

How parental mortality changes with the age of the child

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1 Background

Previous research investigated several different aspects of the relationship between having a child and parental mortality. These aspects refer to maternal mortality connected to the birth of a child (e.g. Menken et al. (2003) and Lane (2004)), the long-term costs of reproduction (e.g. McArdle et al. (2006) and Doblhammer (2000)), heterogeneity represented by differences in the health status among female populations (e.g. (Hyppönen et al., 2005)), as well as social characteristics such as social support that might affect parental mortality differently (e.g. Smith et al. (2002)).

Most of the studies cited above and in fact most of the existing research regarding the effect of children on parental mortality is mainly focused on mothers. Investigations in men are few and limited, such as the study of Dekker and Schouten (1993) who investigated the effect of life time reproduction of men on mortality from coronary heart disease, rather than all-cause mortality. Although their results were not statistically significant, the authors found a higher mortality for men with four or more children. This effect was somewhat lower than that of women (Dekker and Schouten, 1993).

An aspect of research that was neglected until now is the age of the child. If children have an effect on parental mortality it is likely that it is changing with the age of the child because the demands and requests of children are changing as they grow up. Regarding the effect of the age of the youngest child, Martikainen (1995) found that all-cause mortality is lowest for mothers who have a child that is younger than two years. For this age group, age-standardized mortality is only 66 percent of the mortality of women with children that are 16 or older. Starting from this low level, mortality increases with the age of the youngest child, but even mothers with a child that is 16 years and older have a decreased mortality as compared to women who do not have any children living in the household. As this aspect was not the main focus of his paper Martikainen (1995) does not give any presumptions about possible explanations for this finding. The study is also not able to investigate how the effect of children's age was influenced by other variables, for example parental characteristics such as education, socioeconomic status, and marital status. However, it can be concluded that there are some indications that

the effect is changing substantially with age but virtually nothing is known on the causes of this effect and how it is connected to other aspects of parenthood.

2 Research Questions and Hypotheses

In this section I develop some hypotheses about the relationship between the age of the child and risk of dying of the parents. In my model, exposure to risk of mortality depends on an individual's own resources, those of their spouse, their children, and their gender. Previous limitations are addressed by using detailed Danish register data in a time-dependent framework using Hazard regression.

Regarding the impact of children on parental mortality it is not clear whether there is an effect and how this effect might differ between the sexes. It is likely that such an effect on parental survival is substantial but changing with the age of the child. I will examine two conflicting hypotheses.

The first hypothesis is based on the findings of Martikainen (1995) and assumes that having a young child reduces parental mortality because the demands of parenthood force them to switch to a healthier lifestyle and because young parents are a health selected subgroup. If the child is growing older the parental mortality could probably rise again, due to the excess mortality in old age as stated by the cost of reproduction hypothesis. A second hypothesis that I would like to test is that mortality of parents with younger offsprings is probably increased because the stress of child care is remarkably higher. Due to the advantageous effects of social support, an older child could even be a protective factor and thus increase parental survival.

It is likely that this effect also differs by sex. Given that men are generally less involved into parenting than women, even in an egalitarian welfare state as Denmark, I assume that the impact of age of the youngest child is much less pronounced in men.

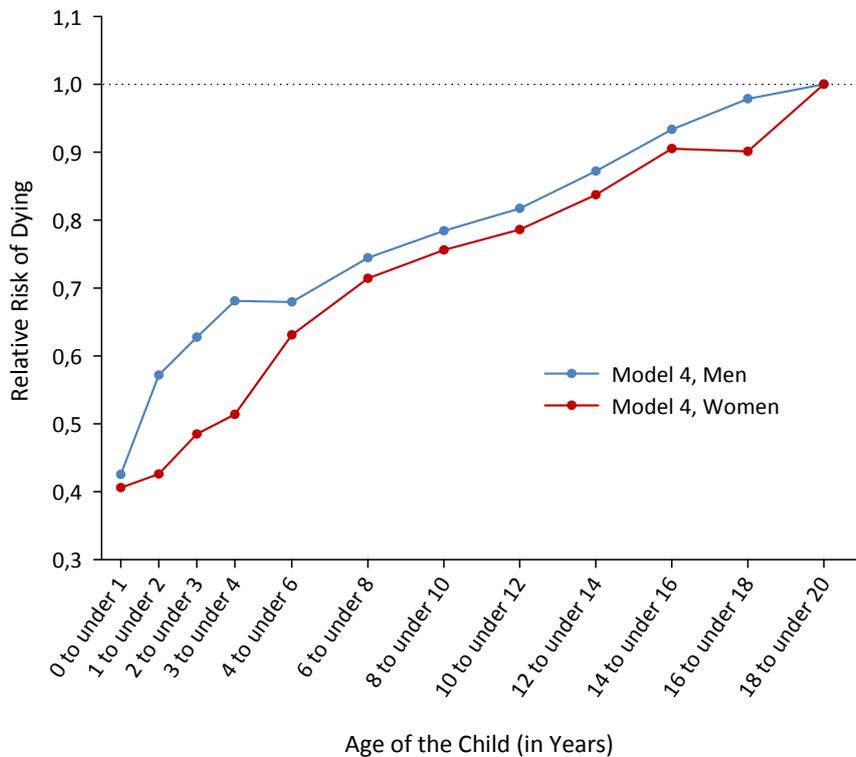
3 Data and Methods

I extend previous research of this area in several aspects. First, I apply a longitudinal approach using Danish Register data and hazard regression models to examine the age and time-varying influences of having children on parents' mortality. Hazard regression, also called Event-History analysis or Survival analysis, represents the most suitable analytical framework for studying the time-to-failure distribution of events of individuals over their life course. Danish registers are considered as a source of detailed and very exact information with a very low percentage of missing data. The information collected for every individual are events such as birth, death, migration, and marital status, as well as a variety of very detailed demographic background information such as occupation, education, income and health. The base population of my analysis consists of all people aged 18–65 living in Denmark between 01 January 1990 and 31 December 2005.

4 Results

I found that there is a distinct mortality pattern by the age of the youngest child, which supports my first hypothesis and the findings in Martikainen (1995). Adjusting for age and a variety of demographic background variables the results presented in Figure 1 show that lowest mortality risks were found for men and women who are parents of a newborn. The risk of dying increases slowly with age of the child for both sexes. The mortality advantage is slightly less pronounced in men over the whole age range studied. Only few of the introduced covariates altered this pattern. The most important exception is the type of *living arrangement*.

Figure 1: Model 9: Relative Risk of Dying by the Age of the Youngest Child



Source: Own calculations based on Danish register data

In further models I investigated the interaction between the most important control variable *living arrangement* and the *age of the youngest child*. It was found that married individuals experience the lowest overall mortality but the lowest relative decrease of mortality when being the parent of young children. For other types of living arrangements (e.g. cohabiters, singles) mortality decrease is much more pronounced when having a young child.

Additional models for causes of death showed that parental mortality is increasing with age of the youngest child for all causes. Suicide and mortality from external causes were found to be reduced for parents of younger children but not for parents of children older than 10.

5 Discussion

Parents of small children experience a substantial mortality advantage. My results suggest that behavioral changes, selection, and probably some unobserved protective effects of having a young child contribute to this pattern. My study extends previous research by using a longitudinal approach on individual-level data that covered the whole Danish population over a 15-year period. For the first time the effects of having a young child on parental mortality were investigated for men and women separately. The findings for men imply that non-pregnancy related pathways are the most important causes of mortality differentials. In a second step I aim to introduce health variables to account for health selection effects.

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