

# **Cause-specific Mortality by Partnership status in England and Wales 2001-2011: A competing risk approach**

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Extended abstract:

This paper extends previous analysis on overall mortality to cause-specific mortality by partnership status using a competing risk approach.

Research on mortality by partnership status shows that married individuals have lower mortality rates than singles (never married), divorced (or separated) and widowed. Recent studies further include cohabitation into their analysis. Overall mortality difference between married and non-married individuals seems to have increased over the last decades (Martikainen et al. 2005, Murphy et al. 2007). Further, controlling for cohabitants and examining non-married non-cohabiting groups show even larger mortality differences, especially at younger ages (Franke and Kulu 2016).

The mortality/health advantage of married in comparison to non-married individuals, previously was believe to be either due to health selection into marriage or due to protective effect of marriage. Recent studies suggest that there could be a selection as well as a protection effect (Cheung 2000, Franke and Kulu 2015, Guner et al. 2014). With declining mortality rates over the last decades, mortality gaps increased. Mortality gaps between host and migrant population (Harding et al. 2008) or married and non-married individuals (Martikainen et al. 2005), are believed to increase due to a faster mortality decline of the reference group (host population, married individuals).

Data

We use the ONS Longitudinal Survey (ONS LS), which is a one percent sample of the population of England and Wales. For our conduction of a survival analysis for the population aged 30-85 between the 2001 census and the 2011 census, the ONS LS provides us with socio-demographic and socio-economic characteristics from the 2001 census, linked with yearly death and embarkation events. Our analysis was conducted for men and women separately, beginning with the whole sample and then separately for the age groups 30 – 49 years (76,368 men and 79,408 women); 50-64 years (47,665 men and 49,076 women); and 65-85 years (34,028 men and 43,222 women).

## Methods

By using Cox proportional hazard models in a competing risk approach each individual is at risk of multiple causes of death. Thus, the estimates of our control variables, like ethnicity, education or socio-economic status, are similar to those from the over-all cause analysis. This enables us to show not only how the risk of a given cause for a specific marital status relates to the risk of the other marital statuses of this cause, but also to any marital status of another cause.

Using the Cox proportional hazard model, the mortality risk of an individual is the product of the baseline mortality risk and a set of covariates. We conducted our analysis in century-month which provides us with the entry-age and duration of each individual. The advantage of the Cox model is that we don't have to define the baseline function and therefore we do not restrict the time and age variable to a specific model.

For all our models our first covariate is the interaction between Marital Status and Cause. Marital Status is hereby defined as 'Married', 'Single', 'Divorced (and separated)', and 'Widowed'. The model that takes cohabitation into account partnership status is defined as 'Married', 'Single', 'Divorced (and separated)', 'Widowed' and 'Cohabiting'. We examine hereby cohabitation not directly, but by comparison of the non-marital groups with and without cohabitants.

### Additional Covariates of the Cox proportional hazard model

Our control covariates are as follows: Country of Birth ('England & Wales', 'Scotland or Northern Ireland', and 'Others'); Ethnicity ('White', 'White mixed', 'Asian', 'Black', 'Chinese' and 'Other'); Education ('No qualification', 'Low qualification', 'Medium qualification', 'High qualification', and 'Missing'); and Socio-economic status (Higher managerial and professional occupations, Lower managerial and professional occupations, Intermediate occupations (clerical, sales, service), Small employers and own account workers, Lower supervisory and technical occupations, Semi-routine occupations, and Routine occupations, and Others). We also include in the analysis two variables on living arrangements: Household size ('1 person', '2 persons', '3 persons', '4 persons', '5 and more persons' and 'Unknown') and Dependent Children ('No children', 'Dependent children', 'Non-dependent children', 'Not applicable').

## Results

We find that mortality rates are lower for married men and women of all age-groups for circulatory, respiratory, alcohol-related and other-digestive diseases, as well as for accident. Those differences decline with age as well as with respect to the circulatory disease risk of married people. The majority of higher digestive disease risk at younger ages is due to alcohol consumption. We could not find a higher cancer mortality risk for not married persons, with exception of divorced. The nervous system disease risk is highest for single men and women as well as divorced women, but disappears at old age. The mortality risk of non-married groups is usually higher, once cohabitants have been excluded. Those differences decrease with age as does to number of cohabiting people.

## Conclusion

The study shows that overall mortality differences are due to mortality differences in all diseases, but cancer. If those differences are due to behavioural choices, like driving too fast, inappropriate clothing on cold days and unhealthy eating, or if it is due to the better accumulation of wealth and resources of married people, stays open for discussion.

## References:

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