly twice as likely to lose a spouse by age 60, and 50% more likely to lose a sibling by age 60.

Although the magnitude of effects fluctuates according to family member type, varies by age, and differs across cohorts, effects are consistently in the same direction. The overall point is that they are substantial and always show more loss among black than white Americans.

Cumulative Exposures to Family Member Death. Next, negative binomial regressions test whether blacks are at greater risk for cumulative death exposures—the total number of deaths accumulated throughout the study period in each dataset and up to the respondent's age during the last survey assessment. Results in Table 2 indicate that, in both the NLSY-97 and HRS, blacks experience more family member deaths than do whites, net of controls for age, gender, educational attainment of parents, currently living in the South, mother's age at respondent birth,

Table 1. Cumulative risk of family member deaths before an individual reaches age *t*

	Mother		Father		Spouse		Sibling		Child	
Age *t*	Black	White	Black	White	Black	White	Black	White	Black	White
NLSY-97										
10	0.020	0.006	0.083	0.034	—	—	0.012	0.010	—	—
20	0.085	0.036	0.171	0.088	—	—	0.028	0.018	0.007	0.003
30	0.206	0.110	0.294	0.247	—	—	—	—	0.049	0.018
HRS										
10	0.026	0.011	0.044	0.024	—	—	—	—	—	—
20	0.070	0.031	0.114	0.078	0.002	0.001	—	—	—	—
30	0.128	0.070	0.254	0.186	0.017	0.009	—	—	—	—
40	0.232	0.147	0.423	0.352	0.034	0.018	—	—	—	—
50	0.402	0.312	0.635	0.577	0.063	0.032	—	—	—	—
60	0.645	0.581	0.857	0.815	0.105	0.049	0.151	0.100	0.010	0.005
70	0.826	0.824	0.960	0.944	0.143	0.080	0.391	0.268	0.047	0.014
80	0.933	0.949	0.993	0.994	0.187	0.128	0.633	0.471	0.104	0.025
90	0.967	0.979	1.000	1.000	0.236	0.187	0.765	0.598	0.213	0.055

Note: Cumulative risk of specific family member deaths for blacks and whites by age *t*.

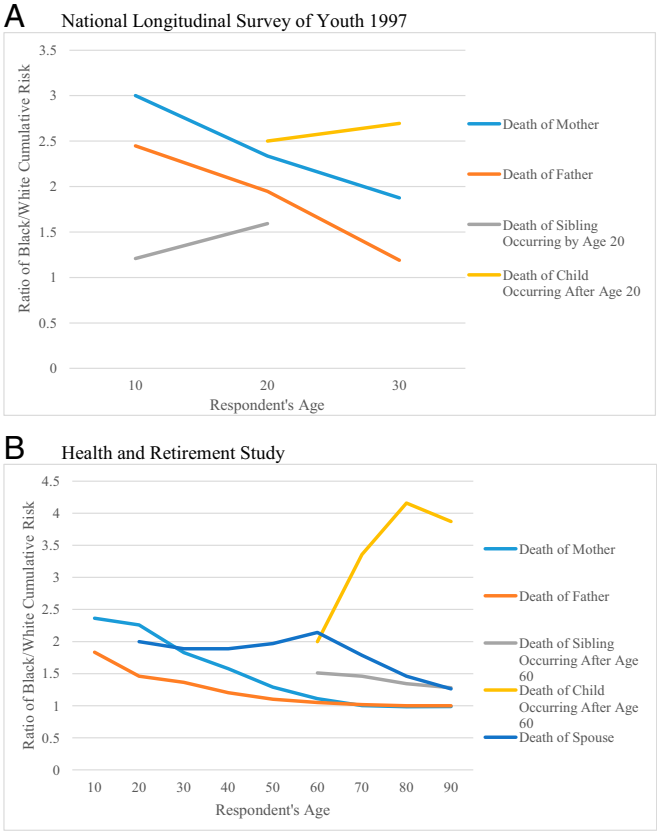

Fig. 1. Ratio for black/white cumulative risk of specific family member deaths. (*A*) National Longitudinal Survey of Youth 1997; (*B*) Health and Retirement Study. Values above 1 reflect greater risk for blacks; age refers to the age by which the death occurred; lines cover the ages when respondents reported on each death.

and household size at baseline; for HRS respondents, additional controls include born in the South and birth cohort. We also estimated logistic regressions to predict the odds of experiencing two or more losses by age 30 in the NLSY-97 and four or more losses in the HRS by age 60, net of controls. Fig. 2*A* shows that, in the NLSY, blacks have significantly lower odds than whites of experiencing no family losses by the age of 30 ($P < 0.001$), but over three times higher odds of experiencing the death of two or more family members by the age of 30 ($P < 0.001$). Fig. 2*B* shows that, in the HRS data, blacks are about 90% more likely than whites to have experienced four or more deaths by age 60 ($P < 0.001$). In stark contrast, whites are 30% more likely than blacks to have never experienced a family loss by age 60 ($P < 0.001$).

Life Course Timing of Death Exposures. To shed light on the life course timing of specific deaths, we calculated the age-specific hazard of death exposures for blacks and whites. Results are illustrated in Figs. 3 and 4. Hazards are shown for ages at which data were available and sufficient sample sizes were present. In the NLSY-97 (Fig. 3), age-specific hazards indicate that, compared with whites, blacks were at greater risk of losing a mother from early childhood through young adulthood, losing a father through their midteens, losing a sibling in their teens, and losing a child through their late twenties. We also estimated semiparametric Cox hazard models to predict black–white disparities in each type of death taking into account background variables that might help to explain the overall pattern of results (control variables noted above) (Table S4). In the NLSY-97 data, racial differences were statistically significant and robust to controls with the exception that the race difference in father and sibling death was no longer significant, although in the expected direction; thus, family social and demographic contexts help to explain racial disparities in father and sibling deaths. Even net of controls, however, blacks experience greater risk of losing a mother and of losing a child up to age 30 in the younger NLSY-97 cohort.

Fig. 4 illustrates the losses that occurred in the older HRS cohorts. The race gap in the age-specific hazard of exposure to death of mother, father, spouse, and sibling is apparent at most ages until later in life. Blacks are at greater risk of losing a parent (mother or father) until their mid-50s, and a spouse or a sibling through their 80s. The racial disparity in death of a child occurring after age 50 grows with advancing age without convergence even at the oldest ages, consistent with the cumulative disadvantage mechanism. The significantly greater risks for blacks than whites were robust to controls in Cox regression models (Table S4).

Discussion

This study provides a population-based documentation of earlier and repeated bereavement experiences for black Americans, who are more likely to experience the deaths of mothers, fathers, siblings, spouses, and children and to experience multiple family member deaths. Moreover, racial differences in exposure to death of mothers, fathers, and siblings appear early in childhood. By early to mid-adulthood, racial differences in exposure to the death of children and spouses are also significant. Understanding exposure to family deaths from childhood through mid to later life is important because bereavement experiences almost certainly add to cumulative disadvantage in multiple life outcomes. Past research has generally focused on the effects of only one loss on subsequent life outcomes, clearly demonstrating adverse effects of bereavement on socioeconomic status, mental health, health behaviors, physical health, and mortality risk (20). Few studies have considered the impact of repeated bereavements (36), and none has focused on racial differences in life course exposure to the death of family members, which may be central to processes of cumulative disadvantage associated with race.

Death of family members is highly likely to disrupt and strain other family relationships as well as the formation, duration, and quality of relationships across the life course, further contributing to a broad range of adverse life outcomes (22, 37). Again, bereavement is a known risk factor for mental and physical health (20), and childhood through early adulthood may be a period of the life course during which bereavement is especially likely to have lasting consequences (14–18). Although the United States has made progress in recent decades in reducing the life expectancy gap between blacks and whites, significant racial differences persist (5, 6), with important implications for surviving family members. Clearly, the most effective strategy for reducing risk of family member losses for black Americans would be to eliminate racial disparities in life expectancy, but current patterns of life expectancy in the United States call for immediate attention to the extent and impact of loss on surviving family members.

Future research should address limitations of this study and extend the scope. First, some of the measures of family death relied on retrospective accounts, which likely underestimated the actual

Table 2. Negative binomial regression models predicting cumulative number of family member deaths

Race	IRR [95% CI]
HRS	
Black	1.245*** [1.244, 1.245]
NLSY-97	
Black	1.531*** [1.315, 1.781]

$n = 34{,}757$ for HRS and $n = 7{,}055$ for NLSY-97. Each cell contains incidence rate ratios (IRRs) based on negative binomial regression models; 95% confidence intervals (CIs) are in parentheses. ***$P < 0.001$.

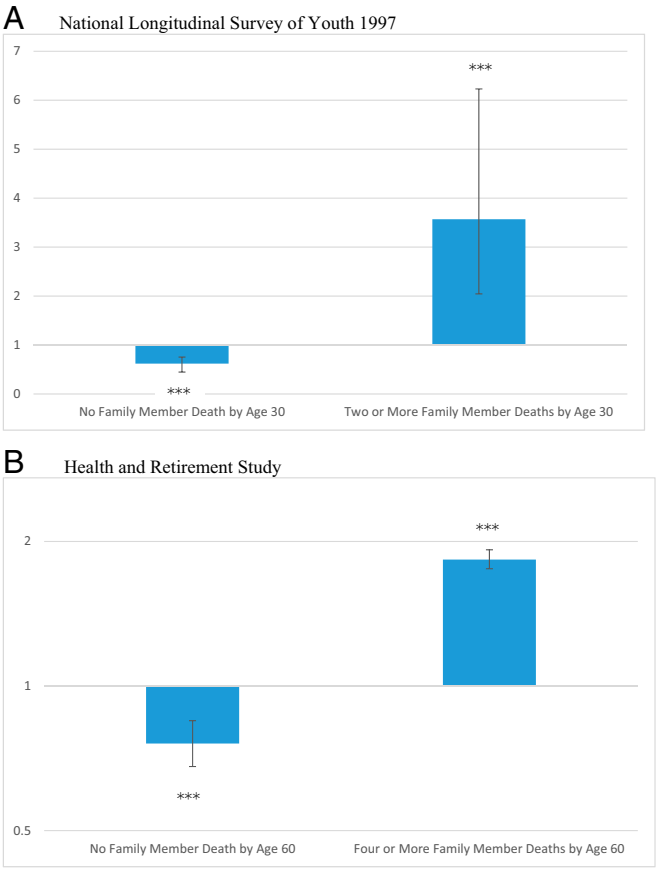

Fig. 2. Odds ratios for no family member deaths and multiple family member deaths for blacks compared with whites. (*A*) National Longitudinal Survey of Youth 1997; (*B*) Health and Retirement Study. n = 34,757 for HRS and n = 7,055 for NLSY-97. ***$P < 0.001$.

number of deaths experienced (38). Second, the datasets we examined lacked detailed information about family size at different points in the life course or about family members and family-like friends beyond parents, children, siblings, and spouses. In light of the important role of extended kin networks in black communities (39), future studies should collect information on a broader range of kin and kin-like ties that may contribute to additional death exposures for children raised by extended kin. Future work should also consider other forms of family member loss that vary by race and add to cumulative loss of family members; for example, black children are much more likely than white children to experience the effects of parental loss due to incarceration of the parent (40). Third, future research should go beyond the simple black–white comparison conducted here to consider disparities across diverse populations. Fourth, this study focused on several age cohorts, but future studies should investigate the potentially different experiences of a range of cohorts. Earlier birth cohorts were characterized by greater racial disadvantage (41), which may have resulted in higher levels of early-life exposure to death, but family deaths may be even more consequential for later birth cohorts because these deaths are less expected. Future research should also consider possible variation in racial patterns of death exposures based on geographic concentrations of poverty (5) and violence (42) that may vary across urban/rural and South/non-South regions as well as across neighborhoods and cities; this approach may reveal variation in spatial concentrations of disadvantage (43, 44).

Conclusion

Bereavement is a risk factor for varied and interconnected life outcomes, and black Americans are more likely to experience the death of multiple family members from childhood through mid to later life compared with whites. Indeed, experiences of loss are central themes in African American literature as well as critical race and black feminist theory (45–48). In this study, we almost certainly underestimated racial differences in exposure to death due to lack of information on the deaths of other important people in black Americans' lives. The effects of losing nuclear family members, extended family, friends, and other loved ones may be further compounded by the highly publicized deaths of black Americans, especially youth, in the United States. The frequent news accounts of young black people dying as a result of police shootings and gang violence almost certainly add to a sense of collective loss and personal vulnerability (41) as dramatized in decades of poetry, literature, and nonfiction writings by and about black Americans, and as underscored in the Black Lives Matter movement. Scholars and policymakers need to attend to the ways in which such losses have reverberating effects throughout family networks. Indeed, earlier and more frequent exposure to death is a distinctive stressor that adds to racial disparities in overall stress exposure and almost certainly results in lifelong cumulative disadvantage for children, adults, and families. Our findings highlight the spiraling damage of racial disparities in life expectancy and point to the need for interventions and policies that address bereavement and loss in high-risk populations.

Materials and Methods

We analyzed data from the HRS and the NLSY-97. The HRS is a longitudinal study of men and women aged 50 and older in the United States who were not institutionalized at baseline. The study began in 1992 with individuals born in 1931–1941 and their spouses. Participants have been interviewed approximately every 2 y since then, and several other cohorts have since been added to the original HRS participants. Data are publicly available (hrsonline.isr.umich.edu). The HRS analytic sample included 34,757 respondents who were either non-Hispanic black (n = 6,681) or non-Hispanic white (n = 28,076). The NLSY-97 follows a nationally representative sample of youth born 1981–1984. Respondents were interviewed at 16 times points, from 1997 to 2013–2014. We used data from the baseline survey and from the most recent data collection in 2013, which are publicly available (https://www.nlsinfo.org/investigator). The analytic sample included 7,617 youth who were either non-Hispanic black (n = 2,386) or non-Hispanic white (n = 5,231). The NLSY-97 sample was selected by household; household informants were asked whether there were any persons for whom the housing unit was the usual place of residence but who were away from the housing unit at the time of the survey (e.g., college students, persons in the military, and persons in prisons or other institutions); imprisoned/institutionalized respondents were excluded from the analysis. Additional information on datasets is available in *Description of Data and Measures*.

Analyses occurred in three steps using Stata. First, we estimated a nonparametric life table approach to consider whether blacks were at greater cumulative risk for exposure to specific family member deaths compared with whites by different ages. An abridged life table was constructed based on each individual's age, grouped into 10-y age intervals. The life table estimates are based on the following parameters:

i) The number at risk: the number of individuals at age t who are at risk for a given family member's death: l_t;
ii) The number of deaths: the number of deaths between ages t and $t + n$: ${}_nd_t = l_t - l_{t+n}$;
iii) Age-specific hazard: the probability of a given family member's death between ages t and $t + n$: ${}_nq_t = {}_nd_t/l_t$;
iv) Survival:

$$S(t_j) = \prod_{j=1}^{k}\left(1 - \frac{d_j}{l_j}\right);$$

v) Cumulative hazard: $H = -\log(S_t)$.

We calculated cumulative risk for exposure to family member death by each age for blacks and whites by assessing the number of deaths that occurred by that age and dividing this by the number of black (or white) respondents in the sample. Then, risk ratios for 10-y intervals (shown in Fig. 1) were calculated by dividing the risk of blacks by the risk of whites by age t (i.e., by the time the respondent was age 10, age 20, age 30, etc.).

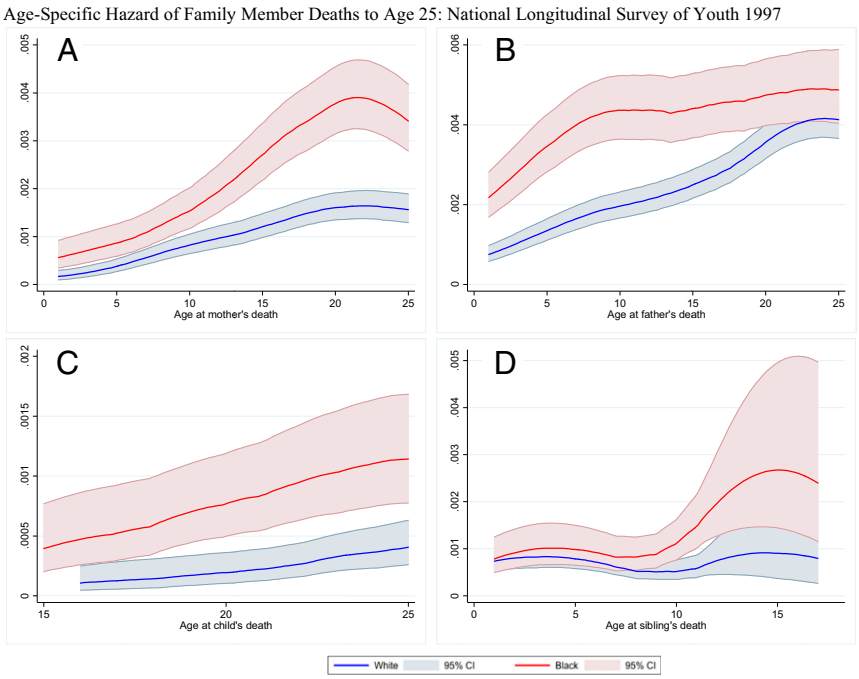

Fig. 3. Age-specific hazard of death exposures for blacks and whites; hazard ratios shown with 95% confidence intervals. (*A*) Maternal death; (*B*) paternal death; (*C*) sibling death; (*D*) child death.

Second, we estimated negative binomial regression models predicting multiple family member death exposures and tested whether blacks were at greater risk for cumulative death exposures—the total number of deaths accumulated up to the respondent's age during the last survey period (Table 2). Count of cumulative death exposures was calculated for all respondents, including those with missing data on one of the specific deaths considered. We also estimated logistic regression models and used those results to illustrate calculated odds of exposure to no family member death or multiple family member deaths for blacks compared with whites in Fig. 2. All negative binomial and logistic regression models control for respondent age at baseline, gender, educational attainment of the respondent's parents (measured in years), binary indicators of whether the respondent resided in the South at baseline, maternal age at respondent's birth, and household size at baseline. Given the multicohort design of the HRS and the older age of the

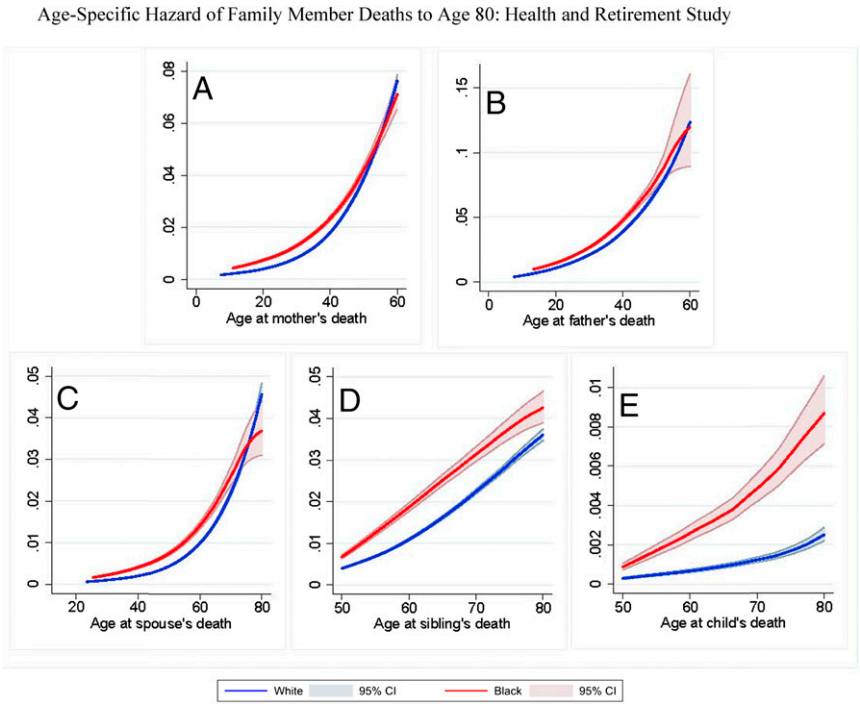

Fig. 4. Age-specific hazard of death exposures for blacks and whites; hazard ratios shown with 95% confidence intervals. (*A*) Maternal death; (*B*) paternal death; (*C*) spousal death; (*D*) sibling death; (*E*) child death.

HRS sample, we also adjust for birth cohort (born before 1924; 1924–1930; 1942–1947, 1948–1953, and 1954–1959), and, given lower life expectancy in the South, we control for whether the respondent was born in the South. More detailed geocode data are not publicly available for the HRS and NLSY-97. Stata's mi suite of commands do not allow the combination of survival analysis and weights; therefore, we use listwise deletion. In total, we deleted 4% of HRS cases and 14% of NLSY-97 cases due to missing data on mortality, and 9% of HRS cases and 4% of NLSY-97 cases due to missing data on controls. As a sensitivity check, however, missingness on control variables was multiply imputed, and results were consistent with those presented.

Third, we evaluated age-specific hazard ratios for black and white exposure to family member death (Figs. 3 and 4) and estimated semiparametric Cox hazard models to predict black–white disparities in each type of death including the control variables described above. The hazard function for individual i at time j is modeled as follows:

$$h(t_{ij}) = h_0(t_j)\exp(Race_i\beta_1 + Z_i'\omega),$$

where $h(t_{ij})$ is the hazard of a given family member's death at the ith individual's age t_j, $h_0(t_j)$ is the baseline hazard function, β_1 is the coefficient for the effect of race (coded 1 for black and 0 for white participants), $\boldsymbol{Z}_i$ are time-invariant control variables, and ω is a vector of parameters. Across datasets, hazards were estimated for all ages at which data were available and sufficient sample size was present.

All analyses apply sampling weights appropriate to each dataset, and regression models also adjust for clustering by household in the NLSY-97 and HRS. Sampling weights were used to adjust for differential probability of selection into the sample and differential nonresponse. With the use of sampling weights, the NLSY-97 and HRS are designed to be nationally representative.

We replicated the HRS and NLSY-97 analyses with two additional datasets: the NLSY-79 and the Add Health; these datasets are described in *Description of Data and Measures*, and replication results are provided in Tables S1–S3 and Figs. S1–S4.

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