To be submitted to *The Gerontologist* as a Research article – max 6000 words including abstract, text and references. Each table/ Figure on one page at the end – max 5 pages

**Gender differences in access to community-based caring resources in old age: An examination of the effects of widowhood and living arrangements**

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## Abstract – 250 words

[250 words (the web-based system will not accept an abstract of more than 250 words), and must include the following headings: Background and Objectives, Research Design and Methods, Results, and Discussion and Implications.]

## Background and Objectives [currently 1010 words- expected 1500 words]

Growing numbers of older people live for longer periods of time with chronic illness and functional limitations, rendering them reliant on (formal and informal) support in order to continue living independently in the community (REF). Large differences in the availability and affordability of long-term care services lead to marked variability in how older people in need of care can access such support across European countries (Oliveira & Llena-Nozal, 2020; Rodrigues et al, 2018). Furthermore, cultural, economic and social dynamics conspire to create variability in care use patterns between different groups within those same countries, such that available care is not always used by those who most need it, but rather by those who can most easily afford and access it. A growing body of evidence suggests inequalities in health and functioning are paralleled and reinforced by persistent inequalities in access to long-term care, severely limiting opportunities for vulnerable groups of older people to maintain independence for as long as possible (Ilinca et al. 2017; Rodrigues et al. 2018). In this study, we aim to understand how widowhood and living arrangements are associated with the probability to receive community-based formal and informal care for older people with care needs and how gender and socio-economic differences affect this association.

A key dimension of inequality in care use is gender. The experience of ageing, as well as functional and socio-economic trajectories, differ markedly between women and men Phillips et al 2016). Women live longer than men, but more years of their lives are lived with disability and functional impairment (Leatterji et al., 2015: Leveille et al., 2014). They are therefore more reliant on care resources in later life but often less able to afford care. Gender differences in income, wealth and social capital, while relevant across age groups, are particularly pronounced for current old age cohorts: women aged 75 years or above are the group with the highest risk of poverty in Europe (Eurostat). Due to higher longevity, women are also significantly more likely to outlive their spouses. Widows greatly outnumber widowers in all European countries (REF). What is more, the experience of widowhood affects men and women differently. Whereas women are more vulnerable to financial distress after the loss of a spouse (Gillen et al., 2009; Biro, 2013), the adverse mental and physical health effects of widowhood are more pronounced for men (Lee et al., 2001; Bennett et al., 2005). Gender is intertwined with every aspect of the experience of ageing and often inseparable from patterns of socio-economic inequality in old age (Van der Linden et al., 2019). Therefore, throughout our analysis, we place gender differences at the core of our analytical strategy, while recognizing the intersectional nature of different sources of disadvantage in old age.

Widowhood is one of the most distressing life events and a life course transition that profoundly affects care use patterns. Bereavement and grief can have long-lasting negative effects on both physical and mental health, leading to functional loss and increasing care needs (REF). In addition, widowhood triggers changes in living arrangements. As the majority of older people in Europe live in nuclear families (Eurostat, 2019 – Ageing Europe), widowhood is often equivalent to a transition to living alone in old age, exposing the widow or the widower to social isolation and loneliness (de Jong Gierveld et al., 2012). At the same time, the loss of a spouse is for many older people also the loss of a key caring resources. While the care literature has overwhelmingly focused on intergenerational support patterns and caregiving by children to older parents, a significant share of informal caregiving in Europe today is provided within the household, most often by a spouse (Bertogg and Strauss 2020).

By increasing older people’s needs for care and support while at the same time severely affecting their social support network, widowhood transitions increase the vulnerability of older adults to unmet care needs and the probability of institutionalization. Widowed older people are at higher risk of institutionalization (Thomeer et al., 2016), especially shortly after the loss of a spouse (Nihtila & Martikaainen, 2008), as are older people who live alone (Pimouguet et al., 2016). However, to the best of our knowledge, no study has attempted to disentangle the effect of widowhood and living arrangement transitions. Because they co-occur so frequently and are so closely related to all the established determinants of care use (health and functionality, economic resources and social ties), separating their effect can be a complex exercise (REF Bennet). We argue that this analysis is rendered both timely and highly relevant by changing patterns of co-habitation among future older age cohorts and the increasing necessity to ensure older adults who have atypical marital and living arrangement patterns throughout the life course are facilitated to live independently. In addition, it is important to understand if transitions into widowhood and changes in living arrangements in old age have an independent effect on the probability to receive needed care, and if such patterns are gendered, in order to correctly target support services and provide guidance to families and other informal caregivers.

The aim of our study is therefore, to explore the complex pattern of associations between widowhood and living arrangements and use of community-based care for older men and women. We state three inter-related objectives. Firstly, to examine if widowhood and living alone are independent predictors of the probability to access care in the community for older women and men with care needs. Secondly, we investigate gender specific patterns in the association of marital status and living arrangements with care use patterns, with particular attention to the effect of transitions into widowhood and living alone. Finally, we analyze how access to financial and social capital intersect with gender to influence patterns of community-based care use for older women and men with care needs.

Understanding how community-based caring resources are accessed by older women and men with different marital status, living arrangements and socio-economic status levels can inform policies to address care gaps for vulnerable groups, therefore ensuring all older people are facilitated to continue living independently.

***[To be developed] Widowhood, living arrangements and care resources***

Living arrangements and care resources [2-3 para – overview of literature]

* Living alone for older people with care needs increases dependence on community-based support (formal and informal) to manage the household (tasks often shared when living in a couple or larger household) and maintain personal care, to maintain a good morale and mental wellbeing, as well as to combat isolation and ensure sufficient social contacts.
* Gender patterns in living arrangements

Widowhood and care resources [2-3 para – overview of literature]

* Widowhood has a similar effect, as it often leads to living alone for older adults who have been living in a nuclear family (most common living arrangement for older people in Europe).
* In addition, widowhood increases vulnerability through negative effects on mental and physical health status – likely increasing the need for social contact and emotional support – gender patterns very relevant here.
* The transition into widowhood can be a particularly stressful life event for older people, which significantly increases their need for emotional and functional support – gender patterns very relevant here.

## Research Design and Methods [1100 words]

We use data from the Survey of Health, Ageing and Retirement in Europe (SHARE) a multidisciplinary and cross-national database including information on health, socio-economic status and social and family networks of older Europeans (Borsch-Supan et al., 2013). We maintain for the analysis only data from the panel waves of the survey, collected in 2004-5 (wave 1), 2006-7 (wave 2), 2011 (wave 4), 2013 (wave 5) and 2015 (wave 6). Waves 3 and 7 (collected in 2009 and 2017), which include retrospective data and life histories, were excluded from the present analysis. We excluded all observations from countries that have not participated in at least two consecutive panel waves, leading to coverage of 15 European countries, representing 4 different welfare regimes: a) Continental (Austria, Germany, France, Belgium and Switzerland); b) Nordic (Sweden, Denmark, Netherlands); c) Southern (Italy, Spain, Greece) and d) Eastern (Czech Republic, Slovenia, Poland, Estonia).

We further restrict the sample to those individuals who are aged 60 years or older at least at one point in the panel and who report continued care needs for at least two consecutive panel waves. Care needs are assessed as the presence of one or more ADL and IADL limitations, three or more mobility, arm function and fine motor limitations or diagnosed cognitive impairment (case of Alzheimer's, dementia or senility diagnosed by a physician). By focusing on those older individuals (population of interest) who experience sustained functional decline, interfering with their ability to live independently for a prolonged period of time, we are able to identify the effect of changes in marital status and living arrangement, not confounded by changes in care needs status. Moreover, in order to ensure we can separate the effect of widowhood from that of any marital status transition, we excluded from the sample those individuals who reported living in a registered partnership, never being married or being divorced.

Our final analytic sample includes 32139 person-year observations from 12733 individuals, describing an unbalanced panel with only a subset of individuals being observed in all 5 study waves. The sample includes 21972 person-year observations (representing 68.4% of the total sample) from 8561 women and 10167 person-year observations (representing 31.6%) from 4174 men. The large gender imbalance in our analytic sample, more pronounced than the gender gap in survival for older age groups, is the direct result of the higher prevalence of functional limitations and care needs among older women.

Descriptive statistics for the study sample, disaggregated by sex, are presented in Table 1.

[INSERT HERE Table 1 – Descriptive statistics and sample overview]

*Dependent variable*

Our dependent variables is a binary indicator of whether an individual receives any type of care in their own home, including both informal care from family members, neighbors and members of one’s social network and formal care, provided by care professionals. The variable captures care provided by persons residing either within the same household as the care recipient or outside the household and takes a value of 1 if an individual responded ‘Yes’ to at least one of the following survey items:

* Thinking about the last twelve months, has any family member from outside the household, any friend or neighbor given you any kind of help [*with personal care or domestic tasks*]?
* Is there someone living in this household who has helped you regularly during the last twelve months with personal care, such as washing, getting out of bed, or dressing?
* During the last twelve months, did you receive in your own home any professional or paid [*care*] services due to a physical, mental, emotional or memory problem? [*including personal care, domestic tasks, meals-on-wheels*].

*Independent variables*

The main covariates of interest for our study are gender (male or female sex as reported by the respondent), widowhood and living arrangements. A binary variable that identifies widowhood has been generated based on self-reported marital status in each panel wave – married living with spouse, married not living with spouse or widowed. Living arrangements are described in our analysis by two separate variables: Living alone (binary variable identifying a household with only one member) and household size (count variable reflecting the number of household members, irrespective of their familial relationships with the respondent).

We further control for a set of physical and mental health status indicators, which includes: poor self-reported health (identifying cases with less than fair health status); the self-reported number of chronic conditions as diagnosed by a physician, and poor mental health (defined as a EURO-D score higher than 3). While our sample has already been selected to include only individuals with care needs we further included controls for physical functioning, i.e. the number of limitations with activities of daily living and independent activities of daily living, which allow us to capture the effect of severe care needs.

*Analytical approach*

Our data are hierarchically structured, with each individual observed on several occasions over time. This structure is significant both methodologically and substantively, as we are interested in modelling both the effect of widowhood and living arrangements on the probability to receive care across the population and the effect of transitioning into widowhood for individuals within the population. In order to examine both cross-sectional (between individuals) and longitudinal (within individuals, over time) associations, rather than assuming they are equivalent, we employ a methodology that is gaining increasing attention in social and political sciences, the random effects within-between model – REWB (Allison, 2009; Bell et al., 2019; Schunck, 2013; Schunk & Perales, 1017). REWB is a multi-level modelling approach, combining the strengths of fixed and random effects estimation and relying on less stringent exogeneity assumptions. Similarly to a random effects model, the REWB between-effects allow for the inclusion of time-invariant covariates (e.g. education achievement), which are of significant interest in our study. At the same time, the model provides fixed effects estimates for within cluster effects allowing for a causal interpretation.

Throughout, we run sex disaggregated models, presenting results for the women and men samples independently. This approach allows us to evaluate whether the widowhood and living alone are independent predictors of care receiving both for women and for men and whether changes in these variables significantly impact care receiving for both groups. Crucially, gender disaggregation also allows us to evaluate whether there is variability in the effect of socio-economic position indicators on the probability to receive care between women and men and to reflect on the intersectional nature of gender and socio-economic disadvantage.

## Results [max 1000 words]

Although we included in the analysis sample only individuals who report functional limitations that are indicative of care needs, the gender patterns we observe closely reflect results from previous population based studies (Table 1). Only half of the older people in our sample receive care, indicating a considerable proportion of unmet care needs in older European populations. Women are on average more likely to receive care, although age and the distribution of care needs across sexes is mixed. The share of women who transition into widowhood and who live alone is substantially higher than that of men, who live in households of larger average size. Significant differences between sexes are also apparent in socio-economic condition. Fewer men report only primary or no education attainment and while women are relatively evenly distributed across income quartiles, older men are concentrated in richer income quartiles.

Table 2 summarizes the results of our analysis. We find widowhood is significantly and positively associated with the probability to receive long-term care for both women and men (between effect), while the transition into widowhood increases the likelihood of receiving care only for older women (within effect). In other words, while both widows and widowers have a higher probability of receiving care than married older individuals, bereavement (i.e. the transition from marriage to widowhood) triggers an average increase in care use only for older women. The results are robust to controlling for a complex set of health and functional status indicators, including severity of care needs (Model 2) and for income and education achievement, as proxies for socio-economic status (Model 3). The direction and statistical significance of this association is confirmed also when considering the effect of living arrangements (Model 4), although the strength of the association is markedly reduced. Living alone is a significant predictor of the probability to receive care for both women and men, while household size is only weakly associated with care use for women, but not for men (between effects). We find no evidence for a causal association between changes in household size or transitioning to living alone and the care use by older women and men.

Socio-economic status indictors are associated with the probability to receive care only for older women in our sample, while no significant effects are identified for older men. In line with previous results, low education achievement (a time-invariant predictor in our analysis) negatively affects the probability to receive care after controlling for health status and severity of care needs. This indicates that older women who completed no education or only primary education are significantly more likely to not be able to access needed care. While small, there is a positive effect of income on the probability of care use for women. We find that belonging to a higher income quartile (between effect) but also a rise in income (within effect) lead to increases the likelihood of receiving needed care.

We next turn our attention to the possibility that the above results are mediated by country specific characteristics and institutional factors that are not fully captured by country specific dummy variables. In Table 4, we present the results of separate analyses of country clusters organized along the care regime typology. For Continental (Austria, Germany, France, Belgium and Switzerland) and Southern European (Italy, Spain, Greece) care regimes the results are very similar to those reported for the pooled European sample. Widowhood is a positive and significant predictor of care use for both women and men, while transitions into widowhood (within effect) only affect care use by older women. In Eastern European countries (Czech Republic, Slovenia, Poland, Estonia) we find evidence of an effect of widowhood and transitions into widowhood only for older women, while in Nordic countries (Sweden, Denmark, Netherlands) the association is not statistically significant for either gender. Living alone is associated with higher probability of receiving care for women across all care regimes, while results for men vary between country clusters.

Finally, we find a highly variable pattern of association between socio-economic status indicators and care use, reflecting large differences in cultural and social underpinnings across country clusters. Low education achievement is significantly associated with lower probability of receiving care only for women in the Southern European care regimes. Average income predicts higher care use for women in the Continental and Nordic care regimes only, while a positive change in income increases the likelihood of receiving care for both men and women in the Southern European care regime only.

## Discussion and Implications [max 1500 words] – all co-authors

## References – max 750 words

Börsch-Supan, A., Brandt, M., Hunkler, C., Kneip, T., Korbmacher, J., Malter, F., Schaan, B., Stuck, S., Zuber, S., 2013. Data resource profile: the survey of health, ageing and retirement in Europe (SHARE). Int. J. Epidemiol. 42, 992–1001.

Ilinca, S., Rodrigues, R., & Schmidt, A. E. (2017). Fairness and eligibility to long-term care: an analysis of the factors driving inequality and inequity in the use of home care for older Europeans. International Journal of Environmental Research and Public Health, 14(10), 1224.

Phillips, S. P., Auais, M., Belanger, E., Alvarado, B., & Zunzunegui, M. V. (2016). Life-course social and economic circumstances, gender, and resilience in older adults: The longitudinal International Mobility in Aging Study (IMIAS). SSM-Population Health, 2, 708-717.

Bertogg, A., & Strauss, S. (2020). Spousal care-giving arrangements in Europe. The role of gender, socio-economic status and the welfare state. Ageing & Society, 40(4), 735-758.

Van der Linden, B. W. A., Cheval, B., Sieber, S., Orsholits, D., Guessous, I., Stringhini, S., ... & Burton-Jeangros, C. (2019). Life course socioeconomic conditions and frailty at older ages. The Journals of Gerontology: Series B, 75(6), 1348-1357.

Chatterji, S., Byles, J., Cutler, D., Seeman, T., & Verdes, E. (2015). Health, functioning, and disability in older adults—present status and future implications. The lancet, 385(9967), 563-575.

Leveille, S. G., Resnick, H. E., & Balfour, J. (2000). Gender differences in disability: evidence and underlying reasons. Aging Clinical and Experimental Research, 12(2), 106-112.

Rodrigues, R., Ilinca, S., & Schmidt, A. E. (2018). Income‐rich and wealth‐poor? The impact of measures of socio‐economic status in the analysis of the distribution of long‐term care use among older people. Health Economics, 27(3), 637-646.

Oliveira Hashiguchi, T. and A. Llena-Nozal (2020), "The effectiveness of social protection for long-term care in old age: Is social protection reducing the risk of poverty associated with care needs?", OECD Health Working Papers, No. 117, OECD Publishing, Paris, https://doi.org/10.1787/2592f06e-en.

Allison PD. (2009) Fixed effects regression models: SAGE publications.

Bell A, Fairbrother M, Jones K. (2019) Fixed and Random effects models: making an informed choice. Quality & Quantity, 53:1051–1074. doi.org/10.1007/s11135-018-0802-x.

Schunck R. Within and between estimates in random-effects models: Advantages and drawbacks of correlated random effects and hybrid models. Stata Journal. 2013; 13(1):65–76.

Schunck R, Perales F. Within-and between-cluster effects in generalized linear mixed models: A discussion of approaches and the xthybrid command. Stata Journal. 2017; 17(1):89–115.

Bennett, K. M., Smith, P. T., & Hughes, G. M. (2005). Coping, depressive feelings and gender differences in late life widowhood. Aging & Mental Health, 9(4), 348-353.

Lee, G. R., DeMaris, A., Bavin, S., & Sullivan, R. (2001). Gender differences in the depressive effect of widowhood in later life. The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 56(1), S56-S61.

Gillen, M., & Kim, H. (2009). Older women and poverty transition: Consequences of income source changes from widowhood. Journal of Applied Gerontology, 28(3), 320-341.

Bíró, A. (2013). Adverse effects of widowhood in Europe. Advances in Life Course Research, 18(1), 68-82.

de Jong Gierveld, J., Dykstra, P. A., & Schenk, N. (2012). Living arrangements, intergenerational support types and older adult loneliness in Eastern and Western Europe. Demographic Research, 27, 167-200.

Thomeer, M. B., Mudrazija, S., & Angel, J. L. (2016). Relationship status and long-term care facility use in later life. Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 71(4), 711-723.

Pimouguet, C., Rizzuto, D., Schön, P., Shakersain, B., Angleman, S., Lagergren, M., ... & Xu, W. (2016). Impact of living alone on institutionalization and mortality: a population-based longitudinal study. The European Journal of Public Health, 26(1), 182-187.

Nihtilä, E., & Martikainen, P. (2008). Institutionalization of older adults after the death of a spouse. American journal of public health, 98(7), 1228-1234.

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Börsch-Supan, A. (2020). Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 4. Release version: 7.1.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w4.710

Börsch-Supan, A. (2020). Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 5. Release version: 7.1.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w5.710

Börsch-Supan, A. (2020). Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 6. Release version: 7.1.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w6.710