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Demographic change among the widowed population in Sweden 1970-2019

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Abstract

There is evidence that the mortality disadvantage of widows and widowers relative to married men and women has been increasing over the last decades. At the same time, a rising life expectancy and heavy size fluctuations between birth cohorts have been reshaping the demographic characteristics of the widowed population, which may have implications for how to interpret the excess mortality of the widowed. This study uses Swedish register data to compare trends in the excess mortality of widows and widowers in younger and older age groups during the years 1970-2019, and link the trends to the demographic changes that occurred in the population in the same period. The results show that the excess mortality increased in all age groups during the period, with the strongest increase occurring in younger ages and among women. At the same time, the widowed population became significantly older, and the contribution from the groups aged 75 or younger to the overall excess mortality of the widowed declined. Further, the results show that widowhood overall became slightly less common among the old during the period, that the relative number of men entering widowhood rose and that the proportion who remarried after widowhood remained negligible throughout the period. The transition to widowhood also began to occur increasingly late in life while the average duration of widowhood before dying or remarrying fell, especially for women. The findings of the study suggest that while increasing selection into widowhood contributed to the rising excess mortality, other mechanisms were at work as well. Other potential explanations include an increasing overlap between widowhood and periods of sickness and disabilities, and a decline in access to formal care and assistance.

Keywords: Widowhood, mortality, population aging, remarriage

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Introduction

It is well known that widows and widowers have a higher mortality risk than their married counterparts, likely due to a combination of grief, loss of marital benefits and selection into widowhood (Ennis & Majid 2019; Moon et al. 2011; Shor et al. 2012; Stroebe et al. 2007). There is also evidence from a number of countries that this mortality disadvantage has been increasing over the last decades, as the gains in life expectancy have been slower for the widowed than for married men and women (Hajdu et al. 1995; Hemström, 2016; Martikainen et al. 2005; Valkonen et al. 2004). At the same time, increasing longevity and/or declining fertility has been causing a steady growth in the share of older persons in virtually every country in the world, with consequences for public health and welfare (United Nations, 2019). For example, this development should influence the demography of the widowed, which may be an important cause of the rising excess mortality of this group.

Using Swedish register data, I present trends of demographic developments among the widowed population during five decades, 1970-2019, including changes in the sex and age composition and the timing and duration of widowhood. The aim of this study is to explore how these demographic changes may be associated with the trends in excess mortality of widows and widowers over time. Many of the demographic patterns may have shifted greatly over time, and assessing them is a way to highlight both the drivers and the outcome of the excess mortality trends of widows and widowers. Yet, the literature has, to my knowledge, not considered the effect of demographic changes on the widowed population.

The dramatic effect the loss of a spouse has on the life-situation and the mortality risk of those who experience it makes it important to monitor the prevalence of widowhood in a population, as well as to whom it happens. Widowhood is generally viewed as a women's issue because women live longer on average than men, but in many countries, including Sweden, the sex distribution of those who experience widowhood may be changing. Sweden has long been one of the countries with the smallest sex difference in life expectancy in the world, and one of the forerunners in the global trend of decreasing sex differences in life expectancy that has taken place over the last decades (Klenk et al. 2016; Ortiz-Ospina & Beltekian, 2018). Between 1970 and 2019, Sweden also saw a substantial growth in the proportion of old, with the share of the population aged 75 or older doubling in size during the period (Statistics Sweden, 2020a). Foreshadowing developments in other countries, such trends make Sweden an interesting case for gaining insight into the dynamics of the widowed population. The declining sex difference in life expectancy should affect both the sex ratio of

the widowed population and the timing of widowhood in the life course of women and men, which in turn may influence the experience of being widowed. In addition, shifts in the average age at widowhood may alter the inclination to repartner or form other types of new relations after widowhood (Carr & Bodnar-Deren, 2009), which may have great implications for both the life quality of the widowed, and the propensity to leave the state of widowhood.

Causes of the elevated mortality risk of the widowed

Several factors may contribute to the elevated mortality risk of widows and widowers. One of the most apparent is perhaps grief over the loss, which may have a direct effect on both physical and mental health (Fagundes & Wu 2020), and have a negative influence on the health behavior of the surviving spouse (Stahl & Schultz 2014). The stress from grief may often be amplified by the changes in the everyday life that the death of a spouse entails. In many cases, the new life circumstances involve a high risk of social isolation (Rico-Uribe et al. 2018; Schmitz 2021), a strained financial situation (Halleröd 2013; Min et al. 2018) and difficulties to replace the skills and resources of the late spouse and pick up different tasks that they used to perform (Umberson et al. 1992; Utz et al. 2004). The surviving spouse may also suffer from the aftermath of the caregiver burden, i.e., the physical and mental cost of taking care of a dying spouse, which may be another important cause of the excess mortality of the widowed (Christakis & Allison 2006).

In addition to the harmful effects of the loss, becoming widowed means losing the positive health effects of being married. For example, the married have better access to social and emotional support than the widowed have. Even though the surviving spouse may have alternative sources of support, like children and close friends, these are not likely to compensate for the loss of the spouse (Stroebe et al. 2007). Marriage is also associated with social control and a mutual responsibility that curbs risk taking and detrimental health behavior. There is some evidence that this protective quality has a lingering effect also after spousal loss, although this appears to be feeble (Brockmann & Klein 2004; Lillard & Waite 1995).

The mortality disadvantage of the widowed may also reflect a selection into widowhood of individuals with a higher mortality risk (Boyle et al. 2011; Christakis & Allison 2006; Elwert & Christakis, 2008). For example, there could be homogamy in different traits with bearing on the mortality risk, i.e. that individuals with a higher mortality risk are more likely to marry others with a higher mortality risk. Compared to their age peers, such individuals would then

experience a greater risk both of becoming widowed and of dying themselves. Mortality risk and risk of widowhood should also have a common determinant in the shared living environment and/or life-style of the spouses. Those who become widowed may have been exposed to the same risk factors as the deceased spouse, which should contribute to an elevated mortality risk (Schaefer et al. 1995). In addition, there may be selection out of widowhood, as healthier individuals should be more likely to remarry after spousal loss than those with worse health (Sasson & Umberson 2014).

Potential explanations for the increasing mortality disadvantage

The rise in the excess mortality of the widowed observed in previous studies may be connected to a number of different changes that has occurred in different areas of society over the last decades. This section lists some potential underlying causes to provide context for the results of this study, even though the aim is not to establish the relative importance of each of these.

Part of the increase may stem from the possibilities to get professional help, care and support to manage life and health after loss has changed over time. Since the 1970s, the welfare systems in Europe have undergone significant changes in extensiveness and commitment, including substantial retrenchment in many countries (Korpi 2003; Starke 2006; OECD 2014). In Sweden, with an extensive healthcare system organized around formal care, the impact of these changes may have been particularly large. The major shift in Sweden occurred in response to the financial crisis in the early 1990s, with recurring austerity measures and rising demands for efficiency in the public health sector, including old-age care. As a result, the provision of care became more restrictive, and by the late 1990s, the proportion of people aged 80 or older who received home help or residential care, respectively, had decreased by one-third and one-fourth relative to before the crisis (Trydegård 2000). With the welfare commitment of 1990 as reference, the gap between needs and resources remained significant also in the decades after the crisis, even though a slow decrease has occurred since the late 2000s (SKR [The Swedish Association of Local Authorities and Regions] 2018; Scocco et al. 2018). This development may have influenced the mortality disadvantage of the widowed in several ways. For example, it may have become more important to have support from a close relative in order to get adequate care or treatment, and the caregiver burden may have become more pronounced if the access to professional assistance has decreased. It may also have become more difficult to compensate for the loss of task support from the spouse through public help. If support from close

relatives have become more important for the health and living conditions of the old, also increases in geographic mobility may contribute to increase the mortality disadvantage of the widowed. Older persons are over-represented in smaller communities, and the proportion living alone tends to be high in small municipalities with a negative net migration (SOU [Official Reports of the Swedish Government] 2015:85). If children or other persons who may provide care and support become more likely to move far away, this may lower widows' and widowers' access to care (Valkonen 2004). However, in Sweden, this explanation may have lost in importance over time. A study on the the average distance between parents and adult children in Sweden between the years 1992 and 2002 showed that a decrease had occurred during this period, likely because the large cohorts who moved to the cities in the 1960s and 1970s tend to live near their adult children (Malmberg & Pettersson, 2008).

It is also possible that the health advantage of the married has increased compared to the non-married, because the married, more than others, have changed their lifestyle and become more health conscious (Valkonen et al. 2004). Because marriage is associated with social control and health monitoring, spouses should benefit from each other's health literacy (Umberson et al. 1992). Therefore, marriage may have an amplifying effect on positive health trends, and positive changes in health behavior should be more likely to occur among the married. Widowhood, on the other hand, has a negative effect on individuals' health behavior, and may lower the inclination to maintain good health practices (Stahl & Schultz 2014).

The growing mortality disadvantage may to some extent also reflect an increasing selection effect. If the relative size of a disadvantaged group decreases and the group becomes more deviant from the norm, the selection mechanism should become stronger (Valkonen et al. 2004). With increasing life expectancy, selection may contribute to the excess mortality among the widowed in younger age groups in particular, as widowhood becomes increasingly uncommon at younger ages. However, it is possible that this trend to some extent has been held back by the sharp rise in divorces that came about in Sweden in the early 1970s after the implementation of new, less restrictive divorce policies (Statistics Sweden 2020b). As with widowhood, there may be a selection of individuals with characteristics associated higher mortality risk into divorce (Metsä-Simola & Martikainen 2013), which would mean fewer of these individuals being at risk of widowhood. From the mid-1970s to the end of the 2010s, the share who was divorced in Sweden remained quite stable at about 2.5 per 1,000 persons, one of the highest levels in Europe throughout the period (Eurostat, 2020). Because divorces

become increasingly uncommon with age after age 50 (Statistics Sweden, 2021c), the rise in divorces in the 1970s should not have affected the influx into the widowed population until decades later. Further, with an increasing number of divorced people in the older ages, it is possible that the number of remarriages after widowhood rises, as this implies a growing pool of potential spouses. If more healthy individuals exit widowhood through remarriage, the selection effect on the excess mortality of the widowed may become even stronger.

The excess mortality of widows and widowers, as well as the risk of becoming widowed, are connected to men's and women's respective life expectancy in a population. For example, if the life expectancy of the men in a population increases relative to that of the women in the population, a higher share of men will outlive their spouses and the men who become widowed can be expected to survive longer after the loss. At the same time, when both men and women experience an increasing life expectancy, the share of both widows and widowers in the total population will decrease and the selection will become stronger in the younger age groups, which may contribute to a greater excess mortality among the widowed in these ages. Changes in the average age difference between spouses may amplify or offset these associations, but in Sweden, the age difference has been rather stable over the last century (Statistics Sweden 2020b). From the beginning of the 1970s to the end of the 2010s, life expectancy at birth in Sweden increased by 7.7 (77-84.7) years for women and 9.1 (72.2-81.3) years for men (Statistics Sweden, 2021a). During the 1970s, the increase was faster for women, as the life expectancy of the men was relatively stable, and the sex difference increased until 1979, peaking at 6.2 years. During the 1980s, the life expectancy of men began to increase at roughly the same rate as that of women, and during the subsequent decades, the increase was faster among men. In 2019, the sex difference had declined to 3.4 years. The faster gains in life expectancy among men during the period led to a decrease in the female predominance in the older ages. For example, in the age group 75 years or older, the number of women per 100 men decreased from 140 to 129 (Statistics Sweden, 2021b). The same trend has been evident in most Western countries, with Sweden as one of the forerunners (Ortiz-Ospina & Beltekian, 2018; Van Oyen, et al., 2013). This should affect the sex composition of the widowed population, as well as the excess mortality of widows and widowers, as more men become widowed and likely survive longer in widowhood, while women become widowed at a later stage in life on average.

Another factor that influences the average excess mortality as well as various components of the demography of the widowed is the variation in the size of different birth cohorts in a

population. Together with the mortality risk, cohort size determine the number of people in ages with different exposure to widowhood and different excess mortality among the widowed. In addition, the size of the different birth cohorts in a population determines the dependency ratio in the population, which should be important for the balance between needs and resources in the welfare system. As in other western countries, birth numbers fluctuated heavily in Sweden during the 20th century (Statistics Sweden, 2021b). For example, the cohorts born in the mid-1930s were almost 40 percent smaller than those born in the early 1920s and mid-1940s. The peaks and lows in the birth numbers from the 1950s onwards largely reflect these different cohorts becoming parents and grandparents. It is possible that the increase in welfare resources in relation to the needs that began in the late 2000s partly stems from historically small birth cohorts entering old age, gradually replacing considerably larger ones in the oldest ages. In this sense, the entry into old age by the small cohorts may contribute to reduce the excess mortality of the widowed. It may also affect the overall excess mortality of the widowed when these cohorts reach ages associated with different levels of excess mortality, because their contribution is smaller than that of the younger and older cohorts.

Data

The analysis builds on Swedish register data, with information on civil status changes and other demographic events of the entire Swedish population, including the date of each event. The register with data on civil status changes in the population goes back to 1968 and includes information on the date of each change, as well as both from and to what civil status people change. This makes it possible to capture all transitions into and out of widowhood, except for the cases where both spouses die on the same day. For individuals with no civil status changes during the period, information on civil status is obtained from the total population register. This makes it possible to calculate the number of person-years spent in widowhood/marriage each year and monitor the civil status at the time of death. It also makes it possible to calculate the median age at entering and exiting widowhood and the median duration of widowhood, as well as to observe all entries and exits that occur each year. Because the register with information on the date of death only includes data up until the end of 2017, analysis that requires this information will be restricted to the years 1970-2017. Other parts of the analysis will cover the entire 50-year-period from January 1st 1970 to December 31st 2019. Information on events that occur during periods when individuals do not live in Sweden is added retrospectively in the registers for those who immigrate/remigrate.

Therefore, the study only includes individuals who were born in Sweden or immigrated before age 18, while those who emigrate are excluded from the study from the date of the emigration.

Figure 1 below shows the age structure of the study population at each decade of the observation period. Some demographic events are distinct, for example the baby boom in the 1940s, which is visible as the large number of people in their 20s in 1970 and in their 70s in 2019. Likewise, the spike in birth numbers that occurred after the end of World War I and the Spanish flu is visible in the number of 50-year-olds in 1970. From 1970 to 2019, the Swedish population grew larger and older, going from a rather bottom-heavy age structure in 1970, to one with fewer 20-year-olds than 75-year-olds in 2019. The figure also shows the sex specific life expectancy at birth for different years. The general trend over the observation period was that life expectancy increased faster for women in the first two decades and faster for men during the rest of the period. Finally, the figure shows the oldest age decile, which will be used as a measure for old age in the analysis.

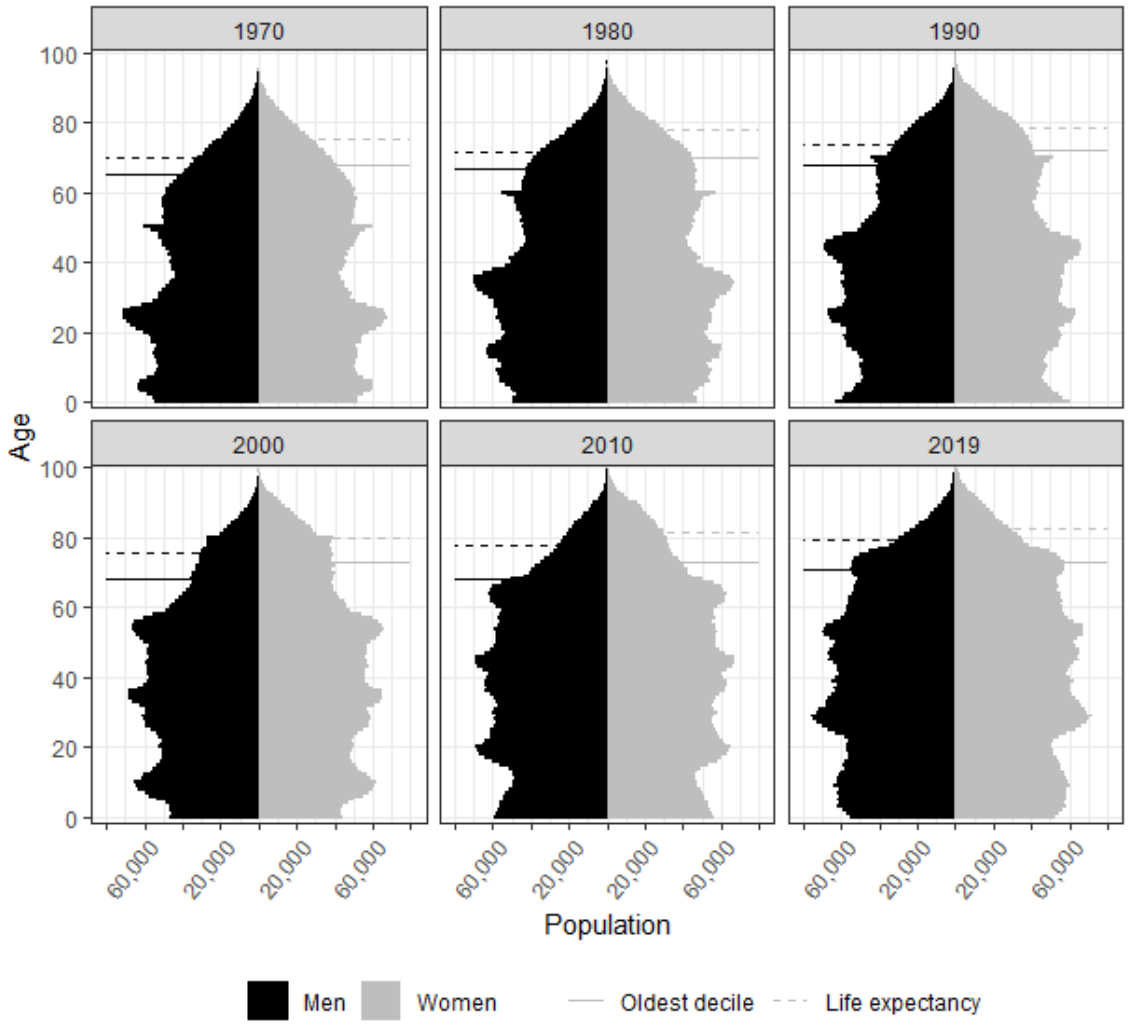

Figure 1. Population pyramids 1970-2019

Results

The first step of the analysis is to examine the relative excess mortality of widows and widowers (compared to married women and men) in different ages during the period 1970-2017. For the number of events to be sufficiently high in each year/age group, the analysis is restricted to ages 65-95. Among the widowers (Figure 2, left panel), the excess mortality was over all higher in younger age groups than in the older ones, although there were some inconsistencies to this pattern. Excess mortality increased over the period in all age groups. Among the widows (Figure 2, right panel), there was not much age difference, or difference over time, in the relative excess mortality in the early years of the period. Around the late 1980s/early 1990s, excess mortality began to rise and the age pattern became more distinct but still clearly weaker than that of the widowers. All age groups saw an increase in the relative excess mortality over the whole period, with the sharpest increase occurring in the youngest age group. Overall, the difference in relative excess mortality between widows and

widowers was somewhat smaller at the end of the period than at the beginning, and in the oldest age group, the relative excess mortality was even stronger for widows than for widowers.

In summary, the results indicate that the relative excess mortality increased, including in the oldest age groups, even though the greatest increase happened in the younger age groups. Overall, the increase was somewhat greater among women than among men. The remainder of this section will focus on demographic changes that occurred among the old and the widowed in parallel with these trends, and on the connection between these changes and the increase in excess mortality. In the next step, I look at how the age distribution of the widowed changed between 1970 and 2019.

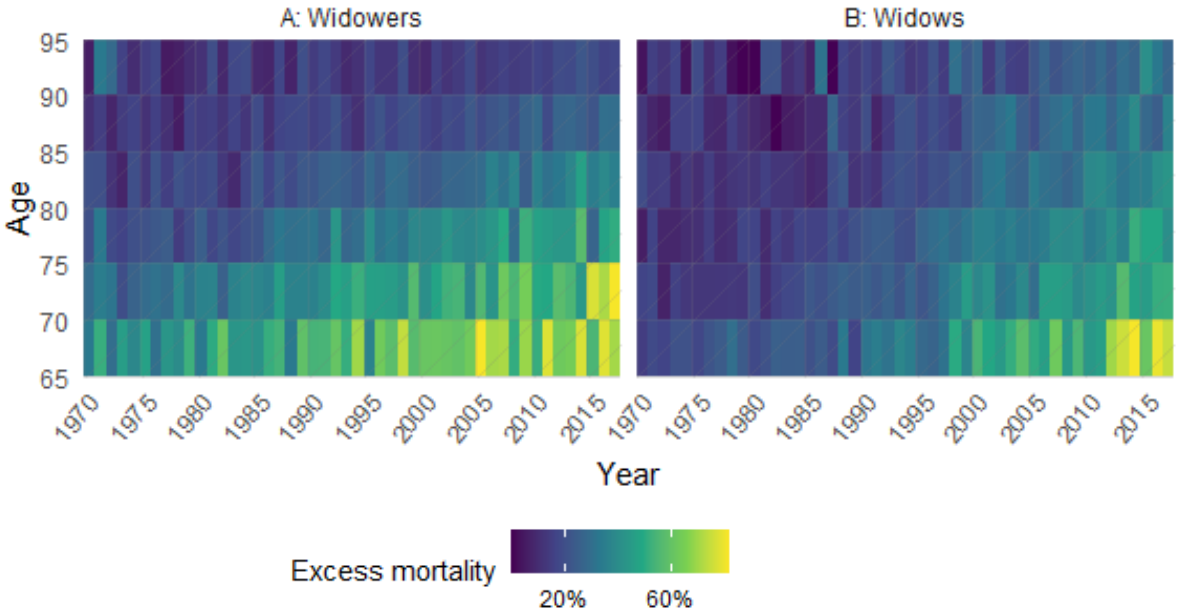

Figure 2. Relative excess mortality in percent of widows and widowers compared to married men (left panel) and women (right panel) for ages 65-95 (1970-2017).

Note: Each year- and age combination is color coded according to the amount of excess mortality of the widowed in the group. Darker (blue) colors denote a smaller excess mortality, brighter (yellow) colors denote a greater excess mortality.

Figure 3 shows how the size and age distribution of the widowed population changed during the period 1970-2019. It also shows the size and age of the different birth cohorts in the population, ranging from 85.020 (born in 1933) to 139.505 (born in 1909). Both the male and the female part of the widowed population aged significantly during the period, with the median age increasing from 74 to 79 for men and from 71 to 82 for women. In 1970, one fifth of the widowers and one fourth of the widows were younger than 65, while fifty years later, this group represented only about five percent of the total number of widows and widowers.

The share of widows and widowers in the youngest age groups shown in Figure 2 decreased in size by between one third and two thirds, enough to cause a decline in these groups' contribution to the overall excess mortality of the widowed, despite the high excess mortality of these groups. The share of widows and widowers in the age groups 70-74 and 75-79 both underwent a substantial decrease between 1970 and 2010, but during the 2010s, the large cohorts born in the 1940s began to replace the much smaller cohorts born in the 1930s in these age groups. This almost completely reset the group size to the level of 1970 in both groups for widowers and in the older age group for widows. Thus, the effect of the increase in excess mortality was not diminished by the group becoming smaller. The three oldest age groups all saw a long-term increase in relative size during the period. By the end of the period, these two age groups were the two largest among both widows and widowers.

The age distribution of the widowed population became slightly narrower as the average age of the widowed rose. Up to 2010, it also became increasingly skewed towards the older ages. This should have bearing not only on the average excess mortality of the widowed, but also on what consequences widowhood may have for different aspects of people's lives and how long people on average live in widowhood. Both the size and age distribution of the widowed population seems to depend on the size difference between the older cohorts. Early in the period, as increasingly small cohorts began to enter the ages with a significant risk of widowhood, there was a relative drop in the number of widows and widowers in the younger range of these ages. At the same time, the larger older cohorts aged, which led to a skewed age distribution with a disproportionate number of widows and widowers at the older side of the age span. Over the three most recent decades, when the smaller cohorts replaced the larger ones at the ages with the highest prevalence of widowhood, the absolute size of the widowed population fell. Towards the end of the period, when larger cohorts began to age into the widowed population, the age distribution became less skewed, especially for men, which indicates that men live a shorter time as widowed.

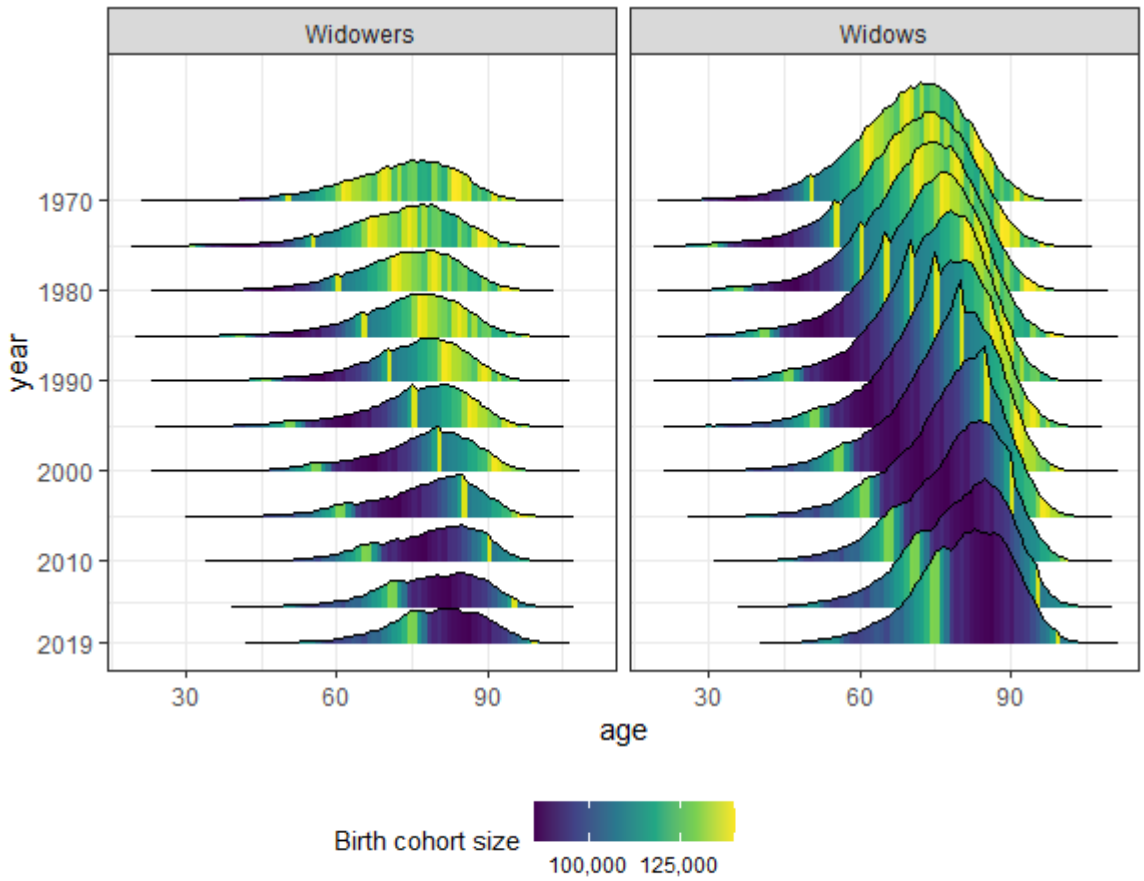

Figure 3. Age structure for the widowed population and birth cohort sizes for men (left panel) and women (right panel) for ages 25-110

Note: Each cohort/age combination is color coded according to its initial size (the number of children born into each cohort). Darker (blue) colors denote smaller birth cohort sizes, brighter (yellow) colors denote larger birth cohort sizes.

In addition to the life expectancy and the cohort dynamics, the relative number- and the excess mortality of the widowed may be linked to the degree of selection into widowhood relative to other non-married states. A decreased share of widowed in the total population may indicate that the widowed more likely have a set of disadvantageous characteristics in respect to health and mortality. Figure 4 below shows the time trends in the relative size of the different civil status groups among the men and women in the oldest age decile each year. In 1970, this included men aged 64 and above and women aged 69 and above, and in 2017 it included men aged 71 and above and women aged 74 and above (see Figure 1 for the age structure of this group at different years).

Throughout the period, the largest civil status group among the men was by far the married. The relative size of this group remained relatively stable over the period, but decreased slightly over the last two decades. The relative size of the second largest group -the widowed-

decreased at a faster rate. At the same time, the greatest change among the men during the period was the rise in the relative number of divorced, which reached the same level as the number of widowers in the final years of the period. Among women, the largest group throughout the period was the widowed. The group increased in relative size until the late 1990s. For the remainder of the period, the share of widowed decreased again at a faster rate than it had increased. The second largest group throughout the period - the married- decreased slightly during the first two decades and then increased again over the subsequent decades. The never-married group decreased relatively sharply in size until the early 2000s, while the growth in the divorced group was similar to that of men.

For men, the rise in the share of divorcees in the oldest decile may have contributed to the decline in the relative number of widowers, because it entails a decrease in the number of people at risk of widowhood. However, for women, the increase in divorcees was offset by the decrease in the never-married group. The increase in the share of divorcees in the oldest age decile became gradually faster over the period, before it levelled off in the final few years. This indicates that the increase came from a rising number of divorcees aging into the oldest decile, rather than that more divorces occurred within in the oldest decile, as the relatively slow increase early in the period contrasts to the sharp increase in the 1970s in the total population. (For the age specific trends for men and women during the period, see Figure A and Figure B in the appendix).

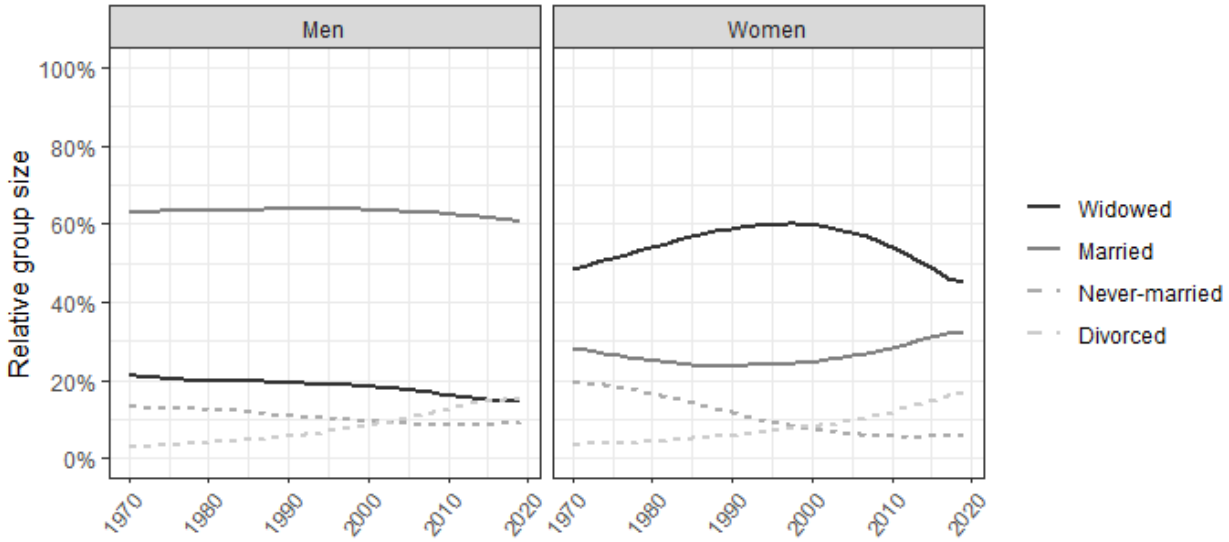

Figure 4. Relative size of civil status groups (widowed, married, never-married and divorced) in the oldest age decile 1970-2019

Previous steps of the analysis have showed that the excess mortality of widows increased faster than that of widowers during the observation period. At the same time, the life expectancy of men increased faster than that of women, which should influence the relative number of men and women becoming widowed. The next step of the analysis is to examine if these trends have led to an increase in the number of men entering widowhood each year, and in a less skewed sex ratio in the widowed population.

Figure 5 shows the sex ratio of those who entered widowhood and of the total widowed population at the end of each year 1970-2017. Over the first ten years, the sex ratio of those who entered widowhood fell from 46- to 41 men per 100 women. After this, it remained on this level until the late 1980s when it began to increase again, rising to just under 50 men per 100 women at the end of the period, which means that about one third of those who became widowed were men. This pattern fully mirrors the trend in the sex difference in life expectancy. The sex ratio of the total widowed population fell from about 34- to 26 men per 100 women over the first 20 years of the period. Around year 2000, it began to increase again, but never reached its initial level again during the period. The increasing difference between the sex ratio of those who entered widowhood and of the total widowed population may be influenced by the fact that those who entered came from increasingly smaller cohorts and therefore made up a less significant part of the total widowed population until the end of the period.

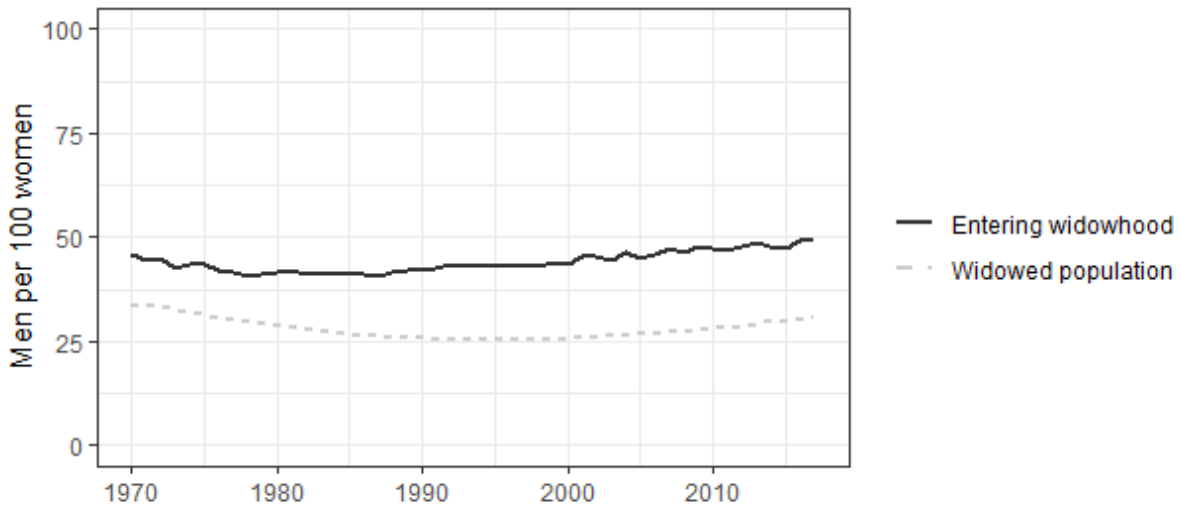

Figure 5. Sex ratio (number of men per 100 women) of those entering widowhood, and the total widowed population at the end of each year 1970-2019

Each year of the period, the sex ratio in the widowed population was lower than that of those who entered widowhood the same year, indicating that women on average stay widowed

longer than men. The next step of the analysis deals with this difference in duration of widowhood before exit for widows and widowers. Here, I look at the median values for entry- and exit age. This measure is possible to use even when only half of the people widowed a certain year exit within the observation period, while the mean would only be possible to calculate for those widowed in the earliest years of the period and would be increasingly problematic towards the later years.

Figure 6 below shows how the median age of those becoming widowed each year shifted over time, together with the median time they remained in widowhood. Throughout the period, women entered widowhood at younger ages and exited at older ages than did men, although the differences declined over time, especially in entry age. The median age of those widowed in 1970 was about 70 years among the men and 66 years among the women. For both men and women, the median age at widowhood increased significantly during the period, reaching about 79 years for men and 77 years for women, before it leveled off in the late 2000s. This trend may reflect both the rising life expectancy and the age-cohort size interaction shown in Figure 3. The median age at entry should rise with the aging of the cohorts born in the early 1920s and earlier, because the younger cohorts are so much smaller that their impact on the median age should be limited. The effect of the cohort size may to some extent be amplified by a higher prevalence of divorces in the younger cohorts, which reduces the number at risk of widowhood. The median time between entry and exit, through either death or remarriage, was 8.3 years for the men and 16.6 years for the women who became widowed at the beginning of the period. The median duration remained quite stable throughout the period for men, but decreased slightly to 7.3 years among those widowed in the mid-2000s. Among women, a sharper increase began in the late 1980s, with the median duration eventually dropping to 11.9 years among those widowed in the mid-2000s. The declining sex difference in life expectancy should contribute to the rising sex ratio of the widowed population over the last two decades.

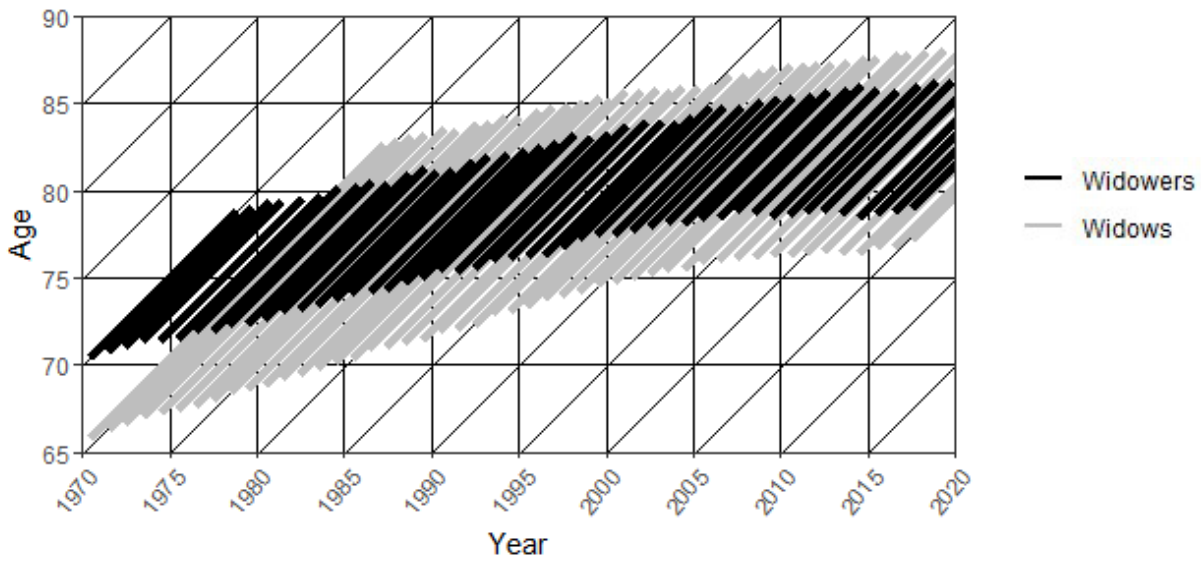

Figure 6. Median age at entry and median duration before exit for men and women by year of entry to widowhood 1970-2017

The final step of the analysis deals with remarriage after widowhood. A sufficiently high remarriage rate would mean that trends in remarriage influences the excess mortality of the widowed, as the widows and widowers with the lowest mortality risk should be the most likely to exit through remarriage. Figure 7 below shows the time trends in the proportion who remarried for men and women, and the proportion who remarried during the period by their age at widowhood.

The left panel of Figure 7 shows that remarriage was very uncommon throughout the period, especially among widows. In the early 1970s, around 0.6 percent of widowers and 0.1 percent of the widows remarried each year. Among both widows and widowers, the remarriage rate halved over the two subsequent decades, with the exception of 1989, when an unusually high number of marriages occurred due to a policy change regarding widowhood pension. The falling remarriage rate may reflect both a change in attitudes towards non-marital cohabitation and the rising average age of the widowed population. From the late 1990s to the late 2010s, the remarriage rate increased again for both widows and widowers, which may be a result of larger cohorts beginning to age into the widowed population and changing its age distribution. Overall, the proportion who remarried was too small for these fluctuations to influence the excess mortality of widows and widowers in a significant way.

The right panel of Figure 7 shows the likelihood of remarriage by age at the transition to widowhood. For both widows and widowers, the likelihood of remarriage was high only in ages where widowhood was uncommon. Among those who became widowed at age 50,

about 25 percent of the men and 5 percent of the women later remarried. For those widowed at age 60, the likelihood of remarriage was less than half of that, and among those widowed at 70 the likelihood was close to zero for both men and women. Thus, for about half of the men and 90 percent of the women, the likelihood of remarriage after widowhood was virtually non-existent. This indicates that the remarriage trends shown in panel A were driven by fluctuations in the relative number of younger widows and widowers.

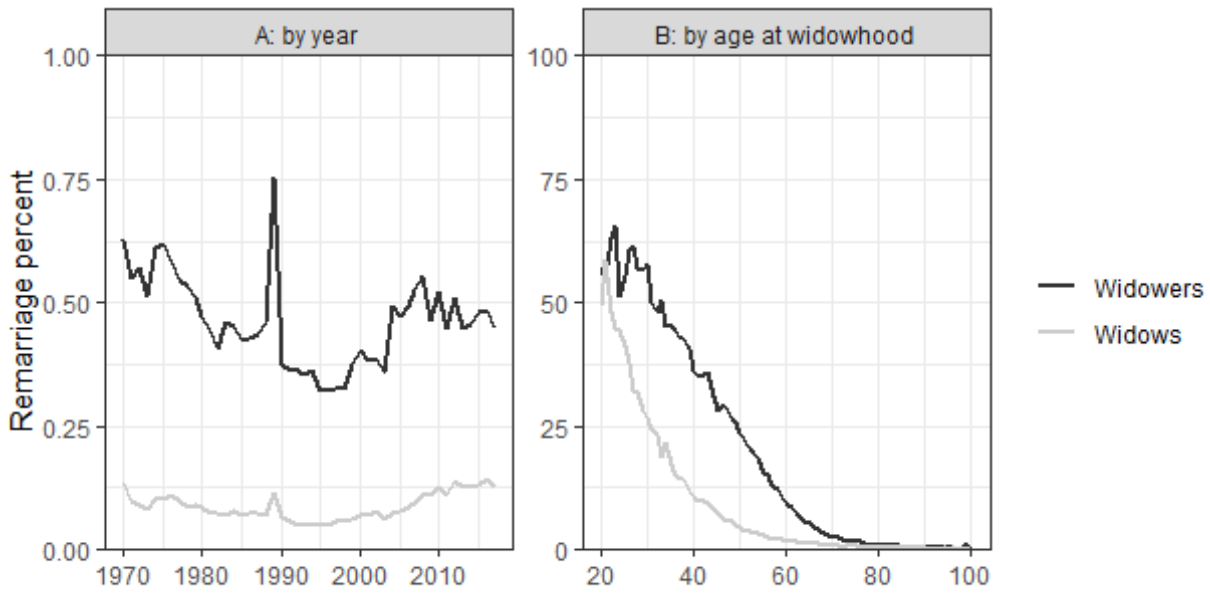

Figure 7. Proportion among widows and widowers who remarried by year (left panel) and by age at widowhood (right panel) 1970-2017
Note: Note the difference in y-axis scale between two panels.

Summary of the results

Over the last five decades, the relative excess mortality of the widowed increased among both men and women, in older as well as in younger age groups. The increase was greater for widows than for widowers, and greater in younger age groups, particularly those younger than 75. At the same time, the share of widows and widowers who were younger than 75 decreased so much during the period that their imprint on the overall excess mortality of the widowed population declined significantly. The number of widows and widowers declined slightly relative to the married, never-married and divorced men and women in the oldest age decile over the period, which supports the suggestion that rising excess mortality may stem from a stronger selection into widowhood. The share of men increased among those who entered widowhood during the period, showing that widowhood slowly is becoming less of a women's issue. At the same time, the sex ratio of the total widowed population did not increase at the same rate as the relative influx of men into widowhood, and did not fully

recover after the drop in the 1970s and 1980s. This was connected to men exiting widowhood at a faster rate than women, even though the difference narrowed significantly over the period. Among both widows and widowers, exits through remarriage were too uncommon for the selection out of widowhood to have had any meaningful effect on the excess mortality.

Discussion

This study shows how the excess mortality of the widowed changed between 1970 and 2017 in Sweden and demonstrates how the respective trends may have been linked to demographic changes among the widowed and the old. This perspective has been lacking in the previous literature. By taking the sex and age composition of the widowed, the prevalence of widowhood among the old and the entry and exit rate of widows and widowers into account in the analysis, this study highlights both the drivers and the outcome of the excess mortality trends of widows and widowers. Further, the demographic changes in the widowed population described in this paper are likely not unique for Sweden, as most other developed countries are experiencing decreasing sex differences in life expectancy and have seen increases in divorce rates since the 1970s. In line with the previous findings, the results from this study show an increase in excess mortality among the widowed, including the age groups where the prevalence of widowhood is highest.

Because excess mortality increased also among the oldest, the increase does not appear to be merely a product of stronger selection due to increasing life expectancy. It is possible that the detrimental effect of spousal loss is strong enough to offset the gains in health and life expectancy in some groups, which would mean that the excess mortality of the widowed rises when the overall health and life expectancy of the groups increase. It is also possible that the retrenchment in the welfare services after the financial crisis in the early 1990s contributed to the rise in widowhood excess mortality. The effect then appears to have been stronger for women than for men as the excess mortality of widows increased sharply in the 1990s, while that of widowers was more gradual over the entire period. Many of the cutbacks may have hit women harder, as women tend to face a more restrictive assessment when it comes to the need for health care (Socialstyrelsen 2011) and community-based home help services (Wattmo et al. 2013). On average, older women also have a lower access to housing that is suitable to their needs compared to men (SOU, 2015:85). These are all problems that may become more acute in widowhood. At the same time, increasing selection indeed appears to have been an important driver of the widowhood excess mortality, albeit not the only one. The increase in excess mortality was greater in younger ages, which should be linked to a

stronger selection effect as the frequency of widowhood fell sharply in the younger age groups.

The changing age structure of the widowed population may have influenced the excess mortality of widows and widowers, as the ages with a high prevalence of widowhood increasingly overlap with periods of sickness and disabilities. Poor health may enhance the detrimental effect of widowhood and vice versa. This should affect women in particular, both because the average age for entering widowhood increased more for women and because women on average spend more years at the end of life with sickness and/or disabilities (SOU [Official Reports of the Swedish Government], 2015:85). Over the last two decades of the period, the large cohorts born in the 1940s began to reach ages with a relatively high prevalence of widowhood, which made the age distribution wider and less skewed towards the older ages. The proportion of widows and widowers who were in their late 70s increased and had the greatest influence on the overall excess mortality of the widowed population. This illustrates how size differences between birth cohorts may drive the age distribution of the old and the widowed in a different direction than the life expectancy trend.

The relative numbers of never-married and divorced among the old shifted during the period, which may have influenced the level of selection into widowhood. Among the men in the oldest age decile, the relative number of divorcees rose during the period, which means that the number at risk of widowhood declined. If the relative rise in divorcees came from the group with both a higher mortality risk and a higher risk of spousal loss, this trend may have held back the increase in excess mortality among the widowers. Among the women, the drop in the number of never-married offset the rise in the number of divorcees. The relative number of divorced and never-married in the oldest age decile showed signs of stagnation at the final years of the period, which may become permanent as the number of divorced and never-married among the old reaches the same levels as in the total population.

The number of remarriages appears to have been too low for both widows and widowers to have a significant influence on the total exit rate and the excess mortality of the widowed. Those who remarried were mainly those who became widowed at unusually young ages, while remarriage was virtually non-existent in the ages where widowhood is common. Both the desire and opportunities to form a new romantic relationship may decrease with age, and the preferences for a certain type of relationship may change too. LAT arrangements may become more desirable with age among those who want a new relationship, while those who

want to live together with a new partner may be more prone to opt for non-marital cohabitation as the benefits of marriage might decrease with age.

One limitation of the study is the lack of information on other forms of re-partnering than remarriage. Those who live in non-marital cohabitation after widowhood likely have a similar life situation as those who remarry, even though they do not formally leave the civil status of widowhood. At the same time, the number of widowed who do so should be limited, as only about 5-7 percent of the total population above age 65 are estimated to live in non-married cohabitation (Sundström & Tortosa, 2010). Given that a significant share of the widowed who lived in non-marital cohabitation chose to remarry in 1989 to avoid losing their right to widowhood pension in the future, this group appears to have been particularly small, as the remarriage spike only reached 0.75 percent among widowers and 0.1 percent among widows. However, with an increasing pool of potential partners from the rising proportion of divorcees in older ages, and more positive attitudes meeting someone new after widowhood, it is possible that re-partnering will become more common in the near future.

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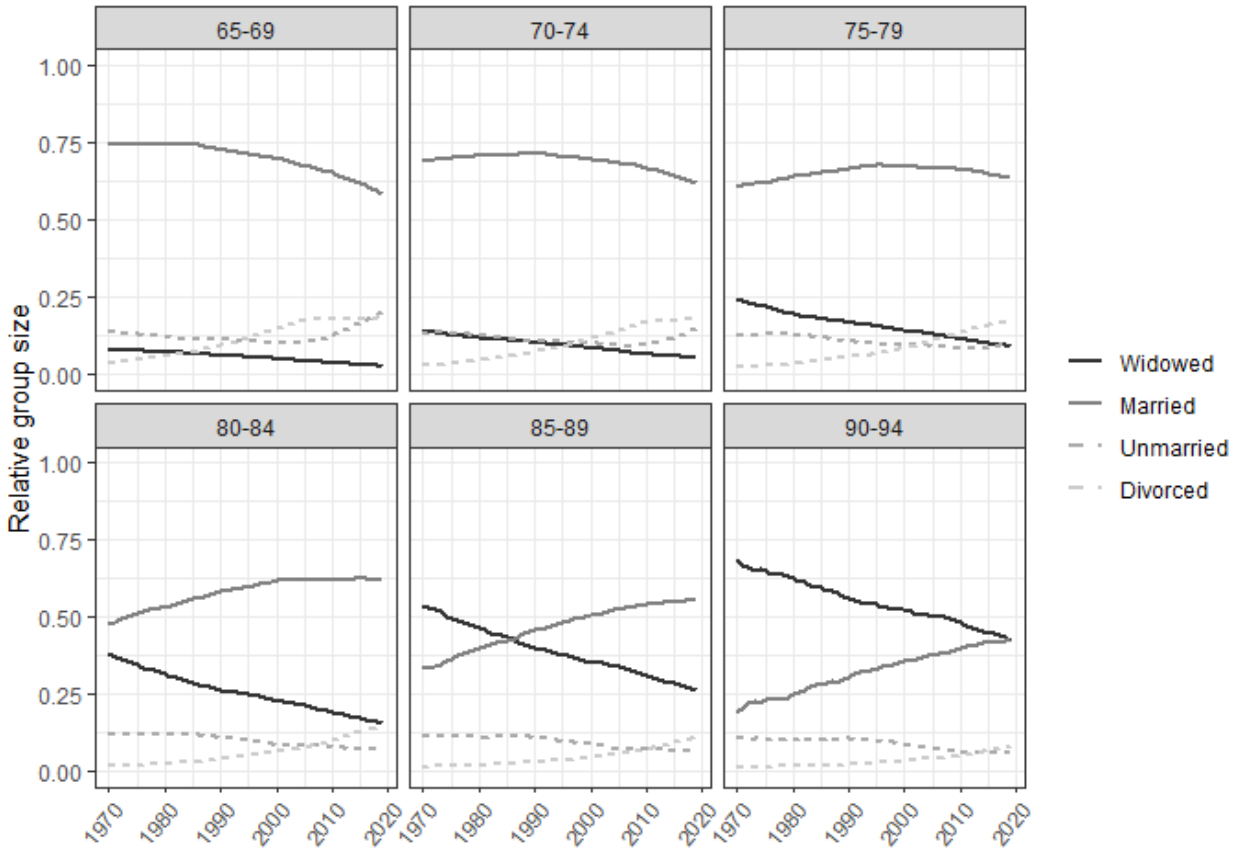
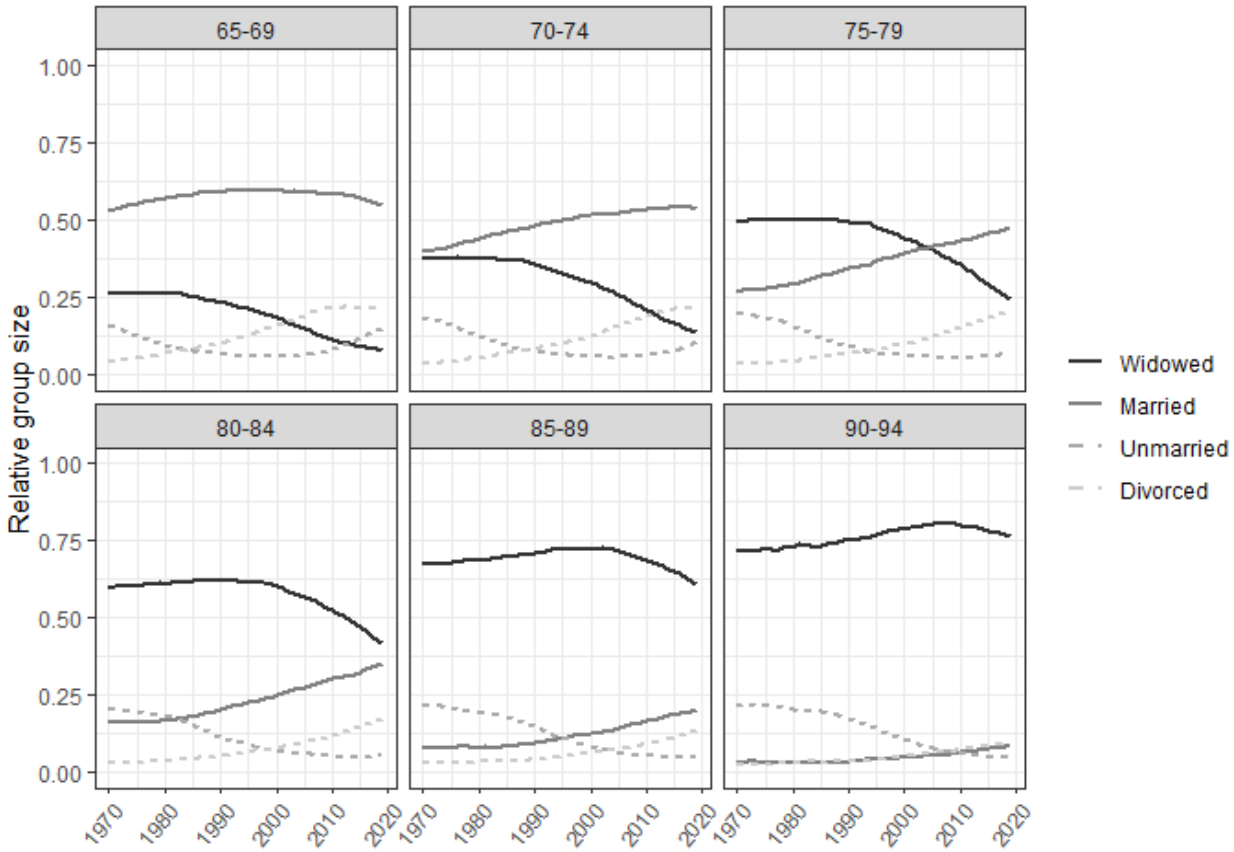
Appendix

A: Period trends in the relative size of marital status groups by age group, men



B: Period trends in the relative size of marital status groups by age group, women



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