Marriage breakdown and mortality patterns. Evidence from the Turin Longitudinal Study

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Introduction and background

The link between marital status, family structure and health is one of the most established associations in the scientific literature. Several researches have shown that lower mortality rates occur for married or cohabitant individuals when compared to non-married groups, with an increasing excesses of mortality for widows, single, divorced and separated persons (e.g., Sbarra, Law, & Portley 2011; Koball et al. 2010, Manzoli et al. 2007, Lund et al. 2002; Hu & Goldman 1990). Studies on the causes of these marital status differentials in mortality provided two major explanations for the phenomena. The first mechanism is related to the so called beneficial effect of marriage on health. As a crucial source of social integration, marriage offers a protected environment to individuals in couple that endorses greater longevity (Anson 1989; Kobrin and Hendershot 1977; Press 2009). The second explanation is that healthier individuals are selected into marriage, so that there is predominance of healthy people getting married and unhealthy people getting divorced or widowed (Goldman 1993; Goldman, Korenman, & Weinstein 1995). In addition, the stress of marriage dissolution, whether due to separation or death of a partner, is also identified as an important factor to expose individuals to premature death (Brockmann & Klein 2004; Hemstrom 1996; Kalmijn 2010; Kalmijn & Broese Van Groenou 2005).

In light of the dynamic changes to the Italian family, where more and more marital unions break down into separation and divorce, the current marital status baseline information has become less informative about marital exposure and associated risks of mortality. Indeed, although a relationship between marital status and mortality has been strongly recognized, research on the association among marital transitions and health outcomes over time remains largely fragmented (Mencarini, Cisotto, and Ferracin 2017). To our knowledge, no investigations have been done in Italy, especially because of the non-availability of data sets which make possible to study the consequences of divorce within a longitudinal framework at a national level and the poor collection of vital statistics on divorce.

Here, using data from the Turin Longitudinal Study, we examine the influence of marital changes on mortality, disaggregating the short and long-term effect of marital disruption caused by separation on mortality risks in the city of Turin. In particular, we analyze the impact of marital transition on mortality: moving from married to separated. This life-course orientation takes into account the patterns of stability and changes within marital status, considering as marital trajectories several aggregated components: marital status, timing of the transition, and in particular, time since marital disruption. The use of census-linked data allows us to measure the consequences of marital transitions in chronological detail, exploring the importance of negative experiences and their effects on mortality. We hypothesize that marital trajectories, more than current marital status, are powerful predictors in understanding how couple dissolution events affect later mortality. Following the existing literature, we also examine many of the factors that can mediate the relation between marital life course and mortality.

Data and method

Data come from the Turin Longitudinal Study (TLS), a record-linkage study containing integrated information for all the residents of the Italian city of Turin from census data, vital statistics registry and health system archives. Individuals who were married or cohabiting and resident in Turin at the 1991 census were identified and followed until the end of 2018. Thus, the dataset includes only individuals that were married at baseline. During the observation period, their marital status and mortality were observed. Data from official vital statistics and the following censuses provide the real change in marital status. Instead, administrative data on residential movements, both inside and outside the city of Turin, allow us to infer the couples' approximate date of separation or divorce, or widowhood.

Here we present the result of the analysis of marital dissolution by separation or divorce, leaving to future research the analysis of widowhood.

We had 394.688 individuals, of which 33.740 (8.5%) are men and women who experienced separation during the follow up. The data are right censored (either at end of the follow-up or at emigration from the city of Turin) and left truncated (as individuals' age at start of the follow up differed). We considered age as the time process of the analysis and used survival analysis techniques. We modeled the process of time to death with a Cox proportional hazard model.

Marital status (married or separated) was modeled dynamically as time varying covariate: each individual, at each age, contributes to the appropriate age specific risk set, according to his or her age specific marital status at that age. The resulting survival curves, therefore, reflect the change in marital status over the life course of the individuals in the sample. The analysis was carried out separately for men and women. To adjust for potential birth-cohort variation and differences in exposure to marital history and mortality risks we controlled for birth cohort by creating a five-category cohort variable: cohorts born from 1889 to 1924, 1925 to 1934, 1935 to 1944, 1945 to 1954, 1955 to 1974 (from the first and last birth year included in the sample). Socioeconomic status and its resources were controlled by the educational level (university, upper secondary, lower secondary, primary, no education) and occupational status (employed, unemployed, retired, student or other and housewife (only for women)). The year of marriage and the age at marriage are also included as continuous variables.

The dataset contains also information on causes of death. We plan to include this information to extend the analysis in a second stage.

First results and discussion

Figure 1 shows the survival curves according to the marital status. The estimated median survival time (age at which 50% of the fictious cohort would be still alive) is higher for individuals who experienced a marital dissolution, for both men and women. However, looking only at the survival curve does not allow capturing the heterogeneity behind the average survival patterns by marital status, which hides complex interactions with the socioeconomic controls.

Table 1 reports the effect of a marital dissolution on mortality, controlling for a set of independent variables. According to previous findings, individuals who experience a separation during the follow-up period have a higher hazard ratio, or mortality risk, than the married reference group. The hazard ratio compares two groups. A ratio of 1.06 indicates that the mortality rate of one group (separated men) is 6% higher than that of the reference group (still married men). The same value is 50% if we compare separated women to women who remain married with the same spouse during the follow-up period.

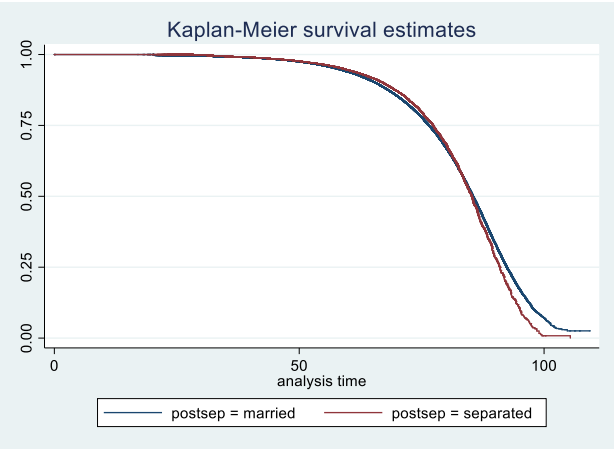

Figure 1. Survival curves of married and separated men and women and total population (SLT data)
Note: figure does not reflect controls

All independent variables contribute significantly to the model and reflect our expectations. The educational gradient is clear in our models and a distinct trend emerge. In general, mortality is particularly high among lower educated people, so that to poorer education levels correspond higher mortality risks. As an example, men without any education report 45% higher risk of dying compare to men with a university degree or higher. Similarly, non-educated women report 34% higher mortality risk compare to higher educated women. No difference emerge between women with a university or a higher secondary education degree. Indeed, according to the cohorts of birth included in our study, we do not expect large variance since higher secondary school degree could be considered as a high level of education for the older women included in the analysis. Similar gender patterns emerge also by occupation status, although the effects report lower magnitude for women compare to men. Unemployed men are at a higher risk of experiencing a shorter lifespan compare to employed men by 64%, while for women the risk increases by 19%. Besides, being retired increases the hazard ratio by 78% and 22% for men and women respectively. The age at marriage, which is included in the model as a continuous year variable, states that every annual increase in marriage age rises the risk of death by 2% for men and by 6% for women. In contrast, a protective effect emerge for what concern the year of marriage, so that the more recent is the marriage the lower is the mortality risk of both men (2%) and women (5%).

Using high-quality register data, that cover the entire population of the Italian city of Turin over almost three decades, our first results show that previously married individuals who separated during the follow up period have higher mortality risks than those who stayed married with the same spouse. When all control variables are introduced in the models, the excess mortality is higher for women and lowest for men. However, selection and protection processes preceding and following marriage dissolution would need to be fully explored as a potential source of bias in the general results. In addition, in our analysis we focus on individuals' first separation, so that important transitions in marital status during the follow-up period are not distinguished in the study (e.g. married individuals who have divorced and who re-married at a later time). Thus, we cannot currently depict whether the observed negative effect is noticeable after remarriage or cohabitation with a new partner.

Further developments of the study will involve additional confounding and moderating variables to be included in the analysis such as the area of birth and family structure. Likewise, we will introduce in the models a set of interaction terms to clarify if the general pattern holds in all socioeconomic groups included in the study. Separated analysis will be run for the sub-sample of separated individuals in order to better understand the role of specific controls such as marriage duration, time since marital disruption, family

typology, children and occupational status at the time of disruption. In the next stage, we plan to use the cause of death information as a specific outcome, and hospital discharge information to control for pre-existing conditions or general frailty of individuals, prior to the union dissolution.

Table 1. Cox regression hazard model estimates of the all-cause mortality risk for separated individuals relative to married. Men and women observed 1991-2018. Hazard ratios and 95% confidence intervals.

	Men		**Women**	
	HR	95% CI	HR	95% CI
Separation	1.06*	1.00-1.11	1.50***	1.40-1.60
Female				
Education				
University	1.00		1.00	
Higher secondary	1.10***	1.06-1.14	1.08	0.99-1.17
Lower secondary	1.22***	1.18-1.26	1.15***	1.07-1.23
Primary	1.33***	1.29-1.37	1.18***	1.10-1.27
None	1.45***	1.39-1.51	1.34***	1.24-1.45
Occupational status				
Employed	1.00		1.00	
Unemployed	1.64***	1.54-1.74	1.19**	1.05-1.35
Housewife	*n.c.*	*n.c.*	1.17***	1.13-1.22
Retired	1.18***	1.15-1.21	1.22***	1.07-1.18
Others	1.35***	1.30-1.40	1.33***	1.23-1.44
Year of marriage	0.98***	0.98-0.98	0.95***	0.95-0.96
Age at marriage	1.02***	1.02-1.03	1.06***	1.06-1.06

Significance level: *p<0.05, **p<0.01, ***p<0.001
Note: model controls for cohort of birth; *n.c.* not calculable, too few observations

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