

The impact of life course employment and domestic duties on the wellbeing of retired women and the social protection systems that frame this.

It has been long recognised that the individual life course has a significant impact upon both mental and physical health and on wellbeing in later life (Benshlomo and Kuh, 2002; Hayward and Gorman, 2004; Elder et al., 2003; Platts et al., 2013). Research has established that favourable conditions in early and midlife are associated with good health and wellbeing later in life, (Flores and Kalwij, 2014) while unfavourable conditions negatively influence the possibilities of health and wellbeing (Brandt et al., 2012). Furthermore, research has indicated that an individual's employment and family obligations have a significant impact on health and wellbeing across one's life (Avendano et al., 2015; Dragano and Wahrendorf, 2014). In particular, economic employment is the main determinant of the financial circumstances in retirement and often influences access to good standards of medical care later in life, and in addition work meets basic psychosocial needs. Thus, it is argued that economic employment is linked to positive later life outcomes, since it provides a sense of belonging to a social network (Siegrist and Marmot, 2004; Wahrendorf et al., 2013; Wahrendorf, 2015), a sense of control and autonomy (Haidt and Rodin, 1999) and a sense of reward (Siegrist, 2005).

The difference in these experiences between men and women is particularly interesting, as women are often more negatively affected by the employment experience. Despite social change and the rapid entry of women into the labour market in recent decades, women continue to play a major role in household management and care for family members. In general, men have not increased their contribution to domestic tasks to compensate for the increase in women's participation in the labour force outside the home (Gershuny, 2000). Women are therefore more vulnerable than men to the stress of domestic duties, particularly family care. Furthermore, giving informal care is

associated with a substantial opportunity cost in the form of reduced occupational attainment and the probability of employment (Bolin, 2008). As a result, male life courses are still predominantly characterised by progressive full-time employment, while women's trajectories are more diverse and most women still combine economic employment with domestic duties.

Focusing on women, the evidence on the relationship between employment and late life health are mixed (Di Gessa & Grundy, 2014; Syse et al., 2017). Some studies suggest that both the provision of informal care (Brenna and Di Novi, 2016) and the investment in only domestic work (Wahrendorf, 2015) have a negative impact on women's mental health. There is also evidence that women who had worked full-time have the best health and quality of life in retirement (Macmillan, 2005; McMunn et al., 2006; Stone et al., 2014). Other research has also suggested that taking a short career break for family care is the key for the most favourable late life health outcomes (Lu et al., 2017). Indeed, moving from family care break to paid work both decreases the odds of having disability for mothers (Benson et al., 2017) and increases their chances of better physical health in old age (Sabbath et al., 2015).

This paper argues that the association between women's labour market trajectories and their subsequent health is framed by the context in which they live. For while the relationship between the labour market and health care is characterised by different labour market interventions and family-friendly policies, there has been little explicit research to analyse the association between work trajectories and health outcomes in different settings. It is therefore important to examine the role of the combination of family life and working life for women living under different social protection schemes in European countries.

This leads us to two hypotheses:

- (i) women who combine employment with domestic duties (household and family care) have better physical and mental health later in life than those who are undertake full-time employment or full-time domestic duties;

- (ii) the state welfare context plays an important role in shaping the relationship between the occupational trajectories and women's health.

There are two sub-hypotheses:

- (iia) women who worked economically full-time in welfare regimes which facilitated and supported women in employment would have better wellbeing in later life than women who undertook full-time work in family based regimes.

Alternatively (iiib) women who undertook full-time domestic tasks in family based welfare regimes would have better wellbeing later than those who undertook full-time work.

To test these hypotheses, we analysed data from the Survey of Health, Aging and Retirement in Europe (SHARE), an international panel survey that provides comparable information on the health, social conditions and employment of Europeans aged over 50 in 12 countries: Sweden, Denmark, Austria, France, Germany, Ireland, Switzerland, Belgium, the Netherlands, Spain, Italy and Greece (Börsch-Supan et al., 2013). The 12 countries were organized into four wellness regions following Neyer (2013). This welfare classification is based on similarities and differences of the labour market structure, on the policies which support families and on the conciliation of employment and domestic duties.

I. *Dual-earner* – this is a social democrat regime with high levels of dual career employment, moderately high levels of family allowances, childcare and leave, and "reproductive" work allocated to the state. (Denmark and Sweden)

ii. *Liberal* – a market orientated regime with low levels of traditional family support and dual career support, with "reproductive" work considered a private responsibility. (Ireland and Switzerland)

iii. *General Family* – a continental regime with low levels of support for women's participation in the labour market, average provision of childcare services, high family allowances. (Austria, Belgium, France, Germany and the Netherlands)

iv. *Familistic* – a family based regime with asymmetric distribution of work between the sexes, low participation of women in the labour market, and implicit support for the essential role of women as caregivers, with poor family services and state subsidies. (Greece, Italy and Spain)

Methods

Three longitudinal waves of SHARE from 2002 to 2009 were analysed, selecting women who had retired during this period, and their health status for the first decade after this retirement. Wave 1 (2004) and wave 2 (2006) provide a complete set of questions on respondent's health, while wave 3 (2009, SHARELIFE) provided a retrospective element. In order to explore the employment history of women across the life course, using annual information on occupational position for their last 30 years before retirement, retrospective information was analysed from the participants who participated in the SHARELIFE study, which provides a complete history of changes in health and socio-economic characteristics, beginning at childhood.

We measure depressive symptoms and self-reported health using EURO-D depression scale and self-reported health status (SRH). EURO-D scale is a standardized measure designed for international comparisons. Individuals are asked whether during the past month they have experienced any of a list of 12 symptoms: depression, pessimism, death wish, guilt, trouble in sleeping, loss of interest, irritability, lack of appetite, fatigue, difficulty in concentration, less enjoyment and tearfulness (Prince et al., 1999). EURO-D ranges from zero to 12, with higher scores indicating higher levels of depressive symptoms. This variable does not follow a normal distribution in our sample, since the majority of women is not affected by depressive symptoms (for the distribution of the original variable see table A1). In order to make a clear picture of women with and without depressive symptoms, we have created two groups: group 1 includes

healthy women (their score is equal or lower than three) and the second group is characterised by depressed women (with score higher than three). The score higher than three is, indeed, a predictor of depression (Castro-Costa et al., 2007; Prince et al., 1999). SRH status is measured by the following question: “How is your health in general?” The possible responses are excellent, very good, fair, bad and very bad, and they are coded 1, 2, 3, 4, and 5, respectively. Since we are mostly interested in comparing women with good health with women in poor health, our final variable is organised in three categories: 1 “excellent, very good”, 2 “fair” and 3 “bad, very bad” (for the distribution of the original variable see table A2). Self-reported health has been found to be a reliable health measure in multiple studies (Idler and Benyamini, 1997; Jylhä, 2009), since it combines the subjective experience of acute and chronic symptoms, and different feelings of wellbeing, such as feeling tired, having backache and headaches.

The entire data set was used in the first set of data analysis, to create the labour market histories using sequence analyses (Abbott, 1995). The second set of analysis explores the association between employment history, welfare regimes and two health outcomes (EURO-D and self-reported health) after labour market exit.

Data on labour market participation came from SHARELIFE (2008/2009) (Brugiavini et al., 2013), where the participants were asked to report each job since leaving full-time education. For each job, several items were collected, including the year the job started and ended, whether the job was part-time or full-time and the reason and the duration of any gaps between jobs. As a part of family and fertility history, participants were asked to report each relationship they had and the details of each natural child, including date of birth. They were also asked whether and for how long they had stopped working when each child was born. As is well known, the reliability of any retrospective survey is based on the accuracy of collected information, since memory bias can

constitute a serious problem in the analysis of retrospective data. Analysis conducted by Garrouste and Paccagnella (2011) highlight that SHARELIFE data is overall strongly consistent with the information reported at the time of occurrence of the events with less than ten per cent recall errors over all events.

Some restrictions of the sample were necessary to avoid results, which are related to sample composition, and that existing findings are attributable to reverse causation. Therefore, firstly we excluded people who had difficulties in responding to the retrospective questionnaire and who reported themselves as ‘retired’ before the age of 45 unless their retirement at this age is a consequence of care tasks. Second, we included only the individuals whose information on health was within ten years from the exit of the labour market¹. After these selections, our sample included 5057 individuals in EURO-D sample and 5088 individuals for the self-reported health sample.

In-depth entire employment histories were analysed using sequence analysis on the SHARELIFE data. Following a multidimensional approach, six categories of labour market participation were created: work full-time, work part-time, unemployed, domestic duties, in education and retired.

Using sequence analysis (“SQ_Ados” in STATA), the five most frequent trajectories of our sample were derived. They have been created based on the principle of “sequencing”, that focuses on the order of the distinct successive states (for example A-B-B-A or A-B-A-A) (Billari et al. 2016).

¹ Due to the missing data in the original sample, we do not always have the information on health in the first year of retirement. We overcome this limitation, including women whose information is within ten years from their labour market exit and controlling for it in the models.

Since the categorisation of the life sequences is highly problematic, three important aspects were taken into account.

First, each trajectory should last 30 years and end when the woman declared herself as “retired”.

Therefore, for each woman we have the information of 30 years immediately prior to retirement.

Second, the total amount of time spent in each position was considered to create the trajectories.

Indeed, we support the idea that a woman who had worked full-time for her entire life and has spent only few years in domestic duties has a different labour market career compared with a woman who has repeatedly interchanged paid work and domestic tasks. These situations produced very different trajectories which should be investigated separately.

Third, a principle of consistency was employed giving empirical attention to the sample size of the group of the employment/domestic duties sequences. (If a group has too few cases, the estimates will be too uncertain).

Based on the mentioned arguments, five groups summarising the employment/domestic trajectories in the 30 years before retirement were defined within the sample.

Full-time employment: women who were employed full-time throughout their working life

Domestic duties: women who worked at home throughout their working life

Combined domestic duties and full-time employment: women who exchange full-time employment and domestic duties throughout their working life

Combined domestic and part-time employment: women who exchange part-time employment and domestic duties throughout their working life

Other mixed-trajectories: includes all the other combinations (excluded in previous categories)

Table 1 describes the five trajectories for women in EURO-D and SRH samples.

--- Table 1 ---

Empirical strategy

Given the hierarchical nature of the data, where individuals are nested in countries, the most common choice would have been to use the multilevel regression models. However, multilevel approaches are problematic when the estimated models have a small sample of macro-level units. Indeed, a small sample size at second level leads to biased estimates of second-level standard errors (Cora et al., 2005) and allows for the control of only a small number of indicators, with the risk of omitting important variables (Möring, 2012). Therefore, after a sample description and bivariate analyses, logistic regression model and ordered logistic regression model were used to study the association between the dependent variables (EURO-D scale and SRH) and women's trajectories under different welfare regimes. Finally, predicted probabilities were used to understand the interconnection between the dependent variables and our employment/domestic duties trajectories in different welfare states. Indeed, predicted probabilities quantify the chances of depression symptoms and poor health between trajectories and welfare states.

For each dependent variable, three models were developed: model 1 includes work trajectories, model 2 adds the welfare states regimes, and in model 3 nine confounders were added. Specifically, our analyses controlled for family composition (number of children and grandchildren, presence of partner during the working life), years of education and economic characteristics (logarithm of income), as all are potential confounders of the relationship between work trajectories and health in later life. The presence of a partner was distinguished as “never had the partner or only before age 30” and “mostly married (or with partner) throughout the adult life”. Education was organised into four categories, based on the maximum number of years of education: 0 year, from 1 to 8

years, from 9 to 13 years and 14 years or more. Despite SHARE including other indicators of education, this variable was the most reliable in our sample. Logarithm of income (€) was derived by imputed income for respondent with initially missing values (see Christelis, Japelli, Paccagnella and Weber, 2009, for a description of multiple imputation procedures in SHARE). Moreover, as a major determinant of health in later life, we also controlled for the condition of poor health during childhood. In wave 3 women reported their health in younger age, using the five-point scale: excellent, very good, good, fair and poor. In our analysis, this variable was dichotomised into two categories: “none health issues during childhood” (excellent, very good or good) versus “presence of health issue during childhood” (fair or poor). Finally, we added two variables about time: the year of birth of women and an indicator of number of year after retirement in which the dependent variables have been measured.

Descriptive statistics of all variables are provided in Table 2.

--- Table 2 ---

Results

The sample of women with full data consisted of 5057 for EURO-D sample and 5088 for SRH sample. The total number of observations across countries was 151,685 for EURO-D sample and 152,615 for SHR sample.

In Table 1 women’s employment experiences and their frequencies are reported. Nearly one quarter of women undertook full-time employment throughout their entire life, while 32 per cent of them invested all their life in domestic duties. The high investment of women in domestic duties

was confirmed also by the second most popular trajectory of our sample: 27 per cent of them had interchanged domestic duties and part-time employment throughout their working life.

As expected, women's labour market experiences are very different across the four welfare regimes (Figure 1). Since EURO-D and SHR sample were very similar, the descriptive analyses showed in Figure 1 were based only on EURO-D sample (the same analyses based on SRH sample are showed in Figure A1). Notably, in all four regimes the main combination was part-time employment and domestic duties. This was also the dominant life course in the *Liberal*, *Dual Earner* and *General Family* regimes, while full-time domestic duties was dominant in the *Familistic* regime.

Thus in *Dual-earner* countries over one quarter (27 per cent) of women were employed full-time for their entire life and nearly half (46 per cent) interchanged domestic duties with episodes of work part-time or full-time employment. In contrast half (48 per cent) of women in *Familistic* countries had only undertaken domestic duties across the life course, and only 23 per cent been employed full-time. A smaller proportion of women undertaking only domestic duties were found in the *General Family* (28 per cent) and *Liberal* (30 per cent), with full-time employment standing at 25.2 per cent and 14.7 per cent respectively. In *General Family* and in *Liberal* countries, 38.3 per cent and 42.5 per cent of women interchanged domestic duties with part-time or full-time jobs.

--- Figure 1 ---

Figure 2 gives a preliminary answer to our first question, presenting frequencies of increased depressive symptoms and self-reported health by life course trajectories. Women who never participated to the labour market were more likely to report both higher depressive symptoms and worse health in later life. Despite the differences between groups being very small, it is possible to

note that women who interchanged full-time employment or combined part-time employment with domestic duties have better health post retirement age. In particular, having full-time employment seems to protect the majority of women from mental and physical problems. Regarding the role of the welfare state in shaping health (Figure 3), results show that women in *Dual-earner* regimes have better self-reported health than women living under the other three systems, while those in both *Dual-earner* and *Liberal* regimes have lower depressive symptoms.

--- Figure 2 & Figure 3 ---

In the next step, logistic regression model and ordered logistic models were used to test the significance of the association between working trajectories and the two health measures in different welfare states. Results of these models are showed in Table 3A and Table 3B, where odds ratios and confidence interval at 95 per cent are indicated.

Model 1A (Table 3A) shows that the odds of having depressing symptoms after retirement was 0.8 times lower for women who had mixed trajectories compared with women who had not undertaken economic employment. The odds ratio of the other work trajectories (despite not significant at 95 per cent) indicate that working full-time in the labour market may protect against depression in later life. Model 2A reveals that living in the *Liberal* welfare state decreased the odds of suffering for depression, confirming the result of our descriptive findings. After taking into account other confounders (Model 3A), we observe significantly lower probability of depression symptoms for women living in a *Liberal* welfare state and for those who had long and full-time working life.

Having full-time employment or mixed trajectories (combination of domestic work and part-time employment) decreased also the odds of reporting poor health during retirement (Model 1B, Table 3B), while women who have undertaken full-time domestic duties have the greater risk of low self-reported health. In addition, in line with our descriptive findings, women with the lowest probability of poor health lived in *Dual-earner* regimes (Model 2B and Model 3C).

--- Table 3A & 3B ---

Predicted probabilities (Figure 4) revealed that women who live in *Familistic* and *General Family* regimes have a higher probability of both poor health and depressive symptoms. This is even stronger for those women who have spent their entire lives undertaking domestic duties only. Indeed, the probabilities of depression symptoms and poor health were 29 per cent and 35 per cent (respectively) among those who undertook full-time domestic tasks in the *Familistic* and *General Family* welfare, compared with 23 per cent and 25 per cent in *Liberal* and *Dual-earner* welfare. In contrast, undertaking full or part-time employment reduced the chances of health issues later in life in all welfare regimes. The predicted probabilities were statistically significant (see Table A3).

--- Figure 4A & 4B ---

Discussion

The role of the welfare state is particularly interesting. Our first welfare state hypothesis that women who worked full-time in *Dual-earner* regimes would have better wellbeing later in life than women who undertook this profile in *Familistic* regimes was confirmed. However, our second

hypothesis that women who undertook full-time domestic duties in *Familistic* countries would have better wellbeing in later life than those who were employed full-time in these countries was not confirmed.

In both the *Familistic* and the *General Family* countries, not only are women at higher risk of poor health and depressive symptoms, but this situation is actually stronger for women who have spent all their active years exclusively in domestic tasks. Indeed, being active in the labour market undertaking full or part-time employment increases the chances of a better wellbeing in later life in *all* regimes.

Therefore women who undertake employment under a regime that supports this both through societal policies and attitudes, have better health outcomes. However, an exclusively domestic occupation under a regime that supports this both through societal policies and attitudes does not result in better health outcomes. Importantly, the combination or interchange of employment with domestic duties provides the best health outcomes for women regardless of the social protection system, but these outcomes are most positive under regimes which that support and facilitate this combination.

Our research therefore suggests that women who have never participated in the labour market are more likely to report higher symptoms of depression as well as poorer health later, while women who have combined or interchanged employment and domestic duties have better health and wellbeing. In addition, living and working in a social protection system that supports this combination enhances these outcomes.

Conclusion

The paper set out to consider the association between life course trajectories and women' health in later life in four European welfare regimes.

Our findings add to the accumulative evidence that both women's roles in the labour market and in undertaking domestic duties, typically family care, through their early and mid-adult life are predictive of their health in later life. We underlined that having paid employment and combining or inter changing it with domestic duties across the life course has a positive effect on late life health. In contrast, staying at home as a care provider for the entire life is detrimental for women's health in old age. Further research should investigate why non-employed women had higher odds of bad physical health and higher chances of depressive symptoms in later life. It may be that focusing on only domestic duties and not being in paid employment contribute to the development of depressive symptoms and health issues.

The study limitations should be noted. Firstly this study is based on secondary analysis of work trajectories and family history; we acknowledge the problem with the analysis of retrospective data. Secondly, the sample size of some of the countries is quite small and this might lead to biased estimates. In common with other studies, these findings do not necessarily reflect causal effects. One barrier to the causal assumption is individual heterogeneity. As earlier discussed, despite controlling for previous health conditions, we should consider that heterogeneity in attitudes, choices and preferences between individuals are complex and almost unobservable in social science research. Another barrier to causal interpretation is the characteristic of SHARE samples. The least healthy members of the population are less likely to have reached the age requirement for entry to SHARE (age 50 years). However this possible bias is likely to be extremely small.

Despite these limitations, this study has many strengths. The study offers advances in term of new research questions and methods. Firstly, we considered patterns of employment and domestic

1
2
3
4
5
6 duties throughout the entire life, from adolescence to middle age. Using sequence analysis, we are
7
8 able to observe the differences in women's work trajectories over 30 years. This technique allows
9
10 us to distinguish careers characterised by full-time employment, a combination of paid work and
11
12 long or short family-related breaks, and housemakers. Our clusterization provides a parsimonious
13
14 model that allows studying the association between life events and later life outcomes. Second, due
15
16 to the richness of the SHARE data we are able to take into account two different measures of
17
18 health (physical and mental) as well as important covariates.
19
20

21
22
23 The paper also importantly provides evidence that the welfare regime plays an important role in
24
25 shaping the relationship between life course trajectories and health in later life. Countries that
26
27 promote the combination of employment and domestic duties protect women from poor health
28
29 and depression in later life. It was particularly interesting that women who undertook full-time
30
31 domestic duties in welfare regimes which promoted this life course were not protected from such
32
33 poor health and depression. Our research thus suggests that women who have never participated
34
35 in the labour market are more likely to report more symptoms of depression as well as poorer
36
37 health in later life, while women who have combined or interchanged employment and domestic
38
39 duties have better health. In addition, living and working in a social protection system that supports
40
41 this leads to better health outcomes.
42
43
44

45
46 It is therefore important that future decisions regarding the role of women in society and the
47
48 workplace take these findings into account and that women continue to successfully combine
49
50 economic and domestic employment in a supportive environment.
51
52

53 54 55 **Acknowledgment**

56
57 This paper uses data from SHARE wave 1 and wave 2, and SHARELIFE release 1, as of
58
59 November 24th 2010 (DOI: 10.6103/SHARE.w3.100). The SHARE data collection has been
60

primarily funded by the European Commission through the 5th Framework Programme (project QLK6-CT-2001-00360 in the thematic programme Quality of Life), through the 6th Framework Programme (projects SHARE- I3, RII-CT-2006-062193, COMPARE, CIT5-CT-2005-028857, and SHARELIFE, CIT4-CT-2006-028812) and through the 7th Framework Programme (SHARE-PREP, N. 211909, SHARE-LEAP, N. 227822 and SHARE M4, N. 261982). Additional funding from the U.S. National Institute on Aging (U01 AG09740-13S2, P01 AG005842, P01 AG08291, P30 AG12815, R21 AG025169, Y1-AG4553- 01, IAG BSR06-11 and OGHA 04-064) and the German Ministry of Education and Research as well as from various national sources is gratefully acknowledged (see www.share-project.org for a full list of funding institutions).

References

- Abbott, A. (1995). Sequence-analysis – new methods for old ideas. *Annual Review of Sociology*, **21**, 93–113.
- Avendano, M., Berkman, L. F., Brugiavini, A. and Pasini, G. (2015). The long-run effect of maternity leave benefits on mental health: Evidence from European countries. *Social Science & Medicine*, **132**, 45–63.
- Benshlomo, Y. and Kuh, D. (2002). A life course approach to chronic disease epidemiology: conceptual models, empirical challenges and interdisciplinary perspectives. *International Journal of Epidemiology*, **3**, 285–293.
- Benson, R., Glaser, K., Corna, L., Platts, L., et al. (2017). Do work and family care histories predict health in older women? *European Journal of Public Health*, **6**, 1010–1015.
- Billari, F. C., Fürnkranz, J., & Prskawetz, A. (2006). Timing, sequencing, and quantum of life course events: A machine learning approach. *European Journal of Population*, **22**(1):37–65.

- Bolin, K., Lindgren, B. and Lundborg, P. (2008). Your next of kin or your own career? Caring and working among the 50+ of Europe. *The European Journal of Health Economics*, **27**, 718–738.
- Börsch-Supan, A., Brandt, M., Hunkler, C., Kneip, T., Korbmacher J., Malter, F., Schaan, B., Stuck, S. and Zuber, S. (2013). Data resource profile: the Survey of Health, Ageing and Retirement in Europe (SHARE). *International Journal of Epidemiology*, **42**, 992–1001.
- Brandt, M., Deindl, C. and Hank, K. (2012). Tracing the origins of successful aging: the role of childhood conditions and social inequality in explaining later life health. *Social Science & Medicine*, **74**, 1418–1425.
- Brenna, E. and di Novi, C. (2016). Is caring for older parents detrimental to women's mental health? The role of the European North-South gradient. *Review of Economics of the Household*, **14**, 745–778.
- Brugiavini, A., Cavapozzi, D., Pasini, G. and Trevisan, E. (2013). Working Life Histories from SHARELIFE: a Retrospective Panel. *SHARE WP Series*, 11–13.
- Castro-Costa, E., Dewey, M., Stewart, R., Banerjee, S., Huppert, F., Mendonca-Lima C., Bula, C., Reiches, F., Wancata, J., Ritchie, K., Tsolaki, M., Mateos, R. and Prince, M. (2007). Prevalence of depressive symptoms and syndromes in later life in ten European countries: the SHARE study. *The British Journal of Psychiatry*, **191**, 393–401.
- Christelis, D., Jappelli, T., Paccagnella, O., & Weber, G. (2009). Income, wealth and financial fragility in Europe. *Journal of European Social Policy*, **19**(4), 359–376.
- Cora, J., Maas, M. and Hox J.J. (2005). Sufficient sample sizes for multilevel modeling. *Methodology*, **1**, 86–92.

- Di Gessa, G., & Grundy, E. (2014). The relationship between active ageing and health using longitudinal data from Denmark, France, Italy and England. *Journal of Epidemiology & Community Health*, 68, 261-267.
- Dragano, N. and Wahrendorf, M. (2014). Consistent health inequalities in Europe: the importance of labour market disadvantage. *Journal of Epidemiology and Community Health*, 68, 1–2.
- Elder, G. H. J., Johnson, M. K. and Crosnoe, R. (2003). The Emergence and Development of Life Course Theory. In J. T. Mortimer and M. J. Shanahan (eds.), *Handbook of the Life Course*. Kluwer Academic Publishers, Hingham MA, pp. 3–19.
- Flores, M. and Kalwij, A. (2014). The associations between early life circumstances and later life health and employment in Europe. *Empirical Economics*, 4, 1251–1282.
- Garrouste, C. and Paccagnella, O. (2011). Data quality: three examples of consistency across SHARE and SHARELIFE data in retrospective data collection. In: Schröder, M. (Ed.), *The Survey of Health, Ageing and Retirement in Europe. SHARELIFE Methodology*. Mannheim Research Institute for the Economics of Ageing (MEA), Mannheim.
- Gershuny, J. (2000). *Changing times: Work and leisure in post-industrial society*. Oxford: Oxford University Press.
- Haidt, J. and Rodin, J. (1999). Control and efficacy as interdisciplinary bridges. *Review of General Psychology*, 3, 317–37.
- Hayward, M. and Gorman, B. (2004). The long arm of childhood: the influence of early-life social conditions on men's mortality. *Demography*, 41, 87–107.
- Idler, E. and Benyamini, Y. (1997). Self-rated health and mortality: a review of twenty-seven community studies. *Journal of Health Social Behavior*, 38, 21–37.

- Jylhä, M. (2009). What is self-rated health and why does it predict mortality? Towards a unified conceptual model. *Social Science & Medicine*, **69**, 307–316.
- Lu, W., Benson, R., Glaser, K., et al. (2017). Relationship between employment histories and frailty trajectories in later life: evidence from the English Longitudinal Study of Ageing. *Journal of Epidemiological Community Health*, **71**, 439–445.
- Macmillan, R. 2005. *The Structure of the Life Course: Standardized? Individualized? Differentiated?*. Elsevier JAI, Amsterdam.
- McMunn, A., Bartley, M. and Kuh D. (2006). Women's health in mid-life: life course social roles and agency as quality. *Social Science & Medicine*, **63**, 1561–72.
- Möring, K. (2012). The Fixed Effect as an Alternative to Multilevel Analysis for Cross- national Analyses. *GK Soclife Working Papers Series*.
- Neyer, G. (2013). Gender Equality and Fertility: Which Equality Matters?. *European Journal of Population*, **29**, 245–272.
- Platts, L.G., Netuveli, G., Webb, E., Zins, M., Goldberg, M., Blane, D. and Wahrendorf, M. (2013). Physical occupational exposures during working life and quality of life after labour market exit: results from the GAZEL study. *Aging & Mental Health*, **17**, 697–706.
- Prince, M.J., Reischies, F., Beekman, A.T., Fuhrer, R., Jonker, C., Kivela S.L., Lawlor, B.A., Magnusson, H., Fichter, M., van Oyen, H., Roelands, M., Skoog, I., Turrina, C. and Copeland, J.R. (1999). Development of the EURO-D scale-a European, Union initiative to compare symptoms of depression in 14 European Centres. *The British Journal of Psychiatry*, **174**, 330–338.
- Sabbath, E.L., Guevara, I.M., Glymour M.M., Berkman, L.F. (2015). Use of life course work-family profiles to predict mortality risk among US women. *American Journal of Public Health*, **105**(4): e96–e102.

- Siegrist J. (2005). Social reciprocity and health: new scientific evidence and policy implications. *Psychoneuroendocrinology*, **30**, 1033–8.
- Siegrist, J. and Marmot, M. (2004). Health inequalities and the psychosocial environment – two scientific challenges. *Social Science & Medicine*, **58**, 1463–73.
- Stone, J., Evandrou, M., Falkingham, J., et al. (2015). Women's economic activity trajectories over the life course: implications for the self-rated health of women aged 64+ in England. *Journal of Epidemiological Community Health*, **69**, 873-879.
- Syse, A., Veenstra, M., Furunes, T., Mykletun, R. J., & Solem, P. E. (2017). Changes in health and health behavior associated with retirement. *Journal of Aging and Health*, **29**, 99-127.
- Wahrendorf, M., Blane, D., Bartley, M., Dragano, N., Siegrist, J. (2013). Working conditions in mid-life and mental health in older ages. *Advances in Life Course Research*, **18**, 16–25.
- Wahrendorf, M. (2015). Previous employment histories and quality of life in older ages: sequence analyses using SHARELIFE. *Ageing & Society*, **35**, 1928–1959

TABLES

Table 1. A typology of job trajectory in EURO-D sample and SRH sample.

	EURO-D	SRH
Domestic work	31.8	31.8
Fulltime employment	24.0	23.9
Combined domestic work & full-time employment	8.9	9.1
Combined domestic work & part-time employment	27.0	26.8
Other mixed-trajectories	8.3	8.4
N	5057	5088

Table 2. Descriptive statistics, percentages or mean (sd).

	%	MEAN (SD)
SELF-REPORTED HEALTH		
Excellent/Very good	28.6	
Good	37.8	
Bad/Very bad	33.6	
EURO-D DEPRESSION SCALE		2.4 (2.2)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46

>3 Euro-D symptoms	26.0	
WELFARE		
Familistic	35.0	
Liberal	7.4	
Dual-earner	16.9	
General family	40.7	
Year of birth (min, max)	1910	1945
Number of children		3.1 (1.5)
Number of grandchildren		4.5 (4.2)
Poor health conditions during childhood		
No	53.2	
Yes	46.8	
Partner over life		
Never partner or only by 30	6.1	
Partner between 30 and later	93.9	
Years of education		
0 - No education	0.22	

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46

From 1 to 8 years	16.6	
From 9 to 13 years	41.8	
14 years or more	41.4	
Log of income		10.51 (0.79)
How many years from retirement		4.5 (4.1)

Table 3A: Associations of work trajectories and welfare state with risk of elevated depressive symptoms: results of logistic estimates (odds ratios and CI 95%).

	MODEL 1A		MODEL 2A		MODEL 3A	
	Odds Ratio	95% CI	Odds Ratio	95% CI	Odds Ratio	95% CI
WORK TRAJECTORY						
Domestic work (reference)						
Fulltime employment	0.84	(0.72, 1.01)	0.87	(0.73, 1.03)	0.83	(0.69, 0.99)
Combined domestic work & full-time employment	0.92	(0.72, 1.16)	0.94	(0.74, 1.19)	0.94	(0.73, 1.19)
Combined domestic work & part-time employment	0.86	(0.72, 1.01)	0.90	(0.75, 1.06)	0.87	(0.73, 1.03)
Other mixed-trajectories	0.76	(0.59, 0.98)	0.82	(0.63, 1.07)	0.80	(0.61, 1.04)
WELFARE						

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46

Familistic (reference)				
Liberal	0.72	(0.55, 0.95)	0.71	(0.54, 0.94)
Dual-earner	0.83	(0.68, 1.02)	0.87	(0.70, 1.07)
General family	0.97	(0.83, 1.12)	0.98	(0.84, 1.13)
Year of birth			1.00	(0.99, 1.01)
Number of children			1.01	(0.96, 1.06)
Number of grandchildren			1.02	(0.99, 1.03)
Poor health conditions during childhood				
No			0.84	(0.73, 0.95)
Yes (reference)				
Partner over life				
Never partner or only by 30 (reference)				
Partner between 30 and later			0.84	(0.84, 1.09)
Years of education				
0 - No education (reference)				
From 1 to 8 years			0.86	(0.25, 2.98)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46

From 9 to 13 years					0.78	(0.23, 2.69)
14 years or more					0.71	(0.20, 2.45)
Log of income					0.92	(0.84, 1.00)
How many years from retirement					1.01	(0.84, 1.00)
_cons	0.39	(0.35, 0.43)	0.406	(0.35, 0.46)	0.30	(0.98, 1.03)
Log likelihood	-2888.23		-2884.16		-2866.957	
Pseudo R2	0.012		0.027		0.078	
N	5,057		5,057		5,053	

Table 3B: Associations of work trajectories and welfare state with risk of poor self-reported health: results of ordered logistic estimates (odds ratios and CI 95%).

	MODEL 1B		MODEL 2B		MODEL 3B	
	Odds Ratio	95% CI	Odds Ratio	95% CI	Odds Ratio	95% CI
WORK TRAJECTORY						
Domestic work (reference)						
Fulltime employment	0.87	(0.75, 0.98)	0.91	(0.79, 1.04)	0.92	(0.78, 1.06)
Combined domestic work & full-time employment	0.83	(0.69, 1.01)	0.88	(0.73, 1.06)	0.93	(0.76, 1.12)

Combined domestic work & part-time employment	0.84	(0.73, 0.96)	0.89	(0.78, 1.02)	0.89	(0.77, 1.02)
Other mixed-trajectories	0.83	(0.68, 1.02)	0.94	(0.76, 1.15)	0.94	(0.75, 1.15)
WELFARE						
Familistic (reference)						
Liberal			1.04	(0.84, 1.27)	1.09	(0.99, 1.03)
Dual-earner			0.73	(0.62, 0.85)	0.81	(0.68, 0.96)
General family			1.01	(0.89, 1.13)	1.05	(0.93, 1.19)
Year of birth					0.99	(0.98, 1.00)
Number of children					0.97	(0.93, 1.01)
Number of grandchildren					1.03	(1.01, 1.04)
Poor health conditions during childhood						
No					1.01	(0.90, 1.17)
Yes (reference)						
Partner over life						
Never partner or only by 30 (reference)						

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46

Partner between 30 and later					0.98	(0.79, 1.21)
Years of education						
0 - No education (reference)						
From 1 to 8 years					0.57	(0.18, 1.72)
From 9 to 13 years					0.44	(0.14, 1.03)
14 years or more					0.34	(0.11, 1.01)
Log of income					0.87	(0.81, 0.93)
How many years from retirement					1.02	(0.99, 1.03)
_cut1	-1.02	(-1.12, -0.93)	-1.039	(-1.14, -0.92)	-8.03	(-23.23, 7.17)
_cut1	0.57	(0.47, 0.66)	0.567	(0.46, 0.67)	-6.39	(-21.60, 8.81)
<hr/>						
Log likelihood	-5551.99		-5541.47		-5479.93	
Pseudo R2	0.008		0.027		0.131	
N	5,088		5,088		5,084	
<hr/>						

FIGURES

Figure 1. Labour market trajectory by welfare state.

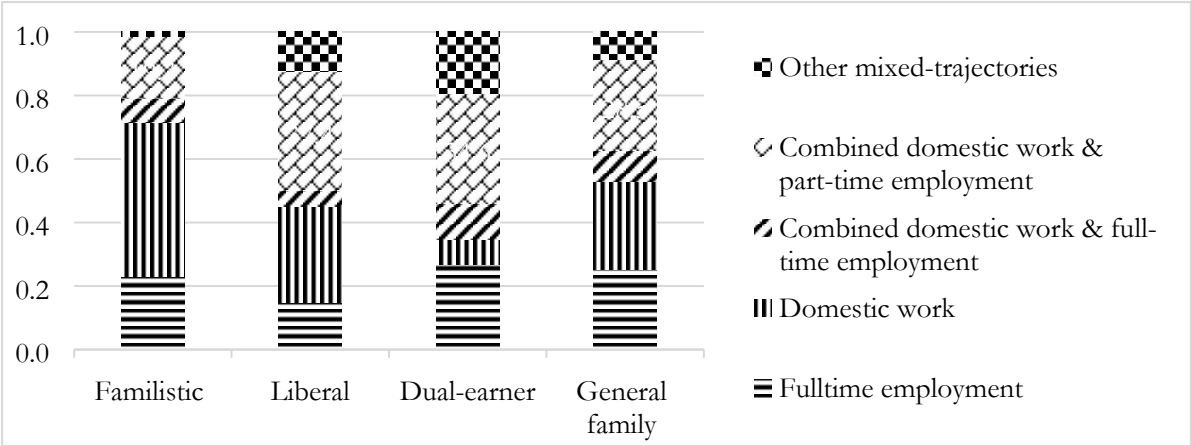


Figure 2. Depression Symptoms and Self-reported health by job trajectory.

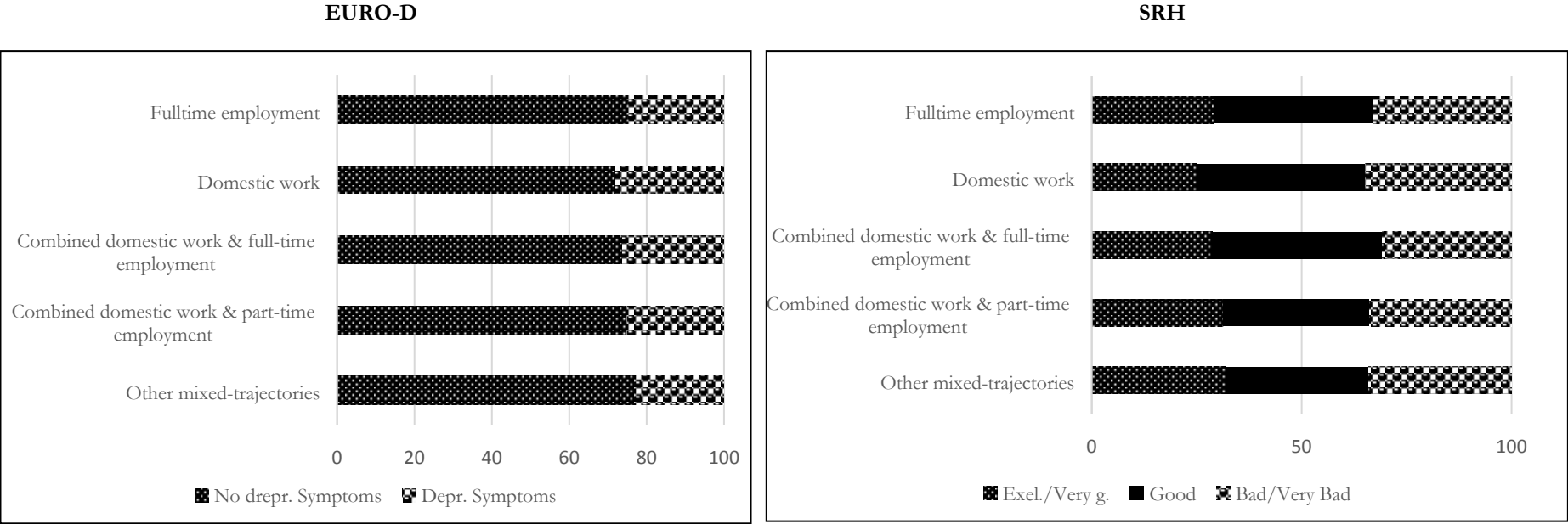


Figure 3. Depression Symptoms and Self-reported health by welfare state.

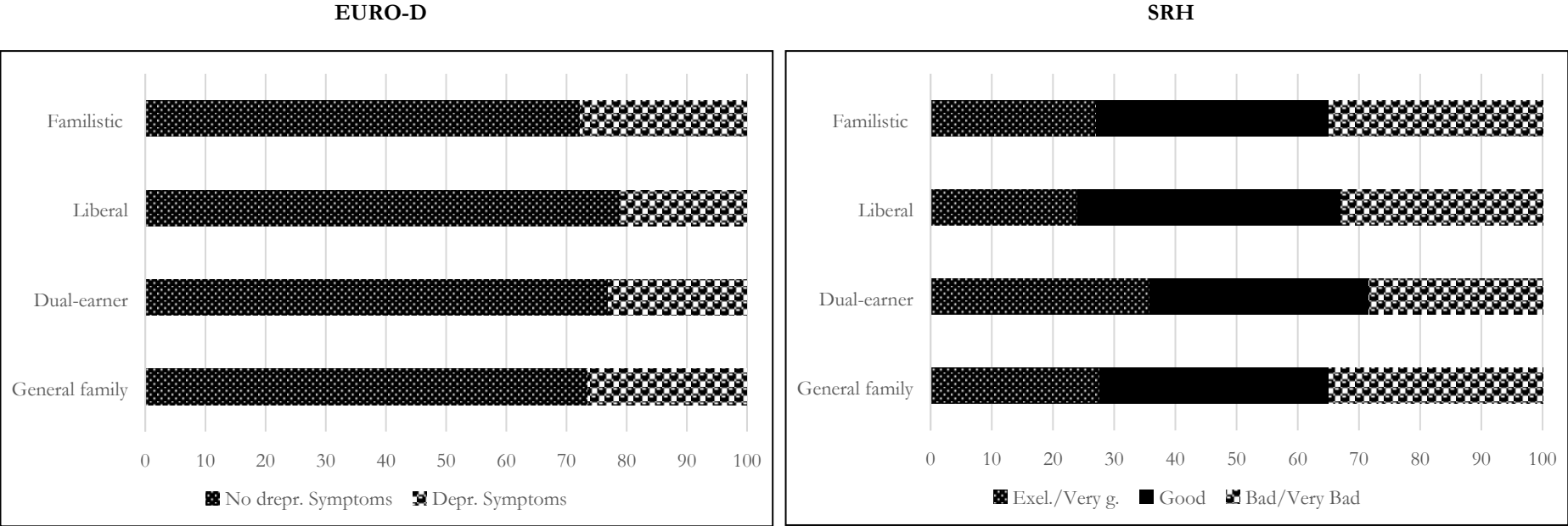


Figure 4A. Probability of Depression Symptoms by job trajectory in four welfare regimes.

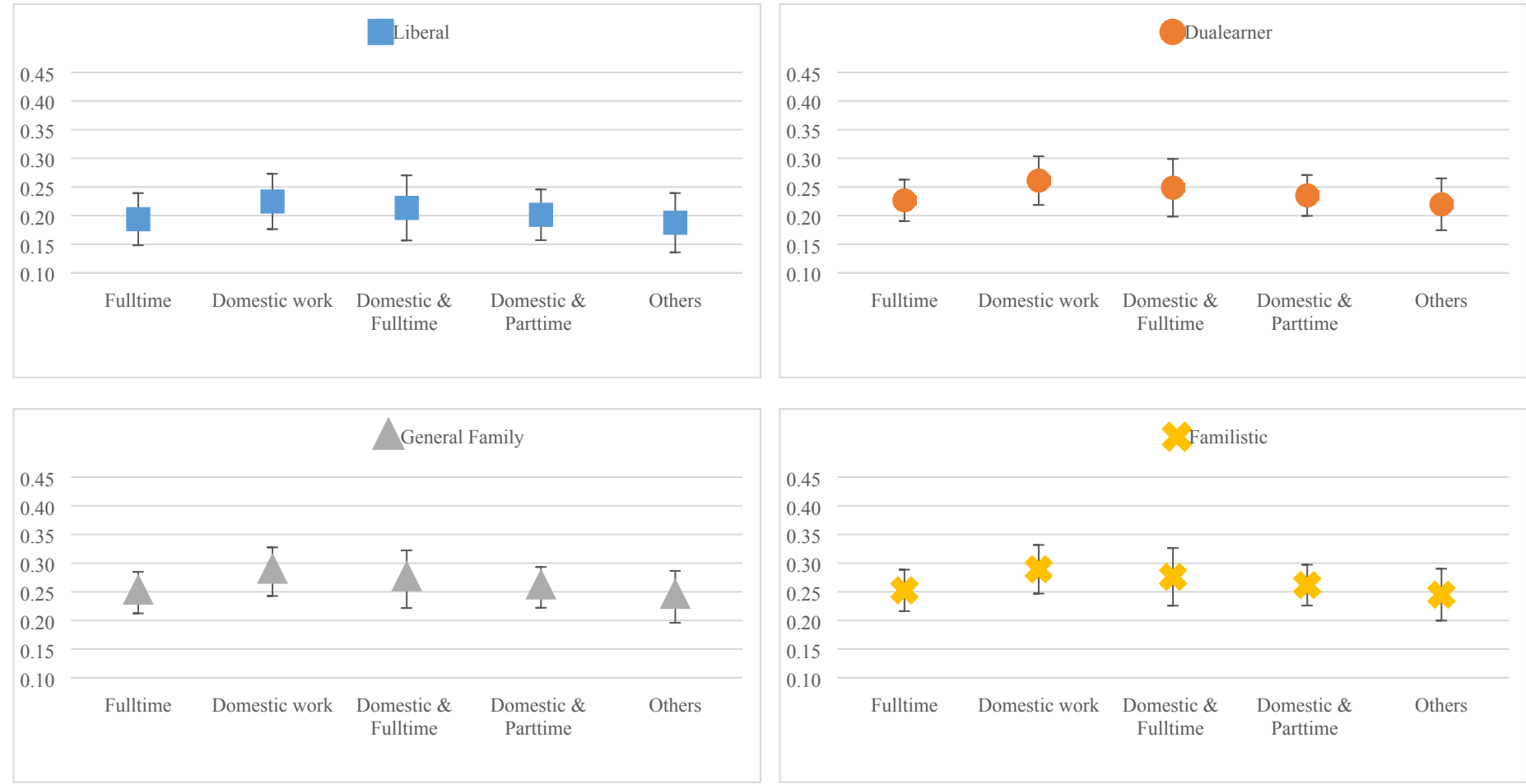
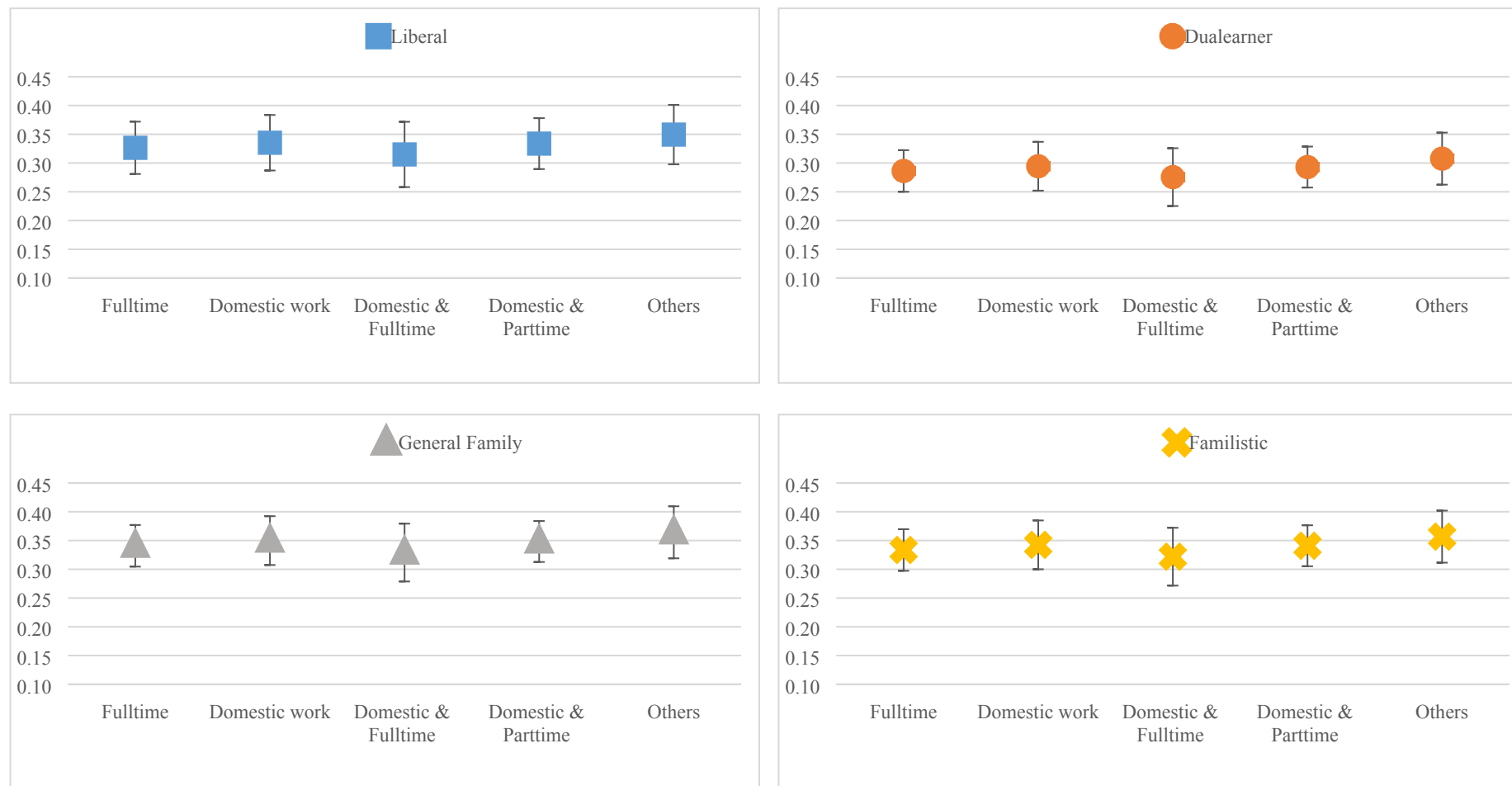


Figure 4B. Probability of Self-reported health by job trajectory in four welfare regimes.



APPENDIX

Table A1: Distribution of EURO_D variable.

	%
0	24.54
1	21.75
2	16.35
3	11.47
4	8.13
5	6.68
6	4.13
7	2.91
8	1.58
9	1.46
10	0.69
11	0.2
12	0.1
Total (N)	5,057

Table A2: Distribution of Self-reported variable.

	%
Excellent	8.71
Very good	19.83
Good	37.83
Fair	25.61
Poor	8.02
Total (N)	5,088

Table A3: Statistics of income before transforming it in logarithm.

	Mean	SD	Min	Max
Income	52303.73	79797.09	0	3204600

Table A3: Predicted probabilities of risk of elevated depressive symptoms and poor self-reported health (margin and CI 95%).

	EURO-D		SRH	
	Margin	95% CI	Margin	95% CI
Domestic work				
Familistic	0.29	(0.26, 0.32)	0.35	(0.32, 0.37)
Liberal	0.23	(0.18, 0.27)	0.34	(0.29, 0.39)
Dual-earner	0.26	(0.22, 0.30)	0.30	(0.26, 0.34)
General family	0.29	(0.26, 0.32)	0.35	(0.32, 0.38)
Fulltime employment				
Familistic	0.25	(0.22, 0.28)	0.34	(0.30, 0.37)
Liberal	0.20	(0.15, 0.24)	0.33	(0.27, 0.38)
Dual-earner	0.23	(0.19, 0.26)	0.29	(0.25, 0.33)
General family	0.25	(0.22, 0.38)	0.34	(0.31, 0.37)
Combined domestic work & full-time employment				
Familistic	0.28	(0.23, 0.32)	0.32	(0.28, 0.37)
Liberal	0.21	(0.16, 0.27)	0.32	(0.25, 0.38)
Dual-earner	0.25	(0.20, 0.30)	0.28	(0.23, 0.33)
General family	0.27	(0.23, 0.32)	0.33	(0.29, 0.38)
Combined domestic work & part-time employment				
Familistic	0.26	(0.23, 0.29)	0.34	(0.31, 0.38)
Liberal	0.20	(0.16, 0.25)	0.34	(0.28, 0.39)
Dual-earner	0.24	(0.20, 0.27)	0.30	(0.26, 0.33)
General family	0.26	(0.23, 0.29)	0.35	(0.32, 0.38)
Other mixed-trajectories				
Familistic	0.25	(0.20, 0.30)	0.36	(0.30, 0.41)
Liberal	0.19	(0.14, 0.24)	0.35	(0.29, 0.42)
Dual-earner	0.22	(0.18, 0.27)	0.31	(0.26, 0.36)
General family	0.24	(0.20, 0.29)	0.37	(0.32, 0.42)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Figure A1. Labour market trajectory by welfare state based on SRH.

