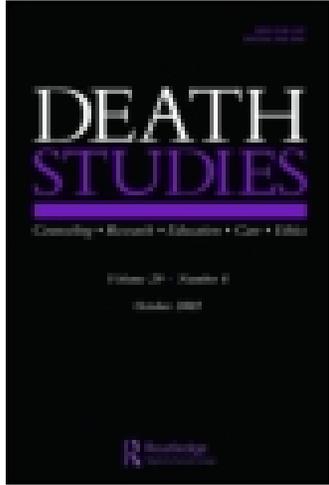


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# Child Death in the United States: Productivity and the Economic Burden of Parental Grief

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This article examines the economic consequences associated with the death of a child. The economic costs (funeral and medical expenses and productivity losses) of child death 6 months following the death were estimated based on 213 parents who had experienced the death of a child (usually unexpectedly and predominantly mothers). Findings suggest that productivity losses associated with child death comprise most of the costs and that the economic effects are substantial. Costs associated with on-the-job productivity losses (“presenteeism”) outweigh the costs associated with absenteeism. To date, no research has empirically measured both absenteeism and presenteeism following bereavement.

There is a substantial body of literature on the impact of bereavement on health outcomes and psychological well-being. Grief, particularly when traumatic, is associated with increased mortality risk and excess medical intervention (Stroebe, Schut, & Stroebe, 2007). To date, the majority of work on the impact of bereavement focuses on the psychological, psychosocial, and physiological impact of grief and its effects on interpersonal relationships. Parents whose children die are typically in their peak earning and productivity years. Thus, the economic impact of bereavement, especially regarding productivity losses, is another important arena, as some interruption in employment is common (Corden, Sainsbury, & Sloper, 2001). In the immediate aftermath

of a death, individuals may take employment leave; however, even after returning to work they may experience significant challenges in their ability to perform day-to-day tasks (Cacciatore, Lacasse, Lietz, & McPherson, 2014; Shalev, 2000). Such productivity losses certainly impact households experiencing grief. However, employers and society also incur costs associated with impaired cognitive functioning, and as a result impaired work performance, in the bereaved.

Still, the economic consequences of grief remain largely unexplored, a critical shortcoming in understanding the impact of bereavement on individuals, families, employers, and society. Very few published studies have examined the economic impact of a loved one’s death on the surviving friends and family, and those have focused on the impact on conjugal death (Corden, Hirst, & Nice, 2008). Methodological issues involved in estimating the economic burden of child death are substantial, and perhaps as a result few

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researchers have attempted to quantify them. Only two studies have attempted to do so and with very different approaches. One mixed-methods study conducted in Australia measured direct costs to families through surveys and interviews (Stebbins & Batrouney, 2007). Another more recent discussion paper uses a unique data set from Sweden to estimate the long-term employment impact of child death (van den Berg, Lundborg & Viktröm, 2012).

One of the challenges in assessing productivity losses associated with grief is monetizing costs. In economic theory, the output of a firm is a function of the stock of labor, capital, and technology. Inputs, such as the labor of an employee, are theorized to be compensated based on the value of that output as long as labor markets are sufficiently competitive. For instance, the human capital approach method of calculating productivity losses uses this fact to estimate the value of such losses due to illness or impairment, using wages or income as a value of an employee's time. Using this approach, an employee's wage effectively represents the additional revenue generated by the work of that employee.

Labor input has two components: quantity worked (the raw number of hours or days worked) and quality of work. Productivity losses due to bereavement can occur due to absenteeism (reduction in quantity of work) or presenteeism (reduction in quality of work while on the job; Johns, 2009). Quantifying such reduction in productivity can be done in a variety of ways. One review of productivity loss measures identified at least 17 different scales and questionnaires that attempt to quantify these losses (Mattke, Balakrishnan, Bergamo, & Newberry, 2007). Moreover, productivity losses associated with unpaid work, such as household production, should also be considered (Zhang, Bansback, & Anis, 2011). A number of studies (see Mattke et al., 2007, for a fairly comprehensive list) examine the extent of absenteeism and presenteeism from a variety of causes, but no prior research has examined these costs as a consequence of child death.

This study estimates the economic costs during the first 6 months following the death of a baby or child in the United States. This is the first attempt at creating such an estimate for the impact of bereavement that incorporates more immediate productivity losses, both explicit absenteeism costs and implicit presenteeism costs, associated with grief.

## METHOD

### Participants

The original survey contained data on 503 respondents, a 51.75% response rate, the characteristics of which are

described comprehensively elsewhere (Cacciatore et al., 2014). To avoid difficulties in international comparisons of productivity, households that resided outside of the United States or for whom location variables were missing were removed ( $n = 41$ ). In addition, we included only mothers or fathers of a child who died at least 6 months prior to the survey date. Also, miscarriages were excluded (losses prior to 20 completed gestational weeks), and these outcomes were then limited to only those in the dataset who lost a child from stillbirth to under the age of 19. We excluded cases with incomplete data on the pertinent economic variables ( $n = 180$ ). This left 252 cases for analysis (234 mothers).

Parent's ages at the time of the child's death ranged from 18 to 59 ( $M = 33.02$ ,  $SD = 8.10$ ), with the majority of parents in their twenties and thirties. Parents predominantly identified themselves as Caucasian ( $n = 214$ ), and others identified as Latino ( $n = 11$ ), Asian ( $n = 6$ ), mixed ( $n = 6$ ), African American ( $n = 2$ ), and Native American ( $n = 1$ ), or no ethnicity was given ( $n = 9$ ). Parents reported relatively high levels of education with most having at least some college or technical school ( $n = 92$ ), completed a bachelor's degree ( $n = 75$ ) or postgraduate education ( $n = 63$ ), with relatively fewer reporting a high school ( $n = 15$ ) or less than high school ( $n = 3$ ) education.

An average of 4.20 years had passed between the date of the child's death and completing the survey ( $SD = 3.68$ ). Major causes of death in the survey were stillbirth ( $n = 115$ ), sudden or terminal illnesses ( $n = 82$ ), and accidental death ( $n = 29$ ). Of live births, the average age of the child who had died was 5.62 years ( $SD = 8.76$ ).

### Materials

There are two issues when constructing a measure of productivity loss related to a health event: measuring the loss and monetizing the loss. For measuring the loss, measures that capture self-perceived impairment are appealing because they compare performance to a benchmark, particularly if a scaled performance measure is used. In addition, their tractability allows for the monetizing of losses. However, of the variety of such scales used, no studies examine the validity of such measures primarily because the productivity of workers is inherently difficult to quantify. A relatively straightforward approach using salary or wages to calculate the value of productivity is not just computationally intuitive but, provided labor markets are sufficiently competitive, is likely to provide at least a lower bound of the estimates of value of productivity losses (Mattke, 2007).

A variety of approaches have been used to assess productivity losses due to a health event, however no single approach has been validated. Both Mattke et al. (2007)

and Zhang (2011) concluded that productivity metrics are guided largely by the available data rather than the superiority of one approach over the others. For the purposes of this study, we focus on a human-capital cost approach that views the household as a productive unit (Liljas, 1998). In such an approach, production occurs both inside the household (e.g., child care, cooking, and cleaning) and outside the household (paid work). In this sense, productivity losses occur due to the inability to perform either.

Following the human capital approach, which uses income as a proxy for worker productivity, respondents indicated their household income at the time of the death within several categories of income in response to the question “What was your income at the time of the child’s death?”, with the option of nine income categories. The median income in each band was used to represent the household income of the respondent. As an estimate of the daily value of time at work, the median value of the income category reported was adjusted to constant 2011 dollars using the most commonly used measure of adjusting income for changes in the cost of living, the consumer price index CPI-U, for the year of the death and divided by 365 to obtain average the daily income. This value was used to monetize the days of productivity losses reported.

Costs associated with on-the-job productivity losses were estimated to be from two sources: formal leave and time away from work (absenteeism) and time at work that was unproductive (presenteeism). To determine the value of absenteeism, respondents were asked “How many leave/vacation days did you take (in number of days)?” during the 30 days and the 6 months immediately following the death. This time was then used to calculate the value, multiplying the days of leave by the average daily income.

To determine the value of presenteeism, respondents rated their ability to perform their jobs from 0% (not at all able to perform the job) to 100% (no impairment) at 30 days and at 6 months following the death of the child. The number of days worked during the 6-month period following the child’s death was determined by considering only nonleave days; for instance, if a respondent reported 10 days of leave in the 30 days following the child’s death, presenteeism costs were calculated based on the remaining 30 days. Then, for the remaining portion of the 6-month period, real daily household wage was weighted by the perceived impairment at 6 months to estimate productivity losses.

There are a wide variety of expenses that potentially could be associated with the death of a child. This study does not attempt to inventory all of these, but rather focuses on quantifying the categories of expense that are likely to be the most costly: funeral expenses, medical expenses, and productivity costs. To determine these

costs, respondents were asked to recall expenditures in three categories: (a) out-of-pocket spending on health care (specifically prescription drugs), (b) outside help received in the 30 days and 6 months following the death, and (c) funeral expenses. To determine funeral expenses, respondents were asked about out-of-pocket costs incurred related to memorial and burial or cremation services, querying how much the family spent for funeral, burial, crematory, and general final disposition expenses during the first 6 months after the loss. Respondents were also asked how many hours per week of outside domestic help they used during the 6 months after the loss; hours per week were valued at \$10 per hour to estimate the approximate cost to hire similar help. Respondents also reported the amount spend out-of-pocket on prescription drugs that they had been prescribed after the death of their child during the first 6 months after the child’s death. These three additional categories of expenses and costs were also adjusted using the CPI-U. All dollar amounts included in the study are adjusted and reported in constant 2011 dollars. The three categories of expenses, absenteeism, presenteeism, and other costs were then combined to create an estimate of the total costs associated with the death of a child at any age.

### Procedure

These analyses are part of a larger, mixed-methods study conducted online that was designed to investigate multiple components of the impact of child death. The survey was a cross-sectional online survey of participants in an online support forum that was conducted between June to October of 2010, with 5,995 individuals registered to use those forums. An invitation to participate with a link to the survey, which was conducted on the World Wide Web using Qualtrics software, was sent to active email addresses used to register to use the forum. The survey contained a combination of questions to collect information on mental health, family functioning, and resiliency as well as economic data. The survey used a skip-logic system, so that the participants’ questionnaire varied in length and content depending on meeting certain criteria, such as the circumstances of death of the child. As such, participants answered between 167–209 individual items, depending on the answers given.

## RESULTS

Table 1 presents estimates for the costs associated with the death of a child. Respondents reported marked decrease in their productivity, as measured by both absenteeism and presenteeism. The mean duration of

TABLE 1  
Economic Costs Associated With Child Death ( $n=252$ )

	<i>M (confidence interval)</i>	<i>10th percentile</i>	<i>25th percentile</i>	<i>50th percentile</i>	<i>75th percentile</i>	<i>90th percentile</i>
Funeral expenses <sup>a</sup>	\$2,419 (\$2,016–\$2823)	\$0	\$288	\$1,063	\$3,113	\$7,444
Outside help (total hours over 6 months)	46.869 (25.36–68.38)	0	0	0	0	100
Value of outside help <sup>a</sup>	\$444 (\$273–\$615)	\$0	\$0	\$0	\$138	\$1,055
Value of out-of-pocket prescription costs <sup>a</sup>	\$106 (\$46–\$166)	\$0	\$0	\$0	\$71	\$292
Total leave days (at 6 months)	41.09 (35.72–46.45)	0	10	30	55	100
Absenteeism value <sup>a</sup>	\$8,774 (\$7,795–\$10,444)	\$0	\$1,879	\$5,699	\$11,356	\$26,855
Ability to perform job at 30 days	30.43% (26.11%–34.74%)	0%	0%	17.5%	50%	90%
Ability to perform job at 6 months	61.996% (58.07%–65.91%)	0%	50%	70%	85%	100%
Presenteeism value <sup>a</sup>	\$9,638 (\$8,335–\$10,941)	\$0	\$1,815	\$6,881	\$13,828	\$22,289
Total costs <sup>a</sup> (all deaths)	\$21,332 (\$19,395–\$23,268)	\$4,352	\$9,272	\$17,513	\$31,963	\$41,034

<sup>a</sup>Rounded to the nearest whole dollar.

absenteeism during the 6 months following the death was 41.09 days ( $SD = 42.00$ , median = 30 days). In the initial 30 days, 45% of respondents were absentee during the entire period. There are no national standards for bereavement leave in the United States; however, a survey of human resources professionals in 2008 indicated that 73% of employers allow only 1 to 3 days of paid leave after the death of a child (Society for Human Resource Management, 2008). In addition, bereavement is not a qualifying condition under Family Medical Leave Act (United States Department of Labor, 2012).

The findings on presenteeism in Table 1 suggest that it is also a major cost in this sample. The average level of functioning at 30 days was 30.43% (median = 17.5%). For those who worked at all during the initial 30-day period, two thirds indicated that they were able to perform at less than half of their full capacity. Over time, respondents do report lower presenteeism: Self-reported ability to perform their job increased to an average of roughly 62% by 6 months (median = 70%). The results presented demonstrate that productivity costs are the largest component of the costs associated with child death. Although the per-household costs of absenteeism are high at an average of \$8,774, the costs associated with presenteeism are yet higher at an average of \$9,638. For both of these measures, the median is substantially smaller than the mean, reflecting several large salary outliers (see Figure 1). To give a more complete picture of the sample, the 10th, 25th, 50th, 75th, and 90th percentiles of costs are also given.

Additional costs associated with parental bereavement include funeral expenses, out-of-pocket prescription costs, and the value of household help. Average funeral expenses were \$2,419 (median = \$1,063). There is reason, however, to believe that this underestimates the economic burden of funeral expenses. It is not uncommon for funeral homes to offer discounted, below

cost, or even free services to families in the event of infant or child death. Indeed, 14.7% of respondents reported no final disposition expenses. In addition, the mean funeral expenses in the case of perinatal death were less than half of that for older children, reflecting that services for infants, in particular, are likely to be heavily discounted. Free or discounted services do not reflect an expense to the household, but the opportunity costs to the funeral home or service provider, and thus society at large, are not fully captured.

Households in the survey averaged 46.89 hr ( $SD = 159.28$ ) of outside help in the 6 months following the child's death. The majority of this time was in the immediate 30 days following a child's death. However, beyond the initial response of friends and families, the amount of outside help that families used was low, and thus the value of that time makes up a small proportion of the costs associated with the death.

Similarly, out-of-pocket expenses on prescription drug costs were small, an average of \$106 ( $SD = \$475.90$ ) in the 6 months following the death. Out-of-pocket spending here is likely to reflect the structure of the

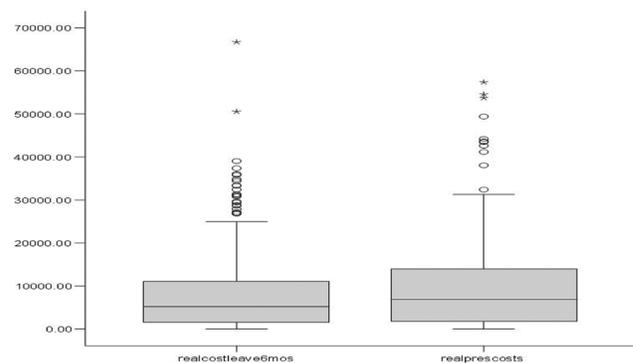


FIGURE 1 Box plot of leave and presenteeism costs.

cost-sharing requirements of an individual or family's insurance coverage rather than the full purchasing price. The majority (93.7%) indicated that they were covered by some form of insurance at the time of death (although 10% also reported that they lost insurance coverage as a direct result of the child's death); however, responses indicated that many respondents were unclear about the details of the coverage such as deductibles and co-pays. This suggests that further research on this issue may require more direct measures of healthcare costs, such as chart review or claims data, to determine such costs more completely.

Total costs associated with the death of a child are, on average, \$21,332 ( $SD = \$15,516$ ) per household (median = \$17,513 per household). There are several considerations when considering these numbers. First, the salaries in the sample are high relative to the general population, and this will lead to an overestimate in productivity costs, particularly in stillbirths which are typically higher in households with lower socioeconomic status. However, these estimates are essentially stochastic: These assume a one-time productivity shock to a household in the year that the death occurs, with no aftereffect on productivity or labor market outcomes. Recent research suggests that there are long-term implications on labor market outcomes for households that experience the death of a child (van den Berg, Lundborg, & Viktröm 2012).

## DISCUSSION

This study examined the economic costs that are associated with the death of a child. The findings in this sample suggest that the costs associated with grief are substantial—and, importantly, the costs associated with presenteeism outweigh the costs associated with absenteeism. Productivity costs associated with parental bereavement are significant and comprise the bulk of the economic burden of grief. Because these costs, unlike funeral and other immediate expenses, are likely to have long-term labor market effects, particular attention needs to be given to these costs. Returning to work following bereavement leave is likely to be driven as much by economic concerns as a readiness to return to workplace. However, returning to work does not necessarily imply a readiness to return or a return to full functioning. Explicit costs such as funeral expenses and cost of leaves of absence are significant, but the opportunity costs associated with on-the-job productivity losses are a substantial and often overlooked aspect of grief and bereavement. While a variety of measures and instruments to determine productivity losses associated with illness exist, there is no consensus on a single, valid measure. In using a simplified approach,

however, such estimates can more easily be included in surveys investigating broader issues and contribute to a better understanding on both the private and societal impact of grief.

The costs included in this survey capture the 6 months immediately following the death of a child. However, many of the true costs may continue well into the future. As described in van den Berg, Lundborg, and Viktröm (2012), there may be long-term employment consequences following the death of a child, particularly in the form of lower income. In addition to the need for further exploration and validation of measures of presenteeism, future work could explore the causal mechanisms of the lower income. For instance, does decreased productivity persist? Are there in effect labor market "penalties" for a brief period of decreased productivity? Or, do parents alter the nature of their labor market participation following the death of a child as a result of different priorities, and that is reflected through a lower wage? Although explored in this article or explicitly through the Traumatic Experiences and Resiliency Study (TEARS) survey, a number of respondents indicated in an open response section that supported all three of these postulations.

We recruited respondents from an online support group for bereaved parents, and this group may be unique and may not be representative of the bereaved population at large. Relative to the national demographics of the United States, our sample is highly educated, White, and affluent. The data are retrospective, subjective self-reported, and participants may have under- or overevaluated the issue of presenteeism in particular. The use of a single-item indicator for use as a dependent variable is less than ideal and could have impact on the accuracy of our estimates. Many respondents who participated in the broader TEARS survey did not answer questions related to productivity, resulting in a substantial missing data; our use of complete-case analyses could lead to biased estimates.

Ideally, medical expenses would include a more robust set of additional expenditures. There are two major barriers to such an assessment. First, with child death these expenditures would be more difficult to directly attribute to the death—for instance, in the case of a stillborn child many of the expenses involved would be related to the infant's birth even if the death had not occurred. Moreover, because of the wide variety of healthcare financing mechanisms, especially the prevalence of third-party payers, individuals are not always aware of actual healthcare costs.

The results of this unique study, perhaps, lay the groundwork for further exploration into the economic burden of child death in society. This tragedy affects individuals, families (Cacciatore et al., in press), communities, and the economic system at large. There

may exist an imperative for improved social support from the various systems such as the business community for mourning parents considering the acute and long-term ramifications of child death.

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