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Abstract

A rich literature documents that spousal bereavement, having lost a spouse or partner through death, is associated with decrements in health and excess mortality risk which peaks immediately after the loss but often persist over time. Yet, the reach of the consequences of the so-called widowhood or bereavement effect tends to differ between social groups (i.e. by age, gender, socioeconomic status) and across different contexts. Despite their relevance, the role of these factors as moderators of the association between spousal death and own mortality risk remains under-researched. Moreover, the intersection of those factors is rarely assessed in the literature on the widowhood effect. Knowledge is particularly scarce for Italy, despite it being a rapidly ageing society where the phenomenon of widowhood affects a substantial portion of the population. Using very recent Italian register social security data 2014-2022 from the National Institute of Social Security (INPS) and logistic regression, the study is the first to map the heterogeneity of the bereavement effect on mortality in the population of Italian old-age pensioners.

Keywords: bereavement; mortality; life expectancy; gender; socioeconomic status

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Introduction

Bereavement, having lost a significant person (e.g. spouse, child, parent, or relative) through death, is one of the most disruptive events individuals could experience in their life course. Spousal bereavement, or widowhood, is the marital condition in which a marriage ends because one of the two spouses has died (Arosio, 2019; Bennet, 2008). In contemporary ageing societies, the prevalence of the phenomenon has steadily increased. The United Nations estimates widows to represent 258 million people globally and according to the Italian Institute of Statistics (ISTAT) estimates, almost 4.4 million individuals in Italy were widowed in 2023 (7.4% of the Italian population). Its relevance increases and its characteristics change also because of other socio-demographic processes taking place in contemporary (especially western) societies: increasing longevity, decreasing fertility and changing families' structures. Longevity implies that widowhood happens later and later in life and has increasingly become an elderly issue. With life expectancy increasing steadily over the past century, spousal loss overwhelmingly falls on older adults. As such, widowhood has important consequences for the living arrangements and the physical, economic and psychological well-being of the elderly (Carr and Bodnar-Deren, 2009). Increasing longevity means also that many elderlies will spend more time in the marital status of widows compared to the past. Furthermore, gender differences in longevity imply that the burden of widowhood falls more frequently on women than men, because they live longer and because they tend to marry older men. Finally, declining fertility and changing family structures means older adults will have a smaller and smaller kin network to support them during old age, which may be particularly detrimental for the widowed (Carr and Bodnar-Deren, 2009).

A rich literature documents that bereavement is associated with decrements in physical and mental health and increased risk of mortality (see among others: Cox and Ford 1964, Parkes et al. 1969, Kaprio et al. 1987, Mendes de Leon et al. 1993, Mineau et al. 2002, Korenman et al. 1997, and Lillard andWaite 1995; Jagger and Sutton 1991, Schaefer et al. 1995, Martikainen and Valkonen 1996, Hart et al. 2007, Espinosa and Evans 2008 and for reviews and meta-analyses see Manzoli et al. 2007; Stroebe et al. 2007; for Moon et al. 2011 ; Shor et al. 2012; Ennis and Majid, 2021; VanWinkle and Konechni, 2022). Moreover, many studies demonstrate that this association, often named *bereavement effect* or *widowhood effect*, is not due to selection processes, namely shared partners' characteristics, or health-related background and lifestyles, but it is causal (Boyle and colleagues 2011; Vignes 2017).

The widowhood effect on mortality is substantial in magnitude. Net of a variety of factors, Schaefer et al. (1995) and Kaprio et al. (1987) found that mortality rates double for the surviving spouse in the first year after the death of their spouse. For the elderly (age 65 or above), the relative increase in mortality in widowed people compared to married people has been estimated to amount to 11% (Manzoli et al., 2007). The widowhood effect varies over time since the loss of the spouse. It is strongest early after the loss, with mortality risk being highest in the first six months following spousal loss (Lichtenstein et al., 1998; Manor and Eisenbach, 2003; Parkes et al 1969; Martikainen and Valkonen 1996, Moon et al. 2011, 2014; van den Berg et al. 2011; Shah et al. 2012). These results point to a short-term, grief-related mechanism linking spousal death to an increased risk of own death. Yet, widowhood extends throughout the subsequent life course of the involved individuals, until they possibly change status again by remarrying (Lopata, 1973; Stroebe and Schut, 1999, 2005; Wade and Pevalin, 2004). Several studies, in fact, point to substantial long-term effects of widowhood (Boyle et al. 2011; Shor et al., 2012).

Excess mortality among the widowed has been demonstrated to exist in a wide variety of age groups, socioeconomic levels, countries and cultures. Yet, the reach of the consequences of bereavement tend to differ between socio-demographic groups. Overall, the literature points to greater bereavement effects in the groups with low baseline mortality risk (i.e. younger or highly educated individuals). Yet, gender constitute the exception, with men suffering both a higher baseline mortality risk compared to women, and larger widowhood effects. Despite the increasing prevalence and its disruptive consequences, the phenomenon of spousal bereavement and its consequences are relatively under-researched compared to other life events, like job loss or divorce. Moreover, despite their relevance, the role of moderating factors and their intersection remains still under-researched, especially in the Italian context (Arosio, 2019; Listorti et al., 2024). To the best of our knowledge, this is in fact the first study to map the heterogeneity of the bereavement effect on surviving spouse's mortality risk among Italian pensioners by gender, region of residence, age and socioeconomic status.

Background

Background theories

According to the crisis model, the decreased health of the surviving spouse is caused by the stress generated by the transition from being married to widowed. Initially, the traumatic experience of spousal loss, generating feelings of despair, grief, helplessness or loneliness, produces somatic symptoms and worsening mental and physical conditions (Stroebe et al., 2007). Later on, the necessity to adapt to new life circumstances and social roles, and to transition into a new lifestyle may generate additional health-deteriorating stress (Vignes, 2017).

The social role model (Durkheim, [1897] 1951) focuses instead more broadly on the health-related advantages of being married. Marriage facilitates social integration, economic wellbeing, emotional support and discourages unhealthy behavior. In this view, divorce or widowhood would produce similarly negative effects on the surviving spouse, linked to the loss of such health-related advantages of marriage (Booth and Amato, 1991).

Finally, analyzing bereavement through the lenses of the life course approach means conceptualizing it as a process that unfolds over time, embedded in a historical and social context, and contextualized into a given life course stage (Ensel et al., 1996; Williams and Umberson, 2004; Carr and Utz 2001; Dupre et al. 2009; Liu 2012; Liu and Umberson 2008; Sasson and Umberson 2014). In this perspective, widowhood is not a dichotomous sudden change of status but is better represented by a long-term process that often starts before bereavement itself, with the health deterioration of the later deceased spouse[1]; it culminates with the spouse's death but also represents an event that triggers long-term changes in the health trajectory of the surviving spouse. The bereavement effect needs to be contextualized in the specific life course stage in which it happens, a stage that may be characterized by high or low degree of vulnerability (e.g. cumulative effect of different stressors arising from financial difficulties or parenting responsibilities; or a life stage characterized by low social support like the more senile ages).

[1] Few studies have examined changes that occur before spousal bereavement, finding higher levels of depression and anxiety, and worse self-reported health for spouses nearing bereavement (Williams et al. 2008).

Empirical evidence and Mechanisms

The widowhood effect on mortality is substantial in magnitude. Net of a variety of factors, Schaefer et al. (1995) and Kaprio et al. (1987) found that mortality rates double for the surviving spouse in the first year after the death of their spouse. For the elderly (age 65 or above), the relative increase in mortality in widowed people compared to married people has been estimated to amount to 11% (Manzoli et al., 2007). To the best of the authors' knowledge, there is only one recent study, Listorti et al. (2024), assessing the widowhood effect in Italy, specifically in a sample of initially married couple between 2001 and 2013 in the city of Turin. The authors find, depending on age and gender, an increased hazard of death of the surviving spouse in the year following bereavement between 14% among women and 47% among men (statistically significant for men over age 75 and for women under age 75).

The magnitude explaining the widowhood effect vary depending on the time elapsed since the death of the spouse. Most studies show that the bereavement effect is strongest right after the loss, with mortality risk being highest in the first six months following spousal loss (Lichtenstein et al., 1998; Manor and Eisenbach, 2003; Parkes et al 1969; Martikainen and Valkonen 1996, Moon et al. 2011, 2014; van den Berg et al. 2011; Shah et al. 2012). These results point to the relevance of the grief-related mechanism linking spousal death to an increased risk of own death. Yet, widowhood does not end with the mourning period - the phase that immediately follows the event of the spouse's death and requires the effort to overcome the moment of their passing - but extends throughout the subsequent life course of the bereaved (Lopata, 1973; Stroebe and Schut, 1999, 2005; Wade and Pevalin, 2004). Several studies, in fact, point to effects of widowhood persisting even after 10 or 20 years (Boyle et al. 2011; Shor et al., 2012).

The possible mechanisms explaining increased mortality after bereavement are numerous and the evidence is highly context- and study-dependent. Some studies have found differential mortality risk by cause of spousal death (Martikainen and Valkonen 1996; Parkes et al. 1969; Shah et al. 2012) while others have found a generalized increase in mortality risk for the surviving spouse (Boyle et al, 2011; Elwert and Christakis 2008 a,b; Espinosa and Evans 2008). Mortality among survivors has been shown in some studies to increase due to external causes (i.e. suicides or accidents), acute events (e.g. acute myocardial infarction) or chronic diseases (Elwert and Christakis, 2008). Yet, other studies suggest that the increased mortality risk for the surviving spouse is not driven by incidents or worsening chronic health conditions

following spousal loss (Shah et al., 2012). Other studies have demonstrated that widowhood is associated with altered eating behavior (e.g. protein consumption) which at older ages may substantially affect health trajectories (Fagundes and Wu, 2021; Pasqualini et al., 2022; Vesnaver et al., 2016). What seems to be an important common driver in all these findings is the reduced self-care, neglect of own-needs, and increased risk behavior that leads to the increase in mortality risk of the surviving spouse (Blanner et al., 2020). In fact, more recent studies focusing on the wellbeing trajectories of widows compared to married point to time spent alone and loneliness as important mechanisms explaining the strong deterioration of widow's wellbeing after spousal death (Adena et al., 2023).

Socio-demographic and Socioeconomic heterogeneity

Mortality risks and life expectancy are neither uniformly nor randomly distributed in societies (Donkin et al., 2002; Lallo and Raitano, 2018). Apart from the recognized fact that women live longer than men, an extensive literature has demonstrated that health and longevity are unequally distributed among sociodemographic and socioeconomic groups, and that inequalities have increased over time (Dowd et al., 2011; Friel and Marmot, 2011; Kunst et al., 2004; Marmot, 2015; Shaw et al., 2000). Health and life expectancy disparities are strongly intertwined with geographical boundaries and contextual characteristics (Smith and Easterlow, 2005). High socioeconomic status individuals display lower mortality risk over the life course and live longer compared to individuals with low income, low levels of education, or leaving in poor areas[2] (Belloni et al., 2013; Cannari and D'Alessio, 2016; Costa et al., 2014; Lallo and Raitano, 2018).

Excess mortality among the widowed has been demonstrated to exist in a wide variety of age groups, socioeconomic levels, countries and cultures. Yet, as much as for baseline mortality risk, the reach of the consequences of bereavement tend to differ between socio-demographic groups and to depend on a range of risk factors influencing individuals' vulnerability (Lopata 1996; Boyle et al. 2011). Such risk factors include (among others) circumstances of spousal death, age- or gender-related frailty, previous medical disorders, intra- and inter-personal factors, ways of coping, socioeconomic status living conditions, or social relations.

[2] Due to direct effects on health, and indirect social environment and social network effects (Cornwell and Qu, 2023), the type of occupation also play an important role in shaping the social gradient of health and mortality (Marmot et al 2006).

Most studies have found larger widowhood effect for younger individuals compared to the elderly (Moon et al. 2011; Shor et al. 2012), for healthier individuals compared to those with previous illnesses (Boyle et al. 2011) and for those with higher socioeconomic status compared to those coming from a deprived background (Boyle et al. 2011; Schaefer et al., 1995; Shah et al. 2012). Spousal deaths at younger ages are more traumatic events given their exceptionality; hence they may leave particularly profound scars on the bereaved spouse (Martikainen and Valkonen, 1996). Also due to the rarity of the event, young widows/ers are less likely to encounter other individuals in the same situation that could provide social support. In addition, elderly adults may have accumulated greater financial resources compared to their younger counterparts, leaving them in better financial conditions in case of widowhood. Finally, compared to the elderly, bereaved young adults may need to bear the additional burden of single parenthood (Lusyne et al., 2009; Kraus and Lilienfeld, 1959).

In terms of gender, while only few studies have found no differences (Schaefer et al., 1995, Kaprio et al., 1987, Manor and Eisenbach, 2003), most prior research finds greater mortality risk for bereaved men than women[3], despite males' baseline mortality being higher than females' (Mineau et al. 2002, Lillard and Waite 1995). Hypothesized mechanisms explaining men's greater vulnerability relate to their fewer social relationships, their lower health literacy and greater difficulties in taking care of themselves after their spouse's death. In addition, due to men's greater likelihood of remarrying, observed widowed men, especially later after widowhood are negatively selected, which may explain part of the greater bereavement effect on men (Stroebe and Stroebe, 1987; Lee et al., 2001).

Differences in the effect of widowhood by socioeconomic status can be explained by both individual and environmental factors. On the one hand, individuals with low socioeconomic status are acknowledged to be more likely to experience stressful life events, and to be less endowed with the (social, emotional, and financial) resources useful to alleviate the consequences of such stressful events (Kessler and Clearly, 1980). On the other hand, due to assortative mating high socioeconomic status individuals tend to be married with similarly high socioeconomic individuals, therefore they have more to lose in case of spousal bereavement because they lose their spouse's greater endowment of resources. Moreover, recent studies find lower social support among the better off after widowhood (Lim-Soh, 2022).

[3] Some studies have argued that the relationship is causal for both genders (Boyle et al, 2011; Lichtenstein et al. 1998; Martikainen and Valkonen 1996) while others found a causal effect only among men (Elwert and Christakis 2008a,b; Espinosa and Evans 2008).

Previous studies have also show that gender and socioeconomic status interact, namely that the mechanisms that link socioeconomic status to bereavement effects may play out differently among widowed and widowers. For instance, men and women of high status similarly have large networks compared to low socioeconomic individuals but differ in term of the kind of network they have (Ajrouch et al. 2005). Also, the returns to marriage differ by socioeconomic status and gender: men with higher status are more likely, at least in older generations, to leave in specialized couples, to be married with women endowed of high social and economic capital, and health literacy (Dabergott, 2022) and, therefore, to lose more in case of wife's deaths compared to low socioeconomic status men (Halleröd, 2013). This may not be the same for women who tend to suffer more from the financial consequences of widowhood, therefore, higher socioeconomic status may be more protective for them after bereavement. To our knowledge only one study addressed the interaction between different factors in the widowhood effect. Dabergott (2022) investigated the sex-by-SES interplay and found that while for men the socioeconomic gradient is positive – the bereavement effect increases with both education and income – for women there is no discernible difference across educational levels and a negative income gradient – the bereavement effect is smaller at higher income levels. Dabergott (2022) ascribes women's null or negative income gradient in bereavement effects to the narrower income distribution among women and to the selection effects of women into high income, high education and high labor market participation, making high income women particularly endowed of resources useful to better deal with the consequences of widowhood. The study is conducted in Sweden, a front-runner country in terms of gender equality, therefore, results may differ from what we will find in the Italian context.

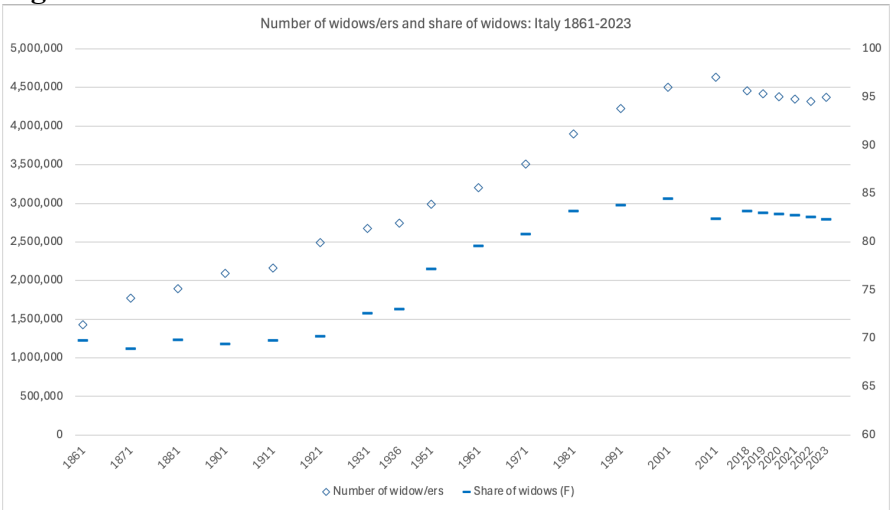
The Italian context

Providing an overview of the prevalence of the phenomenon of widowhood in Italy, Arosio (2019) shows that - in parallel with the rise in longevity of the Italian population - the number and share of widows and widowers in the Italian population has been increasing from the late nineteenth century to 2011. At the time of the last available census, in 2011, around 7.8% of the Italian population was classified as widow or widowers. Figure 1 adds to Arosio's estimates the most recent data from the Italian National Institute of Statistics (ISTAT) showing the presence of 4,369,053 widows in 2023 (a share around 7.4% of the Italian population), together with the share of women among the widowed. In 2023, around 82.3% of the widowed were women. This happens because, first, women's life expectancy at birth is higher than men's

(85.2 and 81.1 years old respectively in 2023, ISTAT). Therefore, wives tend to live longer than their husbands. Second, women tend to marry older men which also increases the probability that women outlive their male spouse. Finally, widowers are more likely than widows to remarry, therefore, men more frequently than women leave their civil status of widowers to re-enter the married status.

Widowhood is also a phenomenon that predominantly concerns the elderly and, due to improving longevity, increasingly so over time. According to ISTAT's most recent estimates, compared to 1991, when among the total 4,223,775 widowed in Italy, 74.1% were aged 65 or more and 27.6% were aged 80 or more, in 2018, among the 4,454,640 widowed individuals in Italy, 87.3% were 65 or older and 49.5% were 80 or more.

Figure 1: Absolute number of widows/ers and share of women: Italy 1861-2023

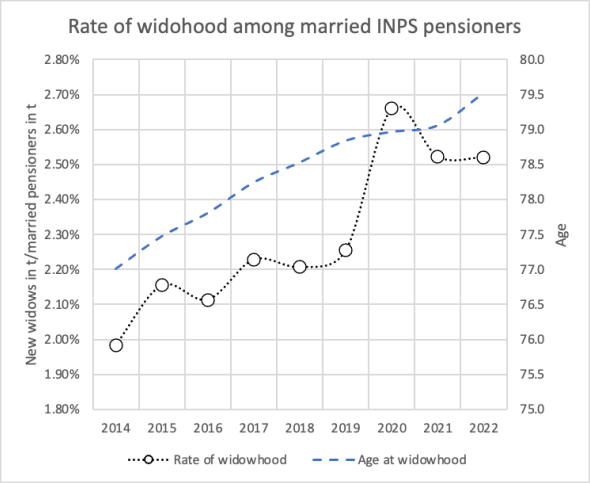


Source: Elaboration of the authors based on ISTAT data (dati.istat.it).

It appears crucial therefore to investigate the phenomenon of widowhood and its consequences among the elderly. However, longitudinal data that allow to evaluate the impact of life course events on mortality risks among the elderly are rare especially in the Italian context (Lallo and Raitano, 2018). In the current study, in order to investigate the widowhood effect among the elderly, we leverage on the data on pensioners from the Italian Institute of Social Security (INPS).

Figure 2 shows the increasing rate of widowhood and age at widowhood among Italian married old-age INPS pensioners in the past decade. The former increased from less than 2% in 2014 to more than 2.5% in 2022 (with a peak slightly below 2.7% in 2020 due to Covid-19 deaths) while the average age at widowhood increased from 77 to 79.5 years old.

Figure 2: Rate and Age at Widowhood among old-age pensioners in Italy (2014-2022)



Source: Elaboration of the authors based on INPS 2024 data.

Data and method

As mentioned, for the study, we use the Italian register data from the National Institute of Social Security (INPS). In particular, we use the 2014-2022 Casellario delle pensioni (d.p.r. 31 dicembre 1971, n. 1388) which keeps track of all recipients of pension benefits disbursed by INPS, providing information about the date at which the pension flow started, the date at which the pension flow ended (if this occurs by the end of 2022), and the type of pension benefit provided (old age employees or self-employed; or other type of funds, e.g. social pension or disability pension). Major schemes managed by INPS cover private-sector employees and self-employed workers, including craftsmen, shopkeepers, and farmers. Except for special funds in very specific sectors of public interest (e.g. energy commodities, transportation, custom duties, national railways), public employees and high-profile freelance professionals (e.g., architects, lawyers) are covered, instead, by non INPS schemes, therefore, they are excluded from our analyses. This register is merged with the Anagrafica dataset which provides pensioners' basic demographic information including gender, year of birth, year of death, region of residence. Register data are accurate and cover the entire population which allows to dig into group heterogeneities, but they suffer from a lack of richness in terms of available variables. For instance, we do not have information regarding educational level and other family background characteristics.

The study population includes Italian old-age pensioners[4,5] who are either married or widowed between 1.1.2014 and 31.12.2022 (9.432.882 individuals). A substantial part of these is and remain married for the entire observed period (6.374.668 individuals, 67.6%). The remaining observed pensioners are either widowed since the start of the observation period (1.852.517, 19.6%) or become widowed during the observation period (1.205.697, 12.8%). We identify marriages and widowhood either because we know the partner's id, or we know that the individuals get a survivor's pension. When we know the partner's id, we also know their date of death, while for those who get the survivor's pension we assign as year of death the year the individual starts perceiving the pension. Individuals who did not report the partner's ID and who did not leave a survivor's pension remain excluded from our study population[6].

We use logistic regression models to predict the mortality risk of Italian old-age pensioners depending on whether they experience widowhood or not. First, the study explores the overall difference in mortality risk between constantly married and widowed pensioners, comparing men and women. Second, we investigate the role of heterogeneities by age, region of residence and family income in the different mortality risk between married and widowed. Finally, we investigate the role of time since spouse's deaths in shaping mortality risks differentiating between less than one year since becoming widowed or more. In a first set of logistic regression models, run separately by gender, the dependent variable is the estimated probability of death ($q(x)$) and the main explanatory variable is the civil status of married or widowed. Additional independent variables are age (categorical from 61 to 100), the type of pension the individual receives (employees, self-employed or other type of funds), socioeconomic status proxied with household income quintiles, region of residence (categorical, 20 regions), and year (categorical from 2014 to 2022). Region and year are included in interaction in the model to control for the very different mortality intensity of the Covid-19 pandemic by region. Household income quintiles are based on the sum of both spouses' after-tax pensions (discounted to 2012 levels) and are calculated by gender, province, and pension scheme[7]. The first quintile includes

[4] Early retirement pensions are included, pensioners living abroad and pensioners under international conventions are excluded. In addition, former invalidity allowance pensioners who had their benefit converted into an old-age pension due to having reached the age/contribution requirements were separated from the old-age pensioners population and the corresponding positions in the invalidity allowance holders' archive were realigned.

[5] The managements examined are the following: FPLD, CDCM, Artisans, Merchants, Transport, Telephones, Electricity, INPDAI, State Railways, IPOST, Tax Collectors, Duties, Gas, Flight, pensions liquidated under the cumulation and totalization system.

[6] These amount to around1.6 million individuals, of which around 13% are married in the observed period and 12% are widowed, meaning that there are around 400,000 individuals that should be included in our study population but could not be included due to the missing information regarding the partner eventual death.

[7] If the deceased was retired, we use the original pension, not the survivor's pension; if the deceased was still working, we apply a 70% substitution rate to simulate the pension amount.

pensioners with average income around 1,097euros per month for men and 1,133euros for women; the fifth quintile includes pensioners with average income around 4,042euros per month for men and 3,735euros for women. Civil status (married or widowed) is then interacted with age, region of residence, and family income quintiles to detect heterogenous effects of widowhood on mortality. Table A.1 presents descriptive statistics.

In a second set of logistic regression models the main explanatory variable is the time since becoming widowed distinguishing between those who have been widowed for less than 1 year, and those who experienced bereavement more than 1 year earlier. We did not find significant differences from the second to later years after bereavement, so we did not distinguish between them. Control variables remain the same as in the set of models by civil status. We present, graphically, predicted relative risks of death by civil status, and then by age groups, regions, household income quintiles and time since widowhood, based on models with full controls. Furthermore, we use the estimated probabilities of death by age in each group and the corresponding 2019 life table values to calculate the differential in the residual life expectancy at age 67 by civil status and time since bereavement, and by gender, region of residence, socioeconomic status.

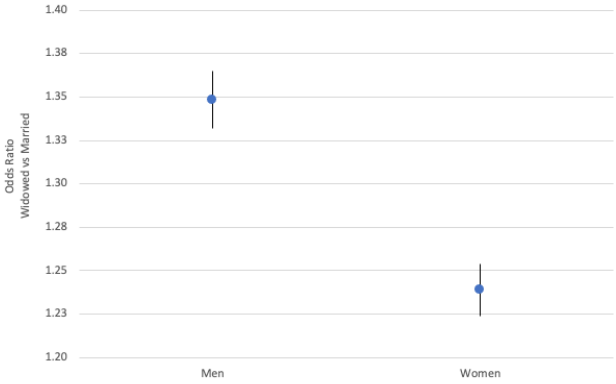
Results

Results show that, in the modal class of the age group 75-80 years old, the mortality risk for men is around 35% greater among widowed compared to married men, while for women the widowhood effect is lower, around 24% (Fig. 3). For the year 2019, this excess risk of mortality among bereaved compared to married individuals translates into a difference in a greater residual life expectancy at age 67 among the latter of 1.7 years among men and 1.2 years among women. Figure 4 shows, however, that national averages mask substantial territorial heterogeneity. The difference in the residual life expectancy among widowers and married man varies from 1.1 years in Molise to 2.1 years in Valle d'Aosta and among widows and married women from 0.6 in Molise to 1.6 in Veneto.

Among both men and women, the excess mortality risk after bereavement declines with age, although differences across age groups are much more pronounced among men (Fig. 5). The mortality risk of widowers is 54% higher in the age group 65-69 while it is only 12% higher among the 95 and above. Among widows the bereavement effect peaks at around 29% among the aged 70-74 but is around 20% among widows aged 95 and over. This finding is in line with

previous studies conducted on other context showing that the widowhood effect is lower among individuals that already had an elevated mortality risk before experiencing bereavement.

Figure 3: Mortality risk Widowed vs Married

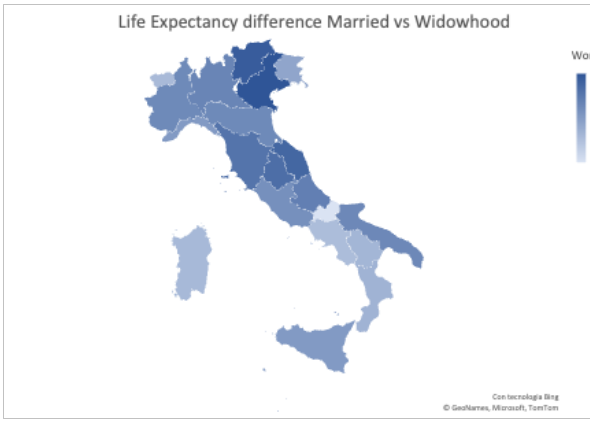


Source: Elaboration of the authors based on INPS 2024 data.

Figure 4: Life expectancy at age 67 Married-Widowed differentials by region.

Men

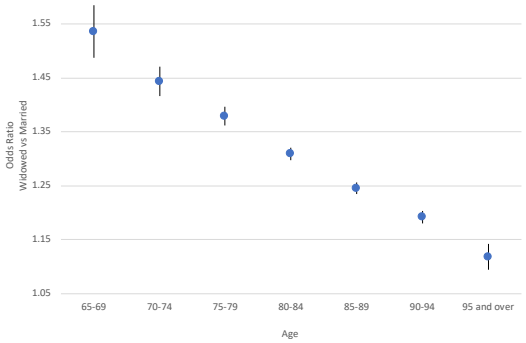
Women



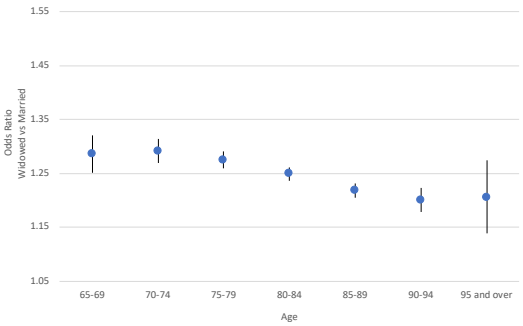
Source: Elaboration of the authors based on INPS 2024 data.

Figure 5: Mortality risk of married over widowed by age.

Men



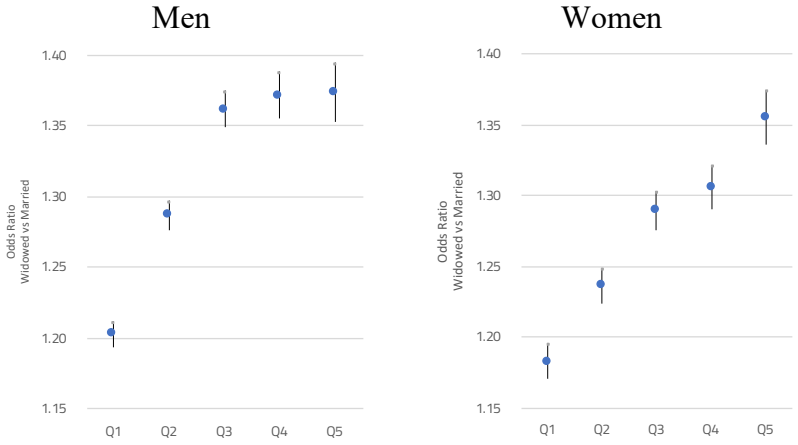
Women



Source: Elaboration of the authors based on INPS 2024 data.

Figure 6 illustrates the bereavement effect across households' income quintiles. The relative risk of mortality after widowhood increases with income for both men and women but the gradient differs across gender. The risk increases steeply among widowers relatively to married man going from the first income quintile (+20%) to the third (+36%) but then only a marginal increase in mortality risk is observed from the third to the two highest income quintiles (+37%). For women, an almost linear increase in relative risk of mortality after widowhood is observed across income quintiles (from +18% in the first quintile to +36% in the fifth quintile). Figure 7 translates these differences in relative risk of mortality in terms of residual life expectancy at age 67 in the different groups. As expected, in all income and marital status groups, women display greater residual life expectancy and smaller married-widow differences compared to men. Among married men and women, as also expected, we find a life expectancy socioeconomic premium: men and women in higher income quintiles enjoy a longer residual life expectancy at age 67 (from 17.3 years to live to 20.2 among men and from 21.3 years to 23.3 among women). All in all, the group with the lowest residual life expectancy among women (widowed with very low income, 20.6 years) has still a greater life expectancy that the group with highest life expectancy among men (married man in highest income quintile, 20.2 years).

Figure 6: Mortality risk of widowed over married and income quintiles.



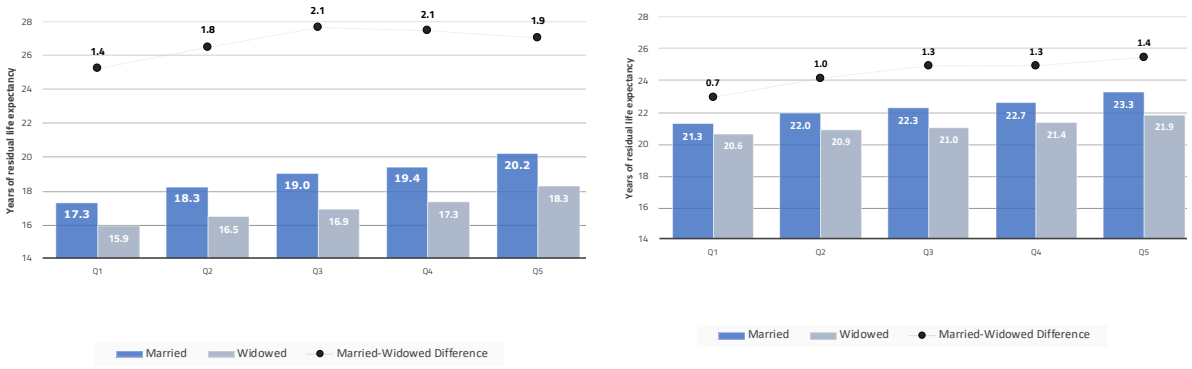
Source: Elaboration of the authors based on INPS 2024 data.

All in all, income differences in longevity are present among both married and widowed individuals but the heterogeneities by socioeconomic status in the former group are larger than those found among widows. Socioeconomic resources affect mortality more weakly among individuals who experienced spousal death compared to married individuals. The bereavement effect across socioeconomic groups partially counterbalances the socioeconomic premium both

men and women enjoy. Men married-widowers difference in life expectancy is minimal in the first income quintile (1.4 years difference) and maximal in the mid-to-high income quintiles (2.1 years in Q3-Q4 and 1.9 in Q5). Similarly, among women, the married-widow difference in life expectancy is minimal in the first income quintile (0.7 years difference) and maximal in the highest income quintile (1.4 in Q5).

Figure 7: Married and widowed Life expectancy at age 67 by income quintiles and Married-widowed differential in life expectancy by income quintiles. Men and Women.

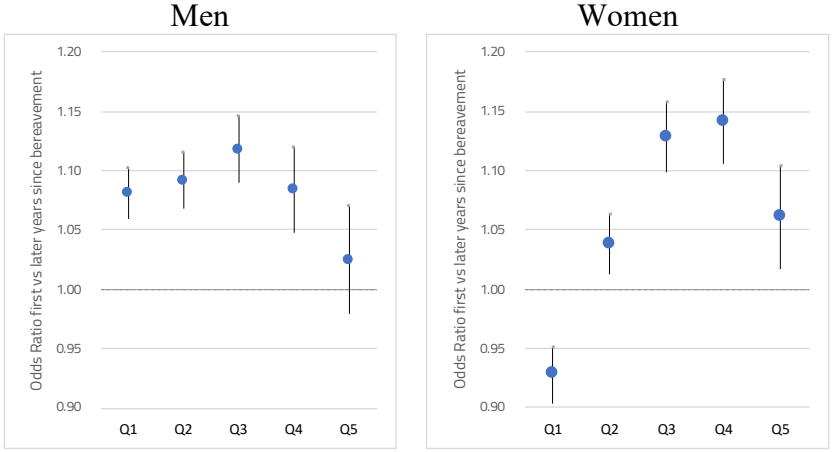
Men Women



Source: Elaboration of the authors based on INPS 2024 data.

Furthermore, we have compared the short- and long-term bereavement effects among widow and widowers. Results show that recent widowhood comes with an elevated mortality risk compared to the experience of bereavement more than one year before in almost all income quintiles for both men and women (Figure 8). For instance, among widowed men the estimates show that in the third quintile of household income the risk of mortality is 12% higher in the first year after bereavement compared to later years. In the highest quintile there is no substantial difference in the mortality risk in the first and later years after men experience widowhood. Among widowed women, the variation in short- vs. long-term effects of bereavement across income levels is instead larger. The greatest difference in mortality risk between the recently bereaved compared to widows who experienced spousal loss more than one year before is registered in the third and fourth quintiles. In those income quintiles, the mortality risk in the first year after bereavement is 13-14% higher than in later years, while in Q2 and Q5 the first-year mortality risk is around 5% higher than in later years. In contrast, women in the lowest income group (Q1) who recently experienced spousal death display a lower mortality risk (-7%) compared to widows bereaved more than one year earlier.

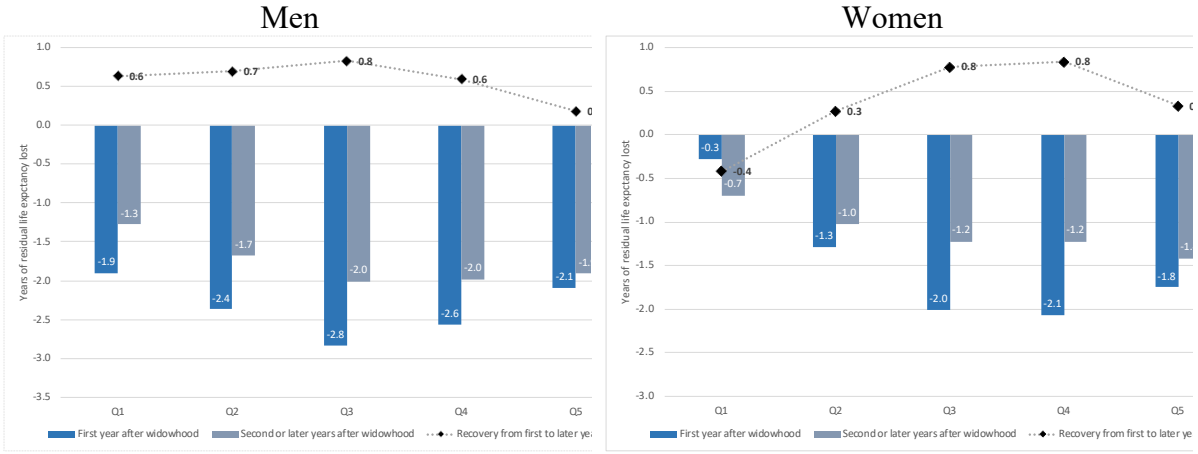
Figure 8: Widowed Mortality risk, Odds ratios by time since widowhood and income quintiles. Men and Women.



Source: Elaboration of the authors based on INPS 2024 data.

Figure 9 presents the same finding in terms of loss of years of residual life expectancy during the first and subsequent years after bereavement by income groups. In the first year after spousal loss, men lose from 1.9 years of residual life in the poorest income quintile to 2.8 years in the middle-income quintile, and 2.1 years in the richest income group. In subsequent years, widowers in all income groups recuperate part of these lost years of life. However, the recuperation is minimal in the highest income group (0.2 of a year) and maximal in the mid-income group (0.8 of a year). Among men, the recuperation only partially alters the socioeconomic gradient of bereavement: the long-term effects are very similar among the mid-to-high income groups and smallest in the lowest income group. Widowed women present a similar configuration to widowers from the second to the fifth income group. We witness maximal short-term negative effects in mid-socioeconomic groups but, since in these groups the subsequent recuperation is also the largest, long-term losses in life expectancy are maximal in the highest socioeconomic group. Yet, as explained earlier, women in the poorest income group display a quite different pattern. In fact, the initial loss in terms of residual life expectancy among recently bereaved women in the first income quintile is very small (4 months, or 0.3 of a year) and instead of showing recuperation as all other income groups, in the subsequent years after bereavement they lose an additional 0.7 years of residual life expectancy.

Figure 9: Residual life expectancy at age 67. Losses and recovery by time since widowhood and income quintiles. Men and Women.



Source: Elaboration of the authors based on INPS 2024 data.

Discussion

The aim of this study was to investigate the magnitude and the heterogeneity across local areas and social groups of the bereavement effect among pensioners in the under-researched context of Italy, a rapidly ageing society in which the phenomenon of widowhood affects a substantial portion of the elderly population. Using very recent Italian register social security data 2014-2022 from the National Institute of Social Security (INPS) and logistic regression, the study is the first to map the heterogeneity of the bereavement effect on the population of Italian old-age pensioners. Our estimates indicate a substantial increase in the mortality risk among the bereaved ranging from 24% for women and 35% for men, which translates respectively in the loss of 1.2 and 1.7 years of remaining life expectancy after age 67.

The main contribution of the study was to map the heterogeneity of the short- and long-term bereavement effect at the intersection of different demographic and socioeconomic characteristics of the population of Italian pensioners. The latter remains still poorly understood in the literature on the widowhood effect. To begin with, territorial variations in the widowhood effect by gender are substantial: the negative effect of spousal death on widowers' life expectancy is almost the double between region with the smallest and largest losses, but it is almost tripled among women. Age-gender interactions are also relevant but in this case age differences in the bereavement effect are much more pronounced among men than women. We find instead a similarly positive gradient by gender in the bereavement effect by household income, our proxy for socioeconomic status. Yet, men's relative risk of mortality after bereavement (and similarly does the married-widowers gap in residual life expectancy at age

67) peaks in the mid-income quintile and does not vary further beyond that, while among women the increased risk of death after widowhood (and the married-widows gap in residual life expectancy at age 67) linearly increases across all income quintiles.

We find the most interesting results when comparing the short- to the long-term bereavement effects at the intersection of gender and socioeconomic status. Overall, we find an inverted U-shaped relationship between household income and the long-term recovery in the bereavement effect, which is in all groups higher in the first year and diminishes later on. This is true for all income and sex groups expect for women in the poorest income quintile. For them, the short-term effect is smaller than the long-term effect of bereavement. Our interpretation of this finding is that women in the lowest income quintile tend to be the primary figure taking care of their sick spouse. Once their husband dies, they are relieved from their caring duties and their mortality risk immediately drops to return higher after one year. Relatedly, for instance, Hamermesh et al. (2023) showed that among women family responsibilities, and the related feeling of pressures of time, increase significantly before the partner's death, but especially so among women with partners affected by long-term illnesses compared to future widows who lost their partners to sudden death. Family constraints become much weaker after spousal death, and much lower compared to continuously married women. Our finding adds to previous studies pointing to the changes in health that take place before spousal death as being part of the bereavement effect itself (Sasson and Umberson, 2014, Lee and DeMaris, 2007; Carr and Utz, 2001). Future studies may focus specifically on this period before spousal loss and, in particular, as our results point to potentially large differences across groups, on the interplay between gender and socioeconomic status.

Our study does not come without limitations. First of all, we focus on only one outcome, mortality. However, the consequences of bereavement vary from behavioral responses to mental and physical health problems, to increased risk of own death. Insofar as different groups react to the experience of widowhood differently, the effects of such experience may appear in different outcomes. Focusing on only one of them, therefore, may mask important group differences (Stroebe and Stroebe, 1987). A second limitation is that we do not address cohort differences. Increasing gender equality in recent cohorts may impact on the bereavement effect and especially on its relative size by gender (Carr and Bodnar-Deren, 2009). Not only women's role in society in terms of education and labor market participial has changed, but also marital and family histories vary importantly by birth cohort. In more recent cohorts, women may be financially less dependent on their husbands, while men may be less dependent on their wives

in terms of care and social relations. On the other hand, the bereavement effect may increase due to declining fertility and the increasing divorces. The former process reduces available social support after bereavement, while the latter makes the stable couples more selected in terms of marital closeness, hence, increasing the grief after spousal death. Another important cohort trend due to ageing is the growing risk of disability among the elderly which may affect bereavement in unpredictable ways. On the one hand, the weight of long-term care of a dying spouse may worsen the effect of widowhood on the surviving spouse, on the other hand, the death of a long-term disabled spouse may relieve the partner from his/her caring duties hence reducing the bereavement effect. Furthermore, as we suggest in this study, the consequences may by more complex, namely differing in terms of short- versus long-term bereavement effects and differing across social groups (in our case in terms of gender and socioeconomic status). Finally, our data focus on old-age pension recipients, namely positively selected individuals who have been employed during their entire adult life and are entitled to receive pension benefits. While this may not constitute a problem among men, it could mean that the group of women - especially in the oldest age groups - are positively selected and hence not fully representative of the entire female population in Italy.

Despite these limitations, our study highlights the importance of investigating the complexity of the phenomenon of bereavement. While concurring with previous studies about the negative - and substantial in magnitude - impact of widowhood on residual life expectancy of the surviving spouse in the Italian context, our findings additionally portraited the compounded effects of spousal death by social groups and their intersection.

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Appendix

Table A.1: Summary statistics by gender.

	Men					Women				
Variable	**N**	**Mean (%)**	**Std Dev**	**Min**	**Max**	**N**	**Mean (%)**	**Std Dev**	**Min**	**Max**
Age	5,219,076	74.18	7.89	40.72	111.13	4,213,806	76.08	8.45	42.26	114.09
Marital status										
Married	4,446,341	85.2				1,928,327	45.8			
Widowed since entry	440,534	8.4				765,163	18.2			
Widowed after entry	332,201	6.4				1,520,316	36.1			
Total	5,219,076	100.0				4,213,806	100.0			
Year										
2014	1,954,064					3,505,201				
2015	3,899,288					3,464,336				
2016	3,880,379					3,431,341				
2017	3,839,153					3,375,630				
2018	3,833,959					3,320,189				
2019	3,835,434					3,259,656				
2020	3,859,127					3,219,142				
2021	3,850,476					3,192,033				
2022	3,857,377					3,184,597				
Family Income quintile										
Q1	1,042,377	19.97				841,965	19.98			
Q2	1,044,322	20.01				842,866	20.00			
Q3	1,044,103	20.01				842,861	20.00			
Q4	1,043,802	20.00				842,730	20.01			
Q5	1,044,472	20.01				843,384	20.01			
Total	5,219,076	100.00				4,213,806	100.00			
Pension scheme										
Private employees	2,757,986	52.84				2,521,631	59.84			
Agricultural self-employed workers	403,617	7.73				643,333	15.27			
Artisans and sales workers	1,509,162	28.92				931,656	22.11			
Special Sector Funds^	315,334	6.04				59,089	1.40			
Managers in special sectors*	132,557	2.54				14,836	0.35			
Others	100,420	1.92				43,261	1.03			
Total	5,219,076	100.00				4,213,806	100.00			
Region										
Abruzzo	105,581	2.02				86,799	2.06			
Basilicata	42,706	0.82				34,748	0.82			
Calabria	119,255	2.28				102,696	2.44			
Campania	319,140	6.11				199,724	4.74			
Emilia Romagna	462,613	8.86				460,194	10.92			
Friuli V.Giulia	118,898	2.28				104,409	2.48			
Lazio	397,824	7.62				270,269	6.41			
Liguria	159,123	3.05				130,946	3.11			
Lombardia	1,020,951	19.56				912,827	21.66			
Marche	154,348	2.96				143,919	3.42			
Molise	23,031	0.44				22,456	0.53			
Piemonte	487,670	9.34				451,785	10.72			
Puglia	298,709	5.72				185,789	4.41			
Sardegna	118,250	2.27				64,280	1.53			
Sicilia	316,108	6.06				148,482	3.52			
Toscana	382,376	7.33				325,331	7.72			
Trentino Alto Adige	90,158	1.73				83,662	1.99			
Umbria	85,537	1.64				74,352	1.76			
Valle D'aosta	11,027	0.21				9,696	0.23			
Veneto	505,771	9.69				401,442	9.53			
Total	5,219,076	100.00				4,213,806	100.00			

Source: Elaboration of the authors based on INPS 2024 data. Note: ^Transportation, Electricity, Gas, Custom Duty, National Railways; *Aviation and mobile operators.

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