

# COVID-19 Death Exposure among Adults in the United States

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## Abstract

As of May 17, 2022, more than a million deaths due to COVID-19 have been recorded in the US. For each COVID-19 death, there are an estimated nine bereaved family members and an unknown number of bereaved friends. This study aimed to assess the correlates of self-reported COVID-19 death exposure (i.e., loss of a close friend or family member) among US adults using online survey data ( $n = 1,869$ ) collected between September 17, 2021 and October 3, 2021. One in four US adults in this national sample reported the loss of a close friend or family member due to COVID-19. The odds of losing a close friend or family member due to COVID-19 death were greater for those age 60 or older, all minoritized racial/ethnic groups except for Asian American respondents, married/coupled respondents, those who had foregone care due to cost in the past year, and those who reported a COVID-19 infection.

## Keywords

COVID-19, death exposure, bereavement, health disparities

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## Introduction

As of May 17, 2022, more than a million deaths due to COVID-19 have been recorded in the United States (US) (Donovan, 2022). For each COVID-19 death, there are an estimated nine bereaved family members (Verdery et al., 2020) and an unknown number of bereaved friends. The concept of “linked lives” argues lives—and deaths—are interdependent and embedded in social networks (Elder, 1998; Patterson et al., 2020). This insight is critical to understanding how death exposure impacts the bereaved. Social relationships are important sources of social, emotional, and instrumental support (House et al., 1988; Umberson, 2017; Umberson & Karas Montez, 2010). For these reasons, the loss of close relationships is a major risk factor for health, and disparate loss is a mechanism for maintaining or widening health disparities (House et al., 1988; Jones-Eversley & Rice, 2020; Thoits, 1995; Umberson, 2017; Umberson & Karas Montez, 2010).

Bereaved individuals are those suffering the death of a loved one, such as a family member or close friend. Loss of a close social tie can influence health through a variety of biopsychosocial pathways (Umberson, 2017). Death of a loved one is considered a “turning point” which elicits emotional and psychological distress (Stroebe & Stroebe, 1987; Umberson, 2017). The stress process model posits stressful life events, such as the loss of a close friend or family member, as influencing health over time (Turner, 2010; Turner et al., 1995). The emotional reaction to bereavement is known as grief and can encompass a diverse range of psychological and physical reactions (Stroebe et al., 2007; Stroebe & Stroebe, 1987). Prolonged grief disorder (PGD), also referred to as complicated grief, is estimated to impact 10% of bereaved adults (Lundorff et al., 2017; Shear, 2015), but the prevalence is expected to be much higher among those who have lost someone due to COVID-19 (Simon et al., 2020; Tang & Xiang, 2021).

The higher prevalence of PGD among COVID-19 bereaved may be due to difficulties coping with death during the COVID-19 pandemic, and a small but growing body of research has begun to recognize the impact of COVID-19 deaths on the bereaved. A study of recently bereaved adults during the pandemic found they experienced more severe grief than those who were bereaved before the pandemic (Eisma & Tamminga, 2020). Evidence from over 10 Latin American countries suggests symptoms of dysfunctional grief—measured by the Pandemic Grief Scale—were associated with a twofold increase in odds of suicidal ideation (Caycho-Rodríguez et al., 2021). A review of qualitative studies of bereaved families who lost a loved one due to COVID-19 suggests the events leading up to and after the death made this experience more difficult than it might have been before the pandemic (Firouzkouhi et al., 2021). For example, many studies noted participants were unable to be with their loved ones before death or reported fears of being infected with or dying from COVID-19 themselves, death anxiety, and inability to perform religious rites during the time of death (Firouzkouhi et al., 2021). Emphasizing the ongoing social and emotional experiences of COVID-19 bereavement, post-mortem issues included inability to hold a funeral, no permission to visit the dead before a funeral, inability to perform religious

services, restrictions on mourning ceremonies, prolonged grieving, and loneliness (Firouzkouhi et al., 2021).

Bereavement, especially in the case of PGD or complicated grief (Shear, 2015), is associated with physical health problems, higher rates of disability, medication use, hospitalization, depressive symptoms, and increased risk of mortality—including suicide (Stroebe et al., 2007). Additional consequences of death exposure for health and well-being can range from educational outcomes (Patterson et al., 2020), increased psychological distress and anxiety (Stroebe et al., 2007), increased sense of collective threat to the safety of one's self and loved ones (Ross, 2011; Umberson, 2017), and lower antibody responses to influenza vaccination among elderly individuals (Phillips et al., 2006).

Although disparities in COVID-19 mortality have been well-documented (Alcendor, 2020; Feldman & Bassett, 2021), much less is known about the disparities in exposure to the uniquely harmful stressor of losing a close friend or family member due to COVID-19. A scoping review found no studies focused on outcomes or support for bereaved people during past pandemics, despite evidence pandemics cause multiple losses directly through death itself and indirectly through disruption of the norms and rituals of death (Mayland et al., 2020). Another review found no studies empirically linking COVID-19 bereavement to health outcomes (Stroebe & Schut, 2021). Evidence from the United Kingdom and Ireland has documented important changes in the support of bereaved people since the pandemic, including increased need for bereavement care, transition to remote support, and stress among practitioners (Pearce et al., 2021).

Fates are linked, but they are not equal. Both the stress process model and life course theory emphasize exposure to stressors, like the loss of a close friend or family member, is shaped by position within social structures. This differential exposure to stressors is posited as one mechanism through which health disparities are produced and reproduced over time (Pearlin, 1989; Pearlin et al., 1997; 2005; Pearlin & Schooler, 1978; Umberson, 2017). The loss of life during the pandemic has been disproportionately experienced by people of color and Black individuals in particular (Feldman & Bassett, 2021; McLaren, 2020). The COVID-19 pandemic is expected to reduce life expectancy by more than 2 years for Black individuals in the US, eliminating over a decade of progress in narrowing the Black-White gap in life expectancy (Andrasfay & Goldman, 2021). Given the many negative consequences associated with bereavement, the widening racial differences in life expectancy are concerning for many reasons, including the long-term health consequences among the bereaved. Even before the pandemic, racial disparities in life expectancy were argued to “constitute a unique stressor among survivors that may launch a lifelong cascade of adversity that further depletes resources and increases stress” (Umberson, 2017, p. 7). Disproportionate death across social groups results in disproportionate exposure to the stressor of death, which in turn may widen racial disparities in health even further (Cooper & Williams, 2020).

Exposure to the stress of losing a close friend or family member due to COVID-19 is expected to present a significant public health concern for years to come. Although

there have been estimates of select kinship loss (Kidman et al., 2021; Verdery et al., 2020), to date, no known studies have examined correlates of self-reported death of both family and close friends due to COVID-19 among US adults. Our study fills this gap in the literature by examining the odds of experiencing the loss of a family member or close friend due to COVID-19 across sociodemographic groups of US adults, as well as for those who reported they had foregone care in the past year or experienced a COVID-19 infection. We ask the following question: What was the relationship between COVID-19 death exposure and age, gender, race/ethnicity, education, relationship status, parenthood, foregone care, and COVID-19 infection among US adults during the pandemic? We discuss the implications of our findings using insights from the stress process model and life course theory and their relevance for understanding the long-term impacts of COVID-19 on population health and health disparities.

## Methods

### *Procedures*

Online survey data of US adults ( $N = 2,022$ ) were collected between September 17, 2021 and October 3, 2021. Respondents were recruited via email through an online registry of individuals who had volunteered to participate in research. The survey was provided in both English and Spanish. Respondents had to be age 18 or older and living in the US. Invitation to participate included information regarding the estimated study duration (10 min), potential risks and benefits, voluntary nature of participation, and confidentiality of responses. Participants indicated consent by agreeing to participate in the survey. Study procedures were approved by a review board for the protection of human subjects at the University of Arkansas for Medical Sciences.

Asian American, Black/African American, Hispanic/Latino, American Indian or Alaska Native, and Native Hawaiian or Pacific Islander individuals were oversampled to avoid aggregation of racial and ethnic groups. Aggregating these groups often obscures diverse histories, experiences, and attitudes (Chang et al., 2020). The data were weighted using the random iterative method to be more closely representative of the US population across key demographic variables including gender (men, women, non-binary), race/ethnicity (Asian American, Black/African American, Hispanic/Latino, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, and White), and age (18–24, 25–34, 35–44, 45–54, 55–64, 65+).

### *Measures*

*COVID-19 death exposure.* The dependent variable was COVID-19 death exposure. To measure COVID-19 death exposure, we asked, “Has a close friend or relative died of COVID-19?” Response options were “yes” and “no.”

*Sociodemographic characteristics.* We collected sociodemographic information including age, gender, race/ethnicity, education, marital/relationship status, and parent status. Respondents reported their age in years, and we categorized them into four groups (18–29, 30–44, 45–59, and 60 or older). Respondents identified their gender as man, woman, non-binary, or self-described. Eight respondents selected a non-binary gender or self-described. Race and ethnicity were measured using a standard two-item question from the Behavioral Risk Factor Surveillance System (CDC, 2020). Responses from the two items were used to categorize individuals into the following mutually exclusive groups: Asian American, Black/African American, Hispanic/Latino, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, and White. The Hispanic/Latino group includes persons of all races who listed their ethnicity as Hispanic, including individuals who selected multiple races; all other groups are non-Hispanic. No multiracial category is included in our analysis because all 27 individuals who selected multiple racial identities were Hispanic/Latino. We asked respondents their highest degree or level of school completed to measure education level. Those with less than a high school degree were combined with high school graduates due to low frequency of responses at the lowest levels of education. Those with a 4-year degree or higher were also combined due to low frequency of responses at the highest level of education.

*Foregone care.* We measured foregone care by asking, “Was there a time in the past 12 months when you needed a doctor but could not see one because of the cost?” Respondents could answer “yes” or “no.” Affirmative responses were coded as 1 to indicate foregone care, and negative responses were coded as 0.

*COVID-19 infection.* We measured COVID-19 infection by asking, “Have you tested positive for, or suspect that you have had, COVID-19?” Respondents could answer “yes-I tested positive for COVID-19,” “yes-I suspect that I had COVID-19,” or “no-I do not believe I had COVID-19.” Both affirmative responses were coded as 1 to indicate COVID-19 infection, and negative responses were coded as 0.

### *Statistical Analyses*

We analyzed the data using STATA 15.1 SE. Statistical analyses include weighted and unweighted descriptive statistics for the sample and a weighted logistic regression. A total of 2022 participants—25.10% of the 8,067 who entered the online survey—were eligible and completed the survey. All except three variables in our analyses had no missing data. Missing data was minimal ( $n = 153$ ; 7.57%), but we note incomplete data for COVID-19 infection ( $n = 69$ ; 3.41%) and COVID-19 death exposure ( $n = 89$ ; 4.40%). Eight individuals who self-described or chose a non-binary gender were excluded from the final analytical sample due to their low frequency. We present all available data in the descriptive analysis. Given the small percentage of missing values, we present results from analyses of complete cases. This resulted in a final analytical sample of 1,896 cases for descriptive and regression analysis. Variance inflation factors

(VIFs) were assessed to examine multicollinearity. The mean VIF for our regression model was 1.10, and they ranged from 1.01 to 1.22—all well-within the acceptable range.

## Results

We present the unweighted and weighted descriptive statistics (frequencies and percentages) in [Table 1](#). Approximately one in four respondents reported having lost a close friend or family member due to COVID-19. Each age group is well-represented in our sample. The sample is split almost evenly between men and women. Over 200 responses were collected from each racial/ethnic group due to the oversampling, allowing us to avoid aggregating diverse groups. The most prevalent education level was a 4-year or graduate degree before and after weighting. A slight majority of the sample were not married/coupled. A third of the sample were parents of at least one child under age 18. More than four out of five respondents had not foregone care due to cost in the past year. More than four out of five respondents reported not having a COVID-19 infection.

We present results from a weighted logistic regression of COVID-19 death exposure in [Table 2](#). Odds of COVID-19 death exposure were significantly and positively associated with age, race/ethnicity, marital/relationship status, foregone care, and COVID-19 infection. Odds of COVID-19 death exposure were 1.76 greater for those age 60 or older (95% CI: [1.17, 2.66]) compared to those age 18–29. Compared to White respondents, odds of COVID-19 death exposure were 2.45 greater for Black/African American respondents (95% CI: [1.70, 3.54]), 2.41 greater for Hispanic/Latino respondents (95% CI: [1.67, 3.47]), 2.22 greater for American Indian or Alaska Native respondents (95% CI: [1.41, 3.49]), and 3.19 greater for Native Hawaiian or Pacific Islander respondents (95% CI: [2.05, 4.98]). Married/coupled respondents had 1.37 greater odds of COVID-19 death exposure compared to those who were not married/coupled (95% CI: [1.04, 1.80]). Respondents who had foregone care due to cost in the past year had 1.70 greater odds of COVID-19 death exposure compared to those who had not foregone care (95% CI: [1.25, 2.30]). Respondents who reported a COVID-19 infection had 1.76 greater odds of COVID-19 death exposure compared to those who did not experience COVID-19 infection (95% CI: [1.30, 2.36]).

## Discussion

One in four US adults in this national sample reported the loss of a close friend or family member due to COVID-19. The exposure to deaths due to COVID-19, however, was not equally distributed across sociodemographic groups. We find the odds of losing a close friend or family member due to COVID-19 death were higher for those age 60 or older, all minoritized racial/ethnic groups except for Asian American respondents, married/coupled respondents, those who had foregone care due to cost in the past year, and those who reported experiencing a COVID-19 infection. Bereavement multipliers

**Table 1.** Descriptive Statistics for Sample of US Adults ( $n = 1,869$ ).

	Unweighted % (Freq)	Weighted %
COVID-19 death exposure		
Exposed	27.34 (511)	24.91
Not exposed	72.66 (1358)	75.09
Age		
18–29	17.28 (323)	18.20
30–44	35.47 (663)	27.34
45–59	24.45 (457)	23.72
60+	22.79 (426)	30.73
Gender		
Women	53.02 (991)	49.58
Men	46.98 (878)	50.42
Race/ethnicity		
Asian American	15.30 (286)	10.20
Black/African American	20.06 (375)	19.88
Hispanic/Latino	19.58 (366)	19.34
American Indian or Alaska Native	12.57 (235)	4.85
Native Hawaiian or Pacific Islander	11.88 (222)	4.71
White	20.60 (385)	41.01
Education		
High school or less	28.20 (527)	27.72
Some college, no degree	21.62 (404)	20.81
Associate degree	12.36 (231)	12.93
Four-year or graduate degree	37.83 (707)	38.54
Married/coupled		
Yes	48.53 (907)	47.93
No	51.47 (962)	52.07
Parent		
Yes	33.44 (625)	26.40
No	66.56 (1244)	73.60
Foregone care		
Yes	18.62 (348)	16.13
No	81.38 (1521)	83.87
COVID-19 infection		
Yes	18.46 (345)	17.96
No	81.54 (1524)	82.04

have been utilized to estimate the number of bereaved kin during the pandemic (Verdery et al., 2020); however, the authors are unaware of any other studies among US adults examining the correlates of death of either a family member or close friend due to COVID-19.

**Table 2.** Weighted Logistic Regression of COVID-19 Death Exposure among US Adults.

	OR	SE	p	[95% CI]	Sig.
Age					
18–29	—	—	—	—	—
30–44	1.32	.234	.118	.932	1.87
45–59	.970	.189	.876	.662	1.42
60+	1.76	.370	.007	1.17	2.66 **
Gender					
Women	1.09	.140	.514	.845	1.40
Men	—	—	—	—	—
Race/ethnicity					
Asian American	.990	.222	.963	.638	1.54
Black/African American	2.45	.458	<.001	1.70	3.54 ***
Hispanic/Latino	2.41	.450	<.001	1.67	3.47 ***
American Indian or Alaska Native	2.22	.512	.001	1.41	3.49 **
Native Hawaiian or Pacific Islander	3.19	.724	<.001	2.05	4.98 ***
White	—	—	—	—	—
Education					
High school or less	1.35	.222	.066	.981	1.87
Some college, no degree	1.13	.194	.467	.810	1.58
Associate degree	1.47	.302	.060	.984	2.20
Four-year or graduate degree	—	—	—	—	—
Married/coupled					
Yes	1.37	.190	.023	1.04	1.80 *
No	—	—	—	—	—
Parent					
Yes	1.09	.165	.589	.805	1.46
No	—	—	—	—	—
Foregone care					
Yes	1.70	.264	.001	1.25	2.30 **
No	—	—	—	—	—
COVID-19 infection					
Yes	1.76	.267	<.001	1.30	2.36 ***
No	—	—	—	—	—
Constant	.087	.021	<.001	.054	.139 ***

\*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ ;  $n = 1,869$ .

The differential exposure to COVID-19 death documented in this study reflects many of the unequal social patterns of COVID-19 mortality in the US population (Alcendor, 2020; Feldman & Bassett, 2021). Previous estimates of bereavement in the US found only slight differences across race, estimating 8.86 bereaved family members for each White person's death due to COVID-19 and 9.18 bereaved family members for each Black person's death due to COVID-19 (Verdery et al., 2020). In our analysis, the



differences in bereavement across race/ethnicity appear to be much starker, ranging from double to triple the odds of death exposure among Black, Hispanic/Latino, American Indian or Alaska Native, and Native Hawaiian or Pacific Islander respondents compared to White respondents; however, our results are not directly comparable to studies using kinship bereavement multipliers. [Verdery et al. \(2020\)](#) were assessing loss only among select kin, while we leave the definition of family member up to respondents and include close friends as well.

In addition to examining sociodemographic correlates of COVID-19 death exposure, we also assessed relationships with foregone care due to cost and COVID-19 infection. Our findings suggest those who had to forego care due to cost and those who had experienced a COVID-19 infection had increased odds of losing a close friend or family member due to COVID-19. These findings have implications for the care and support the bereaved may need during a pandemic. For example, individuals who had to forego care due to cost may be unable to pay for services related to their experience of bereavement. Moreover, individuals who experienced a COVID-19 infection may be dealing with complex feelings if they believe themselves to be the person who exposed their loved one to the virus. Those experiences may require unique forms of bereavement care and support distinct from other types of experiences with death exposure.

As scholars continue to understand the full impact of losing a loved one due to COVID-19, many insights from the stress process model and life course theory should be kept in mind. The differential exposure to death we document—as the stress process model would suggest—represents an unequal stressor which may exacerbate health disparities over time ([Jones-Eversley & Rice, 2020](#); [Umberson, 2017](#)). Although death has long been noted as a uniquely stressful life event, we are only beginning to learn about all the ways COVID-19 deaths may be distinctive in their impact on the bereaved, including potentially more severe and prolonged grief ([Eisma & Tamminga, 2020](#); [Mayland et al., 2020](#); [Pearce et al., 2021](#); [Stroebe & Schut, 2021](#); [Tang & Xiang, 2021](#)). Additionally, not all groups may be experiencing COVID-19 deaths in the same way. For example, not only were Black individuals more likely to die from COVID-19, they were also dying at younger ages. In the summer of 2020, death rates among Black people age 55–64 were higher than those among White people age 65–74 ([Ford et al., 2020](#)). Timing of life course events matters ([Elder, 1994, 1998](#)). Differences in the timing of death for those who died of COVID-19, as well as differences in the timing of death exposure for the bereaved, has implications for how this exposure influences health over time ([Umberson, 2017](#)). This is an area future researchers should explore further. The extensive literature on bereavement makes it clear death is not the great equalizer. Inequality shapes how people experience death whether they be the individual dying or the bereaved ([Carr, 2016](#); [Stroebe et al., 2007](#); [Stroebe & Stroebe, 1987](#); [Umberson, 2017](#)).

### **Limitations**

There are several limitations to be considered when interpreting these results. We analyzed cross-sectional data and, therefore, cannot establish causal relationships. Our sampling methods were not random, which limits the generalizability of this study. Despite their many advantages, online surveys often suffer from low participation among minoritized racial and ethnic groups, as well as those with less education. We anticipated this limitation, to a degree, and corrected by oversampling minoritized racial and ethnic groups in large numbers to ensure their representation in the study and allow us to disaggregate rather than combine diverse groups of people. We rely on self-reports of losing a close friend or family member due to COVID-19 which may be subject to error in terms of cause of death; however, if our interest is in the experiences and impact of death on the bereaved, it may be their subjective self-reports which matter most. Further, our measure of death exposure is more expansive than some others, including both family and close friends and not limiting family by any selected types of kinship. Given the diversity of family formations and structures across groups, this less precise measure may also be a strength in terms of capturing exposure to COVID-19 death among family based on respondent's own definitions of kinship. Finally, our study does not document the potential for multiple losses due to COVID-19, the accumulation of loss due to COVID-19 over time, or the various characteristics unique to losing someone due to COVID-19 that may impact the health of the bereaved differently. We also have not yet examined the relationship between COVID-19 death exposure and mental or physical health outcomes among the bereaved, which may already be evident or may play out over a longer period of time. These are areas future research must consider moving forward.

### **Conclusions**

The impact of COVID-19 on health does not end with death. Death ripples out through the social networks in which individuals are embedded. Our study finds a quarter of US adults have lost a close friend or family member due to COVID-19. Individual experiences of COVID-19 and its associated stressors (e.g., death of a loved one) are connected through our linked fates (e.g., our friendship and kinship ties), but these linked fates are not equal across sociodemographic groups. The odds of exposure to loss of a loved one due to COVID-19 is unequal across age, race/ethnicity, marital/relationship status, foregone care, and COVID-19 infection. Future research should continue to document the prevalence and differential exposure to COVID-19 death, as well as its impact on health over time.

Scholars have documented the massive scale of death brought on by the pandemic, its widely unequal impact, and the uniquely stressful experience of losing a loved one due to COVID-19. Given this growing body of research, including the findings from our own study, death exposure during the pandemic represents a serious public health

concern likely to impact population health and health disparities even after cases and deaths from COVID-19 are substantially reduced.

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### References

- Alcendor, D. J. (2020). Racial disparities-associated COVID-19 mortality among minority populations in the US. *Journal of Clinical Medicine*, 9(8), Article 2442. <https://doi.org/10.3390/jcm9082442>
- Andrasfay, T., & Goldman, N. (2021). Reductions in 2020 US life expectancy due to COVID-19 and the disproportionate impact on the Black and Latino populations. *Proceedings of the National Academy of Sciences of the United States of America*, 118(5), Article e2014746118. <https://doi.org/10.1073/pnas.2014746118>
- Carr, D. (2016). Is death “the great equalizer”? The social stratification of death quality in the United States. *The ANNALS of the American Academy of Political and Social Science*, 663(1), 331–354. <https://doi.org/10.1177/0002716215596982>
- Caycho-Rodríguez, T., Valencia, P. D., Vilca, L. W., Lee, S. A., Carbajal-León, C., Vivanco-Vidal, A., Saroli-Aranibar, D., Reyes-Bossio, M., White, M., Rojas-Jara, C., Polanco-Carrasco, R., Gallegos, M., Cervigni, M., Martino, P., Palacios, D. A., Moreta-Herrera, R., Samaniego-Pinho, A., Rivera, M. E. L., Figares, A. B., & Gallegos, W. L. A. (2021). COVID-19 bereavement in ten Latin American countries: Measurement invariance of the pandemic grief scale and its relation to suicidal ideation. *OMEGA - Journal of Death and Dying*, 2021, Article 00302228211048566. <https://doi.org/10.1177/00302228211048566>

- CDC. (2020). *BRFSS prevalence & trends data: Explore by location*. <https://nccd.cdc.gov/BRFSSPrevalence/rdPage.aspx>
- Chang, C. R., Penaia, C., & Thomas, K. (2020). *Count native Hawaiian and pacific islanders in COVID-19 data—it's an OMB mandate*. Health Affairs Blog. <https://www.healthaffairs.org/doi/10.1377/hblog20200825.671245/full/>
- Cooper, L. A., & Williams, D. R. (2020). Excess deaths from COVID-19, community bereavement, and restorative justice for communities of color. *JAMA*, 324(15), 1491–1492. <https://doi.org/10.1001/jama.2020.19567>
- Donovan, D. (2022). *U.S. Officially surpasses 1 million COVID-19 deaths*. Johns Hopkins Coronavirus Resource Center. <https://coronavirus.jhu.edu/from-our-experts/u-s-officially-surpasses-1-million-covid-19-deaths>
- Eisma, M. C., & Tamminga, A. (2020). Grief before and during the COVID-19 pandemic: Multiple group comparisons. *Journal of Pain and Symptom Management*, 60(6), e1–e4. <https://doi.org/10.1016/j.jpainsymman.2020.10.004>
- Elder, G. H. (1994). Time, human agency, and social change: Perspectives on the life course. *Social Psychology Quarterly*, 57(1), 4–15. <https://doi.org/10.2307/2786971>
- Elder, G. H. (1998). The life course as developmental theory. *Child Development*, 69(1), 1–12. <https://doi.org/10.1111/j.1467-8624.1998.tb06128.x>
- Feldman, J. M., & Bassett, M. T. (2021). Variation in COVID-19 mortality in the US by race and ethnicity and educational attainment. *JAMA Network Open*, 4(11), Article e2135967. <https://doi.org/10.1001/jamanetworkopen.2021.35967>
- Firouzkouhi, M., Alimohammadi, N., Abdollahimohammad, A., Bagheri, G., & Farzi, J. (2021). Bereaved families views on the death of loved ones due to COVID 19: An integrative review. *OMEGA - Journal of Death and Dying*, 2021, Article 00302228211038206. <https://doi.org/10.1177/00302228211038206>
- Ford, T. N., Reber, S., & Reeves, R. (2020). *Race gaps in COVID-19 deaths are even bigger than they appear*. Brookings. <https://www.brookings.edu/blog/up-front/2020/06/16/race-gaps-in-covid-19-deaths-are-even-bigger-than-they-appear/>
- House, J. S., Umberson, D., & Landis, K. R. (1988). Structures and processes of social support. *Annual Review of Sociology*, 14(1), 293–318. <https://doi.org/10.1146/annurev.so.14.080188.001453>
- Jones-Eversley, S. D., & Rice, J. (2020). A call for epidemiology and thanatology to address the dying, death, and grief pipeline among Blacks in the United States. *Death Studies*, 46(1), 140–147. <https://doi.org/10.1080/07481187.2020.1721618>
- Kidman, R., Margolis, R., Smith-Greenaway, E., & Verdery, A. M. (2021). Estimates and projections of COVID-19 and parental death in the US. *JAMA Pediatrics*, 175(7), 745–746. <https://doi.org/10.1001/jamapediatrics.2021.0161>
- Lundorff, M., Holmgren, H., Zachariae, R., Farver-Vestergaard, I., & O'Connor, M. (2017). Prevalence of prolonged grief disorder in adult bereavement: A systematic review and meta-analysis. *Journal of Affective Disorders*, 212(1), 138–149. <https://doi.org/10.1016/j.jad.2017.01.030>
- Mayland, C. R., Harding, A. J. E., Preston, N., & Payne, S. (2020). Supporting adults bereaved through COVID-19: A rapid review of the impact of previous pandemics on grief and

- bereavement. *Journal of Pain and Symptom Management*, 60(2), e33–e39. <https://doi.org/10.1016/j.jpainsymman.2020.05.012>
- McLaren, J. (2020). *Racial disparity in COVID-19 deaths: Seeking economic roots with census data*. National Bureau of Economic Research. <https://doi.org/10.3386/w27407>
- Patterson, S. E., Verdery, A. M., & Daw, J. (2020). Linked lives and childhood experience of family death on educational attainment. *Socius*, 6, Article 2378023120975594. <https://doi.org/10.1177/2378023120975594>
- Pearce, C., Honey, J. R., Lovick, R., Creamer, N. Z., Henry, C., Langford, A., Stobert, M., & Barclay, S. (2021). ‘A silent epidemic of grief’: A survey of bereavement care provision in the UK and Ireland during the COVID-19 pandemic. *BMJ Open*, 11(3), Article e046872. <https://doi.org/10.1136/bmjopen-2020-046872>
- Pearlin, L. I. (1989). The sociological study of stress. *Journal of Health and Social Behavior*, 30(3), 241–256. <https://doi.org/10.2307/2136956>
- Pearlin, L. I., Aneshensel, C. S., & LeBlanc, A. J. (1997). The forms and mechanisms of stress proliferation: The case of AIDS caregivers. *Journal of Health and Social Behavior*, 38(3), 223–236. <https://doi.org/10.2307/2955368>
- Pearlin, L. I., Schieman, S., Fazio, E. M., & Meersman, S. C. (2005). Stress, health, and the life course: Some conceptual perspectives. *Journal of Health and Social Behavior*, 46(2), 205–219. <https://doi.org/10.1177/002214650504600206>
- Pearlin, L. I., & Schooler, C. (1978). The structure of coping. *Journal of Health and Social Behavior*, 19(1), 2–21. <https://doi.org/10.2307/2136319>
- Phillips, A. C., Carroll, D., Burns, V. E., Ring, C., Macleod, J., & Drayson, M. (2006). Bereavement and marriage are associated with antibody response to influenza vaccination in the elderly. *Brain, Behavior, and Immunity*, 20(3), 279–289. <https://doi.org/10.1016/j.bbi.2005.08.003>
- Ross, C. E. (2011). Collective threat, trust, and the sense of personal control. *Journal of Health and Social Behavior*, 52(3), 287–296. <https://doi.org/10.1177/00221465111404558>
- Shear, M. K. (2015). Complicated grief. *New England Journal of Medicine*, 372(2), 153–160. <https://doi.org/10.1056/NEJMc1315618>
- Simon, N. M., Saxe, G. N., & Marmar, C. R. (2020). Mental health disorders related to COVID-19–related deaths. *JAMA*, 324(15), 1493–1494. <https://doi.org/10.1001/jama.2020.19632>
- Stroebe, M., & Schut, H. (2021). Bereavement in times of COVID-19: A review and theoretical framework. *OMEGA - Journal of Death and Dying*, 82(3), 500–522. <https://doi.org/10.1177/0030222820966928>
- Stroebe, M., Schut, H., & Stroebe, W. (2007). Health outcomes of bereavement. *Lancet*, 370(9603), 1960–1973. [https://doi.org/10.1016/S0140-6736\(07\)61816-9](https://doi.org/10.1016/S0140-6736(07)61816-9)
- Stroebe, W., & Stroebe, M. S. (1987). *Bereavement and health: The psychological and physical consequences of partner loss*. Cambridge University Press.
- Tang, S., & Xiang, Z. (2021). Who suffered most after deaths due to COVID-19? Prevalence and correlates of prolonged grief disorder in COVID-19 related bereaved adults. *Globalization and Health*, 17(1), Article 19. <https://doi.org/10.1186/s12992-021-00669-5>
- Thoits, P. A. (1995). Stress, coping, and social support processes: Where are we? What next? *Journal of Health and Social Behavior*, 35, 53–79. <https://doi.org/10.2307/2626957>

- Turner, R. J. (2010). Understanding health disparities: The promise of the stress process model. In W. R. Avison, C. S. Aneshensel, S. Schieman, & B. Wheaton (Eds.), *Advances in the conceptualization of the stress process: Essays in honor of Leonard I. Pearlin* (pp. 3–21). Springer. [https://doi.org/10.1007/978-1-4419-1021-9\\_1](https://doi.org/10.1007/978-1-4419-1021-9_1)
- Turner, R. J., Wheaton, B., & Lloyd, D. A. (1995). The epidemiology of social stress. *American Sociological Review*, *60*(1), 104–125. <https://doi.org/10.2307/2096348>
- Umberson, D. (2017). Black deaths matter: Race, relationship loss, and effects on survivors. *Journal of Health and Social Behavior*, *58*(4), 405–420. <https://doi.org/10.1177/0022146517739317>
- Umberson, D., & Karas Montez, J. (2010). Social relationships and health: A flashpoint for health policy. *Journal of Health and Social Behavior*, *51*(1\_suppl), S54–S66. <https://doi.org/10.1177/0022146510383501>
- Verdery, A. M., Smith-Greenaway, E., Margolis, R., & Daw, J. (2020). Tracking the reach of COVID-19 kin loss with a bereavement multiplier applied to the United States. *Proceedings of the National Academy of Sciences*, *117*(30), 17695–17701. <https://doi.org/10.1073/pnas.2007476117>

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**Emily Hallgren**, PhD is a medical sociologist and Assistant Professor at the University of Arkansas for Medical Sciences in the College of Medicine, Division of Community Health and Research. Dr. Hallgren's research focuses on the relationship between socioeconomic status and health outcomes, with a particular focus on cancer survivors and caregivers. One primary focus of Dr. Hallgren's research is examining the mechanisms underlying financial toxicity and employment outcomes among cancer survivors and caregivers, with an emphasis on rural populations.

**Ramey Moore**, PhD is a medical anthropologist and Assistant Professor at the University of Arkansas for Medical Sciences in the College of Medicine, Division of Community Health and Research. Dr. Moore's research interests are on the social ecology of health and health behaviors, and the effects of social and cultural identity on

health and health-seeking behaviors. His research has focused on community-based participatory approaches, and recent publications have focused on vaccination and vaccine hesitancy, sociocultural resiliency, and health inequalities in immigrant, racial minority, and underserved communities, such as Marshallese Islanders and Hispanic/Latino communities in Arkansas. Across all of his work he is attentive to how individuals, communities, cultures, and societies construct and practice health, understood broadly.

**James P. Selig**, PhD is a Quantitative Psychologist and Associate Professor of Biostatistics in the College of Public Health at University of Arkansas for Medical Sciences. Dr. Selig is the Senior Director of Biostatistics for the Office of Community Health and Research. His areas of expertise include research design and statistical analysis with specific expertise in structural equation models, factor analysis, analysis of clustered data using mixed effects models, and mediated effects. Dr. Selig's professional goal is improving research design and statistical practice through successful collaborations with fellow researchers.

**Aaron J. Scott**, MA is a Research Associate at the University of Arkansas for Medical Sciences in the Division of Community Health and Research. Mr. Scott's proficiencies and interests are in the application of biostatistics and research methods to investigating and addressing issues of public health disparities among various populations, locally and nationally.

**Shashank Kraleti**, MD, FAAFP, is a family physician and an Associate Professor at the University of Arkansas for Medical Sciences (UAMS). Dr. Kraleti serves as the Director for the Primary Care and Population Health Service Line, as Residency Program Director for the Little Rock family medicine residency program, and as Vice-Chair for Clinical Affairs for the Department of Family and Preventive Medicine. Dr. Kraleti is a physician informaticist and holds the Medical Director position for the Institute of Digital Health and Innovation at UAMS. Dr. Kraleti has varied research interests spread across the specialty of family medicine.

**Dr. Pearl McElfish** oversees the Office of Community Health and Research at the Northwest Regional Campus of the University of Arkansas for Medical Sciences, serves as Director of the Center for Pacific Islander Health, is the Associate Director of Community Outreach and Engagement with the Winthrop P. Rockefeller Cancer Institute, and holds faculty positions in the UAMS Colleges of Medicine, Nursing, and Public Health. She is the founder of the Office of Community Health and Research at UAMS Northwest Regional Campus and of the Center for Pacific Islander Health at UAMS. Dr. McElfish's research focuses on reducing health disparities with Pacific Islander and Hispanic Communities. She also conducts food systems research and methodological research related to the best methods for conducting community-based participatory research and for disseminating research results to participants and communities. Since late 2014, she has been awarded more than \$100 million in federal and private foundation grants for investment in community health in Northwest Arkansas and published more than 170 peer-reviewed articles.