

Social Inequalities in Bereavement across the Life Course: A Study of Four-Generation Kinship Networks in Sweden

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Abstract: The death of family members is a near-ubiquitous human experience that profoundly impacts social and psychological well-being. Mortality decline in high-income countries has rendered this experience more predictable across the life course, yet family bereavement patterns vary across socioeconomic strata. This study proposes a demographic framework for understanding how the interplay of mortality inequalities and variation in kinship structure shapes inequalities in bereavement. Drawing on life course theory, it conceptualizes the burden of bereavement as a multifaceted phenomenon relating to cumulative exposure to kin deaths (intensity), when these deaths occur during the life course (timing), and whether they follow the generational ordering (anticipation). Using Swedish population register data, we reconstruct four-generation kinship networks around the 1973 birth cohort and estimate the burden of bereavement by education and income. Inequalities in bereavement are decomposed into differences in kin mortality and structure. The findings reveal a socioeconomic gradient in family bereavement, mainly in timing and anticipation effects. Individuals with lower socioeconomic status experience the death of parents, siblings, cousins, and children earlier in life. Disparities in cumulative exposure to bereavement are largely offset by differences in kin structure. This study underscores how demographic processes shape inequalities in bereavement across the life course.

Keywords: family bereavement; kinship demography; mortality; inequality; socioeconomic status; grandparents

Reproducibility Package: This analysis is based on restricted-use data from the Swedish population and income tax registries. A replication package including the code is available at <https://doi.org/10.6084/m9.figshare.33164087>

Citation: Sasson, Isaac, Linus Andersson, Alyson van Raalte, and Diego Alburez-Gutierrez. 2026. "Social Inequalities in Bereavement across the Life Course: A Study of Four-Generation Kinship Networks in Sweden" *Sociological Science* 13: 1275-1304.

Received: March 28, 2026

Accepted: August 17, 2026

Published: November 3, 2026

Editor(s): Stephen Vaisey, Michael Rosenfeld

DOI: 10.15195/v13.a48

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AN average Swede born in 1780 could expect to live to age 36 and more than one-third of newborns did not survive to the age of ten; a mere century and a half later, life expectancy at birth doubled and more than half of the 1930 birth cohort would live past the age of 80 (HMD 2025). What once was the exception is now the rule, and survival to old age is hardly unique to Sweden. As a result of the rapid mortality decline since the Industrial Revolution, death in many societies is now seen as both predictable and orderly (Bayatrizi 2008). The majority of individuals

living in low-mortality countries can now expect to die at an old age, to be survived by their children, and to get to know their grandchildren.

Yet the prospects of growing old are not equally shared by all social groups. Although life expectancy at birth more than doubled in high-income countries during the mortality transition, substantial disparities in length of life persist across subpopulations within nations. Studies have consistently found that lower socioeconomic strata and disadvantaged minority groups tend to have both shorter and more variable lifespans (Brown et al. 2012; Firebaugh et al. 2014; van Raalte et al. 2011; Sasson 2016). As a result, individuals belonging to disadvantaged groups may also be more likely to experience the death of family members and peers who share similar characteristics and social environments.

Social epidemiologist Richard Wilkinson provides a useful illustration linking demographic rates and how they are experienced by individuals (Wilkinson 2002:57):

“Perhaps the easiest way of seeing intuitively what the socioeconomic differences in death rates mean, is to imagine two people, each with a similar-sized circle of friends and relations [...] but living in separate rich and poor areas. For every death that occurs among the circle of friends of the person in the rich area, the person in the poor area will know of two, three or even four times as many deaths among his or her circle of friends.”

Indeed, mortality rates that are two, three, or four times higher in one social group compared to another are common in contemporary high-income countries (Marmot 2003). In spite of this basic intuition, relatively few studies have focused on how mortality inequalities translate into differential exposure to family bereavement (e.g., Fletcher et al. 2013; Patterson, Verdery, and Daw 2020; Sohn 2023), and even fewer have population-wide microdata at their disposal to observe exposure to kin loss in real family networks (Moretti et al. 2025). By bereavement, we refer to “the objective situation of having lost someone significant through death,” which is distinguished from grief and mourning, the emotional response to bereavement and its public display (Stroebe et al. 2008:4).

One might expect that socioeconomic inequalities in mortality invariably lead to inequalities in family bereavement. However, socioeconomic strata also vary in their fertility, marriage, divorce, and remarriage rates, which in combination impact the number of familial ties, both consanguineal (blood relationships) and affinal (by marriage), as well as generational length. As a result, individuals from different socioeconomic strata differ in kinship size and in their exposure to kin at different ages, in addition to kin mortality (Andersson and Kolk 2023). Thus, the net effect of socioeconomic status (SES) on exposure to family bereavement is difficult to predict.

Addressing this gap, our main objective is to lay the empirical and conceptual groundwork for establishing a social demography of bereavement (Caswell, Margolis, and Verdery 2023; Sasson 2025). Empirically, our study sets out to describe the extent of socioeconomic inequalities in family bereavement, for the first time, in a real population. Conceptually, we develop a demographic framework for understanding the *burden of bereavement* as a multifaceted phenomenon relating

to the intensity, timing, and anticipation of kin loss across the life course, and how that experience is structurally shaped by socioeconomic disparities in mortality and variation in kinship patterns. Our framework does not attempt to make strong causal claims about the relationship between SES and family bereavement. Instead, it highlights how, from an individual standpoint, demographic structure operates as a Durkheimian “social fact,” shaping the lived experience of family bereavement (Sasson 2025).

We apply this framework to Sweden, a post-demographic transition, aging population in which socioeconomic inequalities in mortality have been rising for several decades (Bengtsson, Dribe, and Helgertz 2020). Unlike prior model-based studies of kinship and bereavement, ours relies on complete population microdata and does not make strong assumptions about social mobility or the independence of demographic behavior within families and across generations. Using population register data, we reconstruct four-generation kinship networks surrounding the 1973 birth cohort and enumerate the number of kin deaths, by type of relation, from birth through midlife. Our analysis covers the entire kinship universe, including the death of grandparents, parents, aunts and uncles, in-laws, spouses and childbearing partners, siblings and half-siblings, children (both biological and adopted), and nieces and nephews. For each type of family tie, we estimate the burden of bereavement by education and income levels. Finally, we decompose socioeconomic disparities in family bereavement across the life course into differences in kin age structure and differences in kin mortality.

Theoretical Background

Life Course Approach to Bereavement

The loss of a family member constitutes a stressful life event that is often accompanied by psychological distress (Anderson, Monden, and Bukodi 2022; Denckla et al. 2022; Fletcher, Vidal-Fernandez, and Wolfe 2018) and the transition into new social roles or out of old ones (e.g., caregiving) (Aneshensel, Botticello, and Yamamoto-Mitani 2004). Sociological perspectives on bereavement have emphasized the wider social context in which it occurs, its relation to different stages of the life course, and how the experience of bereavement intersects with class, gender, and race/ethnicity (Carr 2018; Smith-Greenaway, Verdery, and Carr 2025; Thompson et al. 2016). Life course theory further points to several factors that are critical for coping with bereavement, as well as its long-term impact—*cumulative exposure* to loss of family members, the *timing* at which loss is experienced during the life course, *anticipation* of the loss (or lack thereof), and the *type and quality of the relationship*.

Repeated exposure to bereavement can amplify psychological distress and negatively impact well-being (Mercer and Evans 2006). Individuals who experience multiple family losses over time may face prolonged or more intense grief, leading to higher risks of depression, anxiety, and prolonged grief disorder, as well as a slower recovery trajectory (Infurna and Mayer 2019). Other scholars, however, have hypothesized that repeated exposure to bereavement can lead to resilience, thus moderating the impact of subsequent losses (Donnelly, Umberson, and Pudrovska 2020).

The timing during the life course at which loss is experienced is also critical for coping with bereavement, as well as its long-term impact (Carr 2004, 2020). Role theory distinguishes between “on-time” and “off-time” deaths based on whether they follow social scripts regarding the “normal” length of life or the expected generational ordering (George 1993; Hagestad 1996). In particular, deaths that occur prematurely, such as the loss of a sibling, parent, or spouse early in life, or the loss of a child by a parent, can have longer-lasting effects on the bereaved (Herberman Mash, Fullerton, and Ursano 2013; Leopold and Lechner 2015; Sasson and Umberson 2014; Umberson and Donnelly 2022).

The impact of sudden versus anticipated loss on the bereaved can differ substantially. Sudden death can lead to intense shock and unresolved grief, especially if the death was violent (Kristensen, Weisæth, and Heir 2012; Zakarian et al. 2019). In contrast, anticipated loss allows individuals to prepare emotionally, potentially reducing the shock associated with it. Anticipatory grief refers to the mourning process that occurs before a loved one’s death, for example in cases of terminal illness (Siegel and Weinstein 1983), and involves feelings of sadness, anxiety, and fear in anticipation of the impending loss (Coelho and Barbosa 2017). Although anticipatory grief can provide time to adjust, it may also prolong the mourning period.

Finally, the impact of bereavement is moderated by the type and the quality of relationship with the deceased (Smigelsky et al. 2020). Specific relations, such as the loss of a child by a parent or a grandchild by a grandparent, are particularly associated with intense and persistent grief (Stroebe et al. 2007). If the relationship with the deceased was strong and positive, grief tends to be more intense. In contrast, if the relationship was strained or ambivalent, the bereaved may experience mixed emotions, including guilt, anger, or regret, potentially complicating the grieving process and adjustment (Root and Exline 2014).

Thus, in order to adequately characterize social inequalities in bereavement, the experience of bereavement must be understood as a multifaceted phenomenon relating not only to the number of deaths in the family, but also to the type of relationship, the timing at which loss was experienced during the life course, and whether the loss was anticipated.

Social Inequalities in Family Bereavement

In spite of the ubiquity of bereavement as a human experience, we have a limited understanding of how demographic factors shape exposure to bereavement in extended family networks. Even less is known about how this exposure varies across social groups and over the life course. Although there is a long tradition of demographic research on mortality inequalities, few studies have considered their impact from the perspective of the bereaved, rather than the individual being exposed to the risk of mortality. Only in recent years have studies focused on bereavement patterns according to the individual characteristics of the bereaved, including the age at which one experiences death in the family, the relationship to the bereaved, and the cumulative exposure to kin mortality (Alburez-Gutierrez,

Kolk, and Zagheni 2021; Kim et al. 2021; Smith-Greenaway et al. 2021; Umberson et al. 2017; Verdery and Margolis 2017).

Prior research in this area can be broadly divided into two approaches. The first approach consists of survey-based, empirical studies comparing the risk of losing a family member across social groups. Studies based in the United States, for example, have found that black Americans are three times more likely than white Americans to experience the death of a parent by the age of 10 (Umberson et al. 2017), and that they are also more likely to experience the death of other family members by midlife (Donnelly et al. 2020). Other research in this vein has found that the death of a sibling during childhood is more common among families with lower household income (Fletcher et al. 2013), and that U.S.-born Hispanics are more likely to lose a child throughout adulthood than are non-Hispanic whites (Donnelly et al. 2023). Studies in this tradition, however, have tended to focus on dyadic family relations (risk of losing a spouse, child, etc.) without explicit consideration of other demographic factors such as family structure and complexity.

The second approach consists of studies employing either formal demographic models of kinship or microsimulation, offering a comprehensive breakdown of how demographic factors shape the experience of death within family networks (Alburez-Gutierrez et al. 2021; Caswell et al. 2023; Smith-Greenaway et al. 2021). For example, a microsimulation study estimated the number of older U.S. adults without living kin by race (Verdery and Margolis 2017). A model-based study found that, since 1999, black children in the United States have had an increased burden of parental deaths from firearms and drug poisoning (Schlüter et al. 2024). Recent studies on the COVID-19 pandemic have estimated that every COVID death in the United States bereaved nine extended-family members (Verdery et al. 2020), leaving hundreds of thousands bereaved (Snyder et al. 2022). This average, however, masked a disproportionately higher burden of bereavement among black, Latino, and less educated communities (Andrasfay and Goldman 2021; Clouston, Natale, and Link 2021). Yet with few exceptions (e.g., Patterson et al., 2020), this literature has relied on aggregate demographic parameters rather than on individual microdata. Much like Wilkinson's stylized example in the Introduction, this approach assumes that different subpopulations follow a historical or projected set of central demographic rates. As a result, it does not capture the socioeconomic and ethnic heterogeneity that may lie within families.

The present study bridges the two approaches by documenting bereavement patterns, by socioeconomic strata, in a real population. Using the Swedish population register, we trace exposure to family bereavement across four-generation kinship networks. Our study further accounts for socioeconomic variation in kinship structure, in addition to mortality inequalities, in shaping the individual experience of bereavement.

Why the Demography of Kinship Matters

The burden of bereavement depends not only on mortality levels, but also on a host of additional demographic characteristics that shape exposure to kin of varying ages and types of relationships (Coresh and Goldman 1988; Goodman, Keyfitz,

and Pullum 1974). Over the course of the demographic transition, families have become smaller as lives have been extended and fertility declined. As a result, the kinship network structure itself has changed in many societies (Alburez-Gutierrez, Williams, and Caswell 2023). Structures that were once horizontally dominated by siblings, cousins, and aunts and uncles have become vertically dominated “bean-pole” networks of parents, children, and grandparents (Bengtson 2001; Murphy 2011; Verdery 2015).

These major demographic shifts have not taken place uniformly across social groups. Although social gradients in fertility patterns have long been documented by demographers—including ages at childbearing, family size, and multi-partner fertility—many of these gradients have reversed over the course of the twentieth century (Esping-Andersen and Billari 2015; Kravdal and Rindfuss 2008). These changes have led to enormous variation in family size and generational length across families. Within European countries, the age at entry into grandparenthood has an interquartile range of around 10–15 years (Leopold and Skopek 2015), and inter-household variation in generational length has increased over time (Margolis and Verdery 2019). As a result, the majority of Europeans are now part of three-generation families, less than a fifth belong to two- or four-generation families, and only 8 percent have no vertical kin (Puur et al. 2011).

The size of kin networks also varies considerably across race/ethnicity and SES (Andersson and Kolk 2023; Schafer and Vargas 2016). Social gradients in family dynamics determine the exposure to family members of different ages, which, coupled with mortality inequalities, shape exposure to family bereavement. For example, educational attainment is associated with a lower risk of mortality (Hayward, Hummer, and Sasson 2015), but also with later childbearing (Neels et al. 2017; Ní Bhrolcháin and Beaujouan 2012). Thus, from the perspective of the child, he or she is at a lower risk of losing a parent who is highly educated compared with a *parent of the same age* who is less educated; however, education tends to defer fertility to older ages, so if we were to compare *children of the same age*, the one whose parent has higher educational attainment is typically older and therefore subject to a higher risk of mortality. This example demonstrates the potentially countervailing demographic forces at play, which together shape the real-life experience of family bereavement. With this in mind, our study aims to estimate the contribution of both mortality inequalities and variation in kinship structure to socioeconomic inequalities in family bereavement.

Conceptual Framework

We propose the concept of *burden of bereavement*, rooted in life course theory, and introduce a conceptual framework for understanding its determinants and potential consequences from a population perspective. A population perspective is one that emphasizes the role of demographic means, distributions, and rates, as well as their relationships, in understanding individual-level phenomena and their underlying mechanisms (Duncan 2008). Our framework aims to clarify how the burden of family bereavement is shaped by demographic factors, how that burden varies across individuals and social groups, and, ultimately, how differential exposure

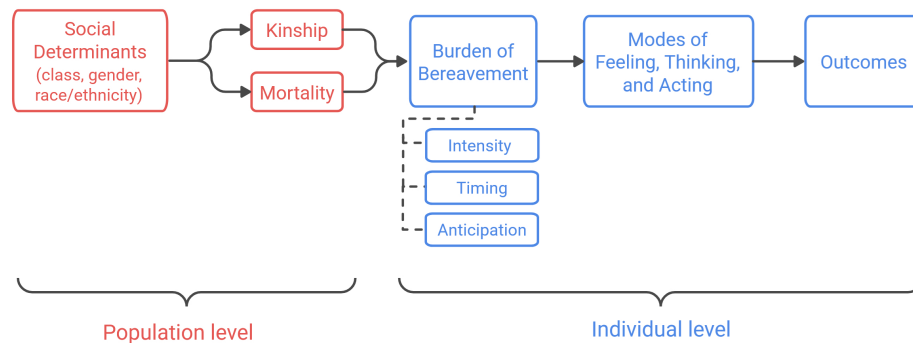


Figure 1: Conceptual framework linking social and demographic determinants to individual exposure to bereavement and its consequences.

to bereavement may give rise to different modes of thinking, feeling, and acting (Sasson 2025).

The relationship between macrolevel demographic factors and the individual-level experience of family bereavement is shown in Figure 1. On the left side, social determinants (class, gender, and race/ethnicity) shape social gradients in both mortality and kinship (size, age, and type of relations). These factors, in turn, coalesce to shape the burden of bereavement, a concept we develop below, across the life course from the perspective of *ego* (the bereaved). In this study, we examine how the experience of family bereavement varies across socioeconomic strata, and the role that kinship patterns and mortality inequalities play in accounting for that variation. Specifically, differences in the burden of bereavement across socioeconomic strata may be attributed to (1) differences in the size and age structure of their respective family networks, assuming no difference in age-cohort-specific mortality rates of each kin member; and (2) kin exposure to different mortality regimes, assuming similarly sized and age-structured family networks.

Incorporating key tenets of life course theory (Carr 2018; Elder 1998) into our framework, we conceptualize the burden of bereavement as a multifaceted phenomenon relating to (1) *intensity*, referring to the cumulative number of kin deaths to which *ego* is exposed to, by age and type of relationship; (2) the *timing* of kin loss during *ego*'s life course (e.g., losing a parent during childhood as opposed to adulthood); and (3) the *anticipation* of kin loss. Importantly, whereas timing refers to the life course stage of the bereaved during which loss is experienced, anticipation refers to the circumstances of the loss—whether the death was sudden or followed a period of anticipatory grief, and whether it conforms to or departs from expected social scripts (a child losing a parent versus a parent losing a child). Here, we operationalize the latter as deaths occurring outside the expected generational order, though more nuanced measurement strategies may capitalize on the cause of death or the deceased's prior health status if data are available (see, e.g., Sasson and Umberson, 2014).

Moreover, our framework not only views the burden of bereavement as an outcome of social and demographic determinants, but also as a driver of social behavior and outcomes. On the right side of Figure 1, we draw attention to the potential role

of exposure to bereavement in shaping individual feelings, perceptions, expectations, and actions. Prior research has shown that exposure to family bereavement may alter perceptions about how long individuals expect to live and how they plan for the future (Bernstein and Sasson 2023; Dormont et al. 2018; Griffin, Loh, and Hesketh 2013; Hurd and McGarry 2002), which ultimately impacts decisions pertaining to retirement and savings (Heimer, Myrseth, and Schoenle 2019; Post and Hanewald 2013; van Solinge and Henkens 2010). The loss of family members has also been linked to changes in social support, health lifestyles, psychological distress, and well-being (Livings et al. 2022; Logan et al. 2018; Sohn 2023; Stahl and Schulz 2014; Umberson and Karas Montez 2010). Although the present study does not directly test the consequences of exposure to family bereavement, our framework draws a direct link between the demographic factors shaping the burden of bereavement, its lived experience, and the individual- and population-level consequences of that experience (Sasson 2025).

Based on this framework, we expect to find a socioeconomic gradient in family bereavement that is shaped by both mortality inequalities and variation in kinship structure. Because SES is correlated within families and across generations, we hypothesize that mortality inequalities contribute to a higher burden of family bereavement among individuals with lower levels of education and income. This higher burden may manifest in all facets of bereavement: a greater number of deaths of family members experienced on average, by age, up to middle adulthood (intensity); a higher probability of losing parents, aunts, and uncles during childhood (timing); and a higher probability of losing kin in the contemporary generation (siblings and cousins) or descendant generation (children, nieces, and nephews) by middle adulthood (anticipation). Finally, we hypothesize that socioeconomic variation in kin structure is an important determinant of inequalities in family bereavement, though we do not have a strong assumption about the direction of such an effect, and whether it will exacerbate or offset disparities in bereavement due to mortality inequalities.

We apply our conceptual framework and test these hypotheses on the Swedish 1973 birth cohort, around which we construct four-generation kinship networks. The next section provides a brief overview of Sweden as a case study, with particular attention to demographic trends in kinship patterns and mortality inequalities.

Sweden As a Case Study

Swedish society exhibits one of the lowest levels of income inequality among OECD countries (OECD 2015). Its welfare regime is characterized by relatively extensive universal welfare provision and strong redistributive policies (Bambra 2007). Nevertheless, Sweden has also seen persistent and even growing social inequalities in mortality in recent decades. Mortality inequalities are observed across multiple social factors, including SES (Katikireddi et al. 2020), gender (Sundberg et al. 2018), migration background (Wallace 2022), and geographic regions (Wilson et al. 2020). Class-based mortality inequalities in particular have been on the rise in Sweden since the 1950s (Bengtsson et al. 2020). These social determinants of health and mortality are also likely to shape population-level patterns of family bereavement.

With respect to kinship, Sweden is characterized by low fertility (though comparatively high by European standards over the past few decades) and diverse family structures. Considered a forerunner of the Second Demographic Transition (Ohlsson-Wijk, Turunen, and Andersson 2020), Sweden's cohort fertility rate was slightly below replacement level until recent years, and cohabitation has long substituted for marriage as the modal union form (though marriage is regaining popularity in recent years) (Ohlsson-Wijk 2011). Divorce and separation rates increased almost steadily through the early 1970s before leveling off, and a commensurate uptake in re-partnering meant an increase in family complexity (Ohlsson-Wijk et al. 2020). Trends in union instability, coupled with increasing multi-partner fertility, have meant a rising share of half-siblings in kin networks (Kolk et al. 2023).

Increasing socioeconomic inequality in Sweden has been accompanied by changing social gradients in family formation and childbearing (Van Winkle 2020). High SES in Sweden is now associated with higher fertility, whereas childlessness is most common among the least educated women—a complete reversal of the patterns observed among cohorts born before the 1960s (Jalovaara et al. 2019). These complex trends in marriage, fertility, and mortality have led to considerable variation in kinship size in Sweden, even among the same birth cohorts (Kolk et al. 2023). Given these complexities, we based our analysis on complete population microdata, which, unlike model-based approaches, requires no assumptions about social mobility within families or demographic behavior across socioeconomic strata.

We trace the genealogies of the Swedish 1973 birth cohort using administrative data to estimate the actual burden of bereavement, by education and income, across the life course. This particular cohort was born amid the expansion of the Swedish welfare state, in which income inequalities were relatively low (Lundberg and Åmark 2001). However, throughout their lives, Sweden experienced rising socioeconomic inequalities and growing inequalities in mortality (Bengtsson et al. 2020; Gurzo et al. 2024). Choosing this particular birth cohort strikes a good balance between the comprehensiveness of kin relations that can be identified in the population register and a sufficient follow-up period, from birth to early midlife. In earlier birth cohorts, linkage to grandparents tends to be incomplete, whereas in later cohorts the follow-up period is necessarily shorter, failing to capture deaths among contemporaries and descendants.

Data and Methods

Genealogies

We used administrative registers of Sweden's entire population, including monthly information on births and deaths, identifying biological and in-law relations via unique personal identification numbers and through marital and residential records. Our index cohort was born in Sweden in 1973 to Swedish-born parents ($N = 91,769$), of which 97.1 percent ($N = 89,033$) were alive at the end of the follow-up period.¹ We further excluded members of the index cohort without identifiable grandmothers on both the maternal and paternal sides, required for producing complete genealogies, which resulted in a final analytic sample of $N = 80,308$. Conditioning the study

population on ancestry presence in registers also means that kin are more likely to reside in Sweden.

We constructed kinship networks of the index cohort, including all kin ever alive and who ever resided in Sweden from an index individual's birth to age 47 (i.e., from their birth in calendar year 1973 through the end of 2020). Grandparents, parents, aunts and uncles, cousins, full- and half siblings, and nieces and nephews were identified using parent–child linkages. Importantly, our analysis included all biological and adoptive parent–child relations but not foster-care relations. Spouses, parents-in-law, and brothers and sisters in-laws (of both spouses and siblings) were identified via partnership linkage. Partnership links consisted of either marriage or co-residence with a childbearing partner. In-law kin were no longer enumerated following union dissolutions.

SES

SES was measured using educational attainment and income. Educational attainment was operationalized as the highest level of education achieved by age 47, categorized into four groups: International Standard Classification of Education (ISCED) levels 0–2 (basic education, lower-secondary, or short/interrupted upper-secondary education, 13 percent), 3 (upper-secondary education, 37 percent), 4–5 (post-secondary or short-cycle tertiary education, 33 percent), and 6–8 (bachelor's degree or equivalent and above, 15 percent) (UNESCO 2012). We also measured SES using annual income earnings based on taxation registers. Earnings were measured at ages 39, 40, and 41, taking the highest value achieved during those three years and grouping the cohort into sex-specific income rank quartiles. (we further examined the three-year mean and highest income centering on ages 35, 40, and 45, but the results did not differ substantively.)

Importantly, linkage to kin did not vary substantially by *ego's* SES. Parental linkage exceeded 99 percent of the index cohort, and a full set of grandmothers was identified for 88.0 percent of cohort members in ISCED levels 0–2, 90.1 percent in ISCED level 3, 90.9 percent in ISCED levels 4–5, and 90.7 percent in ISCED levels 6–8. Despite these minor limitations, population registers are considered the “gold standard” in genealogical research, minimizing biases in enumerating kin relations compared with other sources of demographic data (Calderón-Bernal, Alburez-Gutierrez, and Zagheni 2025). A complete breakdown of the kin population by *ego's* education and income is shown in Appendix A (online supplement).

The bulk of those not in death or residence registers have either migrated or are otherwise counted as migrated. These cases are equally distributed between the lowest and highest education groups for grandmothers and grandfathers, and mothers and fathers (approximately 2.0 percent, 4.4 percent, 0.4 percent, and 0.9 percent, respectively). For siblings and cousins, these figures are moderately higher among the highest education group relative to the lowest but are still relatively rare overall (4.6 percent compared with 2.1 percent, and 4.2 percent compared with 2.5 percent, respectively). We found similar coverage patterns by income, with the exception of spouses and children, which exhibited slight under-coverage among the highest education group but over-coverage among the highest income quartile.

Overall, given that the stock of out-migrated kin is relatively small and does not differ markedly by SES for the most salient types of kin losses, it likely results in minimal bias in our estimates of socioeconomic differences in family bereavement. We further discuss how migration and under-coverage might affect our findings in the *Discussion* section.

Analytical Approach

We enumerate the death of every individual kin member beginning from *ego*'s birth in 1973. Thus, bereavements of kin prior to the birth of *ego* are not enumerated unless otherwise stated. If kin members out-migrate without returning before 2020, they are censored at the year after their last observed residence (*folkbokföring*) in Sweden.

We enumerated bereavements in total and for each kin group, at each chronological age of *ego* from 0 to 47, separately for each education group and income quartile. We computed the number of bereavements, in total and within each kin group (e.g., grandparent, cousin, etc.), at each chronological age of *ego* from 0 to 47. We then calculated, for each SES group, the average number of bereavements per kin group, from ages 0 to 47. Second, we estimated the average cumulative number of kin deaths, in total and within each kin group, from age 0 to 47, separately for each SES group. Third, we estimated education (absolute level) and income (relative rank) gradients in bereavement. The burden of bereavement was measured with respect to its intensity, timing, and anticipation. For intensity, we enumerated the cumulative number of kin deaths by age, from birth to age 47. For timing, we estimated the odds of experiencing at least one kin loss in the grandparents' and parents' (parents, aunts, uncles, and parents-in-law) generations by ages 18 and 47. For anticipation, we estimated the same odds, by age, of losing at least one kin member in the contemporaneous (full/half/in-law-sibling, and cousin) and descendant (own children, nieces, and nephews) generations. We predict each of these binary dependent variables by educational attainment levels (or income quartiles) in a logistic regression, holding the highest SES group as the reference category. We present the odds ratios with 95 percent confidence intervals.

Finally, using standard demographic decomposition methods (Gupta 1993; Kitagawa 1955), we decompose socioeconomic differences in the yearly rate of family bereavement (FBR) into differences in kin structure and differences in kin mortality. A positive difference ($\Delta\text{FBR} > 0$) indicates a higher rate of kin loss among the low-SES group, whereas a negative difference ($\Delta\text{FBR} < 0$) indicates a higher rate of kin loss in the high-SES group. Specifically, differences in FBR between low- and high-SES individuals can be broken down into two components (Eq. [1]): differences in kin age-specific death rates (ASKDR) and differences in kin age-specific prevalence (w), using five-year kin age groups (a), for each age i of the index cohort members:

$$\Delta\text{FBR} = \sum_{ai} \left[\left(\Delta w_{ai} \frac{\text{ASKDR}_H + \text{ASKDR}_L}{2} \right) + \left(\Delta\text{ASKDR}_{ai} \frac{w_{aH} + w_{aL}}{2} \right) \right]. \quad (1)$$

Annual contributions can be further aggregated to cumulative exposure to kin loss.

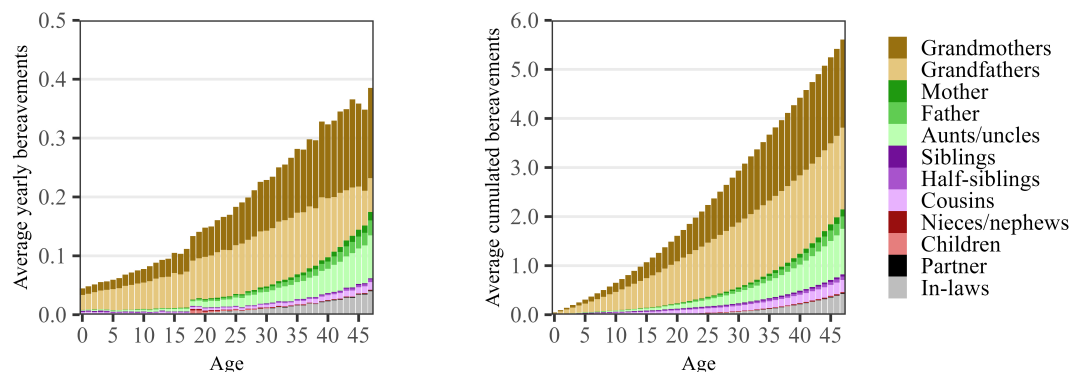


Figure 2: Family bereavement across the life course by kin relationship, 1973 Swedish birth cohort. *Notes:* (left panel) yearly average number of bereavements by kin relationship and age; (right panel) cumulative number of bereavements by kin relationship and age.

Since our findings generalize across gender, the main results are presented for men and women combined. Further breakdown by gender is available in Appendix C (online supplement).

Results

Burden of Family Bereavement across the Life Course

We first analyze the yearly incidence and cumulative exposure to kin bereavement for the cohort as a whole. The left panel of Figure 2 shows the average number of kin deaths for each kin relation at a given age of the index population. An average member of the 1973 cohort experienced a total of 0.04 bereavements during his or her first year of life, and these are almost exclusively the deaths of grandparents. Toward age 20, loss of kin in the parental generation, including parents, aunts and uncles, and parents-in-law, becomes more substantial (the small uptake at age 18 is due to the addition of children, partners, and in-laws when crossing the legal age of marriage). By age 47, bereavement attributed to this group accounts for roughly half of the yearly number of kin deaths (~0.4), with the other half dominated by grandparents. Through the ages, bereavement of generational contemporaries (cousins and full, half, and in-law siblings) accounts for less than 0.01 yearly deaths, on average, and bereavement of descendant kin (including own children, nieces, and nephews) is even rarer.

The right panel of Figure 2 shows the average cumulative number of kin deaths for each kin relation of the index population. Note that these are bereavement events experienced by individuals born in 1973 who survived to 2020. In total, cohort members have experienced nearly six kin deaths by age 47. Of these, the four grandparents account for two-thirds. Second in order of magnitude are aunts and uncles, who outnumber each of the other kin relations in the parental and grandparental generations—by age 47, a member of our index cohort has seen, on average, slightly more than one of his or her aunts or uncles pass away.

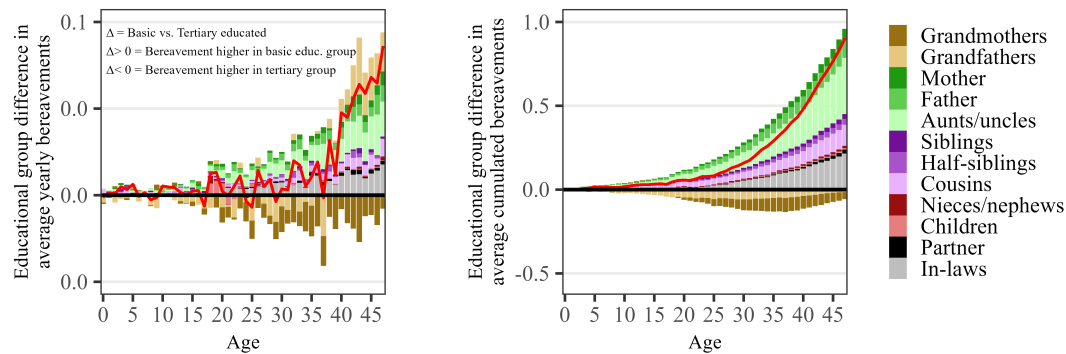


Figure 3: Education gap in family bereavement by kin relationship, 1973 Swedish birth cohort. *Notes:* (left panel) difference between basic and tertiary education groups in the average yearly number of kin deaths; (right panel) difference between the basic and tertiary education groups in the average cumulative number of kin deaths. The red line indicates the net difference between the education groups across all relationship types.

Socioeconomic Differences in Family Bereavement: Intensity, Timing, and Anticipation

Next, we break down the burden of bereavement (intensity, timing, and anticipation) by SES. Kinship networks have been shown to differ by SES. In particular, the growth of kinship networks through the birth of “downstream” kin (children, nieces, and nephews) and the addition of in-laws of the parental and contemporaneous generation (in-law siblings) tends to occur earlier in the life course among low-SES men and women. These SES differences in kinship network size are largely attributed to tempo effects (i.e., earlier childbearing among low-SES men and women), and decline with age. Due to higher union instability, however, individuals of low SES have fewer remaining in-laws at later ages compared with individuals of high SES (Andersson and Kolk 2023).

Below, we present results by level of educational attainment and in (online supplement) by income quartile. The left panel of Figure 3 shows the difference between the average yearly number of kin deaths, by *ego*’s age and kin relation, between the lowest (basic or lower secondary) and highest (tertiary) education groups. Negative values indicate more bereavement in the high-education group, whereas positive values indicate more bereavement in the low-education group. The net difference is indicated by the red line, which almost invariably favors the high-education group. In other words, at almost every age, the average yearly number of bereavements is higher among the low-education group. Furthermore, the additional bereavements in the low-education group are primarily driven by deaths in the parental generation, and to a lesser extent among the contemporaneous generation. By contrast, the high-education group experiences more deaths of grandparents from about age 15 and onward.

The right panel of Figure 3 shows the difference in the intensity of bereavement across the life course, referring to the cumulative average number of kin deaths, between the low- and high-education groups. Note that this measure of bereavement is conditional on members of the 1973 cohort surviving to age 47, in order to

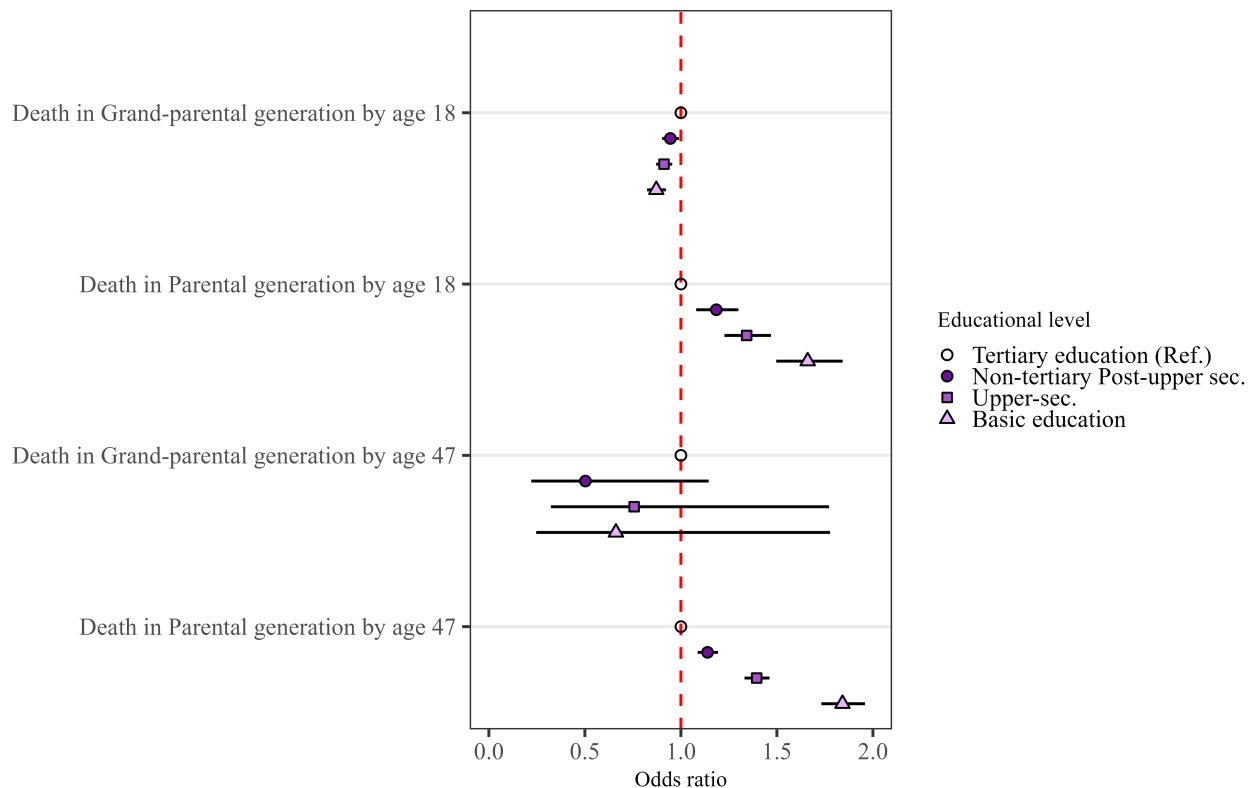


Figure 4: Odds ratios of ever experiencing kin death in the grandparental or parental generation by age and level of education, 1973 Swedish birth cohort (men and women combined). *Note:* logistic regression. Reference group: tertiary education.

reflect the cumulative experience of kin loss by 2020 among comparable individuals with respect to their stage in the life course, but with different levels of SES (results not conditioned on survival are shown in Appendix D, online supplement). By age 47, the low-education group has experienced nearly one additional death in the extended family. Since relatively few individuals have surviving grandparents at age 47, irrespective of their level of education, this difference is driven by deaths in the parental (particularly aunts, uncles, and in-laws) as well as deaths in the contemporaneous generation (siblings, half-siblings, and cousins). At earlier stages of life, however, the gradient, albeit very small, is driven by deaths of grandparental and contemporaneous kin. Overall, these findings lend support to our hypothesis that the intensity of family bereavement differs across socioeconomic strata in the same direction that mortality differs by SES in the general population.

Whereas Figure 3 focused on socioeconomic differences in the intensity of bereavement across the life course, Figures 4 and 5, respectively, focus on differences in the timing and anticipation of bereavement. Here, we estimated the educational gradient in the odds of losing at least one kin of each generation, relative to *ego*, by selected ages (18 and 47). In Figure 4, we test differences in experiencing bereavement in the parental and grandparental generations by *ego*'s age. Although these deaths have come to be expected in low-mortality countries, from the perspective

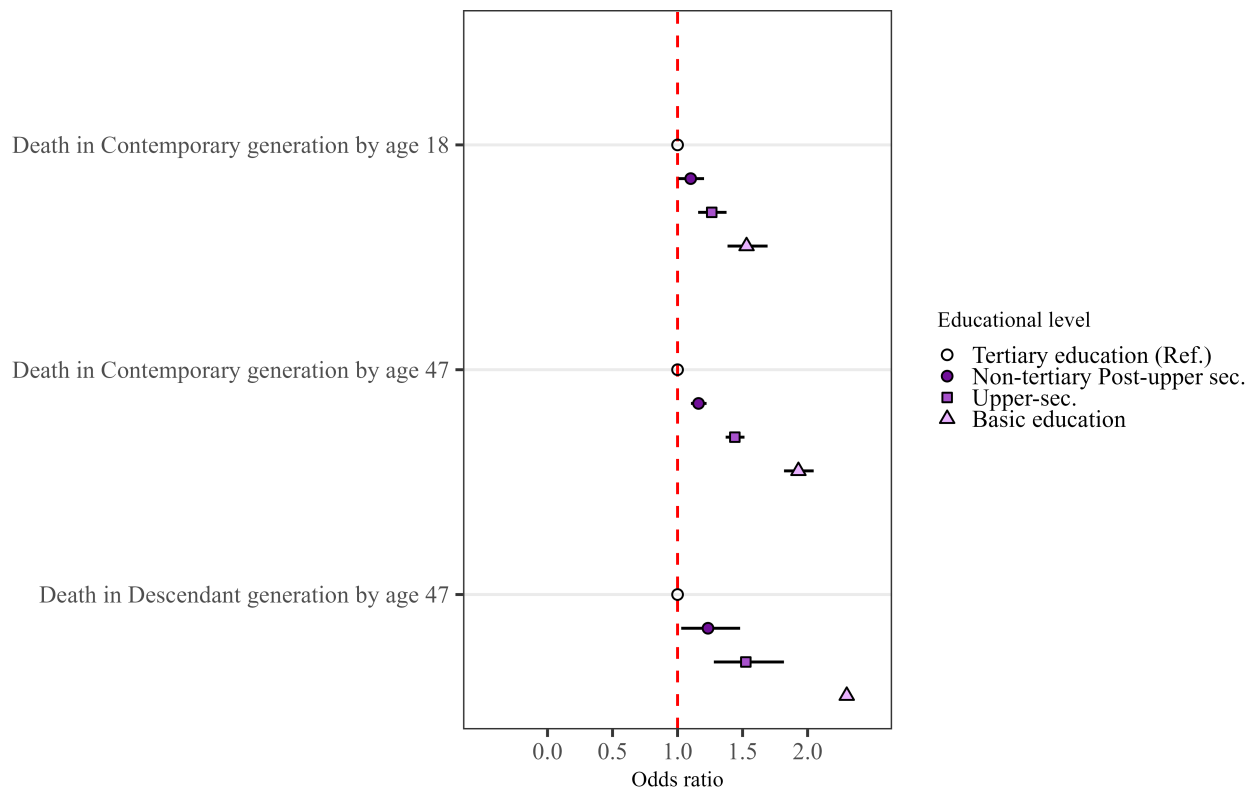


Figure 5: Odds ratios of ever experiencing kin death in contemporaneous and descendant generations by age and level of education, 1973 Swedish birth cohort (men and women combined). *Note:* logistic regression. Reference group: tertiary education.

of *ego*, their consequences are nevertheless dependent on the timing at which they occur during *ego*'s life course. The outcomes are expressed as the odds ratio of experiencing the given bereavement across the three lower education categories (basic, upper secondary, and post-secondary) relative to the tertiary education group. We find no substantive difference across education groups in ever experiencing the death of at least one grandparent by age 18. By contrast, there is a clear and statistically significant education gradient in the odds of bereavement in the parental generation by age 18—the lower the level of *ego*'s education, the higher the odds of bereavement. This general pattern is repeated when estimating at least one bereavement by age 47—no significant differences in the grandparental generation and a negative education gradient in bereavement in the parental generation. These findings too support our hypothesis that the probability of bereavement in the parental generation during *ego*'s childhood will be negatively associated with SES.

In much the same way, Figure 5 shows the odds ratios of losing at least one kin member in the contemporaneous and descendant generations, by *ego*'s age. Unlike deaths in the grandparental and parental generations, these deaths are generally not expected in low-mortality countries during (*ego*'s) childhood and early midlife. Here also, we find a systematic education gradient in the odds of losing at least one sibling, half-sibling, or cousin by ages 18 and 47, as well as in the odds of losing a

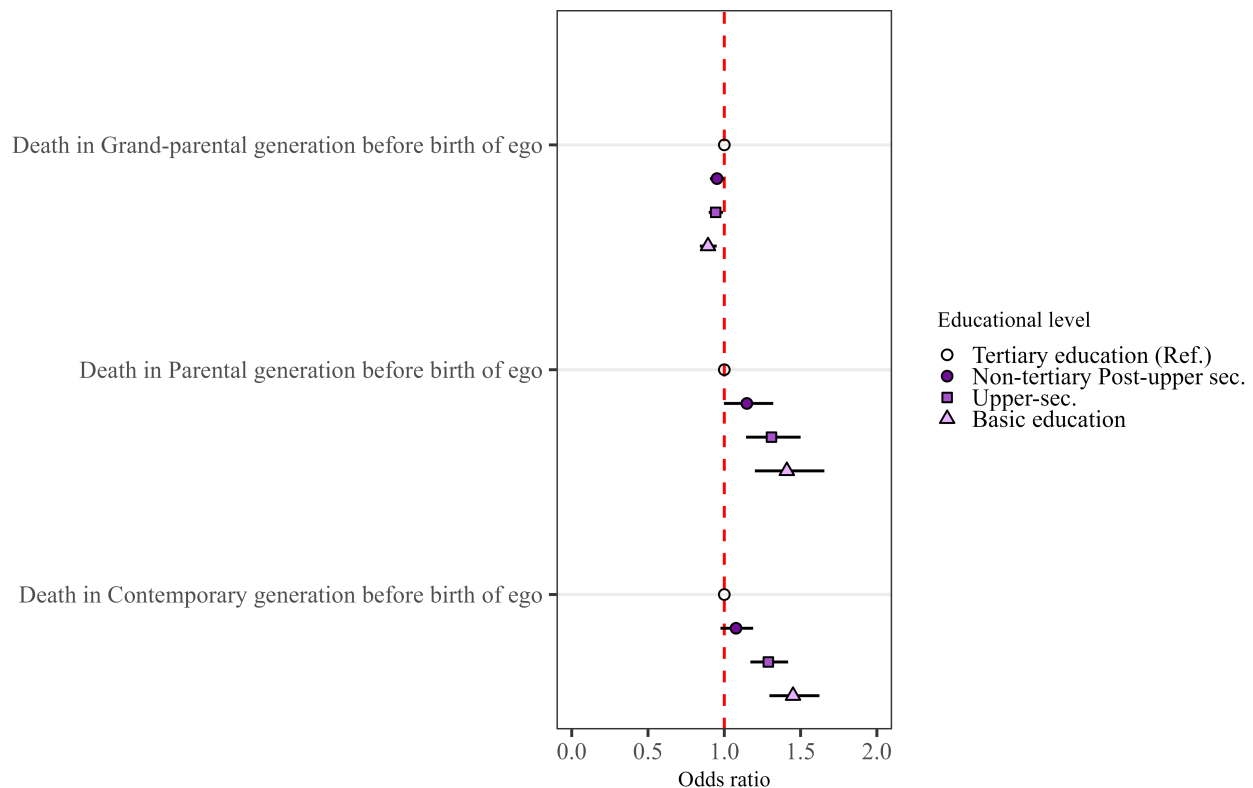


Figure 6: Odds ratios of kin death prior to *ego's* birth by level of education, 1973 Swedish birth cohort (men and women combined). *Note:* logistic regression. Reference group: tertiary education.

child, niece, or nephew by age 47 (the vast majority of cohort members, irrespective of education, had no children by age 18, and almost no deaths occurred among the descendant generation by that age). Thus, as predicted, the lower the level of *ego's* education, the greater the odds of bereavement.

Finally, for completeness, we also estimated the odds of losing at least one kin in the grandparental, parental, and contemporaneous generations prior to *ego's* birth (Fig. 6). Accounting for these deaths may be important for two reasons. First, the death of kin (e.g., a grandparent) prior to birth reduces the risk of experiencing bereavement after birth. Second, the death of kin may have an impact on *ego* even if it is not experienced directly (e.g., loss of a parent prior to birth). Similar to the previous results, we find no substantial education differences in the odds of losing at least one grandparent prior to birth, but a negative education gradient in the odds of losing at least one kin in the parental and contemporaneous generations. The lowest education group was most likely, and the highest education group was least likely, to have had aunts and uncles (and, in rare cases, fathers) die before *ego* was born.

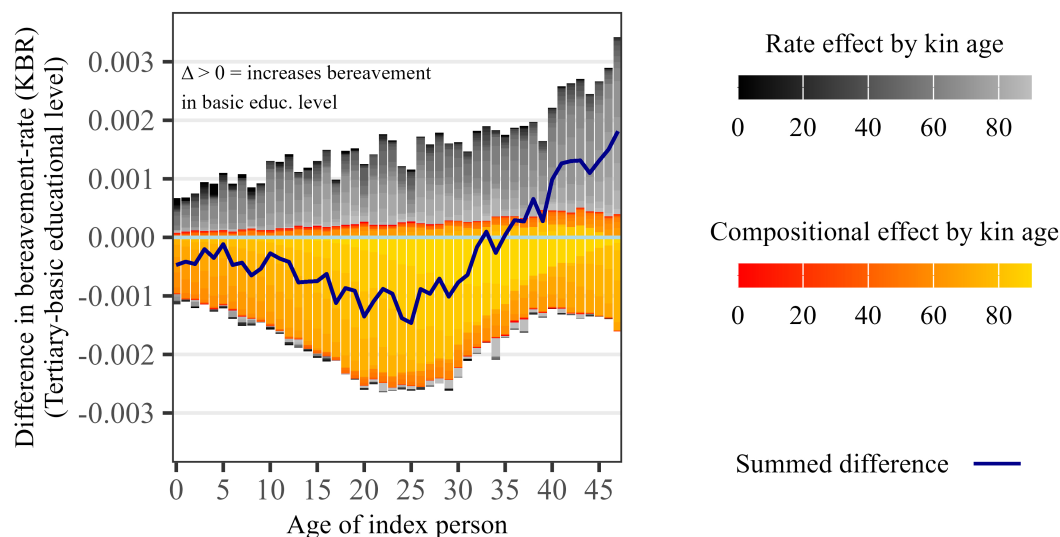


Figure 7: Decomposition of the difference in the yearly bereavement rate between the basic and tertiary education groups, 1973 Swedish birth cohort (men and women combined).

Role of Kin Age Structure and Kin Mortality

The results thus far indicate a socioeconomic gradient in all facets of the burden of family bereavement: intensity, timing, and anticipation. However, the direction and size of the gradient may be shaped by multiple demographic processes. Mortality is higher in the kin networks of low-SES individuals, which contributes to the gradient in family bereavement. What remains unclear is the extent to which inequalities in family bereavement are exacerbated or offset by differences in the age structure of family members, which result from differential fertility and generational length across socioeconomic strata. In order to better understand the demographic determinants of this gradient, we decompose the incidence rate of kin bereavement (FBR) into differences in kin mortality and differences in kin structure.

Specifically, we focus on the yearly FBR, disaggregating it by kin members across five-year age groups. We then decompose the difference between the lowest and highest education groups into a component owing to education differences in the stock of kin of a given five-year age group, and a component owing to education differences in the death rate of these kin age groups. The results are shown in Figure 7. Bars with negative values indicate a contribution to more bereavement in the highest education group, whereas bars with positive values indicate a contribution to more bereavement in the lowest education group; the shades of gray indicate the impact of differences in kin death rates, and the shades of yellow-to-red indicate the impact of differences in the stock of kin in each age group.

Overall, the yearly kin bereavement rate is higher among the high-education group until about age 35, after which it is higher among the low-education group through age 47. The age composition effect favors the low-education group because their kin tend to be younger. In particular, the grandparents, parents, aunts, uncles, and parents-in-law of higher-educated individuals are, on average, older compared to those of their less educated counterparts. By contrast, the kin mortality effect, or

the rate effect, favors the high-education group at every age because kin mortality is higher in the low-education group. Thus, for this particular birth cohort, socioeconomic differences in kinship partly offset inequalities in FBR due to mortality inequalities. In other words, inequalities in FBR would have been even greater had different education groups shared a similar kin age structure.

To reconcile these results showing lower kin bereavement rates among the lower educated (up to around age 35) with their higher overall kin bereavement counts (Fig. 3), differences in overall kinship network sizes need to be considered. Prior research using the same data found that men and women from low-SES backgrounds in the 1973 and adjacent birth cohorts had larger kinship networks due to the higher fertility rates of earlier generations (Andersson and Kolk 2023). Low-SES individuals, on average, have more aunts, uncles, and cousins relative to high-SES individuals of the same age. Thus, despite having lower incidence rates of kin bereavement until age 35, they effectively experience more kin deaths across the life course due to their larger kin networks, as well as a higher kin bereavement rate after age 35.

We further analyzed the socioeconomic gradient in FBR using income quartiles instead of educational attainment as the stratifying variable (Appendix B in the online supplement) and found similar patterns to those presented here.

Discussion

The importance of family bereavement as a driver of social change has long been recognized in demography, including its potential impact on individuals' demographic behavior (Montgomery 2000). Furthermore, bereavement has direct implications for the physical, social, and psychological well-being of the bereaved (Fletcher et al. 2013; Rogers et al. 2008; Sasson and Umberson 2014). Depending on the relationship to the bereaved, the loss of family members can also lead to changes in living arrangements, loss of financial security, and diminished social connectedness and support (Bonnet, Gobillon, and Laferrère 2010; Sohn 2023; Streeter 2020; Utz et al. 2014). Given the ubiquity of family bereavement as a human experience and how deeply it affects individuals, families, and communities, a comprehensive framework is needed for understanding how demographic processes shape the experience of bereavement across the life course.

Whereas social disparities in mortality are well documented, the demographic research literature has only recently begun to understand whether and how such disparities result in inequalities in exposure to bereavement. Socioeconomic inequalities in bereavement are especially difficult to predict because of the potentially countervailing effects of mortality differentials, on the one hand, and variation in kinship patterns, on the other. Finally, there is a need for theoretically informed measures that capture various aspects of bereavement. The framework proposed in this study addresses all of those issues, conceptualizing the burden of bereavement in relation to its intensity (cumulative exposure to the loss of family members by a given age), the timing during the life course at which the loss is experienced, and whether the loss was or could be anticipated. Moreover, our framework highlights

the ways in which inequalities in bereavement may be important drivers of social change by altering how individuals feel, think, and act (Sasson 2025).

Applying this framework to the 1973 Swedish birth cohort and their four-generation kin networks, we find that the burden of bereavement experienced by age 47 is higher among the low-education group by about one family member, on average, relative to the high-education group. Moreover, this excess burden of bereavement is driven primarily by the death of parents and kin of the same generation (siblings and cousins), and it tends to occur earlier in the life course. By contrast, high-SES individuals in this cohort were less likely to experience the death of parents, siblings, and children by the same age. The timing and anticipation effects of bereavement similarly vary by education and income levels. For instance, the odds of experiencing a death in the parental generation by age 18, or the death of kin in the same generation as *ego* by age 47, are 1.5–2 times higher in the lowest education level compared to the highest education level. Overall, we find support for our hypotheses that lower-SES groups experience a greater burden of bereavement, and that this burden is expressed in terms of the number of deaths experienced, when they are experienced across the life course, and in departing from the expected generational ordering. These findings held whether we measured SES using educational attainment or income, and for both men and women.

It may be tempting to equate inequalities in bereavement with inequalities in mortality. However, the burden of bereavement is also shaped by group differences in kinship patterns. Our decomposition analysis revealed that whereas lower-SES groups in Sweden were disadvantaged with respect to kin mortality, their kin were younger on average, which tended to offset the inequality in FBR. It is important to contextualize our findings. Sweden is characterized by low levels of mortality and fertility, a relatively small (albeit widening) socioeconomic gradient in mortality, and moderate levels of intergenerational mobility (Bengtsson et al. 2020; Gurzo et al. 2024; Ohlsson-Wijk et al. 2020). Despite these generally favorable conditions, by international standards, we observed a socioeconomic gradient in family bereavement. The same gradient may be steeper in other social contexts or historical periods—for example, where mortality inequalities are more pronounced or social mobility is lower—as well as across other social determinants, such as race and ethnicity.

Understanding inequalities in bereavement bears theoretical and practical implications. First, it is a first step toward understanding the full impact of mortality inequalities in society, which extends beyond the individuals who are at greater risk of dying. This impact is dependent on kin networks because the death of each individual is experienced by multiple family members. Second, inequalities in family bereavement may explain group differences in other social, psychological, and economic outcomes. Much of the research literature has focused on direct effects such as psychological distress and well-being. There may be other, more subtle effects, relating to how the experience of grief can alter one's time perspective by disrupting habitual expectations, future plans, and life narratives—i.e., how subjects make sense of their lives and the role they assign to their own agency in directing them (Shardlow 2022).

Changes in time perspective and future expectations can last long after the loss is experienced and shape subsequent social behavior and outcomes. For example, expectations regarding one's own survival are both shaped by the death of family members and impact social and economic decision-making, including when to retire from the labor force and when to claim social security benefits (Dormont et al. 2018; Hurd and McGarry 2002; Liu, Tsou, and Hammitt 2007). Furthermore, individuals whose time perspective focuses on the present tend to engage in risky behaviors, whereas those with longer planning horizons tend to adopt healthier behaviors and lifestyles (Adams 2009; Henson et al. 2006). These potential pathways linking exposure to family bereavements and population-level social, economic, and health outcomes are a promising direction for future research. Indeed, if mortality regimes operate as Durkheimian "social facts," that is, empirical regularities that are internalized by individuals and influence their behavior, then inequalities in bereavement, in addition to inequalities in mortality, may constitute a fundamental and overlooked form of disadvantage (Sasson 2025; Smith-Greenaway et al. 2025; Umberson et al. 2017).

To that end, and to spur the burgeoning research interest in a hitherto neglected field (Alburez-Gutierrez et al. 2022), this study has made several important contributions. First, it offered an empirical account, for the first time, of the burden of family bereavement across the life course using complete population data. Second, it documented a socioeconomic gradient in family bereavement, by education and income, as well as how that gradient is shaped by differences in kin mortality and differences in kinship patterns. Third, by adjudicating between intensity, timing, and anticipation of bereavement, this study proposed a novel framework for conceptualizing the burden of bereavement and measuring it using administrative data.

Limitations

This study is not without limitations. First, relying on administrative data means that we can only identify nominal kin relations. Although our analysis goes beyond prior research to cover extensive familial relations, including cousins, in-laws, and half-siblings, among others, it may nevertheless miss other types of meaningful social ties that contribute to the burden of bereavement (e.g., losing a close friend or a romantic partner prior to marriage or family formation). Furthermore, administrative data lack information about the quality of family relationships and how meaningful they are in the lives of affected individuals. Prior research has shown that the quality of relationships matters for individuals' health and well-being and may moderate psychological adjustment to the loss of family members (Carr 2020; Lee, Han, and Boerner 2022; Thomas, Liu, and Umberson 2017).

Second, we use *ego's* adult SES as our primary explanatory variable. Conditioning on adult SES is susceptible to reverse causation. For example, loss of kin early in life may affect *ego's* subsequent status attainment. It also conditions on *ego's* own survival to adulthood, which was very high for this cohort (approximately 97 percent survived to the end of the follow-up period). Furthermore, both SES and mortality are likely correlated, to varying degrees, among family members.

Our intention is not to make strong claims about the underlying causes of family bereavement, but merely to characterize the burden of bereavement across the life course and how it varies across socioeconomic strata in actual, rather than modeled, populations. We encourage future research to disentangle these complex relationships by finding new ways to conceptualize and operationalize SES across family networks, as well as to study the role of family heterogeneity in shaping the burden of bereavement. Comparative work will be needed, for example, to expound on variation in intergenerational transmission of SES (and demographic behavior) and its relationship to kinship structures and experiences of bereavement.

Third, under-coverage due to kin migration in our study was small (less than 5 percent and typically much lower) across all relationship types. Furthermore, we found no evidence of systematic SES differences in kin migration for parents and grandparents; among other kin relations, we found slight under-coverage among high-SES groups, with the exception of spouses and children when SES was measured using income. Thus, although the impact on our overall estimates of family bereavement by SES would be small, differences in population coverage may decrease socioeconomic disparities for some kin relations and increase them for others. Another potential source of bias is the number of kin born abroad, typically cousins, nieces, and nephews, if they are not reported in the Swedish register. If kin fertility and mortality patterns abroad, by SES, differ from those observed in Sweden, they may also impact our findings. Despite these limitations, our analysis is able to capture most kin relations for the 1973 Swedish birth cohort with minimal bias across socioeconomic strata. Accounting for kin residing abroad has become increasingly relevant for more recent birth cohorts, particularly in light of rising immigration to Sweden, and warrants greater attention in future research.

Furthermore, our empirical estimates can be useful for developing more sophisticated demographic microsimulations and mathematical models of kinship, both of which rely on strong assumptions about the independence of demographic processes (Goodman et al. 1974; Ruggles 1993). High-quality estimates of socioeconomic variability in bereavement, such as the ones presented here, can be used to benchmark and ultimately improve model-based approaches to bereavement (Calderón-Bernal et al. 2025).

Conclusion

This study highlights the importance of demographic processes in shaping the experience of bereavement, as well as how it differs across social groups. It proposes a comprehensive framework for understanding how mortality regimes are experienced by individuals embedded in their extended-family networks, with respect to the intensity, timing, and anticipation of kin loss across the life course. It is a first step toward linking group differences in mortality, from a population perspective, to how those differences impact individuals and their families. In doing so, we hope to motivate new research at the intersection of social stratification, mortality, and the demography of kinship.

Note

- ¹ The analysis was repeated without conditioning on survival to age 47, and the findings, shown in Appendix D (online supplement), did not differ substantively from those reported in the *Results* section.

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Acknowledgments: The authors are grateful to Deborah Carr, Yossi Harpaz, Efrat Herzberg, Rami Kaplan, Erez Maggor, Erez Marantz, and the editors for helpful comments.

Funding Statement: This study was funded by the European Union (ERC, DEM-LOSS, 101232065), the Academy of Finland under Grant 320162 for the INVEST research flagship, the FLUX project funded by the Strategic Research Council (decision number 345130), and the Swedish Research Council grant 2020-06426. Views and opinions expressed are those of the authors only and do not necessarily reflect those of the European Union or the European Research Council. Neither the European Union nor the granting authority can be held responsible for them.

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