

The effect of Marital Status on Life Expectancy: Is Cohabitation as Protective as Marriage?

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Motivation - Marital Status

- Evidence of considerable changes in partnership status and living arrangements.
 - Increasing divorce rates.
 - Growing proportion of individuals classified as never married, divorced and widowed are in fact living with a partner.
- Adherence to a particular marital-specific subgroup is closely related to exposures affecting mortality patterns.
 - Smoking, drinking, visits to the doctor, living conditions, work environment, labour force participation, etc.
- Increasingly important to understand the effects of these trends on changes in health in later life and mortality.
 - In particular, how the individual's living arrangements affect end-of-life medical spending.

Motivation - Marital Status

- The advantages in life expectancy enjoyed by married individuals compared to singles have been well documented in the literature.
 - Single, divorced and widowed individuals have higher mortality than married individuals.
 - Hu and Goldman (1990), Johnson et. al. (2000), and Murphy (2007).
- These differences are usually more pronounced for men than women.
- The lower mortality for married individuals is explained by two main reasons.
 - The effects of selection of low-risk individuals into the marriage state.
 - The protective effects of marriage.

Motivation - Marital Status

- Although the topic of married versus single have been extensively studied, questions about the effect of cohabitation remain open.
- Calculate marital-specific specific mortality rates.
 - Among the singles (divorced, widowed, and never married) we also account for cohabitation status in the calculations of life expectancy.
- Take into account transitions in living arrangements throughout an individual's life course.
 - Rather than simply focusing at one stage of the life course - death.

Data

- Currently, most research is based on death certificate data.
- Use a very unique and extensive population register data provided by Statistic Denmark.
 - Track each individual in the population through their Central Person Register number for the time period 1980 – 2012.
- Individual specific data contains information (among others) on age, gender, year, time of death, marital and cohabitating status.
 - Identify an individual's spouse or partner.

Indexation into subgroups

- The analysis is based on marital specific central death rates:

$$m^i(t, x) = \frac{d^i(t, x)}{E^i(t, x)}$$

where $d(x, t)$ is the death count and $E(x, t)$ is exposure-to-risk.

- $i =$ married, widower, divorced, never married, cohabitating-widower, cohabitating-divorced, cohabitating-never married.
- We allow individuals to move between the seven different states until the year prior to death.
 - Avoid large movements towards the single groups in the year of death for married and cohabitating individuals.
- Unequal sized groups - could potential create a problem.

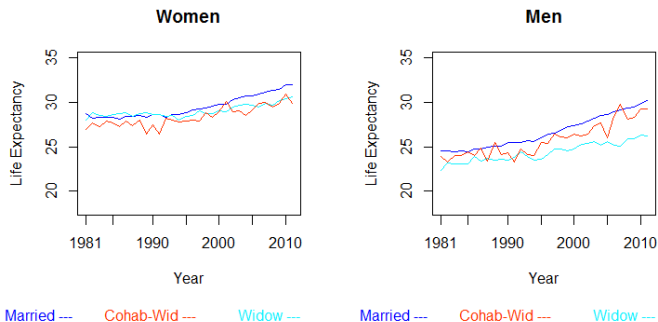
Marital Status

- Which type of single individuals suffers the most in terms of life expectancy?
 - To what extent can cohabitation protect them from early death?
- We calculate the period life expectancies at age x in calendar year t for each of the seven groups:

$$\bar{e}_x^\uparrow(t) = \int_{\xi \geq 0} \exp\left(-\int_0^\xi \mu_{x+\eta}(t) d\eta\right) d\xi = \frac{1 - \exp(-\mu_x(t))}{\mu_x(t)} + \sum_{k \geq 1} \left[\left(\prod_{j=0}^{k-1} \exp(-\mu_{x+j}(t)) \right) \frac{1 - \exp(-\mu_{x+k}(t))}{\mu_{x+k}(t)} \right].$$

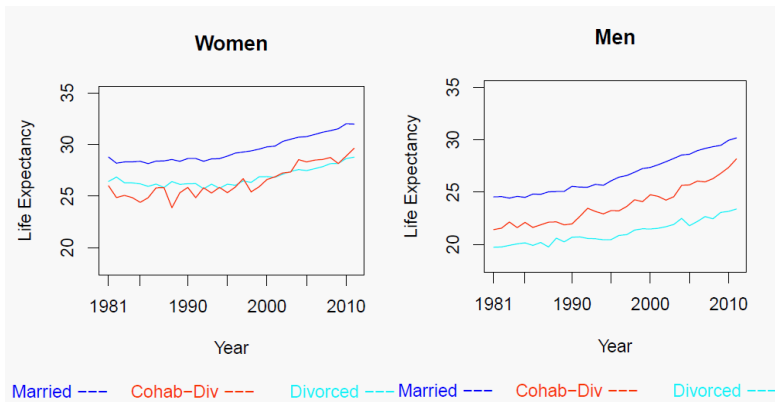
- Only display results for age 50 today.

Married vs Widower and Cohabiting Widower



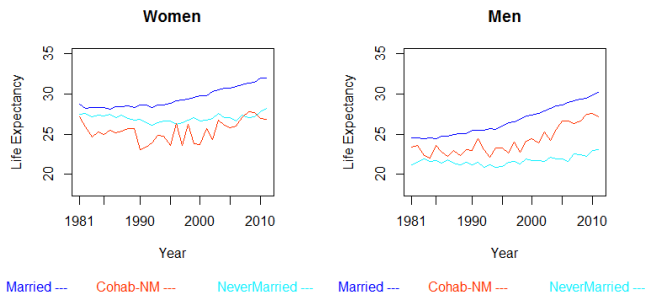
- For females, there are limited differences between mortality rates for married, widowers, and cohabiting widows.
- For males, the protective effect from cohabitation almost as strong as marriage.

Married vs Divorced and Cohabiting Divorced Individuals



- We see a clear gap in life expectancy for both men and women, more pronounced for males.
 - Gap for males are increasing across time - more than five years.
- The protective effect from cohabitation is only observed for males.

Married vs Never Married and Cohabiting Never Married



- Do *not* confirm that the older age never-married women have as good health than their married counterparts (Goldman et al. 1995).
- Increasing gap for both men and women.
- Potential negative effect on female life expectancy from cohabiting as a never married women.

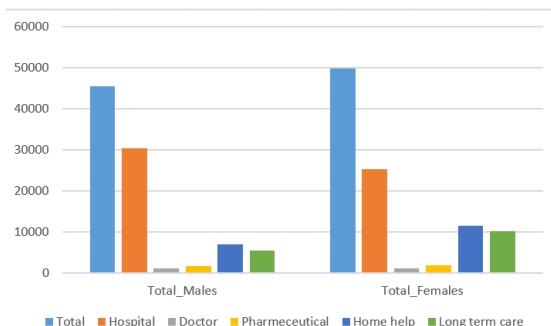
Medical Spending

- Interested in determining health expenditures as individuals approach the time of death.
 - Calculate medical spending in the year of death.
- However, medical spending in the year of death does not represent a full year of expenses.
 - Some individuals die in the beginning of the year, and so only have a few months of expenses.
 - Others die toward the end of the year, and have a full year of expenses.

Medical Spending

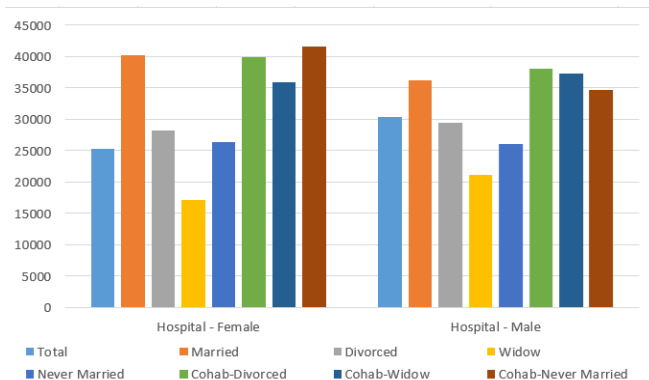
- We therefore exploit the daily nature of the register data to track the 2012 death cohort over their last 12 months prior to death (covering the years 2011 and 2012) and calculate their health costs.
 - Recall: The register data contain individual level information on the entire Danish population.
- The data allow us to link information on demographics such as age, gender, and marital status to information from health care registers such as
 - Individual hospitalization
 - Use of primary health care such as GP and specialists
 - Drug purchases
 - Use of Home help and Long-term care.

Gender-specific Medical Spending by Expenditure



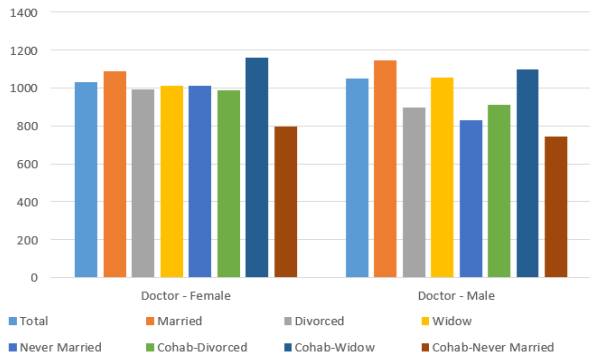
- The true cost over the 12 months prior to death is \$45,461 for males and \$49,750 for females, nearly twelve times higher than average yearly medical spending for the whole population.
- Hospital expenditures account for 67% of the total cost for males and 51% for females.
- Higher spending on home help and long term care for women.

Medical Spending - Hospital



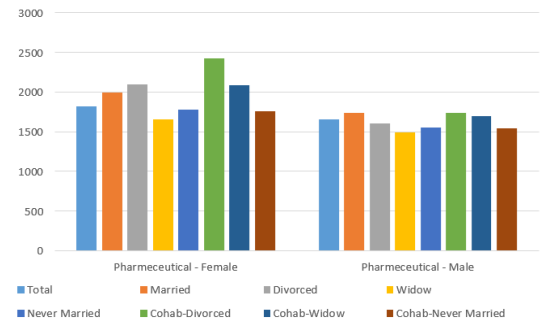
- Significant differences in hospital spending between the seven groups.
 - Married and cohabitating individuals spend the most.
 - Widower spend the least - more likely to be old (Thus, might receive part of the treatment in the retirement home).

Medical Spending - Doctor



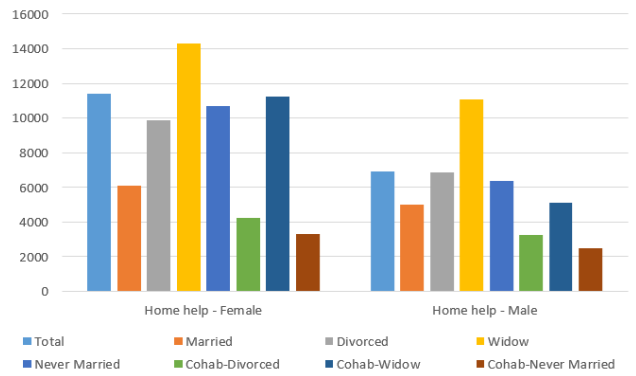
- More or less even distribution across the seven groups.
- Higher usage of GP-services among married men.
- Cohabiting widower account for the highest share of GP spending at the total level.

Medical Spending - Pharmaceutical



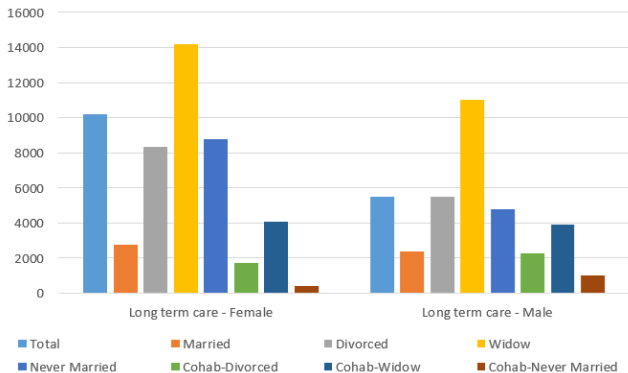
- Consumption of prescription drugs is generally higher for women that are divorced (especially those who are cohabitating).
 - Females that are married or cohabitating widower have above average prescription drugs spending as well.
- Next step is to analyse which type of drugs is being consumed by the different groups.

Medical Spending - Home Help



- Home care is delivered either in people's own home or in residential housing for the elderly: Personal care, practical help, medical help by a nurse, etc.
- Cost are not equally distributed. Very high for widower.
- Clear protective effect from marriage or cohabitation (not cohab-widower).

Medical Spending - Long Term Care



- All types of care for residents in nursing homes and some residential homes for the elderly.
- Non-cohabitating singles have the highest cost.
- Again we see the clear reduction in cost for having someone to care for you.

Concluding Remarks

- In terms of life expectancy you will gain the highest protective effect from marriage.
- All types of single men consistently benefit from living with someone.
 - Women do not gain anything in terms of life expectancy from cohabitation.
 - Seem to have the opposite effect for the never-married women.
- Significant differences in health cost across the different marital groups.
 - Cohabitation seems to reduce medical spending on home help and long-term care.