The Unequal Distribution of Nuclear Family Deaths by Race and its Effect on Attaining a College Degree

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SHORT ABSTRACT

Young adults of color may be more likely to experience the death of a parent or sibling, since early mortality is more prevalent among certain racial/ethnic groups than whites. However, little research has investigated whether the devastating experience of nuclear family death varies by race, or how this death may affect important social determinants of health. Multiple logistic regression results using the longitudinal NLSY97 data showed that experiencing the death of a parent or sibling during early adulthood (ages 19-22) was significantly and negatively associated with obtaining a Bachelor's degree by ages 29-32 (OR=0.55, 95% CI =0.38, 0.81) compared to those not experiencing a family death. Family death during adolescence (ages 13-18) was not significantly associated with obtaining a Bachelor's degree. Because family deaths during early adulthood are associated with lower educational attainment, an important social determinant of health, this exposure may contribute to subsequent health disparities by race.

EXTENDED ABSTRACT

INTRODUCTION

The death of a parent or sibling early in life is a devastating event that may disrupt healthy development and impact important social determinants of an individual's health. Because early mortality is more prevalent among people of color than white individuals, and because people tend to have family members of the same race, it is possible that young people of color are more likely to experience the death of a close family member. Previous analyses from the National Longitudinal Survey of Youth 1997 (NLSY97) found that black individuals have higher odds of losing any family member by age 30 than white individuals, and three times higher odds of losing two or more family members.[1] However, the frequency of family deaths has not been examined for other racial groups. Moreover, the implications of family deaths as an exposure in adolescence and early adulthood have not been explored. This is an important topic to pursue because if family deaths are unequally distributed by race, and also affect health or social determinants of health, then family deaths have the potential to perpetuate racial/ethnic health disparities.

Experiencing the death of a close family member (e.g., spouse or parent, which we call bereavement here), is associated with an individual's health. Bereaved individuals have an increased short-term risk of mortality, and also an increased risk of younger and more unexpected deaths.[2] Conceivably, bereavement may have wider repercussions, including to impact social determinants of health, thereby eroding health across the long run. For example, although education is an important social determinant of health, particularly because it is established relatively early in life, it is unclear whether or if so, how, bereavement may impact the already apparent educational disparities by race.[3] Moreover, bereavement may contribute to some of the well-established racial/ethnic disparities in chronic health conditions and mortality, particularly if educational attainment plays a role. The increased incidence of family member deaths among young adults of color may impact multiple social determinants of health, including education, and therefore serve as a source of potential disadvantage over the life course. Notably, such a focus on the reverberations of family deaths broadens the focus on racial disparities in life expectancy in the United States to include the impacts of such disparities on surviving children, adults and family.[4]

To illuminate the understudied associations between race/ethnicity, family death, and educational achievement, we leverage intensive longitudinal data from a population-based, nationally representative sample of respondents, begun in adolescence. In this manuscript, we ask these research questions: 1) What is the racial distribution of adolescents and young adults who have experienced a death of a close family member? 2) What are the impacts of losing a

parent or sibling at different ages (e.g., adolescence and young adulthood) on attaining a college degree by age 29-32?

METHODS

DATA

We used 4 waves of longitudinal data over 17 years (1997 to 2013) from the National Longitudinal Survey of Youth 1997 (NLSY97) which includes 8,984 Millennials born between 1980 and 1984 who were 13-17 at baseline in 1997. The participants have been followed every year or every other year with 80% of the sample retained at the most recent wave in 2015. The NLSY97 cohort is made up of two subsamples: an initial cross-sectional sample representative of people in that age group in the United States, and a subsequent oversample of Hispanic and Black participants of the same age, resulting in a total survey sample that was 52% white, 26% Black, and 21% Hispanic.

VARIABLES

Exposure. *Family member death* was measured as death of a parent/step-parent or sibling. Participants were asked three times (2002, 2007 and 2013), "In the last five years, that is since you were [respondent's age 5 years ago] years old, has a close relative of yours died?" If participants said yes, they were asked to categorize each relative as mother or step-mother, father or step-father, brother or sister, spouse or partner, child, or other. They were also asked their age at the time of each death. Participants who did not complete a survey in 2007 were given the opportunity to respond to the question if they completed a survey in 2008 or 2009 and were then asked about relative deaths between the years of 2003 and 2007. These questions were used to classify family member death as a 3-category variable: no death, death occurring during adolescence (13-18 years old), or death occurring during early adulthood (19-22 years old). Participants who had experienced more than one family death were classified as the average age that the death occurred. Deaths of grandparents were excluded because the effects of those types of deaths are likely different given they are more common, less unexpected, and in most cases grandparents are not part of the nuclear family unit. Deaths of spouses and children were excluded because these were very uncommon among respondents aged 22 or less. Deaths of 'other' relatives were excluded because we could not define those relationships well. The question structure does not allow us to separate deaths of step-parents from deaths of parents. In sensitivity analyses, we will investigate alternate ways to categorize participants who experienced multiple family deaths over the study period, and alternate ways of categorizing spouse/child deaths.

Outcome. Educational attainment was captured from NLSY in 2013 when participants were 29-32 years old with a variable indicating the highest degree achieved by the respondent at their most recent interview. From this question, *Bachelor's degree attainment* was coded as a binary variable indicating the respondent received a Bachelor's degree or higher, compared to no Bachelor's degree. We chose this outcome to examine the hypothesis that a family death would have a short-term effect on education during the years someone is typically in college, but not a long-term effect if the death happened before college-age years. We will consider other ways to operationalize education.

Covariates. We included the following baseline variables as covariates, measured prospectively in adolescence: household income quartile, mother's education, father's education, parent self-rated health, participant self-rated health, urban/rural, census region, race/ethnicity, and sex. Race/ethnicity was modeled as one key covariate of interest, defined as White, Black, Hispanic, and other.

ANALYTIC PLAN

To examine aim 1, the racial distribution of adolescents and young adults who have experienced a family death, we estimated weighted univariate and bivariate analyses, then graphed the prevalence of family deaths by both age group and race. To examine aim 2, the impacts of losing a parent or sibling during adolescence or young adulthood on attaining a college degree, we used multiple logistic regression adjusted for covariates. The regression analyses accounted for the survey design and adjusted for race/ethnicity rather than incorporating weights, as recommended by NLSY97.[5] We output odds ratio (OR) point estimates, with 95% confidence intervals, to model the odds of completing a Bachelor's degree (vs. not) by aged 29-32, by levels of our nuclear family death variable: comparing those who experienced a nuclear family death in early adulthood, or in adolescence, to those not experiencing such a death from 13 to 22 years old.

We included all respondents (n=8,984) enrolled in the NLSY97 cohort. Overall, 6.5% were missing on key variables used in the analysis, so we imputed missing data using Stata's ice command[6] (5 imputations). This method uses all available variables to impute missing in all variables. We will also compare the results for models with and without imputed data.

RESULTS

Table 1 presents descriptive statistics for the exposure, outcome, and baseline covariates. Overall, 5.2% of participants had a nuclear family death between the ages of 13 and 22. This varied by race with 4.4% of White respondents, 5% of Hispanics, 8.3% of Blacks, 9.1% of Asians, and 13.8% of American Indians, having experienced a nuclear family death. The proportion of participants who obtained a Bachelor's degree by ages 29-32 was 29.7%. See Table 1 for other demographic descriptives.

<< TABLE 1 >>

Figure 1 presents the bivariate relationship between family death by age groups (adolescence, aged 13-18 versus early adulthood, aged 19-22). Overall, 3% of respondents in early adulthood, and 2.2% of adolescent respondents reported a nuclear family death. With both age groups combined, 5.2% of participants had a family death. This varied by race with 4.4% of white respondents, 5% of Hispanics, 8.3% of Blacks, 9.1% of Asians, and 13.8% of American Indians.

<< FIGURE 1 >>

Results from the adjusted logistic regression model (Figure 2) showed that those who experienced a family death during early adulthood - the typical college years - were 45% less likely to attain a Bachelor's degree by ages 29-32 (OR=0.55, 95% CI =0.38, 0.81) compared to those who had not experienced a family death between ages 13 to 22 years old. Youth who experienced a family death before typical college years were not significantly affected, although the point estimate was in the harmful direction (OR=0.76, 95% CI = 0.52, 1.11).

<< FIGURE 2 >>

DISCUSSION

Young people of color were more likely to experience a family death compared to their white peers. American Indian participants were most likely to have a family member die, with a rate three times as high as white respondents. A family death during the college years was

negatively associated with obtaining a college degree, but a family death before college was not. This suggests that a family death may be disruptive if a student is enrolled, or about to enroll in college. College students are expected to perform consistently at a high level, and it is possible that short-term shocks such as a death in the family would be difficult to recover from. Moreover, college students are out on their own for the first time, away from familiar social support networks, which may make them especially vulnerable to family deaths. Adolescents who experienced a family death did have slightly lower odds of obtaining a college degree than those with no family death; however, this difference was not statistically significant. Perhaps grief is a short-term exposure that adolescents have sufficient time to recover from before starting college, or perhaps they are able to draw on stable social supports from other family members and friends while still living at home.

An unequal racial distribution of the exposure to family deaths, paired with the connection between family deaths and obtaining a college degree helps frame health disparities as a collective issue within racial groups, rather than an issue that affects individuals within those racial groups. This research suggests that a family member's early mortality reverberates through the family and may be one pathway leading to the intergenerational and familial transmission of disparities in important social determinants of health, such as education. The literature focuses on social determinants of health as a cause of health disparities, but as this study demonstrates, it is important to consider how health issues also influence social determinants of health.

Connections like these are important to continue exploring; especially as public health professionals and others are interested in studying more explicitly the ways that racial disparities can be perpetuated and exacerbated by our institutions. Camara Jones, past president of the American Public Health Association, and public health leader in addressing health disparities, called on public health scientists to examine "structures, policies, practices, and norms to identify the mechanisms of institutionalized racism."[7] Although structural discrimination is becoming more recognized in the public health field as a cause of health inequities, the public health literature does not reflect that, and a review of the public health literature in the U.S. from 2002-2015 found only 25 articles in high-impact journals that contained 'institutionalized racism' in their titles or abstracts.[8] Acknowledging that certain hardships are concentrated among disadvantaged groups can help us focus on solutions as we strive for health equity.

It is also important to consider from a policy perspective how one might address the vulnerability of early adults to disruptions to their college education resulting from family crises. One potential pathway for intervention is at the college level. University systems can be difficult to navigate, more so when dealing with personal crises. It is important to scrutinize and be curious about whether these systems were designed by, and designed for, groups of people who experience fewer disruptive life events. Are there assumptions, solidified into policies, that students will have the resources to recover financially, socially, and emotionally from unexpected bumps in the road?

Strengths and Limitations.

As with any observational analysis, our conclusions could be biased by unmeasured confounding. We mitigated this risk somewhat by controlling for comprehensive measures of child socioeconomic status and child health at baseline, during adolescence. The operationalization of the exposure also has some limitations. First, it precludes estimation of nuclear family deaths that may happen earlier in life, before age 13. It is conceivable that deaths occurring earlier in childhood may affect later educational attainment, for example through family economic stability. Although we are unable to model this here, our results suggest that family deaths have a more immediate impact on educational disruptions. Our exposure also

only includes parents, step-parents, and siblings in nuclear family deaths. Although we cannot separate parents from step-parents, we will explore other ways to operationalize spouse, child, and grandparent deaths in future sensitivity analyses.

This study also has many strengths. It utilizes a population-based, nationally representative prospective cohort study from adolescence through adulthood: the NLSY97. Therefore, we have prospective measures of nuclear death and educational attainment. The educational history is especially rich in NLSY, as are the baseline measures of confounding. The NLSY conducted oversamples of Black and Hispanic children, which allows for more precise estimation of these subgroups that are at a particular health disadvantage. We conducted multiple imputation, which is appropriate for maintaining the whole sample, for population-based inference. Substantively, little prior literature has probed this hypothesis of how nuclear family deaths reverberate through a social network to affect, and potentially disrupt, social determinants of health among young adults, such as educational attainment. It will be important to probe these relationships further, to understand how to mitigate such risks.

REFERENCES

1. Umberson D, Olson JS, Crosnoe R, Liu H, Pudrovska T and Donnelly R. Death of family members as an overlooked source of racial disadvantage in the United States. *Proceedings of the National Academy of Sciences*. 2017;114:915-920.
2. Stroebe M, Schut H and Stroebe W. Health outcomes of bereavement. *The Lancet*. 2007;370:1960-1973.
3. U.S. Department of Education NCfES, Integrated Postsecondary Education Data System (IPEDS),. Spring 2002 through Spring 2013 and Winter 2013-14 through Winter 2016-17, Graduation Rates. 2017.
4. Umberson D. Black Deaths Matter: Race, Relationship Loss, and Effects on Survivors. *Journal of health and social behavior*. 2017;58:405-420.
5. National Longitudinal Survey of Youth. National Longitudinal Survey of Youth 97 (NLSY97). 2017.
6. Royston P and White IR. Multiple imputation by chained equations (MICE): implementation in Stata. *J Stat Softw*. 2011;45:1-20.
7. Jones CP. Confronting institutionalized racism. *Phylon (1960-)*. 2002:7-22.
8. Hardeman RR, Murphy KA, Karbeah JM and Kozhimannil KB. Naming Institutionalized Racism in the Public Health Literature: A Systematic Literature Review. *Public Health Reports*. 2018;133:240-249.

Table 1

Table 1 Sample Descriptives, National Longitudinal Survey of Youth 1997 (N=8984)

	Percent
Sibling or parent death at age 22 or younger	
1)No sibling or parent death when 22 or younger	89.3
2)Age 13-18	2.2
3)Age 19-22	3.0
missing	5.5
Respondent has Bachelor's degree or higher in 2013	
No Bachelor's Degree	69.3
Bachelor's Degree	29.7
missing	0.9
Respondent self-rated health	
1)Excellent, Very Good or Good	95.6
2)Fair or Poor	4.4
missing	0.1
Race/Ethnicity	
1)Non-Hispanic white	66.6
2)Hispanic	12.9
3)Non-Hispanic Other	5.1
4)Non-Hispanic Black	15.4
Sex	
Male	51.3
Female	48.7
Urban/Rural	
Rural	26.3
Urban	69.2
missing	4.5
Census Region	
Northeast	18.5
North Central	26.3
South	34.2
West	21.0
Father's education	
1)Did not complete 12th grade	15.7
2)Completed 12th grade	31.2
3)Completed 2nd year college	16.1
4)Completed 4th year college or more	20.1
missing	16.9
Mother's education	
1)Did not complete 12th grade	17.0

2)Completed 12th grade	34.3
3)Completed 2nd year college	23.0
4)Completed 4th year college or more	18.7
missing	6.9
Parent income	
1)Quartile 1	17.5
2)Quartile 2	22.1
3)Quartile 3	25.6
4)Quartile 4	28.6
missing	6.2
Parent self-rated health	
1)Excellent, Very Good or Good	78.1
2)Fair or Poor	10.9
Missing	11.0

Survey weighted means of original data before imputations

Figure 1: Percent of respondents who experienced a sibling or parent death, by age and race/ethnicity

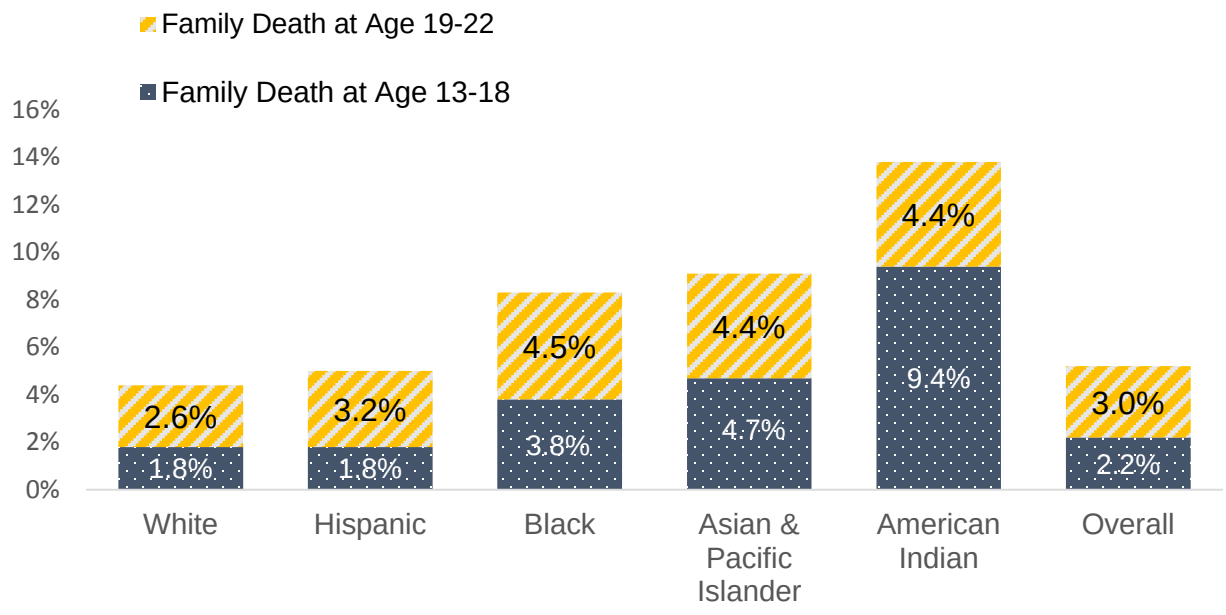

Figure 2: Odds of attaining a Bachelor's degree (and 95% CI) by ages 29-32, compared to those who did not experience a sibling or parent death