

Active ageing and solidarity between generations in Europe

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First results from SHARE after the economic crisis

Edited by

Axel Börsch-Supan, Martina Brandt, Howard Litwin
and Guglielmo Weber

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1 SHARE: a European policy device in turbulent times

Europe faces great economic and social challenges for the coming decades. Explicit government debt in the EU now stands at almost 90 per cent. Reducing this debt will take several decades and will involve more than the current generation. But this debt does not take into account that population ageing generates a demographic imbalance, and this in turn creates an implicit debt that is even higher than the explicit debt. The implicit debt means that entitlements of the current generation to pensions, health and long-term care to be paid in the future are not covered by the taxes and contributions expected to be paid under current policies by the current and later generations. Tackling this dual debt crisis requires Europe to rethink how seriously it takes active ageing and solidarity between generations.

„Active ageing and solidarity between generations” started as a relatively harmless motto for the European Year 2012. The dual debt crisis, however, has given it a much more serious meaning. The high debt levels mean that the financial balance between generations has gotten out of equilibrium and that more economic activity has to be created to pay off the debt, not the least through a more active role of the current ageing generation which has accumulated the debt. The 2012 motto therefore entails serious controversies: Which generation will pay the bulk of the burden? Who has to work longer? Who has to pay more taxes? Who will lose wealth through inflation? Will the current austerity measures deteriorate health and longevity? Will our societies adapt without jeopardising intergenerational cohesion?

This book is built on the premise that such serious questions require solid evidence to be collected and analysed before rushing to quick answers. This holds in particular when the questions are loaded with emotions and are fraught with political prejudices. SHARE – the Survey of Health, Ageing and Retirement in Europe (SHARE) – is designed to provide such evidence. The authors in this book take a first look at the data from the fourth wave of SHARE to shed light on the many micro-level aspects of active ageing and solidarity between generations in times of the dual debt crisis that has followed the financial crisis of 2008/2009. Its main purpose is to provide sober evidence of what has changed in the activities and life circumstances of older Europeans since the crisis has begun, and how it has affected intergenerational solidarity.

The Survey of Health, Ageing and Retirement in Europe (SHARE) collects detailed information on European individuals aged 50+ and makes it available to researchers and policy-makers. The SHARE enterprise allows researchers from across Europe and elsewhere to address key questions that are relevant to the achievement of active ageing and intergenerational solidarity. For example, what are the socio-economic circumstances in which Europeans aged 50 and older live? How healthy are they and does their objective health state reflect how they feel? What is the nature of the social networks in which they are embedded, and to what degree do they engage in the exchange of intergenerational support? And, last but not least, how do varying societal conditions shape their lives as they move through the life course, particularly in the latter half of the life span?

The work in this book is based on the most recent wave of the SHARE data which was collected in 2010 and 2011. The timing of this wave of data collection allows a unique examination of the various influences that the recent economic crisis has had on the lives of people aged fifty and over in different European countries. In this fourth wave, SHARE returned to the “classical” longitudinal design of social research (see Malter & Börsch-Supan 2013 for a description of how the data was collected in Wave 4). Such longitudinal inquiry is necessary to understand the extent of the changes that occur in the life circumstances of people as they age and as they were hit by the economic and financial crises. Our “observation window”, now extending from 2004 to 2012, is augmented by the life histories that were collected in Wave 3 and which provide background information as far back in time as childhood health and economic status (see Börsch-Supan et al. 2011 and Schröder 2011 for information on SHARELIFE). Together, SHARE and SHARELIFE provide a wealth of data to better understand the activities of older Europeans and how they react to exceptional circumstances such as the crises.

SHARE Wave 4 also takes “solidarity between generations” seriously as an object that needs to be measured and analysed. SHARE Wave 4 introduced, therefore, an important innovation, the results of which are presented for the first time in this book. In its fourth wave, SHARE became the first cross-national multi-disciplinary survey to collect harmonised social network information using a name generator approach (Litwin et al. 2013). This innovation adds important new information about the social fabric in Europe which, as the authors in this book show, interacts with the health, economics and social support areas that are already well covered by the SHARE questionnaire.

SHARE is also unique in an important additional aspect. That is, the survey is not only multi-disciplinary, a major undertaking in itself, but also multi-national in scope. The fourth wave of SHARE collected data on some 65,000 individu-

als aged 50 or over (and their spouses of any age) from 16 different countries. Four additional countries joined SHARE in Wave 4 and became new members of the longitudinal infrastructure (Estonia, Hungary, Portugal and Slovenia). On a sad note, Greece did not participate in Wave 4 due to the financial difficulties in that country. It is significant to mention that SHARE is harmonised with the U.S. Health and Retirement Study (HRS), the English Longitudinal Study of Ageing (ELSA) and The Irish Longitudinal Study of Ageing (TILDA). Studies in Korea, Japan, China, India and Brazil also follow these models.

1.1 Finances, work, health, social networks and the crisis

This book is composed of four sections that are edited by scientists who come from different disciplines and backgrounds. However, as will be seen, these separate sections are quite inter-related and are, thus, indivisible in terms of their results and overall conclusions.

(a) The crisis: income, wealth and consumption

The first section, edited by Guglielmo Weber, focusses on the economic situation of 50+ Europeans and investigates the effects of the crisis on income, wealth and consumption. The current financial crisis is having an impact on the lives of many, but by no means all, Europeans. We can expect the impact to be overall stronger in some countries, but to vary a lot across households. The availability of micro data allows us to compare income, wealth and consumption indicators across and within countries. The availability of longitudinal data for a majority of countries allows us to see how individual circumstances have changed over time.

Viola Angelini, Agar Brugiavini and Guglielmo Weber begin this section by investigating household consumption. In particular, they use the failure to eat out in a normal month as an indicator of a low living standard. This suggests that more people enjoy low living standards in Southern and Eastern Europe compared to Central and Northern Europe. Its changes over time reveal that people with low education, low income, poor health and single females were mostly affected by the crisis.

Barbara Cavasso and Guglielmo Weber focus on individuals past retirement age and look at the way financial wealth contributes to smoothing out adverse shocks, such as those associated with changes in individual circumstances (loss

of spouse, onset of poor health or disability) or to the crisis (loss in income, reduced access to welfare benefits). Their results confirm the overarching role of (illiquid) housing wealth in all European countries, and highlight that many households instead have relatively little (liquid) wealth. The authors construct a financial distress indicator, based on the financial wealth to income ratio, and show that financial distress is more common in Southern and Eastern European countries, and that it has increased over time. When looking at the probability of becoming financially distressed in Wave 4, they estimate a protective role for Wave 2 per-capita income and home-ownership, and also for education and being married.

In a related analysis, Giacomo Pasini and Francesca Zantomio show that the crisis has not led to an increased take-up of disability benefits, possibly because of tighter rules enforced in various European countries. The retrenching of the welfare state may explain why households resorted more to using up their financial wealth.

Viola Angelini, Danilo Cavapozzi and Elisabetta Trevisan look more specifically at the way households reduce their financial wealth when they are hit by a negative shock. They first show how financial market participation varies across countries. Stocks and mutual funds are much more commonly held in Northern and Central European countries compared to Southern and Eastern Europe. Such differences are less strong for bonds – and all but disappear when the focus is on life-insurance. The analysis then focuses on what factors drive the decision to liquidate each asset in turn: a decrease in income is seen to be the most important common explanatory factor.

Maja Adena and Michał Myck close the section by pointing out the inadequacy of measuring old-age poverty with reference to relative current incomes. Such an approach to the material conditions of seniors ignores the possibility of running down assets to meet unexpected needs as well as the quality of in-kind support provided to older people. The key message of their contribution is that if one looks at the relationship with changes in the quality of life, relative income poverty is not the relevant measure. In particular, lack of wealth and self-reported difficulties in making ends meet are much better predictors of deterioration in physical health or the onset of depression.

(b) Work and retirement: challenges at the end of working life

The second section, edited by Axel Börsch-Supan, assesses the influences of different work and retirement patterns on the economic situation, cognition and well-being, accounting for the changes due to the European debt crisis.

János Divényi and Gábor Kézdi begin this chapter by a descriptive analysis of work and retirement in Hungary, one of the new countries in Wave 4 of SHARE, and a country which is hit particularly hard by the economic crisis. The Hungarian pension system provides strong incentives for early retirement, and these appear to be strengthened by the low income attainable if an individual remains in the labour force. Hungary also fares worst in terms of most health indicators in the SHARE sample. An important finding of this paper is the extent of heterogeneity in Hungary: while the employment rate among older Hungarians with high cognitive skills and good health status is very similar to the European level, employment among older Hungarians with low cognitive skills and bad health status is much lower.

Rita Borges Neves, Fátima Barbosa, Alice Delerue Matos, Victor Rodrigues and José Machado investigate the association between unemployment and depression. Indeed, the unemployed in their SHARE sample are more likely to suffer from depression. There are, however, mitigating factors in this relation. Married unemployed, e.g., are less likely to report many depressive symptoms than the unmarried, particularly if the partner is a source of emotional support. But also having other meaningful social relationships serves as a moderating factor. Financial distress seems to be a key mechanism: those unemployed who report higher financial strain are consistently more prone to depression.

Agar Brugiavini, Giacomo Pasini, Elisabetta Trevisan and Guglielmo Weber look at the effects of economic downturns at the beginning and the end of the working life. They use both a self-reported measure of financial hardship from Wave 3 (SHARELIFE) and information on regional GDP growth in the most recent years, and relate their analysis to the literature that shows that leaving school during a recession has negative long-term effects on employability and earnings (“scarring effects”). The authors find strong effects of recent financial hardship on household income and on objective health. These effects are stronger for singles (when looking at income) and women (when looking at health status).

Elena Meschi, Giacomo Pasini and Mario Padula investigate how the economic crisis has changed the pathways to retirement. They exploit the longitudinal character of SHARE and compare the transitions between 2004 and 2006 and those between 2008 and 2011. Their results indicate a higher rate of exit from the labour market before the crisis than after the crisis, suggesting that the crisis is associated to a reduced likelihood of retirement, with a smaller effect of the crisis on Eastern European countries compared to both Northern and Southern European countries.

Morten Schuth and Marlene Haupt analyse the coverage by private and occupational pensions in Europe. In Sweden, the Netherlands, Denmark and Switzerland more than 70 per cent of SHARE respondents expect to receive retirement

income from occupational schemes, which is very different from the Mediterranean countries, especially Portugal and Spain. Overall, male and more highly educated workers are more likely to be covered by occupational pensions – the very same individuals who have more financial and housing wealth. In general, the authors find a higher coverage among younger workers, indicating a growing importance of supplementary pensions in Europe in the future.

Raquel Fonseca, Arie Kapteyn, Jinkook Lee, Gema Zamarro and Kevin Feeney analyse cross-country differences in financial and subjective wellbeing and how they relate to retirement. Upon quick inspection, early retirement countries, especially Mediterranean countries like Greece, Spain and Portugal, tend to have a high incidence of poverty and lower subjective wellbeing, while the Scandinavian countries have later retirement ages and, at the same time, higher subjective wellbeing and lower levels of poverty. Is this a causal effect? The authors' main contribution is to account for potential reverse causation, using full and early pension eligibility ages as instruments. They find that retirement *per se* does not lead to either relative or subjective poverty, nor does it have adverse effects on subjective well-being.

(c) Active and healthy ageing

The health section, overseen by Martina Brandt, discusses active and healthy ageing with a focus on the effects of individual and societal socio-economic downturns. The chapters in this section assess a great variety of health related issues, starting from self-rated health, cognitive functioning and frailty processes, to the use of health care services, institutional care and different places of death. The articles in this section assess how different health indicators vary across different age groups in Europe and how the wellbeing of older Europeans has been affected by the economic crisis.

Sonja Vestergaard, Mette Lindholm Eriksen and Karen Andersen-Ranberg start the section with descriptions of the variation of health across 16 European countries and the development of individual health across SHARE waves in twelve countries. They find that people in Central and Eastern Europe are in poorer health than their Western counterparts. Differences in institutional factors have a major impact on health disparities in Europe and must be addressed to increase healthy and active ageing all over Europe, but especially in the East. Carmen Borrat-Besson, Valérie-Anne Ryser and Boris Wernli then focus on the determinants of frailty processes, which follow a geographical North-South gradient. Amongst other measures, keeping socially and physically active proves to be an efficient prevention to delay and reduce the onset and progression of frailty among older individuals.

We know that subjective and objective health measures sometimes differ considerably – with different patterns across countries. What we do not know exactly is how these differences can be explained. Jérôme Schoenmaeckers attempts to fill in this gap and explains the divergence between subjective and objective health measures by individual characteristics such as age, gender, education and social network characteristics in order to enable efficiently targeted public policy design.

The subsequent papers by Fabrizio Mazzonna and Franco Peracchi, and Chiara Dal Bianco, Christelle Garrouste and Omar Paccagnella assess the links between cognitive function, age and early life circumstances. Education and employment status are important predictors not only of the level of cognitive scores, but of their age-related decline. Cognitive function in older age is closely linked to early life circumstances such as the number of books available in the parental household at age ten. Older people in the Mediterranean countries generally start from a lower level but exhibit lower rates of cognitive decline than other European countries, suggesting a process of convergence across countries as people age.

In their first large-scale, population-based European study of the longitudinal effect of hearing impairment Sonja Vestergaard and Karen Andersen-Ranberg show that developing a hearing impairment is significantly associated with depressive symptoms as well as poor health in general. Thus, addressing the need for screening of hearing ability and making access to hearing aids easy for older adults is likely to have a high impact on increasing active and healthy ageing.

Tabea Bucher-Koenen and Fabrizio Mazzonna then turn to the health effects of the crisis. On a regional level, rising unemployment rates have a negative effect on the health of the old-age population, and especially on those still working. Thus, during times of crisis, budgetary cuts in health expenditure as well as policies aimed at increasing labour market participation of older persons should be examined very carefully.

The last three papers in this section examine different institutional influences on health, care and the end of life. The incentives for health care use in multimorbid patients are assessed by Juliane Köberlein and Hendrik Jürges. The authors find that people with more illnesses make greater use of the health care system, and are more likely to do so in countries with higher physician density. Although the introduction of prospective inpatient payment in different European countries has led to a more efficient health care supply by reducing the average length of hospital stay – it might also re-direct multimorbid patients to long term care institutions. Anne Laferrère, Aaron Van den Heede, Karel Van den Bosch and Joanna Geerts look into predictors and alternatives for such institutional care. Health conditions that limit the possibility of living alone after the death of a spouse are the most important predictors of entry into a nursing home, espe-

cially for people with scarce economic resources. In countries with few public long term care alternatives, it is the social network, and especially the children, who support their infirm older relatives. A chapter on the individual and social determinants of places of death by Annemarie Künn-Nelen and Hendrik Jürges concludes the health section. They find that in countries that have a large number of beds in long stay institutions, people are less likely to die at home, whereas in countries with high investment in home-based care, the opposite is true. This implies that governments have the possibility of enabling the end of life to be experienced in older people's own domicile, if that is their preference.

(d) Social embeddedness and intergenerational solidarity across the life course

One of the major methodological innovations of SHARE Wave 4, the measurement of social cohesion and intergenerational solidarity in the social network module, is at the centre of the compilation of articles edited by Howard Litwin. The first chapters in this section describe the nature of the most intimate configuration within the interpersonal environment of older Europeans – the personal social networks in which they are embedded. These are followed by several chapters that link between social networks and other key areas that are addressed in the SHARE questionnaire, using either the new social network module or other aspects of the interpersonal realm.

Kimberly J Stoeckel and Howard Litwin open the section with a descriptive analysis of the structure of personal social networks. They find that such networks are relatively small among older Europeans but nevertheless satisfying. Strong relationships with children are evident among Southern Europeans, while those living in Northern and Western Europe are more likely to consider friends as confidants. Eastern Europeans have smaller social networks that are comprised, more often, by only the spouse. Anat Roll and Howard Litwin consider the role of personal social networks in the calculus of social exchange and their contribution to well-being, utilising the unique linkage between social network and exchange data that is available only in SHARE. Their analysis demonstrates that network members play different roles in the exchange of different kinds of help. Moreover, regional differences prevail in the exchange of support with social network members. In particular, financial transfers with one's network members are correlated with greater well-being.

Christian Deindl, Karsten Hank and Martina Brandt look at the associations between interpersonal solidarities and the health of older adults in Europe. They document the salutary effect of social integration by showing the close relation-

ships that exist between network characteristics and self-rated health. They also affirm the association between social cohesion at the country level and self-rated health at the individual level, suggesting that the maintenance and promotion of social relationships in later life can diminish health disparities. Liili Abuladze and Luule Sakkeus view the personal social networks of older Europeans in relation to physical functioning, seeking to clarify whether disability determines connectedness. Among their several findings, they reveal that severely limited persons aged 80 and older have fewer people with whom to communicate, less diverse networks, lesser interaction and lower satisfaction with their networks. However, education has a strong protective effect against the social isolation of severely limited older people, thus pointing to a key area of attention for policy-makers.

Viola Angelini and Anne Laferrère consider, in their analysis, the effect of the physical environment – principally housing and socio-economic status – on the nature of the interpersonal environment. They find a positive correlation between income and wealth and the size of the social network, confirming that people do not seem to compensate for low resources by having more friends. They also show that cities are not anonymous places where older people are lost or lonely, but that several aspects of urban living may favour sociability.

The remaining chapters in this section look at social networks and their associations in differing contexts. Axel Börsch-Supan and Morten Schuth argue that early retirement reduces retirees' social networks, particularly in relation to their non-family ties. They hold, furthermore, that it is these kinds of ties that keep working people mentally agile. They suggest, therefore, that cognitive decline after early retirement may be partly explained as a function of network reduction. Sharon Shiovitz-Ezra considers loneliness in relation to network structure and quality. Using a scale of loneliness that was introduced in SHARE in Wave 4, she finds, perhaps paradoxically, that feelings of loneliness are more widespread in Southern and Eastern Europe than in Northern and Western European countries. Moreover, older people with no confidant network at all feel lonelier than those who have at least one confidant.

Daniela Craveiro, Alice Delerue Matos, Sara Gabriela Silva, Roberto Martinez-Pecino and Maria Johanna Schouten look at differences in the social network types that exist among women who assist their older parents and parents-in-law in Europe. They show that the configuration of the social networks of these women is related to the extent and nature of familism in the different SHARE countries, and the respective caregiving regimes that are in place. Agar Brugiavini, Raluca Elena Buia, Giacomo Pasini and Francesca Zantomio also consider the act of helping, but they look particularly at its consequences. They ask whether the provision of help to grandchildren in earlier times results in more help received in

later life. Their analyses provide support for a positive response to this interesting question.

Jim Ogg and Sylvie Renaut examine the exchange of intergenerational support as a function of major life-course events. They find that older Europeans give more support than they receive and that such support is more often practical in nature than financial. However, ill health and poverty during the life course clearly challenge one's ability to engage in the provision of support in late life. Finally, Simone Croezen, Mauricio Avendano, Alex Burdorf and Frank J van Lenthe consider the interplay between social participation and depression among older Europeans. They consider the data from several waves of SHARE and find that participation in religious and church activities is related to a reduced risk of developing depressive symptoms. This finding implies that policies should be instituted to enable older adults to maintain their affiliation to religious communities. This, in turn, may result in reduced prevalence of depressive symptoms among the oldest cohort.

1.2 Special thanks go to...

As in previous waves of the SHARE survey, thanks belong first and foremost to the participants of the SHARE study – the tens of thousands of respondents who give of their time to provide on-going data about their lives. None of the work presented here and in the future would have been possible without their support, time and patience. It is the rich data that they supply that allows us to sketch solutions to some of the most daunting problems of ageing societies. The editors and researchers of this book are aware that the trust given by our respondents entails the responsibility to use the data with the utmost care and scrutiny.

The editors also thank the many authors in this collection for their impressive work – under rigorous time constraints. We wish to equally acknowledge the precious help in reviewing that was contributed by Karen Andersen-Ranberg, Thorsten Kneip and Matthias Weiss, and the copy editing by Markus Berger, Felizia Hanemann, Sabine Riedl, Lisa Schug, Eva Maria Tralle and Melanie Wagner. In addition, it is our privilege to note that this book is the first open access project in a SHARE-De Gruyter-collaboration, and we are grateful to Anke Beck and Christoph Schirmer for making this possible.

The fieldwork of SHARE relied in most countries on professional survey agencies – IFES (AT), PSBH, Univ. de Liège (BE), Link (CH), SC&C (CZ), Infas (DE), SFI Survey (DK), Statistics Estonia (EE), TNS Demoscopia (ES), INSEE and GfK-ISL (FR), TARKI (HU), DOXA (IT), TNS NIPO (NL), TNS OBOP (PL), GfK Metris (PT),

Intervjubilaget (SE), CJMMK (SI). We thank their representatives for a fruitful cooperation. We wish to note especially that the work of close to 2,000 interviewers across Europe was essential to this project.

Collecting these data was made possible through a sequence of contracts by the European Commission and the U.S. National Institute on Aging, and by the support from the member states. In Wave 4, member states' support accounted for 59 per cent of the budget, while 33 per cent came from the European Commission and eight per cent from the U.S. National Institute on Aging. This is distinctively different from the first three waves of SHARE, in which the European Commission contributed 62 per cent, member states 26 per cent and US-NIA twelve per cent.

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Last, but by no means least, SHARE is a research infrastructure from researchers to researchers. Consequently, we thank all our users, supporters, readers and colleagues. Without them, SHARE would not be the great success that it is. Researchers may download the SHARE data free of charge from the project's website at www.share-project.org.

Acknowledgement

The analyses are based on the first official release of the SHARE Wave 4 data as of November 30, 2012. Some analyses used corrections in the weights, imputations and ISCED files which will be published in the next data release. Any further errors or inconsistencies detected in the data or additional modules will be corrected in further releases.

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Part I **The crisis: income, wealth and consumption**
Edited by Guglielmo Weber

2 Household consumption and the crisis

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- ▶ We analyse the living standards of older Europeans throughout the crisis
 - ▶ We use the share of income spent on food at home and failure to eat out as indicators
 - ▶ Standards of living are lower in Southern and Eastern Europe
 - ▶ People with low education, low income, poor health and females were affected by the crisis most
-

2.1 Food consumption as an indicator of standard of living

In this chapter we exploit the longitudinal dimension of the Survey of Health, Ageing and Retirement in Europe (SHARE) to compare household consumption behaviour before and after the financial crisis. The global economic downturn has affected the material well-being of European households, albeit in different ways depending on their age, country of residence, labour market attachment and access to welfare state and social networks support.

In SHARE we do not observe total household expenditure (like in many other surveys, see Browning et al. 2003), but have food consumption recall data, divided into three groups: food consumed at home, food consumed outside the home and home produced food. The sum of food consumed at home and the market value of home produced food we call “food in” – the ratio of food in to total household income is the food share. As long as food in is a necessity, the food share declines as a function of available resources, and its level can be used to assess the standard of living of households at a point in time. Its changes over time could in principle be used to detect the perceived importance of the recession, but measurement error in either numerator or denominator makes individual changes hard to explain. Food consumed outside the home (or “food out”) is instead typically considered a luxury. Given that for large fraction of individuals it is reported to be zero in a typical month, an interesting research question we address is how this fraction has varied for different individuals over time.

2.2 A snap-shot of food consumption during the crisis

We first look at Wave 4 data to analyse how the countries that have recently joined the SHARE project (Hungary, Slovenia, Portugal and Estonia) compare to the others, and to assess in which countries living standards of the 50+ appear particularly low, as a result of their history or of the current financial crisis.

In Figure 2.1 we show how the median food share (defined as the ratio of the sum of food consumed at home and own-consumption of home-produced food to household disposable income) varies across countries that were involved in Wave 4. There is a striking similarity in the median food shares in Eastern and Southern European countries. In fact, median food shares are between ten and 20 per cent in Northern and Central European countries (including Switzerland and Austria), between 20 and 30 per cent in Italy, Hungary and Slovenia, and exceed 30 per cent in Spain, Poland, Portugal and Estonia. Broadly speaking, we can say that food consumption by households in Southern and Eastern European countries is consistent with a lower standard of living compared to the remaining countries. To what extent this is due to long term differences in living standards or instead to the differential impact of the great recession is an issue that deserves careful investigation (see Brugiavini & Weber 2012, for an analysis along these lines).

In Figure 2.2 we show the proportion of households who report never to eat out in a normal month by country in Wave 4. Eating out is of course partly a matter of taste, partly a matter of relative prices but in all countries it is a luxury good compared to eating at home. Other things being equal, we expect households with lower standard of living to eat out less often than households with no financial problems. Again, there is a striking similarity in the proportions of households who never eat out in Eastern and Southern European countries (but also in Denmark and France). Figure 2.2 shows that the countries where the proportion of households who report never to eat out is highest are Spain, which was particularly hit by the financial crisis, Poland and the new SHARE countries Hungary, Slovenia and Estonia.

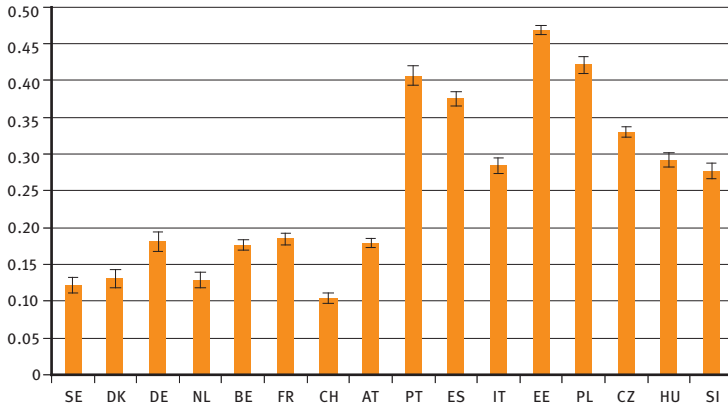


Figure 2.1: Median share of food in out of total household income by country

Notes: Wave 4 households (n=40,239)

Source: SHARE Wave 4 release 1

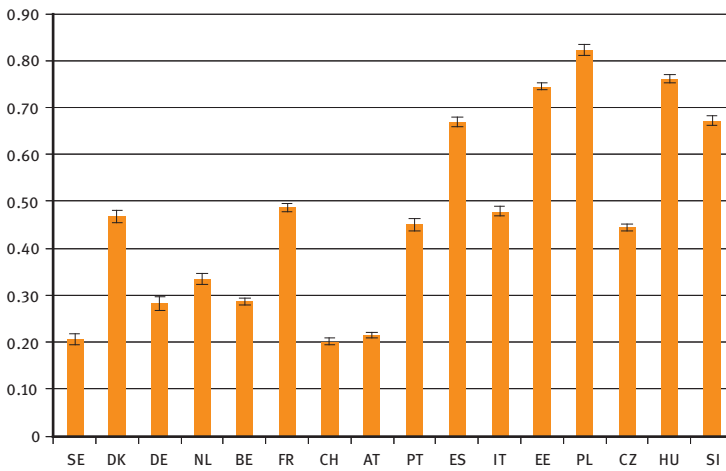


Figure 2.2: Proportion of households who report never to eat out by country

Notes: Wave 4 households (n=40,239)

Source: SHARE Wave 4 release 1

2.3 How has eating out been affected by the crisis?

To study the impact of the global economic downturn on the 50+ in Europe, we now turn to the longitudinal sample and focus only on those households who were interviewed in both second and fourth waves. In this way, we can look at which groups of the population were most affected by the crisis for the ten countries that took part in both waves.

Given the difficulties in analysing individual food share equations, we focus on the second consumption measure described above. We study the probability of not eating out in Wave 4, separately for the sample of households who did and did not eat out in Wave 2. Parameter estimates are reported in Table 2.1 – column (1) refers to the sample of households who reported eating out in a normal month in Wave 2 (7,112 observations in all) – column (2) refers to the sample of households who instead reported not to eat out in Wave 2 (5,595 observations).

We estimate two probit models controlling for:

- age, gender, education, household size, employment status, per-capita income and health in Wave 2
- changes in household size, employment status, income and health between Wave 2 and Wave 4
- country dummies.

Looking at the sample of households who used to eat out in Wave 2 (“Wave 2 Eaters”), we see that households whose respondent is female are more likely not to eat out in Wave 4. Older and less educated households are also more likely not to eat out, and so are households who were in poor health in Wave 2. The employed and those with higher per-capita income in Wave 2 are more likely to eat out, confirming that not eating out is a good proxy for a low living standard. Household size has a marginally significant negative coefficient: the more household members there were in Wave 2, the higher the probability of eating out in Wave 4, for a given per-capita income. Changes in household size between waves have no effect on the probability, possibly because of limited variability, while a change in health is highly significant (its deterioration increases the probability of not eating out; its improvement is associated to an almost identical increase in the probability of eating out). For those who retired between waves there is a marked increase in the probability of never eating out in Wave 4, in line with the findings of the retirement consumption puzzle literature (see Attanasio & Weber 2010, for an appraisal). Finally, real income increases between waves strongly decrease the probability of non-eating out in Wave 4.

In the last part of the table, we report country dummies coefficients. Country fixed effects capture differences in eating out that are not explained by the model.

Table 2.1: Probability of not eating out

	(1)	(2)
Variables	Wave 2 Eaters	Wave 2 Non-eaters
Female	0.034*** (0.010)	0.042*** (0.014)
<i>Variables in Wave 2</i>		
Age	0.005*** (0.001)	0.005*** (0.001)
Low education	0.084*** (0.014)	0.047** (0.020)
Medium education	0.032** (0.013)	0.001 (0.021)
Log(income per capita)	-0.054*** (0.007)	-0.057*** (0.009)
Employed	-0.070*** (0.015)	-0.100*** (0.026)
Log(household size)	-0.024* (0.014)	-0.108*** (0.017)
Bad health	0.082*** (0.015)	0.057** (0.023)
<i>Changes between Wave 2 and Wave 4</i>		
Increase in income	-0.064*** (0.011)	-0.047*** (0.014)
Increase in household size	0.031 (0.025)	0.010 (0.026)
Decrease in household size	-0.001 (0.015)	0.028 (0.018)
Health improvement	-0.057*** (0.015)	-0.092*** (0.026)
Health deterioration	0.049** (0.020)	0.016 (0.027)
Newly retired	0.078*** (0.021)	0.045 (0.028)
<i>Country effects</i>		
Sweden	-0.033 (0.022)	-0.175*** (0.045)
Denmark	0.209*** (0.031)	0.168*** (0.025)
The Netherlands	0.038 (0.025)	0.043 (0.034)
Belgium	-0.003 (0.021)	-0.018 (0.038)
France	0.129*** (0.027)	0.123*** (0.027)

	(1)	(2)
Variables	Wave 2 Eaters	Wave 2 Non-eaters
Switzerland	0.041 (0.027)	-0.084* (0.051)
Austria	-0.047* (0.026)	-0.198*** (0.052)
Spain	0.285*** (0.040)	0.139*** (0.027)
Italy	0.090*** (0.029)	0.116*** (0.028)
Czech Republic	0.132*** (0.032)	-0.031 (0.036)
Poland	0.418*** (0.047)	0.241*** (0.021)
Observations	7,112	5,595

Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Notes: Probability of not eating out in Wave 4 for households who reported to eat out in Wave 2 (column 1) and not to eat out in Wave 2 (column 2). Probit model, marginal effects at the mean of the variables. Standard errors in parentheses.

Source: SHARE Wave 2 release 2.5.0, SHARE Wave 4 release 1

The omitted category here is Germany. Compared to similar German households, Polish and Spanish households are much more likely not to eat out. Less strong, but still significant, positive effects are associated to France, Italy and the Czech Republic. These effects are fully consistent with the patterns displayed in Figure 2.2 – and this confirms that much of the cross-sectional variability across countries relates to factors that do not vary over time.

Column (2) estimates show that the determinants of the probability of not eating out are overall similar for those who did not eat out in Wave 2. The effects of education and health in Wave 2 are less strong, the effects of income, employment and household size stronger. Changes in observables between waves are less important: there is no effect of retirement (those who did not eat out as workers, keep not eating out when they retire) and a smaller (but quite significant) effect of income. Health deterioration is insignificant, but a health improvement has a stronger, negative impact. Positive coefficients on country dummies are overall less large, while negative coefficients (Sweden and Austria) become larger in absolute terms.

2.4 Consumption behaviour and the crisis

As various chapters in this book reveal, the financial crisis has had different effects on European households, depending on their labour market attachment, their access to welfare state provisions, social support networks and private economic resources (savings). Even among the retirees, the crisis has probably been more acutely felt by those whose children or grandchildren have lost their job or have suffered substantial earnings cuts.

Our analysis of household food consumption of the European 50+ has highlighted some interesting patterns that shed light on the differential impact of the crisis on this segment of the European population.

First of all, we have seen using Wave 4 data that the share of food at home to income is much lower in Northern and Central European countries compared to Southern and Eastern European countries. Thus Estonian and Polish households devote as large a fraction of their resources (40 %) to eating at home as Spaniards and Portuguese. To a large extent this similarity carries through when we consider another indicator of limited access to economic resources: the proportion of households who report not to eat out in a normal month. For instance, more than 70 per cent of Poles, Hungarians and Estonians fail to eat out – a similarly large proportion is found in Spain, a country hard hit by the crisis.

Our analysis of individual changes in eating out has shown the importance of factors like education, gender and poor health. It has also highlighted the key role played by economic factors, most notably income and the employment status of respondents. An income decrease, for instance, is associated to a strong increase in the probability of not eating out for all; retirement instead has a strong, positive effect, but only for those households who used to eat out while still employed.

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Barbara Cavasso and Guglielmo Weber

3 The effect of the great recession on the wealth and financial distress of 65+ Europeans

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- ▶ Household wealth plays a key role in smoothing out adverse shocks for retirees
 - ▶ Many older households have little (liquid) wealth, especially in Southern and Eastern European countries
 - ▶ Financial distress has increased with the crisis
 - ▶ Pre-crisis high income, home-ownership, education and being married reduce the risk of falling into financial distress
-

3.1 The financial crisis and low wealth among Europeans past retirement age

The key theoretical model used by economists to understand individual consumption and saving behaviour is Franco Modigliani's life cycle theory (Modigliani & Brumberg 1954; Modigliani 1976). According to this theory, forward-looking consumers aim at keeping the same living standard over time, and to this end accumulate real and financial assets during their working lives, and use up the wealth they have so accumulated during their retirement years. Wealth plays a crucial role in supporting consumption in old age, particularly for those individuals whose retirement income falls below their pre-retirement earnings. The more liquid part of wealth, financial wealth, is likely to be used up first in times of need – an adverse health shock, or an unexpected reduction in income, should lead to a reduction in financial wealth.

This chapter investigates how wealth holdings of the European individuals past retirement age (aged 65 or more) were affected by the onset of the great recession, and in particular to what extent the adverse business cycle conditions have increased their financial distress (an indicator defined similarly to the one proposed in a recent paper by Christelis et al. 2009).

After a brief review of the key concepts, based on Wave 4 data (that cover four new countries, two of which most heavily affected by the recession: Portugal and Hungary), we display changes for those individuals who participated in both Waves 2 and 4 (Wave 3 does not record wealth holdings). The resulting sample

(of 65+ as of 2006) is relatively small and includes only twelve countries, but the analysis captures business cycle effects, as the first wave we consider was before the great recession (2006–7), whereas the second wave (2010–11) was well after it.

3.2 A snap-shot of Europe during the crisis

We know from a number of papers (Angelini et al. 2012) that housing wealth plays a key role in household portfolios.

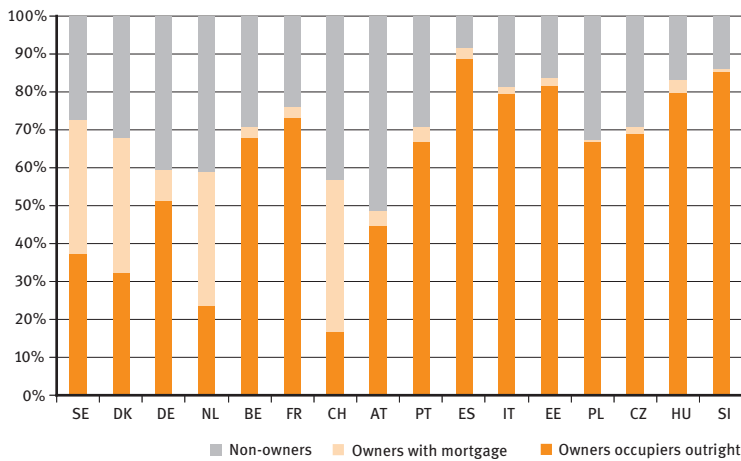


Figure 3.1: Housing tenure by country
Notes: 21,102 observations
Source: SHARE Wave 4 release 1

Figure 3.1 shows housing tenure choice in all Wave 4 countries. Home-ownership rates are high in Austria, Switzerland, Germany and the Netherlands, very high (above 60 %) in all other countries. Mortgages are relatively common in only four countries (Sweden, Denmark, the Netherlands and Switzerland), rare or extremely rare in all other countries (including Portugal, Hungary, Slovenia, Estonia and Poland). The largest proportions of home-owners without a mortgage (“outright”) are observed in Southern countries (especially Spain) and in Eastern countries. Note that in this paper non-home-owners include tenants and people living in rent-free accommodation, as well as nursing home residents (who are overall only 1.64 % of our sample, due to the selection rules adopted by SHARE).

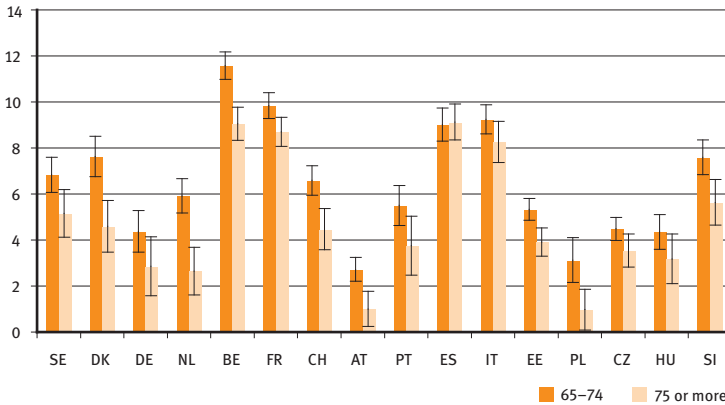


Figure 3.2: Net worth income ratio by age

Notes: 21,102 observations

Source: SHARE Wave 4 release 1

Figure 3.2 displays the median ratios of net worth to income by age band: households are classified according to the age of the financial respondents in a younger group (65–74) and in an older group (75+). Household net worth is defined as the sum of all real and financial assets, minus liabilities. The real assets value is the sum of the market values of the main residence, of other real estate, own business and cars, minus the outstanding mortgage on the main residence. The financial assets value is the sum of the balance in bank accounts, government and corporate bonds, stocks/shares, mutual funds, individual retirement accounts, contractual savings for housing and the face value of life insurance, net of liabilities (that include all non-mortgage debt). Household income is defined as the total income received by all household members, net of taxes and contributions.

A high value of the ratio denotes the presence of an adequate buffer of wealth in case of need. It could also imply very low income, but in all European countries the older people qualify for some form of pension income, so this is a less likely case. The picture reflects a lot home-ownership patterns both across countries and between age groups (the older are more often non-owners in Germany, the Netherlands and Austria, partly because of public housing accommodation available to individuals of the pre-war generations, partly as a result of testamentary rules, whereby the surviving spouse does not inherit the place of residence, rather acquires the right to live there for free for the rest of her life).

This figure suggests net worth is not necessarily the most interesting concept to use if one is concerned with potential financial distress, also known as financial

fragility. In particular, Christelis et al. (2009) argue for a measure that is based on the financial wealth income ratio: if financial wealth, net of non-mortgage debt, is less than three months' income there is a risk of financial distress in case of need. This indicator is still biased as an individual with a high income can appear as financially distressed only because he has a relatively low level of financial wealth. We adjust the indicator of financial distress to account for this situation. The indicator of financial distress we compute considers distressed individuals whose financial wealth (value of net financial assets) is lower than three months of income and whose per-capita income is not in the top third of the income distribution (we also experimented with a per-equivalent adult income concept, as in the chapter by Adena and Myck in this volume, obtaining similar results).

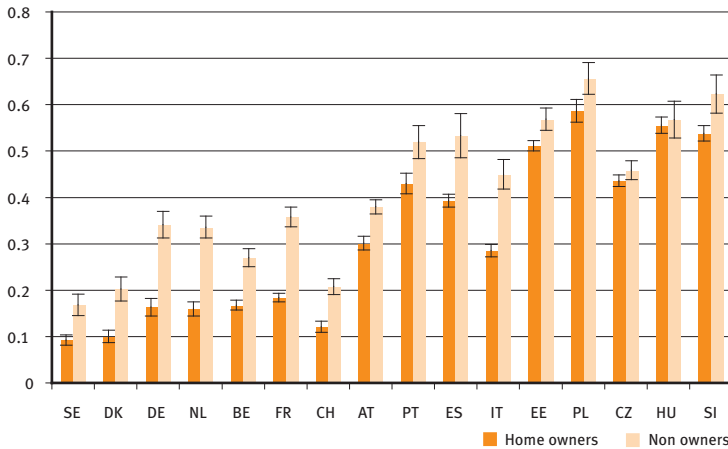


Figure 3.3: Fraction of households in financial distress

Notes: 21,102 observations

Source: SHARE Wave 4 release 1

Figure 3.3 reveals that financial distress is particularly high among tenants (who are on average poorer in all countries). It also reveals dramatic differences across countries: financial distress is particularly low among home-owners in Sweden and Denmark – highest among home-owners in Slovenia, Hungary and Poland. Among renters, it is above 50 per cent in Estonia, Slovenia and Poland, above 40 per cent also in Portugal, Spain, Italy, the Czech Republic, and Hungary.

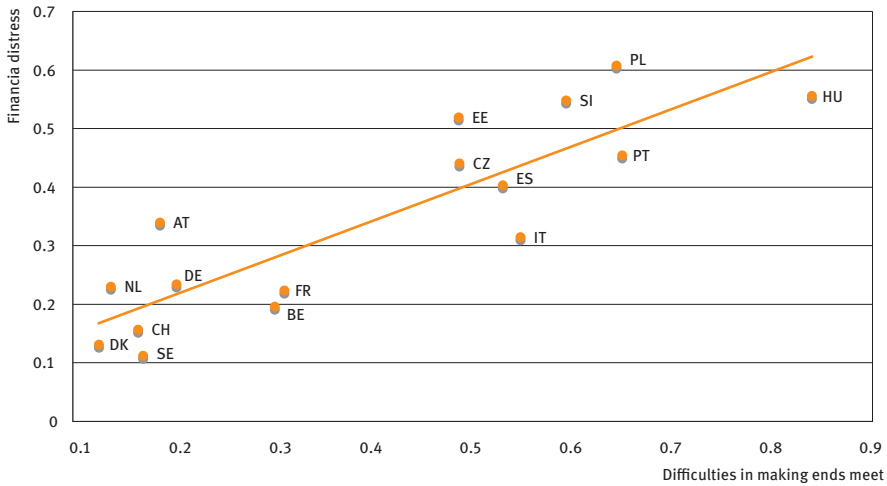


Figure 3.4: Households with a low wealth-income ratio versus difficulties making end meet

Notes: 21,102 observations

Source: SHARE Wave 4 release 1

In Figure 3.4 we compare our measure of financial distress with a widely used indicator of financial hardship: the proportion of households who report difficulties making ends meet. We see that there is a strong positive correlation, but with some clustering along regional/language dimensions (Nordic and Germanic countries to the left, French in the middle, Latin and Slavic countries to the right). Hungary is instead an outlier, with well over 80 per cent of respondents reporting difficulties making ends meet, but a more moderate distress index of 50 per cent. It is well known that Hungary was hard hit by the great recession and this may have an impact on the reporting style to the more subjective questions on making ends meet.

We estimated a probit model for financial distress as a function of demographics (gender, marital status and age; education), health (self-reported poor or very poor health; presence of limitations in ADL), home-ownership and (the logarithm of per-capita) income, to assess to what extent an increase in income could reduce the risk of financial distress. Our estimates (reported in Table 3.1) show that education has a highly protective role, and so do home-ownership and income. A one percentage increase in per-capita income reduces the probability of financial distress by 4.6 per cent; the probability that a home-owner is in financial distress is 5.4 per cent lower than it is for tenants.

Table 3.1: Probit estimates for financial distress

Variables	Marginal Effect	
	Coefficients	Standard error
Age	0.0413***	(0.009)
Age squared	-0.0003***	(0.000)
Female	0.0489***	(0.007)
Married	-0.0401***	(0.007)
High School	-0.1002***	(0.007)
College	-0.1951***	(0.007)
Logarithm of per-capita income	-0.0482***	(0.002)
Home-owners	-0.0524***	(0.008)
Poor health	0.0600***	(0.010)
Limitation with activities	0.0477***	(0.007)
Sweden	-0.1306***	(0.016)
Denmark	-0.0776***	(0.020)
Germany	0.0469**	(0.024)
Netherlands	0.0067	(0.019)
Belgium	-0.0430***	(0.015)
Switzerland	-0.0415**	(0.018)
Austria	0.1321***	(0.017)
Portugal	0.1881***	(0.024)
Spain	0.1212***	(0.019)
Italy	0.0633***	(0.018)
Czech Republic	0.2120***	(0.017)
Hungary	0.2671***	(0.021)
Slovenia	0.3329***	(0.020)
Estonia	0.2492***	(0.016)
Poland	0.3113***	(0.024)
N. Obs.	21,106	
Pseudo R-squared	0.1284	

Significance: *** = 1 %; ** = 5 %; * = 10 %

Notes: The dependent variable is the financial distress indicator.

Source: SHARE Wave 4 release 1

3.3 Financial distress and the crisis

In this section we display the same set of indicators for those households who participated also in a previous wave. This restricts the number of countries to just twelve and the number of households in each country, both because the age limit (65+) is applied at a much earlier date (2006–7 instead of 2010–11) and because of attrition across waves (due to death or unwillingness to participate). The resulting sample size is around seven thousands households.

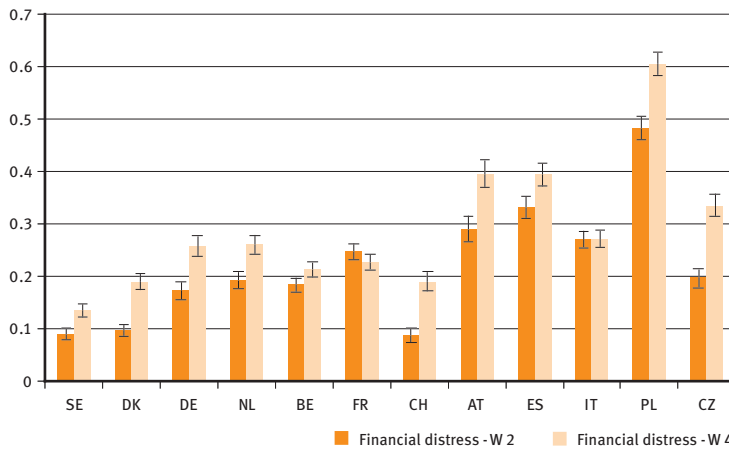


Figure 3.5: Proportions in financial distress by wave and country

Notes: 7,074 observations

Source: SHARE Wave 2 release 2.5.0, Wave 4 release 1

In Figure 3.5 we show the proportions of households in financial distress, using the indicator we discussed above. It is worth noting that its changes over time are most likely driven by changes in net financial wealth, given that the incomes of the older individuals are relatively stable in real terms (pension income is typically price-indexed). To avoid spurious effects due to changes in the income cut-off, we applied the Wave 2 thresholds to both waves. Financial distress changes between Waves 2 and 4: in most countries it increases, particularly in Denmark, Switzerland, Austria, Poland and the Czech Republic. A decrease is observed in France, while there is no change in Italy (where the crisis was mostly felt after the sampling period – that ended in June 2011). In some countries (Spain and Germany) the increase in financial distress corresponds to an increase in the fraction of households who make use of non-mortgage debt. Our evidence on the effect of the great recession on the lives of European senior citizens is broadly in

line with (but more clear-cut than) what we observe when looking at consumption-based indicators of financial hardship, that are presented in another chapter (see Angelini et al. in this volume).

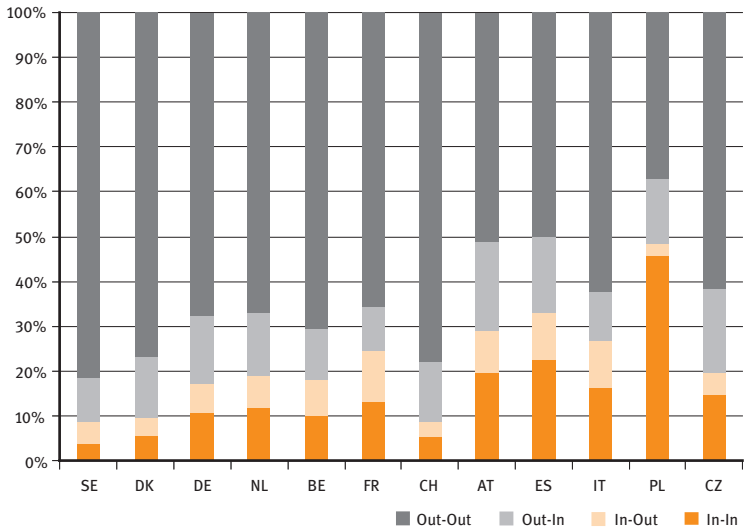


Figure 3.6: Financial distress – Transitions

Notes: 7,074 observations

Source: SHARE Wave 2 release 2.5.0, Wave 4 release 1

In Figure 3.6 we show the transition probabilities of the financial distress indicator we discussed above. We observe a lot of persistence in financial distress in Poland, Austria, Spain, the Czech Republic and Italy. Transitions into financial distress prevail in all countries but France, in agreement with what we showed in Figure 3.5. There are non-negligible fractions of households leaving financial distress in France, Italy and Spain.

We can estimate transition probabilities in and out of financial distress as a function of demographics, health, home-ownership and household income, and their changes. The effects of the recession could partly be attributed to changes in observable variables – partly to changes in coefficients. The outcome variable in the model reported in the first two columns of Table 3.2 is the probability of entering financial distress in Wave 4 given that an individual was not in financial distress in Wave 2. We estimate a protective role for Wave 2 per-capita income and home-ownership, and also for education and being married, in line with what we found looking at the cross-section. Health in Wave 2, age and gender are now insignificant.

Table 3.2: Probit estimates for transition probabilities in and out of financial distress.

Variables	IN		OUT	
	Coefficients	Standard error	Coefficients	Standard error
Age	-0.0044	(0.008)	0.0019	(0.031)
Age squared	0.0003	(0.000)	0.0000	(0.000)
Female	0.0069	(0.008)	-0.0623	(0.032)
Married	-0.0489***	(0.009)	0.1220**	(0.033)
High School	-0.0207**	(0.008)	0.0109***	(0.037)
College	-0.0491***	(0.009)	0.0496	(0.060)
Logarithm of per-capita income	-0.1059***	(0.005)	0.0835***	(0.030)
Home-owners	-0.0513***	(0.010)	0.1001***	(0.030)
Poor health	0.0075	(0.009)	-0.0244	(0.044)
Limitation with activities	0.0009	(0.008)	-0.0824**	(0.030)
Sweden	-0.0058	(0.016)	0.0362	(0.075)
Denmark	0.0450**	(0.021)	-0.0969	(0.065)
Germany	0.0448**	(0.024)	-0.0460	(0.066)
Netherland	0.0093	(0.018)	-0.1249**	(0.053)
Belgium	-0.0095	(0.015)	-0.0437	(0.055)
Austria	0.0611***	(0.027)	-0.1452**	(0.051)
Switzerland	0.0418*	(0.024)	-0.1292	(0.071)
Spain	-0.0429***	(0.012)	-0.0843	(0.057)
Italy	-0.0069	(0.016)	-0.0520	(0.052)
Czech Republic	-0.0168	(0.016)	-0.0660	(0.063)
Poland	-0.0701***	(0.008)	-0.2865***	(0.047)
N. Obs.	5,634		1,314	
Pseudo R-squared	0.1799		0.1149	

Significance: *** = 1 %; ** = 5 %; * = 10 %

Notes: In the first two columns the outcome variable in the model reported in Table 3.2 is the probability of entering financial distress in Wave 4 given that an individual was not in financial distress in Wave 2. The outcome variable in the model reported in the second two columns is the probability of leaving financial distress in Wave 4 given that an individual was in financial distress in Wave 2. Income, home-ownership, limitation with activities and poor health are relative to Wave 2.

Source: SHARE Wave 2 release 2.5.0, Wave 4 release 1

The outcome variable in the model reported in the second two columns of Table 3.2 is the probability of leaving financial distress in Wave 4 given that an individual was in financial distress in Wave 2. The sample size is much smaller compared to the previous model (down to 1,314 households), but the protective role of Wave 2 income and home-ownership is confirmed.

3.4 The crisis highlights the need the for a wealth buffer in old age

In this chapter we have shown how wealth holdings of European individuals aged 65 or more were affected by the onset of the great recession, and in particular to what extent the adverse business cycle conditions have increased their financial distress.

In the first part of the paper, we have considered the cross sectional evidence from the most recent wave (2011–12), finding that housing tenure still plays a key role in household portfolios. We have defined a financial distress indicator that signals low liquid wealth for a given income. We have shown that financial distress is linked to some household demographic and socio-economic characteristics, with the leading role played by home-ownership, education and income.

In the second part we have analysed changes in financial distress for those individuals who participated also in a previous wave (2006–7). The comparison of household conditions before and after the great recession shows, as we can expect, a generalised worsening in terms of financial distress in all European countries with only a few exceptions. We find that pre-crisis high per-capita income, home-ownership, education and being married all reduce the risk of falling into financial distress during the crisis.

References

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4 Disability benefits receipt across the financial crisis

-
- ▶ In a recession, disability benefits are often used as earnings replacements, resulting in increased benefit rolls
 - ▶ Older working-age Europeans have not followed this trend after the onset of the recent financial crisis
 - ▶ Benefit participation has been driven by the tighter access rules recently enforced in various European countries
 - ▶ Sickness and disability benefits are especially used when in less favourable economic circumstances
-

4.1 Work disability and benefit receipt – the issues at stake

Contemporary European societies share the view that individuals of working age should be protected against the risk of losing their capacity to earn labour income due to a disability or chronic health condition. This view has long been reflected in national social security institutions, which provide for compensatory cash programmes targeted to individuals in such circumstances (Bound & Burkhauser 1999). Although each country differs with respect to the detailed features of specific programmes, a common structure of public disability insurance schemes can be outlined. First, after the onset of the disabling condition, a ‘sickness’ benefit is provided for a limited period of time, typically less than two years. After this period, if the disabling condition is expected to last for longer, potentially compromising the individual capacity to *ever* return to work, the sickness payment is replaced by a ‘disability’ benefit. Receipt of a disability benefit in cash is often regarded as a so-called ‘absorbing state’: typically, once in, recipients stay on benefits until they reach retirement age and the benefit is subsumed into the old-age pension.

Since these programmes’ inception, the number of people receiving disability benefits has increased remarkably throughout Western countries. Although the increase was mostly driven by older workers’ usage of these programmes (OECD 2010), demographic factors, such as population ageing, or disability prevalence and intensity, seem to have played a minor role in explaining the trend.

More credit is given instead to explanations arising from the economic, social and institutional contexts. For example, the coverage of impairments deemed worth of compensation has widened over time, with claims motivated by mental health problems having registered a striking increase in the past two decades. Also, benefit receipt rates have tended to increase more in times of economic recessions, and to remain on structurally higher levels afterwards. The institutional features of programmes themselves, such as the length of awards, the amounts receivable and the administrative rigour in assessing cases, have been identified as the main drivers of the observed growth and fluctuations in benefit rolls both in Europe and the United States (Burkhauser & Daly 2012).

Currently, policy attention in the area of disability has shifted from the original aim of ensuring an earnings replacement to disabled individuals, thus protecting them from the risk of income poverty. The concern that the fiscal cost of public disability insurance might become unsustainable, felt on both sides of the Atlantic (Autor 2011), has moved the policy focus on improving disabled individuals' incentives to return to the labour market (possibility also favoured by current technological progress), encouraging their employment inclusion and, one way or another, limiting the number of people claiming disability benefits. In Europe the past two decades have witnessed a lively sequence of policy reforms aimed at tightening access to cash support for disabled individuals, especially in Northern European countries that were running the most generous programmes.

The recent financial crisis put even more policy pressure on reducing disability benefits rolls. An aspect that deserves special attention in this respect is *benefit targeting*, that is ensuring that payments are received by truly deserving cases, and those only (Zantomio 2013). Efficient benefit targeting allows minimising the fiscal cost of these programmes, without compromising their effectiveness. On the one hand, in times of rising unemployment, finding a job might prove more difficult for a disabled individual, than a non disabled one; an effective disability insurance system should then succeed in offering adequate income protection to disabled individuals, who are likely to be more severely hit by the economic downturn and for whom benefits often represent the primary source of income.

On the other hand though, the crisis has revived a long-standing concern that, especially in times of adverse economic conditions, disability benefits might be improperly used by undeserving individuals as earnings replacement, as a form of early retirement or hidden unemployment benefit (Bound 1989; Parsons 1996; Börsch-Supan 2008), compromising target efficiency. Empirical evidence has shown that in fact disability benefit rolls typically tend to increase after the onset of a recession. This chapter looks at older working age individuals' participation in disability benefit programmes, and investigate how benefit participation and the pattern of benefit receipt has evolved across the latest crisis experienced in Europe.

4.2 Benefit receipt rates of older working age Europeans across the crisis

Twelve European countries were covered in both the second wave (with interviews held before the financial crisis, that is in 2006/7) and the fourth wave (with interviews held after the crisis inception, that is in 2010/11) of SHARE. These include two Scandinavian countries (Sweden, Denmark), two Mediterranean countries (Italy and Spain), six Central European countries (Austria, Germany, Netherlands, Belgium, France and Switzerland) and two transition countries (Czech Republic and Poland). The analysis focused on older workers aged between 50 and the statutory retirement age (which varies across countries, spanning from 56 for Czech women to 65 for both genders in most countries). Figure 4.1 represents sickness and disability benefits participation rates, that is the population-weighted proportion of recipients in the selected age range, in each country as observed before and after the beginning of the economic crisis.

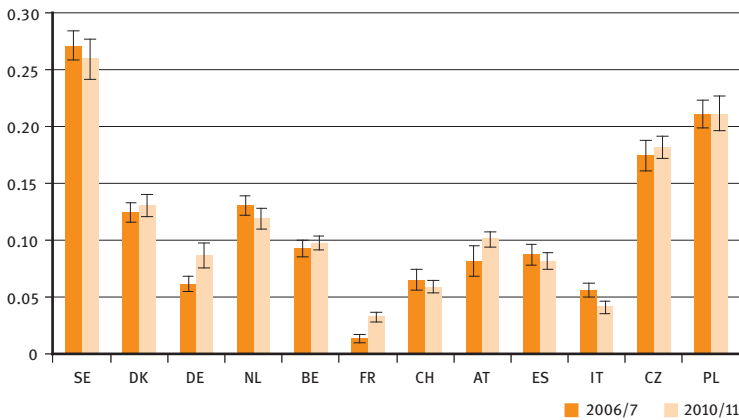


Figure 4.1: Benefits participation rates

Notes: 30,485 observations

Source: SHARE Wave 2 release 2.5.0, Wave 4 release 1

At each point in time, participation rates show a remarkable degree of heterogeneity across countries, reflecting the variation in sickness and disability benefits expenditure (ranging from more than three per cent of GDP in Scandinavian countries to 1.2 per cent of GDP in the least generous ones, such as Italy).

Before the crisis, Scandinavian and transition countries, plus Netherlands, displayed the highest rates of receipt (more than one in ten individuals, and more than one in four in Sweden); participation rates spanned between five and ten

per cent in Germany, Belgium, Austria, Switzerland, Spain and Italy, while in France less than two per cent received either a sickness or a disability benefit. The observed cross-countries' diversity in participation rates was maintained in 2010/11, after the crisis onset.

If we look at how participation rates varied through this period comparing the two points in time, the concern that disability benefits rolls were used more (i. e. as earnings replacements) after the crisis began seems groundless: on the contrary, participation rates even decreased in some countries (Sweden, Netherlands, Italy, Spain, Switzerland) and remained almost unchanged in many others. This cross-sectional evidence is consistent with the analysis by Meschi et al. in this volume who found a decline in labour market status transitions from employment into disability after the crisis.

Benefit participation rates reflect not only the probability of pursuing a claim, but first and foremost, country-specific institutional features, both in terms of formal eligibility rules and in terms of assessment practices (i. e. the probability of being judged as a deserving case, once a claim is pursued). These were extensively reformed in a less generous direction both before and throughout the time span we considered in most countries, especially with respect to the first sickness absence phase. Such a common trend in institutional reforms is likely to explain the observed time pattern (OECD 2010). For example, broad reforms recently enforced in the very generous systems of Sweden (2008), Netherlands (2006) and Denmark (2005), tightened the rules for benefits access (i. e. shortening benefits durations), affected the amount of payments, and also entailed a more stringent application of assessment criteria.

It might be argued that variations in benefit rolls could be explained by changes in the underlying health and disability population structure. Börsch-Supan (2008) found no evidence in this sense, when comparing the first and second wave of SHARE; however this could be true in our case, given the longer time span considered. Figure 4.2 presents a focus on the possibly eligible population: the proportion of recipients among those (in the same age range) who reported to have 'any health problem or disability that limits the kind or amount of paid work' they can do. Conditioning on this indicator of benefit eligibility, the decrease in benefit receipt observed in Sweden, Netherlands, Italy, Spain, Switzerland was confirmed. A sizeable increase in benefit participation, among those experiencing a disability related work limitation, was observed instead only in France and in the Czech Republic, while Germany and Austria now did not show a significant increase in benefit rolls.

Using self-reported disability related work limitation as indicator of benefit eligibility might result in biased participation rates if recipients are, other things equal, more likely to report experiencing such limitation in order to 'justify' their status of recipients (the so called 'justification bias'). For this reason, Figure 4.3

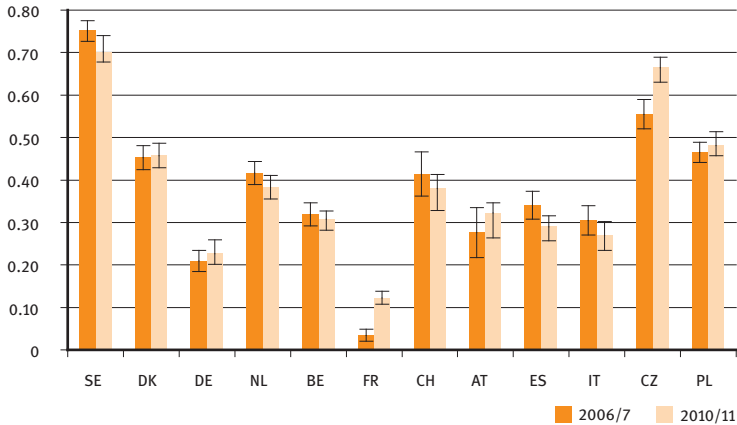


Figure 4.2: Receipt rates for those whose health/disability limits the kind or amount of work they can do

Notes: 6,570 observations

Source: SHARE Wave 2 release 2.5.0, Wave 4 release 1

presents receipt rates computed using an alternative indicator of benefit eligibility, that is a long standing illness/disability which limited ‘activities people normally do’ (rather than amount or type of work) at least in the last six months.

Except for Austria, which appeared to join France and the Czech Republic in registering a significant increase in benefit participation, the overall picture of

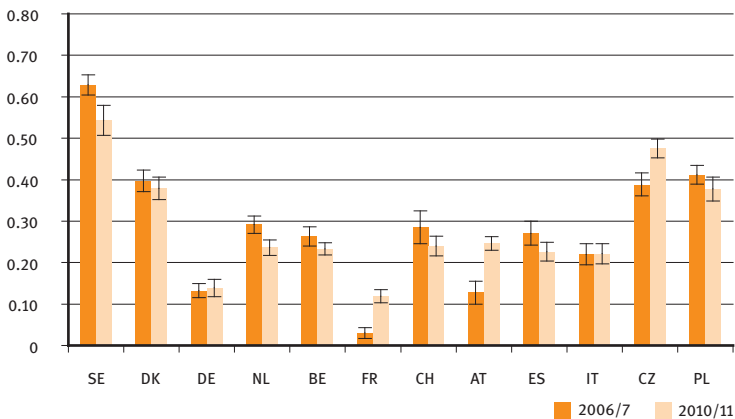


Figure 4.3: Receipt rates for those whose health/disability limits activities people normally do

Notes: 8,793 observations

Source: SHARE Wave 2 release 2.5.0, Wave 4 release 1

participation in disability benefits remained substantially unaltered in clashing with the hypothesis that disability benefits rolls increased for older workers after the onset of the crisis.

This however does not exclude the possibility that, other things equal, the propensity to claim increased after the onset of the crisis: a higher propensity to claim might in fact have been balanced by more stringent benefit rules and assessment practices motivated also by fiscal consolidation needs.

4.3 The pattern of receipt across the crisis: disability and income gradients

Besides computing participation rates, SHARE data allowed to deepen the analysis and to investigate the pattern of benefit receipt, with respect to a large set of individuals' characteristics. In particular, we focussed on the disability and income gradient in benefit receipt, as they both provide indications about the effectiveness of benefit targeting. Disability is the main determinant of eligibility; effective targeting implies a significant positive relationship between disability and benefit receipt. On the other hand, sickness and disability benefit typically are not means tested, i. e. household income does not affect eligibility; therefore, any significant relationship between household income and benefit receipt would rather reflect a behavioural aspect of benefit claiming.

Table 4.1 reports estimates from a probit model of benefit receipt run on the 2006/7 cross section (first two columns) of SHARE data and on the 2010/11 one (last two columns). Reassuringly, in both years benefit receipt appeared significantly related to disability indicators.

Before the crisis benefit receipt generally decreased with per capita household income. After the crisis onset, a significantly higher negative income gradient in receipt both at lower and, even more so, at higher income levels was registered. This suggests that, after the onset of the crisis, claiming behaviour became more tightly related to the amount of financial means otherwise available, at all income levels. Such evidence hints at the possibility that older workers below retirement age might have been 'insuring' against income poverty and unemployment by claiming benefits. This appeared significantly more likely for male individuals, for those having more years ahead before reaching statutory retirement age, for the less educated and for those relying less on family support (because living without a partner or living with a lower number of household members). Such evidence complements the income risk protection of retirement found by Brugiavini, Pasini, Trevisan and Weber in this volume.

Table 4.1: Multivariate analysis of benefit receipt

Variables	Probit estimates 2006/7			Probit estimates 2010/11		
	Marginal effect		Standard error	Marginal effect		Standard error
DISABILITY						
ladls (#)	0.010	***	(0.003)	0.007	**	(0.003)
Difficulties in mobility(#)	0.014	***	(0.001)	0.015	***	(0.001)
Symptoms(#)	0.011	***	(0.002)	0.005	***	(0.001)
Chronich_diseases(#)	0.020	***	(0.002)	0.018	***	(0.002)
FINANCIAL MEANS						
Log Income ^a	-0.004	**	(0.002)	-0.010	***	(0.001)
Log Income *above median ^b	0.000		(0.001)	-0.002	***	(0.001)
Assets	-0.002	**	(0.001)	-0.000		(0.001)
OTHER CONTROLS						
Age	-0.003	***	(0.001)	-0.002	***	(0.001)
Male	0.049	***	(0.005)	0.034	***	(0.004)
Cohabiting partner	-0.019	***	(0.007)	-0.011	*	(0.006)
Household size	-0.005	*	(0.003)	-0.006	***	(0.002)
Education	-0.006	***	(0.002)	-0.003	*	(0.002)
In work	-0.108	***	(0.006)	-0.090	***	(0.005)
SE ^c	0.202	***	(0.013)	0.175	***	(0.012)
DK	0.102	***	(0.014)	0.98	***	(0.011)
DE	0.014		(0.014)	0.017		(0.015)
NL	0.078	***	(0.012)	0.080	***	(0.010)
BE	0.023	*	(0.012)	0.045	***	(0.009)
FR	-0.105	***	(0.021)	-0.001		(0.011)
CH	0.059	***	(0.016)	0.058	***	(0.011)
AT	-0.006		(0.017)	0.041	***	(0.010)
IT	-0.039	***	(0.013)	-0.026	**	(0.011)
CZ	0.102	***	(0.014)	0.095	***	(0.010)
PL	0.080	***	(0.012)	0.076	***	(0.011)

Significance: *** = 1%; ** = 5%; * = 10%

Notes: 13,033 observations (2006/7); 16,031 observations (2010/11)

^a Logarithm of household per capita income (net of sickness and disability benefits).^b Logarithm of household per capita income (net of sickness and disability benefits) interacted with a dummy identifying individuals whose income is above the population weighted country specific median.^c Spain is the omitted country.

Source: SHARE, Cross sections from Wave 2 release 2.5.0, Wave 4 release 1

Probit estimates were also obtained on the pooled cross sections, interacting each regressor with an ‘after crisis onset’ dummy (for those observed in 2010/11) to gauge whether a structural change in the pattern of receipt after the crisis onset could be traced. Overall, a Chow test of structural stability rejected the hypothesis that the multivariate pattern of benefit receipt remained stable across the financial crisis ($\text{Chi}^2(24) = 87.99$; $\text{P-value} = 0.0000$). France, Austria and Belgium systems appeared to have become more generous after the crisis onset, compared to Spain. Looking at the disability indicators, in 2010/11 benefit receipt appeared to be less tightly related to the ‘number of symptoms’, the most subjective among the disability indicators. Paired with the possibly tighter relation of benefit receipt with the reported number of difficulties in mobility (while no significant difference was registered for the number of limitations in instrumental activities of daily living and the number of chronic health conditions), this hints at a change in assessment practices, more strictly tightened to less subjective indicators in 2010/11. While no significant post-crisis-onset change was observed for most personal characteristics (with the only exception of age), a striking difference was found for the income coefficients: at both lower and higher income levels, the negative income gradient in receipt became significantly stronger in the post-crisis-onset year.

4.4 Structural changes in the benefit receipt pattern

Previous empirical literature shows that, after the onset of recessions, sickness and disability benefits rolls typically tend to increase and to remain on higher levels afterwards. One explanation is offered by the possibility that individuals make an improper use of these benefits as earnings replacements to protect themselves against the increased risk of unemployment. An analysis of SHARE data, collected before and after the onset of the recent crisis in Europe, showed that generally benefit rolls did not increase after the onset of the great recession. However, this trend did not seem a reflection of individuals’ claiming behaviour, but appeared rather driven by the institutional reforms enforced in the past decade, which restricted access to these programmes. Multivariate analysis showed that a structural change in the benefit receipt pattern could indeed be traced: low income became a more important determinant of the probability of claiming, poor health conditions, if anything, are less important. As these benefits are generally not means-tested, the stronger negative income gradient registered during the crisis should not be attributed to tighter eligibility rules. Rather, this change suggests that, because of stricter access rules, low income increased its relative importance.

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Viola Angelini, Danilo Cavapozzi and Elisabetta Trevisan

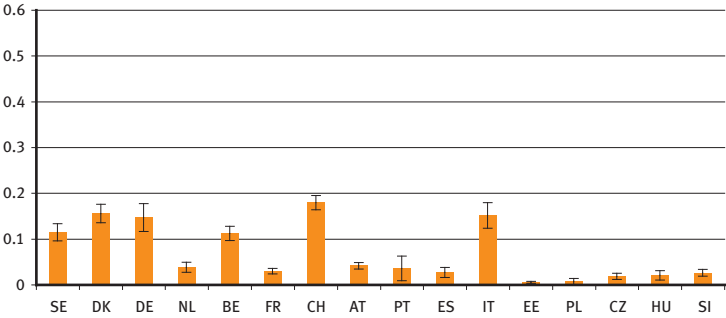
5 Financial market participation and the crisis

-
- ▶ We analyse financial market participation of older Europeans throughout the crisis
 - ▶ Risky assets are much more commonly held in Northern and Central European countries
 - ▶ We then study what factors drive the decision to liquidate assets during the crisis
 - ▶ We find that a decline in income is the most important explanatory factor
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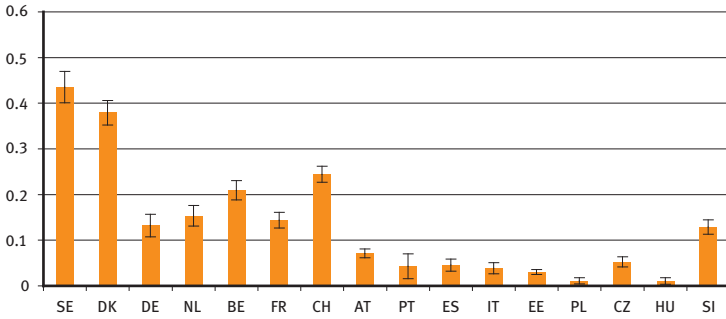
5.1 Financial market participation in Europe

In this chapter we investigate financial market participation of the 50+ in Europe and the role played by the recent financial crisis. Understanding the determinants of financial market behaviour of older individuals is crucial for the theme of active ageing. Indeed, a limited use of financial markets is often associated with financial hardship late in life (see Angelini et al. 2009). Therefore, the improvement of the financial awareness and sophistication of older people may increase their well-being through an increased ability to manage their savings and plan for their future.

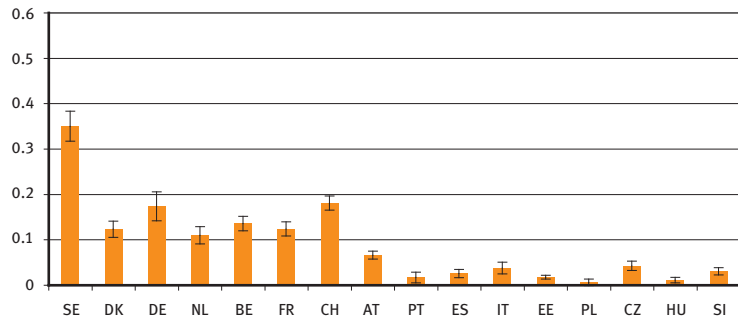
Figure 5.1 shows the proportion of households who own bonds, stocks, mutual funds and life insurance policies in each country using data from the fourth wave of the Survey of Health, Ageing and Retirement in Europe (SHARE). Households own stocks and mutual funds much more frequently in Sweden, Denmark, Belgium and Switzerland, where financial markets and institutions are more developed. In Austria, the Southern countries (Italy, Spain and Portugal) and Eastern Europe (Czech Republic, Estonia and Hungary) financial market participation is less widespread, while in Slovenia direct stock ownership is over ten per cent. For relatively safe assets, such as bonds, we observe a similar pattern, with the exception of Italy where the proportion of households who own bonds is among the highest in Europe. Life insurance policies are held by more than 16 per cent of households in all countries but Italy, Spain and Estonia.



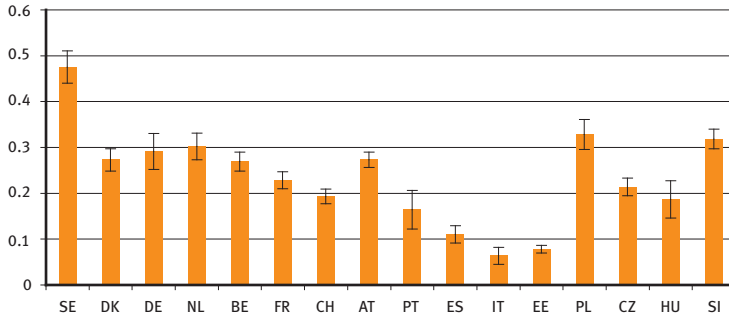
(a) Bonds (n= 38,605)



(b) Stocks (n= 38,623)



(c) Mutual funds (n= 38,588)



(d) Life insurance policies (n= 38,888)

Figure 5.1: Financial market participation in Europe (Wave 4), weighted figures
Source: SHARE Wave 4 release 1

5.2 Ownership of financial assets across waves

To study the impact of the global economic crisis, we now turn to the longitudinal sample and focus only on those households who were interviewed both in the second and in the fourth wave of the survey. Figure 5.2 shows how direct stock-ownership has changed across waves. For each country we consider four groups of households: those who hold stocks in both waves (in-in), those who exit the stock market during the financial crisis (in-out), those who enter (out-in) and those who stay out (out-out).

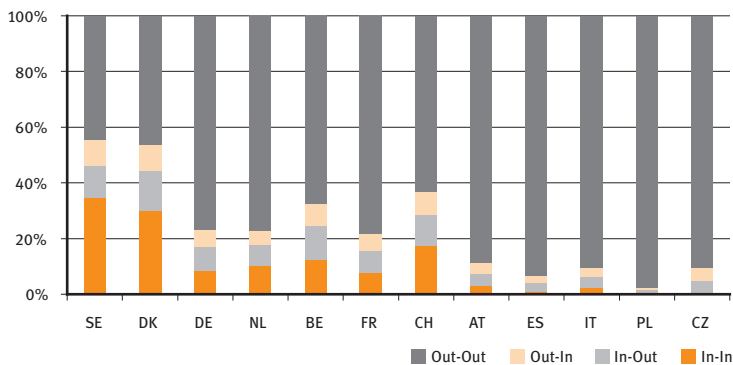


Figure 5.2: Direct stock ownership transitions between Wave 2 and Wave 4 by country
Notes: 12,684 observations
Source: SHARE Wave 2 release 2.5.0, Wave 4 release 1

Figure 5.2 shows a substantial number of transitions, both in and out of the stock market (see Christelis et al. 2008 for similar figures for the first two waves of the survey). In all countries but the Czech Republic, the households who exit the stock market are more than those who enter in it: although changes in participation are not very large, it is interesting to note that stock holding has substantially declined also in countries with well-developed financial markets, such as Denmark and Switzerland.

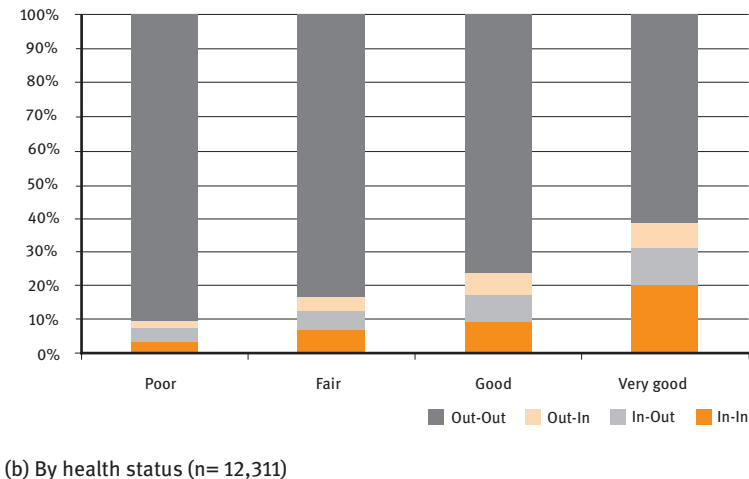
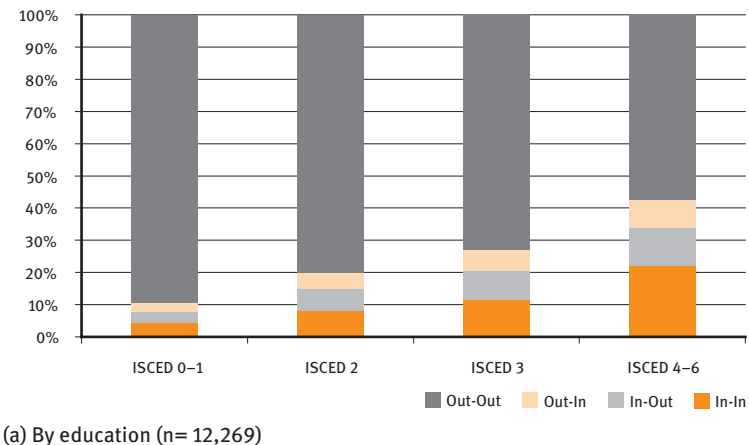


Figure 5.3: Direct stock ownership transitions between Wave 2 and Wave 4 by education and health status
Source: SHARE Wave 2 release 2.5.0, Wave 4 release 1

A similar pattern can be observed if we focus on mutual funds and life insurance policies, while the data show a clear increase in the number of households holding bonds in Austria and Italy. In these countries there seems to be a shift in household portfolio composition from risky to safe assets in response to the financial crisis. In our analysis we did not look at the change in ownership of individual retirement accounts (IRAs). Differently from the other assets considered, IRAs typically allow early withdrawal only in very special cases (e. g. permanent disability, high education costs, etc.) and subject to fees. Therefore, IRAs cannot be considered as a ‘liquid’ asset.

Figure 5.3 shows that there are large differences in financial behaviour not only across countries but also across groups of the population.

Higher education and better health conditions are associated with higher participation in the stock market. Changes in participation between the second and fourth wave are small, but both the probability to remain in the stock market and that of entering in it are higher for highly educated and healthier households, even during the financial crisis. The same is true for households where the financial respondent has higher cognitive abilities and comes from a family with good cultural background, as measured by the number of books in the house at the age of ten.

5.3 What are the individual determinants of changes in financial behaviour during the crisis?

From the analysis in the previous sections, it is clear that the financial crisis did not affect all individuals in our sample equally. From a policy perspective, it is crucially important to understand which groups of the population were most affected by the recent economic downturn.

In what follows, we focus on households who owned a certain type of asset in Wave 2 and we study the individual determinants of changes in financial behaviour during the crisis period. In particular, we estimate a linear probability model where the outcome variable is the decision of leaving the financial market between Wave 2 and Wave 4, separately for each type of asset. In our regressions we control for the characteristics of the household head as measured in the 2006/7 wave:

- demographic characteristics (gender, age, marital status, household size)
- socio-economic status (education, employment, income and wealth)
- health and cognitive abilities (self-reported good health, numeracy, fluency and recall – see Christelis et al. 2010)
- country fixed effects.

In addition, we control for the changes in the individual time-varying characteristics between 2006/7 and 2011: whether cognitive abilities and health have improved or deteriorated, whether household size has increased or decreased, whether there has been a decline in income and whether the household head has retired.

Table 5.1 presents the estimation results. The most interesting finding is that exiting the financial market is more likely for households who experience a decrease in income during the crisis period. In general, for households who own bonds, mutual funds and stocks, having low income and wealth before the crisis are also important risk factors. On the contrary, the economic conditions in 2006/7 do not seem to play a role in the probability of selling life insurance policies, which is highest for people aged between 61 and 65, out of the labour market, in good health, with low cognitive abilities and without a university degree. Males are less likely to liquidate their stock and mutual fund position, while we do not observe gender differences in the financial behaviour related to the other assets.

It is interesting to note that a decline in numeracy is associated with a higher probability of selling one's mutual funds and life insurance policies.

Table 5.1: Estimation results for the probability of leaving the financial market between Wave 2 and Wave 4 by type of asset

Variables	Bonds	Stocks	Mutual funds	Life insurances
<i>Demographics</i>				
Male	-0.027 (0.030)	-0.070*** (0.022)	-0.045* (0.026)	-0.011 (0.019)
Age 50–55	0.082 (0.061)	-0.038 (0.043)	-0.022 (0.053)	-0.124*** (0.039)
Age 56–60	0.089* (0.052)	-0.057 (0.037)	-0.060 (0.044)	-0.071* (0.037)
Age 61–65	0.086** (0.044)	-0.026 (0.033)	-0.044 (0.040)	0.082** (0.035)
Age 66–70	0.062 (0.043)	-0.043 (0.033)	0.028 (0.039)	0.021 (0.040)
Low education	0.039 (0.039)	0.040 (0.028)	0.034 (0.032)	0.016 (0.024)
Medium education	0.058* (0.034)	0.052** (0.024)	-0.015 (0.029)	0.044** (0.022)
<i>Wave 2 characteristics</i>				
Numeracy	-0.017 (0.016)	-0.027** (0.012)	0.004 (0.014)	-0.012 (0.010)
Fluency	-0.003 (0.002)	-0.002 (0.002)	-0.002 (0.002)	-0.004*** (0.002)

Recall	-0.005 (0.009)	-0.008 (0.007)	-0.011 (0.008)	-0.006 (0.006)
Employed	-0.001 (0.049)	0.015 (0.033)	0.027 (0.042)	-0.084*** (0.027)
Good health	-0.027 (0.043)	-0.023 (0.033)	-0.073* (0.038)	0.063** (0.026)
Single	-0.046 (0.043)	-0.034 (0.032)	-0.116*** (0.036)	0.023 (0.026)
Household size	0.005 (0.022)	-0.010 (0.018)	-0.014 (0.021)	-0.008 (0.011)
Income	-0.056** (0.024)	-0.037** (0.017)	-0.082*** (0.021)	-0.013 (0.010)
Wealth	-0.010 (0.007)	-0.014*** (0.004)	-0.007 (0.004)	0.001 (0.002)
<i>Changes from Wave 2 to Wave 4</i>				
Increase in numeracy	-0.055 (0.213)	-0.108 (0.139)	-0.015 (0.171)	0.090 (0.093)
Decrease in numeracy	0.015 (0.146)	0.021 (0.184)	0.480*** (0.054)	0.229** (0.110)
Increase in fluency	-0.000 (0.055)	0.007 (0.038)	-0.005 (0.046)	0.013 (0.034)
Decrease in fluency	0.036 (0.053)	0.038 (0.038)	0.014 (0.045)	0.056* (0.034)
Increase in recall	-0.018 (0.039)	-0.022 (0.027)	-0.038 (0.032)	-0.018 (0.023)
Decrease in recall	-0.017 (0.040)	-0.013 (0.028)	0.002 (0.033)	0.020 (0.025)
Health improvement	-0.007 (0.060)	-0.021 (0.047)	0.043 (0.051)	0.056 (0.035)
Health deterioration	0.081* (0.046)	-0.009 (0.032)	0.038 (0.039)	-0.012 (0.028)
Increase in household size	0.059 (0.075)	-0.013 (0.059)	0.055 (0.067)	0.034 (0.040)
Decrease in household size	0.024 (0.040)	0.045 (0.032)	0.032 (0.037)	0.030 (0.024)
Decrease in income	0.066** (0.030)	0.062*** (0.022)	0.056** (0.026)	0.037** (0.019)
Newly retired	-0.039 (0.053)	-0.045 (0.034)	-0.043 (0.043)	0.080*** (0.028)
Observations	1,279	2,294	1,764	3,110
R-squared	0.073	0.112	0.072	0.090

Significance: ***=1%; **=5%; * = 10%.

Notes: Robust standard error in parenthesis. The outcome variable is the probability of leaving the financial market between Wave 2 and Wave 4. The regressions also control for country dummies (not reported). Germany, age group 71+ and high education dummy are used as baseline.

Source: SHARE Wave 2 release 2.5.0, Wave 4 release 1

5.4 Financial behaviour in times of crisis

In this chapter we have analysed the financial behaviour of the 50+ in Europe, focusing on holdings of stocks, bonds, mutual funds and life insurance policies.

The data show large cross-country variation in financial market participation, which is highest in Northern countries and lowest in Southern and Eastern Europe. When we focus on the longitudinal dimension to study the effects of the financial crisis, we find that especially households who have experienced a decline in income have liquidated their holdings of all assets under consideration.

The use of financial wealth to cope with negative shocks suggests that households rely more on self-insurance (i. e. their savings) rather than on top of other forms of insurance, such as the ones provided by the state or the family.

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6 Poverty and transitions in key areas of quality of life

-
- ▶ Measures other than income-based poverty may be more appropriate to analyse the well-being of older people
 - ▶ We find little overlap between income-based poverty and other measures of poverty
 - ▶ We find no evidence for the effect of income-based poverty on changes in physical health and life satisfaction
 - ▶ Subjective and wealth-based poverty correlate strongly with deterioration of quality of life
-

6.1 Poverty and quality of life

Poverty alleviation is one of the key objectives of socio-economic policy of most governments, not only as a direct goal, but also as an intermediate target to improve the aspects of the quality of life which are consequences of low economic standards. In early life poverty has been shown to affect health and school performance (e. g. Smith et al. 1997). There is also growing evidence for correlation of poverty with outcomes at later stages in life, in particular with physical and mental health (Dahl & Birkelund 1997, Grundy & Holt 2001, Huisman et al. 2003) as well as broader aspects such as life satisfaction and happiness. In cross-European context Kok et al. (2008) showed that low levels of wealth and education are positively correlated with outcomes such as heart attack, diabetes as well as with poor health in general. In times of rapid demographic changes, understanding the role of poverty in determining the key aspects of well-being of older people seems more important than ever. The questions gain further relevance as governments find themselves under increased pressure to search for savings in the public pension, health and welfare systems, all of which could affect the material situation of the older population in Europe nowadays and in the future.

While the question of the effect of poverty for other outcomes among older people is particularly important and has significant implications for policy, there has so far been little debate on what concept of poverty is the relevant one to use with respect to older people. Most studies on poverty in developed countries specify poverty rates among older people using the standard income based definitions of relative poverty used for the entire population and other

age groups. While using the general concept of poverty for the analysis of the older population is clearly convenient, it is by no means obvious that it is the appropriate way of approaching the analysis of the financial situation of older people, and consequently whether it is the appropriate target to consider for policy interventions. The permanent income theory raises doubts concerning the importance of current income as a determinant of quality of life of older people. Moreover, numerous other aspects such as health, mobility and social networks affect the material situation of this group of individuals. This would suggest that effective policy should target other more specific indicators of the material well-being of older people. The recent crisis in particular provides additional reasons to identify the most relevant dimensions of material circumstances of older persons, so that they can be monitored and targeted by policy.

In this chapter we analyse the role that the financial situation of the older population has on deterioration (or improvement) in their conditions by examining the nature of the relationship between poverty and well-being in twelve European countries for different concepts of poverty. For this purpose we use the SHARE longitudinal data from Waves 2, 3 and 4 collected between 2006 and 2012. The longitudinal nature of the data facilitates the examination of differences in transition probabilities from “good” to “bad” states of quality of life (hereafter referred to as good states and bad states) and *vice versa* controlling for the financial situation in the initial period.

We find that the income-based definition of poverty correlates very weakly with transitions in physical and mental health and measures of life satisfaction. However, there is very strong evidence for the correlation of subjective poverty and poverty measured with respect to wealth with transitions in all analysed measures of well-being. There is also significant correlation between the analysed outcomes with poverty indicators reflecting financial distress (as defined in Cavasso & Weber in this volume) and failure to spend on food outside of home (Angelini et al. in this volume).

These findings suggest that with respect to the analysis of the quality of life of older people it may be more appropriate to use alternative measures of poverty to the standard income-based definition. Such measures need to be more in line with the specific conditions and material needs of older persons.

6.2 Analysing poverty and transitions in well-being

The focus of our analysis is on transitions from good to bad states (*and vice versa*) in measures of health and life satisfaction, conditional on being in the good (or *the bad*) state in Wave 2 of the survey, which we treat as the initial period. We thus examine determinants of the following transition probability:

$$P(y_{w4} = 1 | y_{w2} = 0) = \beta X_{w2} + \gamma \Pi_{w2} + \varepsilon$$

where $y_{w2} = 0$ stands for being in the good state in Wave 2 and $y_{w4} = 1$ implies being in the bad state in Wave 4. X_{w2} is a vector of exogenous characteristics measured at the time of Wave 2 and Π_{w2} is the poverty measure defined at the time of Wave 2. In the case of the transition from bad to good states, the estimated probability takes the following form:

$$P(y_{w4} = 0 | y_{w2} = 1) = \beta X_{w2} + \gamma \Pi_{w2} + \nu$$

The probabilities are estimated in a logistic regression and the results in Section 6.4 are presented as odds ratios.

6.3 Measures of well-being and poverty in the SHARE data

The analysis uses data from Waves 2, 3 and 4 of the Survey of Health, Ageing and Retirement in Europe (SHARE) collected in twelve countries between 2006 and 2012. In total, the sample includes respectively 34,415 (W2), 27,975 (W3) and 59,599 (W4) individuals aged 50+ in the three waves, of which 16,153 are present (and alive) in all three waves of data and are the reference sample for the analysis. Given the incidence of missing information on some items used in the analysis, the final total sample used in the regressions includes 15,276 individuals aged 50+. The resulting sample size ranges from 487 observations for Austria to 1,806 for Belgium and Italy. There are 6,757 male and 8,519 female respondents (see Table 6.1).

Table 6.1: Sample size by country*(a) In the good state*

	Number of observations in the good state in Wave 2				
	Total sample	3+SMT	3+ADL	4+EURO-D	UNHAPPY
SE	1,091	881	917	992	1,006
DK	1,508	1,257	1,293	1,370	1,463
DE	1,206	977	970	1,074	1,083
NL	1,382	1,219	1,176	1,219	1,282
BE	1,806	1,435	1,424	1,491	1,598
FR	1,429	1,110	1,146	1,124	1,265
CH	974	860	868	876	920
AT	487	381	354	424	435
ES	1,131	874	790	830	959
IT	1,806	1,395	1,346	1,370	1,498
PL	1,278	775	740	788	1,094
CZ	1,178	878	925	1,025	1,021
Total	15,276	12,042	11,949	12,583	13,624

(b) In the bad state

	Number of observations in the bad state in Wave 2				
	Total sample	3+SMT	3+ADL	4+EURO-D	UNHAPPY
SE	1,091	210	174	99	85
DK	1,508	251	215	138	45
DE	1,206	229	236	132	123
NL	1,382	163	206	163	100
BE	1,806	371	382	315	208
FR	1,429	319	283	305	164
CH	974	114	106	98	54
AT	487	106	133	63	52
IT	1,806	411	460	436	308
ES	1,131	257	341	301	172
PL	1,178	300	253	153	157
CZ	1,278	503	538	490	184
Total	15,276	3,234	3,327	2,693	1,652

Source: SHARE Wave 2 release 2.5.0 conditional on being observed and alive in Wave 2, 3 and 4.

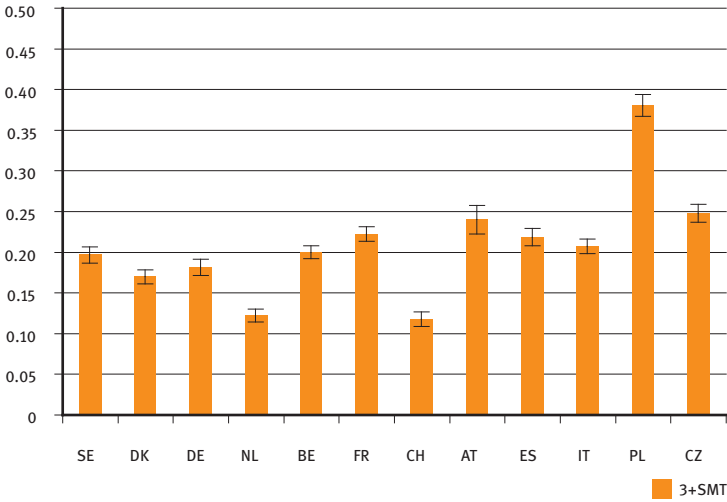
6.3.1 Measures of well-being

We examine four binary outcomes measuring well-being of the respondents – two reflecting physical health, one reflecting mental health and one measuring individuals' happiness with life. The two measures of physical health are generated with reference to the list of twelve symptoms of bad health and the list of 13 limitations in activities of daily living (ADLs). In both cases we define someone to be in a bad state if they have three or more symptoms or limitations. The two definitions are labelled as: “3+SMT” (three or more symptoms) and “3+ADL” (three or more limitations in ADLs).

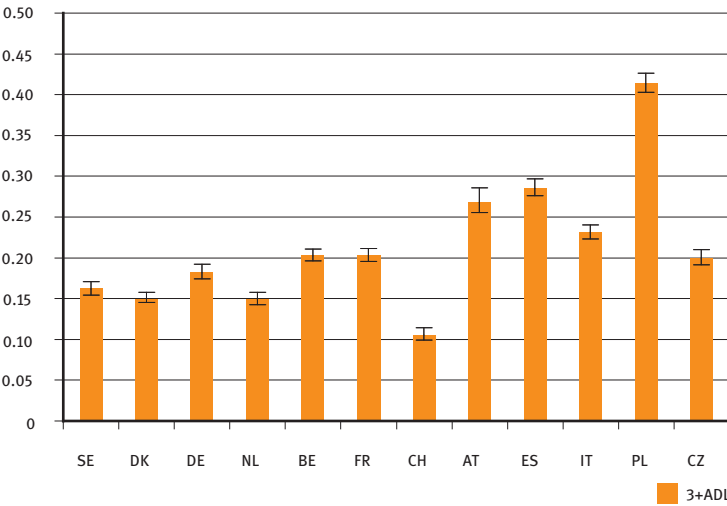
For a binomial measure of depression we refer to the EURO-D scale used extensively in the psychological literature (see e.g. Prince et al. 1999). The EURO-D scale is based on a set of twelve items such as lack of sleep, lack of concentration or feeling of guilt, and the threshold identifying depressed individuals is taken as suffering from four or more symptoms of depression (“4+EURO-D”). Additionally we also use a more general measure of happiness based on a question asking respondents how often they look back on their lives with a sense of happiness (always, often, rarely or never). Those answering rarely or never are identified as being in a bad state as far as happiness with life is concerned (“UNHAPPY”).

The distribution of respondents into those in the good and bad states in the four analysed dimensions at the time of Wave 2 is presented in Figure 6.1 for all of the twelve countries we consider. This distribution determines the sample sizes for the estimations of transition probabilities from good to bad states and *vice versa*. In Table 6.1a we present the sample sizes conditional on being in the good state in Wave 2 by country and by the four measures of well-being. Table 6.1b shows the sample sizes for the alternative transition estimations.

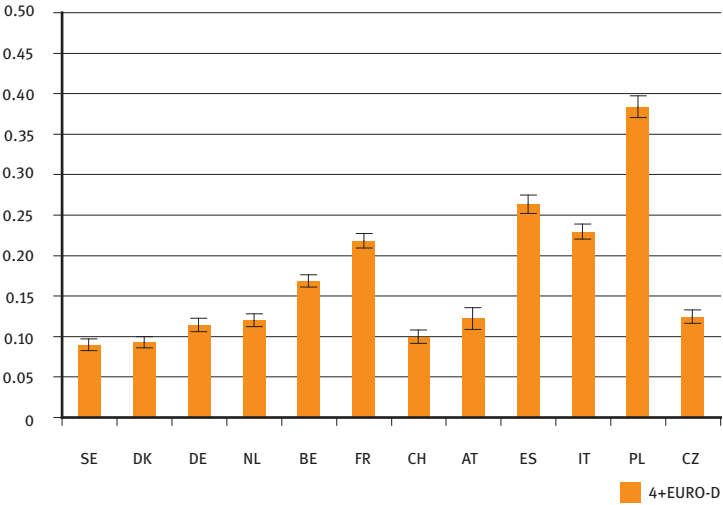
As we can see from Figure 6.1 there are important differences in the levels of well-being as reflected in the four measures. There is a similar cross-country pattern in the distribution of the two measures of physical health, with highest proportions of those identified as being in poor health in Poland (38.0 % by 3+SMT and 41.3 % by 3+ADL), and lowest in Switzerland (respectively 11.8 % and 10.6 %). Poland has also the highest proportion of individuals identified as suffering from depression on the EURO-D scale (38.4 %) with Spain, Italy and France also standing out from other countries at respectively 26.4 per cent, 23.0 per cent and 21.8 per cent. Relatively few respondents declare that they rarely or never look back on their lives with happiness. In this respect the four worst performing countries are Italy (16.4 %), Poland (15.0 %), Spain (14.3 %) and the Czech Republic (13.3 %), while in Denmark and Switzerland only 3.1 per cent and 5.4 per cent of the older people respectively declare unhappiness with their lives.



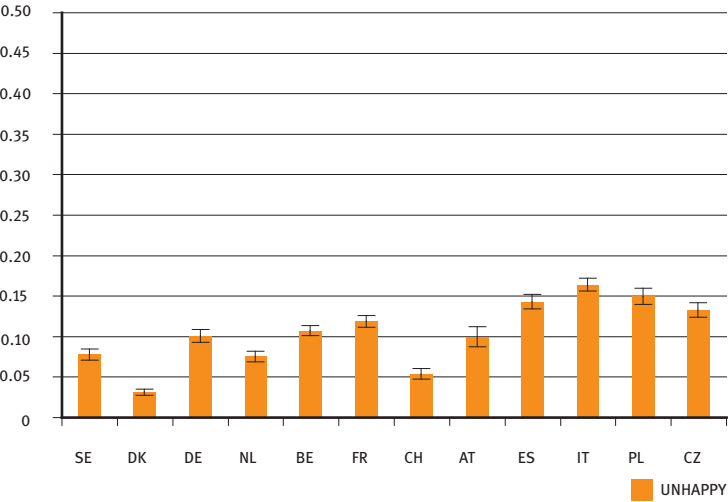
(a) 3+SMT: Three or more symptoms of poor health (n=15,276)



(b) 3+ADL: Three or more limitations in activities of daily living (n=15,276)



(c) 4+EURO-D: Four or more reported items on the EURO-D scale (n=15,276)



(d) UNHAPPY: Rarely or never look back on life with happiness (n=15,276)

Figure 6.1: Proportion of respondents in the good and bad states by country (Wave 2)
Notes: Data weighted using Wave 2 sample weights.
Source: Authors' calculations using SHARE data (Wave 2 release 2.5.0)

Figures 6.2 and 6.3 present raw transition rates respectively from the good to the bad states and *vice versa* for the four outcomes by country. There is high variation in these rates, with the rates of 3+SMT transitions to the bad state (Figure 6.2) ranging from 9.9 per cent in Switzerland to 25.5 per cent in the Czech Republic, and the “3+ADL” transitions varying from 9.3 per cent in Switzerland to 21.9 per cent in Spain. The highest rates of transitions to the bad state defined by the depression scale can be found in Spain (22.9 %) and Poland (20.1 %), though the rates are almost equally high in France (17.7 %), Austria (16.3 %) and Italy (17.0 %). The Czech Republic, Poland, Spain and Italy have the highest transition rates to the bad states with respect to happiness with life (respectively: 15.3 %, 13.3 %, 14.3 % and 12.3 %).

The raw transitions from bad to good states are presented in Figure 6.3. The recovery rates for 3+SMT vary between 33.5 per cent in France and 56.1 per cent in Switzerland. For 3+ADL the lowest recovery rates can be found in France (21.9 %) and Italy (23.7 %). The highest recovery rates are found in Switzerland (48.1 %). France has also the lowest recovery rates for depression (42 %). Improvements in life satisfaction between Waves 2 and 4 range from 59.2 per cent in the Czech Republic and 59.4 per cent in Italy to as much as 82.7 per cent in Austria.

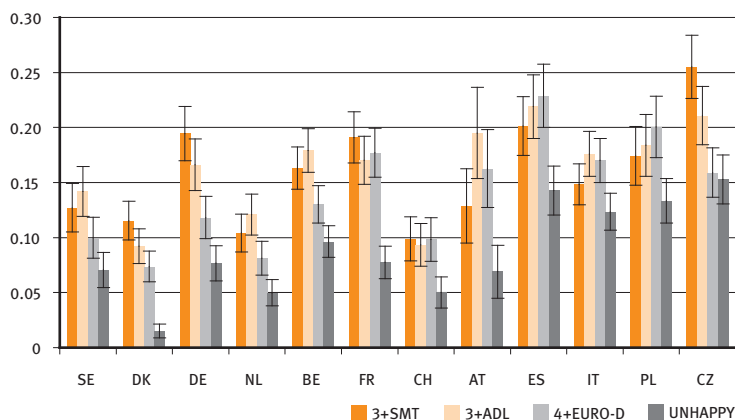


Figure 6.2: Transition rates from the good to the bad states

Notes: Data weighted using Wave 2 sample weights. N=12,042 (3+SMT); N=11,949 (3+ADL); N=12,583 (4+EURO-D); 13,624 (UNHAPPY).

Source: Authors' calculations using SHARE data (Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1)

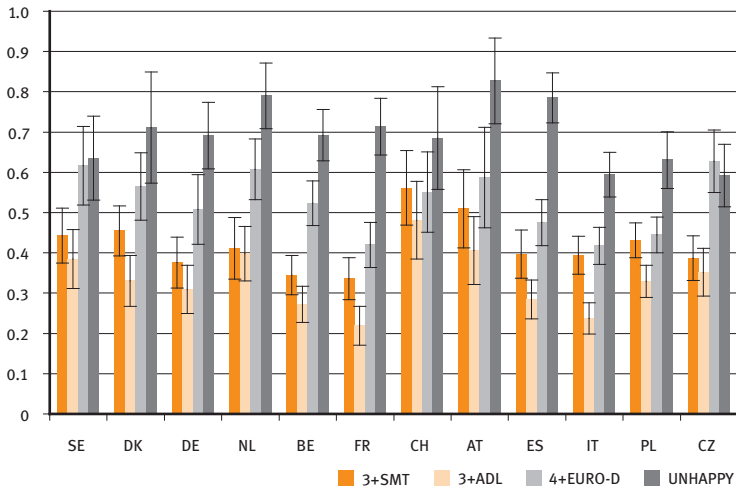


Figure 6.3: Transition rates from bad to good states

Notes: Data weighted using Wave 2 sample weights. N=3,234 (3+SMT); N=3,327 (3+ADL); N=2,693 (4+EURO-D); 1,652 (UNHAPPY).

Source: Authors' calculations using SHARE data (Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1)

6.3.2 Measures of poverty

Five definitions of poverty are used here to identify poor respondents. The first is the standard definition of income-based relative poverty (referred to as “*income poverty*” – *INC*), where we identify poor people with reference to the official poverty thresholds published by EUROSTAT and defined as 60 per cent of the median equivalised household net income. The second approach defines poverty with reference to the financial distress measure (“*financial distress*” – *FD*) suggested in Cavasso and Weber (in this volume), while the third using the information on consumption of food outside of home. In the latter case individuals are identified as poor if they declare no such expenditure (“*no food out*” – *NFO*), which is a measure analysed in detail by Angelini et al. (in this volume). The fourth definition of poverty is based on subjective declarations by respondents, in which case (“*subjective poverty*” – *SUB*) people are identified as poor on the basis of a question of how easily they can make ends meet. If the answer is “with some” or “with great” difficulty the individuals in the household are classified as “poor”. Finally the fifth definition refers to respondents’ wealth. Poor households defined with reference to wealth (“*wealth poverty*” – *WEALTH*) are those that belong to the bottom tertile of the wealth distribution of the sample in each

country. For this purpose households' wealth is the sum of household real assets (net of any debts) and household gross financial assets. Since a significant proportion of households' wealth is housing, a large proportion of respondents qualified as poor in this case are those who do not own their accommodation. In the three cases where we use specific amounts of financial resources of households, i. e. in the case of *INC*, *FD* and *WEALTH*, the analysis is conducted using equivalised measures based on the modified OECD scale. With respect to the financial distress measure this means we take a different approach than Cavasso and Weber (in this volume) who use per capita values, but this does not significantly affect the results.

In the case of three out of five definitions of poverty (*income*, *financial distress* and *wealth*) where we rely on detailed sets of financial questions, the quality of the measures substantially relies on the degree of item non-response to these questions. For example, in the case of bank account savings, depending on the country, we miss from 22 per cent to 56 per cent of specific values. Therefore the analysis is implemented using imputed values for the financial variables (Christelis 2011) with five imputations for each missing value (Rubin 1987).

As we can see in Figures 6.4 and 6.5 there is significant variation across countries in the levels of poverty as well as within countries depending on the measure of poverty used (details are also presented in Table 6.2). For example while the Czech Republic belongs to countries with one of the lowest income based poverty levels (8.7 %), Czech poverty levels defined by financial distress or by the subjective measure belong to the highest in the sample (respectively 26.0 % and 53.3 %). Belgium on the other hand has one of the highest levels of income-based poverty (18.4 %) and one of the lowest levels of poverty measured by the financial distress approach (13.3 %) and by no food out expenditures (21.1 %). It is interesting to note also that the distribution of the subjective measure and of poverty using the no food out approach are very similar, despite a very different nature of the questions – one being very subjective and the other a much more objective one. In Figure 6.5 we combine the four definitions of poverty shown in Figure 6.4 with the definition identifying the poor according to the country-specific wealth distribution. Thus in each country a third of the population is considered poor by the value of their (equivalised) wealth. The figure shows the overlap of this definition with other measures of poverty. Naturally, in countries where poverty rates based on income, financial distress, no food out and subjective assessment are low (e. g. Sweden, Denmark, Netherlands and Switzerland) the degree of overlap with the wealth-based measure is low. In countries with high poverty rates according to these four definitions (Italy, Spain, Czech Republic and Poland) the proportion of the 50+ population which is defined poor only using the wealth definition is very low (respectively 2.2 %, 1.9 %, 3.8 %, 0.8 %).

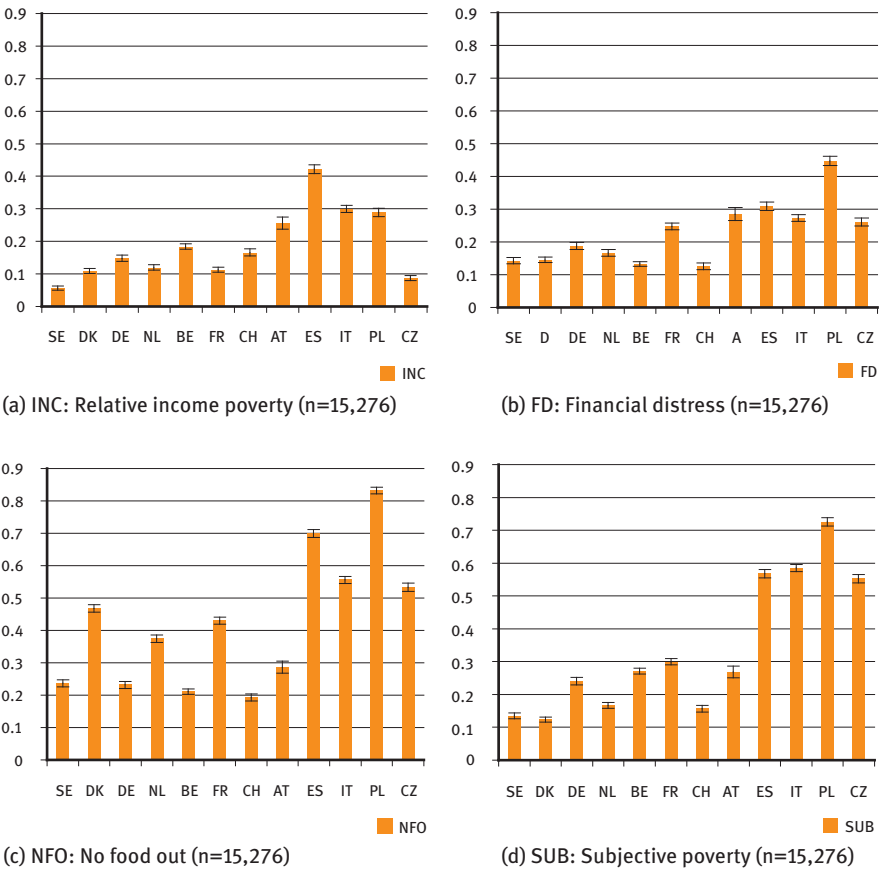


Figure 6.4: Poverty rates in Wave 2 data by poverty definition and country
Notes: Data weighted using Wave 2 sample weights.
Source: Authors' calculations using SHARE data (Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1)

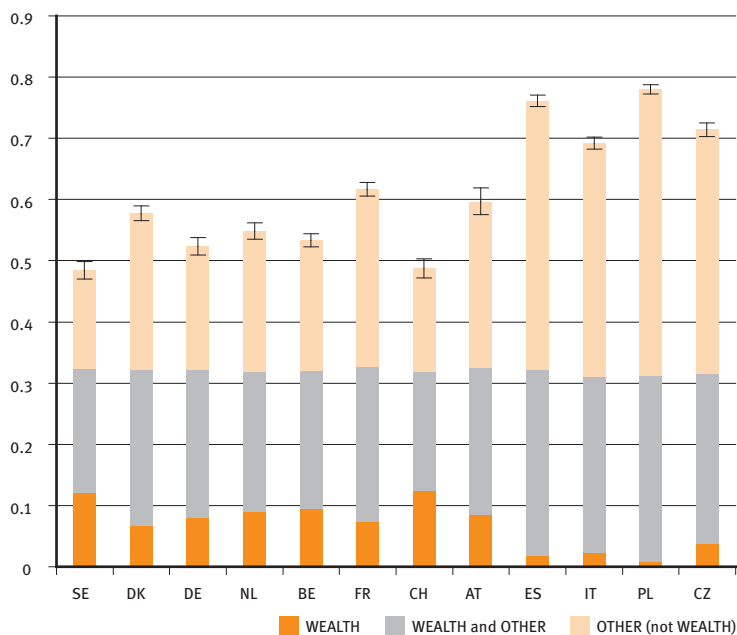


Figure 6.5: Poverty rates in Wave 2 data: wealth poverty and other measures by country

Notes: Data weighted using Wave 2 sample weights. N=15,276.

Source: Authors' calculations using SHARE data (Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1)

Table 6.2: Shares of individuals living in poverty in Wave 2 by country

Shares of individuals living in poverty in Wave 2						
	Total sample(N)	INC(%)	FD(%)	NFO(%)	SUB(%)	WEALTH(%)
SE	1,091	6	14	24	13	33
DK	1,508	11	15	47	12	33
DE	1,206	15	19	23	24	33
NL	1,382	12	17	37	17	33
BE	1,806	18	13	21	27	33
FR	1,429	11	25	43	30	33
CH	974	17	13	19	16	33
AT	487	26	28	29	27	33
ES	1,131	42	31	70	57	33
IT	1,806	30	27	56	59	33
PL	1,278	29	45	83	73	33
CZ	1,178	9	26	53	55	33
Total	15,276	18	22	42	34	33

Source: SHARE Wave 2 release 2.5.0 conditional on being observed and alive in Wave 2, 3 and 4

In Figure 6.6 we demonstrate the overlap between the traditional income-based approach and the four other measures of poverty by looking at pairwise poverty prevalence. For example in Figure 6.6a we show the proportion of the sample which is poor only with respect to the income definition (*INC*), the proportion where income poverty and the second measure – in the case of 6.6a, the FD

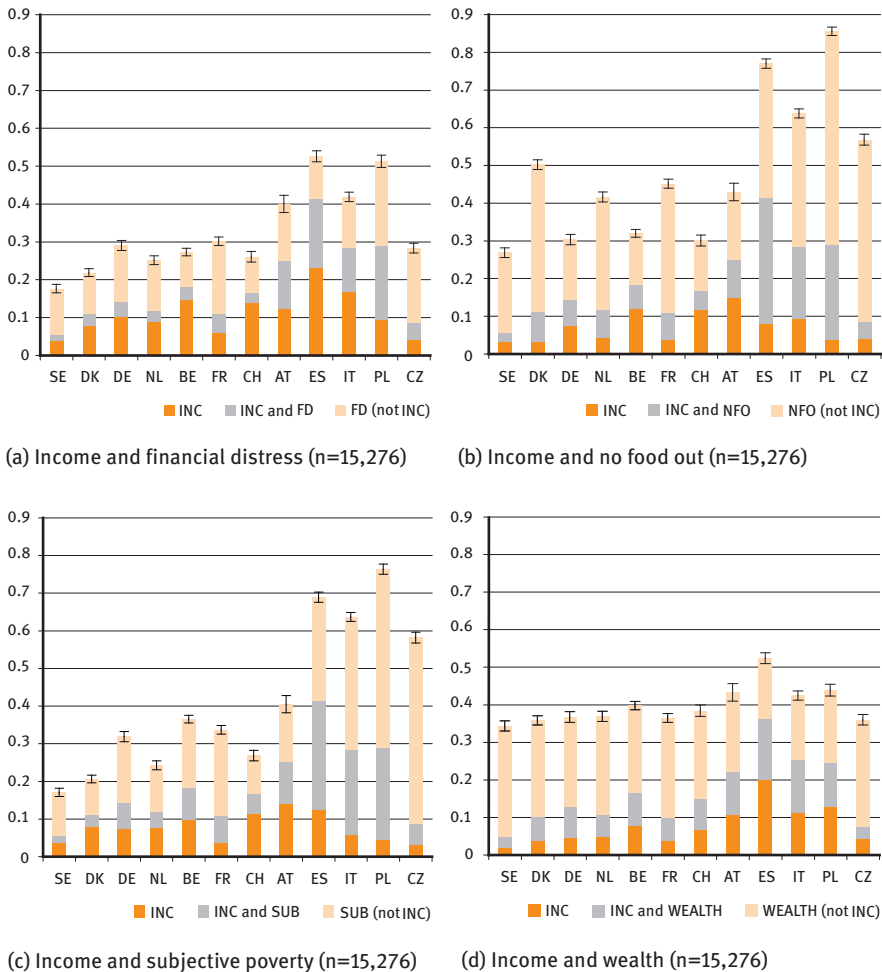


Figure 6.6: Poverty rates in Wave 2 data: overlap between income poverty and other measures by country

Notes: Data weighted using Wave 2 sample weights; “INC” – income defined poverty; “FD” – poverty defined with reference to financial distress; “NFO” – poverty defined with reference to no food out consumption; “SUB” – subjective poverty; “WEALTH” – relative wealth poverty. For details of definitions see text.

Source: Authors’ calculations using SHARE data (Wave 2 release 2.5.0)

– overlap (*INC and FD*), and the proportion which is classified as poor according only to the second measure, and not income (*FD (not INC)*). The degree of overlap in different countries between the measures corresponds to the disproportions in poverty prevalence as specified by the different approaches. For example, there is very little overlap between income poverty and the subjective and no food out measures in the Czech Republic, Sweden and Denmark. On the other hand, a significant proportion of the population in Spain (33.4 %) and Poland (25.1 %) are defined as poor both with respect to income and the no food out measure, and similarly with respect to income and the subjective approach (28.9 % in Spain and 24.6 % in Poland). The general impression from Figure 6.6, however, is a low degree of overlap between income defined poverty and the four other approaches, which in itself may raise doubts concerning the value of income based poverty as an indicator of material conditions of the older population.

6.4 Specifications and results – the effects of poverty

In this section we present the results of the estimations of the transition probabilities, which have been conducted using two specifications. In Specification 1 in addition to country and poverty dummies we control for the most basic characteristics such as age, age squared, gender, education, education squared, town size and the time between the interviews in Wave 2 and 4 (in months).

In Specification 2, in addition to these basic variables, we also control for other contemporaneous characteristics which could affect the transitions. Additionally, we include variables which allow us to examine the potential role of endogeneity of poverty with respect to the initial state of the individuals in Wave 2. For this purpose we use a series of variables from the SHARELIFE interview which are likely to be correlated with poverty status in Wave 2. As we shall see below there is very little difference in the estimated results between these two specifications.

The following variables from Waves 2 and 3 are used in Specification 2:

Wave 2 variables: extent of engagement in physical activities; current smoking and drinking; living together with a partner, controls for the number of children and grandchildren (see e. g. Cattell 2001, Litwin 2009, Litwin & Stoeckel 2013).

Wave 3 (SHARELIFE) variables: information relating to the situation at home at the age of ten: number of books at home, facilities in the household, occupation of main breadwinner; parental behaviour (smoking, drinking and mental problems); hospital stays in childhood, ever having been disabled or seriously injured.

6.4.1 Results – poverty and transitions in key aspects of quality of life

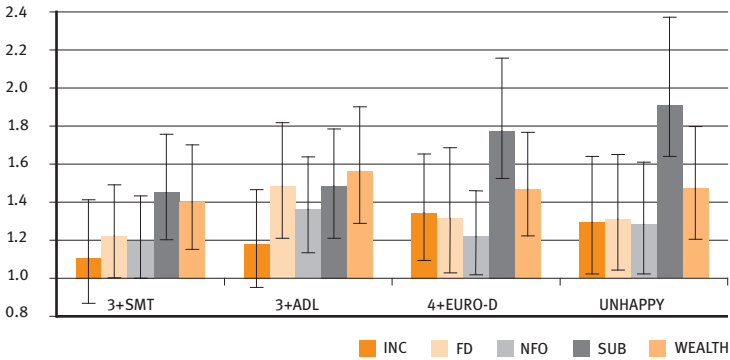
Since, in total, we run 80 separate regressions (four outcomes, five poverty measures, two specifications and two transitions in each), the results reported in this section focus on the odds ratios related to the respective estimated poverty dummies. These ratios are presented in Figure 6.7 for the transition from good to bad states and in Figure 6.8 for the transitions from bad to good states (95 % confidence intervals are included in the figures).

All signs of the estimated coefficients on poverty indicators in all regressions and the resulting values of the odds ratios presented in Figures 6.7 and 6.8 indicate the negative effect of poverty on the changes in the four measures of well-being. Poverty increases the probability of moving into the poor physical health status and reduces the probability of health improvements as indicated by our measures. The same conclusions apply to depression and to the measure of happiness with life. It is interesting to note that the estimated effects of poverty on transitions from good to bad states and *vice versa* are mirror images both in terms of the direction of the effect and in terms of its statistical significance.

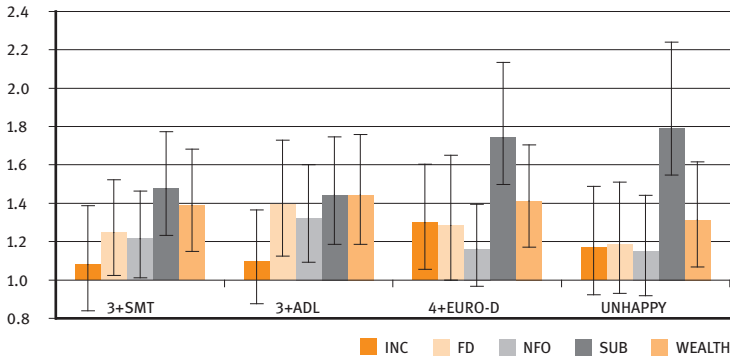
As we can see from Figures 6.7 and 6.8, conclusions concerning the magnitude and in particular statistical significance of the effect of poverty on transitions in well-being differ depending on the measure of poverty used in the analysis. In particular in both specifications, poverty measured by relative income is insignificant as determinant of transitions in physical health in both directions. Additionally in Specification 2 income poverty is also insignificant as a determinant of changes in declared happiness with life. Physical health strongly correlates with poverty measured by financial distress and no food out, but in these cases there is no effect in the case of transitions in depression or happiness.

In contrast to these measures, if poverty is identified with reference to wealth or subjective declarations, all estimates in both specifications are statistically significantly different from zero. The magnitudes of the estimated poverty odds ratios are also in most cases much greater compared to the ratios using income, financial distress or no food out measures.

According to our results in Specification 2, poor individuals by the subjective poverty definition, are about 45 per cent more likely to become ill in Wave 4 (according to both measures we use), they are 74 per cent more likely to start suffering from depression and they are 79 per cent more likely to declare that they rarely or never look back on their lives with happiness. These values for those identified as poor using relative wealth are respectively: 39 per cent, 45 per cent, 41 per cent and 31 per cent. For respondents identified as being in the bad state in Wave 2 subjective and wealth poverty significantly reduce the probability of



(a) Specification 1



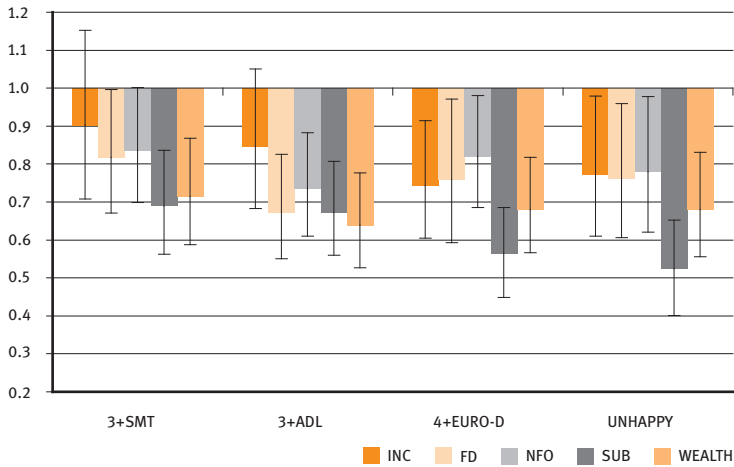
(b) Specification 2

Figure 6.7: Poverty and transitions from good to bad states

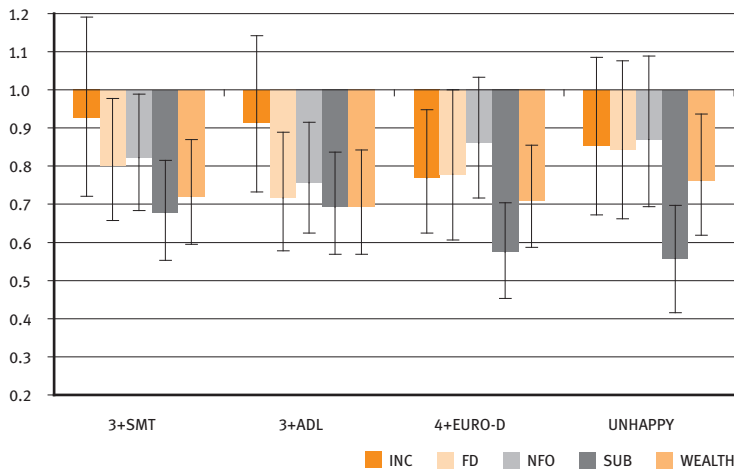
Notes: Data weighted using Wave 2 sample weights. N=12,042 (3+SMT); N=11,949 (3+ADL); N=12,583 (4+EURO-D); 13,624 (UNHAPPY).

Source: Authors' calculations using SHARE data (Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1)

moving out of these states, with the probabilities being reduced by about 25 per cent to 30 per cent in the case of wealth poverty, and by 30 per cent to 40 per cent in the case of subjective poverty.



(a) Specification 1



(b) Specification 2

Figure 6.8: Poverty and transitions from bad to good states

Notes: Data weighted using Wave 2 sample weights. N=3,234 (3+SMT); N=3,327 (3+ADL); N=2,693 (4+EURO-D); 1,652 (UNHAPPY).

Source: Authors' calculations using SHARE data (Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1)

6.5 The role of material conditions for health and life satisfaction of the elderly

Conclusions concerning the role of the financial situation on the development of well-being of the older persons significantly depend on the measure of material well-being used in the analysis. In this chapter we defined poverty with respect to income, financial distress, food consumption outside of home, subjective assessment and relative wealth. Of those five, wealth-defined poverty and subjective assessment of the material well-being strongly correlate with deterioration and improvements in physical and mental health as well as overall life satisfaction. Poverty defined by financial distress and consumption of food outside of home is significantly related to changes in physical health but there is no evidence for the effects of these measures of poverty with mental health and life satisfaction.

Levels of old-age poverty significantly differ across the SHARE countries, but both the level of poverty and ranking of countries strongly depend on the definition of poverty used in the analysis. While in the case of some countries poverty is consistently low on measures based on income, no food out and subjective assessment (e. g. Sweden, or Switzerland), in others like France or the Czech Republic, income based poverty levels are among the lowest from among the twelve analysed countries, but both the no food out measure and subjective poverty are either at the upper end (CZ) or in the middle of the country rankings (FR).

Most importantly however, we found little evidence for the role of relative income poverty on changes in the well-being of older people. While income poverty significantly relates to the onset of depression, increasing its probability by about 30 per cent in the space of four years, we find no effect of the most common measure of poverty on changes in physical health or overall life satisfaction of older people. This suggests that the traditional income measure of household material situation may not be appropriate as a proxy for the welfare of older populations, and may perform badly as a measure of improvements in their quality of life and thus as a target for old-age policies.

As studies of Cavasso and Weber and Angelini et al. in this volume demonstrate, the recent financial crisis has had a significant effect on the current material situation of older people in many European countries. Our results suggest that the wealth reduction due to the crisis may have long-lasting consequences on health and life satisfaction of older people. The analysis also points out that if indicators of the material situation are to be valid measures to monitor the post-crisis developments in the quality of life of the older people they should cover broader aspects of the financial well-being than income poverty. Such measures

could incorporate aspects of wealth and the subjective assessment of the material situation as well as indicators more specifically focused on the consumption basket of the older population.

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Part II Work and retirement: challenges at the end of working life

Edited by Axel Börsch-Supan

János Divényi and Gábor Kézdi

7 Low employment among the 50+ population in Hungary: the role of incentives, health and cognitive capacities

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- ▶ Employment rate in Hungary among the 50+ population is among the lowest in Europe
 - ▶ Earnings in Hungary are very close to retirement income, creating incentives to retire early
 - ▶ Hungarians are in significantly worse health than the people in most other European countries
 - ▶ The employment gap between Hungary and Europe is largest among people with bad health and low skills
-

The employment rate in Hungary has been very low over the past 20 years. And this is especially true for those people aged 55–64 years: while the corresponding OECD average employment rate is 54 per cent, in Hungary it is a mere 34 per cent (OECD 2011). In fact, Kátay and Nobilis (2009) argue that the low level of labour force participation among the 50+ population is one of the major reasons for the low level of aggregate labour force participation in Hungary.

In this paper we use the cross-sectional data of SHARE Wave 4 to try to discern the main reasons for the low employment level of the 50+ population in Hungary. Hungary, together with three other countries, joined in Wave 4. While SHARE is a panel dataset that follows individuals over time, the single wave of the Hungarian data provides a single cross-section. Our analysis is therefore a cross-sectional one and ignores information from previous waves for the other countries, too. We focus on people aged between 50 and 75; the number of observations in this age range is 2,500 in the Hungarian sub-sample and 45,000 in the entire sample.

Our paper is mainly descriptive: it points out interesting features in the data, rather than establishing causal relationships. We make use of questions on standard demographics, employment, income, health (including two tests) and cognitive functioning (working memory, vocabulary and numeracy) to investigate the potential causes of the low employment rate of older Hungarian people.

We show that incomes during retirement are very similar to earnings in the relevant age range in Hungary, while there are smaller or larger differences in most other European countries, including other Eastern-European countries. We also show that the level of education and cognitive capacity is lower than but not very far from the European average, while health status is among the

lowest in European comparison. The facts that available earnings and pensions create weak incentives for staying in employment in Hungary and the bad health status of Hungarians are well established in the literature (Cseres-Gergely 2007, Eris 2012), while the results on cognitive capacity are new. Our most important contribution is the joint analysis of health, cognitive capacity and employment. We show that bad health may account for over a quarter of the employment gap between Hungary and the European average. More importantly, our result suggests that the employment of healthy people with high cognitive capacity is as high in Hungary as in other European countries, while the employment of the less healthy and those with lower cognitive capacity lag behind the European average by a large margin. Our results suggest that active ageing and health and cognitive status are closely related, but that relationship varies from country to country, a phenomenon that calls for further research.

7.1 Differences in employment and retirement rates between Hungary and Europe

Whether a person is employed or not can be defined in various ways. SHARE allows quite a few definitions to be considered. In this analysis, we focus on individuals' self-assessment: respondents are asked what the best description of their labour market situation is, with answer categories of retired, employed or self-employed, unemployed, etc. (The results are very similar if we use alternative definitions of employment.)

Comparing the age- and gender-specific employment rates of Hungary to those of the other 15 SHARE countries considered, we find substantial shortfalls across the board. Let us take the group of men aged 50–54 as an illustrative example: while 80 per cent of them are employed in the other European countries, in Hungary only 59 per cent are. The discrepancy is greatest in the 60–64 age group (31 versus nine per cent).

A substantial part of the employment gap is due to retirement. While only four per cent of 50–54-year-old men are retired in the other European countries, some eleven per cent are in Hungary. The differences are spectacularly large in the 60–64 age group among both men and women. The fraction of retirees in that age group is slightly below 60 per cent among both men and women in the other European countries, whereas it is around 80 per cent in Hungary among men and over 80 per cent among women.

Early retirement is an important factor in the low employment rate in Hungary. In a European comparison, the average age of retirement is among the

lowest across all birth cohorts: while the average male retiree born in 1940 (and thus 71 years old at the time of the survey) retired at the age of 58 in Hungary, in the other countries the ages ranged from 57 to 64; the average female retiree born in 1940 retired at 53 in Hungary, but at between 52 and 65 in the other countries. The average age of retirement in the younger cohorts shows that Hungary's ranking has not changed in recent years: Hungarians continue to retire earlier than people in the other European countries.

7.2 Differences in earnings and retirement income are in line with the employment gap

As a next step, we look at the role of economic incentives for early retirement in Hungary. The theory of the option value of work and retirement compares the benefits of retirement to the costs of earnings forgone (the seminal paper is Stock and Wise 1990 or Börsch-Supan 2000). When making a decision about whether to retire at a certain age, individuals compare the income flow they would have in future if they stayed employed to the income flow they would receive if retired. Thus, the decision about when to retire is greatly affected by current and anticipated earnings, as well as by the rules governing retirement and the pension formula. The Hungarian pension system is characterised by low deductions in the case of early retirement and practically zero bonuses for working over the legal retirement age – a topic covered in detail by Cseres-Gergely (2007). Here we look at the levels of expected wages and pension benefits.

Unfortunately, we only have information on earnings for those who work and on pension income for those who do not. The first limitation is common across studies in the literature; the second is overcome in many studies by applying the pension formula to earnings histories, but such an exercise is beyond the scope of our analysis. Comparing the earnings of those who are employed to the retirement income of those who are retired is obviously imperfect for our purposes, but it can still provide useful information, especially in cross-country comparisons. Figure 7.1 shows the median earnings of those who are employed, together with the median income of those who are retired, for men, by age, for each country separately. All figures are normalised to median earnings in the corresponding country (and gender) between age 55 and 59. The corresponding figure for women is not shown here but it shows very similar patterns.

The figures reveal strong patterns: median earnings in Hungary are practically equal to median retirement income. The comparison of earnings to retirement income is mostly between non-overlapping ages, but neither earnings

nor retirement income seems to follow any age pattern. As a result, median retirement incomes in Hungary are a straight continuation of median earnings. These results suggest that Hungarian employees may have little incentive to stay employed in their 50s and 60s. This is not the case in most other countries: there is some (albeit often small) level shift in almost any other country and a negative age profile in median retirement incomes in some countries. (Median earnings exhibit a positive age profile in older ages in some countries, too, but that likely shows the effects of self-selection becoming stronger at older ages.)

It seems, therefore, that pure economic incentives may be in large part responsible for the low levels of labour force participation and employment in Hungary. However, many factors may shape those incentives. Besides the pension formula, attainable earnings are an equally important part of the picture. Pre-retirement earnings in Hungary seem very low by European comparison. In the remainder of the paper we look at factors that may be responsible for the low earnings of older Hungarians.

7.3 The potential role of education and cognitive capacity in explaining low employment rates in Hungary

We first look at education and cognitive capacity. The fraction of people with low and medium levels of education in Hungary is similar to their fraction in most other European countries in the relevant age group. At the same time, the fraction of Hungarians with high levels of education is substantially lower in the relevant age group than in most other European countries. These numbers indicate that the education distribution is relatively compressed in Hungary – as is the case with the other post-communist countries and the Scandinavian countries – but is not particularly low by comparison with the rest of Europe. The level of formal education is therefore unlikely to be a major factor behind the employment gap. But the same formal education may correspond to different content in different countries, and labour market experience and other factors may have led to additional differences to the actual skill composition of older workers in the different countries.

A major advantage of SHARE is that we can look at more than education: a battery of cognitive tests makes some skills directly comparable. Five simple cognitive tests are administered – on episodic memory (both short-term and longer-term), verbal fluency, numeracy and basic numerical skills. Figure 7.2 shows the average of each measure by gender and age. The figure shows the Hungarian

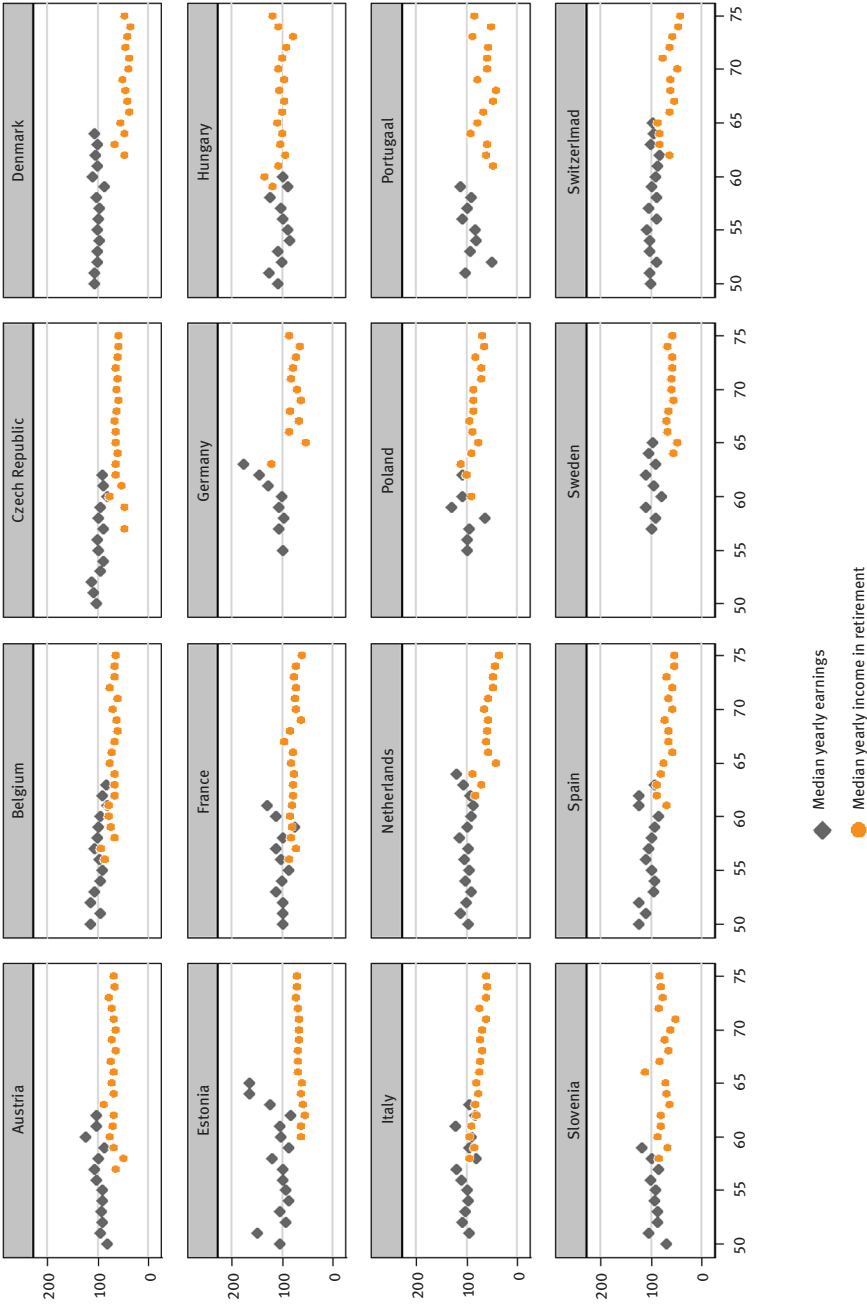


Figure 7.1: Median earnings and median pension benefits of men, by age, in the 16 countries of SHARE Wave 4

Notes: Number of observations = 16,312

Source: SHARE Wave 4 release 1

average for each measure together with the lower quartile and the upper quartile of the distribution of the corresponding average measures in the 15 other SHARE countries. The Hungarian average and the upper and lower quartiles are measured for each year of age and are presented as smoothed graphs. The scores achieved in the memory and numerical tests put 50–55-year-old Hungarians in the middle of the European distribution, while older Hungarians are more in the bottom half. On average, Hungarians perform relatively worse in terms of verbal fluency, and they, especially the men, rate their own cognitive capacity lower, too. These comparisons suggest that the skill composition of the older Hungarian population may be in part responsible for their relatively low levels of employment, but it is unlikely to be an important part.

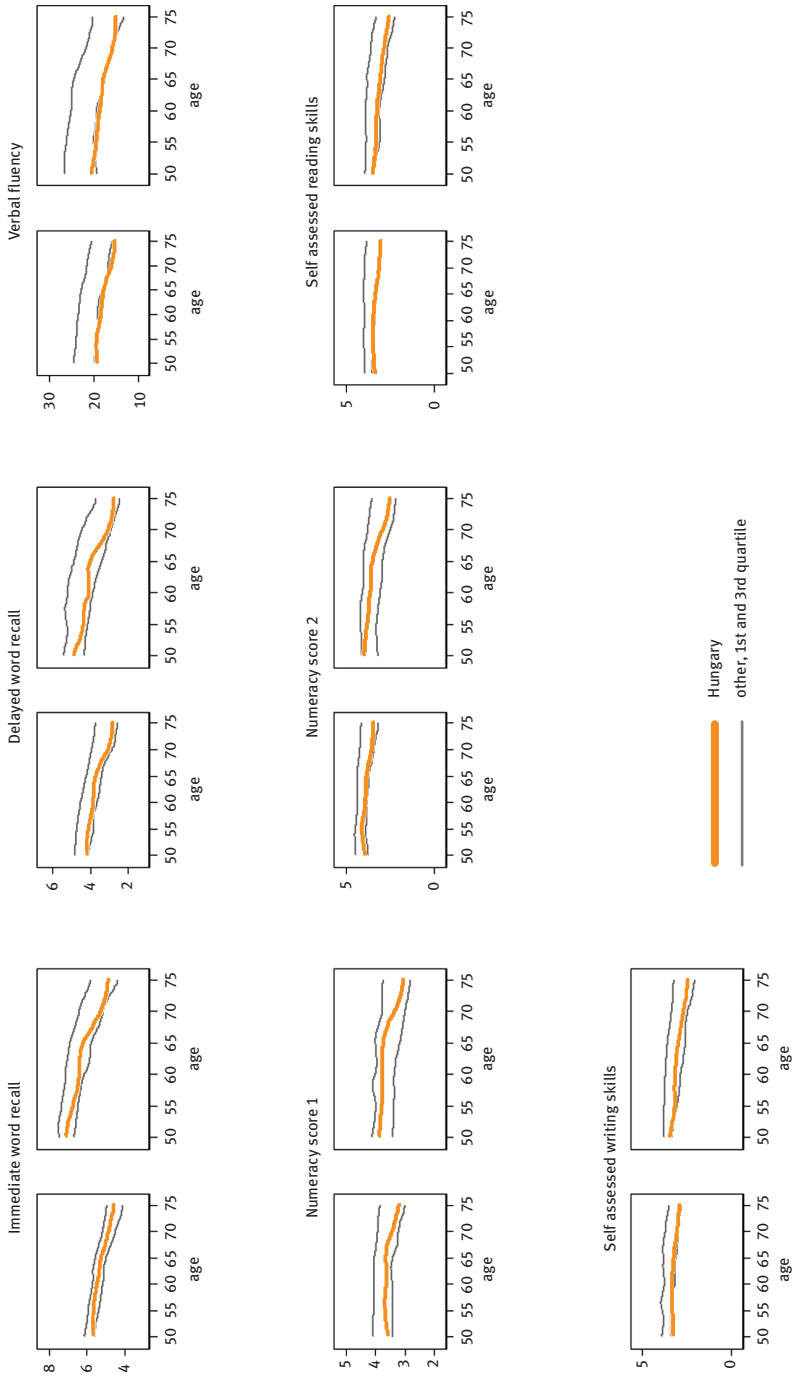
7.4 The potential role of health in explaining low employment rates in Hungary

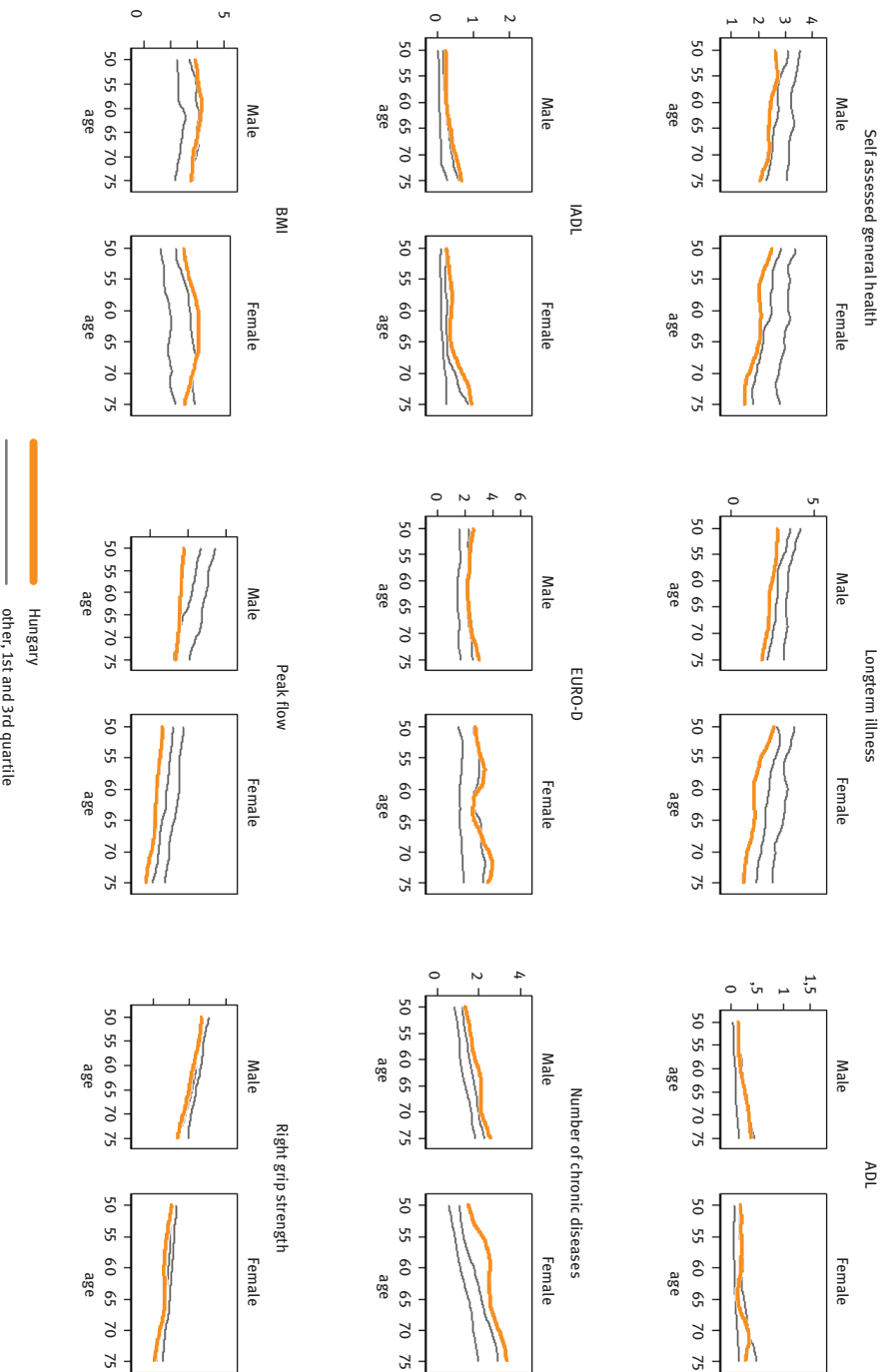
Another advantage of the SHARE data is information on the health status of the respondents. SHARE measures a wide range of indicators of physical health, including self-assessed health, whether respondents have ever been diagnosed with a chronic disease, whether they have ever had symptoms lasting at least six months, limitations in functioning and measurement of peak flow and grip strength. *Peak flow* is a measure of respiratory functioning and is a good predictor of related health problems. *Grip strength* is a strong predictor of functional limitations and disability (Rantanen et al. 1999). Besides these variables on physical health, SHARE collects data on respondents' height and weight, which allows their body mass index to be calculated. There is also an 11-item test for clinical depression (the Euro-D scale). Figure 7.3 shows the average of each measure by gender and age in Hungary in a European comparison. Similarly to Figure 7.2 with the cognitive measures, the Hungarian figures are compared with the lower quartile and the upper quartile of the distribution of the average measures in the other 15 countries, for each year of age (smoothed).

► **Figure 7.2:** Average cognitive measures in Hungary, by gender and age, together by the lower and upper quartile of the country averages in the other 15 countries of SHARE Wave 4

Notes: Number of observations = 1,143/1,403; 19,314/23,865 (Male/Female, Hungary; Male/Female, other) – together: 45,752

Source: SHARE Wave 4 release 1





Whichever of these measures we consider, the results suggest that Hungarians are in significantly worse health than the people in most other European countries. Hungarian women seem to be in especially bad shape. Perhaps the most striking results are revealed by the two objective health measures in the SHARE data – peak flow and grip strength. The measures are very different across gender and age, showing a clear decline by age and lower values for women. The Hungarian grip strength flow measures are in the bottom part of the cross-country distribution among both men and women, the Hungarian average peak flow measures are in the bottom part of the cross-country distribution among men and at the very bottom among women. When we break down the figures by employment status (not shown here), we see that the Hungarian health measures are worse in a European comparison among the non-employed than among the employed. Taken all these facts together, the bad health status of older Hungarians may be an important factor in explaining the low levels of employment in Hungary.

7.5 Can health and cognitive capacity explain the low employment rate in Hungary?

In this section we try to assess the potential role of cognitive skills and health in the low employment rate in Hungary in a more systematic way. An operational question that can shed some light on the more general question is the following: What would happen if Hungarians had conditions similar to the rest of Europe, as represented in SHARE Wave 4? We would need robust exogenous variation (or at least panel data) to hope to establish causal links, but the following simple descriptive analyses can still provide us with valuable information about the question in hand.

First we run simple linear regressions, where the dependent variable is the employment dummy, which is explained by country (reference: Germany), age (5-year age group dummies), education (International Standard Classification of Education – ISCED – categories), cognitive skills (measured by all the cognitive

◀ **Figure 7.3:** Average health measures in Hungary, by gender and age, together by the lower and upper quartile of the country averages in the other 15 countries of SHARE Wave 4

Notes: Number of observations = 1,143/1,403; 19,314/23,865 (Male/Female, Hungary; Male/Female, other) – together: 45,752

Source: SHARE Wave 4 release 1

variables) and health status (measured by all the health variables). We focus on the 50 to 69 years old population.

The most important results are summarised in Table 7.1. The coefficient of interest is the country dummy of Hungary, which expresses the employment gap relative to Germany, if the Hungarian 50–69 years old population had the same age, education, cognitive skills and health status on average. Comparison of the estimated coefficients in columns (1) and (4) reveals that part of the gap is explained by differences in health composition while education and cognitive skills appear not to make a difference. The greater part remains unexplained.

The regression assumes linearity in the score variables and poolability across countries, which might not be appropriate for the true relationships. We therefore also show the results of a simple non-parametric regression that allows for non-linearities and Hungary-specific slopes. First, we construct two synthetic variables: one for cognitive capacity and one for health. The first is the average of all cognitive scores, and the second is the principal component of the objective health measures. Then we create 5 categories from each synthetic variable, so that every respondent falls into one of the 25 bins defined by the 5×5 categories. Within each bin, we estimate the employment rate for Hungary and for the rest of Europe separately. Figure 7.4 shows the results for the male population aged 50–69. The figures for females show the same patterns.

The figures show that the relationship between health/cognitive skills and employment is stronger in Hungary than is the European average. Those with the good health and good cognition enjoy the same rate of employment in Hungary as elsewhere in Europe. However, as we move farther away from this category, so the employment probabilities deteriorate strongly and the employment gap increases relative to Europe. The increase in the gap is more substantial in health. This heterogeneity in the gaps suggests that the average slide in employment rates can be attributed to various factors, which affect different groups to a different extent.

Table 7.1: Cross-country differences in employment rates: raw differences and differences controlled for individual characteristics. OLS estimates of linear probability models with right-hand side variables of country, age, education, cognitive capacity and health. Age between 50 and 69.

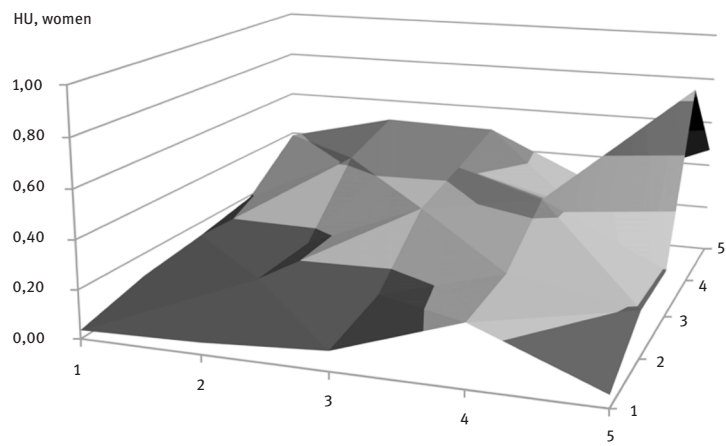
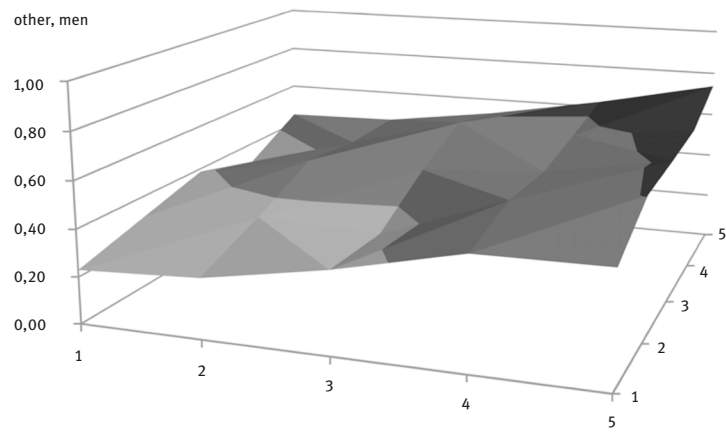
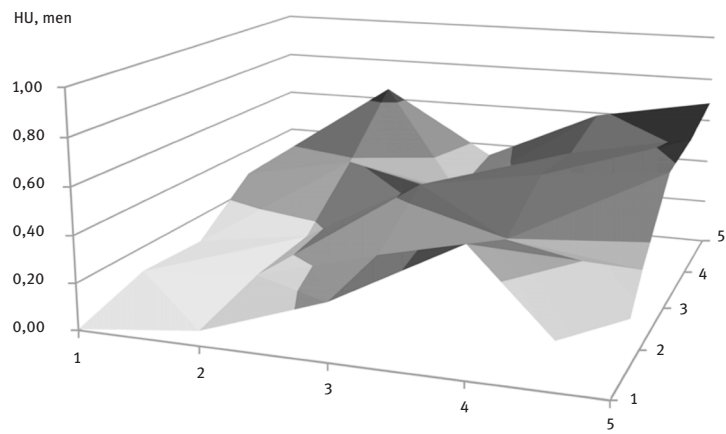
	Men		Women					
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Hungary	-0.17 [0.024]***	-0.17 [0.024]***	-0.12 [0.023]***	-0.13 [0.024]***	-0.21 [0.022]***	-0.19 [0.022]***	-0.14 [0.021]***	-0.15 [0.021]***
Country dummies (reference: Germany) ^a	YES	YES	YES	YES	YES	YES	YES	YES
Age dummies ^b	YES	YES	YES	YES	YES	YES	YES	YES
Education and cognitive variables ^c		YES		YES		YES		YES
Health variables ^d			YES	YES			YES	YES
Number of observations	16,489	16,489	16,470	16,470	20,444	20,444	20,421	20,421
R squared	0.35	0.37	0.40	0.41	0.33	0.35	0.37	0.38

Significance: ** = 5%; *** = 1%

Notes: Robust standard errors in brackets.

^a The variables are jointly significant at 1%.^b Dummy variables for age 55–59, 60–64, 65–69 (reference category: 50–54). The variables are jointly significant at 1%.^c Education entered as four categories based on ISCED classification. Standardised scores are entered for each cognitive measure. When entered, the variables are jointly significant at 1%.^d Subjective health (five categories) and standardised scores for each health measure. When entered, the variables are jointly significant at 1%.

Source: Own calculations based on SHARE Wave 4 release 1



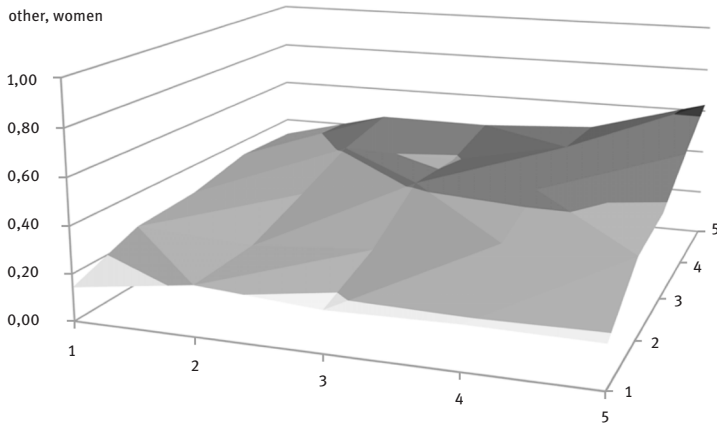


Figure 7.4: Employment rate by 5x5 categories of synthetic health and cognitive variables, 50–69-year-old men; Hungary and the other European countries in SHARE Wave 4
 Notes: x-axis: health; z-axis: cognitive capacity; y-axis: employment rate; HU, men (n=952); other, men (n=15,508); HU, women (n=1,164); other, women (n=19,248).
 Source: SHARE Wave 4 release 1

7.6 Research and policy should focus on the employment of less healthy and less skilled Hungarians of older age

In a mainly descriptive analysis, we have revealed some stylised facts featuring the employment of the population aged 50+ in Hungary. Although we have not established causal relationships, our results point out interesting associations that should be analysed in more detail in the future.

According to our results, the Hungarian pension system appears to provide strong incentives for early retirement, and these are probably strengthened by the low income attainable if an individual remains in the labour force. On average, levels of education and cognitive skills appear not to be responsible for the low employment rate among older Hungarians. The poor health status of the Hungarian population might play a more important role. Perhaps the most important key finding of the paper is that there are strong differences in the relationship between employment and cognitive skills and health across countries. The employment rate among older Hungarians with good cognitive and health status is very similar to the European level, but the employment rate among older Hungarians with lower cognitive skills and/or worse health status is substantially

lower. An important policy conclusion from these results is that the low employment rate for people with health problems impedes active ageing in Hungary.

To understand the causes of low employment rate in Hungary and suggest specific policy recommendations, research should uncover why health status of older Hungarians is so low in European comparison and why older Hungarians with lower cognitive and health status have substantially lower rates of employment than similar people in most other European countries. Subsequent waves of SHARE, with continued participation of Hungary, would help provide conclusive evidence on those questions by allowing for direct analysis of the transition to retirement and trajectories of cognitive and health status. Potential linkages with social security and health insurance records could add further evidence on the role of earnings histories and health care utilisation. The SHARE data opens very promising perspectives for understanding the low levels of old-age employment in Hungary (as well as some of the other European countries) and for evaluating the policy options.

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Victor Rodrigues and José Machado

8 Unemployed 50+: exploring risk factors for depression in Europe

-
- ▶ 50 plus unemployed have higher risk of depression compared to the employed
 - ▶ Unemployed most vulnerable to depression have higher financial strain and worse physical health
 - ▶ Jobless in Austria, Spain, Italy, Poland, Hungary and Czech Republic have increased risk of depression
-

The recent economic crisis has forced companies worldwide to restructure, downsize and close down, leading to the loss of millions of jobs. More than nine per cent of the 23,000 million individuals affected by unemployment in 2011 were over 55 years old (EUROSTAT). This percentage may in fact be even larger if we take into account discouraged people who opt out of the labour market through pre-retirement and early retirement.

Job loss may threaten mental health. The unemployed often suffer from depression, anxiety, stress-related physical ailments, and some even commit suicide (Wanberg 2012). A recent meta-analysis study indicates that 34 per cent of the unemployed have mental health problems, compared with 16 per cent of those in work (Paul & Moser 2009).

These results are understandable in a Western context where a salary is the main resource for living and adulthood roles are entangled with a working identity. This makes paid work central to wellbeing. However, some people can suffer more than others if they lose their job, and therefore it can be assumed that the economic and psychosocial need for paid work varies (Nordenmark & Strandh 1999). Unemployed who have financial stability and are socially more involved could be better protected from the negative consequences of job loss. It has been shown that intimate reciprocal relationships, such as marriage and cohabitation, may be an important support and prevent depression in the event of unemployment (Paul & Moser 2009). Involvement in rewarding social activities may grant a sense of connection, and social contact has also been shown to be associated with an increased sense of wellbeing (Sirven & Debrand 2008, Wahrendorf et al. 2008).

The current context of economic crisis and population ageing together with Europe's commitment to active ageing policies that envisage the enhancement

of “opportunities for health, participation and security”, highlight the need for insights into the association of unemployment with mental health at older ages. Few studies have addressed this topic, however. Longitudinal studies show that depression is an outcome of job loss, regardless of baseline health status and sociodemographic differences, for Americans in the 50+ age group (Gallo et al. 2000; 2006). They identify the less wealthy as a group particularly susceptible to depression, among the unemployed (Gallo et al. 2000). A European study showed that the unemployed are at enhanced risk of being depressed, compared with the employed (Alavinia & Burdorf 2008). Despite the valuable information given by these studies, the potential for social involvement (emotional support and participation in social activities), and country differences, are still underexplored.

This research aims to fill these gaps by: 1) investigating the risk of depression among the older unemployed in Europe, compared with the employed, while controlling for sociodemographics, financial distress, health, and social involvement characteristics; 2) establishing a profile of the older unemployed more vulnerable to depression; 3) understanding to what extent the relationships between depression and unemployment/ employment may vary from one country to another. The most recent SHARE data, collected after the onset of the global financial crisis, will enable this analysis.

8.1 Analysing unemployment and depression

We restricted our sample to SHARE Wave 4 respondents aged over 50, in the labour force, either unemployed or employed/self-employed, while excluding retirees, the disabled and homemakers. Cross-sectional analyses over 1,850 unemployed and 14,992 employed people disclosed similarities and differences between these two groups regarding depression. Since the survey does not have a uniform sampling design, calibrated individual weights were used for descriptive analyses. Binary logistic regressions were performed for depression. Finally, odds ratios of depression for the unemployed/employed were calculated for each country, controlling all covariates.

Outcome:

“Depression” was measured by using the EURO-D 12-item scale that includes questions about feelings of depression, pessimism, wishing death, guilt, irritability, tearfulness, fatigue, sleeping troubles, loss of interest, loss of appetite, reduction in concentration, and loss of enjoyment over the last month. The threshold we use is having four or more symptoms (also see, e. g., Dewey & Prince 2005).

Covariates:

“Unemployment/Employment” is a self-reported measure that distinguishes those that define themselves as unemployed, having no paid work, having been laid off or being out of work, from those who define themselves as employed or self-employed.

Sociodemographics: 1) “age” – calculated according to the interview date; 2) “gender”; 3) “education” – categorised as lower (no schooling, levels 0–2), medium (levels 3–4) and higher (levels 5 and 6) according to the International Standard Classification of Education –97 (ISCED).

Health: 1) “chronic diseases”: ever diagnosed (heart disease, stroke, hypertension, diabetes, cancer, lung disease, and general disability) less than two and two or more diseases. 2) “Limitations in mobility”: self-reported difficulty with various everyday life activities due to a health or physical problem. Difficulties that last less than three months are excluded.

Financial distress was based on the respondents’ assessment of how easily monthly income enables the household to make ends meet. Two groups were created, those that reported “with great difficulty” or “with some difficulty” (financial distress) and those that stated “fairly easily” or “easily” (no financial distress).

Social involvement: 1) “emotional support” distinguishes those who mention the spouse/partner as a person with whom they discuss important things, problems and concerns from those who receive emotional support from significant others and those that do not receive any emotional support; 2) “number of social activities” in the past twelve months, including voluntary or charity work, educational or training course, attending sports, social or other clubs, taking part in activities of a religious organisation, taking part in a political or community-related organisation, reading books, magazines or newspapers and games such as crossword puzzles, Sudoku, cards or chess; 3) “Given help to others” refers to the provision of personal care or practical household help to family members living outside the household, friends or neighbours in the past twelve months.

8.2 Depicting the unemployed

Within our sample eleven per cent are unemployed. As seen in Table 8.1 the average age of the total sample is 57.05 (Standard Deviation = 4.03). 45 per cent are women. The unemployed are just slightly older (mean = 57.20; SD = 3.65) than the employed counterparts (mean = 57.03; SD = 4.08). The proportion of men is higher among the unemployed (60.4 %). Compared with the employed, the unemployed have lower education levels (43.1 % against, 24.6 % of the employed), and they are more likely to suffer from financial distress (77.7 % of the unemployed but

only 33.8 % of the employed). The unemployed report receiving less emotional support from the spouse (only 57 % of the unemployed compared to 66 % of the employed) and rely on emotional support from others (39.1 % against 31.4 % of the employed).

Those without a paid job were involved in fewer than two activities in the last year (mean = 1.87, SD = 1.83), fewer than the two and a half reported by the employed (mean = 2.56, SD = 1.94). The unemployed suffer more from chronic diseases than the employed (41.8 % had two or more chronic conditions against 28 % of the employed) and have more limitations in mobility (28.2 % reported at least two activities they feel are limited by health problems, against 16.2 % of the employed). Overall the unemployed perform worse than the employed in most of the parameters that measure health.

And as a matter of fact, 22 per cent of our total sample reported four or more depressive symptoms. The prevalence of depression among the unemployed was 35 per cent, whereas for the employed group it was 21 per cent. On average the unemployed report one more depressive symptom (mean=3.07; SD=2.46) than the employed (mean=2.06; SD=1.99).

Table 8.1: Characteristics of the sample

Variable	total sample (n=16,842)	unemployed (n=1,850)	employed (n=14,992)	p value
Age, mean (SD) years	57.05 (4.029)	57.2 (3.646)	57.03 (4.078)	<0.040
Gender: Female (%)	44.9	39.6	45.6	<0.001
Education (ISCED-97)				<0.001
Lower (%)	26.8	43.1	24.6	
Medium (%)	45.4	46.0	45.3	
High (%)	27.9	10.9	30.2	
Financial distress: Yes (%)	39.0	77.7	33.8	<0.001
Emotional support				<0.001
Emotional support from the spouse (%)	65.0	57.0	66.0	
Emotional support from other(s) (%)	31.4	39.1	30.4	
No emotional support (%)	3.6	3.8	3.6	
Number of activities, mean (SD)	2.48 (1.936)	1.87 (1.826)	2.56 (1.936)	<0.001
Given help to others: Yes (%)	32.4	24.1	33.5	<0.001
Chronic diseases ≥ 2 (%)	29.7	41.8	28.0	<0.001
Limitations in mobility ≥ 2 (%)	17.6	28.2	16.2	<0.001
Depressive symptoms ≥ 4 (%)	22.3	35.3	20.6	<0.001

Source: SHARE Wave 4 release 1; weighted data

Table 8.2 shows a comparison of the depressed with the non-depressed unemployed in terms of sociodemographics, financial distress, health, emotional support and participation in social activities. Looking at both the non-depressed and depressed unemployed, we find that the typical depressed unemployed person is a woman who receives less emotional support from her spouse, relies on emotional support that she receives from others and is more prone to health problems.

Table 8.2: Characteristics of the unemployed

Variable	< 4 depressive symptoms (n=1,182)	≥ 4 depressive symptoms (n=668)	p value
Age, mean (SD) years	57.10 (3.638)	57.37 (3.651)	0.082
Gender: Female (%)	32.9	51.9	<0.001
Education (ISCED-97)			0.23
Lower (%)	42.4	44.4	
Medium (%)	45.7	46.5	
High (%)	11.9	9.1	
Financial distress: Yes (%)	75.2	82.3	<0.001
Emotional support			<0.001
Emotional support from the spouse (%)	63.6	44.9	
Emotional support from other(s) (%)	32.5	51.4	
No emotional support (%)	3.9	3.7	
Number of activities, mean (SD)	2.02 (1.897)	1.58 (1.650)	0.048
Given help to others: Yes (%)	23.0	26.3	0.011
Chronic diseases ≥2 (%)	36.5	51.6	<0.001
Limitations in mobility ≥2 (%)	19.5	44.2	<0.001

Notes: N=1,850

Source: SHARE Wave 4 release 1; weighted data

8.3 Country-to-country variation in prevalence of depression

Figure 8.1 shows the percentage of individuals with four or more depressive symptoms, by country. As seen, the prevalence of depression varies from one country to another and is significantly higher for the unemployed than the employed counterparts in Denmark, Belgium, Switzerland, Austria, Portugal, Spain, Italy, Estonia, Poland, Czech Republic, Hungary and Slovenia. The highest percentages of depressed unemployed are found in Poland (55%), Portugal (44%) and Czech Republic (42%). The differences between unemployed and employed who are depressed are most glaring in Poland and Czech Republic.

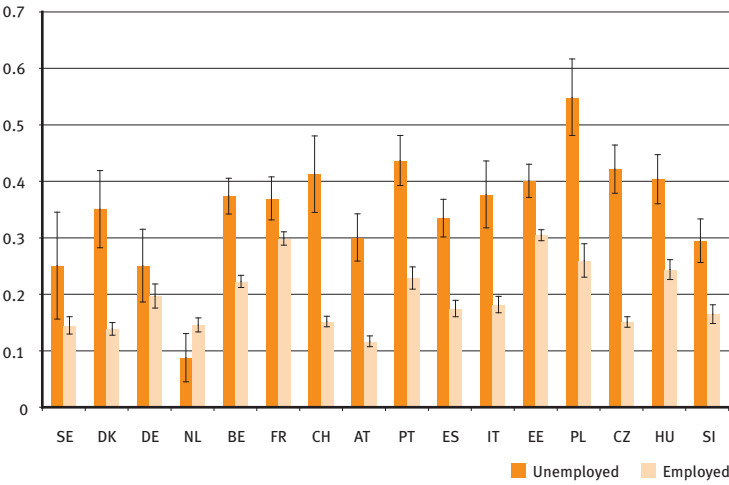


Figure 8.1: Four and more symptoms of depression as measured on EURO-D scale, unemployed vs. employed

Notes: N=16,842 (total), N=1,850 (unemployed), N=14,992 (employed)

Source: SHARE Wave 4 release 1; weighted data

8.4 Risk of depression

An assessment of the association between depression and unemployment, after controlling for all of the covariates, shows that the overall risk of depression for the unemployed is 45 per cent higher than for the employed (Odds Ratio=1.45; 95 % Confidence Intervals=1.290–1.629).

Being unemployed, having health problems (having at least two limitations on daily activities and at least two chronic diseases), being a woman, suffering from financial distress, not receiving emotional support from the spouse and providing help to others go hand in hand with an increased risk of depression.

An analysis by country shows that there are no significant differences between depression risks for the unemployed, except for Austria, Spain, Italy, Poland, the Czech Republic and Hungary. The effect was particularly strong for Poland (OR=2.942; 95 % CI=1.347–6.423) followed by Austria (OR=2.193; 95 % CI=1.342–3.583) and Italy (OR=2.013; 95 % CI=1.080–3.752).

Table 8.3: Results from logistic regression analyses with depression as the dependent variable

Variables	OR	95 % CI	p value
Unemployed	1.450	1.290–1.629	<0.001
Age	0.985	0.977–0.994	0.001
Gender: Female	1.949	1.795–2.116	<0.001
Education (ISCED-97)			
Low	1.043	0.934–1.164	0.457
Medium	0.945	0.860–1.038	0.237
High (a)			
Financial distress: Yes	1.680	1.544–1.827	<0.001
Emotional support			
Emotional support from the spouse (a)			
Emotional support from other(s)	1.462	1.344–1.589	<0.001
No emotional support	1.514	1.233–1.859	<0.001
Number of activities	0.945	0.924–0.967	<0.001
Given help to others: yes	1.419	1.306–1.541	<0.001
Chronic diseases >=2	1.695	1.556–1.847	<0.001
Limitations in mobility >=2	2.530	2.299–2.784	<0.001

Notes: (a) reference category; N=16,509

Source: SHARE Wave 4 release 1; unweighted data

Table 8.4: Results from logistic regression analyses by country with depression as the dependent variable

Country	N	OR(a)	95 % CI	p value
SE	521	2.560	0.905–7.243	0.076
DK	985	1.923	0.948–3.900	0.070
DE	373	0.799	0.332–1.921	0.616
NL	804	0.788	0.313–1.984	0.613
BE	1,644	1.118	0.796–1.570	0.521
FR	1,618	1.022	0.701–1.490	0.911
CH	1,513	1.706	0.894–3.258	0.105
AT	1,220	2.193	1.342–3.583	0.002
PT	579	1.447	0.899–2.329	0.128
ES	841	1.816	1.186–2.780	0.006
IT	744	2.013	1.080–3.752	0.028
EE	2,498	1.272	0.953–1.697	0.102
PL	231	2.942	1.347–6.423	0.007
CZ	1,582	1.929	1.246–2.987	0.003
HU	714	1.890	1.171–3.050	0.009
SI	642	1.391	0.826–2.342	0.215

Notes: (a) OR of covariate unemployment/employment; the results are adjusted for age; gender; financial distress; education; emotional support; given help to others; number of activities; chronic diseases and mobility.

Source: SHARE Wave 4 release 1; unweighted data

8.5 Individual and country differences in depression

The aim of this paper was to explore depression in unemployed Europeans aged over 50 compared with their employed counterparts. We have shown that depression is more prevalent in the unemployed, regardless of sociodemographic characteristics, financial distress, health problems, or emotional support and participation in social activities. This means that even after considering some of the factors that can account for depression among the jobless, there are still differences between being employed and unemployed that explain higher risk of depression among the latest. Previous studies have also found higher risk of depression among the unemployed (Gallo et al. 2000, Mckee-Ryan et al. 2005, Gallo et al. 2006, Paul & Moser 2009).

We found that the odds for being depressed is higher for younger unemployed females that live under financial distress, that have no emotional support from the husband, that helps others, and presents chronic diseases (≥ 2) as well as limitations in mobility (≥ 2). Gender differences have been well established in the psychiatric literature (Prince et al. 1999) and our results also show that women are more prone to depression. Being engaged in intimate and supportive social relationships is another important resource for mental health, which is consistent with previous literature (Mckee-Ryan et al. 2005). We noticed however that the support received from a spouse/partner is particularly important, more than the support received by significant others. In the scope of this paper it was not possible to explore the reasons for this difference. Future research would benefit from a better understanding regarding the impact of social networks.

Having difficulties making ends meet is reportedly associated with increased depression risk (Selenko & Batinic 2011). This holds true for the present paper as well. Financial strain can be a stressful factor and increase the risk of mental illness, but it can also be an outcome of poor mental functioning. Health related problems are also relevant while addressing depression risks among active 50 plus which is in line with previous studies (Dewey & Prince 2005).

The experience of unemployment may derive into a chain of adversity that affects economic, social and health dimensions of the lives of the jobless (Price et al. 2002). However, those in worse health and socially more vulnerable may be selected out of the labour force (Salm 2009). Reverse causality could also play a role concerning the other links we showed. Future longitudinal approaches inferring causal relationships may benefit from the insertion of social involvement variables while discriminating for the provider of emotional support and social participation.

On a country level, mental health inequalities between unemployed and employed are significant in Austria, Spain, Italy, Poland, Hungary and the Czech Republic after controlling for relevant factors on the individual level. Being jobless in these countries is associated with an increased risk of depression. Larger country samples would enable a more detailed comparative analysis. Further examination of cultural and welfare factors should be considered in future research.

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9 Economic crisis and pathways to retirement

-
- ▶ Probabilities of transition out of the labour force in Europe did not change substantially over time
 - ▶ Accounting for individual and institutional differences across countries, the crisis is associated to a reduced likelihood of retirement
 - ▶ The effect of the crisis is stronger in regions that experienced a bigger economic slowdown
-

9.1 Retirement during the crisis

Retirement decisions, and more generally the decision to exit from the labour force, exhibit stark differences across Europe. Individual characteristics, including gender, age, health and marital status, and household variables, such as real and financial wealth, drive such a decision, but they are not the only determinants. The persisting heterogeneity in institutional settings across countries also plays a role, determining different incentives to retire, as documented in Gruber and Wise (1999) and (2004). For example, in Scandinavian countries people can experience transition pathways through disability or partial employment before entering full retirement, while in Mediterranean countries the generosity of public pension systems induces individuals to retire early. Many European countries have gone through important revisions of their pension systems, but we are still far from a common institutional framework.

The aim of this paper is to analyse how retirement choices have evolved over the last decade using all the information available in the four waves of SHARE. Our work draws on and extends the analysis performed by Brugiavini, Pasini and Peracchi (2008) that describes the individual determinants of the decision to exit from the labour force over the 2004–2006 period. We extend this research by lengthening the time period considered, making use of the new data available in the last two waves of SHARE collected in 2008 and 2011 respectively. In particular, we aim at describing the evolution over time of patterns of transition out of the labour market across countries characterised by different institutional settings. The availability of data from Wave 4 (collected in 2011) will also enable us to study whether the 2007/2008 financial crisis and the ongoing economic slowdown have had any effects on retirement decision across Europe. The analysis of the effects of the financial crisis and the resulting economic downturn on retirement decisions is a novel topic that has

not yet received much attention in the economic literature and that is clearly relevant from a policy perspective. The economic crisis can generate a quest for earlier retirement schemes, which brings additional strains on public finances. Moreover, the economic slowdown and the ongoing recession may affect individual decisions by altering their incentives to retire. Modelling retirement decision in a standard life cycle framework, negative shocks to income reduce the option value of continuing to work, and therefore push individuals into retirement. On the other hand, the downturn, by negatively affecting incomes, reduces the consumption of leisure and therefore induces individuals to delay retirement. Moreover, the adverse wealth effects of the slowdown are an additional likely cause for individuals to postpone retirement. The balance between these forces depends on the degree of curvature of the utility function and, more broadly, on the effect of the shock on the rates at which current is traded off against future consumption.

9.2 Descriptive analysis of transitions in labour market status

Our analysis will be based on the self-reported current economic status of the SHARE respondents. The survey distinguishes between six labour force states: working, unemployed, disabled, retired, homemaker and “other”. Table 9.1 shows the distribution in the four waves of labour market status of people aged 55–65, where the last two categories are combined into a single one. We focus on individuals in this age group because they are the subpopulation “at the margin”, i. e. unlike older respondents in SHARE, they are likely to face important labour force participation decisions.

Table 9.1 provides a static picture of labour market status in different periods and seems to suggest a slight increase over time in the probability of being in the labour force. We will exploit the longitudinal dimension of the survey to study the patterns of transition out of the labour force in more detail. In particular, we will compare changes in the probability of exiting from the labour force between Wave 1 and 2 (2004–2006), a period not affected by the economic crisis, and changes in this probability between Wave 3 and 4 (2008–2011), when the economic crisis occurred in all countries in the sample.

Table 9.2 and Table 9.3 show the transition matrices for the two periods: from 2004 to 2006 in Table 9.2 and from 2008 to 2011 in Table 9.3, for people aged 55–65 at the beginning of the two periods. The labour force states considered in the tables are those described in Table 9.1 except for the residual category “other”, which is now excluded. The fraction of people moving out of employment force into retirement is

Table 9.1: Labour market status of individuals aged 55–65

	Retired	Employed/ Self empl	Unemployed	Disabled	Other	Total
Wave 1	3,406 <i>35.12</i>	3,669 <i>37.84</i>	532 <i>5.49</i>	541 <i>5.58</i>	1,549 <i>15.97</i>	9,697 <i>100</i>
Wave 2	3,137 <i>33.16</i>	3,964 <i>41.91</i>	442 <i>4.67</i>	519 <i>5.48</i>	1,397 <i>14.77</i>	9,459 <i>100</i>
Wave 3	2,443 <i>30.99</i>	3,667 <i>46.65</i>	323 <i>4.10</i>	298 <i>3.78</i>	1,141 <i>14.48</i>	7,882 <i>100</i>
Wave 4	4,620 <i>34.65</i>	5,761 <i>43.21</i>	678 <i>5.09</i>	652 <i>4.89</i>	1,622 <i>12.17</i>	13,333 <i>100</i>
Total	13,606 <i>33.70</i>	17,071 <i>42.29</i>	1,975 <i>4.89</i>	2,010 <i>4.98</i>	5,709 <i>14.14</i>	40,371 <i>100</i>

Notes: Row percentages in *italic*

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1

about 25 per cent from 2004 to 2006 and about 23 per cent from 2008 to 2011, suggesting that the probabilities of transition have not changed substantially over time. However, this aggregate picture may hide relevant differences across countries and across different subgroups of the population (for example by age, gender, health status, etc.), which we investigate in the next section. Transitions into unemployment, which may be affected by the crisis, seem not to change substantially over time, while there is a sizable increase of people moving directly from unemployment into retirement (43.5% between 2004 and 2006, rising to 48.17% between 2008 and 2011). Still, the number of observed transitions in and out unemployment in the age group under study is too small to draw reliable conclusions.

Table 9.2: Transition matrix, self-reported labour market status in 2004 and 2006

LABOUR MARKET STATUS IN 2004	LABOUR MARKET STATUS IN 2006				
	Retired	Employed/ Self empl	Un- employed	Disabled	Total
Retired	2,366 (100)	0 (0)	0 (0)	0 (0)	2,366 (100)
Empl/self empl	595 (25.62)	1,580 (68.04)	84 (3.62)	63 (2.71)	2,322 (100)
Unemployed	142 (43.56)	50 (15.34)	117 (35.89)	17 (5.21)	326 (100)
Disabled	127 (41.64)	22 (7.21)	5 (1.64)	151 (49.51)	305 (100)
Total	3,230 (60.73)	1,652 (31.06)	206 (3.87)	231 (4.34)	5,319 (100)

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0

Table 9.3: Transition matrix, self-reported labour market status in 2008 and 2011

LABOUR MARKET STATUS IN 2008	LABOUR MARKET STATUS IN 2011				Total
	Retired	Employed/ Self empl	Un- employed	Disabled	
Retired	1,970 (100)	0 (0)	0 (0)	0 (0)	1,970 (100)
Empl/self empl	646 (23.26)	1,970 (71.25)	98 (3.54)	51 (1.84)	2,765 (100)
Unemployed	105 (48.17)	17 (7.80)	86 (39.45)	10 (4.59)	218 (100)
Disabled	65 (31.10)	4 (1.91)	3 (1.44)	137 (65.55)	209 (100)
Total	2,786 (53.97)	1,991 (38.57)	187 (3.62)	198 (3.84)	5,162 (100)

Source: SHARE Wave 3 release 1, Wave 4 release 1

9.3 The role of individual heterogeneity and institutional differences across countries

In order to study transitions out of labour force accounting for individual and institutional heterogeneity, we compare the transition to retirement between 2004 and 2006 to those between 2008 and 2011 within a regression framework. We run a series of probit regressions on the full set of observed transitions, where the dependent variable is a dummy that is equal to one for those who retire or move into disability and zero otherwise, and the key regressor is a *post crisis* dummy, which takes value 1 for transitions which take place between 2008 and 2011 and zero otherwise. Next to it, we control for age, gender, health status, income and education to account for individual heterogeneity. The chosen specification, while being parsimonious in the set of individual controls, recognises that decision to retire depends on institutional characteristics, which vary in Europe along the North-South gradient. To allow for those characteristics to shape the effect of the crisis on retirement, we grouped the countries in the sample into three groups Mediterranean countries (Italy and Spain), Northern Europe (Denmark, Netherlands and Sweden) and Central Europe (Austria, Belgium, France, Germany and Switzerland), and we included macro-regional dummies, both as direct controls and interacted with the post-crisis dummy, in our baseline specification. The results are reported in Table 9.4. Column 1 shows that age increases the chances of exiting the labour force and that better health status is associated to lower retirement likelihood (self-reported health goes from 1, excellent to 5, poor). The coefficients on the post-crisis and the Northern dummies are negative, which suggests a negative correlation between retirement and the economic slowdown and

that exiting the labour market is less likely in Northern countries. The latter may be due to the large use of disability as a pathway to retirement in Scandinavian countries: Pasini and Zantomio in this volume report significantly higher sickness and disability participation rates for all the Northern countries, and in particular for Sweden, both before and after the crisis. Column 2 of Table 9.4 modifies the baseline specification to include household income, entered non-linearly using a full set of quantile dummies, and column 3 adds educational attainment as well. We take the former as a proxy for current, the latter for permanent income. The results are by and large unaltered and show that retirement is inversely related to our proxies for current and permanent income.

Column 4 adds the interaction between the post-crisis and the geographical dummies. Coefficients of the age, gender, health status, are within one standard deviation from those reported in column 1, while the post-crisis coefficient is affected in a statistically significant way. The interaction between the post-crisis and the Central Europe dummies has a positive and statistically significant effect on retirement probability. While the crisis has meant a reduction in likelihood of retirement for all countries, such effect is less pronounced in Central European countries. Such evidence confirms that the coefficient on the post-crisis dummy shown in column 1 hides potentially relevant between-countries heterogeneity. In particular, geographic areas dummies may capture changes in the relevant legislation: all European countries in recent years went through important pension reforms which changed the incentives to retire, mostly in a more restrictive sense. If those reforms were implemented earlier in Central Europe, or even only anticipated by older individuals living in that area, the results we propose may not point to an effect of the financial crisis on retirement.

Table 9.4: Baseline Probit estimates

	(1)	(2)	(3)	(4)
Age	0.220*** (0.007)	0.225*** (0.008)	0.224*** (0.009)	0.224*** (0.009)
female	0.046 (0.039)	0.027 (0.043)	0.023 (0.045)	0.022 (0.045)
SR health status – very good	0.124* (0.064)	0.133* (0.070)	0.119* (0.072)	0.123* (0.072)
SR health status – good	0.245*** (0.060)	0.255*** (0.065)	0.238*** (0.067)	0.242*** (0.067)
SR health status – fair	0.477*** (0.071)	0.434*** (0.079)	0.385*** (0.082)	0.388*** (0.083)
SR health status – poor	0.735*** (0.114)	0.714*** (0.133)	0.691*** (0.142)	0.697*** (0.142)

	(1)	(2)	(3)	(4)
2nd income quintile		0.161* (0.084)	0.166* (0.088)	0.172* (0.088)
3rd income quintile		0.208** (0.081)	0.249*** (0.085)	0.254*** (0.086)
4th income quintile		-0.151* (0.081)	-0.093 (0.085)	-0.094 (0.086)
5th income quintile		-0.330*** (0.092)	-0.318*** (0.097)	-0.315*** (0.097)
ISCED 2			-0.051 (0.079)	-0.044 (0.079)
ISCED 3			0.021 (0.070)	0.025 (0.070)
ISCED 4			-0.135* (0.074)	-0.127* (0.074)
Northern Europe	-0.226*** (0.062)	-0.001 (0.084)	0.052 (0.089)	-0.014 (0.102)
Central Europe	0.078 (0.059)	0.033 (0.070)	0.046 (0.074)	-0.082 (0.088)
Post crisis	-0.299*** (0.039)	-0.329*** (0.045)	-0.346*** (0.047)	-0.621*** (0.136)
Post crisis* Northern Europe				0.220 (0.154)
Post crisis* Central Europe				0.385** (0.151)
Constant	-13.601*** (0.437)	-13.865*** (0.496)	-13.776*** (0.519)	-13.724*** (0.521)
Observations	5,630	4,603	4,331	4,331

Significance: *** p<0.01, ** p<0.05, * p<0.1

Notes: Standard errors in parentheses, excluded categories: first income quintile, Mediterranean Europe, excellent self-reported health status, lowest isced education category.

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1

In other words, in Table 9.4 we find that geographical differences captured by the North, Central and South Europe dummies affect retirement decisions, but we cannot disentangle country specific institutional changes from the effect of the economic slowdown induced by the financial crisis. In Table 9.5 we perform a different exercise, assuming that the effects of the financial crisis can be captured by differences in the regional rate of gross value added growth (Columns 1 and 2) and in the national employment rate (Columns 3 and 4). Regional data are downloaded from the Eurostat website covering the period of interest, while

regions are defined at the NUTS2 or NUTS1 level (different privacy policies across SHARE countries do not allow to have a homogeneous level of disaggregation). Since the relevant pension and disability legislation varies mainly by country, going to a lower level of geographical disaggregation allows to isolate the effect of the economic downturn from the effect of retirement or disability policy changes.

The results show a negative association between retirement and regional growth rate of the economy (columns 1 and 2) and employment rate (columns 3 and 4). The coefficients on the interactions are estimated much less precisely, still the effect of the crisis on labour force exits is less pronounced the higher the rate of growth of the economic activity: while the crisis affected everybody's retirement decision, those who live in regions where the effect on the economy was less pronounced did change less their behaviour. Such a result confirms that what we found in Table 9.4 (individuals living in Central European countries change their retirement behaviour relatively less than those in Mediterranean countries) can be attributed to the effect of the economic downturn. Results on the employment rate, though in line with those in column 1 and 2 of Table 9.5, are much less statistically significant.

Table 9.5: Probit estimates with regional indicators

	(1)	(2)	(3)	(4)
Age	0.225*** (0.009)	0.214*** (0.008)	0.207*** (0.010)	0.196*** (0.009)
female	0.036 (0.046)	0.037 (0.042)	-0.009 (0.051)	-0.001 (0.046)
SR health status – very good	0.118 (0.073)	0.144** (0.068)	0.078 (0.082)	0.107 (0.076)
SR health status – good	0.255*** (0.069)	0.286*** (0.063)	0.197*** (0.075)	0.235*** (0.069)
SR health status – fair	0.378*** (0.085)	0.488*** (0.077)	0.363*** (0.094)	0.476*** (0.085)
SR health status – poor	0.681*** (0.152)	0.768*** (0.127)	0.644*** (0.173)	0.683*** (0.146)
2nd income quintile	0.169* (0.091)		0.196** (0.094)	
3rd income quintile	0.255*** (0.088)		0.271*** (0.092)	
4th income quintile	-0.076 (0.086)		-0.006 (0.095)	
5th income quintile	-0.281*** (0.084)		-0.318*** (0.099)	

	(1)	(2)	(3)	(4)
ISCED 2	-0.031 (0.080)	0.024 (0.073)	-0.027 (0.081)	0.053 (0.074)
ISCED 3	0.021 (0.072)	0.016 (0.065)	-0.014 (0.075)	0.065 (0.069)
ISCED 4	-0.118 (0.076)	-0.116* (0.067)	-0.149* (0.080)	-0.062 (0.071)
Post crisis	-0.596*** (0.100)	-0.459*** (0.085)	-0.027 (0.438)	-0.483 (0.380)
Gva growth rate	-0.050** (0.022)	-0.068*** (0.021)		
Post crisis* Gva growth rate	0.021 (0.029)	0.077*** (0.026)		
Employment rate			-0.006 (0.005)	-0.017*** (0.004)
Post crisis* Employment rate			-0.004 (0.006)	0.003 (0.006)
Constant	-13.747*** (0.532)	-13.130*** (0.473)	-12.332*** (0.637)	-11.118*** (0.564)
Observations	4,092	4,839	3,288	3,903

Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Notes: Standard errors in parentheses, excluded categories: first income quintile, Mediterranean Europe, excellent self-reported health status, lowest isced education category.

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1, Eurostat statistics database as of December 2012

9.4 Conclusions

This chapter reviews the transition out of the labour market around the recent economic slowdown. To this aim, we compare the transitions between 2004 and 2006 to those between 2008 and 2011, focusing on the *at risk* segment of the overall 50+ population. The results indicate a higher rate of exit from the labour market before the crisis than after the crisis, suggesting that the crisis is associated with a reduced likelihood of retirement. Our approach recognises that the effect of the crisis on retirement is likely to be shaped by cross-country institutional differences and the evidence shows a smaller effect of the crisis in Central European compared to Northern and Southern European countries. Future work will dig deeper onto the effect of the crisis into retirement, in the attempt to single-

out the various channels through which the slowdown of the economic activity can affect observed retirement, distinguishing labour supply and labour demand factors concurring to determine observed retirement behaviour.

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10 Economic downturns at the beginning and at the end of working life

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- ▶ There is a strong association between individuals in financial hardship and low GDP growth rates
 - ▶ There is little evidence of long-term “scarring effects” of recessions on total household income
 - ▶ Recent financial hardship had strong negative effects on household income and on objective health
 - ▶ This effect was stronger for singles (income) and for women (health)
-

10.1 Short and long term effects of economic downturns

Negative business cycle episodes can have important effects on individual labour market decisions. In the short-run, economic downturns can lead to real wage reductions and less employment opportunities for job seekers. Also, households can react to worsening labour market conditions taking irreversible decisions that can lead to long-lasting effects: weaker unemployed individuals can be discouraged and thus pull out of the labour force, older people can be induced to retire earlier.

In this chapter, we investigate the different effects of recessions hitting individuals at the beginning and at the end of working life. Understanding how macro shocks affect the welfare of individuals is particularly important for active ageing. As shown in the literature (see Elwood 1982, Mroz & Savage 2006, Oreopoulos et al. 2006) adverse macro episodes have “scarring effects” (permanent or at least persistent) on individual income and potentially on health (Brugiavini & Weber 2012, van den Berg & Lindeboom 2012), happiness and job satisfaction. Moreover, a thorough understanding of the degree of persistence of adverse macro shocks on income can shed light on the evolution of income inequalities over time (see Gottschalk & Moffit 1995, Moffit & Gottschalk 2002) and contribute to the design of more effective policies aimed at protecting individuals’ income and supporting labour market participation later in life.

In our analysis, we combine the fourth wave of SHARE, which was conducted after the beginning of the “great recession”, with information from SHARELIFE,

that allows to study the effect of economic downturns over the entire career of SHARE respondents.

To capture different aspects of household and individual welfare we consider two outcomes: total household income and health. We estimate how these outcomes are affected by adverse macro shocks (such as recession and high inflation episodes) occurring early in life or more recently.

Our estimates suggest that recession and high inflation periods at the beginning of working life have no effect on total household income both for singles and couples, while they have a negative effect on women's health. More recent financial hardship episodes have instead strong negative effects on both income and health.

10.2 Financial hardship and adverse macro shocks

We consider individuals (and households) interviewed both in Wave 3 and Wave 4, obtaining a sample of 16,327 individuals. Table 10.1 presents descriptive statistics on the variables of interest.

Table 10.1: Descriptive statistics

Variables	Mean	Std. Dev.	Min	Max
Total household income (in 2011)	31,225	45,029.71	0	2,945,299
Health index (in 2011)	0.837	0.133	0	1
Recession at school leaving age	0.098	0.297	0	1
High inflation at school leaving age	0.032	0.177	0	1
Financial hardship during recession	0.101	0.301	0	1
Financial hardship during high inflation	0.014	0.116	0	1
Financial hardship in 2009	0.060	0.237	0	1
Female	0.563	0.496	0	1
Age (in 2011)	68.37	9.571	32	104
Married (in 2011)	0.729	0.444	0	1
Years of education	10.28	4.50	0	25
Retired (in 2011)	0.616	0.486	0	1
SE	0.073	0.560	0	1
DK	0.093	0.290	0	1
DE	0.075	0.265	0	1
NL	0.092	0.290	0	1
BE	0.120	0.325	0	1
FR	0.105	0.306	0	1
CH	0.060	0.238	0	1

AT	0.032	0.177	0	1
IT	0.110	0.313	0	1
ES	0.083	0.276	0	1
CZ	0.070	0.256	0	1
PL	0.085	0.279	0	1

Notes: The sample is composed by 16,327 individuals. The sample selection criteria are explained in the main text.

Source: SHARE Wave 3 release 1, Wave 4 release 1

Our sample is composed mainly of women (56 %), married (73 %) and retired individuals (62 %). Average age is 68 years and the average years of education are ten. Individuals in the sample are mostly healthy (based on a health indicator described in the next section) and the average total household income is about 24,000 Euros (Purchasing Power Parity adjusted German Euros as of 2005).

About six per cent of individuals included in the sample were in financial hardship in 2009, ten per cent experienced financial hardship during a recession and only 1.4 per cent declared to have been in financial hardship during a period of high inflation (>20 %). Looking at the adverse macro shocks occurred early in life, ten per cent of the sample entered the labour market during a recession and about three per cent during a period of high inflation (>20 %).

To have an idea of the magnitude of the recent economic crisis, we look at the real GDP growth at regional level between 2007 and 2009 (see Figure 10.1a). Several European countries have been characterised by negative GDP growth (see for example Spain, Italy, Greece). However, there is some degree of variability both between and within countries. When looking at the percentage of individuals who were not in financial hardship in 2009 by region (see Figure 10.1b), we notice that low GDP growth rates are frequently associated with lower percentages of individuals not in financial hardship (Sweden is an exception).

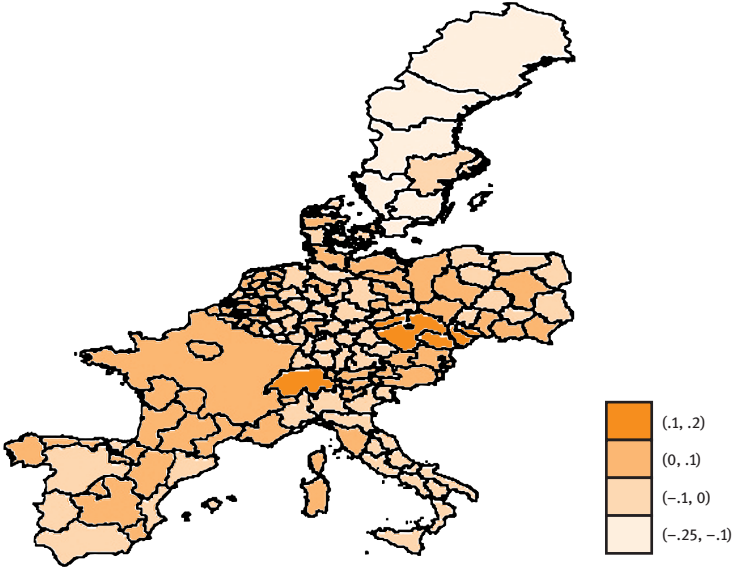


Figure 10.1(a): Regional GDP growth 2007–2009
Source: Eurostat statistics database as of December 2012

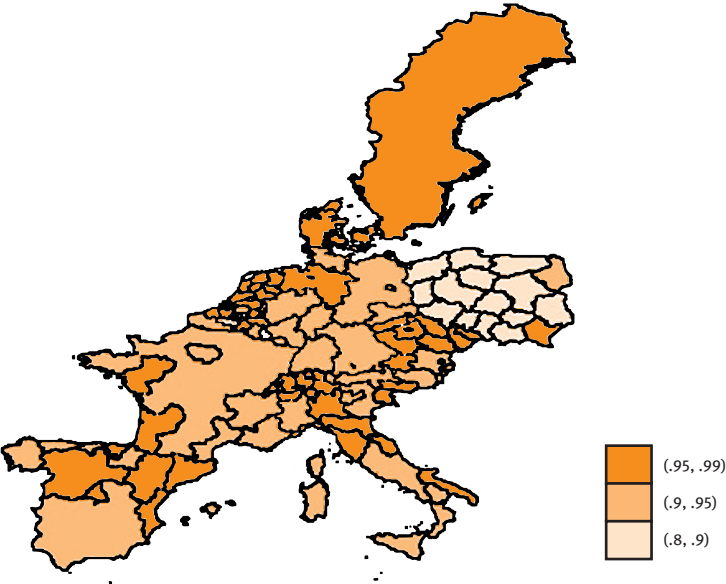


Figure 10.1(b): Percentage of individuals not in financial hardship by regions – 2009
Source: SHARE Wave 3 release 1

10.3 How do macro shocks affect income and health?

The first outcome variable in our analysis is the logarithm of total household income, analysed separately for singles and couples. After excluding households with non-responding partners, for which we do not observe partner's characteristics, the sample size is 8,351 households. We define a set of variables to control for adverse macro shocks at different times in life. The zero-one indicators "Recession at school leaving age" and "High inflation (>20 %) at school leaving age" take value one if the individual (or at least one of the two partners in couples) entered the labour market during a period of recession or of high inflation respectively. Similarly, "Financial hardship during recession" and "Financial hardship during high inflation" take value one if the individual (or at least one of the two partners) was in financial hardship during a recession or during a period of high inflation. To control for more recent adverse shocks, we add as explanatory variables real regional GDP growth between 2007 and 2009, a dummy variable taking value one if the individual (or at least one of the two partners) was in financial hardship in 2009 and the interaction between these variables. Additionally, we control for individual characteristics (such as gender, number of children, age, years of education), retirement status, health status in 2009, characteristics at the age of ten (such as number of books, number of people living in the house, relative mathematical and verbal abilities) and country dummies. In the analysis performed at the couple level, characteristics of both partners are included. Table 10.2 shows the estimation results for the key variables of interest.

Table 10.2: Ordinary Least Squares estimates of log total household income

Variables	Singles		Couples	
	Coefficient	Standard error	Coefficient	Standard error
Recession at school leaving age	0.078	(0.073)	-0.003	(0.005)
High inflation (>20 %) at school leaving age	-0.180	(0.121)	-0.054	(0.061)
Financial hardship during recession period	0.182*	(0.094)	0.078*	(0.040)
Financial hardship during high inflation (>20 %) period	0.046	(0.228)	-0.030	(0.086)
Real regional GDP growth	0.850**	(0.412)	0.320*	(0.183)
Financial hardship in 2009	-0.490***	(0.134)	-0.328***	(0.068)
Financial hardship in 2009 * real regional GDP growth	1.088	(1.084)	0.275	(0.528)

Variables	Singles		Couples	
SE	0.396***	(0.126)	0.304***	(0.063)
DK	0.186	(0.123)	0.051	(0.057)
NL	0.332**	(0.130)	0.230***	(0.060)
BE	0.492***	(0.122)	0.382***	(0.057)
FR	0.502***	(0.126)	0.336***	(0.060)
CH	0.719***	(0.131)	0.691***	(0.069)
AT	0.395**	(0.163)	0.102	(0.100)
IT	0.191	(0.151)	−0.001	(0.062)
ES	−0.333**	(0.156)	−0.304***	(0.065)
CZ	−0.546***	(0.134)	−0.600***	(0.064)
PL	−0.689***	(0.151)	−0.545***	(0.064)
N. Obs.	3,601		4,750	
R-squared	0.113		0.280	

Significance: ***=1%; **=5%; * = 10 %

Notes: The outcome variable is the logarithm of total household income. Additional controls are gender, number of children, age, years of education, early life characteristics (number of rooms, number of people living in the house, number of books, relative ability on math and language at age ten), retirement status, health status in 2009 and country dummies (Germany is used as baseline). For the couples' equation, characteristics of both partners are included and the variables presented in the table are defined at the couple level.

Source: Wave 3 release 1, Wave 4 release 1

For both singles and couples, entering the labour market during a recession or a high inflation period has no significant effect on total household income: in other words, there is little evidence of scarring effects in our data. Experiencing financial hardship during a recession has a positive, though only slightly significant effect – this suggests that individuals whose most important financial hardship episode occurs at the time of a recession tend to recover when the economy picks up again. This result is consistent with findings of Gottshalk and Moffit (1995): transitory income shocks may affect earnings stability, but not necessarily lead to lower life-cycle income trajectories. More recent shocks have strong and significant effects on household income both for singles and couples. Both individuals living in regions where real (inflation adjusted) GDP growth is lower and individuals who report to have been in financial hardship in 2009 have lower total household income. The effects are less strong when looking at couples. Turning to the interaction term, there is no evidence of differential effects of being in financial hardship by the level of regional economic growth. Retirement has a protective effect on income; early life characteristics (of both partners) have an important effect on household income only when looking at couples. Other individual characteristics have the expected signs.

The panels of Figures 10.2a and 10.2b present predicted total household income as a function of real GDP growth by financial hardship in 2009, separately for singles and couples. The effect of financial hardship is stronger for couples, but GDP growth has a stronger impact for singles (in the panel lines in 10.2a are steeper than in 10.2b).

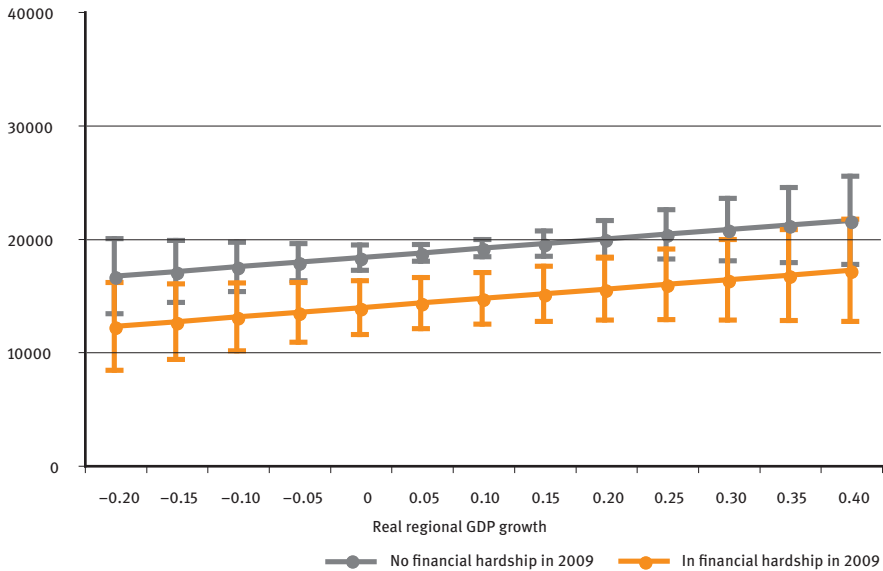


Figure 10.2(a): Predicted outcomes from Ordinary Least Squares analysis – Total household income – singles

Notes: Predicted total household income by real regional GDP growth depending on financial hardship status in 2009. Figures are obtained from estimates presented in Table 10.2, based on 3,601 observations.

Source: SHARE Wave 3 release 1, Wave 4 release 1

In order to capture the effect of adverse macro shocks on health, we construct an objective health index, following a procedure proposed by Jürges (2007). This procedure uses the predictions of a non-linear regression of self-reported health on all relevant information on health conditions, such as diagnosed diseases, depression, body mass index and physical measures of upper and lower limb strength, and uses normalised coefficients as “disability weights”. The resulting health index is normalised to 0 for the worst observed health state and to 1 for the best observed health state.

In our model, we regress this objective health index on a set of variables capturing macro shocks occurring at different times in life, individual characteristics,

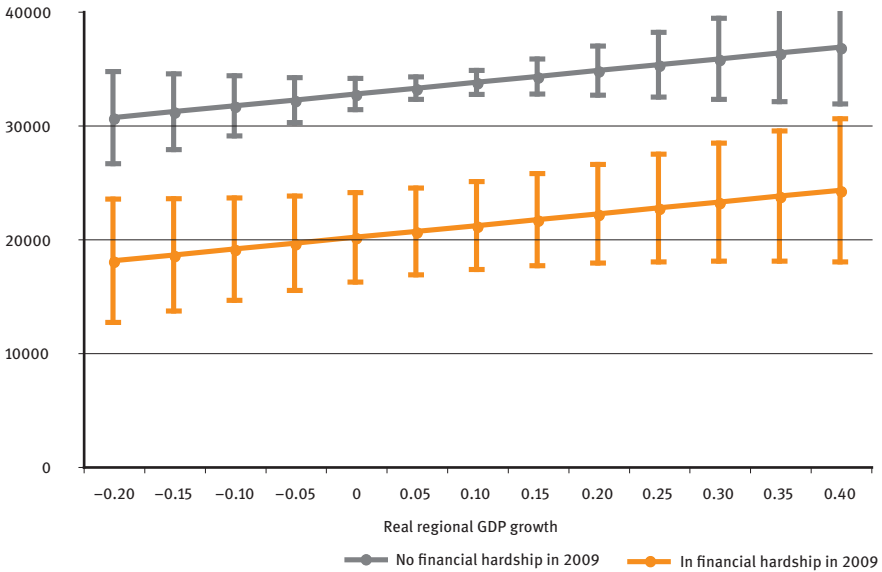


Figure 10.2(b): Predicted outcomes from Ordinary Least Squares analysis – Total household income – couples

Notes: Predicted total household income by real regional GDP growth depending on financial hardship status in 2009. Figures are obtained from estimates presented in Table 10.2, based on 4,750 observations.

Source: SHARE Wave 3 release 1, Wave 4 release 1

early life conditions and country dummies, as defined above. We run separate analyses for men and women and Table 10.3 reports the estimation results.

Entering the labour market during a recession has no effect on health for men or women, while women's health is negatively affected by a period of high inflation at school leaving age. Men's health is instead negatively affected by financial hardship during a recession. Both for men and for women real regional GDP growth has a positive and significant effect, while being in financial hardship in 2009 has a negative impact on health. The effects are stronger for women than for men, as can also be seen in the panels of Figure 10.2c and 10.2d.

Country dummy variables are by and large significant, which points to unexplained cross country differences over and above economic performance. Differences in welfare regimes are likely determinants both of observed differences in household income and in health status. Nevertheless, it is difficult to identify the effect of country specific institutions separately from other unobservable factors.

Table 10.3: Ordinary Least Squares estimates of health index

Variables	Male		Female	
	Coefficient	Standard error	Coefficient	Standard error
Recession at school leaving age	-0.003	(0.005)	-0.006	(0.004)
High inflation (>20 %) at school leaving age	0.007	(0.008)	-0.013*	(0.008)
Financial hardship during recession period	-0.021***	(0.006)	-0.005	(0.005)
Financial hardship during high inflation (>20 %) period	-0.006	(0.013)	0.006	(0.011)
Real regional GDP growth	0.056**	(0.022)	0.089***	(0.020)
Financial hardship in 2009	-0.026***	(0.009)	-0.051***	(0.007)
Financial hardship in 2009 * real regional GDP growth	-0.015	(0.073)	-0.016	(0.057)
SE	0.039***	(0.007)	0.033***	(0.007)
DK	0.027***	(0.007)	0.011*	(0.006)
NL	0.032***	(0.007)	0.023***	(0.006)
BE	0.026***	(0.007)	0.010	(0.006)
FR	-0.007	(0.007)	-0.006	(0.006)
CH	0.039***	(0.008)	0.050***	(0.007)
AT	-0.004	(0.011)	0.026***	(0.010)
IT	-0.002	(0.007)	-0.010	(0.007)
ES	-0.009	(0.008)	-0.040***	(0.007)
CZ	-0.035***	(0.007)	-0.047***	(0.007)
PL	-0.032***	(0.008)	-0.045***	(0.007)
N. Obs.	7,101		9,226	
R-squared	0.144		0.218	

Significance: ***=1%; **=5%; * = 10 %

Notes: The outcome variable is a health index for which 0 means bad health and 1 perfect health. We controlled for marital status, number of children, age, years of education, early life characteristics (number of rooms, number of people living in the house, number of books, relative ability on math and language at age ten), retirement status and country dummies (Germany is used as baseline).

Source: SHARE Wave 3 release 1, Wave 4 release 1

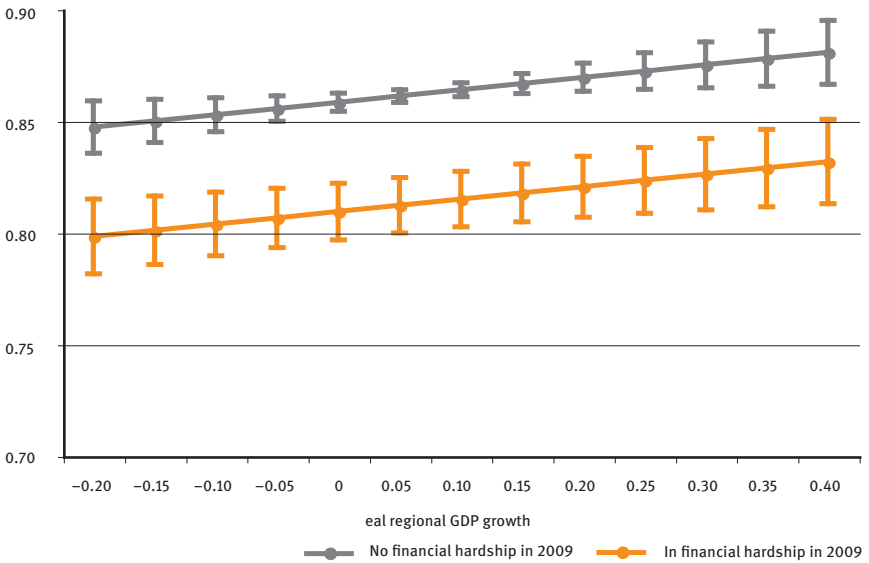


Figure 10.2(c): Predicted outcomes from Ordinary Least Squares analysis – Health index – male
Notes: Predicted health index by real regional GDP growth depending on financial hardship status in 2009. Figures are obtained from estimates presented in Table 10.3, based on 7,101 observations.
Source: SHARE Wave 3 release 1, Wave 4 release 1

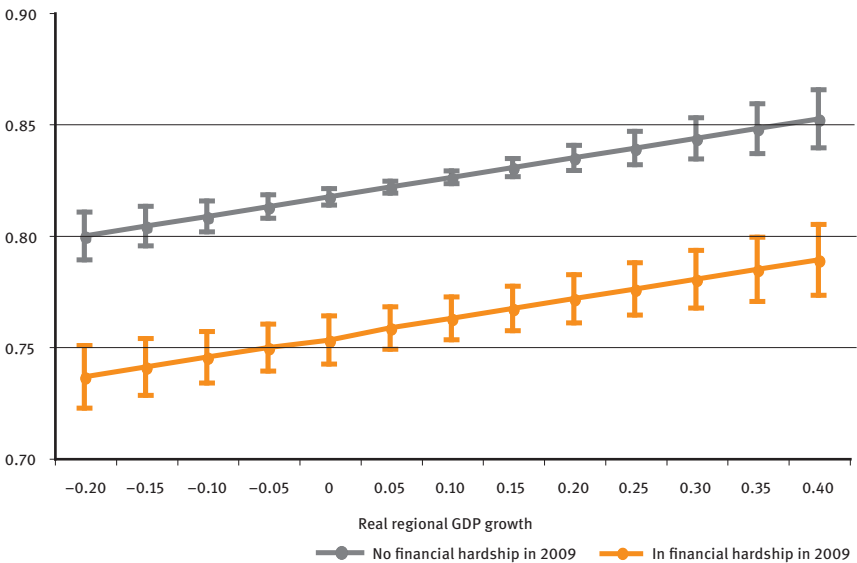


Figure 10.2(d): Predicted outcomes from Ordinary Least Squares analysis – Health index – female
Notes: Predicted health index by real regional GDP growth depending on financial hardship status in 2009. Figures are obtained from estimates presented in Table 10.3, based on 9,226 observations.
Source: SHARE Wave 3 release 1, Wave 4 release 1

10.4 Transitory shocks or permanent scars?

In this chapter, we have investigated the effects of macro shocks hitting individuals at different times in life. We have combined information from the fourth wave of SHARE, which was conducted after the beginning of the “great recession”, and information from SHARELIFE that allows us to control for shocks occurring along the entire life of the respondent. We analysed two different outcomes: total household income and individual health.

We find little evidence of scarring effects of recessions on total household income, while entering the labour market during a period of high inflation appears to have long lasting effects on women’s health. A possible explanation is that women entering the labour market during a period characterised by less favourable economic conditions are more likely to accept less qualified and more physical demanding jobs. In the long run this choice affects their health.

More recent shocks, captured in our analysis by the variable “Real regional GDP growth” and the dummy “Financial hardship in 2009”, have strong and significant effects both on household income and objective health. These effects are stronger for singles (when looking at income) and women (when looking at health status).

Our results suggest that the negative effects of recessions on income and health are transitory. Recent adverse shocks, such as the recent economic crisis started in 2008, have a strong impact on individual and household welfare, hitting in particular the mostly disadvantaged groups of older population, such as singles and women. Therefore, the characteristics of safety nets protecting individual and household welfare play a key role. Countries where public insurance mechanisms are prevalent (such as Nordic countries) might be more successful at reducing the effects of financial hardship on income for all, while countries where informal insurance is the main safety net might fail to protect specific groups who do not have social and family support.

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11 Pension coverage today and in the future

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- ▶ Coverage rates for private and occupational pensions vary widely across SHARE countries
 - ▶ In all countries coverage rates for private pensions are higher among future pensioners
 - ▶ There is a growing importance of supplementary pensions in Europe in the future
 - ▶ Financial and housing wealth is strongly intertwined with entitlements to supplementary pensions
-

11.1 Fundamental reforms of pension systems

Pension systems in Europe as well as in other countries of the industrialised world have been subject to fundamental reforms (Börsch-Supan 2013). As mentioned by Callegaro and Wilke (2008), three main reform trends can be observed: the increasing importance of supplementary pension schemes, the trend towards defined-contribution systems and an effort to further extend social security coverage to better cope with poverty in old age.

Following the common practice in pension policy analysis, pension schemes can be described using a distinction between pillars and tiers. Pillars describe the sector in which the pension programme is located: the first pillar refers to the public sector pay-as-you-go or funded pension, the second pillar to occupational pension schemes and the third pillar to individual private sector pensions. Additionally, tiers indicate the function of a pension benefit with respect to income security in old age. The first tier provides basic social security through targeted, minimum or flat-rate basic pensions, the second tier aims to maintain the standard of living through earnings-related benefits. The third tier is a topping-up of income in old age through voluntary saving or fringe benefits for high-skilled employees (Ebbinghaus 2011). Tiers can also be used to indicate whether these benefits are mandatory or voluntary. While most first pillar schemes in Europe have universal coverage, second and third pillar schemes are more often voluntary leading to varying degrees of coverage across countries and demographic groups.

In this article we focus on the increasing role of supplementary pensions in terms of *coverage rates*. We are not taking into account the *level* of entitlements which will be addressed in later research. This chapter is structured as follows. Section two describes public pension coverage for today's pensioners. Section three investigates coverage rates of supplementary pension schemes for today's

and future pensioners. In section four we conduct probit regression analyses to investigate which factors influence entitlements to supplementary pensions of today's and future pensioners. Section five concludes.

For our analyses, we use individual cross-sectional data from the employment and pensions section (EP) of SHARE Wave 4 providing detailed information on pension coverage both for today's pensioners and working or unemployed individuals. We combine this data with selected demographic and socio-economic characteristics from the demographic module (DN), the children module (CH) and the consumption module (CO). Information on housing and financial wealth is provided in the assets section (AS). For longitudinal respondents, previous waves of SHARE are used to take account of demographic characteristics that were only asked in the baseline interview, i. e. when respondents were interviewed for the first time.

In most countries, data collection for SHARE Wave 4 took place in 2011. However, in Estonia field work already started in 2010 while Poland collected data in 2012. To be able to compare countries, we restrict our descriptive analysis to respondents interviewed in 2011. Therefore, Poland and Estonia are excluded. Thus, we end up with 14 countries, including Denmark and Sweden in Northern Europe and Austria, Belgium, France, Germany, the Netherlands and Switzerland in Western Europe. Italy, Portugal and Spain are referred to as Mediterranean European countries. As Eastern European countries we include the Czech Republic, Hungary and Slovenia in our analysis. To deal with problems of sample attrition and unit non-response, the descriptive statistics are weighted with calibrated individual weights (Deville & Särndal 1992).

We limit our analysis to persons who respond to be retired (today's pensioners) ($N = 27,593$) and today's population of working age (future pensioners), i. e. respondents considering themselves to be employed, self-employed or unemployed ($N = 14,717$).

11.2 Public pension coverage of today's pensioners

For today's pensioners, SHARE provides detailed information concerning first pillar pensions. A pensioner, i. e. a person who responds to be retired, is covered by the public pension system if he or she receives an old age, an early retirement or a survivor pension. If respondents consider themselves retired and receive some kind of disability pension or unemployment benefits, they are also included in this category since these ways to leave the labour market are considered to be

main pathways into retirement in many European countries. Those alternative pathways were most often used in Slovenia, Portugal, Hungary and the Czech Republic. Here, unemployment or disability schemes might be more easily available, more generous or used more often as a solution to economic problems (e. g. high unemployment rates and industrial restructuring).

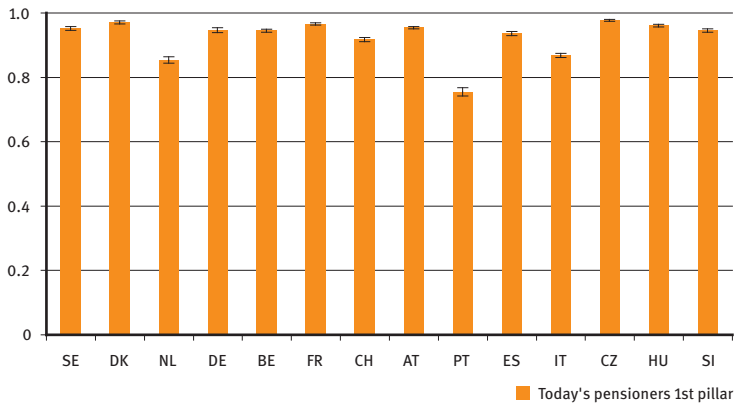


Figure 11.1: Public pension coverage of today's pensioners across countries for SHARE in 2011

Notes: Sample size 27,593. Weighted observations.

Source: SHARE Wave 4 release 1

When we look at the public pension coverage we find very similar rates across countries (Figure 11.1). In most SHARE countries, more than 90 per cent of today's pensioners receive benefits from public pension schemes. The only exceptions are the Netherlands and Italy with coverage rates of 85 to 87 per cent and Portugal with 76 per cent respectively. It might be the case that the respondents do not consider any type of means-tested basic pension to be part of the public pension scheme. Universal coverage rates of public pensions can also be expected in the future. Since we are having a focus on the increasing role of supplementary pensions due to recent pension reforms, we do not present figures on public pension claims for non-retired individuals.

11.3 Occupational and private pension coverage for today's and future pensioners

For today's pensioners the picture of second pillar coverage is different (Figure 11.2). As occupational pension we define every type of pension provided through the employer, i. e. old age, early retirement, disability and survivor benefits from a job. Coverage rates are the highest in the Netherlands, Sweden and Switzerland where between 70 and 50 per cent of today's pensioners receive an occupational pension. Here, high coverage rates are mostly achieved due to quasi-mandatory systems where employees must join schemes that their employers established through industry-wide or nationwide collective bargaining agreements. In Portugal, Denmark and Germany between 25 and 37 per cent of today's pensioners state to receive pensions from company pension schemes. In those countries occupational pensions are mostly voluntary. Nonetheless, a recent study of the OECD finds higher coverage rates for Denmark of about 58 per cent compared to the results of SHARE (OECD 2012). One obvious reason for the difference is that the OECD provides coverage rates with respect to the total working age population (i. e. individuals aged 15 to 64) while we focus on today's pensioners. In the remaining countries, second pillar pensions only play a minor role covering less than ten per cent of today's pensioners. As public pension systems were quite generous in the past and occupational pensions both voluntary and less important to secure the standard of living in old age, today's pensioners in those countries have at large lower coverage rates compared to other SHARE countries where employer pension plans have a long tradition and are well established.

For employed, self-employed or unemployed future pensioners we identify a growing role of occupational pension schemes in providing for old age in almost every SHARE country investigated compared to today's pensioners (also Figure 11.2). The only countries with a stronger decline in coverage rates compared to today's pensioners are Portugal, Spain and the Czech Republic. Due to the recent financial and economic crisis, respondents in those countries might face a higher risk of unemployment or drastic cuts to pension entitlements and therefore contribute less to occupational plans. In Sweden, the Netherlands, Denmark and Switzerland, more than 70 per cent of respondents expect to receive retirement income from occupational schemes. In France, Germany, Belgium and Italy between 18 and 36 per cent of today's working or unemployed individuals responded to expect receiving a second pillar pension in the future. In the other countries investigated occupational pensions will continue to play only a minor role in the overall retirement income system.

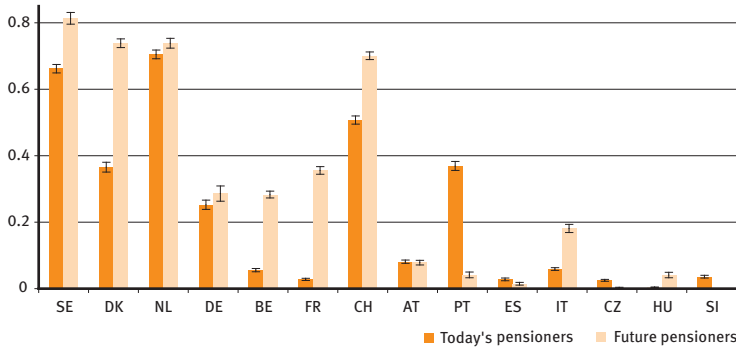


Figure 11.2: Occupational pension coverage of today's and future pensioners across countries for SHARE in 2011

Notes: Sample size 14,717. Weighted observations.

Source: SHARE Wave 4 release 1

To be covered by or entitled to private sector pensions we define all today's and future pensioners that state to receive or expect to receive regular life insurance payments and/or regular private annuities or private personal pension payments respectively as well as respondents that state to put money away in individual retirement accounts. Based on this rather narrow definition of third pillar pensions, we are able to support earlier work using previous waves of the SHARE data set (Brunner et al. 2005, Callegaro & Wilke 2008). For today's pensioners we confirm that private pensions only play a minor role in the overall retirement income system with the exceptions of Sweden, Denmark, France and the Czech Republic (Figure 11.3). In those countries, between 20 and 36 per cent of today's retirees receive income from private schemes. In all other countries investigated, coverage rates are below ten per cent, only Belgium has a slightly higher coverage rate of 15 per cent. One obvious explanation is that private savings were less important to maintain the standard of living in old age in the past due to generous public sector pay-as-you-go and occupational pensions. Furthermore, today's pensioners are not affected by the recent reforms aiming at the increasing role of supplementary pensions.

For future pensioners the picture looks quite different (also Figure 11.3). Actually, in all countries investigated we see that coverage rates are increasing considerably compared to respondents already retired confirming again the increasing importance of supplementary pension schemes in the overall retirement income system. The highest coverage rates are found among non-retired individuals in Sweden, the Czech Republic, Belgium and Denmark where coverage rates rise to 60 and almost 70 per cent. Apart from pension reforms, one possible explanation

for this strong increase could also be that respondents might confound to which pillar their pension claims belong to. In Sweden for instance, a pension reform led to the introduction of a mandatory funded scheme with individual investment accounts in 1999. Since the insured can freely decide on their fund portfolio it might be the case that many respondents consider this to be a private pension although it is in fact part of the public pension scheme. This might lead to an overestimation of coverage rates. According to Sjögren Lindquist and Wadensjö (2011) only about one third of the Swedish working population pays contributions to voluntary individual pension schemes. Nonetheless, this trend of increasing importance of private sector pensions can also be observed in Switzerland and France where about half of the future pensioners are entitled to such schemes. Still about one third of the non-retired respondents state to be entitled to third pillar pensions in Portugal, Germany, Austria and Spain. In the remaining SHARE countries investigated entitlements to private schemes only play a minor role. A reason for this might also be the rather narrow definition of third pillar pensions we used for our analysis.

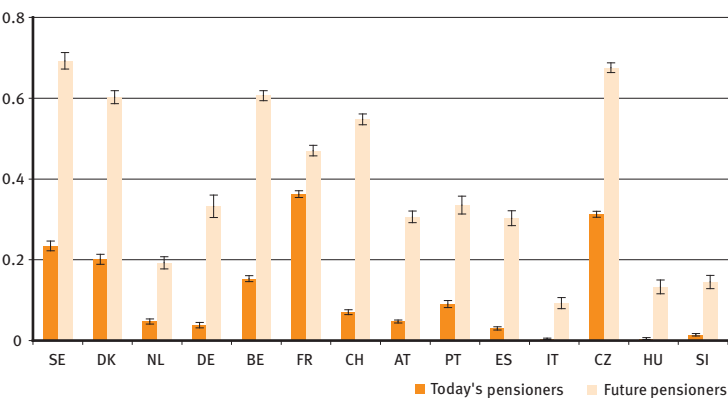


Figure 11.3: Private pension coverage of today's and future pensioners across countries for SHARE in 2011

Notes: Sample size 14,717. Weighted observations.

Source: SHARE Wave 4 release 1

11.4 Correlates of supplementary pension entitlements

Based on these descriptive statistics we conduct probit regressions to investigate which factors influence coverage by or entitlements to occupational and private pension schemes both for today's and future pensioners. Our dependent variables "receipt of or entitlement to an occupational pension" and "receipt of or entitlement to a private pension" are binary. They take the value one if a respondent receives or expects to receive income from such a scheme in old age.

To control for country-specific characteristics of pensions schemes we include country fixed effects in all regressions. In addition, we include Poland and Estonia in our analyses and also include dummy variables for month and year of interview to account for time and interviewer effects during fieldwork. The regression tables report the average marginal effects for occupational and private pension claims both for today's and future pensioners.

Table 11.1: Correlates of occupational pension entitlement/reciency. Average marginal effects from probit regressions

Variables	Today's pensioners		Future pensioners	
	Average Marginal Effect	Delta-method Std. Err.	Average Marginal Effect	Delta-method Std. Err.
Pension entitlements/reciency				
Private pension (dummy)	0.003	(0.0076)	0.077***	(0.0079)
Socio-demographics				
Male (dummy)	0.033***	(0.0041)	0.032***	(0.0072)
Age (years)	0.000	(0.0003)	-0.003***	(0.0009)
Married (dummy)	-0.005	(0.0071)	0.021*	(0.0108)
Divorced (dummy)	0.004	(0.0089)	0.023*	(0.0124)
Widowed (dummy)	0.032***	(0.0078)	0.016	(0.0210)
No. of children	-0.005***	(0.0015)	-0.003	(0.0028)
Years of education	0.003***	(0.0005)	0.005***	(0.0009)
Retirement status				
<i>(ref. regular retirement)</i>				
Disability as reason for retirement	0.016**	(0.0065)		
Early retirement	0.028***	(0.0043)		
Employment situation				
Unemployed (dummy)			-0.104***	(0.0358)
<i>Labour force status (ref. employee)</i>				
Civil servant			-0.062***	(0.0102)
Self-employed			-0.103***	(0.0133)

Variables	Today's pensioners		Future pensioners	
	Average Marginal Effect	Delta-method Std. Err.	Average Marginal Effect	Delta-method Std. Err.
Financial and housing wealth				
Able to make ends meet (dummy)	0.019***	(0.0047)	0.012	(0.0093)
Own house/apartment (dummy)	0.004	(0.0045)	-0.017*	(0.0089)
No. of own cars	-0.003	(0.0033)	0.000	(0.0051)
Own firm/company/business	-0.031**	(0.0126)	0.021	(0.0130)
Has bonds	0.010	(0.0067)	0.006	(0.0123)
Has stocks	0.021***	(0.0056)	0.022**	(0.0094)
Has mutual funds	0.023***	(0.0060)	0.029***	(0.0102)
Controlled for country fixed effects	yes		yes	
Controlled for time fixed effects	yes		yes	
No. of observations	20,762		9,097	
Pseudo-R ²	0.39		0.43	

Significance: *** = 1 %, ** = 5 %, * = 10 %

Notes: Average marginal effects from probit regressions with robust standard errors clustered at household level in parentheses. All regressions include dummy variables for country and year and month of interview.

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1

Table 11.1 summarises the results for occupational pensions. The regressions for occupational pension entitlements or receipt of an occupational pension explain about 39 per cent for today's pensioners and 43 per cent for future pensioners of the total variation measured as the pseudo-R². These high values for pseudo-R² are driven by the included country dummies and indicate the strong influences of the characteristics of pension schemes on the national level. With regard to occupational pensions the socio-demographic characteristics male, widowed and years of education bear the expected positive statistically significant correlation with the dependent variable for today's pensioners. For retired respondents the number of children is negatively correlated. For future pensioners being male and years of education also correlate significantly with occupational pension claims, while the number of children is no longer significant.

For future pensioners every employment situation compared to the reference group (employee) is associated with a lower probability of being member of an occupational pension scheme. That might be due to the reason that they are often linked to dependent employment, i. e. there are basically no employer pension plans available for self-employed persons. What is surprising at first glance is

the lower probability of civil servants to have an occupational pension entitlement. This might be due mainly to the high socio-economic status of this group of people with rather safe and well-paid jobs. Therefore, they are easily able to fulfill private pension plans. Additionally, occupational pensions are not even available to civil servants in some SHARE countries.

When it comes to the retirement status of today's pensioners, alternative pathways to leave the labour market, i. e. early retirement and disability as a reason to retirement, are positively correlated to receiving a second pillar pension compared to the reference group (regular old age pension). Concerning the wealth variables we observe the expected signs. Significantly positively correlated are holding stocks and mutual funds both for today's and future retirees. For retired respondents being able to make ends meet bears a positive correlation while owning a business is negatively correlated when it comes to occupational pension claims. The latter might again be due to the fact that occupational pensions are mostly related to dependent employment.

Table 11.2: Correlates of private pension entitlement/reciency. Average marginal effects from probit regressions

Variables	Today's pensioners		Future pensioners	
	Average Marginal Effect	Delta-method Std. Err.	Average Marginal Effect	Delta-method Std. Err.
Pension entitlements/reciency				
Occupational pension (dummy)	0.007	(0.0066)	0.112***	(0.0127)
Socio-demographics				
Male (dummy)	0.003	(0.0041)	-0.007	(0.0089)
Age (years)	-0.005***	(0.0003)	-0.004***	(0.0011)
Married (dummy)	-0.012	(0.0076)	0.001	(0.0137)
Divorced (dummy)	-0.008	(0.0090)	0.016	(0.0161)
Widowed (dummy)	-0.007	(0.0083)	0.022	(0.0226)
No. of children	-0.002	(0.0016)	-0.006	(0.0037)
Years of education	0.002	(0.0005)	0.008*	(0.0011)
Retirement status				
<i>(ref. regular retirement)</i>				
Disability as reason for retirement	-0.001	(0.0061)		
Early retirement	0.015***	(0.0044)		
Employment situation				
Unemployed (dummy)			-0.058***	(0.0480)
<i>Labour force status (ref. employee)</i>				
Civil servant			0.039***	(0.0132)
Self-employed			-0.034**	(0.0146)

Variables	Today's pensioners		Future pensioners	
	Average Marginal Effect	Delta-method Std. Err.	Average Marginal Effect	Delta-method Std. Err.
Financial and housing wealth				
Able to make ends meet (dummy)	0.049***	(0.0046)	0.102***	(0.0105)
Own house/apartment (dummy)	0.011*	(0.0046)	0.057***	(0.0112)
No. of own cars	0.014***	(0.0031)	0.013**	(0.0062)
Own firm/company/business	0.016	(0.0116)	0.057***	(0.0144)
Has bonds	0.017**	(0.0077)	0.045***	(0.0174)
Has stocks	0.047***	(0.0058)	0.103***	(0.0123)
Has mutual funds	0.055***	(0.0060)	0.111***	(0.0138)
Controlled for country fixed effects	yes		yes	
Controlled for time fixed effects	yes		yes	
No. of observations	21,484		9,723	
Pseudo-R ²	0.31		0.19	

Significance: *** = 1 %, ** = 5 %, * = 10 %

Notes: Average marginal effects from probit regressions with robust standard errors clustered at household level in parentheses. All regressions include dummy variables for country and year and month of interview.

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1

Table 11.2 summarises the results for private pensions both for today's and future pensioners. Similar to the previous results our regressions with country dummies for entitlements to or the receipt of a private pension explain about 31 per cent of the total variation measured as pseudo-R² for today's and 19 per cent for future pensioners respectively.

With regard to private pension plans the variable age bears the expected negative statistically significant correlation both for today's and future pensioners. All other socio-demographic variables are not significant except for the years of education which are significant for future pensioners. Early retirement correlates stronger with private pension claims for today's pensioners compared to the reference group (regular old age pension).

Similar to entitlements to occupational pensions, for today's population of working age the employment situations of being unemployed or self-employed are associated with a lower probability of being member of a private pension scheme compared to the reference group (employee). This result might change when controlling for income in the analysis. Being a civil servant bears the expected positive statistically significant correlation. As described above they

might be more easily able to fulfill private savings contracts due to the safe and well-paid jobs.

Concerning the wealth variables we observe the expected signs. Significantly positively correlated are all variables for today's working respondents. Holding stocks and mutual funds as well as being able to make ends meet increases the possibility to expect receiving private pensions the most. Owning a business is only positively significant for non-retired individuals. Since concluding a private pension contract mainly depends on the financial scope of an individual, we find higher probabilities among wealthier respondents.

When finally comparing results from both tables it becomes clear that for today's working population, the variable age which actually controls for birth cohort is negatively correlated with entitlements to an occupational or private pension. This indicates a greater relevance of supplementary pensions for younger cohorts. Entitlements to an employer or private pension plan seem to be more important for them as they are more strongly affected by recent reforms and the resulting decline in public pensions. As expected, being unemployed is also negatively correlated with entitlements to supplementary pensions among future pensioners.

Individuals that retired due to disability are more likely to receive income from an occupational pension in comparison to regular old age retirement, whereas we find no significant correlation between disability as main reason for retirement and private pension entitlements. Furthermore, among future pensioners, individuals owning real estate are more likely entitled to private pensions due to their socio-economic status. Although we obviously face reversed causality between financial and housing wealth and supplementary pension entitlements, it gives us a clear picture that these entitlements are strongly intertwined with additional sources of old age income as well.

Since a higher socio-economic status is apparently highly correlated with occupational and private pension entitlements, future research should try to shed more light on how this varies along the distribution of income in old age of future pensioners, especially for individuals at the lower end of the old age income distribution. According to our analyses, being unemployed is negatively correlated with having entitlements to supplementary pension schemes. Therefore, this group might also be of special interest for further research since they only acquire reduced entitlements to public schemes in some SHARE countries.

In addition, the influence of country-related supplementary pension patterns e. g. mandatory versus non-mandatory schemes among others should be an additional focus. When it comes to the analysis of poverty in old age, welfare regimes in terms of pension coverage might be an important determinant.

Finally when looking at both tables, future pensioners with entitlements to occupational pensions are also more likely entitled to private pensions and vice versa, while for today's pensioners these positive correlations do not exist. This simultaneity for future pensioners emphasises the growing importance of more diverse pension coverage, whereas we are not able to distinguish the causal relationships in our regressions and these basic analyses. The trend is even persistent when controlling for country-specific effects and appears to be rather general across Europe.

11.5 Summary and perspectives for future research

The main results of our descriptive statistics and regression analyses of the supplementary pension coverage in the SHARE countries in 2011 can be summarised as follows. In Sweden, the Netherlands, Denmark and Switzerland more than 70 per cent of respondents expect to receive retirement income from occupational schemes in SHARE 2011. In addition, we find a strong decline in occupational pension coverage rates among future pensioners in Portugal and Spain, which might indicate the ramifications of the recent financial and economic crisis as respondents in those countries face a higher risk of unemployment or drastic cuts to pension entitlements and therefore contribute less to occupational plans. Even when controlling for country and time fixed effects, being male and being higher educated remains important regarding the entitlement to occupational pensions among future pensioners, but play only a minor role for private pension entitlements. Overall, country-specific characteristics explain much of the variation in pension claims. Financial and housing wealth is strongly intertwined with entitlements to supplementary pensions especially when it comes to private pension coverage among both today's and future pensioners. Since we only focus on coverage rates, future research should account for the level and composition of entitlements to supplementary pensions. Although we are not able to clearly identify the causal relationships due to simultaneity and reversed causality, our results indicate the growing importance of supplementary pensions in Europe in the future. Our findings might show the first implications for supplementary pension coverage of the recent pension reform efforts for future pensioners in the SHARE population aged 50+. It remains to be seen how this trend of more diverse pension coverage from different pillars evolves over time. The SHARE study provides an excellent basis for further research as it enables us to track future pensioners in Europe till their retirement and beyond. Thus, we will e. g. be able to compare

the respondents' self-assessed pension entitlements prior to retirement with the receipt of a pension when retired in future waves. In addition, SHARE enables us to exploit variation across different welfare state regimes in Europe.

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12 Financial and subjective well-being of older Europeans

-
- ▶ Among individuals 50+, poverty is highest in Eastern Europe and Greece, Spain and Portugal
 - ▶ In these countries, subjective well-being among 50+ also tends to be lower
 - ▶ Retiring has no effect on financial well-being and a mild, positive effect on subjective well-being
-

12.1 Cross-country variations in well-being

Economic indicators, such as income and poverty rates, suggest significant cross-country variations in the financial well-being of Europeans, and such variations are more pronounced among older adults. Cross-country variations in subjective well-being also exist, and a country's rank in subjective well-being may not match with its rank in financial well-being, even though financial well-being is an important determinant of the former.

In this chapter, we examine cross-country differences in financial and subjective well-being and the role of retirement in explaining the variations we observe. We investigate financial and subjective well-being, using multiple measures – including relative and perceived poverty, depressive symptoms, quality of life, and life satisfaction. By using a diverse set of indicators, we develop a fuller understanding of the various dimensions of well-being. We then examine the effects of retirement on financial and subjective well-being.

12.2 Poverty, a measure of financial well-being

Both absolute and relative poverty measures are widely used, but in the European context, a relative poverty line is most common (OECD 2008). A widely accepted approach has been to use 60 per cent of the national median equivalised disposable income as the definition of a national poverty line (Zaidi 2010).

To identify individuals at risk of poverty, we aggregated all household members' income after tax and then divided the total net household income

by the number of household members converted into equivalised adults, following the Eurostat's equivalence scale. Household heads get a weight equal to one; other household members over 14 get a weight equal to 0.5 and household members under 14 get a weight equal to 0.3. We then identified those at risk by comparing equivalised income with country-and-year-specific poverty thresholds. We report the income of countries in nominal Euros of 2010, after adjusting for purchasing power parity.

We also made use of a subjective poverty measure where available. Subjective poverty measures are based on surveys in which individuals are asked about basic needs or minimum income levels (see Kapteyn et al. 1988; Pradhan & Ravallion 2000). Adena and Myck (chapter 6) note earlier in this volume that subjective poverty correlates more strongly with health and well-being than traditional income-based approaches. The SHARE respondents were asked: "Thinking of your household's total monthly income, would you say that your household is able to make ends meet?". Response options are: with great difficulty, with some difficulty, fairly easily, or easily. We classify an individual as being subjectively poor if the respondent answers the household has great difficulty in making ends meet.

Figure 12.1 shows the population-level relative poverty rates in 2010 taken from Eurostat together with our estimate of the relative poverty rates and subjective poverty rates for individuals 50 years and older from the SHARE Wave 4 data. All descriptive results from the SHARE data are weighted. Reflecting different standards of living, significant cross-country variations exist in poverty thresholds, ranging from € 3,595 in Hungary to € 20,950 in Switzerland. Cross-country variations also exist in relative poverty rates for the population, ranging from nine per cent in the Czech Republic to almost 21 per cent in Spain. We found even greater cross-country variations in relative poverty rates for individuals 50 years and older, ranging from 17 per cent in Estonia to 34 per cent in Portugal. Particularly, relative poverty rates among older adults are twice higher than those among the population in Czech Republic, Portugal, and Slovenia.

Subjective poverty rates and threshold are presented in Figure 12.2, showing a strong negative correlation between poverty thresholds and subjective poverty rates (the correlation is -0.8). In other words, in countries with high relative poverty lines (that is with high median incomes) subjective poverty rates are lower. For example, over 30 per cent of 50+ individuals in Hungary reported being in poverty, while only two per cent of individuals at the same age in Switzerland and Denmark reported to feel poor. We do note, however, a modest positive correlation between the percentage in relative poverty and in subjective poverty across countries for individuals 50 or older (the correlation is 0.18).

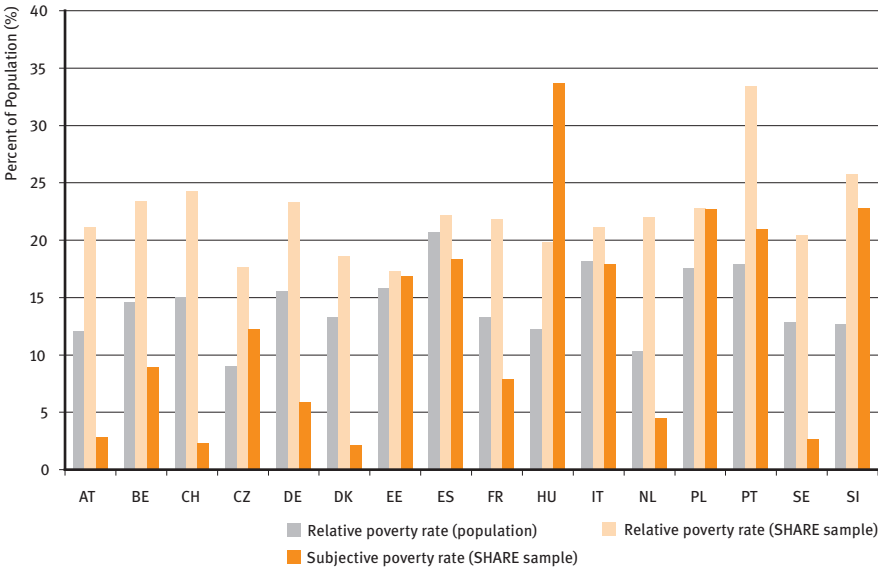


Figure 12.1: Relative and subjective poverty rates in SHARE countries

Notes: Thresholds reflect 60 per cent of the median income in the 50+ population in 2010 Euros. N=55,447 for SHARE sample subjective poverty and N=54,712 for SHARE sample relative poverty. Source: Relative poverty rate for population is drawn from Eurostat data (online data code: ilc_peps01, ilc_li01 and ilc_li02). Relative poverty rate for age 50+ and subjective poverty rate in SHARE sample is from SHARE Wave 4 release 1.

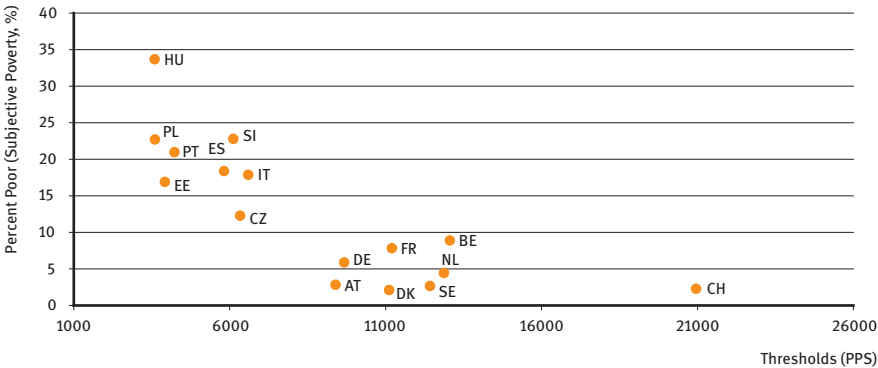


Figure 12.2: Subjective poverty and poverty thresholds

Notes: Thresholds reflect 60 per cent of the median income in the 50+ population in 2010 Euros. N=55,447 for SHARE sample subjective poverty. Source: SHARE Wave 4 release 1

12.3 Subjective well-being

SHARE includes three measures of subjective well-being: the EURO-D depression measure, a single item life satisfaction measure, and the CASP-12 scale of quality of life for middle and older ages. The EURO-D (Prince et al. 1999) includes twelve “yes-or-no” questions about depression, pessimism, suicidality, guilt, sleep, interest, irritability, appetite, fatigue, concentration, enjoyment, and tearfulness during the last month to capture emotional health and well-being. The EURO-D is scored by summing individual items. Total scores range from 0 to 12 with a higher score indicating more depressive symptoms.

For life satisfaction, a single item question was asked at the core interview. The question asks: “On a scale from 0 to 10 where 0 means completely dissatisfied and 10 means completely satisfied, how satisfied are you with your life?”.

To measure quality of life, SHARE included an abridged version (twelve items) of the CASP-19 (Control, Autonomy, Self-realisation, Pleasure) (Hyde et al. 2003). Respondents were asked how often they experience certain feelings and situations on a 4-point scale, ranging from ‘never’ to ‘often.’ The twelve items first ask if (1) age, (2) family responsibilities, or (3) shortage of money prevent the respondent from doing things s/he enjoys; if s/he feels (4) what happens to him or her is out of his or her control; (5) s/he feels left out of things, (6) that s/he can do things that s/he wants to do, (7) s/he feels life has meaning, (8) happy, (9) full of energy, (10) that life is full of opportunities, (11) that the future looks good for them; and (12) that s/he looks forward to each day. The total score of CASP-12 ranges from 12 to 48, with higher scores indicating a better quality of life.

Figure 12.3 shows a consistent pattern across the three measures. For example, older adults in Denmark have the lowest depressive symptom scores and the highest life satisfaction and quality of life scores. In contrast, older adults in Hungary and Estonia report the highest mean depressive symptom scores and the lowest level of life satisfaction, and their quality of life score is also at the bottom. In general, older adults in Eastern European countries report lower levels of subjective well-being than older adults in Western and Scandinavian countries. Older adults in Southern European countries are in the middle of the spectrum, except that older adults in Portugal report the lowest level of quality of life. To further illustrate the consistency in reports, we note that the correlation in mean scores of Euro-D and life satisfaction across countries equals -0.44 ; similarly the correlation between Euro-D and CASP-12 equals -0.53 and the correlation between CASP-12 and life satisfaction equals 0.59 .

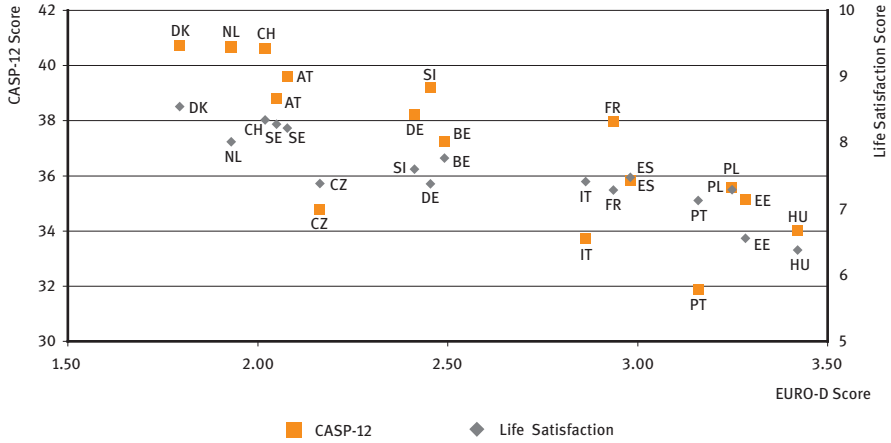


Figure 12.3: Subjective well-being by country

Notes: N=54,903 for EURO-D; N=55,209 for life satisfaction; N=53,269 for CASP-12

Source: SHARE Wave 4 release 1

As one would expect, life satisfaction and subjective poverty rates are negatively related as shown in Figure 12.4. The correlation is -0.85 .

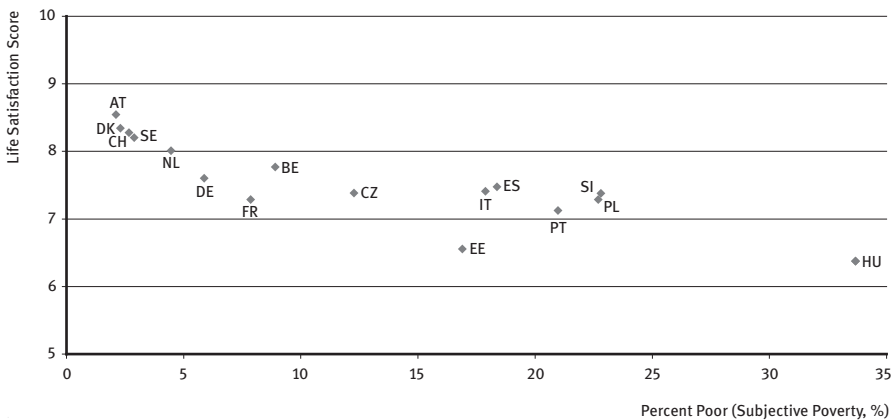


Figure 12.4: Life satisfaction and per cent poor in the SHARE sample

Notes: N=55,447 for SHARE sample subjective poverty and N = 55,209 for life satisfaction

Source: SHARE Wave 4 release 1

12.4 Retirement effects on financial and subjective well-being

Most developed countries devote a substantial portion of their resources to the protection of well-being after retirement by providing old-age pensions, but policy variations exist, including differences in official retirement ages, generosity of pension benefits, and other retirement incentives (OECD 2011). Full pension eligibility ages are typically 65 among our analysis countries, but exceptions include age 60 in Austria (women only) and France. Austria, Germany, and Italy are also phasing in increases in their retirement ages. By comparing countries with different pension entitlement ages as well as exploiting within-country variation in pension eligibility, we will evaluate the retirement effects on well-being, using all available waves of SHARE.

First, we investigate the effects of retirement on financial well-being. Our dependent variables include relative poverty and subjective poverty, and we fit unweighted random effects models, controlling for country, year, and cohort effects. In estimating the effects of retirement, we separate out unemployment, while the reference category is “currently working”. To address endogeneity of retirement, we instrument with two dummy variables indicating whether the respondent is eligible for full or early retirement public pensions using country and gender specific pension-eligibility ages. In this, we follow a similar strategy as Rohwedder and Willis (2010), Angelini et al. (2009), and Coe and Zamarro (2011). It is important to keep in mind the interpretation of the instrumental variables procedure. The procedure compares the wellbeing of individuals before they are eligible for retirement pensions and after they are eligible for each country, after controlling for continuous age, birth cohort, and country effects. That is we are estimating the dis-continuous jump in wellbeing when individuals become eligible for retirement pensions for each country and then aggregate that effect.

The explanatory variables included in estimation are: age, age squared, marital status (a dummy variable, indicating married or living with a partner), gender, interaction of gender and marital status, education (a set of dummy variables with less than high school as a reference category), health (having at least one difficulty with activities of daily living, and a binary indicator for having any of the following major chronic diseases: cancer, stroke, heart diseases, or lung disease).

Table 12.1 presents both random effects (RE) estimates and RE estimates with retirement instrumented by pension eligibility. The first two models examine relative poverty. In the RE specification of the first model, we find that retirement is positively associated with relative poverty, while controlling for other covariates. In the instrumental variables specification, we find however that retirement

has no effect on relative poverty, while unemployment, disability, and education have significant effects.

The models for subjective poverty yield similar findings. Retirement is positively associated with one's subjective assessment of poor economic standing, but once we instrument retirement with pension eligibility ages, we find that retirement is not significantly associated with subjective poverty. Health problems such as disability and major disease continue to be associated with subjective poverty, although the models here do not attempt to identify the direction of that relationship. Women are more likely to be poor and higher educational attainment protects against subjective poverty in later life.

Table 12.1: Effects of retirement on financial well-being

	Relative Poverty	Relative Poverty (IV)	Subjective Poverty	Subjective Poverty (IV)
Age	-0.018*** (0.003)	-0.006 (0.005)	-0.001 (0.002)	0.001 (0.003)
age sq ($\times 10^{-2}$)	0.012*** (0.002)	0.005 (0.003)	-0.001 (0.002)	-0.002 (0.002)
Female	0.073*** (0.007)	0.075*** (0.006)	0.029*** (0.005)	0.030*** (0.005)
Married	-0.036*** (0.006)	-0.038*** (0.006)	-0.032*** (0.005)	-0.033*** (0.005)
married x female	-0.091*** (0.007)	-0.086*** (0.008)	-0.042*** (0.006)	-0.041*** (0.006)
College	-0.187*** (0.005)	-0.195*** (0.006)	-0.096*** (0.004)	-0.097*** (0.004)
high school	-0.112*** (0.004)	-0.113*** (0.004)	-0.070*** (0.003)	-0.070*** (0.003)
Retired	0.076*** (0.005)	0.002 (0.022)	0.033*** (0.003)	0.021 (0.016)
Unemployed	0.191*** (0.009)	0.160*** (0.013)	0.173*** (0.007)	0.171*** (0.010)
Disability	0.014** (0.006)	0.018*** (0.006)	0.043*** (0.005)	0.044*** (0.005)
Disease	0.002 (0.004)	0.006 (0.004)	0.028*** (0.003)	0.029*** (0.003)
N	72,018	72,018	72,887	72,887

Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Models control for country, wave, and birth cohort effects. Standard errors in parentheses.

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

We next investigate the effects of retirement on subjective well-being, while controlling various covariates, such as health and demographics. Our dependent variables include: Euro-D, life satisfaction, and CASP-12, and we fit unweighted random effect models, controlling for country, year, and cohort effects. By taking an instrumental variable approach, we avoid potential reverse causation of poor subjective well-being leading to retirement.

Table 12.2 presents a random effects model together with an instrumental variables model for all three subjective well-being measures. Under the RE model, retirement is found to be negatively associated with subjective well-being. The instrumental variables specification shows that retirement does not have adverse effects on subjective well-being: for the EURO-D and CASP measures, retirement increases quality of life and decreases depressive symptoms, whereas there is no significant change in life satisfaction with retirement.

Table 12.2: Effect of retirement on subjective well-being

	EUROD	EUROD (IV)	CASP12	CASP12 (IV)	Satis- faction	Satis- faction (IV)
Age	-0.200*** (0.016)	-0.125*** (0.024)	0.518*** (0.046)	0.155** (0.068)	-0.001 (0.017)	-0.039 (0.024)
Age sq ($\times 10^{-2}$)	0.143*** (0.012)	0.097*** (0.016)	-0.404*** (0.033)	-0.183*** (0.045)	0.007 (0.012)	0.030* (0.016)
Female	0.677*** (0.037)	0.693*** (0.037)	-0.541*** (0.105)	-0.622*** (0.107)	-0.037 (0.033)	-0.047 (0.033)
Married	-0.394*** (0.033)	-0.402*** (0.033)	0.745*** (0.096)	0.786*** (0.097)	0.534*** (0.031)	0.537*** (0.031)
married x female	0.081* (0.042)	0.114*** (0.043)	0.206* (0.121)	0.041 (0.124)	-0.019 (0.038)	-0.034 (0.039)
College	-0.408*** (0.030)	-0.460*** (0.032)	2.055*** (0.085)	2.309*** (0.092)	0.373*** (0.027)	0.397*** (0.029)
high school	-0.317*** (0.023)	-0.327*** (0.023)	1.282*** (0.067)	1.328*** (0.068)	0.255*** (0.021)	0.259*** (0.021)
Retired	0.258*** (0.024)	-0.212* (0.117)	-0.590*** (0.068)	1.744*** (0.328)	-0.206*** (0.024)	0.035 (0.108)
Unemployed	0.582*** (0.046)	0.370*** (0.070)	-2.232*** (0.132)	-1.163*** (0.199)	-0.766*** (0.048)	-0.661*** (0.067)
Disability	1.366*** (0.033)	1.389*** (0.034)	-3.720*** (0.098)	-3.840*** (0.100)	-0.730*** (0.031)	-0.740*** (0.031)
Health condition	0.737*** (0.021)	0.762*** (0.022)	-1.754*** (0.061)	-1.863*** (0.063)	-0.428*** (0.020)	-0.441*** (0.021)
N	73,367	73,367	61,760	61,760	48,375	48,375

Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Models control for country, wave, and birth cohort effects. Standard errors in parentheses.

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

12.5 Conclusions

The previous sections described the cross country differences in measures of financial and subjective well-being. Eastern and Central-Eastern European countries and Mediterranean countries like Greece, Spain, and Portugal tend to have high incidence of poverty and lower subjective well-being. On the other hand, Scandinavian countries tend to have higher subjective well-being and lower levels of poverty (both subjective and relative).

We then examined the effect of retirement on both financial and subjective well-being, using an instrumental variable approach. Once we accounted for potential endogeneity of retirement, using full and early pension eligibility ages as instruments, we found that retirement does not lead to increases in either relative or subjective poverty. We also found that retirement does not have adverse effects on subjective well-being. Instead, it has a positive effect on depression symptomatology and quality of life and no effect on life satisfaction. These results carry particular weight as populations across Europe continue to age.

Although we formulate conclusions in terms of the effect of retirement on financial and subjective well-being, the important policy question is the effect of later retirement ages on well-being. Our results suggest that under the current institutional arrangements in the SHARE countries, the effects on financial well-being will be minimal. This depends crucially how policies inducing longer working lives are structured. Regarding subjective well-being measures (including depression measures), the analysis suggests that potentially longer working lives may reduce well-being and increase the prevalence of depressive symptoms. It would seem therefore that policies that induce longer work lives need to be accompanied by forms of work place accommodation that minimise the potential adverse effects on subjective well-being.

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Part III Active and healthy ageing

Edited by Martina Brandt

Mette Lindholm Eriksen, Sonja Vestergaard and
Karen Andersen-Ranberg

13 Health among Europeans – a cross-sectional comparison of 16 SHARE countries

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- ▶ Poor self-rated health and several risk factors for cardio-vascular diseases are, in general, more common in Eastern European countries
 - ▶ Germany shows almost the same high levels of adverse health outcomes as East European countries
 - ▶ Differences in institutional factors have a major impact on health disparities and must be addressed to increase healthy and active ageing in Europe
-

Not only do older Europeans live longer today than earlier; they also seem to be living their longer lives in better health, at least in terms of physical functions (Christensen 2009). However, although improvements are clear in a national setting, even at very old ages (Christensen 2008), there are still differences across nations. Within the EU27 area there is a well-known disadvantage in health in the Eastern EU countries compared to the Western countries (OECD 2010). The divide is most clear in mortality and is mainly explained by chronic diseases in adulthood and a high prevalence of underlying health risk factors such as health behaviour, diet, alcohol consumption and smoking, while pollution and access to health care are believed to have less impact (Bobak 1996). However, changes in institutional factors may reverse adverse health outcomes as shown by Vaupel and colleagues (2003) in their remarkable comparative study of age specific mortality rates of German birth cohorts born around the year 1900; before the re-unification in 1990 Germans living in the former Eastern Germany had higher mortality rates than their birth cohort peers living in the former Western Germany, but just a few years after the re-unification these higher mortality rates declined to the same level as in the western part of Germany. It is generally accepted that this effect is explained by improved health care services, also to older people, in the former Eastern Germany.

Europe is ageing due to several factors: (a) the baby boomer generations after World War II now entering the older age groups, (b) a decline in oldest old mortality, and (c) declining birth rates. The challenges of an ageing Europe are substantial, especially since the dependency ratio is increasing (i. e. the sum of

young aged <15 years and older adults aged >65 years divided by the number of people aged 15–64). Demographic projections show that especially the Eastern and Southern EU countries will experience the highest dependency ratio in the future (EUROSTAT 2011, Lancieri 2011), which reinforces the need for increasing our knowledge in the dynamics of the ageing process and the relation to health and socioeconomic situation.

While the health of the citizens in the European Union in general is monitored by Eurostat with the collection of information from national health surveys including mortality data to calculate life expectancy and healthy life years (also called disability-free life expectancy) (Robine 2003), it must be acknowledged that health is more than mortality. Health is also disability in various areas, and morbidity, but while information on disabilities and functional declines are rather easily collected, morbidity data from population studies are scarcer. In fact, little is known about disparities in various common diseases across the European countries. Since morbidity in most cases precedes disability and functional decline, understanding disparities in morbidity is important to address disparities in health across Europe (O'Donnell 2009). SHARE is the only cross-national longitudinal ex-ante harmonised survey that collects data from a wide range of health indicators; i. e. from very subjective measures, e. g. self-perceived health, to more objective measures, e. g. walking speed and grip strength.

13.1 The cross-national measurement of health

This chapter aims at describing the health of middle-aged and older Europeans participating in the fourth wave of SHARE in 2010–2011. The health area in SHARE is composed by a wide range of questions covering different areas of health: general health, functional health, physical and mental health, but here we focus on diversities in functional and physical health across SHARE. Of the 16 countries participating in SHARE Wave 4, four were new in SHARE and meant the addition of three more Eastern European countries (Slovenia, Hungary, Estonia) to the existing two (the Czech Republic and Poland), and one more Southern European country (Portugal) to the already included Spain and Italy (see Malter & Börsch-Supan 2013 for details).

We present here cross-sectional results within three of the health domains: *general health* (self-perceived health, the Global Activity Limitation Index (GALI), and longstanding health problems), *physical functions* (information on Basic Activities in Daily Living (B-ADL) and Instrumental Activities of Daily Living (I-ADL)), and specified *chronic diseases*. In the reporting of diseases and chronic

conditions the questions were phrased: “Has a doctor ever told you that you had/have [specific disease/condition]...”, e. g. a heart attack, high blood pressure, stroke, diabetes, chronic lung disease, arthritis (osteoarthritis and rheumatism), cancer, gastrointestinal ulcer, Parkinson’s disease, cataracts, hip fracture, other fractures, and dementia/cognitive impairment.

The question on self-perceived health had five answer categories and was phrased “Would you say your health is excellent, very good, good, fair or poor?”. The answer categories were dichotomised into two categories: (0) excellent, very good and good vs. (1) fair and poor. The GALI question was phrased: “For the past six months at least, to what extent have you been limited because of a health problem in activities people usually do”? with three answer categories: ‘not limited’, ‘limited, but not severely’, and ‘severely limited’. The three categories were dichotomised into (0) ‘not limited’ and (1) ‘limited, but not severely’ or ‘severely limited’. Physical functions were measured by the ability to independently perform basic activities of daily living (ADL), i. e. dressing (including shoes and stockings), walking across a room, getting in or out of bed, bathing or showering, eating, incl. cutting up the food, and using the toilet, including getting up or down. ADL was dichotomised into 2 categories: (0) no ADL limitations or (1) one or more limitations (“1+ADL”). The variable of chronic diseases was dichotomised into two categories: (0) less than 2 chronic diseases and (1) 2 or more chronic diseases (“2+ chronic diseases”). All analyses were adjusted by age and gender, and included data from 59,599 participants.

13.2 General health poorer in Eastern and Southern European countries

Overall, there were considerable cross-country variations regarding the various health measures of 50+ year old Europeans, but with a certain geographical pattern. Higher prevalences of poor self-perceived health were seen in the more Eastern and Southern European countries compared to the Western and Northern ones, the only exception being Germany, which had the same level as Eastern European countries. Among the Eastern European countries, Hungary and Estonia, in particular, showed notably high prevalences (above 60%, Figure 13.1).

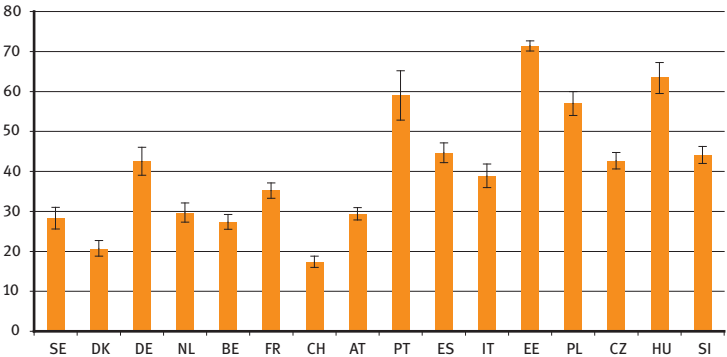


Figure 13.1: Cross-national prevalence proportions (y-axis; per cent) of respondents reporting poor self-perceived health (N=53,213)
Notes: Whiskers represent confidence intervals (CI). Adjusted by age and gender.
Source: SHARE Wave 4 release 1, using calibrated individual weight

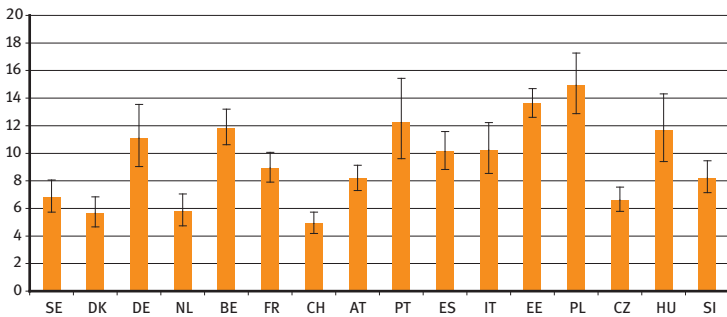


Figure 13.2: Cross-national prevalence proportions (y-axis; per cent) of respondents reporting limitations in activities of daily living (1+ADL) (N=53,222)
Notes: Whiskers represent confidence intervals (CI). Adjusted by age and gender.
Source: SHARE Wave 4 release 1, using calibrated individual weight

This pattern was, in general, also recognised in the cross-national comparisons of physical functions, defined as at least one limitation in basic activities of daily living (1+ADL), again with Germany being at the same level as Southern European countries, but now also accompanied by Belgium (Figure 13.2). In contrast, the Czech Republic was at about the same level as the Northern European countries. Interestingly, a somewhat different geographical pattern was seen in the prevalence of long-standing limitations in usual activities because of a health problem (GALI) (Figure 13.3). Compared to the prevalences of poor self-rated health and 1+ADL, the southernmost SHARE countries, i. e. Portugal,

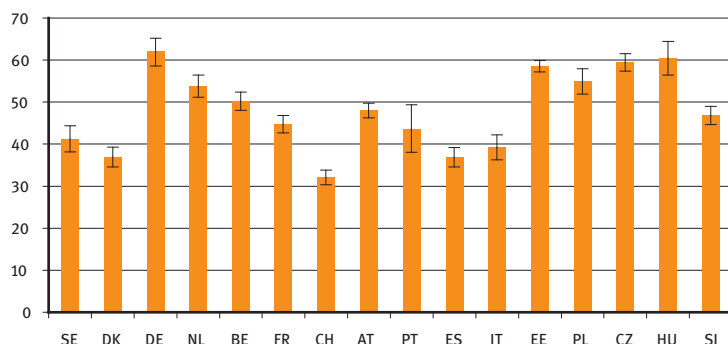


Figure 13.3: Cross-national prevalence proportions (y-axis; per cent) of respondents reporting to because of a health problem being limited in daily activities (severely or not severely) for at least 6 months (GALI) (N=53,225)

Notes: Whiskers represent confidence intervals (CI). Adjusted by age and gender.

Source: SHARE Wave 4 release 1, using calibrated individual weight

Spain and Italy reported the lowest proportions in health related activity limitation (GALI), which may be interpreted as Southern Europeans seeing activity limitations and poor health as natural consequences of ageing, not of age-associated diseases.

13.3 Cardio-vascular diseases and their risk factors were highly prevalent in Eastern European countries

In Europe, morbidity is dominated by diseases in the cardio- and cerebrovascular system (CVD) (Mendis 2011). SHARE data showed the same pattern. The most prevalent disease in all SHARE countries was hypertension, which moreover showed a clear geographical distribution (Figure 13.4a). The highest prevalences of hypertension were seen in East European countries (Hungary, Estonia, the Czech Republic, Slovenia and Poland), and all above 40 per cent. Again Germany stuck out by having almost the same high prevalence as in the East European countries. Hypertension is a well-known risk factor for diseases in the cardio- and cerebrovascular system, and therefore it was not a surprise to see almost similar patterns of high prevalences of cardiovascular diseases (Figure 13.5), although Estonia and Hungary showed particularly high prevalences when compared to the three other Eastern European countries, i. e. Poland, the Czech Republic and Slovenia.

Another well-known risk factor for diseases in the cardio- and cerebrovascular system is diabetes. Again, the cross-national pattern of diabetes prevalence was almost similar to the geographical pattern seen for the cardiovascular diseases; i. e. higher prevalences of diabetes in the more Eastern and Southern European countries, and in Germany (Figure 13.6a).

It is worth mentioning that the geographical pattern of diabetes prevalence found in SHARE was similar to the pattern found in OECD data (2010), which indicates the validity of the SHARE data.

Another risk factor for diseases in the cardio- and cerebrovascular system is high cholesterol, but in contrast to the rather uniform geographical pattern described above, the highest prevalences for high cholesterol were identified in Belgium, Portugal and Spain (Figure 13.7a).

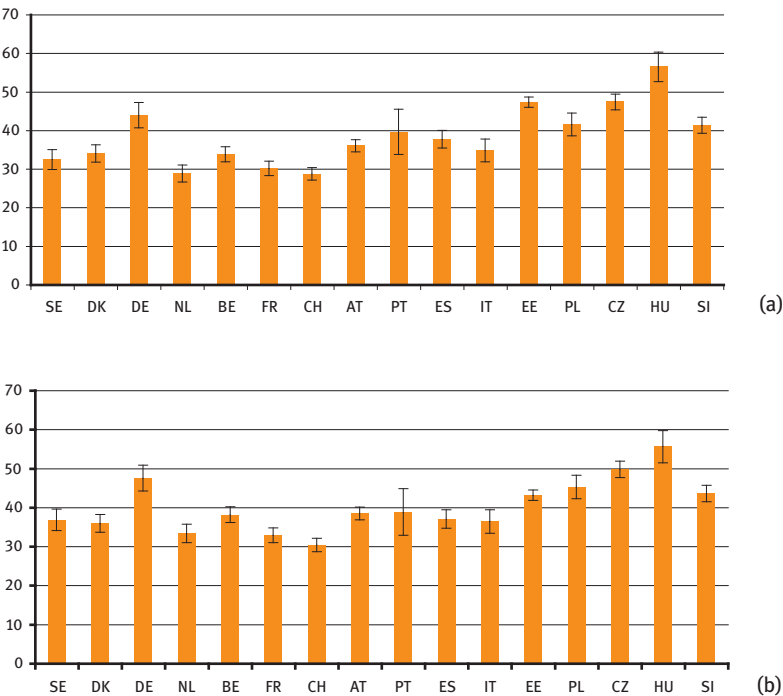


Figure 13.4: Cross-national prevalence proportions (y-axis; per cent) of respondents reporting to have hypertension (N=53,207) (a) and taking anti-hypertensive medication (N=53,225) (b)
Notes: Whiskers represent confidence intervals (CI). Adjusted by age and gender.
Source: SHARE Wave 4 release 1, using calibrated individual weight

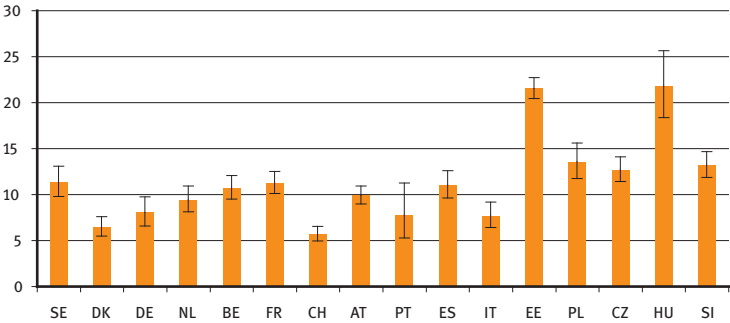


Figure 13.5: Cross-national prevalence proportions (y-axis; per cent) of respondents reporting to have a cardiovascular disease (N=53,207)
Notes: Whiskers represent confidence intervals (CI). Adjusted by age and gender.
Source: SHARE Wave 4 release 1, using calibrated individual weight

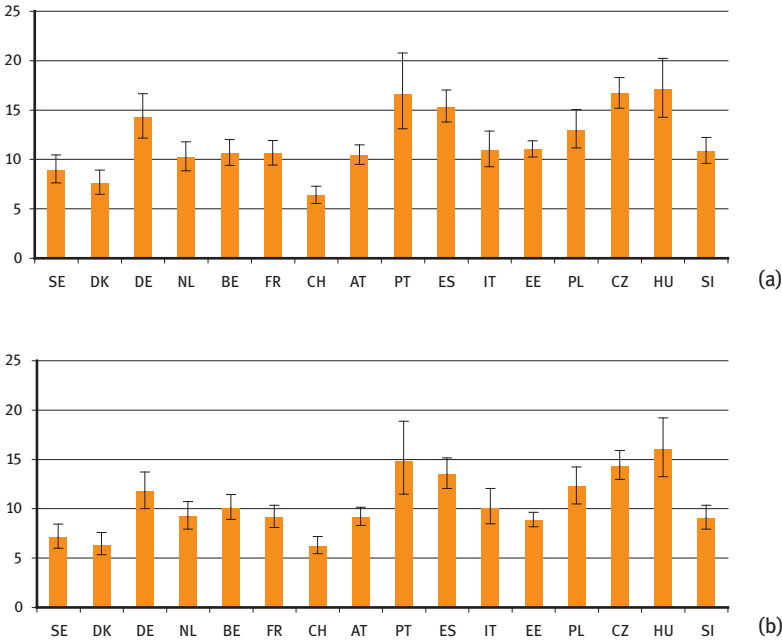


Figure 13.6: Cross-national prevalence proportions (y-axis; per cent) of respondents reporting to have diabetes (N=53,207) (a) and taking anti-diabetic medication (N=53,225) (b)
Notes: Whiskers represent confidence intervals (CI). Adjusted by age and gender.
Source: SHARE Wave 4 release 1, using calibrated individual weight

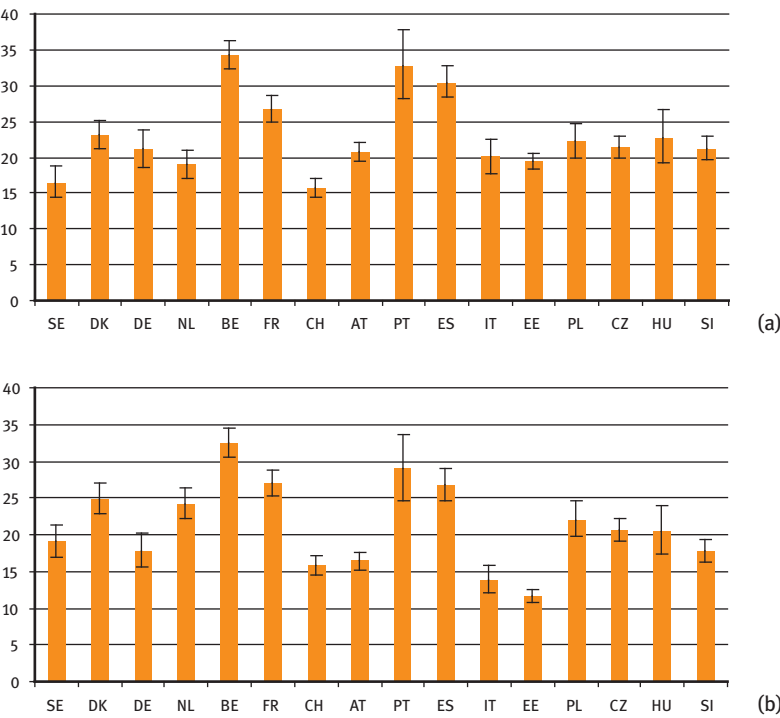


Figure 13.7: Cross-national prevalence proportions (y-axis; per cent) of respondents reporting to have high cholesterol (N=53,207) (a) and taking cholesterol lowering medication (N=53,225) (b) Notes: Whiskers represent confidence intervals (CI). Adjusted by age and gender. Source: SHARE Wave 4 release 1, using calibrated individual weight.

13.4 Use of medication mirrors the cardiovascular diseases and its predisposing conditions in SHARE respondents

Use of medication may sometimes be a useful tool as a proxy for diseases, as respondents may underreport diseases by simple forgetfulness or because they believe that ongoing medical treatment has cured them. A typical example is hypertension, where lay people may think that when they take their antihypertensive pill they no longer have the disease. A comparison of the prevalences of specific diseases with the equivalent specific medical treatment, e. g. hypertension is treated with antihypertensives, showed that underreporting of some common diseases may be the case also in the SHARE survey. Comparing the cross-national

prevalences of hypertension with the respective prevalences of antihypertensives showed very similar patterns, but higher prevalences of use of antihypertensives than what was actually reported (Figure 13.4a & b). In contrast, treatment with antidiabetics was lower than the prevalence of diabetes, which however, may be explained by treatment only by sugar-free diet (Figure 13.6a & b). An interesting finding was that in most countries cholesterol lowering medication was less prevalent compared to the actual prevalence of having the condition of high cholesterol, in contrast to the more Northern SHARE countries Sweden, Denmark and the Netherlands where the opposite was found. This may be explained by differential national guidelines for treatment of diseases. International guidelines recommend cholesterol lowering treatment as a primary preventive measure in diabetic patients with affected kidneys even though they have normal levels of cholesterol. The lower treatment prevalence in most other countries may also reflect low adherence to international guidelines, dietary treatment, or even costs. This should be investigated further, as there might be a link between higher prevalences of cardiovascular diseases in the Eastern SHARE countries and less treatment with cholesterol lowering medication (Figure 13.7a & b).

13.5 Eastern European SHARE countries followed by Southern European SHARE countries experience worse health than their Northern and Western peers

In conclusion, adverse health outcomes varied across Europe, but with a clear geographical pattern: Compared to their Northern and Western age and gender peers, people living in the Eastern European SHARE countries, and to some extent also those living in the Southern countries, suffered from poorer health, whether it was assessed as general health, physical functions or common cardiovascular diseases including well known risk factors (i. e. diabetes, hypertension). A striking result was to see that Germany showed a general pattern of adverse health outcome more similar to Eastern and Southern European countries than its more Western and Northern peers. This is in parallel with other findings based on SHARE data showing that Germans tend to underrate their true health (Jürges 2007, for details also see the chapter by Schoenmaeckers in this volume). On the other hand compared to their Western and Northern peers Germans also report more often problems with activities in daily living (1+ADL), suffering from long-term illness, having long-standing health related limitations in activities people

usually do, and suffering from hypertension and diabetes, even when adjusting for relevant covariates i. e. BMI and physical activity (analyses not shown).

Disparity in the health of Europeans is evident. Some of it may be explained by lifestyle factors (sedentary lifestyle, obesity, smoking and drinking, unhealthy diet), but adjusting for these factors in our analyses did not change the results significantly, and neither did adjusting by educational level (analyses not shown). The results presented here are only adjusted by age and gender, which was chosen in order to increase comparability with other mainly national studies, which more often report results with basic adjustments. Further, as lifestyle factors and education did not significantly change the cross-national differences in health in SHARE it may be suggested that institutional factors have a certain impact. Therefore these results may be used at the national level to identify possible intervention schemes within the areas of public health and health care.

To meet the challenges of an ageing Europe we must address the path to increase active ageing in the European community. One path is to focus on the most common diseases leading to functional decline and disability. Both primary, secondary and tertiary preventive measures as well as active treatment strategies should be implemented, but in particular in the easternmost European countries, which seem to suffer more from common ill health, chronic conditions and diseases.

Increasing healthy and active ageing in Europe will lessen the burden on the younger generations and thereby increase the intergenerational solidarity.

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14 Development of health over four years among middle-aged and older Europeans

-
- ▶ Older adults in Eastern and Central European countries have a higher risk of developing poor self-rated health over four years
 - ▶ The same geographical pattern is seen for a higher risk of developing hypertension and diabetes
 - ▶ Low educational level significantly increases the risk of developing poor self-perceived health
-

Ageing is associated with an increased risk of disease, and older adults have more diseases than younger adults. The increasing life expectancy from birth and not least the decline in mortality rates among older adults (Christensen 2009) have led to a discussion about the consequences of increased survival, especially in the older population. Is the increased survival a result of better treatment and access to health care leading to the survival of even frail older persons who would have otherwise died had they been born in earlier generations? Or is the increased survival reflecting a healthier life and improvements in health care and preventive measures leading to lower morbidity? These questions are of great interest to the individual as well as health care professionals, policy makers and other professionals involved in the organisation of health care systems.

In the past decades the literature has been dominated by a generally positive picture with a decline in cohort specific disability prevalence (Crimmins 2004, Donald 2010). In contrast, the prevalence of morbidity has been less optimistic in the most recent literature by showing increasing age-specific prevalence of common diseases (Christensen 2009, Crimmins 2011, King 2013). The question is, however, whether the higher prevalence is explained by higher incidences or by an increased survival with diseases. Incidence studies yield mixed results. In Norway, a large scale follow-up study has shown a decline in the age-adjusted incidence for coronary heart disease in middle-aged men, but an increase in middle-aged women (Mannsverk 2012). In stroke, incidence rates decreased in high income countries but increased markedly in low to middle income countries during the last decades (Feigin 2009). While prevalences based on cross-sectional studies of common diseases and health conditions are relatively easy to find, incidence data for cross-national comparisons are much harder to identify as such longitudinal studies are scarce.

Due to its longitudinal design, SHARE provides data on individuals developing diseases and functional declines over time. In the following we present the results of incidence data on common diseases and conditions over 4-years of follow-up. We used unweighted data on longitudinal respondents participating in SHARE Wave 2 (2006) and with a follow-up in SHARE Wave 4 (2010) about 4 years later. Twelve countries were included: Sweden (SE), Denmark (DK), Germany (DE), Belgium (BE), the Netherlands (NL), Austria (AT), Switzerland (CH), France (FR), Spain (ES), Italy (IT), Poland (PL) and the Czech Republic (CZ), and representing almost 20,000 individuals aged 50+ (N=19,141).

For details about the variables please see Lindholm Eriksen and colleagues in this volume. In addition to these we also analysed the variable “Do you have any long-term health problems, illness, disability or infirmity?”, with two answer categories: No (0) or Yes (1), and Instrumental Activities of Daily Living (IADL), that is the ability to use a map to figure out how to get around in an unfamiliar place, to prepare a hot meal, to shop for groceries, to make telephone calls, to take medication, to do work around the house and garden, to manage money, such as paying bills and keeping track of expenses. Like the other variables, including ADL, IADL was dichotomized into two categories: (0) no IADL limitations and (1) one or more limitations (“1+IADL”). Incident cases were defined as not having the condition in Wave 2 but having the condition in Wave 4. We looked at incident cases of poor self-rated health, defined as participants who reported being in excellent, very good or good health in Wave 2, but who reported to be in fair or bad health 4 years later in Wave 4. Incident cases of suffering from a chronic or long-term health problem was defined as reporting ‘No’ in Wave 2, but ‘Yes’ in Wave 4. Incident cases of more than six months’ limitation of activities people usually do due to a health problem (Global Activity Limitation Indicator; GALI) were defined as having no limitation at all in Wave 2, but reporting a non-severe limitation or a severe limitation in Wave 4. Incident cases of being limited in activities in daily living (1+ADL) or in instrumental activities (1+IADL) were defined similarly, i.e. having no limitations in Wave 2, but having at least one limitation in Wave 4. Similarly with incident diseases, e. g. reporting no hypertension in Wave 2, but incident hypertension in Wave 4; likewise for diabetes and cardiovascular diseases. In stroke and heart attack, both diseases which may occur more than once in a person, specific questions were asked about having a new incident of stroke or heart attack since last interview. For methodological details please see Lindholm Eriksen and colleagues in this volume.

All analyses were done with adjustment for age and gender (basic model), as well as adjustment for time-interval between Wave 2 and Wave 4 (months), due to the fact that time interval at the individual level varied from 42 to 65 months between the two waves. Initially, all analyses were also made with adjustments for lifestyle factors (smoking, low physical activity, high body mass index (BMI)) and educational level, but these adjustments did not significantly change the results

from the basic model. For reasons of comparisons with country specific national health surveys we chose to present only the results based on the basic model.

Finally, in analyses of the association between socioeconomic conditions on incident poor self-rated health, both education and wealth were used as independent variables. Educational level categorised according to ISCED codes (high, medium and low educational level). Wealth was defined as the sum of all financial and real assets (minus liabilities) and categorised into country-specific tertiles.

Overall, the longitudinal analyses were made on a total number of 18,375 respondents, but due to missing information in the different variables the actual numbers of respondents in the various analyses are given in the figures.

Logistic regression was used to model the incidence proportion of specified chronic diseases, self-perceived health, long-standing illness, limitations in daily activities for at least six months (GALI), disability (1+ADL and 1+IADL) and death between the two waves. Incidence is reported as the proportion of new cases developing from Wave 2 to Wave 4.

14.1 Higher risk of developing adverse health outcomes in the Eastern and Southern European SHARE countries

The 4-year follow-up between SHARE Waves 2 and 4 allowed us for the first time to compare the incidence of common diseases and chronic conditions in a cross-national setting including two Eastern European SHARE countries, the Czech Republic and Poland. It was interesting to see that the incidence of reporting the development of poor self-perceived health between the two waves was among the highest in these two Eastern European countries together with the Southern European countries Spain and Italy (all above 25 %), closely followed by Germany and Austria, while the more Western and Northern SHARE countries together with Switzerland had lower incidences (Figure 14.1). This may partly be explained by more incident cases of participants with long-term health problems (Figure 14.2) and impairments in instrumental activities of daily living (1+IADL) (Figure 14.3) as these countries with the exception of Italy, in general showed the same geographical pattern as incident poor health. An incident functional decline in basic activities of daily living (1+ADL) (Figure 14.4) was more evenly distributed across the countries with the exception of Poland, which had the highest incidence proportion. Conversely, the more Northern European SHARE countries such as the Netherlands and Denmark, together with Switzerland and to some extent Sweden and Belgium showed lower incident cases of adverse self-perceived general health.

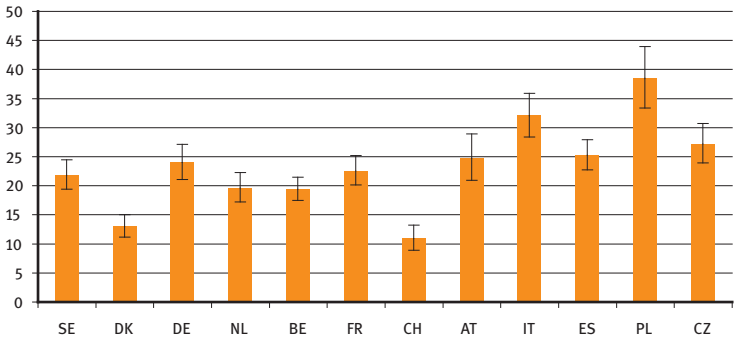


Figure 14.1: Country specific 4-year incidence proportions (y-axis %) of respondents developing incident fair or poor self-perceived health from Wave 2 to Wave 4. (N=11,812)

Notes: Adjusted for age, gender and time interval. Unweighted data. Whiskers represent confidence intervals (CI).

Source: Wave 2 release 2.5.0, Wave 4 release 1

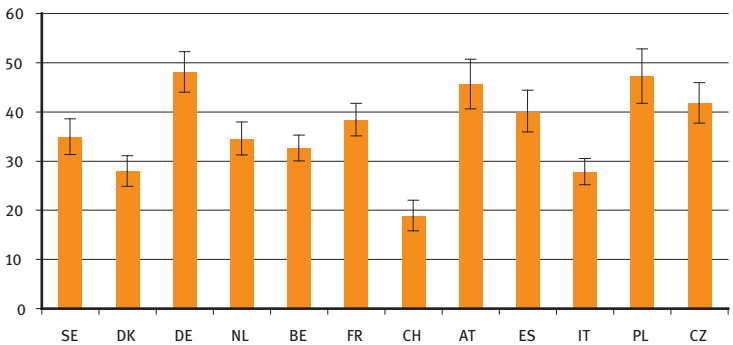


Figure 14.2: Country specific 4-year incidence proportions (y-axis %) of respondents developing incident long-term health problems from Wave 2 to Wave 4. (N=9,251)

Notes: Adjusted for age, gender and time interval. Unweighted data. Whiskers represent confidence intervals (CI).

Source: Wave 2 release 2.5.0, Wave 4 release 1

The GALI question aims at describing those who because of a health problem develop limitation in activities people normally do and lasting for more than six months. The incidence proportions were rather high, approximately 25 to 40 per cent when looking at incident cases, i.e. cases who reported being not limited at all in Wave 2, but reporting to be limited, severely or not severely in Wave 4 (Figure 14.5). This striking increase between the two waves was, however, mainly

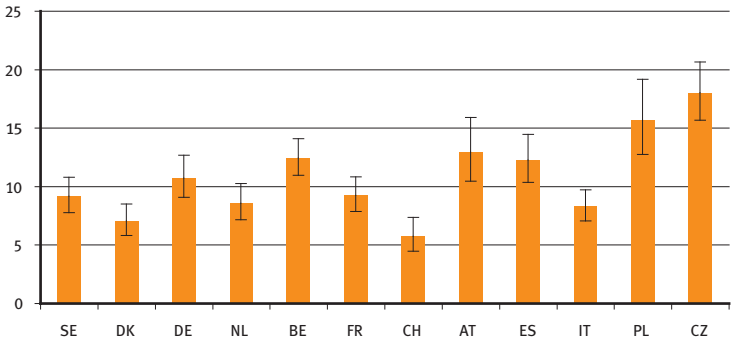


Figure 14.3: Country specific 4-year incidence proportions (y-axis %) of respondents developing incident impairment in instrumental activities of daily living (1+IADL) from Wave 2 to Wave 4 (N=15,297)

Notes: Adjusted for age, gender and time interval. Unweighted data. Whiskers represent confidence intervals (CI).

Source: Wave 2 release 2.5.0, Wave 4 release 1

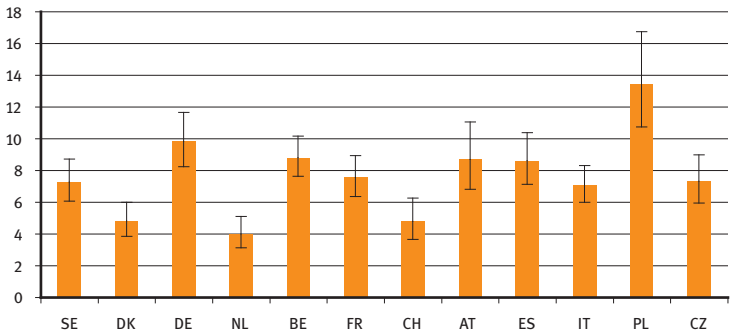


Figure 14.4: Country specific 4-year incidence proportions (y-axis %) of respondents developing incident impairment in basic activities of daily living (1+ADL) from Wave 2 to Wave 4 (N=16,125)

Notes: Adjusted for age, gender and time interval. Unweighted data. Whiskers represent confidence intervals (CI).

Source: Wave 2 release 2.5.0, Wave 4 release 1

accounted for by incident cases of not severely limited cases as seen in Figure 14.6. Again, the geographical pattern showed the lowest incidence proportions for the Northern SHARE countries and Switzerland.

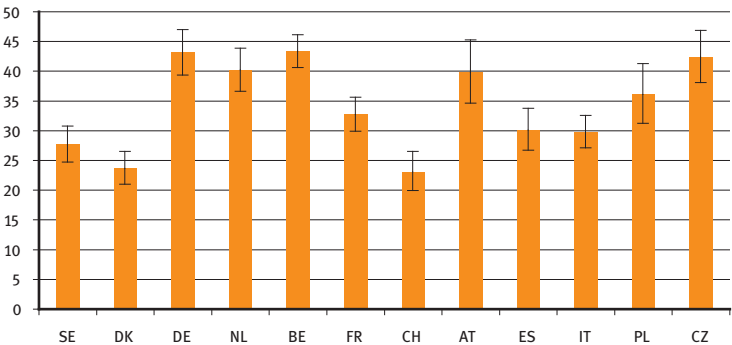


Figure 14.5: Country specific 4-year incidence proportions (y-axis %) of respondents developing incident limitations, both severely and non-severely, in usual activities for at least six months and due to a health problem from Wave 2 to Wave 4 (N=10,254)

Notes: Adjusted for age, gender and time interval. Unweighted data. Whiskers represent confidence intervals (CI).

Source: Wave 2 release 2.5.0, Wave 4 release 1

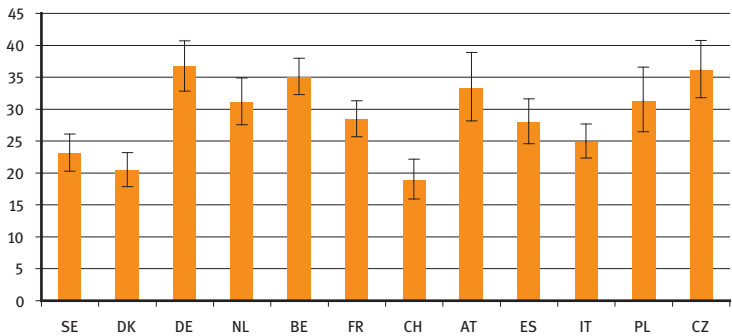


Figure 14.6: Country specific 4-year incidence proportions (y-axis %) of respondents developing incident limitations, only non-severely, in usual activities for at least six months and due to a health problem, from Wave 2 to Wave 4 (N=9,497)

Notes: Adjusted for age, gender and time interval. Unweighted data. Whiskers represent confidence intervals (CI).

Source: Wave 2 release 2.5.0, Wave 4 release 1

14.2 Higher risk of developing cardio-vascular diseases in the Eastern and Southern European SHARE countries

With respect to the incidence of cardio-vascular diseases and the diseases predisposing to cardio-vascular disease, i. e. hypertension and diabetes, cross-national comparisons showed an almost similar geographical pattern as seen with the self-perceived general and functional health outcomes earlier in this chapter. In the case of diabetes, the incidence was generally higher in the more Eastern and Continental countries (Poland, the Czech Republic, Austria and Germany) and in the Southern European countries (Spain and Italy) (Figure 14.7). A similar geographical pattern was observed for hypertension (Figure 14.8).

No clear geographical pattern could be seen in the incidence of cardiovascular diseases (Figure 14.9) except for Denmark and Switzerland reporting the lowest incidence proportions, but in incident heart attack (Figure 14.10) there was a marked geographical pattern of higher incidence proportions in the most Eastern and Southern SHARE countries. In contrast, incident stroke (Figure 14.11) was almost uniformly distributed across the participating countries. It is noteworthy that Switzerland showed the lowest (or was among the lowest) incidence proportions in cardiovascular disease, heart attack and stroke, and the predisposing diseases diabetes and hypertension.

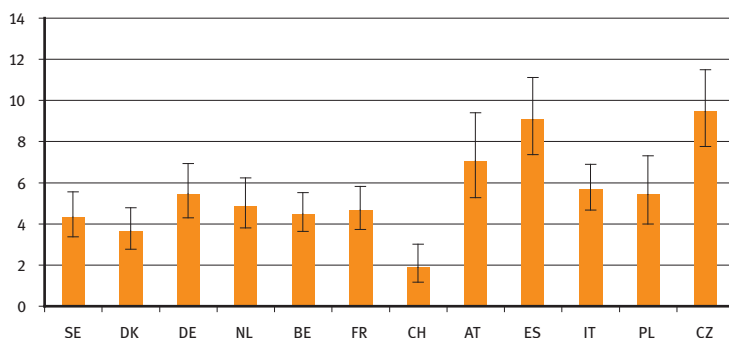


Figure 14.7: Country specific 4-year incidence proportions (y-axis %) of respondents developing incident diabetes from Wave 2 to Wave 4 (N=15,860)

Notes: Adjusted for age, gender and time interval. Unweighted data. Whiskers represent confidence intervals (CI).

Source: Wave 2 release 2.5.0, Wave 4 release 1

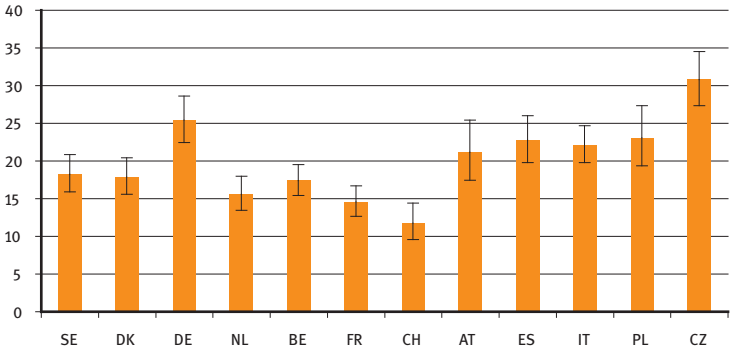


Figure 14.8: Country specific 4-year incidence proportions (y-axis %) of respondents developing incident hypertension from Wave 2 to Wave 4 (N=11,489)

Notes: Adjusted for age, gender and time interval. Unweighted data. Whiskers represent confidence intervals (CI).

Source: Wave 2 release 2.5.0, Wave 4 release 1

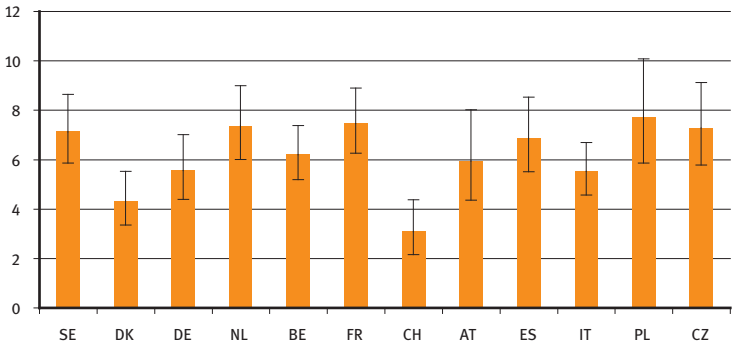


Figure 14.9: Country specific 4-year incidence proportions (y-axis %) of respondents developing incident cardio-vascular disease from Wave 2 to Wave 4 (N=15,564)

Notes: Adjusted for age, gender and time interval. Unweighted data. Whisker represents confidence intervals (CI).

Source: Wave 2 release 2.5.0, Wave 4 release 1

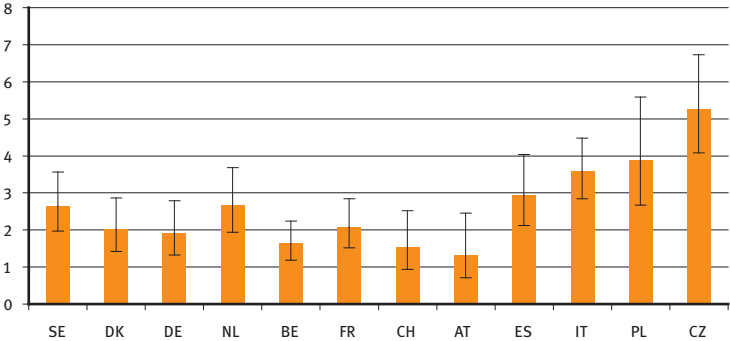


Figure 14.10: Country specific 4-year incidence proportions (y-axis %) of respondents developing incident heart attack from Wave 2 to Wave 4 (N=17,451)

Notes: Adjusted for age, gender and time interval. Unweighted data. Whiskers represent confidence intervals (CI).

Source: Wave 2 release 2.5.0, Wave 4 release 1

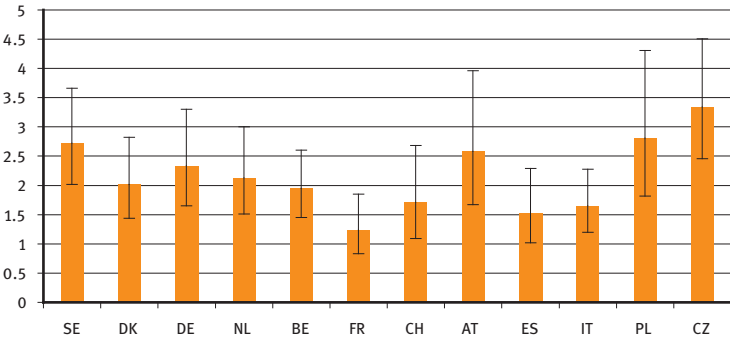


Figure 14.11: Country specific 4-year incidence proportions (y-axis %) of respondents developing incident stroke from Wave 2 to Wave 4 (N=17,442)

Notes: Adjusted for age, gender and time interval. Unweighted data. Whiskers represent confidence intervals (CI).

Source: Wave 2 release 2.5.0, Wave 4 release 1

14.3 Cross-national comparisons of incident deaths mirror life expectancy at age 50

Among the SHARE countries incident deaths were most common in the Eastern European countries, Spain and Denmark, but confidence intervals were large and overlapping due to the low numbers of observations. But it was interesting to note that incident cases of deaths (mortality), with the exception of Spain, showed an almost similar pattern with known life expectancies at age 50 in the same countries. According to the 2011 Eurostat life expectancy tables (EUROSTAT 2012), Denmark is, within the SHARE countries participating in both Waves 2 and 4, the country with the third lowest life expectancy at age 50 (31.5 years) closely followed by the Czech Republic (29.8 years) and Poland (29.5 years). Noteworthy was also the discrepancy between the low incident proportions of adverse self-reported health outcomes e.g. poor self-perceived health, and the high incidence proportions of deaths observed in Denmark (Figure 14.12).

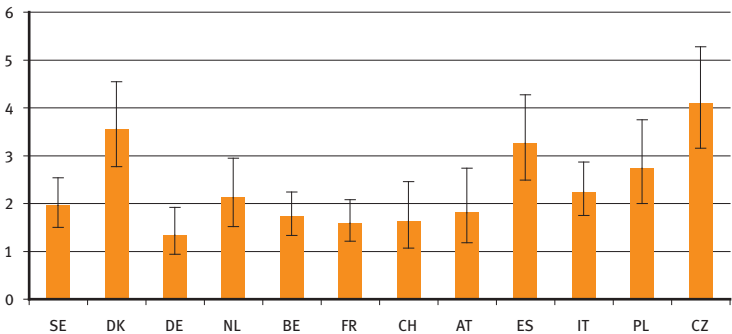


Figure 14.12: Country specific 4-year incidence proportions (y-axis %) of respondents dying between Wave 2 and Wave 4 (N=18,375)

Notes: Adjusted for age, gender and time interval. Unweighted data. Whiskers represent confidence intervals (CI).

Source: Wave 2 release 2.5.0, Wave 4 release 1

14.4 Low socioeconomic status significantly increases the risk of incident poor self-perceived health but with no geographical pattern

Self-perceived health is a well-known predictor of mortality (Idler 1997), and is influenced by education (Bago d'Uva 2008) and wealth (Doorslaer 1997). We analysed the influence of socioeconomic status by education and by wealth on the incidence of developing poor self-perceived health from SHARE Wave 2 to Wave 4.

Analyses of the risk of going from an excellent, very good or good self-perceived health to fair or poor self-perceived health clearly showed that the educational level matters (Figure 14.13). Especially the lowest educational level was in most countries associated with a significantly higher odds of developing poor health, odds ratios (OR) being between 1.59 to 6.16, the exceptions being Germany, Poland and Italy, which may be explained by low number of observations. Having a medium level of education had a significant negative effect only in the Czech Republic, Spain, Austria, Switzerland, Germany and Sweden with ORs between 1.56 and 3.09.

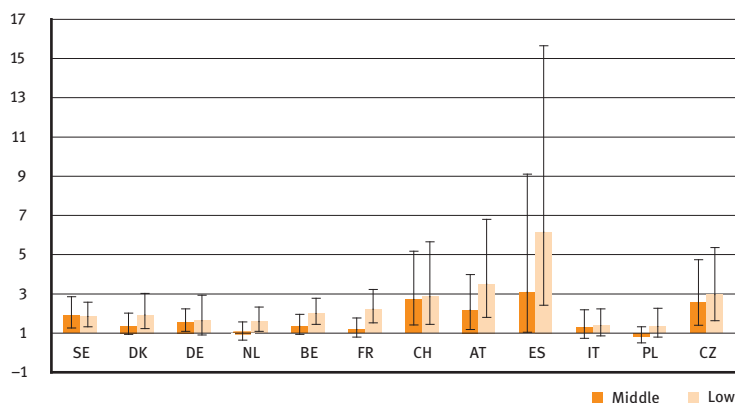


Figure 14.13: Country-specific odds ratios (OR) for developing poor self-perceived health between Wave 2 and Wave 4 in relation to educational level by ISCED categories (middle and low) (N=11,812)

Notes: Reference group is the highest educational group (post-secondary education). Adjusted for age, gender, and time interval. Unweighted data. Whiskers represent confidence intervals (CI).

Source: Wave 2 release 2.5.0, Wave 4 release 1

Although Austria and in particular Spain could be noted for presenting with the highest ORs in both the lowest and medium educational levels confidence intervals were overlapping with the other countries, and may thus not represent a true country specific difference from the other SHARE countries. However, the ORs remain significant and should thus lead to further investigation of this area.

Also, being less wealthy was associated with an increased risk of adverse health outcome. Participants in the lowest wealth tertile had a significantly higher risk of incident poor self-perceived health in almost all countries (ORs between 1.70 and 2.83) with the exception of Austria, the Czech Republic and Poland. Being in the medium wealth tertile had less impact on the risk of incident poor self-rated health in most countries, with the exceptions of Sweden, Denmark, Belgium, Spain and the Czech Republic (Figure. 14.14). As with educational level country specific confidence intervals are overlapping and does not allow to interpret the results at the institutional level.

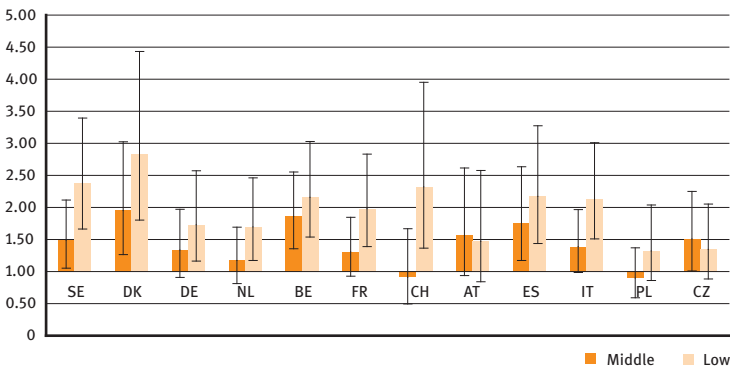


Figure 14.14: Country-specific odds ratios (OR) for developing poor self-perceived health between Wave 2 and Wave 4 in relation to wealth tertiles (N=11,811)
Notes: Reference group is the highest wealth tertile. Adjusted for age, gender, and time interval. Whiskers represent confidence intervals (CI).
Source: Wave 2 release 2.5.0, Wave 4 release 1

14.5 Increasing active ageing in Europe by prioritizing countries with the highest incidences of adverse health outcomes

Overall, a pattern of more incident cases of adverse health outcomes could be detected in the Eastern and Southern countries, but also in Germany and Austria. The presented results were adjusted for age and gender, but even when adjusting for potential confounders such as BMI, physical activity, smoking and socio-economic status, the results did not change significantly. However, although there is a clear geographical pattern our results must be interpreted with caution since the analyses were carried out on unweighted data sets of Wave 2 and Wave 4.

The year 2012 was the European Union year of Active Ageing and Intergenerational Solidarity. With this initiative the European Union aimed at addressing the challenges arising from the ageing European population and the need for strategies in promoting active ageing. In continuation of this the European Union has set a goal of raising the average number of healthy life years (HLY) by two years by year 2020 (European Commission 2012). HLY is defined as years of life without any long-standing limitations in activities people normally do (e. g. GALI = not limited) and is used to monitor healthy life expectancy in Europe (van Oyen 2006). Based on the presented results it may be suggested that focus is pointed at those countries with the highest incidences of adverse health outcomes, especially the Eastern European countries. This is also supported by the cross-sectional results of Wave 4 in which three additional Eastern European countries, Slovenia, Hungary and Estonia, showed higher prevalences of poor subjective health outcomes and common diseases (see Lindholm Eriksen and colleagues in this volume).

The coming decades will bring along large cohorts of older people due to the big post-World War II birth cohorts hitting retirement age. The current low fertility rate in most European countries is adding to the societal challenges of an ageing population, including the organisation and costs of future health care in an ageing European population (Christiansen 2012). Therefore it is of great importance to address how we may adapt institutional factors in order to increase healthy ageing. By increasing healthy ageing we also increase active ageing and intergenerational solidarity.

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Carmen Borrat-Besson, Valérie-Anne Ryser and Boris Wernli

15 Transitions between frailty states – a European comparison

-
- ▶ Frailty trajectory is not a linear process but a dynamic one with room for improvement
 - ▶ Men and women experience different patterns of frailty transitions
 - ▶ Physical activity prevents the decline of frailty states and facilitates frailty states improvement
 - ▶ A North-South gradient was observed in the probability to decline toward a worse frailty state
-

The unprecedented increase in life expectancy means that the number of young-old and old-old citizens will dramatically increase. However, individuals aged 50+ are much more vulnerable. They are more likely to experience negative events such as hospitalisation, institutionalisation, disability, or even death. The increase in the number of seniors impacts the sustainability of health and social security systems. Therefore, the development of effective interventions based on active ageing and inter-individual solidarity to prevent, delay, and reduce the collateral consequences of ageing is a challenge for any ageing society.

This chapter examines the evolution of physical vulnerability among older individuals from a frailty perspective. The concept of frailty appeared in the geriatric literature 20 years ago to define physical decline due to ageing (Spini et al. 2007: 572). It refers to a complex phenomenon recognised as geriatric syndrome, which is distinct from disability and comorbidity, resulting from a gradual and inevitable decline in reserve capacity, affecting different physiologic systems as people age (Fried & Walston 2003: 1489–1490, Spini et al. 2007: 573–575). In other words, physiological systems are wearing out as people age. The fact that many systems become disturbed reduces and weakens resilience capacities. This leads to a loss of homeostasis, which means that the body is not anymore able to react properly to environmental changes in order to maintain itself in the condition so that all organs can function properly.

Although frailty is a gradual dynamic process, few studies have adopted a longitudinal perspective (Guilley et al. 2008: 301, Etman et al. 2012: 1116–1117, Sirven 2012: 9–12). Recent longitudinal studies established that several sociodemographic determinants such as age, gender, and social inequalities affect the frailty process. Older individuals are more likely to become frail. Women are more affected than men by physical decline, and their trajectories in older age often take a more dramatic turn compared to men. And finally, the evolution of frailty is related to financial condition; poorer individuals are more likely to become frail when they get older (Sirven 2012: 23).

One of the most common recommendations to prevent and delay the onset of frailty is physical exercise, which is considered one of the most effective prevention tools against frailty (Fried 2011:1–2). Designing new ways to keep people active and socially engaged would be a major political measure to prepare against what the American National Institute of Ageing characterised as a “silver tsunami” (Fox et al. 2001 in Fried & Hall 2008: 1791).

Based on the theoretical background presented above, this research aims to offer more insights into the way people’s frailty state evolves over time. Using the SHARE data from Wave 2 and Wave 4, we examine first to what extent sociodemographic determinants and more specifically living arrangements and gender are related to different evolution patterns, and second to what extent engagement in regular physical exercise prevents the transition toward worse frailty states. These findings will contribute to the broader literature on the relation between socio-determinants and frailty transitions patterns in older age among European countries.

15.1 Sample, measures and methods

15.1.1 Sample

The study population consists of the 15,776 participants who took part in the second and fourth waves of the SHARE survey. We selected individuals aged 50+ for whom complete information on frailty state at both waves and on all variables considered in the analyses was available.

15.1.2 Measurement of frailty state and frailty transitions

Our dependent variable is the evolution of frailty states between Wave 2 and Wave 4. There are different operational definitions of frailty in the literature (Levers et al. 2006: 284–287). For the current paper, we followed the definition proposed by Fried and Walston (2003: 1489–1490) and adapted for the SHARE survey by Santos-Eggimann et al. (2009: 676). Frailty is defined on the basis of the five following dimensions: 1) shrinking, 2) exhaustion, 3) low physical activity, 4) muscle weakness, and 5) slow walking speed. *Shrinking* refers to the self-report of appetite loss. *Exhaustion* refers to the self-report of poor endurance and lack of energy during the month preceding the interview. *Low physical activity* refers to individuals who rarely or never engaged in activities that required a low or moderate level of energy such as gardening, cleaning the car, or going for a walk. *Muscle weakness* is based on grip strength measures. This dimension was fulfilled when

a respondent's score was in the lowest 20 per cent, applying cut-offs based on gender and body mass index. *Slow walking speed* is operationalised by a question that asks participants whether they experienced difficulty (expected to last more than 3 months) walking 100 meters and/or climbing one flight of stairs because of a health problem. Based on the number of fulfilled dimensions, respondents were considered non-frail (zero dimensions), pre-frail (one or two dimensions), or frail (three or more dimensions).

Then, based on this categorisation – non-frail, pre-frail, frail – two dummy variables were computed to capture the transitions of frailty states between Waves 2 and 4. The first dummy variable identifies people who experienced a transition toward a worse frailty state or died (0= no change and 1=got worse or died) and the second dummy variable identifies individuals whose frailty state improved over time (0= no change and 1 = improved).

Of the 15,776 participants, 6,713 (42.5 %) showed a transition toward another frailty state. Transitions toward a worse frailty state (N=4,325; 27.4 %) were more likely than transitions toward a better frailty state (N=2,388; 15.1 %). Table 15.1 details the transition patterns observed between Wave 2 and Wave 4.

Table 15.1: Frequency of the different frailty transition patterns between Waves 2 and 4

Frailty state at:		Layer %	Total %	N
Wave 2	Wave 4			
Non-frail to...	Non-frail	63.4	34.6	5,461
	Pre-frail	31.7	17.3	2,733
	Frail	2.6	1.4	224
	Deceased	2.2	1.2	191
	SUBTOTAL	100.0	54.6	8,609
Pre-frail to...	Non-frail	32.4	12.8	2,012
	Pre-frail	51.3	20.2	3,282
	Frail	11.6	4.6	719
	Deceased	4.6	1.8	288
	SUBTOTAL	100.0	39.3	6,201
Frail to...	Non-frail	7.0	0.4	68
	Pre-frail	31.9	2.0	308
	Frail	43.5	2.7	420
	Deceased	17.6	1.1	170
	SUBTOTAL	100.0	6.1	966

Notes: Excluding individuals younger than 50 years old

Source: SHARE Wave 2 release 2.5.0; Wave 4 release 1

At Wave 2, 8,609 participants were non-frail. Most of them remained non-frail at Wave 4 (63.4 %). In case of health decline, transition toward pre-frailty (31.7 %) was much more likely than transition toward frailty (2.6 %) or death (2.2 %).

At Wave 2, 6,201 participants were pre-frail. The majority of them remained pre-frail at Wave 4 (51.3 %). The health state of a non-negligible number of participants improved over time, moving from pre-frailty to non-frailty (32.4 %), whereas a minority of them declined, moving from pre-frailty to frailty (11.6 %) or death (4.6 %).

Finally, 966 individuals were frail at Wave 2. The majority of them remained frail at Wave 4 (43.5 %). Again, a non-negligible number of frail individuals improved over time, moving from frailty to pre-frailty (31.9 %) or non-frailty (7.0 %), whereas about one fifth died (17.6 %).

Our descriptive results show that individuals are more likely to experience a transition toward a worse frailty state than toward a better frailty state. This is not surprising given the fact that panel participants are getting older and more exposed to physiological degenerative processes (see Andersen-Ranberg et al. in this volume). The descriptive results also show that a non-negligible number of individuals improve over time. This is in line with the literature and confirms that the frailty process is not a linear one but a dynamic one with space for improvement. Individuals who get pre-frail might still have enough resources to recover from their health decline. However, the literature shows that individuals who were already once pre-frail are more likely to get pre-frail again and to further decline toward frailty (Spini et al. 2007: 576–577).

15.1.3 Individual characteristics considered in the analyses

The individual characteristics of interest were (1) gender (male=1), (2) living arrangement, and (3) regular physical exercise at baseline. *Living arrangement* refers to whether people live alone, coded 1, or with a spouse or partner, coded 0. *Regular physical exercise* refers to individuals who engage in vigorous physical activity, such as sports, heavy housework, or a job that involves physical labour at least once a month, coded 1.

Analyses were controlled for age, years of education, chronic diseases, income, frailty state at baseline, and country. Chronic diseases were measured by a dichotomous variable where 0 refers to individuals who had no chronic diseases and 1 to individuals who indicated one or more chronic diseases. Income information is based on the total annual household income adjusted for household size by dividing the value of income following the OECD (1982) equivalent-scale and categorised into country-specific tertiles. Twelve countries were part of the

analyses: Sweden, Denmark, Germany, Netherlands, Belgium, France, Switzerland, Austria, Spain, Italy, Poland, Czech Republic. Each country was compared to the mean of the overall sample.

15.1.4 The statistical analyses

We used logistic regressions to model four-year changes in frailty state as a function of (1) gender, (2) living arrangement, and (3) regular physical exercise and controlled for age, years of education, chronic diseases, income, frailty state at baseline and country. We used “no change” in frailty state as a reference category. Interaction terms between frailty state at baseline and each of the variables of interest were introduced one by one. No weights were used.

15.2 Results

15.2.1 The relationship between gender and frailty transitions

Figure 15.1 (left-hand panel) shows that men who were non-frail at baseline were less likely to move toward a worse frailty state compared to non-frail females at baseline (Odds Ratio (OR) = 0.81; 95 per cent confidence interval (CI) 0.73 to 0.88). However, this advantage among men disappears for pre-frail and frail individuals at baseline. Indeed, men who were pre-frail at baseline were more likely to pass to a worse frailty state compared to pre-frail women at baseline (OR=1.26; 95 per cent CI 1.08 to 1.46), and men who were frail at baseline were more likely to die compared to frail women at baseline (OR= 2.51; 95 per cent CI 1.70 to 3.70).

However, even though pre-frail and frail men were more likely to move toward a worse frailty state, they were also more likely to move toward a better frailty state (right-hand panel of Figure 15.1, OR= 1.35; 95 per cent CI 1.21 to 1.51).

These results show that the frailty process differs for men and women. In line with the literature, they suggest that women experience a smoother decline, living longer in a sort of intermediary health state, whereas men live longer in a good health, recovering more often from slight health declines, but declining rapidly once reaching a certain point.

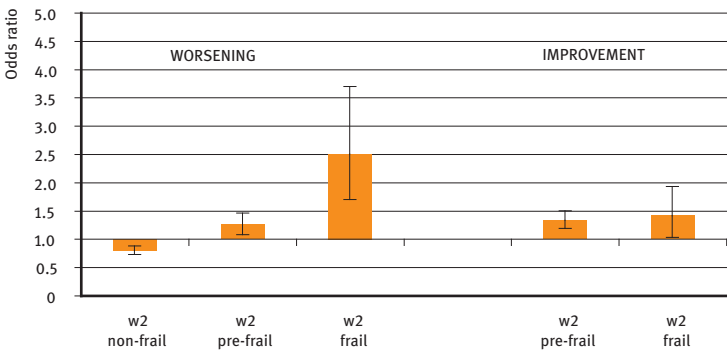


Figure 15.1: Odds ratio comparing men and women (ref.) with respect to their probability to move toward a worse versus better frailty state according to their baseline frailty state
Notes: Logistic regressions were controlled for age, years of education, chronic diseases, income, frailty state at baseline, and country (Sweden, Denmark, Germany, Netherlands, Belgium, France, Switzerland, Austria, Spain, Italy, Poland, and Czech Republic). Worsening: N=13,388; Improvement: N=5,990.
Source: SHARE Wave 2 release 2.5.0; Wave 4 release 1

15.2.2 The relationship between living arrangement and frailty transitions

Figure 15.2 shows that non-frail individuals who live alone were more likely to move toward a worse frailty state compared to non-frail individuals who live with a partner or a spouse (OR=1.15; 95 per cent CI 1.02 to 1.29). This difference turned out to be non-significant for pre-frail and frail individuals regardless of whether they experienced a transition toward a worse or a better frailty state.

This result is consistent with the literature showing that social networks are positively linked to self-rated health (see Deindl et al. in this volume) and physical health. An explanation might be that social contacts facilitate healthier behaviours such as exercise or eating healthy. They might also promote adherence to medical regimes and thus maximises adaptation and recovery from illness. Finally, social network availability influences psychological processes like mood, depression, and self-esteem, which in turn might influence people's general physical health state. However according to our results this protective effect seems to be significant only at the early stage of the frailty process.

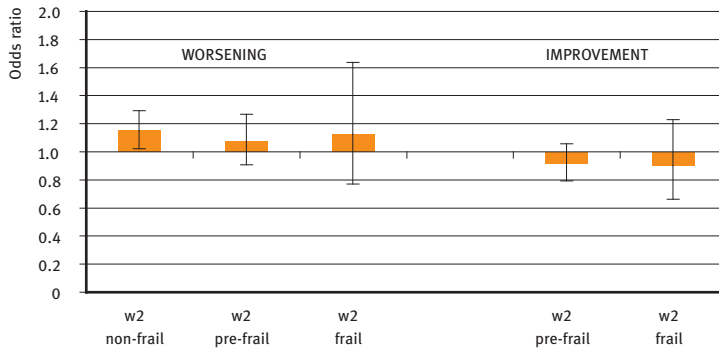


Figure 15.2: Odds ratio comparing individuals living alone and individuals living with a partner (ref.) with respect to their probability to move toward a worse versus better frailty state according to their baseline frailty state

Notes: Logistic regressions were controlled for age, years of education, chronic diseases, income, frailty state at baseline, and country (Sweden, Denmark, Germany, Netherlands, Belgium, France, Switzerland, Austria, Spain, Italy, Poland, and Czech Republic). Worsening: N=13,388; Improvement: N=5,990.

Source: SHARE Wave 2 release 2.5.0; Wave 4 release 1

15.2.3 Regular physical exercise lowers the risk of becoming frail

Figure 15.3 (left-hand panel) shows that individuals who engage in regular physical exercise at baseline were less likely to move toward a worse frailty state four years later (OR=0.75; 95 per cent CI 0.81 to 0.69). However the impact of regular physical exercise was stronger for individuals who were pre-frail at baseline (OR=0.55; 95 per cent CI 0.48 to 0.65) than for individuals who were non-frail (OR=0.85; 95 per cent CI 0.77 to 0.94) or frail (OR=0.68; 95 per cent CI 0.32 to 1.41) at baseline.

Similarly, Figure 15.3 (right-hand panel) shows that individuals who engage regularly in physical exercise at baseline were more likely to move toward a better frailty state four years later (OR=1.23; 95 per cent CI 1.10 to 1.38). However, the impact of regular physical exercise was stronger for individuals who were frail at baseline (OR=1.81; 95 per cent CI 1.20 to 2.75) than for individuals who were pre-frail at baseline (OR=1.19; 95 per cent CI 1.06 to 1.34).

These results are consistent with Fried's assertion (2011) that regular physical exercise might be one of the most promising preventive interventions against frailty. Indeed, our results show that regular physical exercise was associated with a lower probability to pass to a worse frailty state and with a higher probability to pass to a better frailty state.

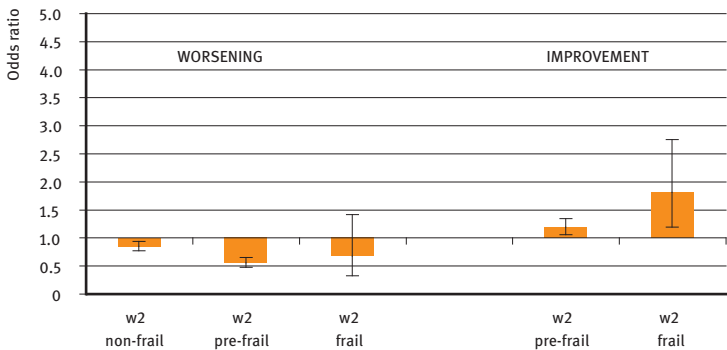


Figure 15.3: Odds ratio comparing individuals' engagement in regular physical exercise or inactive individuals (ref.) with respect to their probability to move toward a worse versus better frailty state according to their baseline frailty state

Notes: Logistic regressions were controlled for age, years of education, chronic diseases, income, frailty state at baseline, and country (Sweden, Denmark, Germany, Netherlands, Belgium, France, Switzerland, Austria, Spain, Italy, Poland, and Czech Republic). Worsening: N=13,388; Improvement: N=5,990.

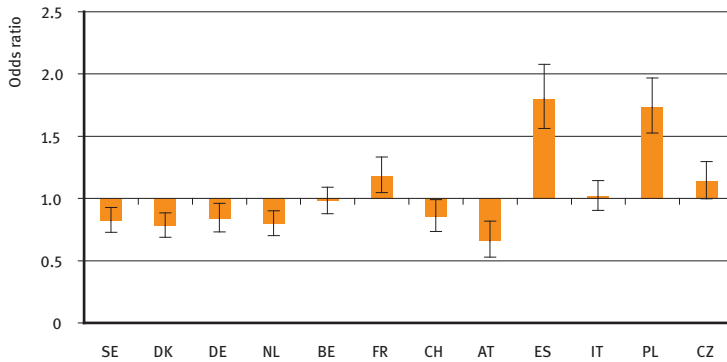
Source: SHARE Wave 2 release 2.5.0; Wave 4 release 1

15.2.4 Variations of frailty transitions across European countries

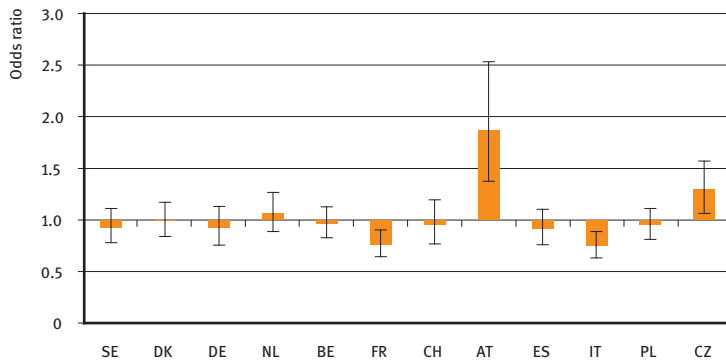
Country level probabilities of transitions toward worse versus better frailty states were compared to the average probability of the overall sample. Figure 15.4a shows that the probability to experience a transition toward a worse frailty state after four years varies from one country to another. Individuals living in the Northern countries (Sweden, Denmark, Germany, and Netherlands) were less likely to experience a transition toward a worse frailty state. This was also the case for individuals living in Switzerland and Austria. In contrast, individuals living in France, Italy and Poland were more likely to move toward a worse frailty state.

The differences between countries were attenuated when looking at the probability to move toward a better frailty state as shown by the Figure 15.4b. Only the Czech Republic, Italy and France significantly differed from the average. Italians and French were less likely and Czechs were more likely to move toward a better frailty state than the average.

We hypothesised that people's health state would decline more rapidly in some countries because sport was less widespread in these countries, as shown by the Eurobarometer Survey on Sport and Physical Activity (2010: 10–18) and because, as demonstrated by our analyses, regular physical exercise was signifi-



(a) Odds ratio comparing the country level probability to move toward a worse frailty state to the probability of the overall sample (N=13,388)



(b) Odds ratio comparing the country level probability to move toward a better frailty state to the probability of the overall sample (N=5,990)

Figure 15.4: Country specific transitions patterns

Notes: Logistic regressions were controlled for age, years of education, chronic diseases, income and frailty state at baseline.

Source: SHARE Wave 2 release 2.5.0; Wave 4 release 1

cantly related to the evolution of frailty. However, sport did not mediate differences between countries in our analyses. Other authors explained this North-South gradient in frailty state by differences in rates of institutionalisation around Europe (Santos-Eggiman et al. 2009: 680). As far as frailty is associated with disability, the higher prevalence of frailty in the Southern Europe might be due to a lower rate of institutionalisation compared to Central and Northern Europe.

15.3 Principal results and general discussion

Individuals aged 50+ experience a lot of new life course transitions (e. g. transition to retirement, to grandparenthood, to frailty, disease and disability). SHARE is a unique longitudinal data source which gives researchers the opportunity to better understand the processes underlying these important life course transitions and provide scientific based information to develop targeted prevention and intervention campaigns.

In this regard, this contribution examined the evolution of frailty among individuals who participated to the second and the fourth wave of SHARE. We first reported the different frailty transition patterns that were observed in this sample. The descriptive results suggest that frailty trajectories are not a linear process but a dynamic one with room for improvement. Indeed, a substantial percentage of participants who were already pre-frail or frail at baseline experienced an improvement of their physical health state. Future studies should examine more closely this process by considering for instance more than two measurement points.

In a second step, we used logistic regressions to test to what extent sociodemographic variables and regular physical exercise were related to different frailty transition patterns. First of all, our results showed gender-specific frailty transition patterns. The results suggest that women might experience a smoother decline, living longer in an intermediary health state, compared to men who live longer in a good health condition, recovering more often from slight health declines, but declining rapidly once reaching a certain threshold. The next step would be to further investigate the reasons underlying these differences and to model terminal drop or terminal health decline by gender.

Living arrangement was also related to frailty transition patterns, but only among individuals who were non-frail at baseline. Non-frail people at baseline who live alone were more likely to decline than non-frail individuals living with a spouse or a partner. One explanation might be that people living with someone have more social resources, which help them maintain a stable and good health state and motivates them to remain active or to adopt health-promoting behaviors. Future studies need to investigate further why living arrangement matters only for the specific group of non-frail individuals.

With respect to regular physical exercise, the results showed that individuals engaging in vigorous physical exercise at least once a month were less likely to move toward a worse frailty state and more likely to move toward a better frailty state. These results consolidate the claim that the promotion of physical exercise is an efficient prevention measure to delay and reduce the onset and progression of frailty among young-old and old-old individuals.

Finally, we observed, once again, a North-South gradient in the probability to decline toward a worse frailty state that could not be explained by cross-country differences in physical activity levels. Further research should investigate country-specific characteristics more thoroughly to better understand the cross-country differences in frailty transition patterns.

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Jérôme Schoenmaeckers

16 Filling in the gap: how to explain the divergence between subjective and objective health measures

-
- ▶ Most respondents underestimate their health compared to a “true health index” based on objective factors
 - ▶ The older respondents are, the less likely they under- and more likely they overestimate their health
 - ▶ Public health expenditures link more closely to objective than to subjective health measures
 - ▶ Future research should focus on understanding the genesis of health assessment
-

16.1 Assessing health: just how?

Increasing the quality of life for older people is a major concern because the proportion of the ageing over the active population continues to grow. In order to optimise older people’s opportunities, evaluating their situation and their health status in particular is essential for policy makers at a time when European countries are facing substantial public deficits.

As Sen (2002) pointed out, a critical analysis of public health care and a resulting medical strategy depends, among other things, “on how individual states of health and illness are assessed”(Sen 2002: 860). He also noticed that “the internal view of health deserves attention, but relying on it in assessing health care or in evaluating medical strategy can be extremely misleading”(Sen 2002: 861). Indeed, the design of a public policy requires precise information so as to allocate rare resources in the most efficient way. As there is a mismatch between self-reported health (SRH) and physician-reported health information (which can also include health register data), measuring the gap between both indicators and decoding systematic patterns dependent on socioeconomic differences can be helpful. This divergence between SRH and the “actual” health state of individuals measured by using medical records or clinical examination, has notably been demonstrated by Mackenbach et al. (1996) and Crossley and Kennedy (2002).

A part of literature explains that self-reporting underestimates actual health, by respondents forgetting some diseases, or by thinking that they no longer have a certain disease, because it has been or is being treated – even though they were

asked “Has a doctor ever told you that you had/have now...?”. Moreover, Subramanian et al. (2009) insist on the fact that “self-assessment of health is directly contingent on social experience; it has been argued that disadvantaged groups will fail to perceive and report the presence of illness or health deficits”. This may also be due to non-information by the health professional to the patient/respondent.

In this article, we will conduct within country analyses of SRH for all countries included in SHARE. More precisely, we use SHARE data from the fourth wave to assess whether compatriots speak “different languages” when responding to a same health question. Our analysis is twofold. Firstly, we compute a “true health index” following the methodology proposed by Poterba et al. (2011) and compare the distributions of this index to SRH measures in the SHARE countries. Secondly, we try to explain the divergence observed between SRH and a true adjusted health status. More precisely, we test the explanatory power of gender, age, education, income and wealth but also that of other variables that can have an influence on self-assessment, such as happiness that we characterise by social network size, marital and dwelling statuses following former research (Layard 2005).

16.2 Introducing a new “true health index”

In addition to SRH which is asked to respondents at the question PH003 : “Would you say your health is...?” in Wave 4, SHARE provides a wide range of information relating to specific health problems described in detail in other contributions to this volume. Questions on self-reported diagnosed chronic conditions, physical symptoms or functional limitations combined with the results of physical tests (predictive of disability and mortality in old age, Jürges 2007) are used to compute, for each individual, a “true health index”. Table 16.1 shows the various conditions chosen by Jürges (2007) on the one hand, and by Poterba et al. (2010) on the other to build their own latent health index. The third column lists the various conditions considered in the creation of our index. This health index is also not completely objective; it is just a different and more complex measure than SRH, based on self-reported medical diagnosis. For simplicity, we will call it “true health index” from now.

Like Jürges (2007), we used different self-reported physical conditions, having ever been treated for depression, body mass index (BMI), grip strength and peakflow (“low” corresponds to the bottom quartile once data were sex standardised and “no” corresponds to tests which were not complete for health, or other, reasons). We added three measures of functional limitations: *those in*

Table 16.1: Comparison of health indexes based on self-reported physical conditions

Jürges (2007)	Poterba et al. (2010)	Our index
Generalised Ordered Probit Model	First Principal Component	First Principal Component
Heart attack or other heart problems	Number of periods: health problems limit work	Heart attack or other heart problems
High blood pressure	Number of periods with difficulty push/pull	High blood pressure
High blood cholesterol	Number of periods: self-reported health fair or poor	High blood cholesterol
Stroke or cerebral vascular disease	Number of periods with difficulty walking several blocks	Stroke or cerebral vascular disease
Diabetes	Number of periods with difficulty lift/carry	Diabetes
Chronic lung disease	Number of periods with some difficulty with an ADL	Chronic lung disease
Asthma	Number of periods with difficulty stoop/kneel/crouch	Arthritis or rheumatism
Arthritis or rheumatism	Number of periods with difficulty getting up from chair	Cancer or malignant tumor
Osteoporosis	Number of periods with difficulty reach/extend arms up	Stomach, duodenal or peptic ulcer
Cancer	Number of periods with difficulty climbing stairs	Parkinson disease
Stomach, duodenal or peptic ulcer	Number of periods: health worse in previous period	Cataracts
Parkinson disease	Ever experience arthritis	Hip fracture or femoral fracture
Cataracts	Number of doctor visits	Other fractures
Hip fracture or femoral fracture	Number of periods with difficulty pick up a dime	Alzheimer's disease, dementia
Other conditions	Number of periods with difficulty sitting two hours	Other conditions
Ever treated for depression	Number of periods with back problems	Ever treated for depression
Low grip strength	Ever experience psychological problems	Low grip strength
No grip strength	Ever experience lung disease	No grip strength
Low peakflow	Ever experience diabetes	Low peakflow
No peakflow	Ever experience high blood pressure	No peakflow
BMI<20 (underweight)	BMI at beginning of period	BMI<20 (underweight)
25<BMI<30 (overweight)	Number hospital stays	25<BMI<30 (overweight)
BMI>30 (obese)	Number of periods: home care	BMI>30 (obese)
	Ever experience stroke	Mobility (3 mobility limitations or more)
	Ever experience cancer	ADL2
	Number of nursing home stays	IADL2

Source: SHARE Wave 4 release 1; Jürges (2007); Poterba et al. (2010)

activities of daily living (ADL2), in instrumental activities of daily living (IADL2) and in mobility (MOBILIT3) following Poterba et al. (2010).

Like the latter, we chose the method of first principal component to build our true health index whereas Jürges (2007) calculated weights for each condition or impairment from a generalised ordered probit model with country dummies. The first principal component synthesises the above 26 measures (see Table 16.1). We used this method for each country separately so as to obtain a measure free of systematic institutional and reporting differences. We predicted a value for each individual and rescaled the predicted values by normalising (1= “best observed health”, 0 = “worst observed health”) in order to classify the SHARE countries by the distribution of this health index. Figure 16.1 illustrates countries ranked by the median value. The healthiest respondents came from Denmark, followed closely by Switzerland and the Netherlands (left side of the graph) while Hungary and Estonia occupied the last two ranks.

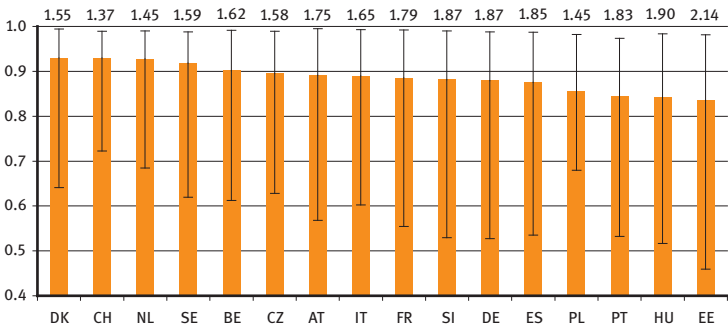


Figure 16.1: Distribution of normalised true health index by country, ranked by median value and 90th/10th inequality ratio (n=57,262)
Source: SHARE Wave 4 release 1

The upper and lower bars represent the 90th and the 10th percentile of health distribution, respectively. Looking at Figure 16.1 and health inequalities in terms of the 90th/10th percentile ratio, Switzerland (1.37) did a little better than the Netherlands and Poland (1.44), while Estonia was far behind (2.14) and showing the highest inequality in terms of the percentile ratio.

16.3 Comparing self-reported health (SRH) and the true health index

A simple way to check the robustness of SRH measures is to compare them to the true health index. Indeed, we expect that two individuals reporting the same SRH should have a similar, though not exactly the same, true health state, measured by the true health index. At least, the variance of the true health index should be minimal. When comparing the two measures, the distribution of the principal component health index (considered as true value) was divided in quintiles that we related to the five SRH statuses that are reported in SHARE. We expected that people reporting poor SRH, the worst possible subjective health status, would mainly occupy the first quintile of the true index, whereas most people in excellent health should be located in the highest quintile. We performed this exercise for men and women separately in order to compare misreporting between genders (see Table 16.2). For respondents declaring poor health, we find that the proportion of women in the first quintile of true health (65%) was greater than that of men (58%). Thus, women in bad health seem to assess their health more accurately than men based on our true health indicator. The same seems to happen when we look at “excellent” health evaluated: women are more likely to be in the highest quintile of our true indicator than men (46.1% vs. 45%).

Table 16.2: Percentage of individuals in SRH categories in true health quintiles (n=57,262)

Quintiles “True health measure”	Poor		Fair		Good		Very good		Excellent	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
1st	58.0	65.0	22.1	29.4	8.0	10.6	3.5	4.9	2.5	2.5
2nd	24.2	22.3	27.5	27.8	17.4	18.6	11.3	11.6	9.1	8.5
3rd	11.0	7.8	23.6	21.1	24.1	22.8	20.1	18.2	17.1	15.0
4th	5.0	3.2	17.7	15.0	26.8	25.8	28.7	28.0	26.2	27.8
5th	1.8	1.8	9.1	6.7	23.8	22.2	36.5	37.3	45.0	46.1

Source: SHARE Wave 4 release 1

16.4 Profiling the gap

In the following, we look at the determinants of mismatches between SRH and true health measures as explained above. We performed an ordered probit model with SRH as dependent variable on a country-by-country basis and the predicted value from the first principal component analysis as explanatory. For each country, threshold parameters were computed and used to replace respondents in order to adjust their true health measure. If we randomly pick the case of Belgium, each respondent whose non-standardised health index was inferior to -1.71 (first average threshold) was considered in excellent health. If health index was between the first and second average thresholds (from -1.71 to -0.75), the respondent was assigned to very good health, and so on. We categorised the adjusted health measure from 1 (synonymous of excellent health) to 5 (poor health). If the difference between the indicators was positive, respondents overestimated their health, if there was no difference, the evaluation was equivalent to the true measure and if the difference was negative, they underestimated their health status. Table 16.3 shows evaluation differences for each country. Eastern (and particularly Estonian), Portuguese and German citizens seemed to better evaluate their health (more than 40 % of correct estimations) while Italians were the ones who most underestimated their health, in addition to exhibiting the lowest overlap between SRH and the indicator among SHARE countries (only 33.4 % of correct evaluations). The Dutch citizens are most likely to overestimate their health (27.5 %). However, these conclusions must be drawn carefully because they could be due to measurement differences between the countries.

Health comparisons across nations have also been questioned and criticised as health evaluation is affected by social and cultural values as well as by language specificities (Sommerfeld et al. 2002, Jürges 2005). To assess who are the respondents who might under- or overestimate their adjusted true health, we performed multinomial probit analysis across all countries. Explanatory variables used were gender, age, education, income, wealth, home ownership, social network (the existence of at least one confidant, see Stoeckel and Litwin in this volume for details) and marital status. We use the latter three as external factors indicating unhappiness which is likely to have an influence on misreporting instead of health indicators like the EURO-D scale. A survey of the Belgian Observatory of Life at Home shows that tenants are less happy than the owners (Layard 2005). Nearly half of the tenants believe they would be happier in a home of their own. Moreover, for 85 per cent of Belgians, owning a home is essential to be happy. That could impact the reporting of health. One can also imagine that having no one to talk to or being alone might influence our health judgment insofar as respondents have no one to compare to (see Shiovitz-Ezra in this volume for the relationship between loneliness and depression).

Table 16.3: Percentages of under-, correct and overestimation of the adjusted true health index compared to SRH, by country (n=57,262)

	Underestimation	Correct estimation	Overestimation
SE	42.4	34.2	23.4
DK	41.2	36.0	22.8
DE	36.2	40.8	23.0
NL	38.2	34.3	27.5
BE	40.1	34.4	25.5
FR	38.4	36.1	25.5
CH	39.7	35.4	24.9
AT	40.0	33.7	26.4
PT	36.9	40.3	22.8
ES	39.5	37.9	22.6
IT	43.1	33.4	23.5
EE	31.0	49.3	19.8
PL	36.6	43.0	20.4
CZ	36.7	40.3	23.0
HU	35.6	42.9	21.5
SI	38.3	36.0	25.8

Source: SHARE Wave 4 release 1

On the contrary, within country comparisons of SRH are less problematic (Deboosere 2008). For instance, income does not seem to impinge on the answering behaviour and thus does not bias health inequality indicators (Burstrom & Fredlund 2001). However, divergences in responding to SRH may arise by gender (Idler et al. 1992, Spiers et al. 2003, van Doorslaer & Gerdtham 2003). Deboosere (2008) showed that evaluation of good and very good health is probably influenced by education and concluded that low-educated people tend to underestimate their health. On the contrary, no educational gradient has been found regarding bad health assessment (Huisman et al. 2007).

Table 16.4 shows the results of the model. The reference was no misreporting men, aged 50–69, having a low or middle education, no social network, being tenant, not in couple and whose income and wealth were below median. Across all countries, women were less likely to underestimate their health. Age had a significant effect: the older the respondents, the less likely they underestimated and the more likely they overestimated their health. A more educated person less likely underestimated his or her health.

Table 16.4: Determinants of under- and overestimation of the adjusted true health index compared to SRH: Results of multinomial probit models across all SHARE countries (n=56,886)

	Under- estimation	Standard deviation	Over- estimation	Standard deviation
Woman	-0.0826***	(0.0158)	-0.0156	(0.0169)
Age (70+)	-0.4759***	(0.0168)	0.2303***	(0.0172)
High education	-0.1281***	(0.0185)	-0.0228	(0.1987)
Income	-0.0003	(0.0176)	-0.0335*	(0.0191)
Wealth	0.0867***	(0.0176)	0.0579***	(0.0189)
Homeowner	-0.0014	(0.0219)	-0.1874***	(0.0228)
Social network (>=1)	0.1046***	(0.0233)	-0.2199***	(0.0243)
In relationship	0.1167***	(0.0196)	-0.1365***	(0.0205)
Log-likelihood	-60026.856			

Significance: *** = 1%; ** = 5%; * = 10 %

Source: Wave 4 release 1

When SHARE respondents' income was higher than the country-specific median, they less likely overestimated their health, and we noted the opposite trend once we considered wealthier people. The wealthier respondents were, the more likely they under- and overestimated health.

Homeowners were less likely to overestimate their health. The results for the underestimation are not significant. Finally, if people were not alone or if they reported to have at least one person to talk about important matters, they were

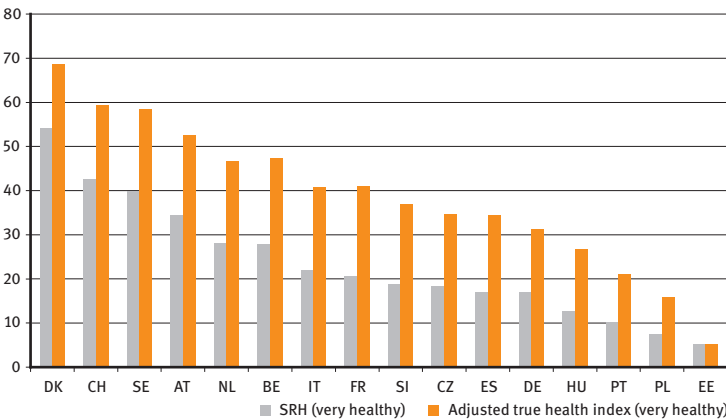


Figure 16.2: Self-reported health (SRH) and adjusted very healthy SHARE respondents, by country (n=57,262)

Source: SHARE Wave 4 release 1

more likely to underestimate and less likely to overestimate their health. These results are surprising and should be assessed in future research.

Finally, looking at the new distribution of the adjusted true health index, we see that the proportion of respondents in excellent or in very good health seems to be much higher than for SRH. This result is true for every country and especially pronounced for France where the gap was 20.3 per cent. On the contrary, this gap appears to be almost non-existent for Estonia where it reached only 0.1 per cent. It is important to note that these results, illustrated on Figure 16.2, are in line with our previous findings. Indeed, considering all countries, we found that respondents are more likely to underestimate their health than to overestimate it.

16.5 Implications for public policy design

Different health status assessments could be problematic in terms of policy design especially when needs are not properly assessed. To illustrate this point, we followed Jürges (2007) and decided to analyse the relationship between public health expenditures and SRH as well as the adjusted true health index. These relations are presented in Figure 16.3.

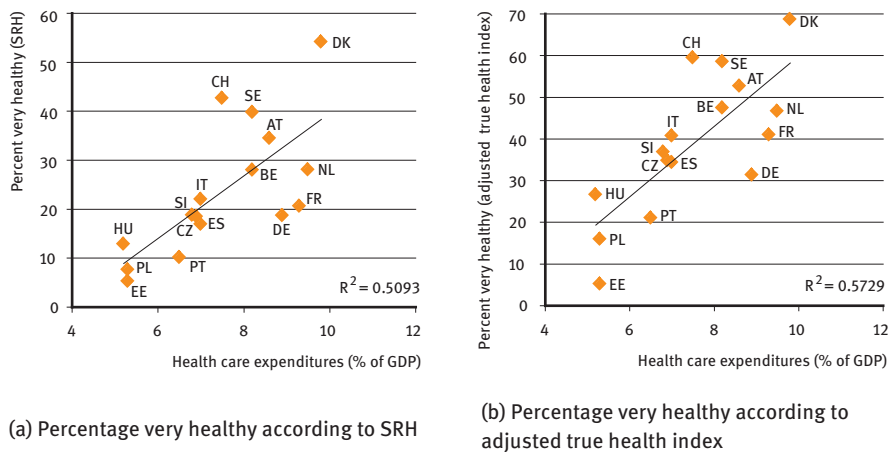


Figure 16.3: Percentages of very healthy SHARE respondents (SRH and adjusted true health index) and care expenditures, by country (n=57,262)

Source: SHARE Wave 4 release 1; European Commission (2012, p.159): data from 2009

One major conclusion can be derived from these figures. We observe that the explained variance was a little higher ($r^2=0.57$) when public health expenditures were used to explain our adjusted health measure instead of self-reported health ($r^2=0.51$). This indicates that public health expenditures are linked to adjusted true health more than to SRH, highlighting the effects of reporting styles.

16.6 The differences between subjective and objective health measures

In our analysis we found that self-reported health varies largely between SHARE countries. Scandinavian respondents report better health than their Eastern and Southern counterparts. We introduced the concept of a true health index based on the prediction of the first principal component. We adjusted this index to take into account country-specific reporting styles and found that Eastern, Portuguese and German respondents had the most accurate assessment of their health.

We then described the profile of people who under- and overestimated their health by a multinomial probit analysis. Being female, older or highly-educated implies a lower probability to underestimate health, and this probability is higher if people are wealthier and have confidants in their social network. Besides, people are more likely to overestimate their health if they are older or wealthier; on the contrary, this probability is lower if they are homeowners or have someone in entourage to talk to.

In addition to the impact of loneliness which should be analysed more precisely, future research should focus on understanding the reasons for these differences while studying the topic at the national level and to dwell on the origins of health misreporting. Public health expenditures were more closely linked to our true health index than to subjective self-reports. Thus, for the social planner, it is important to identify the objective picture to fight the hard core of health poverty.

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17 Patterns of cognitive ageing

-
- ▶ High school dropouts and retired individuals show a higher cognitive decline
 - ▶ Decline in health and cognitive abilities are strongly correlated
 - ▶ Mediterranean countries show a lower cognitive decline over the 4 years period
 - ▶ Institutional differences only partially explain the convergence in cognitive levels in Europe
-

17.1 The determinants of cognitive decline

Ageing is often associated with cognitive decline. Schaie (1989) shows that cognitive impairment increases sharply after age 50, but also that cognitive functioning varies substantially across people at all ages. In fact, recent research in neuroscience (see van Praag et al. 2000 for a review) has questioned the idea that cognitive decline is inevitable and fixed.

Understanding whether individuals can at least partly offset “biological” age-related cognitive decline is especially relevant to social scientists. The reason is that cognitive abilities are fundamental for economic decisions and represent an important dimension of human capital, along with education, health and non-cognitive skills. A better understanding of the complex process of age-related neurodegeneration, and the role that individual choices may play, is also central to the agenda for the European Year of Active Ageing in 2012. Recent studies show that education (Banks & Mazzonna 2012) and retirement (Rohwedder & Willis 2010, Bonsang et al. 2012, Mazzonna & Peracchi 2012) causally affect the level of cognitive abilities and their rate of decline at older ages. These findings have important policy implications. For example, they imply that policies aimed at fostering labour force participation of older people may have large spillovers by reducing the loss of cognitive capital caused by early retirement.

The SHARE project represents a precious source of information on cognitive ageing. First, the cross-country dimension of the survey allows determining how cognitive decline varies in different institutional environments. Second, its longitudinal nature allows us to analyse how cognitive decline depends on behavioural and environmental factors while netting out the confounding effects of cohort differences and other time-invariant omitted effects. In fact, being able to observe the same individual over time (not only individuals of different ages in a single wave), allows us to directly relate changes in cognitive function at the individual level to observed behavioural and environmental changes.

The aim of this chapter is to investigate which factors help explain between- and within-country heterogeneity in the age-related decline of cognitive function. We focus on differences in test scores over the four-year period between Wave 2 (2006) and Wave 4 (2010) of SHARE. Consistently with the available literature, we show that gender, education, and employment status are important in explaining heterogeneity in the rate of cognitive decline. We also show that changes in cognitive abilities and changes in health status are strongly correlated, which suggests that a common underlying process of biological ageing may drive both changes (see Dal Bianco et al. in this volume for an analysis of influencing childhood factors). Finally, we show that there are large and systematic differences in the rate of cognitive decline across European countries. In the light of previous work (Mazzonna & Peracchi 2012), this result may be interpreted as evidence that cognitive abilities tend to converge across European countries as people age.

17.2 Cross-country differences in cognitive decline

We use data from the eleven European countries that participated both in Wave 2 and Wave 4 of SHARE. These countries represent different regions of Europe, from Scandinavia (Denmark, Sweden) through Central Europe (Austria, Belgium, Czech Republic, France, Germany, Netherlands, Switzerland) to Mediterranean countries (Italy, Spain). We consider all individuals who participated in Wave 2 and were between 50 and 80 years of age, irrespective of their labour force status. Our outcomes of interest are the level of cognitive test scores in 2006 and 2010 and the change in cognitive test scores between the two waves. We focus on two cognitive domains: recall and fluency. To ensure comparability with previous literature on cognitive decline (Rohwedder & Willis 2010, Banks & Mazzonna 2012, Bonsang et al. 2012), for recall we take the sum of the scores on immediate and delayed recall, while for fluency we take the raw score.

Table 17.1 presents, for each cognitive domain and for each country, the average test scores in Waves 2 and 4 (computed from the cross-sectional sample of respondents in each wave) and the average test score difference over the four-year period (computed from the longitudinal sample of respondents in both waves). For recall, the average test score difference over time is negative and statistically significant for four countries (Austria, Denmark, the Netherlands, and Sweden), positive but not statistically significant for two countries (Czech Republic and Germany), and positive and statistically significant for the other five countries. Similar evidence has been found by Zamarro et al. (2008) who analyse differ-

ences in test scores between the first and the second waves of SHARE. This result, which apparently contrasts with the hypothesis of an age-related decline in cognitive abilities, could arise for three not mutually exclusive reasons. The first is composition effects, namely the fact that our table does not take into account cross-country differences in the composition of the sample by age, gender, education, employment status, etc. The second is non-random attrition that selects individuals with lower test scores out of the panel. The third is learning effects due to repeated exposure of SHARE respondents to similar (but not identical, as the word lists to recall is different across waves) cognitive tests. For fluency, the evidence is instead more consistent with the hypothesis of an age-related decline. In fact, the average change is negative and strongly statistically significant for all countries except for the Czech Republic (where it is positive and statistically significant) and Denmark (where it is negative but not statistically significant).

Table 17.1: Average test score in Wave 2 and 4 and average test score difference for the longitudinal sample by country

	Recall				Fluency			
	Wave 2	Wave 4	Panel difference	(std. error)	Wave 2	Wave 4	Panel difference	(std. error)
Austria	9.71	8.86	-0.74***	(0.18)	21.57	19.64	-1.32***	(0.38)
Belgium	8.92	9.26	0.32**	(0.08)	20.66	19.94	-0.84***	(0.14)
Czech Rep.	8.44	8.89	0.02	(0.10)	19.23	21.90	-1.81***	(0.25)
Denmark	10.31	10.28	-0.24**	(0.08)	22.71	22.95	-0.03	(0.16)
France	8.33	9.33	0.69***	(0.08)	20.34	19.02	-1.99***	(0.17)
Germany	9.70	9.88	0.07	(0.11)	22.08	20.79	-1.74***	(0.23)
Italy	7.68	7.97	0.33**	(0.08)	15.50	15.07	-0.44**	(0.12)
Netherlands	9.79	9.84	-0.19*	(0.09)	20.70	20.32	-0.78**	(0.16)
Spain	6.48	6.78	0.40***	(0.10)	14.57	14.10	-0.49**	(0.22)
Sweden	9.99	9.77	-0.36***	(0.09)	23.71	22.50	-1.31***	(0.20)
Switzerland	9.62	10.13	0.44**	(0.11)	21.61	19.94	-0.01***	(0.22)
N	23,483	13,011	13,011		23,476	13,005	13,005	

Source: SHARE Wave 2 release 2.5.0, Wave 4 release 1

Table 17.1 also shows evidence of a positive cross-country relationship between initial levels and subsequent changes in average test scores. This largely reflects the fact that the two Mediterranean countries, Spain and Italy, show lower initial levels but also lower declines or larger improvements of test scores for both cognitive domains.

Although interesting, the descriptive evidence reported so far suffers of two main limitations: *i*) it does not take into account differences across countries in the composition of the sample by age, gender, education, employment status, etc., which may drive the cross-country differences in average test scores; and *ii*) just looking at differences in test scores might not be the best way to analyse the changes in cognitive abilities associated with ageing. Looking at differences, either absolute or relative, places too much emphasis on the cardinal interpretation of test scores. Therefore, we prefer to focus on cognitive rank changes, namely changes in the relative position of an individual in terms of test scores. In the next section we address both issues by showing the results from a regression analysis based on cognitive rank changes across waves.

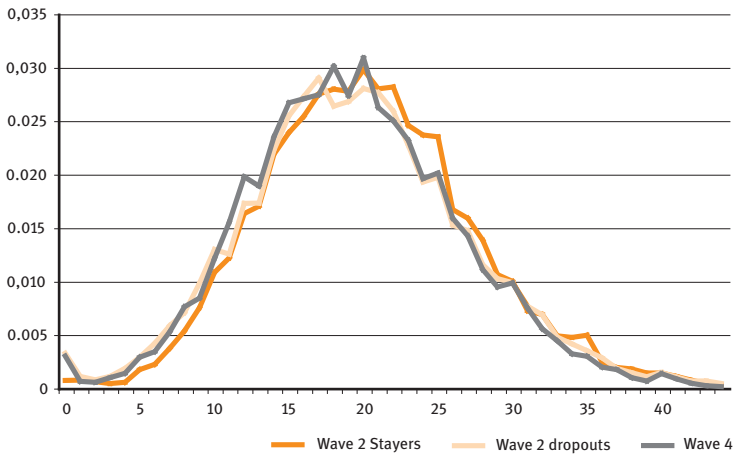
17.3 Education, retirement and cognitive decline

Figure 17.1 separately presents the density of test scores in the two waves, differentiating by cognitive domain. Respondents in Wave 2 are split into those who also participated in Wave 4 (“Wave 2 stayers”) and those who left the panel (“Wave 2 dropouts”). Results are different for recall and fluency. In the case of recall, the density in Wave 2 dropouts is to the left of the density in Wave 2 stayers, suggesting non-random attrition that selects individuals with lower test scores out of the sample. For stayers, there is also evidence of a mean-preserving spread in the distribution of test scores as we move from Wave 2 to Wave 4, suggesting increasing dispersion with age. In the case of fluency, instead, we see little evidence of a difference between the density of stayers and dropouts in Wave 2, while the density of stayers shifts to the left between the two waves suggesting an overall worsening of test scores as individuals age.

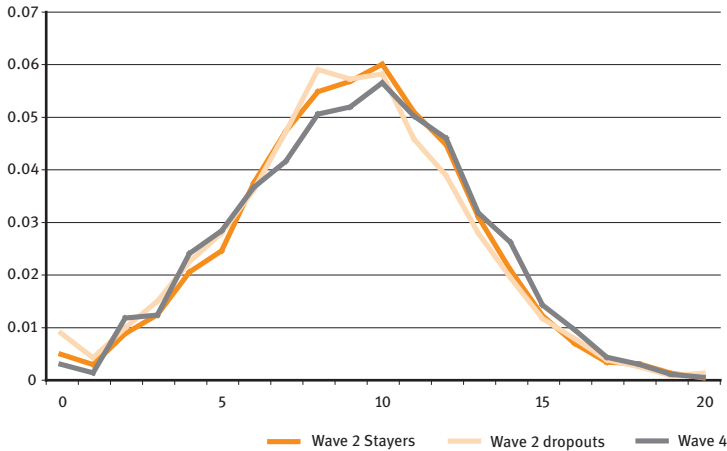
Figure 17.1 tells us nothing about changes in the rank of individuals over the four-year period. Going from Wave 2 to Wave 4, the rank of each respondent may change: a positive change in rank indicates that his/her relative position improved, while a negative change indicates that his/her relative position worsened.

To simplify the analysis and to ensure comparability across cognitive domains, we look at cognitive rank changes between the two waves and focus on decile rank changes. We investigate which variables (gender, age, education, etc.) help predict decile rank changes and in which direction. Thus, we first classify individuals into ten equally-sized classes, or deciles, depending on their relative position in terms of test scores. We then consider regression models for changes in decile rank between the two waves. Although the outcome variable is discrete,

ranging between -9 and 9 (with zero corresponding to no change), little is lost by using ordinary least squares. The results of our regression analyses are shown in Tables 17.2 and 17.3 for recall and fluency respectively.



Panel (A)



Panel (B)

Figure 17.1: Density of fluency (panel A) and recall (panel B) by wave and panel participation: Wave 2 respondents are split between those who also participated in Wave 4 (Wave 2 stayers, $N=13,005$) and those who left the panel (Wave 2 dropouts, $N=10,472$)

Source: SHARE Wave 2 release 2.5.0, Wave 4 release 1

Table 17.2: OLS regression for rank changes in the recall test between Wave 2 and 4 (model E and E1 are conditional on being employed in Wave 2)

	Model A			Model B			Model E			Model E1		
	Coefficients	Std. Error		Coefficients	Std. Error		Coefficients	Std. Error		Coefficients	Std. Error	
female	-0.073**	(0.048)		-0.074**	(0.048)		0.162	(0.143)		0.152	(0.142)	
age	-0.024***	(0.004)		-0.024***	(0.004)		-0.005	(0.026)		-0.004	(0.026)	
age ²	-0.000	(0.000)		-0.000	(0.000)		0.000	(0.002)		0.000	(0.002)	
HS	0.051	(0.060)		0.053	(0.061)		-0.001	(0.116)		0.002	(0.116)	
college	0.236***	(0.069)		0.241***	(0.069)		0.067	(0.121)		0.062	(0.121)	
employed (wave2)	0.153**	(0.072)		0.158**	(0.072)							
SRH				-0.011	(0.054)							
ΔSRH				0.062***	(0.023)					0.302**	(0.141)	
still employed							0.318**	(0.141)		0.350**	(0.180)	
still employed* female							-0.354*	(0.180)		-0.362***	(0.111)	
N	13,011			13,011			3,807			3,807		

Significance: *** = 1%; ** = 5%; * = 10 %
Notes: Each regression includes also a full set of country dummies.
Source: SHARE Wave 2 release 2.5.0, Wave 4 release 1

Table 17.3: OLS regression for rank changes in the fluency test between Wave 2 and 4 (model E and E1 are conditional on being employed in Wave 2)

	Model A			Model B			Model E			Model E1		
	Coefficients	Std. Error		Coefficients	Std. Error		Coefficients	Std. Error		Coefficients	Std. Error	
female	0.053	(0.046)		0.053	(0.046)		0.200	(0.137)		0.192	(0.137)	
age	-0.028***	(0.004)		-0.028***	(0.004)		0.000	(0.022)		0.001	(0.021)	
age2	-0.001	(0.000)		-0.001	(0.000)		0.001	(0.001)		0.001	(0.001)	
HS	-0.002	(0.058)		-0.000	(0.058)		-0.050	(0.110)		-0.048	(0.110)	
college	-0.008	(0.065)		-0.005	(0.065)		-0.029	(0.112)		-0.032	(0.112)	
employed (Wave2)	0.011	(0.069)		0.014	(0.070)							
SRH				-0.020	(0.052)							
ΔSRH				0.287***	(0.046)					0.288***	(0.104)	
still employed							0.233*	(0.135)		0.217*	(0.129)	
still employed* female							-0.133	(0.171)		-0.124	(0.111)	
N	13,005			13,005			3,796			3,796		

Significance: *** = 1%; ** = 5%; * = 10 %

Notes: Each regression includes also a full set of country dummies.

Source: SHARE Wave 2 release 2.5.0, Wave 4 release 1

Our baseline specification (Model A) includes a constant, a quadratic age term, an indicator for being a female, indicators for high school (HS) and college degree, an indicator for being employed in Wave 2, and a full set of indicators for the country of residence. The estimates from this model show evidence of a negative effect of age for both cognitive domains, implying that older people tend to lose their position relative to younger people over a four-year period. The age effect is stronger for fluency than for recall. Gender and education are important for recall, with men improving their position relative to women and college graduates relative to people with lower education. However, these gender and education effects are not seen for fluency. Finally, the coefficient on being employed in Wave 2 is always positive, but is large in size and statistically significant only for recall.

Model B controls for health status by adding to Model A a binary indicator (SRH) for the initial level of self-rated health (equal to 1 for individuals reporting to be in good or very good health) and its change between the two waves (Δ SRH). This specification provides evidence on the relationship between health and cognitive abilities over time. For both recall and fluency, only changes in health – not their levels in the initial wave – help predict cognitive rank changes across waves. One possible explanation for this result is that a common underlying biological process determines the age-profiles of health and cognitive abilities. In addition, the correlation between health changes and cognitive rank changes appears to be stronger for fluency than for recall.

The last two specifications (Models E and E1) study the effect of retiring between the two waves by restricting attention to those who were employed in Wave 2. In addition to the predictors in Model A, Model E includes an indicator for being employed in Wave 4 (“still employed”) and its interaction with gender. For both cognitive domains, the effect of age now vanishes while the effect of being still employed in Wave 4 is positive and statistically significant, although only for men. The latter result is consistent with previous cross-sectional evidence based on the first wave of SHARE (Rohwedder & Willis 2010, Mazzonna & Peracchi 2012). The different result for women may depend on the strong selection effect produced by conditioning on being employed in Wave 2 (only 25 % of women were employed). The results from Model E are robust to the inclusion of an indicator for the change in self-rated health over our four-year period in Model E1. Including this variable is important in order to control for the potential bias caused by omitting health shocks.

Although we cannot claim that the coefficients on being still employed in Models E and E1 represent estimates of the causal effect of retirement on cognitive abilities, using the longitudinal dimension of SHARE allows us to control for time-invariant effects whose omission might bias the relationship between retirement and changes in cognitive abilities.

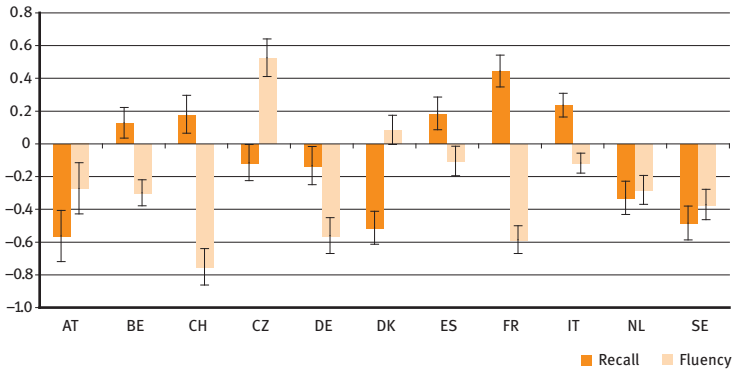


Figure 17.2: Estimated rank changes in test scores by country for a retired aged-65 high-school male dropout

Notes: N=13,011 (Recall); 13,005 (Fluency)

Source: SHARE Wave 2 release 2.5.0, Wave 4 release

Finally, Figure 17.2 shows the coefficients for the countries from Model A. These represent estimates of the cognitive rank changes for the reference individual in each country, namely a retired aged-65 high-school male dropout. The figure confirms the descriptive evidence of a process of convergence in cognitive abilities among countries. In fact, respondents from Scandinavian and (partially) Central European countries – who display higher levels of cognitive abilities in Wave 2 – are also those with a higher probability of lowering their rank over our four-year period.

17.4 Discussion: what policy intervention can(not) do

The longitudinal evidence on changes in cognitive abilities over the four-year period between Wave 2 (2006) and Wave 4 (2010) of SHARE confirms and extends the evidence based on Wave 1 (2004) and on changes between Wave 1 and 2.

Education and employment status are important predictors, not only of the level of cognitive scores as already pointed out in the literature (e.g. Banks & Mazzone 2012; Mazzone & Peracchi 2012), but also of their age-related decline. We find some evidence that this decline is stronger for fluency than for recall. The correlation between cognitive rank changes and changes in self-rated health also appears to be stronger for fluency than for recall. Finally, Mediterranean countries show lower rates of cognitive decline relative to other European countries, suggesting a process of convergence across countries as people age.

Our results show that this convergence process is only partially explained by differences in education and retirement status, which are clearly influenced by differences in public policies and institutions (see for instance the cross-country study in Gruber and Wise 1999 on the importance of differences in retirement policies). For this reason, future research should focus on other determinants of the observed differences between and within countries in the age profiles of cognitive abilities, such as differences in behaviour and life-style, or more simply biological processes that lead to a sort of convergence as people age.

Although the longitudinal nature of SHARE has the advantage of allowing us to control for time-invariant omitted effects, more research is needed to uncover causal relationships from the available data. In particular, as for most household panel surveys, attrition in SHARE is an important concern because it may affect the quality of the inference that can be obtained from the data.

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Chiara Dal Bianco, Christelle Garrouste and Omar Paccagnella

18 Early-life circumstances and cognitive functioning dynamics in later life

-
- ▶ Cognitive decline in later life is partially related to childhood book shortage
 - ▶ Measuring variations over time on cognitive abilities depends upon test contents
 - ▶ Women show larger cohort effects because of differences in educational attainment
 - ▶ Education policies may play a role to explain cognitive decline differences across cohorts
-

18.1 Childhood and later life cognitive skills

It is universally accepted that there is an inverse association between age and cognitive performance, even though the age at which the cognitive decline begins remains the subject of a large debate (Singh-Manoux et al. 2012). Socioeconomic status has been found to be positively related to better performance by older adults: individuals of lower socioeconomic status and poorer health have shown greater age-related decreases in performance on intellectual measures (Schmitz-Scherzer & Thomae 1983).

Early life conditions are related to cognitive development and abilities in childhood and cognitive function in adulthood. However, the association between early life conditions and cognitive changes in old age is not yet well documented. Everson-Rose et al. (2003) examined the relation between socioeconomic status (SES) and cognitive milieu in childhood and change in cognitive function in a population-based sample of 4,398 community-dwelling adults aged 65 years or older from Chicago, Illinois (USA), between 1993 and 1997. Change in cognitive function was assessed by means of a global cognitive index derived from measures of memory, perceptual speed and overall cognitive function. After controlling for age, sex, race and education, interactions of time with childhood SES and childhood cognitive milieu turned out to be non-significant statistically, indicating that early life conditions were not related to cognitive changes over time. On the other hand, they find that a better SES and a more stimulating cognitive environment in childhood have small but significant effects on absolute level of cognitive function. However, they do not seem to protect against cognitive decline in old age. Similarly, in a study determining whether the socioeconomic environment experienced during childhood has an impact on cognitive functioning in middle age (aged 58–64), Kaplan et al. (2001) found a significant and

graded association between parental SES (as an index) and cognitive function both prior to and after adjustment for respondent's education. Those from more disadvantaged backgrounds exhibited the poorest performance. When the separate components of the parental SES measure were used, father's occupation and mother's education were independently associated with the respondent's score for three and five of the tests respectively (there was no association with father's education and mother's occupation). After adjustment for the respondent's education, father's occupation was no longer associated with the respondent's test score, however, the results were essentially unchanged for mother's education. Hence, higher SES during childhood and greater educational attainment were found to be both associated with cognitive function in adulthood, with mothers and fathers each contributing to their offspring's formative cognitive development and later life cognitive ability (albeit in different ways). Their conclusive recommendation is that improvements in both parental socioeconomic circumstances and the educational attainment of their offspring could possibly enhance cognitive function and decrease risk of dementia in later life.

In an experimental study of the role of various cultural and experiential antecedents on memory development, Wagner (1978) had earlier demonstrated that structural features of memory may be universal, while control processes or information retention in memory are probably culture-specific, or a function of a variety of experiential and cultural factors that surround the growing child. Hence, according to the type of memory that is tested, childhood conditions may play a very different role in changes in late cognitive skills.

An important qualifying point of the 2012 – European Year for Active Ageing and Solidarity between Generations is to seek promoting active ageing in the independent living area: the cognitive status declines as people grow old, but assessing how parental or socio-economic background may affect cognitive functioning in later life might help to better understand the role that public policies might play for coping with this decline.

Hence, this paper aims at enriching this literature on the relationship between cognitive decline in later-life and socio-economic conditions in early-life, exploiting life-history data and longitudinal cognitive test performances collected respectively in SHARELIFE and in three waves of SHARE survey. On the one hand, this richness of information allows to further investigating cohort and time effects measuring cognitive results over time. On the other hand, this contribution aims at showing the difficulties in finding a single reliable indicator of cognitive decline and how relationships measuring variations over time on cognitive abilities may significantly depend upon test contents.

By providing first descriptive evidence on cognitive decline in later life, this work complements the chapter by Mazzonna and Peracchi in this volume.

18.2 The childhood socio-economic status

The SHARELIFE questionnaire allows constructing many childhood indicators. Some of them are expected to be correlated with the economic resources of the household during childhood, such as the number of rooms per capita or the type of occupation of the household's main breadwinner at the age of ten.

However, according to the topics investigated in this contribution, we prefer to focus our analyses on a third indicator, which is correlated with the intellectual/educational background of the household where respondents grew up. It is obtained by the question that asks respondents to provide an estimate of the number of books available in their accommodation at the age of ten. Book availability is measured in terms of number of shelves and bookcases that can be filled (magazines, newspapers and school books are not considered). The information is rearranged to discriminate between respondents who had enough books to fill at least one bookcase and those having fewer books in their accommodation. We expect that the higher the number of books, the higher is the expected average educational level of the parents or other relatives in the household.

18.3 The cognitive measures

In each of the SHARE surveys, a series of brief tests on the individual cognitive abilities is collected, even though the features of some of them have been changed between Wave 2 and Wave 4 (Malter & Börsch-Supan 2013). In this work we are going to focus our attention on two of these measures in particular.

The first measure is a test on verbal fluency that consists of naming as many distinct elements (without repetitions or proper nouns) as possible from a particular category (in SHARE, animals) in a specific time interval (one minute). The second measure (the ten word-list-learning test) is a standardised modified version of the Rey's Auditory Verbal Learning Test-RAVLT: it is a test of verbal learning and memory, where the respondent is asked to learn a list of ten common words. The respondent may hear the list only once and then will be asked to recall the words immediately (immediate recall) and again later on (delayed recall), after an interference period. The original RAVLT consists of five consecutive trials each followed by an immediate recall and one delayed recall (Trial 6), which enables to compute several indices from the outcomes (Estévez-González et al. 2003). The SHARE version of the RAVLT differs as in each wave the collected test consists of only one immediate recall trial and one delayed recall (the lists of ten words used in Wave 4 are however different with respect to those used in the previous waves).

It is known that some respondents may improve their cognitive performances over time because of a learning effect of the administrated test. The features of the RAVLT test in SHARE should prevent from this problem, while the verbal fluency measure could be potentially affected.

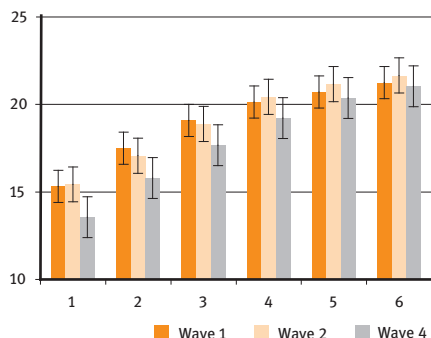
Since three waves are so far available in SHARE, three different time spans can be computed (this allows testing for the presence of time effects): two years (on average) comparing Wave 1 and Wave 2, four years comparing Wave 2 and Wave 4 and six years comparing Wave 1 and Wave 4.

We consider only those respondents who completed all SHARE interviews. The total number of observations is then equal to 9,561. Six cohorts are then created according to the respondent's year of birth:

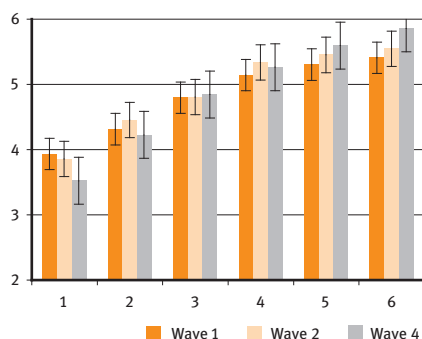
- before 1931
- between 1931 and 1935
- between 1936 and 1940
- between 1941 and 1945
- between 1946 and 1950
- between 1951 and 1955.

In Figure 18.1 we plot results of each cognitive test by cohort and wave. Investigating the longitudinal component of the SHARE sample only, there is a clear evidence of cohort effects: the younger the cohort, the better the cognitive performances. At the same time, this figure highlights some interesting time effects: for the older cohorts, the larger the time span, the worse the performances; for the younger cohorts, the larger the time span, the better (or at least no worse) the performances. Similar evidence are in Zamarro et al. (2008) who compare test score results between the first two SHARE waves. Disaggregating the results by country, a large cross-country heterogeneity also appears.

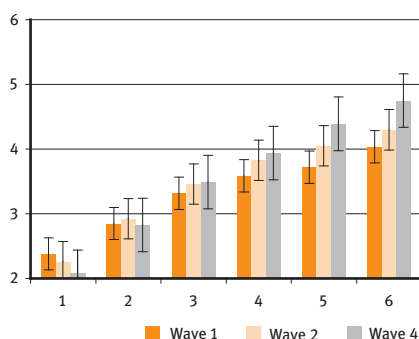
Moreover, there are also some important differences according to the analysed cognitive indicator: the delayed recall test shows the largest differences across cohorts and over time, while the animal test (fluency) presents some patterns over time which could be quite difficult to interpret. This result is partly expected, since each test aims at evaluating a different area of the individual cognitive functioning. Indeed, the verbal fluency test in SHARE is used as a semantic/category subtest, which is quite effective in measuring executive functioning and language ability and it is often used as a screen for dementia. The RAVLT may evaluate a wide set of cognitive functions, from a short-term auditory-verbal memory and rate of learning (the immediate recall) to retention of information and differences between learning and retrieval (the delayed recall).



(a) Animal test (n=9476 in Wave 1; 9450 in Wave 2; 9349 in Wave 4)



(b) Immediate recall test (n=9503 in Wave 1; 9481 in Wave 2; 9370 in Wave 4)



(c) Delayed recall test (n=9505 in Wave 1; 9485 in Wave 2; 9379 in Wave 4)

Figure 18.1: Scores of each cognitive test by cohort and wave

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0; Wave 4 release 1

18.4 Measuring cognitive decline

Figure 18.1 signals that the decline of cognitive performances over time is not systematic for all cohorts and for all tests. It is mainly true for the older cohorts and the ten words recall tests. This highlights that measuring a cognitive decline over time is not an easy task. Cognition is a multidimensional concept and several issues are related to longitudinal variations of the cognitive performances (Morris et al. 1999). First, cognitive test results are affected by many factors other than the process under study, from educational attainments to emotional and physi-

cal states, from the environment to cultural experiences, as well as measurement errors, like for instance interviewer errors in collecting the respondents' answers. Education and age may be both confounders and risk factors for cognitive decline and often it could be very difficult separating cohort, age and time effects. Second, several brief tests have some floor and ceiling effects, due to the features of these administrated tests. Then, in any longitudinal analysis of cognitive change there is the need of taking into account the amount of the initial level of the cognitive performances. This is particularly important analysing the RAVLT results, because variations over time of the performances may partly be due to poor initial learning rather than to different abilities to retain information over time.

In order to reduce overall measurement errors, Wilson et al. (1999) combined all cognitive tests in their study in a single factor by means of a factor analysis approach. However, several reasons could support the idea that a global measure does not adequately summarise all individual test performances. First, a global index may be affected by severe educational or cultural biases that characterise only a few of the combining tests, leading to over/under evaluations of specific relationships of the cognitive decline. Then, each test usually measures a different aspect of the cognitive concept and a single indicator could mix up different patterns of these aspects. Finally, a combined index does not necessarily normalise skewed distributions.

Based upon all these considerations and the SHARE data specificities, we opt for a separate analysis of the three cognitive test results (animals, immediate recall and delayed recall) and we compute three different indices of cognitive variations over time calculating the *per cent variation* across waves of the corresponding respondent's test results. In particular, this approach allows to take into account individual differences in the initial level of the cognitive performances.

We first define a respondent having a cognitive decline with respect to a particular index if his/her per cent variation in the analysed time span of that index is negative. Since very small per cent variations might not reveal true cognitive decline and could be affected by different sources of measurement errors, we decide to focus our attention on high negative per cent variations. We then define a respondent having a *high cognitive decline* if his/her per cent variation in the analysed time span is lower than -20 per cent. In the literature there are no standard thresholds to discriminate across different levels of cognitive decline. Hence, our choice of -20 per cent roughly means that, from one wave to another, in the RAVLT a respondent forgot about two words (if the initial level was high) or one word (if the initial level was middle or low), while in the verbal fluency test he/she cited four animals less, if the initial level was equal to 20 reported animals. Moreover, the cognitive decline distributions for each test by time span show about -20 per cent as 25th percentile (as expected the decline tends to be higher for older cohorts and lower for younger cohorts).

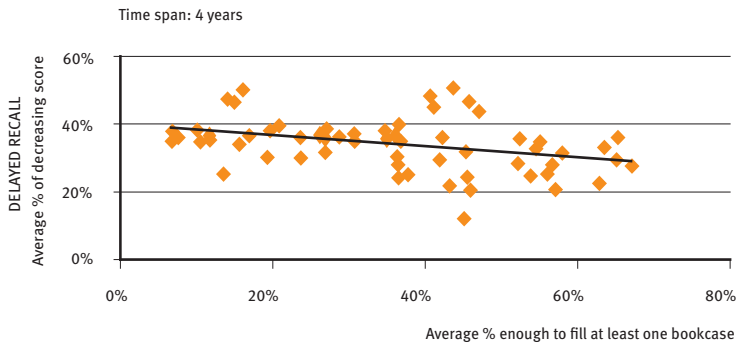
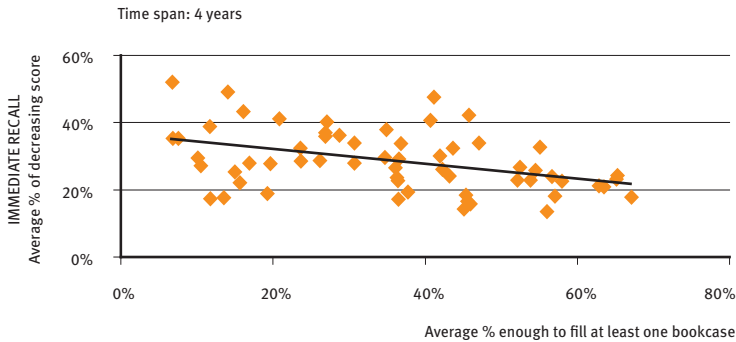
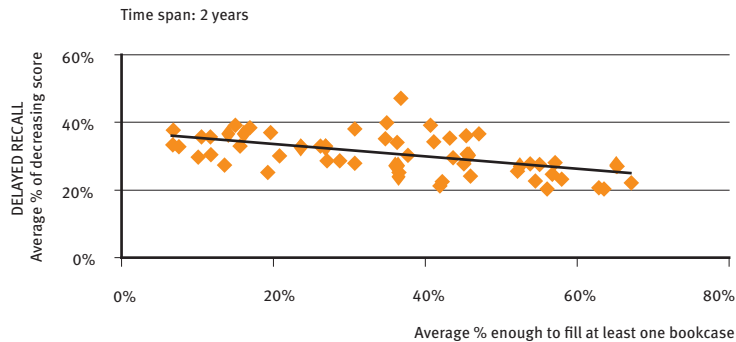
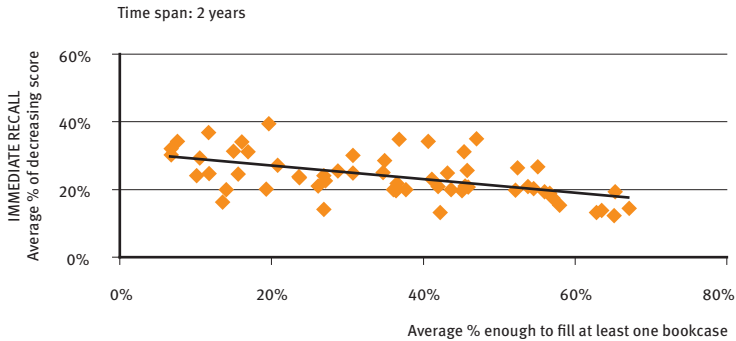
For the rest of this contribution the term “cognitive decline” has to be meant as “high cognitive decline” and, according to the evidence of Section 3, the units of the following analyses will be the country cohorts. Moreover, because of space constraints, any relationships involving the verbal fluency test will be just commented.

18.5 Early-life conditions and cognitive decline

Figure 18.2 shows how the cognitive decline varies with the availability of books in the parental accommodation. More precisely, at the country cohort level, the proportion of respondents with a cognitive decline (according both to the immediate and the delayed recall test) is plotted against the proportion of respondents with abundance of books in their childhood accommodation.

As expected, cross-country cohorts with higher proportions of individuals grown up in households with availability of many books are those with lower rates of cognitive decline, regardless the time span. In other words, the cognitive decline measured by means of both the immediate recall and the delayed recall test is positively correlated with book shortage. This relationship does not suffer from time effects in a way that it does not weaken or strengthen enlarging the span across waves. However, it is interesting to note that data variability increases together with the length of the time span. While findings based on the immediate recall and the delayed recall test are basically the same (we can just underline that the scatter plots for the immediate recall test show a larger variability than those for the delayed recall test), conclusions according to the verbal fluency test are characterised by a singular pattern over time: there is a strongly positive correlation between decline and scarcity of books in the shortest and largest spans, but only a weak relationship investigating the middle span.

Schneeweis et al. (2012) provide evidence of a causal link between SHARE respondents’ education (measured by their number of years of schooling) and cognitive functioning in old-age, stronger in delayed memory, but weaker (or even null) on verbal fluency, numeracy, orientation to date and dementia. Moreover, as shown by Cavapozzi et al. (2011), countries where individuals spend on average more years in full-time education are also those where children are more likely to grow up in better educated and richer households. Hence, the link between individual schooling and cognitive decline might be driven by this positive correlation between socio-economic condition of parental household and educational attainment of respondents. To address this issue we study the relationship between cognitive decline in later life and education (measured by the number of years in full-time education), disaggregating the sample by gender and childhood background (Figures 18.3 and 18.4).



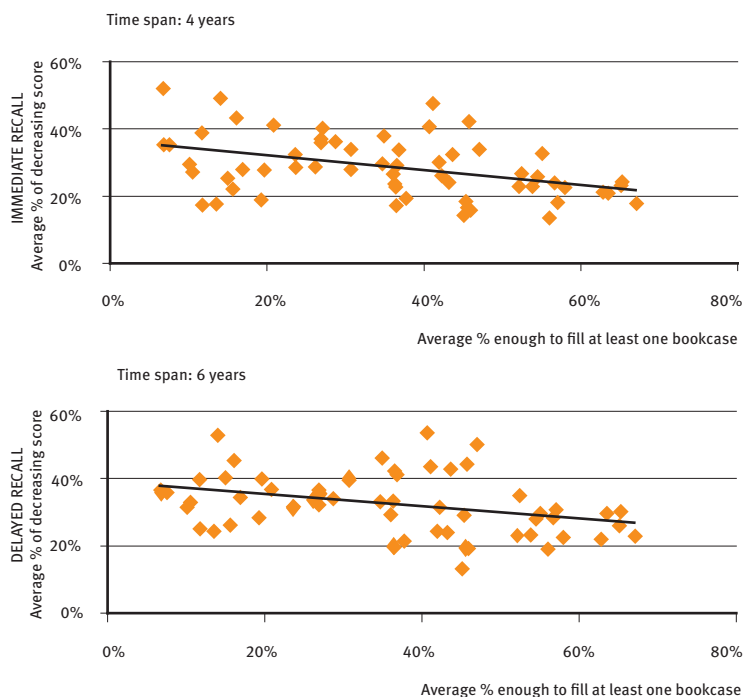
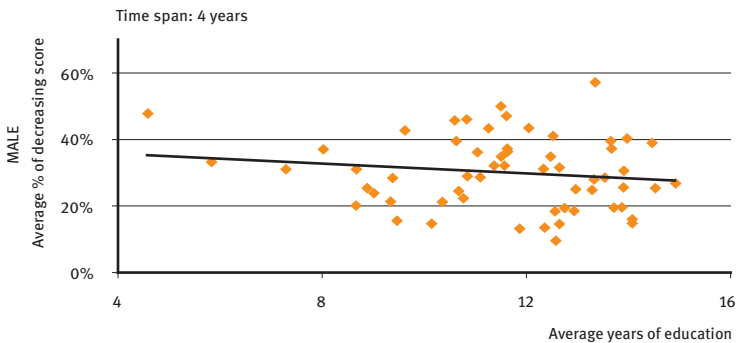
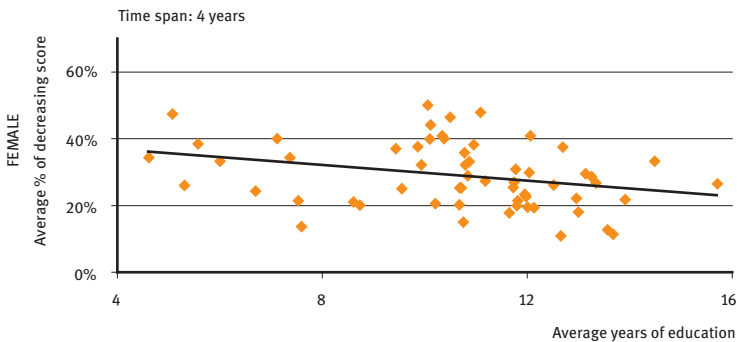
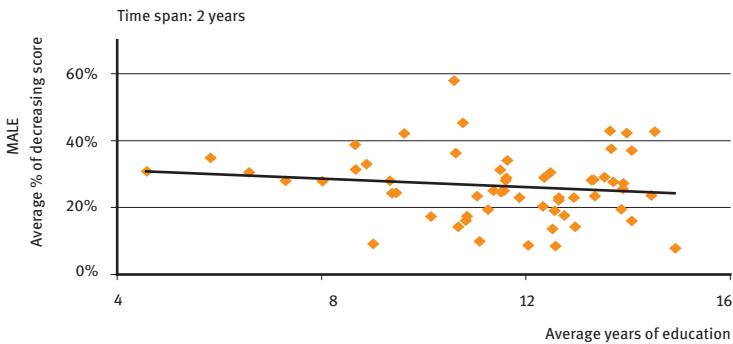
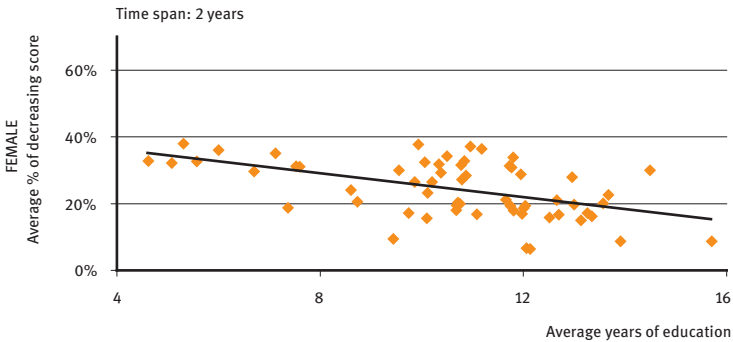


Figure 18.2: Relationships between cognitive decline and number of books in the accommodation at the age of ten, over time, by type of ten word-list-learning test (immediate and delayed recall)

Notes: Each dot denotes a country cohort. Number of observations: 60.

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0; Wave 3 release 1; Wave 4 release 1

Our results partly confirm Schneeweis et al.'s findings, that is, even controlling for the cultural background of the parental household, cognitive decline and education are strongly (negatively) related in some facets of the cognitive functioning (e. g. delayed recall), while in others (e. g. immediate recall) this relationship is more pronounced than in Schneeweis et al.'s conclusions. However, there are interesting issues related to the heterogeneity in the sample composition. For males experiencing book shortage at the age of ten, a marginal increase in the average years of education is not statistically associated with a decrease in the cognitive decline, measured neither according to the immediate recall test nor to the delayed recall test, regardless the time span. The opposite relation appears for women: according to both the immediate recall and the delayed recall test, females experiencing book shortage in the accommodation at the age of ten show a negative relationship between education and cognitive decline, regardless the time span. These relationships are stronger looking at the delayed recall test (i. e.,



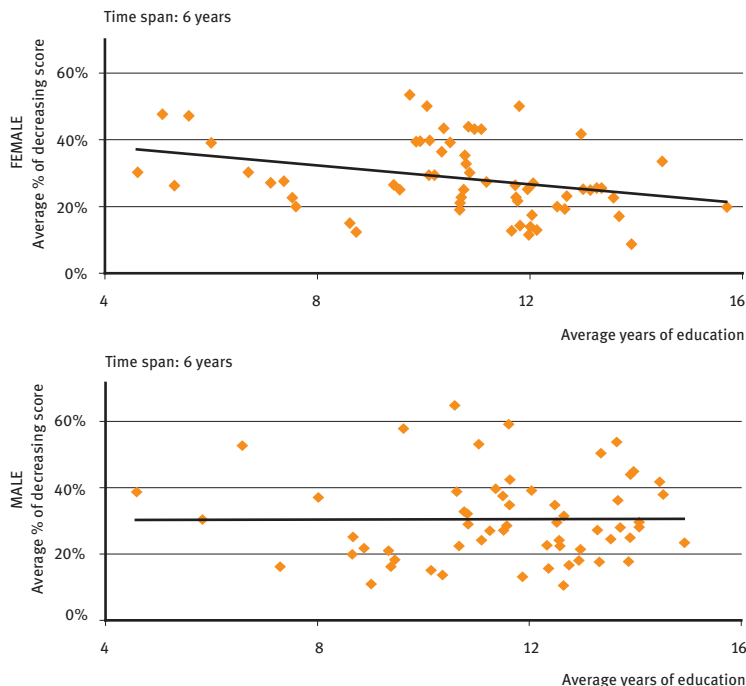


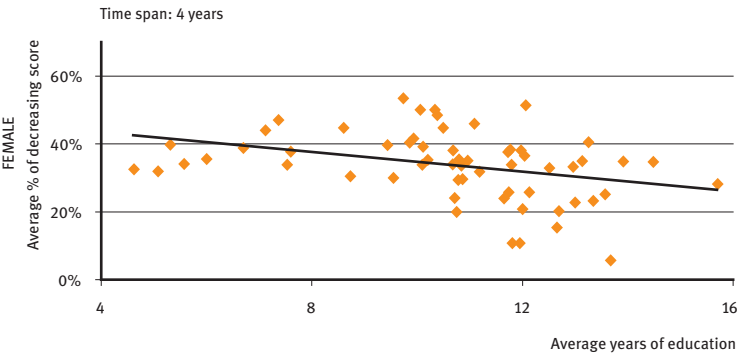
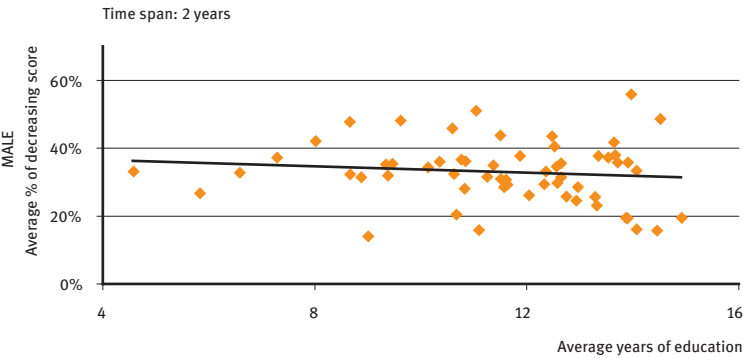
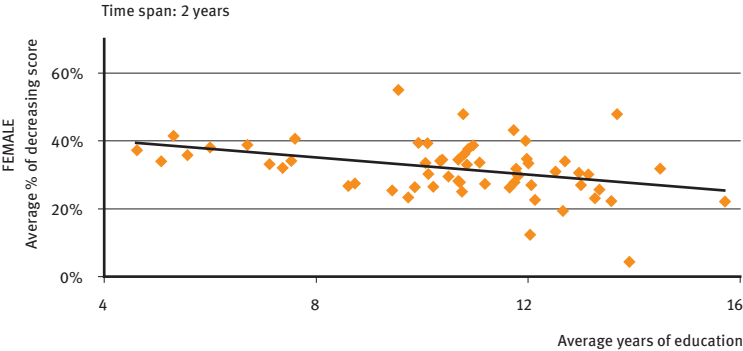
Figure 18.3: Individuals experiencing book shortage in the accommodation at the age of ten: relationship between cognitive decline according to the immediate recall test and years of education over time, by gender

Notes: Each dot denotes a country cohort. Number of observations: 60.

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0; Wave 3 release 1; Wave 4 release 1

they are always statically significant at one per cent level) than looking at the immediate recall test (where relationships are statistically significant at the five per cent level).

The analysis based on the verbal fluency test is a little bit different: controlling for scarcity of books at the age of ten, males show a statistically significant relationship between years of education and cognitive decline in the shortest span but not in the others, while females show a statistically significant relationship in all spans but the middle.



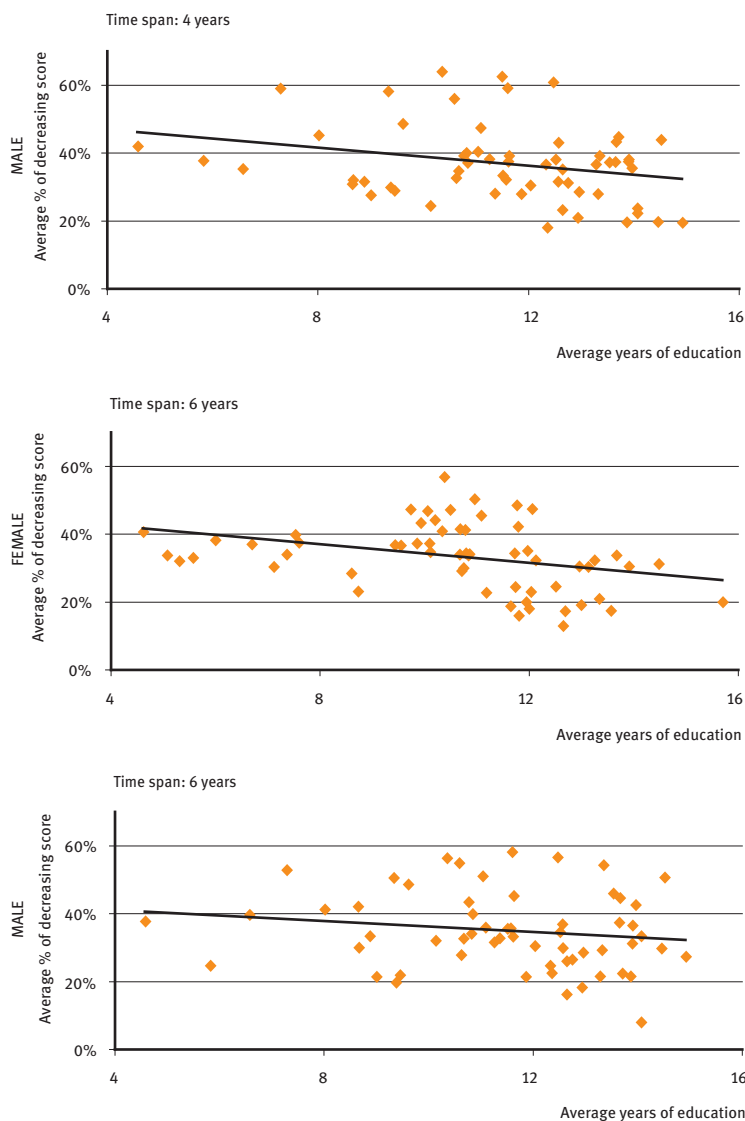


Figure 18.4: Individuals experiencing book shortage in the accommodation at the age of ten: relationship between cognitive decline according to the delayed recall test and years of education over time, by gender

Notes: Each dot denotes a country cohort. Number of observations: 60.

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0; Wave 3 release 1; Wave 4 release 1

18.6 The multidimensional nature of the cognitive decline

In this contribution we provide descriptive evidence that cognitive decline in later life is partially related to some early-life conditions. Two main findings may be underlined.

First, since the cognitive decline is a multidimensional phenomenon, performances in cognitive abilities depend upon test contents. The measurement of the ability to retain and retrieve information is the cognitive functioning whose decline shows the strongest relationships with childhood conditions, regardless the time span. Higher education is associated with lower cognitive decline even if individuals grew-up in socio-economically disadvantaged households. This is true also when short-term auditory-verbal memory and rate of learning is measured, even though these relationships are generally weaker than those obtained looking at the previous cognitive functioning test.

Second, there is evidence of gender effects. Controlling for socio-cultural background in early-life, males do not show statistically significant relationships between education and cognitive decline, regardless the time span, while the opposite appears for women. Our findings support Singh-Manoux et al. (2012), who find “larger cohort effects in women because of differences in educational attainment across the birth cohorts in our study population”. This issue might be further investigated controlling for the education of the respondents’ parents, rather than their book shortage at the age of ten. This information will be collected in the next wave of SHARE.

The language ability is the cognitive functioning which results are more difficult to interpret, because of the lack of a clear pattern over time and by gender. One explanation could be that the related test is likely to suffer from learning effects by the respondents.

Our findings reveal that education policies may play only a partial role in explaining directly the observed differences in cognitive decline across countries and cohorts. This suggests the need to investigate the role played by other factors, probably occurred in adulthood and affected by education in other ways, like occupational paths or household fertility patterns.

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Sonja Vestergaard and Karen Andersen-Ranberg

19 Hearing impairment and adverse outcomes among Europeans

-
- ▶ Hearing impairment is more common in countries where use of hearing aids is less common
 - ▶ Being hearing impaired predicts symptoms of depression and poor self-rated health
 - ▶ Developing hearing impairment is associated with increased odds of developing symptoms of depression and poor self-rated health
-

Impaired hearing affects many older adults and not being able to hear properly challenges the interaction of the individual with the surroundings. Impaired hearing may thus lead to reduced ability to react to signal of immediate danger, reduced social interaction, rejection of visiting theaters and lectures, reduced cultural stimulation and quality of life (Solheim 2011). Furthermore, hearing impairment induces an increased toll on the sensory system to cope with the demands of the daily life (Tun 2009, Jennings 2010), which may mean earlier departure from the labour market. In cross-sectional studies, hearing impairment has been associated with negative outcomes such as depression, cognitive impairment and poor self-rated health (Cronin 2011, Helzner 2011). In a longitudinal design, an American study found an accelerated loss in cognitive decline during six years in older adults with hearing loss compared with older adults with normal hearing (Lin 2013). In Japanese community-dwelling older adults independent in instrumental activities of daily living (IADL), e.g. shopping, using public transportation, handling banking, preparing meals, hearing impairment was significantly associated with the development of dependency in IADLs three years later (Yamada 2012).

The prevalence of hearing impairment increases gradually with ageing (Lin 2011), but varies also by methodology used and criteria for hearing impairment as shown in a recent review based on mainly national surveys in Europe (Roth 2011). Objective assessment of hearing impairment by pure tone audiometry identified 28.5 per cent of 50–59 year olds to have a hearing loss > 25dB, gradually increasing with advancing age groups and being 89.1 per cent in 80+ year olds (Lin 2011). In general, this is higher than for self-report of hearing impairment, which is known to underestimate objectively measured hearing impairment (sensitivity 41–65 %) (Agrawal 2008) but self-report of hearing impairment is still accepted in epidemiological studies where pure tone audiometry is not feasible (Valete-Rosalino 2005).

But irrespective of the method, hearing impairment is a condition associated with substantial negative consequences for the individual, which may thus hamper active ageing and social interaction. However, although the evidence is clear from national studies as described above, large scale cross-national comparisons using one method do not exist, neither in a cross-sectional nor in a longitudinal setting.

In this chapter we describe the prevalence of hearing impairment and study whether being hearing impaired at Wave 2 could predict having symptoms of depression, cognitive impairment, and poor self-rated health at Wave 4. Furthermore, among those without hearing impairment at Wave 2, we studied the association of becoming hearing impaired (incident hearing impairment) during the four years between Waves 2 and 4 with status of symptoms of depression, cognitive impairment, and poor self-rated health at Wave 4. Lastly, among those aged between 50 and 64 years old, we studied the association of hearing impairment with not being employed at Wave 4.

We used data from the twelve countries participating in both SHARE Waves 2 and 4: Sweden, Denmark, Germany, Belgium, the Netherlands, Austria, Switzerland, France, Spain, Italy, Poland and Czech Republic, a total of 17,213 individuals.

Impaired hearing was categorised from answers to the question 'Is your hearing (using a hearing aid as usual)'. Responding 'fair' or 'poor' defined those having impaired hearing while those responding 'excellent', 'very good' or 'good' were categorised as not having impaired hearing.

Assessment of adverse outcomes included i) symptoms of depression using the EURO-D scale, which consists of 12 items and ranges from 0-12 and those with scores from 4 to 12 were categorised as having symptoms of depression (Prince 1999) ; ii) cognitive function using a ten-word list-learning test from which scores ranged from 0 to 10 words recalled (Souhay 2000) with those with scores 0 to 3 were categorised as cognitively impaired; iii) poor self-rated health using the standard question 'Would you say your health is' and those answering 'fair' or 'poor' defined poor self-rated health versus those answering 'excellent', 'very good', or 'good'. Lastly, we looked at employed SHARE Wave 2 respondents aged 50 to 64 years and the association between the incident of hearing impairment and employment status in Wave 4.

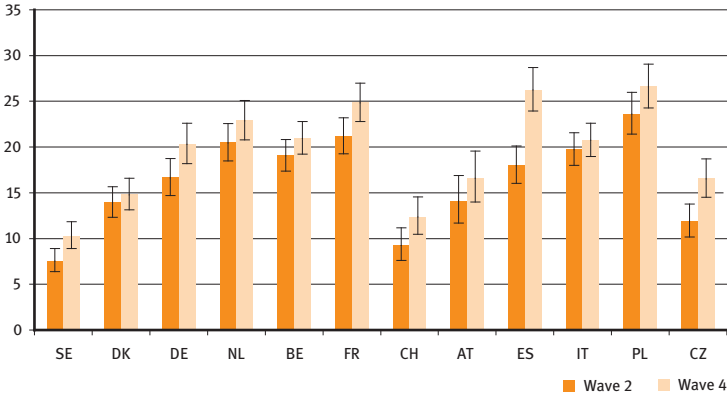
The analyses were controlled for age, gender, having poor vision, having experienced limitations in performing usual activities during the last six months, and the use of hearing aid. As use of hearing aid may be affected by access to health care we also controlled for individual wealth, which was defined as the sum of all financial and real assets (minus liabilities) and categorised into country-specific tertiles. Education was also included using the International Standard Classification of Education from which three groups were formed: lower-secondary school

or lower (levels 0–2), upper secondary (level 3), post secondary (levels 4–6). The time-interval between interviews in Wave 2 and Wave 4 was included, varying from 42 to 65 months between respondents.

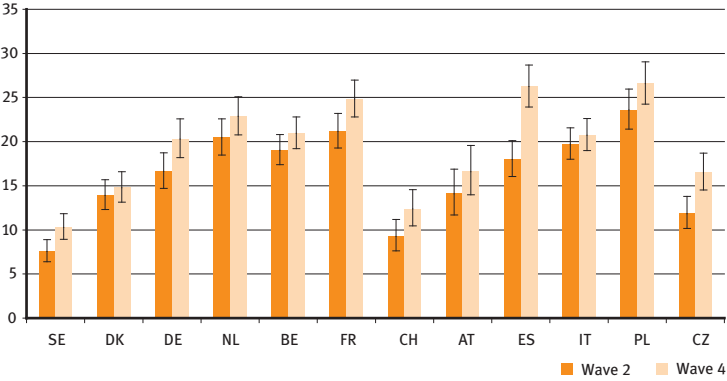
When analysing the predictive power of hearing impairment for adverse outcomes by means of a multiple logistic regression, robust variance estimation was used as the observations over time are not independent from each other. Four models were estimated (Model 1: baseline level of outcome variable and time interval. Model 2: 1 + age, gender. Model 3: 2 + remaining covariates; Model 4: 3 + hearing aid use, not shown in figures). The analytical sample comprised only those without missing information in any covariate, leaving 17,213 for the analysis on prevalence and hearing impairment as predictor, 13,708 for the analysis of incident hearing impairment, and 4,050 for the analysis of incident hearing impairment and employment maintenance. As the longitudinal analyses were carried out on unweighted data for the two waves the results presented here may be subject to minor changes when weighted data become available.

19.1 The prevalence of hearing impairment and use of hearing aid among 50+ year old Europeans in 2006 and 2010

Overall, the prevalence of self-reported hearing impairment at Wave 2 was 18 per cent. 13.6 per cent developed hearing impairment between Wave 2 and 4. In the age group 65+ years 24.2 per cent had hearing impairment and more men than women reported such difficulties. The age- and gender adjusted proportion of hearing impairment varied among the European countries (Figure 19.1a). In Sweden, for example, only 8.0 per cent reported hearing impairment in Wave 2, whereas in France this amounted to 24.0 per cent of respondents. The proportion of respondents reporting to have a hearing aid varied from 0.8 to 6.9 per cent in Wave 2 and 1.8 to 11.5 per cent in Wave 4, being particularly low in Southern and Eastern European countries, but also in Germany, Belgium and France, especially in Wave 2. In most countries a significant increase in the proportions of hearing aid users was identified from Wave 2 to Wave 4, which could be expected due to the ageing of the cohort. However, the highest increases were seen in the Northern SHARE countries Sweden, Denmark, the Netherlands, as well as Switzerland. With the exception of the Netherlands, there was in general an inverse relationship between having a hearing aid and reporting having a hearing problem (Figure 19.1a and 19.1b).



(a) Hearing impairment (n=17,213)



(b) Hearing aid use (n=17,213)

Figure 19.1: Cross-national proportions of respondents reporting hearing impairment and hearing aid use in Wave 2 and Wave 4

Notes: Data are presented as per cent with 95 % confidence intervals and are adjusted for age and gender.

Source: Wave 2 release 2.5.0, Wave 4 release 1

19.2 Hearing impairment as a predictor of adverse health outcomes over four years

When adjusting only for the baseline level of outcome variable and time interval between interviews (model 1), those having hearing impairment (HI) at Wave 2 were at higher odds of reporting symptoms of depression (DS), cognitive impairment (CI) and poor self-rated health (SRH) (Odds Ratios [95% Confidence interval] DS, 1.39 [1.26–1.52], CI, 1.65 [1.49–1.82], and SRH, 1.48 [1.35–1.62]), respectively, compared with those without HI (Figure 19.2). When adjusting for multiple covariates as in Model 3 reduced the odds for DS, CI, and poor SRH, respectively, and only the odds ratios of DS and poor SRH remained statistically significant. Adding baseline HA use to the model did not change the estimates (analyses not shown). Among those being employed at baseline in Wave 2 and below 65 years of age, hearing impairment did not predict whether they were not being employed at follow-up in Wave 4 in the fully adjusted model (data not shown).

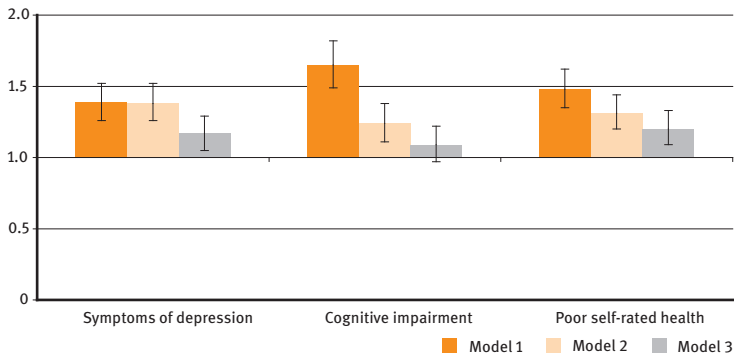


Figure 19.2: Hearing impairment at Wave 2 predicting symptoms of depression, cognitive impairment, and poor self-rated health at Wave 4

Notes: Model 1: adjusted for baseline dependent variable and time interval. Model 2: adjusted for Model 1 + age, gender. Model 3: adjusted for Model 2 + poor vision, limited in usual activities, wealth, education, and country. Data are presented as odds ratio and 95% confidence interval (*Symptoms of depression*, $n=16,753$; *Cognitive Impairment*, $n=16,870$; *Poor self-rated health*, $n=17,125$).

Source: Wave 2 release 2.5.0, Wave 4 release 1

19.3 Incident hearing impairment and odds of adverse health outcomes

When analysing only those who did not report hearing impairment at Wave 2, having developed a hearing impairment at follow-up at Wave 4 was associated with higher odds of experiencing DS (OR 1.88 [1.68–2.11]), CI (OR 1.91 [1.68–2.18]), poor SRH (OR 2.35 [2.10–2.64]), and becoming unemployed (OR 1.23 [0.98–1.53]), respectively, compared to those who had not experienced a hearing impairment incident. However, when adjusting for all covariates the magnitude of the associations were reduced and only DS and poor SRH remained statistically significant. Hence, compared to participants not developing hearing impairment, incident hearing impairment between Waves 2 and 4 was associated with higher odds for having DS (OR 1.42 [1.26–1.62]) and poor SRH (OR 1.58 [1.38–1.81]) at Wave 4, respectively.

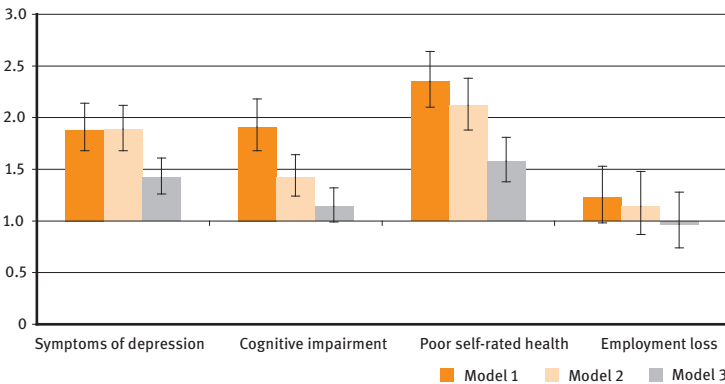


Figure 19.3: Incident hearing impairment at Wave 4 and association with symptoms of depression, cognitive impairment, poor self-rated health, and unemployment at Wave 4
Notes: Model 1: adjusted for baseline dependent variable and time interval. Model 2: adjusted for Model 1 + age, gender. Model 3: adjusted for Model 2 + poor vision, limited in usual activities at waves 2 and 4, and wealth, education, and country. Furthermore, levels of other adverse outcomes at waves 2 and 4. Data are presented as odds ratio and 95 % confidence interval (*Symptoms of depression*, $n=13,708$; *Cognitive Impairment*, $n=13,708$; *Poor self-rated health*, $n=13,708$; *Unemployment*, $n=4,050$).

Source: Wave 2 release 2.5.0, Wave 4 release 1

19.4 Hearing impairment predicts symptoms of depression and poor self-rated health

This is the first large-scale, population-based European study of the longitudinal effect of hearing impairment on adverse outcomes, where inclusion of multiple covariates at the micro level provided better knowledge of the negative implications of hearing impairment on health, i. e. poor self-rated health and depressive symptoms. Both are adverse health outcomes with high individual and societal costs. At the individual level isolation and as a consequence low social activity, perhaps even social exclusion, may have devastating effects for the older person (Arlinger 2003) who may already be at risk of social isolation due to loss of the next of kin. Furthermore, isolation and lack of social engagement may lead to less physical activity resulting in loss of functions (Gopinath 2012).

Although we were unable to show a significant relationship between the development of hearing impairment and cognitive impairment when adjusting for relevant covariates, others have found such a relationship (Arlinger 2003, Lin 2013). Since cognitive impairment is a slow insidious condition it may well be that the time span was not long enough to disclose a significant decline in cognitive ability. Also, as self-reported hearing impairment underestimates true hearing impairment our results based on self-reported hearing impairment may not have enough strength to pick up a cognitive decline in the specified time period. The same underestimation may also imply higher impact on the negative outcomes found with respect to self-rated health and depressive symptoms.

As expected, the almost inverse proportions of hearing impairment versus use of hearing aid suggest that access to hearing aid relieves the sensation of hearing impairment. Given the many negative consequences of hearing impairment, here shown as an increased risk for developing depressive symptoms and poor self-rated health, policymakers should address the need for screening of hearing ability, and make access to hearing aids easy for older adults. Following such recommendations may have a high impact on increasing active and healthy ageing and intergenerational solidarity by the mere effect of improved communication and social interaction.

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20 The recent economic crisis and old-age health in Europe

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- ▶ The current crisis had a negative effect on old-age health
 - ▶ One per cent increase in unemployment has a negative effect on health equivalent to more than one additional year of age
 - ▶ Effects are stronger for individuals who are still in the labour force
 - ▶ Effects are stronger in the Northern countries due to the high labour force participation of the older population
-

20.1 Economic crises and health

European countries experience turbulent times: the 2007/2008 financial crisis was followed by a severe economic downturn in many countries and most recently the European Union members struggle from the sovereign debt crisis. Even though many countries have taken quick policy measures to prevent the worst impact, unemployment rates increased dramatically and, more recently, budget crises are demanding grave cuts in government expenditure. Concerns have been raised that the recent shock to the macroeconomic conditions might have negative consequences for public health. There are various potential channels through which this crisis may adversely affect individuals' health. Income losses, job losses, and higher risk of unemployment, for instance, might increase levels of stress, lead to the adoption of unhealthy life-styles, and have negative effects on mental health. Furthermore, individuals might delay seeking care due to cost concerns and tight public budgets might lead to poorer health services. On the other hand economic downturns decrease economic activity which might result in lower opportunity cost of health investments and an improvement of health due to less job-specific medical problems. In that sense economic downswings can also improve population health. Therefore, empirically the effect of macroeconomic shocks on individuals' health is not clear (see Ruhm 2005b for a literature review). While there is evidence that in developing countries economic downturns adversely affect health (e.g. Leon et al. 1997; Cutler et al. 2002) the evidence from developed countries is more controversial. For example, Ruhm (2000, 2005a) finds a procyclical relationship between unemployment and mortality across the United States, where procyclical means that when unemployment-

ment rates decrease mortality increases. Similar evidence is provided, for example, for 23 OECD countries (Gerdtham & Ruhm 2006), for Germany (Neumayer 2004), and for Sweden (Gerdtham & Johannesson 2005). Contrary to that Deaton and Paxson (2004) find no relationship between mortality and income in the UK and the US. Common explanations for the procyclical relationship are that job related stress is higher and job and car accidents increase in times of economic upturns. However, results vary by country and the generosity of social safety nets (e. g. Gerdtham & Ruhm 2006; Stuckler et al. 2009) and for different population sub-groups.

In this chapter we analyse the effects of the most recent adverse macroeconomic conditions on health outcomes across European countries in order to shed light on the relationship between macro-shocks and health among the older population. We think this is particularly interesting because on the one hand older people might be more vulnerable to adverse shocks with respect to their health. They might, for example, suffer more from cuts in public health budgets. On the other hand, older individuals might be less affected as many of the effects of crises on health are channelled via the labour market. Older people are less likely to participate in the labour market, they do not have to worry about labour market fluctuations and have relatively stable retirement incomes. For this reason we analyse individuals' health outcomes with a specific focus on their labour force participation.

More specifically, we match information about the severity of the current crisis at the regional level measured by the changes in the age-specific employment rates, i. e. employment among the 55 to 64 year old, at NUTS (*Nomenclature des unités territoriales statistiques*) 1 level to the SHARE data and analyse the relation between macro-conditions and individuals' subjective health of the population aged 50 to 70. Thus, in contrast to most of the empirical studies cited before we do not use aggregate but micro-data to analyse the effect of the recent recession on health. We look at the overall effect of the economic crises on changes in health among older persons. Therefore, we measure health before the start of the crisis in 2006 (Wave 2) and again in 2010 (Wave 4). The effects are analysed for specific subsets of countries, by labour market status, and by education.

Our contribution is organised as follows. In section two we will introduce the data and variables used for our analysis. Section three contains our estimation strategy and the results regarding the effect of macro-economic fluctuations on health in old age. We conclude in section four by giving starting points for possible policy interventions.

20.2 Measuring crises and health outcomes

20.2.1 Regional variation in economic crises

We measure economic crises by using a trend and cycle decomposition of the time series of age-specific employment rates from 1999 to 2010. The data are provided by Eurostat. We apply the Hodrick-Prescott filter with a smoothing parameter of ten to that time-series. In contrast to previous studies we do not use unemployment, because especially for the population 55+ unemployment is not necessarily informative about the labour market situation. Many countries and firms offer generous early retirement windows if they want to reduce their work force. Therefore regional changes in employment are in our view more informative. Our measure for the severity of the crisis is the deviation of the regional employment from its ten-year trend. Figure 20.1 presents the regional distribution of our crisis measure in 2008 for all SHARE countries included in the analysis. We pick 2008 because it is the year in the middle of our observation period (2006 to 2010) and marks the onset of the crisis. In regions shaded in dark orange there was a severe negative deviation of the employment rate among the 55–64 year old from the trend in 2008. We interpret this as a negative macro-economic climate. In contrast in regions with lighter shade the deviation from the ten-year trend was less negative or even positive. There is substantial variation of the macro-economic measure within countries. We also construct a similar measure based on general employment rates for the population 15–64. (As alternative crisis indicators we use first differences in the employment rates and the deviation of the employment rate from a quadratic country specific trend. Our results are robust using these alternative measures. The results are not included in the paper and available upon request).

20.2.2 Self-reported health

In all SHARE waves respondents evaluate their health on a self-rating scale. The specific question is “Would you say your health is 1 – excellent, 2 – very good, 3 – good, 4 – fair, 5 – poor”. We use changes in self-reported health between waves as dependent variable. Thus our dependent variable can take values from four to minus four, where positive values refer to an improvement in health (For further information on the changes in self-reported health between waves see Vestergaard et al. in this volume).

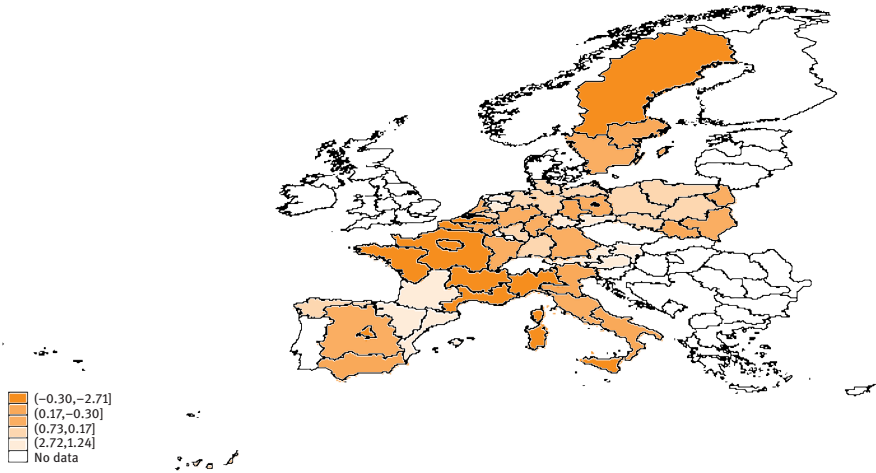


Figure 20.1: Changes in employment rates

Notes: Map of the changes in employment rates for the population 55–64 in 2008 by NUTS 1 regions in Europe; deviations of the employment rate from its ten-year trend are calculated using a Hodrick-Prescott filter with a smoothing parameter of ten.

Source: Eurostat http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database

20.3 The European crisis and old-age health

20.3.1 Econometric specification

We estimate the following linear regression specification:

$$\Delta H_{ijc} = \alpha + \beta X_{ijc} + \gamma R_{jc} + \delta_c + \varepsilon_{ijc},$$

where ΔH_{ijc} is the change in the health status between waves for individual i living in region j and country c ; X_{ijc} is a vector of individual specific variables including age; R_{jc} is the region specific macroeconomic indicator as described before; δ_c is a country fixed effect. Since the model is specified in first differences controlling for country fixed effects in this regression is equivalent to allowing for linear country specific time trends in health levels. The intercept α measures the baseline decline in health in the four year period 2006 to 2010; ε_{ijc} is an error term. The estimation is heteroskedasticity robust using the Huber-White sandwich estimator.

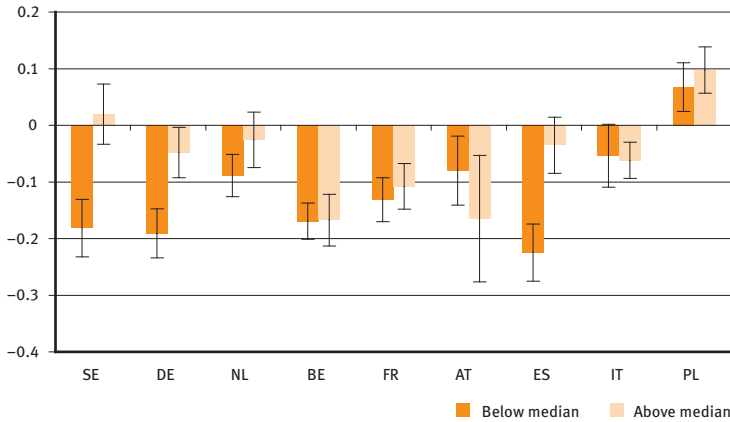
Since the macro-economic indicators are age-specific for the population 55–64 we restrict our estimation sample to individuals between age 50 and 70 in Wave 4. However, for robustness we also estimate the effects on the whole sample. Finally, we explicitly allow for heterogeneity of the effects by employment status in 2006, levels of education (high school dropout, high school, college), and for three European macro-regions (Northern, Central and Mediterranean). The selection of countries included in our analysis depends on participation in SHARE Waves 2 (2006) and 4 (2010) as well as the availability of NUTS 1 level indicators, because the identification of the crisis depends on variation across regions within countries. Sweden and the Netherlands (Northern), Germany, Belgium, France, and Austria (Central), Spain and Italy (Mediterranean), and Poland are included in our analysis. Poland is the only transitioning economy included and we do not construct the respective macro region.

20.3.2 Effect of the economic crisis on self-reported health

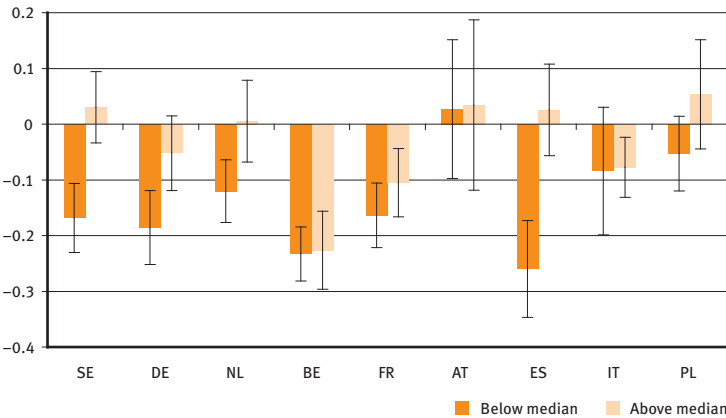
Figure 20.2 shows the changes in self-reported health between Wave 2 and 4 for all the countries. On average we find a decrease in health in the four year period among those aged between 50 and 70, which is not surprising because people become older. The only exception to this trend is Poland. However, understanding health trends in transitioning economies can be an interesting topic for future investigations.

We split regions into those with above and below median trend deviation in employment within countries. In regions which were more affected by the economic crisis, i. e. in which the negative deviation from the long term trend in employment rates is stronger (“below median”), individuals show a stronger decline in self-reported health between 2006 and 2010 compared to regions with above median deviation from the long-term trend. The differences are particularly large and significant in Sweden, Germany and Spain for those aged 50–70 (see Figure 20.2a). Conditional on labour market participation the picture is very similar, and the difference for the Netherlands is now also significant (see Figure 20.2b). Overall, we find a negative correlation between the severity of the crisis and changes in self-reported health.

Our results are confirmed in a multivariate regression specified as described above. In Panel A of Table 20.1 we report results using the deviation in the age-specific employment rates. A one percentage point increase in employment (from its trend) reduces the decline in health over the four-year period by around 0.057 standard deviations. In other words, a one percentage point lower employment rate compared to its ten-year trend implies an average decline in health approxi-



(a) Mean changes in self-reported health among individuals aged 50-70 by country between 2006 and 2010 for regions with below and above median trend deviation in employment rates (N= 10,862)



(b) Mean changes in self-reported health among individuals aged 50-70 by country between 2006 and 2010 for regions with below and above median trend deviation in employment rates, conditional on employment in 2006 (N= 3,605)

Figure 20.2: Regional changes in self-reported health by country

Source: Eurostat data on regional employment and SHARE Waves 2 and 4

mately equal to 1.2 additional years of aging. What is more, the negative effect of the crisis on health is lower if we drop the age restriction and also include respondents older than 70. It becomes more severe if we only include individuals who reported to be in the labour force in 2006. This is an indication that some of

the effects of the recent economic crisis on health seem to be channelled through the labour market.

In Panel B of Table 20.1 we use general instead of age-specific employment rates. We find no effect of the region specific decline in employment rates on health of the older population. The effects are smaller compared to the effects reported in Panel A and not significant. We take this as evidence, that there is no general effect of the macro-economic climate on health of the population we investigate, but that there are negative effects of difficult labour market conditions.

Table 20.1: Linear regression: The effect of employment rate on changes in self-reported health

Panel A: Age specific employment rates			
Sample:	Full sample	Age restricted	Employed W2
gamma	0.043 ***	0.057 ***	0.078 ***
(s. e.)	(0.012)	(0.015)	(0.023)
N	14,178	8,289	3,605
Panel B: Total employment rates			
Sample:	Full sample	Age restricted	Employed W2
gamma	0.022	0.029	0.083
(s. e.)	(0.027)	(0.035)	(0.083)
N	14,178	8,289	3,605

Significance: *** = 1%; ** = 5%; * = 10 %

Notes: Controlled for gender, age and a full set of country dummies; s.e. = standard error.

Source: SHARE Wave 2 release 2.5.0, Wave 4 release 1

In Table 20.2 we separate the sample according to three levels of education: high school drop-outs, high school and college. Including all respondents between age 50 and 70 we find the largest effect on the college educated, followed by a smaller but still significant effect for those with the lowest level of education (Panel A). This result seems puzzling at first glance as usually those with lower levels of education are more affected by labour market turbulences. However, if we focus on individuals in the labour market in 2006 (Panel B), the effects among the college educated are almost of equal size. We are dropping about 40 per cent of the sample. At the same time, among the high-school drop-outs the effect doubles and is highly significant, while the sample is reduced by around 70 per cent. Thus, the different effects of the crisis on health by education seem to be partly driven by differences in labour market participation among older people depending on education levels.

Table 20.2: The effect of employment rate on changes in self-reported health by levels of education

Panel A: Age restricted			
	High school dropouts	High school	College
gamma	0.052 **	0.052 **	0.102 ***
(s. e.)	(0.025)	(0.026)	(0.032)
<i>N</i>	3,336	2,995	1,852
Panel B: Age restricted & Employed			
	High school dropouts	High school	College
gamma	0.103 **	0.054	0.099 **
(s. e.)	(0.044)	(0.037)	(0.040)
<i>N</i>	1,033	1,382	1,141

Significance: *** = 1%; ** = 5%; * = 10 %

Notes: Controlled for gender, age and a full set of country dummies; s.e. = standard error.

Source: SHARE Wave 2 release 2.5.0, Wave 4 release 1

In Table 20.3 we report the effects by groups of countries. The population between 50 and 70 seems to be most affected in the Northern countries. There is a small but only marginally significant effect of the crisis on health of the residents in Central Europe and no effect in the South. As before the results seem to be driven by labour market participation. In fact, when we condition on labour market participation in 2006 the effects in the Northern and Central European countries remain almost stable (about 43 per cent of the respondents in North and 55 per cent in Central Europe are not participating in the labour market in 2006). For the Mediterranean countries the effect more than doubles its size and becomes significant. In the Mediterranean countries about two-thirds of the population were not participating in the labour force in 2006. Overall, we find consistent evidence that negative labour market conditions have an adverse effect on health of older individuals, in particular of those who are still participating in the labour force.

Table 20.3: The effect of employment rate on changes in self-reported health by macro-region of residence

Panel A: Age restricted			
	Mediterranean	Central	Northern
gamma	0.037	0.041 *	0.14 ***
(s. e.)	(0.025)	(0.022)	(0.042)
N	1,838	3,496	1,949
Panel B: Age restricted & Employed			
	Mediterranean	Central	Northern
gamma	0.083 *	0.057 *	0.118 **
(s. e.)	(0.046)	(0.030)	(0.059)
N	623	1,585	1,114

Significance: *** = 1%; ** = 5%; * = 10 %

Notes: Controlled for gender, age and a full set of country dummies; s.e. = standard error.

Source: SHARE Wave 2 release 2.5.0, Wave 4 release 1

20.4 Conclusions: a case for policy interventions?

We evaluate the cost of the current crisis in terms of public health and find consistent evidence that adverse labour market conditions have a negative effect on the old-age population. More specifically, we find that a one percentage point negative deviation of employment from its trend enhances the decline in health equivalent to about 1.2 years of aging. The effects are even stronger for groups that are still participating in the labour market and are thus more exposed to macro-economic fluctuations.

For policy makers this result can be interesting from various perspectives. First, the health consequences of the current crisis should be considered when designing policies to overcome the crisis. In particular budgetary cuts in health expenditure have to be examined very carefully. Second, side effects of current policies aimed at increasing labour market participation of older persons should be discussed. If older workers remain in the labour market their exposure to macroeconomic fluctuations is increased with potentially negative effects on their health. However, before jumping to conclusions more research regarding the underlying mechanisms is necessary. So far we have looked at the reduced form effects of macro-economic conditions on health. Further work should focus on exploring how economic downturns negatively affect individuals' health and

how such effects can be prevented. In that respect it will be important to investigate how economic fluctuations affect income, and how they influence retirement decisions and unemployment. Moreover, it will be interesting to analyse the effects of economic crises on health behaviour and the likelihood to suffer from specific diseases. Furthermore, it is crucial to look at the heterogeneity of the effects across a wider set of sub-populations to identify vulnerable groups and propose concrete policy interventions.

Finally, one caveat of our approach is that including country fixed effects in a regression of changes in health eliminates all country specific variation in health policies over time, such as, for example, the effects of cuts in public health budgets. In future work we plan to overcome this limitation by collecting information on country specific policies. This might allow us to point out how health policies could prevent adverse effects of macro-economic fluctuations.

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21 Multimorbidity, incentives and the use of health services in Europe

-
- ▶ The relation between multimorbidity and health care utilisation is positive and homogenous across Europe
 - ▶ Countries with a higher density of hospital beds and physicians show higher rates of health service utilisation
 - ▶ After the introduction of prospective inpatient payment, the length of stay decreases for multimorbid individuals more than for non-multimorbid
-

21.1 Introduction

As a result of improved medical care, the number of individuals surviving to old age with multiple coexisting chronic conditions (multimorbidity) is increasing. Multimorbidity entails a high burden on the older people. This is associated with multiple symptoms as well as disabilities such as cognitive impairments, limitations with activities of daily living or reduced mobility (Fortin et al. 2004, Boyed & Fortin 2010), and thus affects quality of life. Furthermore, multimorbidity is associated with a high economic burden because patients use health care services in a high frequency and have complex health care needs (Wolff et al. 2002, van den Bussche et al. 2011).

To deal with the economic burden of an ageing multimorbid population and to address the hazard of a fragmented, ineffective, inefficient and incomplete care (Boyed & Fortin 2010), recent health care reforms introduced regulation mechanisms (e.g. gatekeeping, copayment schemes, financing tools). These developments should be evaluated and require situation-specific permanent adjustment. Therefore the knowledge about the prevalence of multimorbidity, the implication of multiple conditions for the use of health services and the influence of various regulatory mechanisms on health care utilisation as well as on quality of care is becoming an increasingly important issue for clinicians, patients and policy makers.

Studies examining patterns of multimorbidity and health service utilisation have been conducted within many countries, but the absence of a uniform way of defining and measuring multimorbidity as well as differences in data collection methods are of special concern and do not allow the comparison of prevalence and consequences across different countries. Furthermore, evidence on the impact of different health care system components on health care utilisation is scarce.

In this chapter, we use SHARE data to provide evidence on the relationship between multimorbidity and the use of health services in different European countries within one dataset and the influence of country specific system characteristics on health care utilisation. Furthermore, we examine the impact of health care reforms on health service utilisation of multimorbid patients using as example the introduction of prospective inpatient payment in different European countries (so called diagnosis-related groups or DRGs).

21.2 Data and methods

Data: We use data from the first (2004/2005), second (2006/2007) and fourth wave (2010/2011) of the Survey of Health, Ageing and Retirement in Europe (SHARE) to analyse the influence of multimorbidity on the use of health services. We measure *outpatient health care utilisation* by the number of physician and specialist contacts as well as the probability to visit a general practitioner or specialist. For *inpatient care* we take into account the hospitalisation rate, the number of hospital visits and total length of stay. According to the behavioural model of health services utilisation by Anderson (1995) we include three sets of individual-specific covariates: needs, resources and predisposing circumstances. *Need* is specified by the number of chronic conditions. *Resources* are defined by education, household size, and marital status. *Predisposing circumstances* are described by the variables sex and age.

In addition to these individual characteristics we include health care system characteristics for both the outpatient and inpatient setting at the country level. We investigate for outpatient health service utilisation the influence of physician density and for the inpatient care setting the available number of hospital beds as well as the corresponding payment system in hospital (*Diagnosis Related Groups (DRGs)* vs. other financing scheme).

Methods: We estimate a sequence of models. First, we analyse specific influences of individual characteristics on outpatient and inpatient health care utilisation using probit analyses of the likelihood of physician visits and hospital stays as well as count data methods to estimate the number of physician contacts and times stayed in hospital.

Second, we add supply indicators at the country level (physician density, number of beds) to analyse the impact of country characteristics on the propensity to visit and the number of physician contacts (general practitioner (GP) and specialist) as well as inpatient care.

Third, we use a difference-in-difference approach to investigate the influence of the introduction of prospective payment as a new financing tool for hospitals (DRGs) on the use of inpatient care.

Definition of multimorbidity: In their literature review Fortin et al. (2006) found that most studies defined multimorbidity as the existence of two or more chronic diseases. We follow that practice and classify an individual suffering from at least two long-term diseases (out of 14 conditions available in all regular waves of SHARE) as multimorbid. We further distinguish among the multimorbid by patterns of conditions and the number of conditions.

Multimorbidity rates among European older people: Our descriptive results show a multimorbidity rate of 44.3 per cent across all available waves. On average, multimorbid individuals suffer from at least three long-term diseases. Cardiovascular diseases (87.7%), metabolic disorders (62.2%), and arthritis (40.2%) are the most common medical conditions.

Country specific multimorbidity rates are presented in Figure 21.1. Switzerland and the Netherlands have the lowest multimorbidity rates across SHARE countries. When adjusting for age this result remains. At more than 55 per cent, Hungary, Estonia, Poland and Portugal show the largest age-adjusted multimorbidity rates.

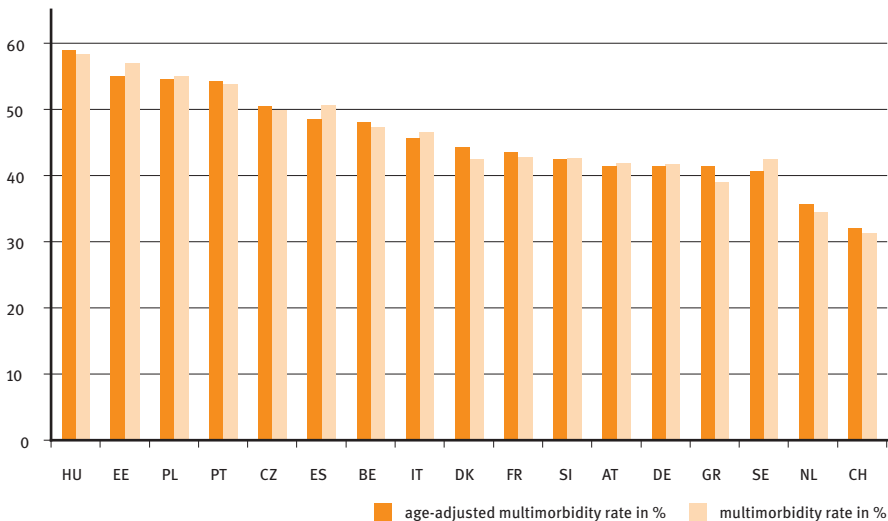


Figure 21.1: Country-specific rates of multimorbidity in Europe (n = 116,797)

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

Multimorbid patients are on average older than the non-multimorbid (68.4 years versus 62.6 years), there is a higher percentage of females among them (58.5% versus 54.1%), they are less educated and live in smaller households. Moreover multimorbid individuals are at higher risk to suffer from functional limitations and limitations with activities of daily living (analyses not shown).

21.3 Multimorbidity and health services utilisation

We find a significant relation between multimorbidity and the use of health services. Multimorbidity is positively related to ambulatory care and hospitalisation. The average number of physician contacts per individual is two times higher than the contact rate of non-multimorbid patients (9.5 (SD \pm 11.4) contacts vs. 4.3 (SD \pm 7.1)). Hospitalisation rates among multimorbid patients are increased by a factor of three.

Table 21.1 shows the results of count data models estimating the link between multimorbidity and health services utilisation, controlling for a number of individual covariates. For general practitioner visits and specialist visits, we use hurdle models with a first stage probit for participation and a second stage truncated negative binominal regression for usage. For hospital visits, we use a zero-inflated negative binominal regression model. Count data models are appropriate for the analysis of health care utilisation because the distribution of the dependent variables, number of physician contacts and hospital visits, is not continuous, non-negative, skewed to the right and contains a large proportion of zeros.

Results indicate that multimorbid persons have a 15 percentage point (pp.) higher chance of visiting a GP, a 22 pp. higher chance of visiting a specialist and an 8.6 pp. higher chance of staying at a hospital than non-multimorbid persons. Conditional on visiting at all, the multimorbid have two more GP and one more specialist visit. Hence, multimorbid individuals use specialists more often and have a higher number of hospital stays.

Among multimorbid respondents, relationships between individual characteristics and health care utilisation (analyses not shown) are as follows: older people have higher levels of resource usage. Gender is a significant determinant only for inpatient services, with males having a higher level of health service utilisation than females. Moreover, the degree of education is negatively related to the use of health care. The higher the education level the lower health services utilisation was.

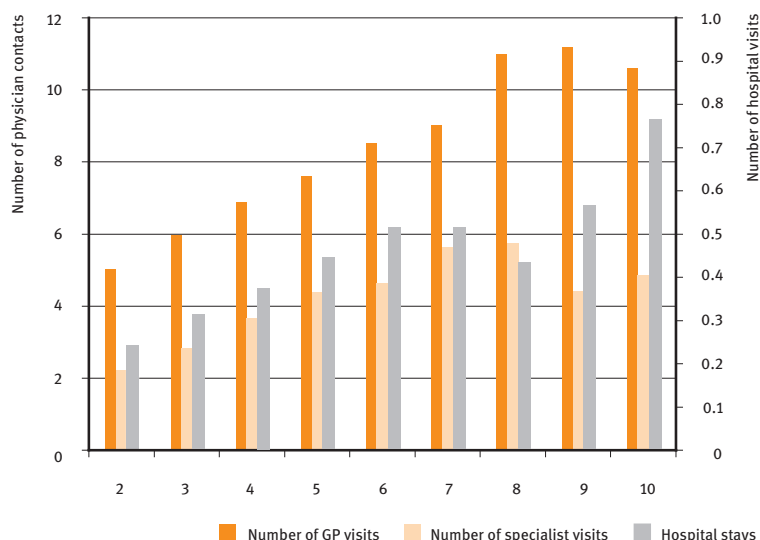
Table 21.1: Estimates for the probability of resource utilisation and the amount of health services use

Model	Probit models probability of:		Count data models number of:	
	Marginal effects	SE	Marginal effects	SE
<i>General practitioner visits</i> (<i>n</i> = 116,071)				
Multimorbidity	0.149***	0.003	2.019***	0.044
<i>Specialist visits</i> (<i>n</i> = 116,062)				
Multimorbidity	0.220***	0.003	0.981***	0.054
<i>Number of hospital visits</i> (<i>n</i> = 116,797)				
Multimorbidity	0.086***	0.002	0.097***	0.004

Significance: *** = 1%; ** = 5%; * = 10 %

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

Likewise the number of chronic diseases drives the number of outpatient consultations and hospital stays. Figure 21.2 demonstrates that the number of chronic conditions almost linearly increases the number of GP visits, specialist visits, and hospital stays. The trend becomes somewhat unstable for very large numbers of conditions due to a small number of observations.

**Figure 21.2:** Number of chronic conditions and predicted number of events (*n* = 51,741)

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

Furthermore, health services utilisation differs between combinations of diseases. In Figure 21.3 we summarise different complexity levels of chronic conditions and the number of physician contacts. Complexity level 1 is defined as suffering from diseases of one organ system whereas level 2 includes patients presenting chronic conditions of two systems and so forth. The results demonstrate significant associations for both: the number of general physician contact and the number of specialist visits.

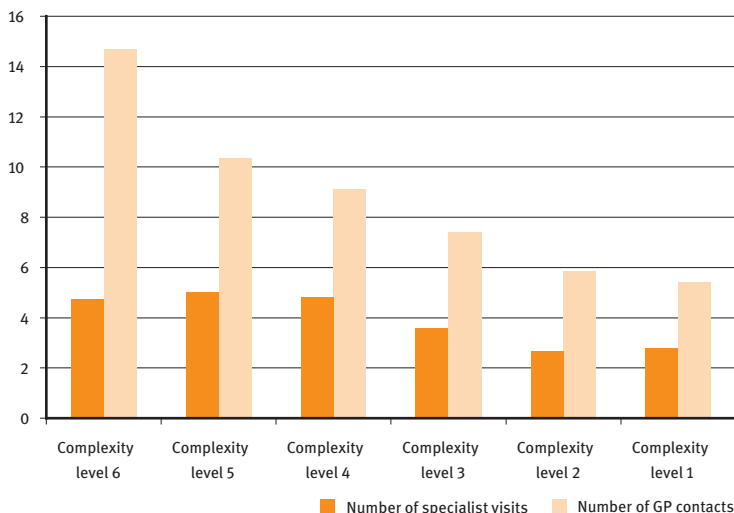


Figure 21.3: Differences in outpatient resource utilisation of different disease complexity levels (n= 51,741)

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

21.4 Health care systems and health care utilisation among the multimorbid

Physician density and number of hospital beds: Health care system characteristics may have an important influence on resource utilisation especially in vulnerable patient groups. We used two OECD indicators describing the national availability of health services to investigate their impact on the probability and number of physician contacts as well as hospital stays. Therefore we include physician density and the number of available hospital beds in our probit and count data models. The OECD provides this information for all countries of our analysis for the years 2004–2011.

In Figures 21.4 and 21.5 we look at cross-national differences in health care utilisation net of the influence of differences in individual characteristics across countries. We plot country-fixed effects obtained from utilisation regressions (see 21.3) against the described health care system characteristics. These fixed effects contain the country-differences in utilisations net of country differences in individual patient characteristics. For both, the probability of visiting a specialist and the probability of hospital stays, we find a significant positive relationship with the availability of the respective service. Furthermore, the number of hospital visits is positively and significantly correlated to the amount of available hospital beds (analysis not shown).

We did not find significant relations for the *number* of physician contacts (both GP and specialist, analyses not shown). These results could be explained by access mechanisms and their level of application (e.g. skip and pay, referral, free access), which mainly drive outpatient care utilisation and thus have more impact on patients' behaviour than structural characteristics.

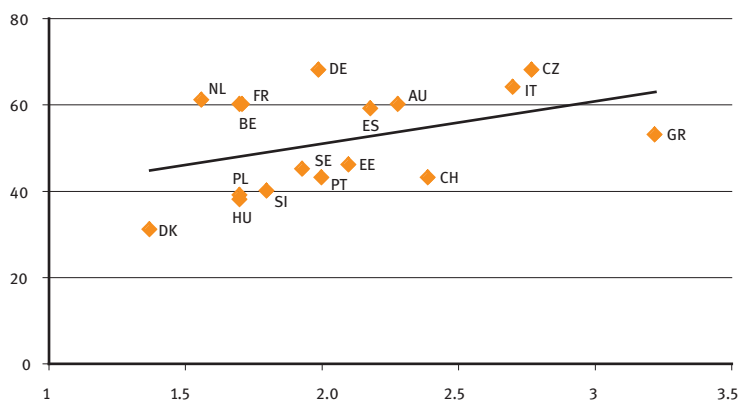


Figure 21.4: Relation between specialist's density per 1,000 population and the probability of a specialist's consultation (net of the influence of individual characteristics) (n=17)

Notes: Control variables: gender, age, marital status, education, household size, resource utilisation within other health care sectors.

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1 and OECD (average over available data from 2004–2011)

Remuneration: Beside structural characteristics that determine access to care, patients' health services utilisation may be related to the remuneration of health care providers. In this section we study the impact of health care reforms using as example the introduction of prospective inpatient payment in different European countries (so called diagnosis-related groups or DRGs). By paying a fixed

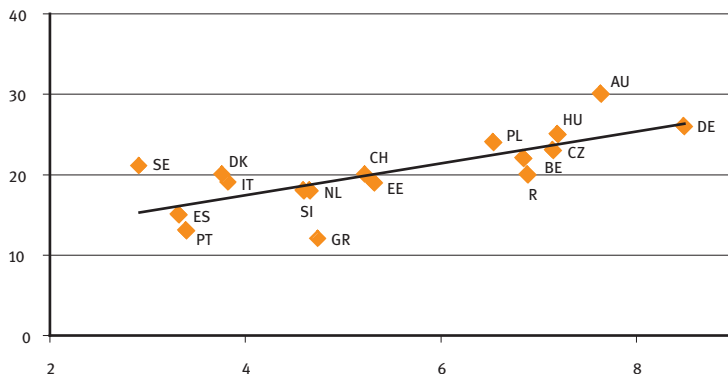


Figure 21.5: Relation between the number of hospital beds available per 1,000 population and the probability of hospital visits (net of the influence of individual characteristics) (n=17)
 Notes: Control variables: gender, age, marital status, education, household size, resource utilisation within other health care sectors.
 Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1 and OECD (average over available data from 2004–2011)

payment rate conditional on patient characteristics to hospitals, DRGs aim at a more efficient allocation of resources. As previous payment systems gave an incentive to inefficient extensions of patients' length of stay beyond the regular duration of treatment especially within care intensive populations, DRGs should induce more efficient resource utilisation. However, hospitals may have an incentive for an inappropriate early discharge of patients.

Because of their larger number of diagnoses and worse overall health, multimorbid individuals are more care and cost intensive. Furthermore, the longer the stay of these individuals, the higher their probability to die in hospital or to develop severe complications, for example nosocomial infections that require further intensive care. Therefore under prospective payment, hospitals should be particularly interested in shorter lengths of stay of multimorbid patients compared to non-multimorbid patients. However this can lead to a "revolving door" phenomenon, i.e. a higher rate of readmission.

We used a difference-in-difference approach to assess the influence of DRG introduction on the average length of stay of multimorbid versus non-multimorbid individuals by exploiting cross-national variation in terms of the introduction date of DRGs (see Figure 21.6) and to generate control and treatment groups.

We find that hospital remuneration has significant relation to the average length of stay in hospital (see Table 21.2). After the introduction of DRGs, the average length of stay decreases for multimorbid individuals 1.46 days more than for non-multimorbid. Including individual characteristic into the model, regres-

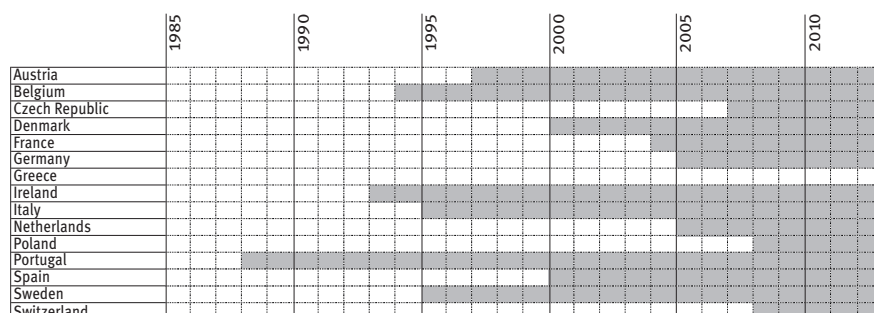


Figure 21.6: Year of DRG introduction as payment system in hospitals

Source: European Observatory on Health Systems and Policy Series (all available reports per country)

sion results remain significant ($p < 0.1$) and demonstrate that multimorbid hospitalised individuals experience an additional reduction in length of stays of about 1.4 days (see Table 21.2).

Table 21.2: Difference-in-difference estimates of the effect of DRGs on hospitalisation

	Model 1	Model 2
DRG	-0.05 (0.55)	0.16 (0.61)
DRG*Multimorbid	-1.46** (0.71)	-1.40* (0.74)
country fixed effects	yes	yes
year fixed effects	yes	yes
individual controls	no	yes
linear country trends	yes	yes
N	17,048	17,043

Significance: *** = 1 %; ** = 5 %; * = 10 %

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

21.5 Conclusion

Our findings show that the relation between multimorbidity and health care utilisation is positive and homogeneous across Europe: people with more illnesses make more use of the health care system. Furthermore, we find evidence for people with multiple conditions to have a higher probability of general practitioner and

specialist contacts and we observe a significant relationship between multimorbidity and the number of general practitioner as well as specialist contacts.

Including health care system characteristics demonstrated that multimorbid individuals living in countries with a higher physician density visited doctors more often than people in countries with a lower density. Likewise countries with a higher density of hospital beds showed a higher number of hospital visits.

The results of a difference-in-difference approach show a significant reduction of the average length of stay after the introduction of the DRGs. This effect is consistent with our expectations, because one possible consequence of those prospective payments discussed in the literature is a reduction of the lengths of stay. In contrast to previous payments schemes like per diems or fee-for-service, DRGs seem to successfully create incentives for more efficient health care supply and avoid an expansion of treatment of individual cases. However, reducing their length of stay can lead to a “revolving door” phenomenon in vulnerable patient groups like multimorbid individuals or may cause a cost shift to other sectors (e.g. long-term care). The international literature gives no clear evidence in that case, therefore further research is highly requested.

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22 Entry into institutional care: predictors and alternatives

-
- ▶ Supply of residential care varies greatly across European countries
 - ▶ Nursing home entry is triggered by functional limitations
 - ▶ Nursing home entry is more frequent among persons with low income or wealth
 - ▶ In low supply countries co-residence with children is a substitute for nursing homes
-

22.1 Few older persons enter residential care

Opinion surveys show regularly that old people want to stay in their home as long as possible. At the same time the arrival of large baby-boom cohorts may increase the demand for home care and for nursing homes (European Commission 2012). Governments faced with increased long-term care cost are looking for the most efficient way of providing such care (Geerts & Willemé 2012). Given these policy concerns, it comes as a surprise to learn that little is known of the nursing home population. In many countries they are left out of official surveys. SHARE is beginning to fill the gap as respondents are followed when they move to nursing homes.

There are many national studies of entry into institutional care of older persons, see Luppá et al. (2010) for a review. Age, disability and the availability of informal care (predominantly delivered by the spouse, but children are also important) appear to be the main predictors of institutionalisation. Apart from the recent paper by Angelini and Laferrère (2012), who studied entry into nursing homes between Wave 1 and Wave 2 of SHARE, there is to our knowledge no cross-national study of moving into residential care. This chapter complements and extends that study.

Using SHARE data from Waves 2, 3 and 4, we selected persons who were at least 65 in 2006, since the use of residential care is very rare before that age. We further left out those who already lived in a nursing home. We considered both those who moved to a nursing home and were interviewed in Wave 4, and those who moved and died in a nursing home between Wave 2 and Wave 4. We knew what happened to the latter, thanks to the End-of-Life questionnaire which was answered by a surviving respondent, often the spouse, or a child (Jürges 2008). For persons who were single, often women, such a respondent was more difficult to find, hence men and married persons were overrepresented. Whether SHARE

respondents lived in nursing homes is ascertained by the interviewer, who was given the following definition: “A nursing home provides all of the following services for its residents: dispensing of medication, available 24-hour personal assistance and supervision (not necessarily a nurse), and room and meals”. This description seems rather similar to the one often used for care homes or homes for the aged (Norton 2000: 961). Nursing homes are supposed to deliver nursing care in addition. It seems reasonable to suppose that interviewers regarded any long-term care facility for older persons as nursing homes. For this reason, we use the terms ‘nursing home’ and ‘residential care’ interchangeably.

Few respondents in Italy or Poland moved to a nursing home. According to data collected by the OECD (2012) in those countries less than two per cent of the people aged 65 and over are institutionalised, whereas the rate is three per cent in Spain, four per cent in Austria and the Czech Republic, five per cent in France, Denmark and Germany, seven per cent in Switzerland, Belgium and the Netherlands and eight per cent in Sweden. The number of persons making this transition in the sample was low, even though it was substantially higher when those who died in a nursing home were included. Because follow-up of dead and living respondents was incomplete, especially when they had moved, the numbers

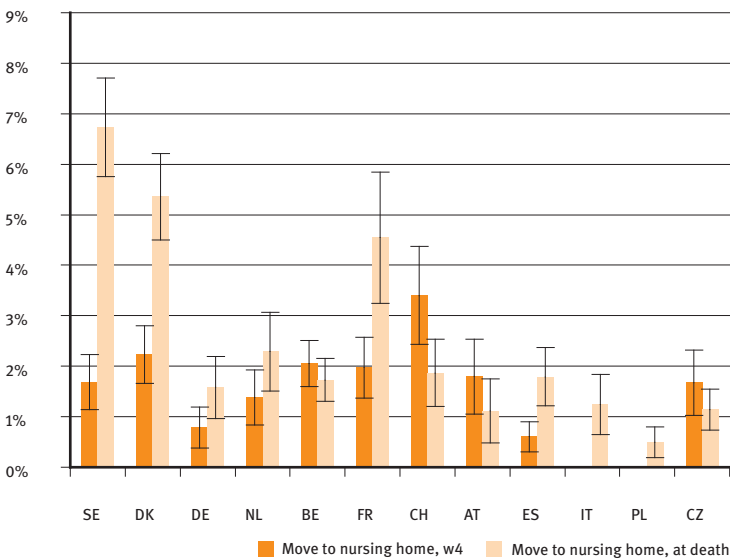


Figure 22.1: Proportion of persons aged 65+ entering residential care between Wave 2 and Wave 4, or between Wave 2 and their death by country

Notes: Only persons not in residential care in Wave 2. n (unweighted) = 8,949.

Source: SHARE Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1

shown in Figure 22.1 should be regarded as indicative only. The proportion of persons dying in nursing homes, relative to those found alive in nursing homes in Wave 4 differed by country. This is likely to be partly due to the varying success of the End-of-Life interviews across countries. But it also reflects the different role of nursing homes in the long-term care systems. In Italy, Spain, Poland, Germany and to a lesser extent Sweden, Denmark or France, it seems very much an end-of-life institution; whereas this seems less the case in Switzerland, Belgium, the Czech Republic or the Netherlands (see Künn-Nelen and Jürges in this volume).

22.2 Functional limitations trigger the entry, but women differ

We modelled the probability of a transition from living in the community to living in an institution between Waves 2 and 4, using probit regression. Following Geerts and Van den Bosch (2012), we considered a wide range of predictors, referring to various dimensions of health, household and neighbourhood characteristics, income, wealth and use of formal home care. In Table 22.1, model (1) presents the results for those who moved to residential care and survived in Wave 4 and model (2) adds those who moved and died between Wave 2 and Wave 4. Moves to a nursing home happened mostly after age 85, and even at very high age many persons manage to stay at home. Relying on the rich information provided by SHARE, we found that bad self-perceived health, depression, having severe conditions or even motor limitations as such did not lead to such a move. More precisely, motor limitations were found to be associated with nursing home entry only when we did not control for limitations in activities of daily living (ADL, e. g. washing oneself, eating) and instrumental activities of daily living (IADL, e. g. preparing a hot meal, doing work around the house or garden). Indeed, ADL and IADL, the accumulation of limitations and even more the evolution in the number of such limitations were the direct triggers of nursing home entry. Apparently, it is not so much the conditions, but their consequences in day to day life that are the crucial factors preventing independent living. In the same vein, low cognitive function was not significant per se but only in that it prevented people from taking care of themselves. Low cognition is a composite variable, incorporating orientation in space and time, numeracy and short-term memory. When we added some of the specific health problems as measured in Wave 2, stroke, Alzheimer, osteoporosis (for those not observed dying in a nursing home) were predictive of a move, while all other conditions were not (Table 22.1). Bad health generally only pushes persons into nursing homes if it leads to loss of autonomy.

Table 22.1: Probit model of determinants of the move to a nursing home

		Without end-of-life respondents		With end-of-life respondents, with IT & PL	
	Variables	(1) coef	se	(2) coef	se
Age	Female	−0.244*	(0.128)	−0.026	(0.084)
	Age 65–74	ref.		ref.	
	Age 75–84	0.325**	(0.128)	0.322***	(0.089)
	Age 85+	0.677***	(0.171)	0.393***	(0.118)
Household variables	Single Wave 2	0.761***	(0.147)	0.412***	(0.091)
	Became single between Waves 2 and 4	0.759***	(0.185)	0.545***	(0.130)
	Has a child in Wave 2	0.384**	(0.196)	0.198	(0.139)
	Has a daughter in Wave 2	−0.312**	(0.128)	−0.190**	(0.092)
Income & wealth in Wave 2	Distance to nearest child less than 25 KM in Wave 2	−0.309**	(0.142)	−0.319***	(0.096)
	Low income	0.184	(0.116)	0.081	(0.081)
	Low wealth	0.318***	(0.115)	0.165**	(0.080)
	Health in Wave 2	Stroke	0.252	(0.186)	0.237*
	Osteoporosis	0.255*	(0.145)	0.053	(0.110)
	Hip fracture	−0.041	(0.248)	−0.198	(0.171)
	Alzheimer	0.634**	(0.280)	0.595***	(0.154)
	Low cognition	−0.026	(0.127)	0.088	(0.082)
	No motor limitations	ref.		ref.	
	1 motor limitation	0.023	(0.187)	0.014	(0.134)
	2–3 motor limitations	0.128	(0.162)	0.028	(0.117)
	4–6 motor limitations	0.094	(0.183)	0.090	(0.130)
	7–8 motor limitations	0.058	(0.266)	−0.023	(0.174)
	9–10 motor limitations	−0.289	(0.388)	0.005	(0.218)
	ADL level in Wave 2	No ADL limitations			
	1 ADL limitation	0.420*	(0.247)	0.534***	(0.185)
	2–3 ADL limitations	0.291	(0.292)	0.342*	(0.205)
	4–6 ADL limitations	0.240	(0.436)	0.662***	(0.238)
	ADL changes	No change in ADL limitations	ref.	ref.	
	0 to 1 ADL limitation	0.168	(0.192)	0.343**	(0.145)
	0 to 2–3 ADL limitations	0.286	(0.226)	0.297*	(0.160)
	0 to 4–6 ADL limitations	0.676***	(0.246)	0.832***	(0.162)
	Other increase in ADL limitations	−0.056	(0.275)	0.100	(0.179)
	Fewer ADL limitations	0.018	(0.256)	−0.200	(0.175)
IADL level in Wave 2	0 IADL limitations	ref.		ref.	
	1–2 IADL limitations	0.194	(0.229)	−0.042	(0.173)
	3–4 IADL limitations	0.513	(0.337)	0.568***	(0.217)
	5–7 IADL limitations	0.892**	(0.406)	0.537**	(0.235)

IADL changes	No change in IADL limitations	ref.		ref.	
	0 to 1–2 IADL limitations	0.324*	(0.179)	0.131	(0.146)
	0 to 3–4 IADL limitations	0.395	(0.271)	0.301	(0.187)
	0 to 5–7 IADL limitations	1.208***	(0.260)	0.705***	(0.176)
	1–2 to 3–4 IADL limitations	0.478*	(0.266)	0.356*	(0.204)
	1–2 to 5–7 IADL limitations	1.160***	(0.274)	0.786***	(0.193)
	3–4 to 5–7 IADL limitations	0.068	(0.390)	–0.016	(0.230)
	Fewer IADL limitations	–0.011	(0.241)	–0.101	(0.151)
Residence and neighbourhood in Wave 2	Moved recently	0.500**	(0.212)	0.267*	(0.153)
	Vandalism and crime in area	0.415*	(0.216)	–0.013	(0.164)
Home care in Wave 2	Sufficient facilities	–0.067	(0.157)	0.076	(0.099)
	Nursing home care	–0.027	(0.187)	–0.048	(0.120)
	Domestic home help	0.125	(0.151)	0.283***	(0.101)
	Meals-on-wheels	0.122	(0.221)	0.264*	(0.142)
Residential care Wave 2	Hospitalised recently	–0.079	(0.136)	–0.036	(0.089)
	Taken up in other institution recently	0.448	(0.288)	0.443**	(0.212)
	Pseudo R ²	0.3781		0.4378	
	Observations	6,123		8,705	

Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Notes: Standard errors in parentheses. Other controls: country and source of data (Wave 4, End of Life (EOL) Wave 3 or EOL Wave 4) dummies, number of months elapsed between Wave 2 and Wave 4 (or death). Model (1) excludes IT and PL. Excluding IT and PL from model (2) does not change the results. 65+, non-nursing home residents in Wave 2.

Source: SHARE Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1

The effects of health limitations were not independent from the family situation. Those who could not receive care or help from within the household were more likely to have moved. Nursing home entry was more likely, *ceteris paribus*, for those who had no spouse in Wave 2, or had lost their spouse since. We found that the presence of a spouse also helped not to die in a nursing home (Table 22.1, model 2). As far as children are concerned, the results were less clear; only having a living-in or nearby daughter decreased the likelihood of a move. More women moved to nursing homes than men, but keeping family situation and other factors constant, women were no more likely to move. They were just more likely to become widowed than their husband, and also faced a greater chance of suffering from motor limitations. Interestingly, an interaction term between being single and ADL level indicated that the former had a much larger impact at low ADL levels than at high ADL levels. When persons had four or more ADL limitations, household situation did not matter anymore (result not shown). This confirms former studies with SHARE data showing that family is an effective substitute for long-term care as long as the needs of the older persons concerned are low (Bonsang 2009).

22.3 Does formal home care prevent older persons from moving?

We introduced three variables regarding the type of formal help received at the original private home in Wave 2: professional or paid nursing care, professional or paid domestic help and meals-on-wheels. Among these variables, only domestic help and meals-on-wheels had a significant *positive* effect; moreover the effect was significant only for those we observed dying in a nursing home. It is as if the need for help predicted the future need of institutionalisation rather than help being a substitute. Obviously, use of formal home care may have captured the effects of unobserved differences in needs for care. Also, this finding fits in with home care allocation policies and practices in many countries, with publicly funded domestic help services often restricted to persons having no informal care available (and who will be less able to stay at home when their health further deteriorates), whereas access to home nursing services is solely or more strongly based on needs (ADL-limitations), regardless of informal care availability. Ideally, we would have liked to have used an indicator of the supply of formal home care in the community where the respondent lives, independent of actual use, but such data were not available.

Few characteristics of the housing environment had any independent effect. We found no association of residential care entry with having special features to adapt one's home in Wave 2, area transportation, noise and pollution, and the number of facilities. Only living in a crime ridden neighbourhood increased the likelihood to move to a nursing home. This could be a direct link (crime induces to move) or an indirect link (neighbourhoods where crime is high may lack services that older persons find important). Note that crime had no effect for those who moved and died in a nursing home. These persons may have been already severely disabled when they moved, so comparatively trifling reasons like neighbourhood circumstances did not make much difference. Contrary to what was found for mobility between private homes (Angelini & Laferrère 2012), the length of housing tenure had no effect on mobility to nursing homes. Habit, i. e. having become used to a home, did not prevent older persons from moving; apparently people moved to a nursing home because they had to move. We added a control for "having moved recently", expecting the first move to delay the second and final one, as the first move could have been motivated by the wish to live in a home better adapted to disabled persons. In fact, it had a positive effect on entry into a nursing home, though it was non-significant when the dead were included. The move may have been to a residence adapted to old age that did not qualify as a nursing home. Having stayed in other types of institutions in the year before the

Wave 2 interview also made it more likely to move to a nursing home and die. Our interpretation is that it is often not easy to adapt a private home to the requirements of an older person who needs care.

22.4 Are nursing homes for the poor?

In the SHARE countries taken as a whole, moving to a nursing home and surviving in Wave 4 was more frequent for those who are in a country's lowest wealth or income quartile (Table 22.1, column 1). This result confirms what was found between Wave 1 and Wave 2 (Angelini & Laferrère 2012). It is in line with what was found on US data by Börsch-Supan (1990) and on French census data. In that respect, moving to a nursing home is the ultimate downsizing. There was no evidence that some individuals might be prevented from moving to nursing institutions because of the cost of residential care. In no country did we find that a higher income induces a move to nursing homes. However, entry into a nursing home shortly before death did not depend on income or wealth (Table 22.1, column 2).

In a second specification (Table 22.2), we replaced country dummies by context variables. We used the share of the 65+ population by country from Eurostat and three indexes describing the accessibility and degree of cost sharing of residential care collected by the project 'Assessing Needs of Care in European Nations' (ANCIEN, Kraus et al. 2010). First, the aggregate share of private spending in total long-term care (LTC) expenditure in three groups of countries (around a low 10 % in most countries, 30 % in France, Austria, Spain and, Poland, 38.5 % in Italy); second, a dummy for means tested access to a nursing home (Spain, Italy and Poland); third, how many expenses (up to three: home care, home nursing and residential care) are shared between the public system and the care recipient. In general, cost sharing is the rule for residential care in all countries. All other costs are borne by the public system in Denmark and Germany (where the variable equals 1); there is cost sharing in home care but not in home nursing care in Belgium, France, Italy and Spain (the variable equals 2); cost sharing exists for all three types of expenses in Sweden, the Netherlands, Austria, the Czech Republic and Poland (variable equals 3). Switzerland was left aside for lack of information. We found that living in a country where access to a nursing home is means tested reduced the likelihood to move. Having a larger co-payment did the same and it was more significant if we included those who died in a nursing home. The effect of the other variables was not modified by the use of contextual variables.

Table 22.2: Effects of institutional context on the move to a nursing home

Variables	Without End-of-Life respondents		With End-of-Life respondents, with IT & PL	
	(1) coef	se	(2) coef	se
Rate 65+ in the country population	−0.076	(0.055)	−0.012	(0.031)
Private spending 10 %	ref		ref	
Private spending 30 % (FR, AT, ES, PL)	−0.220	(0.154)	−0.228**	(0.113)
Private spending 38,5 % (IT)			−0.149	(0.264)
Cost sharing for all types of care	ref		ref	
Cost sharing in residential and home care (not in home nursing)	0.239	(0.161)	0.053	(0.108)
Cost sharing in residential care only	−0.033	(0.175)	−0.060	(0.114)
Access to NH is means tested	−0.544*	(0.279)	−0.873***	(0.158)
Pseudo R ²	0.3755		0.4295	
Observations	5,711		8,256	

Significance: *** p<0.01, ** p<0.05, * p<0.1

Notes: Standard errors in parentheses. Other controls: all those of Table 22.1, except country dummies. Model (1) excludes IT and PL. Excluding IT and PL from model (2) does not change the results. 65+, non-nursing home residents in Wave 2. CH is excluded.

Source: SHARE Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1

22.5 Alternatives to residential care?

As we mentioned above, the supply of residential care is very unequal across European countries. These differences raise the question: What is the situation of those older persons in countries with very little residential care who, if they were living in Sweden, Belgium or another country with a relatively ample supply of such care, would have moved to a nursing home?

The cross-country comparable SHARE data make it possible to answer this question in some detail. Using Wave 4 data only, we distinguished between countries where the supply of residential care is relatively high (Sweden, Denmark, the Netherlands, Belgium, France and Switzerland), and countries where there is very little residential care, and where in fact we observed very few persons living in nursing homes (Italy, Portugal, Poland and Slovenia). Germany, Austria, Spain, Hungary and Estonia, which are intermediate, are left out of this analysis. We looked only at respondents aged 75 or over, and focused on the most important determinants of entry into residential care, which are, apart from age, living

without a partner and limitations in activities of daily living (ADL). Respondents without a partner and with an ADL score of 5 or higher were regarded as being at high risk of entering residential care. In the high-supply countries, no less than 46 per cent of this group in the SHARE sample were institutionalised, about eight times the overall institutionalisation rate among those aged 75+ in those countries. We compared low- and high risk persons in the low-supply countries with each other, and with their counterparts in the high-supply countries. For the latter group of countries, we also show the characteristics of the respondents who were actually living in residential care.

Although the analysis was hampered by the small sample size, there are a number of remarkable results (Table 22.3). By definition, all persons in the high-risk group were living without a partner, both in the high-supply countries, and in the low-supply countries. The most striking result is that in low-supply countries 35 per cent of persons in the high-risk group were living with one or more children in the same household, and so did a substantial minority among the low-risk group. In the high-supply countries, hardly any older person was living with a child, irrespective of the risk of moving to residential care. Co-residence with other relatives or non-relatives was less common in all groups. About four in ten persons in the high-risk group in low-supply countries received personal help from someone inside the household, mostly from someone whom the person regards as part of her or his personal network (cf. the section on social networks in this volume). For high-risk persons in the high-supply countries, this was very seldom the case. The latter did often receive practical or personal informal help from someone outside the household. Remarkably, the proportion receiving informal help from outside the household was at nearly the same level for the high-risk group in the low-supply countries, despite their already high level of help from inside the household.

A large proportion of persons in low-supply countries had daily contacts with children or other family members, irrespective of the risk of entering residential care. In high-supply countries, these proportions were much lower; being at high-risk of moving to a care home, or actually living there, seemed to be accompanied by reduced contact with a family member; living in residential care was associated with much less contact with children. Finally, in all countries respondents in the high-risk group reported significantly lower levels of life satisfaction and life happiness than those at low risk, probably due to the health problems of the former group. It is too early to say whether the family copes equally adequately in low-supply countries, as formal care workers do in the high-supply countries. A complete picture would also consider the feelings of the family helpers themselves, as they might feel strained (Colombo et al. 2011).

Table 22.3: Characteristics of persons aged 75+, by risk of entering residential care and supply of residential care in country

	Countries with ample residential care (1)			Countries with very little residential care (2)	
	Low risk of residential care	High risk of residential care (3,4)	Actually in residential care (4)	Low risk of residential care	High risk of residential care (3)
Household size = 1	44 %	88 %	95 %	36 %	12 %
Living with children (5)	4 %	2 %	0 %	14 %	35 %
Living with persons other than spouse or children	1 %	1 %	3 %	2 %	10 %
Received personal help from person inside household	5 %	3 %	0 %	12 %	41 %
Received practical or personal help from person outside household	25 %	47 %	35 %	28 %	40 %
Daily contact with at least one family member	57 %	23 %	20 %	75 %	51 %
On average, daily contact with a child	11 %	11 %	2 %	33 %	33 %
Life satisfaction 8–10	61 %	40 %	48 %	45 %	30 %
Life happiness: often	60 %	45 %	49 %	33 %	22 %
n (unweighted)	5,784	102	192	2632	65

Notes: (1) Belgium, Denmark, France, The Netherlands, Sweden and Switzerland; (2) Italy, Portugal, Poland and Slovenia. (3) Not living with partner and 5 or more limitations in ADL. (4) categories overlap n = 27. (5) including children-in-law and stepchildren.

Source: SHARE Wave 4 release 1

22.6 Conclusions: inability to cope at home drives the move to an institution

Rather few SHARE respondents moved to a nursing home in the approximately four years that elapsed between Wave 2 and Wave 4. Many of those who entered a nursing home died fairly shortly afterwards, and we could trace them only thanks to the end-of-life questionnaire. Nevertheless, using the SHARE data we were able

to draw a clearer picture of the determinants of such a move, and to highlight some cross-country differences. Our main conclusions were the following.

Limitations in activities of daily living (ADL) and instrumental activities of daily living (IADL) are the factors that were most strongly associated with nursing home entry. These in turn are consequences of health problems. Among all health conditions that influence institutionalisation through their impact on ADL and IADL limitations, dementia and motor problems that limit the possibility to live alone after the death of a spouse were found to be the most important.

Across countries, the population in the lower quarter of economic resources was more likely to move to a nursing home. Our analysis of alternatives to residential care pointed to the importance of co-residing family members, mostly children, for taking care of disabled older people in countries where there is little residential care. Maybe as a consequence, these persons appeared to have more frequent contacts with family than their counterparts in countries where formal care is more abundant.

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23 Individual and social determinants of home death

-
- ▶ Most elders prefer to die at home
 - ▶ The percentage dying at home is largest in Southern and lowest in Northern Europe
 - ▶ Government spending on home care is linked with higher rates of home death
 - ▶ SHARE end of life interviews are well suited to study place of death
-

In this chapter, we focus on the place of death of older Europeans. Earlier studies report that most people would like to die at home (e. g., Gottet et al. 2004, Gomes & Higginson 2006). However, for many older individuals and people with progressive illnesses, this requires intensive, sustained and coordinated home care. Moreover, social support is often found to be a prerequisite of home death (e. g., Gomes & Higginson 2006), highlighting the role of active ageing and intergenerational solidarity also in the last months of life.

Within the SHARE end of life interviews, a lot of information is provided to analyse determinants of elders' place of death. First, we show the proportion of home death across Europe. Second, we analyse determinants of home death. We distinguish between individual characteristics, social support and factors related to illness. Third, we analyse whether country differences in providing beds in institutions and differences in government spending on home-based long term care (LTC) play a role in explaining cross-national differences in home death (Muramatsu et al. 2008).

23.1 Home death among Europeans

Altogether, the three waves of SHARE with end of life interview data include 2,568 observations on deaths for which the place of death is known. Across SHARE countries, 34 per cent died at home, 49 per cent died in a hospital and 10 per cent in a nursing or elderly home. The remaining 7 per cent died at other places like someone else's home, or a hospice. In our analyses, we distinguish between home death on the one hand and death at other places like hospitals and nursing homes on the other.

In Figure 23.1, the proportion of home deaths is reported for each country separately. In Southern European countries, the percentage of home deaths is largest. In Greece and Italy, about half of the deaths occur at home. In Spain almost 40 per cent of the deaths occur at home. Also in Poland the percentage of home death is larger than 40 per cent. This is in sharp contrast to Northern countries like Denmark (24 %) and Sweden (21 %), or the Czech Republic (20 %). In Western European countries like Germany, the Netherlands, Switzerland and Belgium the percentage of home deaths lies in between that of Southern and Northern Europe, at around 30–35 per cent.

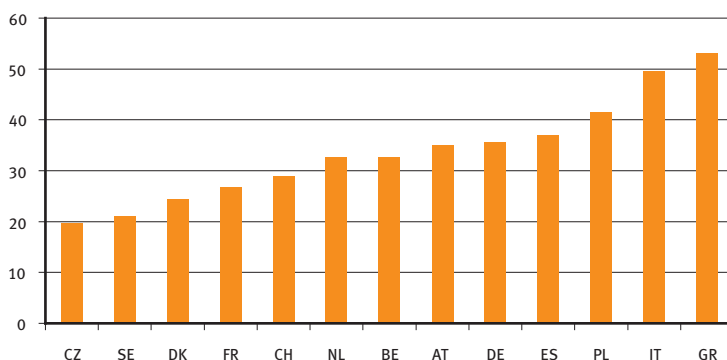


Figure 23.1: Percentage home death in Europe (n=2,568)

Source: SHARE (end of life interview Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1). End of life interviews are available only for countries with more than one wave of data collection.

23.2 Individual determinants of home death

In the column (1) of Table 23.1, we report linear probability model estimates of the probability of home death. We follow the literature and distinguish between individual factors, measures for social support and factors related to illness as possible determinants of home death (Gomes & Higginson 2006). As individual factors, we include gender, education level, age at time of death, whether the deceased owned (part of) a house. Even though several studies have found that someone's preference for home death is a good predictor for actually dying at home (e. g., Cantwell et al. 2000, Brazil et al. 2002), we are not able to test this as this information is not available in SHARE. The table shows no difference in home deaths between men and women and between individuals with different educational backgrounds, or by age at time of death. However, the deceased who owned

(part of) a house have a larger probability to die at home. This result is robust to including household wealth in a further specification. This is because household wealth does not add to the explanation of the probability of home death.

Table 23.1: Determinants of place of death

	Home versus hospital/ nursing home (1)	Nursing home versus hospital, excl. home death (2)
Individual factors		
Female	-0.0108 (0.0223)	0.0446** (0.0203)
Age at the time of death: 80 and over	0.0286 (0.0246)	0.111*** (0.0222)
Education high (ISCED 3 to 6)	-0.0399 (0.0446)	0.00309 (0.0426)
Deceased owned (part of a) house	0.0535** (0.0226)	-0.0521** (0.0203)
Social support		
Deceased had children at time of death	-0.0130 (0.0336)	-0.123*** (0.0332)
Deceased lived together (from SHARE Wave 1/2)	0.00338 (0.0299)	-0.0186 (0.0272)
Anyone helped with ADL	-0.0492 (0.0651)	-0.0765 (0.0572)
Illness-related factors		
Cause of death: Cancer	ref	ref
Cause of death: Heart attack	0.181*** (0.0391)	0.0200 (0.0360)
Cause of death: Stroke	-0.0403 (0.0406)	0.0372 (0.0336)
Cause of death: Other cardiovascular disease	-0.0485 (0.0389)	-0.000521 (0.0328)
Cause of death: Respiratory disease	-0.146*** (0.0486)	-0.00479 (0.0368)
Cause of death: Disease of the digestive system	-0.151** (0.0624)	0.0326 (0.0561)
Cause of death: Severe infectious disease	-0.206*** (0.0411)	-0.0437 (0.0416)
Length of terminal illness: <1 month	ref	ref
Length of terminal illness: 1 to 6 months	-0.0801** (0.0327)	0.0300 (0.0282)
Length of terminal illness: 6 months or more	-0.00200 (0.0284)	0.0425 (0.0261)

	Home versus hospital/ nursing home (1)	Nursing home versus hospital, excl. home death (2)
No. of difficulties with ADLs/IADLs in last year of life	0.00687 (0.00443)	0.0285*** (0.00423)
3 or more hospital stays (in previous wave)	-0.104*** (0.0398)	-0.0130 (0.0343)
Took 5 or more drugs (in previous wave)	-0.0802** (0.0325)	-0.0677** (0.0304)
Any cognitive impairment in last year of life	-0.0297** (0.0115)	0.0628*** (0.0118)
Observations	1,918	1,239

Significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Notes: Standard errors are robust to heteroskedasticity; Control variables not reported: wave of end of life interview, country dummy variables, dummy variables for missing information on education and social support.

Source: SHARE (end of life interview Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1)

As measures for social support we include dummy variables for whether the deceased had any children, whether the deceased received help with activities of daily living (ADLs) during the last year of life, and whether the deceased lived together with a partner in the most recent available main questionnaire of SHARE. We find *no significant relation* between these social support measures and the probability of dying at home. Additional analyses, not reported here, also show no significant relation between home death and having a daughter, having one or more children living within five km, or having at least one child which visited the deceased at least once a week. Family support therefore does not seem to matter for the likelihood of dying at home in Europe. These results are robust to excluding individuals who have been ill before death for less than a month.

We have analysed the role of several indicators related to health and illnesses. First, the cause of death turns out to be an important predictor for the place of death. Compared to those who died from cancer (reference group), the probability of home death is nearly 20 percentage points larger for those who die from a heart attack. In contrast, those dying a severe infectious disease have a nearly 18 percentage points lower probability of dying at home, most likely because they die in acute care. The length of the terminal illness also matters for the probability of home death. Here we find a U-shaped relationship. Individuals who are sick for less than one month or longer than six months have a ten percentage point higher probability of dying at home than individuals who were sick between one and six months before dying.

We find no significant relationship between home death and the number of difficulties with activities of daily living or instrumental activities of daily living (ADLs or IADLs) the deceased had during his/her last year of life. This includes difficulties with for example dressing, eating, or shopping for groceries.

Illness-related information from the latest available main questionnaire of SHARE also seems to predict whether or not someone died at home. Individuals who were more often in the hospital and individuals who took more medications during an earlier wave of SHARE have a lower probability of home death.

In the end of life interviews of Waves 3 and 4, we have information on cognitive impairment in the last year of life. Therefore, as measure of cognitive impairment we include a dummy variable that equals one if the deceased had any of the following difficulties in the last year of life: (1) remembering where he/she was, (2) remembering the current year, and (3) recognizing family or friends. Cognitive impairment is significantly associated with a smaller probability of home death. Probably, these individuals had to live in nursing homes for some time before their death.

Though not reported in Table 23.1, cross-national differences in home death rates controlling for the above individual covariates are not very different from the home death rates plotted in Figure 23.1. Individuals who lived in Denmark, Sweden or the Czech Republic had a relatively low probability of dying at home, whereas Italians, Greeks, and Poles had a relatively large probability of dying at home.

23.3 If not at home, where do people die?

We now supplement the preceding section by analysing determinants of place of death among those *who do not die at home*. We exclude all individuals who died at home and estimate a linear probability model of dying in a nursing home or hospice versus acute care (i. e. in a hospital), using the same covariates as above. The results can be found in the column (2) of Table 23.1.

Individual factors: Whereas the age of death does not relate to dying at home, we find that the older someone is at the time of death, the larger the probability of dying in a nursing home or hospice rather than a hospital. Moreover, women have a larger probability of dying in a nursing home or hospice even conditional on age. Education however has no impact, whereas the probability of dying in a nursing home or hospice is smaller when the deceased owned a home.

Social support factors: Conditional on not dying at home, the probability of dying in a nursing home or hospice is largely decreased for elders who have children. This finding provides an important qualification to our earlier result that

children do not matter. Again, living together with a partner in the SHARE survey wave preceding death and receiving help with ADL during the last year before death are not significantly linked with the place of death.

Illness-related factors: The link between cause of death itself and place of death is much weaker than shown before and none of the effects is statistically significant. Other factors related to health, in particular those that represent the severity of chronic conditions, limitations in activities of daily living and cognitive impairment continue to be related to the place of death. For instance, individuals who took more than five different drugs in the last wave of SHARE in which they participated have a larger probability of dying in the hospital. The more difficulties someone had with ADLs, the greater the probability of dying in a nursing home or hospice and individuals who suffered from cognitive impairment also have an increased probability of dying in a nursing home or hospice (also see Laferrère et al. in this volume).

23.4 The role of government spending on home-based long-term care and providing beds in institutions

The OECD provides information concerning health expenditures and long-term care resources and utilization for most countries taking part in SHARE (OECD Health Data). Specifically, for these countries we make use of two measures that might be related to the probability of home death. First, we have yearly information on the percentage of government spending on home-based long-term care (LTC) compared to total LTC spending. This information is, however, not available for Greece, Ireland and Italy. Figure 23.2 shows the average percentage of home over total LTC government spending per country across the years 2004-2011. In Poland, almost 80 per cent of all LTC government spending is spent on home-based LTC. In contrast, in countries like Sweden, the Netherlands, Spain, France and Czech Republic this proportion is below 20 per cent.

Second, we have the number of beds in institutions (excl. hospitals) per 1000 people aged 65 or above. Again, no information is available for Greece and Ireland. This measure is also shown in Figure 23.2. As expected the number of beds in institutions is much larger in countries with a relatively low percentage of home based LTC spending. In Germany and Denmark, both the government spending on home-based LTC and the number of beds in institutions are more or less in the middle of the distribution.

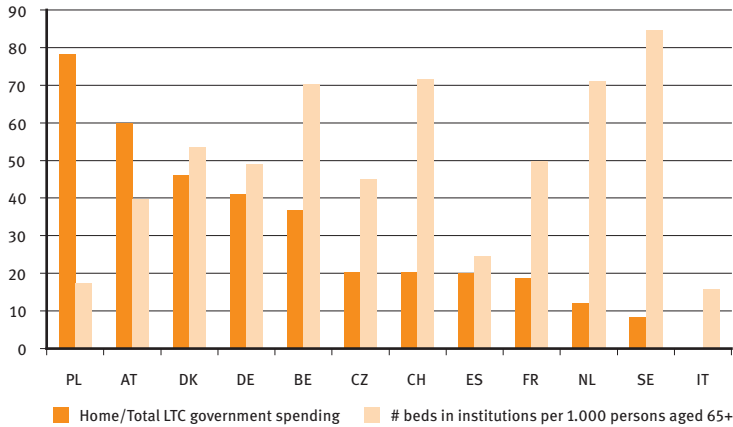


Figure 23.2: Country differences in home LTC spending and number of beds in institutions (n=11)
Source: OECD Health Data (average across available data from 2004–2011). For Italy there is no information on LTC spending available. For Greece and Ireland, no information on LTC spending and on number of beds in institutions is available.

In order to link this information on governmental home-based LTC spending and on the number of beds in institutions to the probability of home death net of the influence of different individual characteristics, we estimate an OLS regression similar to the one reported in Table 23.1 and compute country fixed effects. In Figure 23.3, these country-fixed effects are plotted against (a) the average spending on home based LTC compared to total spending on LTC and (b) the number of beds in institutions available per 1000 individuals aged at least 65.

For both governmental spending on home-based LTC and for the number of beds in institutions, we find a significant relation with the probability to die at home. As expected, the more a government spends on home-based LTC compared to overall LTC, the larger the probability that older people die at home. The opposite holds for the number of beds in institutions: the larger the number of beds in institutions, the smaller the probability of dying at home. Hence, differences in cross-national probabilities to die at home are partly explained by these two measures for governmental health expenditures and long-term care resources provided by the government.

In additional analyses, we not only make use of cross-country differences, but also of differences across years of death. Based on the country and year of death, we merge the OECD policy data to the SHARE end of life waves. Thereby, we can estimate the role of policies on home death controlling for individual factors, social support and illness-related factors. The findings from these models are comparable to the findings observed in Figure 23.3: we find a significant

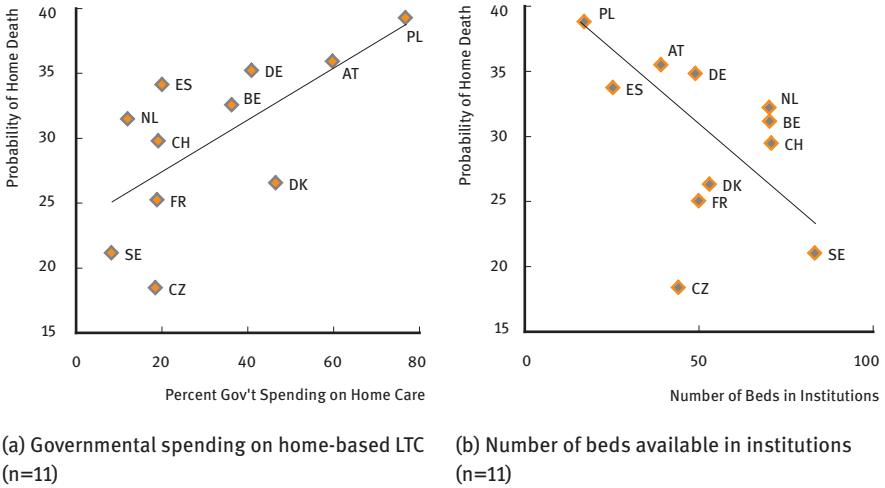


Figure 23.3: The relation between governmental influences and the probability of home death
Source: SHARE (Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1) and OECD

positive association between government spending on home-based long-term care as a percentage of total long-term care and home death. This suggests that in countries where governments spend relatively more money on home-based care, people are indeed living longer at home, even until they die. Moreover, we observe a clear negative and significant relationship between home death and the number of beds in institutions, implying that people living in a country with relatively more beds in nursing and residential care facilities have a smaller probability of dying at home.

23.5 Conclusion

In this chapter, we analysed the determinants of home death or place of death in general. Whereas we have no information on someone's preference concerning the place of death, the end of life interview as well as earlier information from SHARE, provide important information for predicting the place of death.

We distinguish between individual factors, social support and illness-related factors. We show that if the deceased owned a house the probability of dying at home is larger. However, educational status does not relate to the place of death. In contrast to studies from the United States (e. g., Jordhoy et al. 2000,

Bruera et al. 2003), we find that the probability of dying at home is not related to social support as measured whether the deceased had any children, whether the deceased lived together with a partner, and whether someone helped them with ADLs or IADLs. However, when we differentiate between dying at the hospital and dying at a nursing home or hospice among those who do not die at home, we find that social support is associated with a lower probability of dying in a nursing home. Illness-related factors seem to predict someone's place of death to a large extent. Individuals dying from a heart attack have the largest probability and those who suffered from a severe infectious disease have the lowest probability of dying at home. But also information on illness in an earlier wave of SHARE predicts home death: sicker individuals, that is, individuals with a larger number of hospital stays and of drugs taken have a smaller probability of dying at home.

Yet after including individual factors, social support and illness-related factors, the probability of dying at home remains largely dependent on the country someone died in. Adding OECD data to SHARE reveals that in countries where a large percentage of LTC government spending goes to home care, the probability of dying at home is larger. In contrast, people living in countries in which a large number of beds in institutions is available have a smaller probability of dying at home. This implies that governments have the possibility to enable more alignment in the preference of people to die at home and their actual place of death.

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Part IV Social embeddedness and inter- generational solidarity across the life course

Edited by Howard Litwin

Kimberly J Stoeckel and Howard Litwin

24 Personal social networks in Europe: do people from different countries have different interpersonal solidarities?

-
- ▶ Older Europeans maintain close personal social ties with two to three people
 - ▶ Almost six percent report having no close confidants at all
 - ▶ Social ties are generally accessible, emotionally close and personally satisfying
 - ▶ Regional differences in intergenerational and peer solidarity exist in Europe
-

24.1 Social networks and ageing well

The social networks in which people of all ages are embedded constitute both an important measure of social solidarity and a crucial mechanism through which to obtain or to maximise meaningful social interactions (Gray 2009). Social networks are also associated with a range of outcomes that contribute to quality of life among their members, as well as comprising, in among themselves, significant measures of well-being (Fiori et al. 2006, Cornwell & Waite 2009, Merz & Huxhold 2010, see also Deindl et al. in this volume). Social networks also play a major role in fostering and maintaining active ageing (Bowling 2008, Cornwell & Waite 2009). As such, personal social networks are an essential component of ageing well in the 21st century.

Using data from the newly implemented SHARE Social Network Module, this chapter describes the social network characteristics of older Europeans in sixteen countries. The analysis considers key selected network measures and the associations that exist among them. In addition, it examines country differences with respect to selected network composition variables. As such, we seek to clarify whether there are, indeed, differing interpersonal solidarities of note among older Europeans.

The current analysis examines the subjective personal networks of older Europeans. Much of the social network literature focuses upon inferred social networks that are measured by means of sociodemographic proxies, such as marital status or number of children (Litwin 1996). In contrast, this inquiry addresses the named confidants of the people in the sample, obtained by a direct probe asking with whom the respondent discussed important matters in the previous twelve

months. This approach enables the analyst to consider the interpersonal ties that are deemed to be the most important to respondents, and thus, most closely reflective of their personal social networks (McPherson et al. 2006).

The analysis looks first at the distribution of network size, relationship composition, proximity, contact, emotional closeness and satisfaction. We then examine the correlations between these network measures. In the third and final part of the analysis, we consider the likelihood of respondents from the respective countries to name three key relationship categories within their confidant networks – spouse or partner, child(ren) and friend(s). The country differences are examined controlling for sociodemographic background (age, gender, education, number of children, grandchildren and siblings), and health (difficulty in performing basic and instrumental activities of daily living and mobility limitation). A logistic regression was employed in which the respective dichotomous outcome (cited the relationship/did not cite the relationship) was considered in relation to country and confounders. Each multivariate analysis was limited to respondents with one or more network members who were theoretically able to cite the relationship in question (that is, had a spouse/partner or children; we assumed that everyone can potentially name a friend). The descriptive analyses employed normalised weights (Malter & Börsch-Supan 2013). The correlation analyses and logistic regression analyses did not.

24.2 The nature of the networks

The frequency distribution of the number of social network members is displayed in Figure 24.1. The average network size among older Europeans aged 50 and older ($n=56,755$) was between two and three members, with a median of two members. Although respondents were permitted to identify up to seven confidants, the small average network size suggests that older Europeans maintain confidant relationships with only a few selected, close, personal contacts. Moreover, SHARE respondents in Scandinavian and Western European countries had larger than average social networks while those in Eastern European and Southern European countries had smaller social networks (see Figure 24.2).

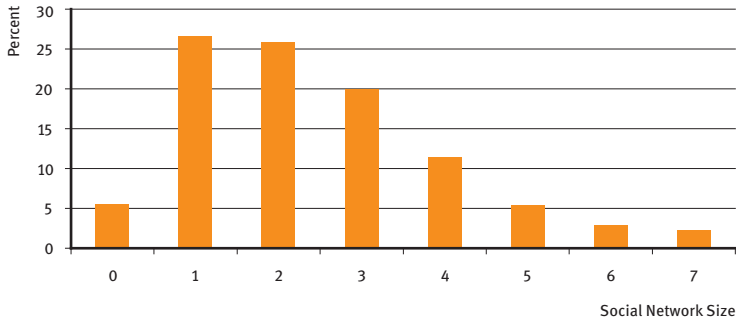


Figure 24.1: Social network size. Weighted observations (n=56,755)

Source: SHARE Wave 4 release 1

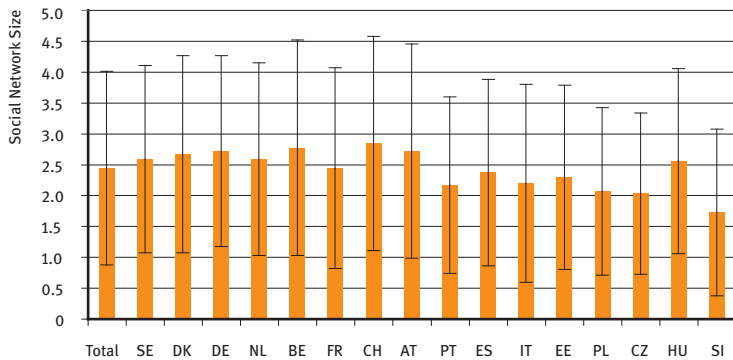


Figure 24.2: Average social network size by country. Weighted observations (n=56,755)

Source: SHARE Wave 4 release 1

We should note that the social network data were obtained by means of a name generator (discussed in more detail in Litwin et al. 2013). This approach to network delineation allowed us to identify a subgroup of respondents who reported having no confidants at all (5.5 % of the sample). Further analysis using two-sample t-tests revealed statistically significant differences ($<.001$) between these socially isolated older Europeans and their counterparts who listed one or more social network members. Respondents with no personal social network were older ($t(3,413.0) = 23.0$), less likely to have a spouse or partner ($t(3,323.5) = -18.1$), had more depressive symptoms ($t(2,227.5) = 8.4$) and had more limitations in activities of daily living (ADL) ($t(2,993.9) = 19.6$). We can state with some degree of confidence, therefore, that these respondents were more socially marginalised.

As for the majority who had a personal social network, the networks were largely family-based. Sixty-two per cent of the respondents with one or more confidants ($n=53,990$) reported having a social network comprised solely of family members, inclusive of spouse/partner, children, or extended family relationships. The social network of an additional 23 per cent of respondents was comprised of a majority of family members (50–99%). In comparison, only eight per cent had no family members in their network. The personal social networks of these latter respondents were comprised entirely of friends, neighbours, current or former colleagues and formal helpers.

Spouse or partner and children were the most commonly cited confidants of the older Europeans in the sample. Among married/partnered respondents ($n=39,314$), four-fifths included their partner in their social network. Three-fifths of respondents with children ($n=49,087$) counted one or more of their children among their confidants. However, as these numbers reveal, these familial relationships were not always considered to be close confidants. Almost one fifth of the respondents with a spouse or partner did not name that person as a confidant, and approximately two fifths of those with children did not cite their children as members of their personal social network. A bit less than a third of respondents (30%) included one or more friends in their social network, indicating that friends constituted a significant source of meaningful social ties among a minority of older Europeans. More distant relationship categories, such as neighbours, current or former colleagues, clergy, therapists, and formal helpers, were listed among the confidants of only some twelve per cent of respondents.

The analysis revealed that older Europeans mostly live within close proximity of their confidants. Fifty per cent of the respondents lived within five kilometres of all members in their social network. Moreover, 70 per cent lived in the same household or the same building with their geographically closest social network member. A distance of more than 25 kilometres separated less than five per cent of the respondents from their nearest confidant. Additional analysis distinguishing between partnered and non-partnered respondents revealed that this close proximity of social network members persisted even among respondents without a spouse or partner confidant in their household. More than three quarters of non-partnered respondents ($n=15,658$) lived in the same household, same building or within five kilometres of their nearest confidant.

In light of the close proximity between older Europeans and their social networks, the frequency of contact with social networks is understandably high. Four-fifths of older Europeans reported having daily contact with their most contacted confidant. In comparison, fewer than five per cent reported contact of twice a month or less with their most contacted confidant. In addition, 36 per cent had daily contact with every member in their network. This high level of contact

frequency persisted even among unmarried or non-partnered respondents who may not be as likely to live with a member of their network. Among this subgroup of respondents ($n=15,244$), nearly two-thirds had daily contact and an additional 23 per cent had contact several times each week with the most frequently contacted confidant.

Respondents also reported high levels of emotional closeness with social network members. Only seven per cent were somewhat close or not very close with every member of their confidant network, compared to 71 per cent who reported being extremely or very close with all of their listed confidants. Taking into account the degree of closeness with the emotionally closest social network member, the data revealed that 56 per cent had at least one confidant with whom they felt extremely close, and an additional 37 per cent had at least one confidant with whom they felt very close.

When asked to rate the level of overall satisfaction with the relationships with the social network, on a scale of 0–10, respondents with one or more confidants and not missing data on the network satisfaction variable ($n=52,027$) were overwhelmingly well satisfied. Forty per cent were completely satisfied (10) while an additional 48 per cent reported high levels of satisfaction (8–9). Less than three per cent reported being dissatisfied (0–5). Among the sub-group having no social network at all and not missing data on the satisfaction variable ($n=1,722$), only ten per cent expressed complete dissatisfaction with this situation. Twenty-three per cent had very low levels of satisfaction (1–5), but nearly half (45%) reported being very to completely satisfied (8–10) with their having cited no meaningful relationships or confidants.

24.3 Are components of social networks related?

The strength and direction of the relationships between the social network measures were examined in the second stage of the analysis by means of Pearson correlations. Only respondents who reported having one or more social network members were included in the correlation analysis ($n=53,990$). The results are displayed in Table 24.1.

As the table shows, network size was strongly correlated with network relationship composition, proximity and frequency of contact. Insofar as larger networks are facilitative of a more diverse composition of members, the correlation between network size and the relative proportion of members from different compositional categories was to be expected. Moreover, network size was negatively correlated with the proportion of network members living in close proximity and

Table 24.1: Bivariate analysis of social network measures: Pearson correlations

	Network Size	% Spouse or Partner	% Children	% Friends	% 5 km or less	% Daily Contact	% Very to Extremely Close	Network Satisfaction
Network Size	1							
% Spouse or Partner		1						
% Children			1					
% Friends				1				
% Within 5 km					1			
% Daily Contact						1		
% Very to Extremely Close							1	
Network Satisfaction								1

Significance: *** = 1%
Notes: Unweighted observations = 53,990; excluding respondents aged < 50 and without a social network.
Source: SHARE Wave 4 release 1

with the proportion of the network that maintained daily contact. Positive correlations were found between network size and the proportion of members that were children or friends, in contrast to a negative relationship that emerged with the proportion of the network that was represented by a spouse or partner. Stated differently, this last finding confirms that exclusively spouse-based networks were also the smallest.

Satisfaction with one's social network was positively correlated with all of the other network measures, with one exception – the extent of satisfaction was lower when friends constituted a greater proportion among the cited network members. The strongest positive correlations were observed between satisfaction and when respondents maintained daily contact and very close emotional connections with a larger number of their social network members. Another important correlation of note is the positive association between network size and satisfaction. Overall satisfaction with the social network increased when more confidants were named.

The correlation analysis also revealed two unique characteristics of the social networks that are comprised mostly of friends. First, a higher percentage of friends among the confidants were related to a lower proportion of social network members living within close proximity. Second, having more friends in one's social network lessened the proportion of confidants with whom daily contact was maintained and with whom very close emotional ties were reported.

Finally, the correlations suggest that proximity, emotional closeness and frequency of contact are strongly interrelated aspects of the interpersonal environment. That is, living in close proximity to a greater proportion of one's confidants increases the proportion of social network members with whom one maintains daily contact and with whom one enjoys very close emotional ties.

24.4 Do networks differ in different countries?

The third stage of the analysis considered country differences in network composition, specifically, the naming of spouse or partner, child(ren) or friends as confidants. Three separate logistic regression models were run in which the dependent variables distinguished between survey respondents who did or did not include a spouse or partner, child(ren) or friends, respectively, as members of their social network. Because not all respondents had a partner or child, the first and second of the analyses were limited to those for whom it was theoretically possible to cite a spouse or child. However, all the respondents with one or more social network members were included in the third analysis insofar as, in principle, everyone has the potential to name friends.

In order to examine the existence of country differences in regard to network composition, each logistic regression model controlled for an array of sociodemographic characteristics and health measures that might themselves be related to the structure and/or the nature of the networks in question. Cases with missing data on any of the independent variables were removed from the analyses. Effect coding was used to compare countries to the unweighted sample mean. The results of the three logistic regression models are displayed in Figure 24.3.

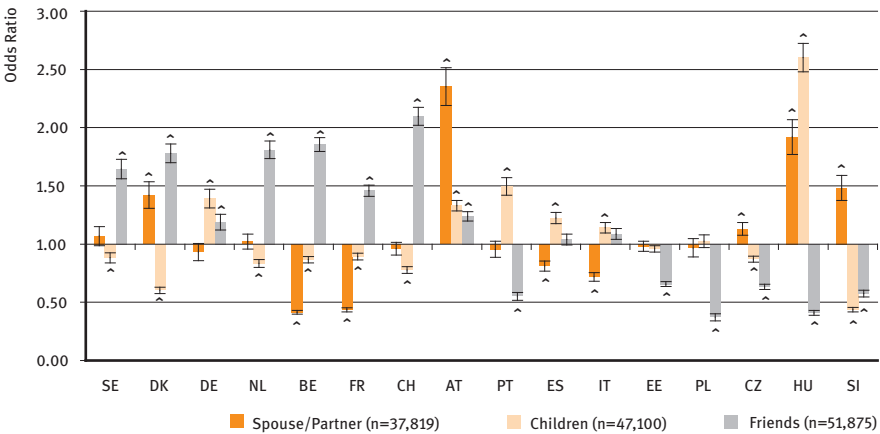


Figure 24.3: Country differences in the selection of spouse/partner, children and friends within named personal social networks

Notes: ^ denotes statistical significance of .05 or less; models are adjusted for age, gender, education, marital status, living siblings, grandchildren, activities of daily living (ADL), instrumental activities of daily living (IADL) and mobility limitations.

Source: SHARE Wave 4 release 1

The first logistic regression model was limited to married or partnered respondents with a social network and analysed the likelihood of naming a spouse or partner as a confidant (n=37,819). Austrian respondents had the highest likelihood of naming their spouse or partner as a confidant. Those living in Denmark, the Czech Republic, Hungary and Slovenia also had higher expected odds of including a spouse or partner in their network in comparison to the sample as a whole. In contrast, respondents in Belgium, France, Spain and Italy had lower expected odds.

The naming of children as confidants is an indicator of the strength of inter-generational solidarity. The second analysis focused, therefore, on respondents with a social network who have one or more children (n=47,100). The results showed that respondents from most Northern and Western European countries

had lower expected odds of naming children as confidants. Two exceptions were those living in Germany and Austria. Respondents from two Eastern European countries (Czech Republic and Slovenia) had lower expected odds of including children in their network. However, Hungarian respondents had higher odds of including children, and in fact, had the greatest expected odds of all countries in SHARE. Southern European respondents (Portugal, Spain and Italy) had strong representation of children in their social networks and greater odds of listing children as confidants.

Solidarity between peers is another important facet of relationships during later life and can be measured by the inclusion of friends as social network members. The third analysis included all respondents with one or more social network members ($n=51,875$) and explored the likelihood of naming friends among the confidants. Strong regional differences emerged in this case. Survey respondents from all Scandinavian and Western European countries participating in SHARE had higher expected odds of naming one or more friends in their social network. In contrast, peer solidarity in Southern and Eastern European nations was limited. Survey respondents from Portugal and all the Eastern European countries had lower expected odds of including friends as confidants. Poland had the lowest expected odds among all the SHARE countries.

Comparison of the findings across all three of the regression analyses highlights some unique characteristics in social network composition in different regions in Europe. Respondents from Northern and Western European countries appear to be more likely to count their friends among their confidants. However, among these same countries, the findings for naming a spouse or partner in the social network were less conclusive. Belgian and French respondents had lower expected odds of naming a spouse or partner as a confidant. Danish and Austrian survey respondents had higher expected odds. The rest were not different from the unweighted mean.

In Southern European countries, strong intergenerational solidarity was evident. Respondents in Portugal, Spain and Italy had a higher likelihood of including children as confidants in their networks. These findings provide empirical support for the assertion that family ties and role expectations are still strong in Southern Europe. However, the findings suggest that the naming of confidants in this region do not necessarily extend to the spousal relationship. Spanish and Italian respondents were less likely to list their spouse as a social network member.

Notable distinctions emerged in relation to the Eastern European countries represented in the SHARE Wave 4 sample. In general, personal social networks in these countries were more often comprised of spouse or partners, and fewer children or friends were counted. These findings align with the trend reported earlier that social networks were smaller, on average, among the Eastern European respondents. This suggests that in these countries, confidant networks are

less diverse in relational composition in comparison to confidant networks of other Europeans.

In contrast to the other Eastern European countries, Hungary emerged as having more unique social network composition characteristics. Similar to other countries in this regional block, Hungarian respondents had lower expected odds of including friends in their personal social networks. However, unlike their regional counterparts with lower odds of naming children as confidants, the Hungarian respondents had the greatest such odds among all the SHARE countries. In addition, and similar to Slovenian and Czech respondents, they also had a higher likelihood of mentioning their spouse or partner as a member of their social network. These findings indicate that older Hungarians may consider their immediate family members to be their most important confidants in the second half of life.

24.5 The social networks of older Europeans

In summary, the results of this analysis reveal that older Europeans maintain close, personal relationships with relatively few persons, as evidenced by a median social network size of two persons. Nevertheless, the social ties that they do maintain are geographically accessible, emotionally close and personally satisfying. Notably, almost six per cent of older Europeans report having no personal social network at all. In addition to being older and more likely to be without a spouse or partner, the older adults with no personal social network also exhibit greater vulnerability in regard to health and well-being.

The relational composition of social networks serves as an indicator of solidarity between familial generations and among friends. Personal social networks of older Europeans are largely family based, with more than 60 per cent citing a network comprised solely of family members. In comparison, less than ten per cent include no family members in their social network. Moreover, older persons in Europe maintain a relatively high degree of emotional closeness with the individuals in their personal social networks. They also live within close proximity and maintain frequent, if not daily, contact. In comparison, those with a higher proportion of non-family member confidants live at greater distances from, maintain less frequent contact with and feel less emotionally connected to their personal social networks.

Analysis of country differences in social network composition reveals differences in intergenerational and peer solidarity patterns across national settings. Confidant relationships with children are particularly evident among Southern

European older adults, suggesting strong intergenerational solidarity among the families in this part of the Continent. In contrast, older Europeans living in Northern and Western European countries have stronger connections with friends and are more likely to consider friends as confidants. Eastern Europeans tend to have smaller social networks that are frequently comprised of only a spouse or partner. Additional analysis on how these solidarity distinctions across Europe influence active ageing is clearly warranted.

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Anat Roll and Howard Litwin

25 The exchange of support and financial assistance: differences in exchange patterns and their implications for ageing well

-
- ▶ Network members play different roles in the exchange of different kinds of help
 - ▶ Regional differences prevail in the exchange of support with social network members
 - ▶ Financial transfers with network members are correlated with greater well-being
-

25.1 The exchange of support and financial assistance among older European adults

Human beings live and function within complicated exchange networks from which they derive a range of resources and supports that are necessary for them to thrive. Within their exchange networks, people tend to trade time and money as well as information, values and space (Litwin et al. 2008). Such exchange has particular importance in the latter half of life, insofar as both the needs that people have and their resources change as they age. Moreover, the exchange of support is a crucial component of intergenerational solidarity. It also constitutes a key source of motivation for older people to remain active and to live independently in the community (Gray 2009, Chiatti et al. 2013).

Much of the literature places the exchange network within the larger domain of the social network, that is, the collection of social ties that people generally maintain and from which they receive various kinds of assistance. However, some recent studies distinguish between exchange networks and personal social networks. The latter are comprised by the most meaningful relationships that people maintain, the social ties that they consider to be their confidants. This distinction between personal social networks and exchange networks is important because these two social entities may have different implications for well-being in late life. That is, personal social networks and exchange networks might work in different ways and they may yield different outcomes (Cheng et al. 2011).

This chapter focuses on the exchange of practical support and financial assistance among older European adults and the role of the personal social network in such exchanges. These particular modes of exchange, time and

money, are the two dominant kinds of transfers. Financial transfers comprise the exchange of money and goods; time transfers include provision of services such as physical assistance with daily activities (Litwin 2004). The research reported here examines the role of the personal social network in the exchange of this support. We seek to clarify the extent to which different types of exchange are carried out with social network members as opposed to the exchange that takes place with other persons, those not considered to be confidants. We also seek to learn whether exchange with members of the personal social network is differentially associated with selected well-being outcomes than exchange with others.

Although exchange is a universal phenomenon, it may well be shaped by differing cultural norms, values and customs. Patterns of exchange may also be tempered by social policy and by the varying availability of public services, such as those provided through the welfare state. This latter point is particularly relevant for intergenerational exchange, insofar as the exchange of informal support across generations may be encouraged or, conversely, “crowded out” by existing formal services and benefits (Kohli et al. 2009). We consider the question of cultural context in terms of country differences. That is, do exchange patterns differ by country?

Personal social network is measured in the SHARE Wave 4 questionnaire by a unique module that identifies the people with whom respondents discussed matters of importance to them during the previous twelve months. This form of network mapping, by means of a name generator, allows the designation of respondents’ closest ties, that is, their unique collection of confidants (Litwin et al. 2013). Given that social contacts with significant others, in this case - the members of the personal social network, are generally more meaningful than contacts with others, it may also be assumed that exchange with members of the personal social network are more meaningful vis a vis well-being outcomes. We hypothesise, therefore, that exchanges with the personal social network will yield more positive associations with selected well-being outcomes than exchanges with others.

As for the cultural context, it may be assumed that exchanges with intimate others, like members of the personal social network, are more significant in settings where fewer formal support alternatives exist. Broadly speaking, we might expect such exchanges to be more meaningful in the Southern and Eastern countries of Europe, where welfare state services are less available, than in the North and the West of the continent. We hypothesise, therefore, that exchange with members of the personal social network will have stronger associations with selected well-being outcomes among the respondents from the Southern and Eastern countries.

25.2 How we measured the modes of exchange

The overall study sample for the inquiry reported here included 56,755 respondents aged 50 and older. However, insofar as the SHARE questionnaire routes the questions differentially, not all respondents were asked all of the questions. The probes on personal care within the household were addressed only to respondents who resided in households larger than one, by definition (N=44,485). Questions about assistance given or received to or from someone elsewhere were routed to the family respondent, i. e., one designated respondent per household (N=39,335). Queries on financial transfers were answered, in turn, by the selected financial respondent, again, one person per household (N=38,888).

The analysis addressed three key areas of exchange: 1) personal care that is given to or received from someone within the household, 2) assistance of any kind that is given to or received from someone elsewhere (outside the household), and 3) the provision or receipt of financial transfers. These variables were operationalised as follows. Personal care from/to a member of the household refers to regular help (almost daily) of at least three months in tasks such as washing, dressing and getting out of bed. Assistance from/to someone elsewhere reflects personal care, practical help in the home, or help with paperwork or legal matters. It should be noted, therefore, that the first variable measures only personal care given by or to a co-resident in the household whereas the second variable addresses any kind of help provided by or to anyone who does not co-reside in the same household with the recipient. The third exchange variable – financial transfer – reflects either of two monetary exchanges: 1) assistance of at least 250 Euros, or 2) a large gift (5,000 Euros or more). All three of the exchange variables were dichotomised to reflect receipt (or not) and provision (or not) of each form of support.

As noted earlier, identification of the personal social network was obtained through the use of a name generator. The naming of confidants allowed subsequent queries as to the nature of the relationship with the person to whom help was given and from whom help was received. Specifically, this mechanism allowed the creation of the variables necessary for the current inquiry: help given and received in each of the three areas of support, to/from a network member or to/from a person not considered to be part of the personal social network. The linkage that made this possible was carried out only for the cases in which support was actually exchanged (given or received).

Two well-being outcome variables were considered. The CASP scale reflects functional well-being on twelve different items and is measured on a scale of 12–48 (Hyde et al. 2003). Life satisfaction was measured on a single global probe yielding a score of 1–10. The higher the scores in both cases, the greater was the respondent's state of well-being.

Control variables taken into account included selected demographic background and health variables. The background variables included age, gender, number of children, marital status, education level and perceived income adequacy. The health variables were the number of chronic conditions, the number of physical symptoms, limitations in activities of daily living (ADL) and limitations in instrumental activities of daily living (IADL).

25.3 How we considered support types and directions

The first analysis considered the support types and directions that were more dominant among the social network members and those which were observed more frequently among the more distant relationships. In the second phase of the inquiry, logistic regressions identified country differences in relation to these same types of support. We should note that country differences have already been found in the provision and receipt of transfers (Attias-Donfut et al. 2005). This phase of the current analysis considered whether there were any country differences vis a vis the role of the personal social network in the respective transfers, after controlling for demographic and health variables. The third part of the study employed linear regressions to assess the relationships between each support exchange type and the well-being of the respondents, controlling for demographic and health variables and for country differences. The descriptive analysis employed normalised weights. The regressions did not.

25.4 Exchange of support with confidants

On the whole, about one third of the households gave money to others (31 %) and a quarter gave personal or practical support to someone not in the household. Somewhat less prevalent were the receipt of personal or practical support from someone not in the household (20 %) and the receipt of money (17 %). The least common types of exchange were the receipt and provision of personal care from/to someone in the same household (12 % and 8 %, respectively).

Investigation into the proportion of social network members involved in these transfers presents a somewhat more complex picture (Figure 25.1). The vast majority of respondents who received money did not receive it from a person they had named in their personal social network (80 %). In contrast, almost one half of those who gave financial support did so to someone they considered to be a member of their confidant network. Additional analysis (not shown in the figure) revealed that this gap exists in most countries.

A similar picture emerges in relation to support exchange with someone not in the household (elsewhere). Only about a third gave this kind of help to a personal social network member, on average, ranging from 17 per cent in Spain to 44 per cent in Hungary. In comparison, more than half of those who received help from elsewhere received such help from someone in their personal social network, on average. We note, nevertheless, that the diversity between countries in relation to the receipt of help from elsewhere was high, ranging from 35 per cent in the Netherlands to 78 per cent in Italy.

As for personal care given in the household, slightly more than half of those giving such help (a small minority overall) gave the help to a network member. This ranged from 39 per cent in Portugal to 74 per cent in Hungary. In contrast, the proportion of those receiving personal care in the household who received such care from someone considered to be a network member was much greater (about 80 %, on average). Ranging from 72 per cent in Belgium to 93 per cent in Hungary, this high degree of network-provided support may be due to the fact that most respondents cited a spouse in their personal social network and the spouse is generally the main provider of personal care in the household.

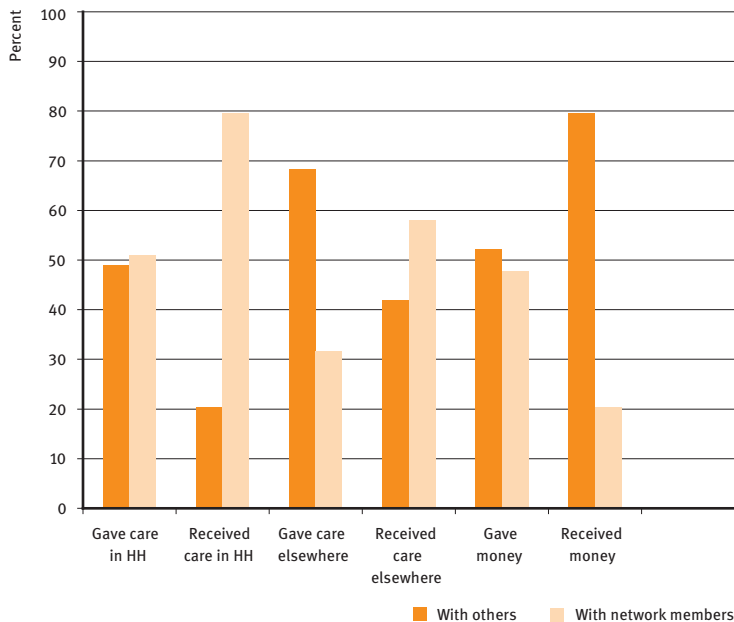


Figure 25.1: Exchange of support with network members and with others (weighted)

Notes: Unweighted observations: Gave care in HH (n=3,580), Received care in HH (n=2,419), Gave care elsewhere (n=10,023), Received care elsewhere (n=7,674), Gave money (n=11,888), Received money (n=8,169)

Source: SHARE Wave 4 release 1

25.5 Country differences in the exchange of support with social network members

In order to more clearly substantiate the country differences in relation to the probability of exchange with members of the personal social network, each of the dichotomous exchange outcomes (transfers from or to network member as opposed to transfers from or to other relationships) was regressed on country, controlling for demographic background and health. Effect coding was employed to ascertain the country effects. The results of the respective analyses are presented in Figures 25.2–25.4. Each figure presents the odds ratios of provision and receipt of the respective types of support exchange with a personal social network member, as opposed to exchange with a non-network member. The countries that showed significant differences in this respect are marked by asterisks.

Figure 25.2 presents the odds ratios, by country, for the provision and receipt of personal care in the household to and from someone in the personal network. It may be seen from the figure that among those who gave help in the household, the respondents from France, Spain and Italy had a lower probability of giving such help to a social network member than the general country mean. In contrast, the respondents from the Netherlands, Austria and Hungary each had a higher probability of giving such help to a social network member. Country variations were also found in relation to the receipt of such in-house support from a confidant. The Belgians and the French were less likely to have received personal care from someone in their personal social network. The Austrians and the Hungarians had a higher probability of having received such help from a network member.

The probability of exchange of personal and practical help with a social network member elsewhere is summarised in Figure 25.3. As the figure reveals, respondents from the Northern and Western countries, for the most part, were less likely to have received help from members of their personal social networks outside their households, than the level reflected in the general country mean. Respondents from the South and the East, in comparison, were generally more likely to have received such help. Those from the Czech Republic and Hungary were more likely to have given such help, while those from Spain and Portugal were less likely. Austrian respondents were unique among the Western countries in that they were likely to have both given and received help to and from members of the personal social network outside their households. The Italians were more likely to have received such help, but not to have given it.

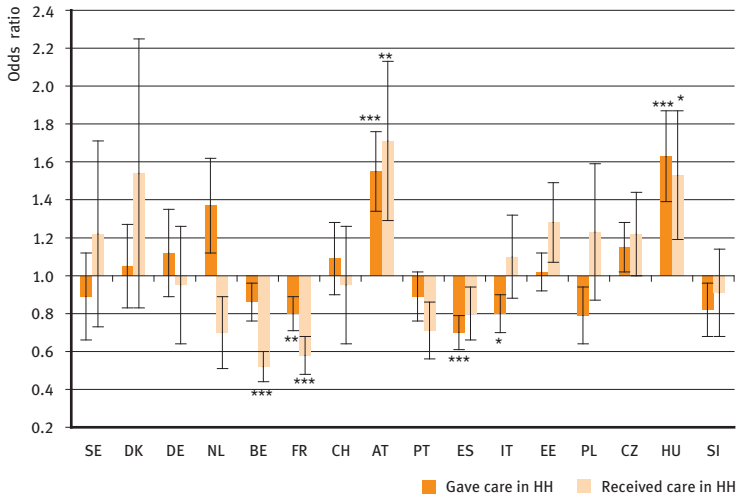


Figure 25.2: Country differences in the exchange of support with network members in the HH: Odds ratios and standard errors

Significance: *=10%; **=5%; ***=1%

Notes: Gave care in HH (n=3,580), Received care in HH (n=2,419)

Source: SHARE Wave 4 release 1

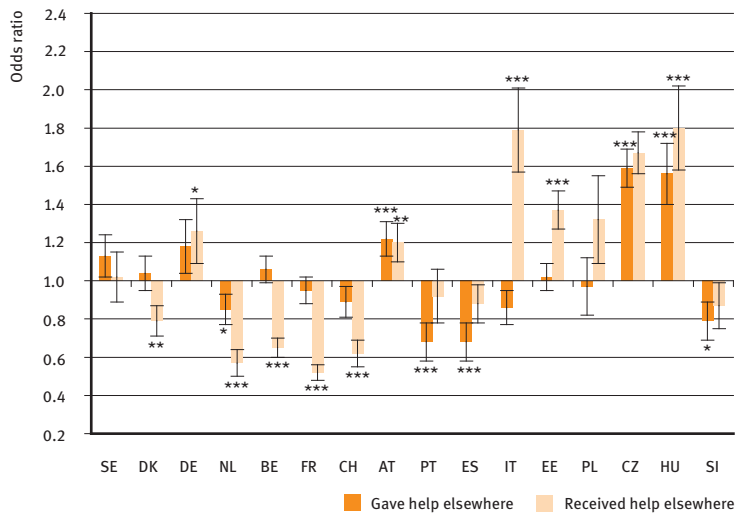


Fig. 25.3: Country differences in the exchange of support with network members elsewhere: Odds ratios and standard errors

Significance: *=10%; **=5%; ***=1%

Notes: Gave care elsewhere (n=10,023), Received care elsewhere (n=7,674)

Source: SHARE Wave 4 release 1

Figure 25.4 presents the findings in relation to the exchange of financial support. As is evident in the figure, respondents from the North and West were, for the most part, less likely to have received a financial transfer from someone they considered to be a member of their personal social network. In contrast, the respondents from the East, again for the most part, were more likely to have received a financial transfer from a social network member. The patterns for giving financial support were more varied. A majority of the countries were less likely to give money to a social network member (Sweden, Denmark, the Netherlands, Belgium, France, Switzerland, Spain and Slovenia). However, respondents from Austria, Portugal, Estonia, Poland and Hungary had higher expected odds of giving such financial support.

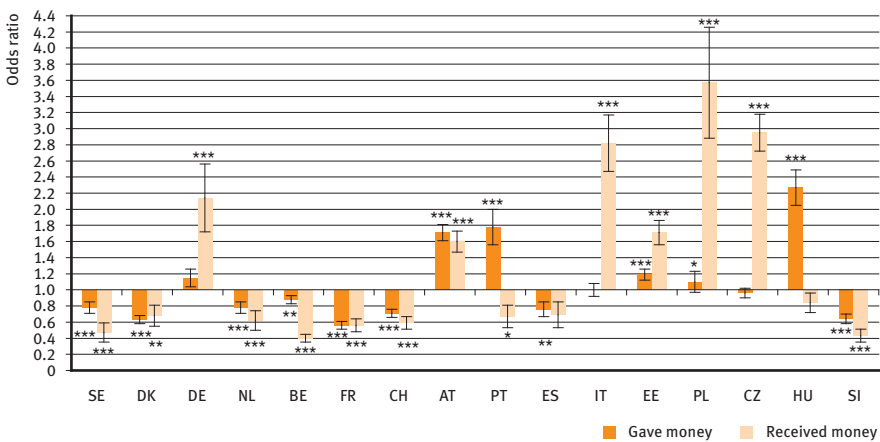


Figure 25.4: Country differences in the exchange of financial support with network members: Odds ratios and standard errors

Significance: *=10%; **=5%; ***=1%

Notes: Gave money (n=11,888), Received money (n=8,169)

Source: SHARE Wave 4 release 1

25.6 Patterns of exchange of support with social network members

Looking at the composite picture, that is, the tendency of respondents in different countries to engage in exchange of all kinds with people they consider to be their confidants, shows a number of patterns. Based upon the findings presented in the figures, we grouped the countries in which the respondents were more likely to have engaged in substantial exchange with members of their personal social network.

We considered a greater likelihood of exchange to have occurred when countries revealed significantly higher or lower odds ratios in two or more of the three realms of exchange: personal care within the household, help from/to someone elsewhere and/or financial assistance. This was done both for support provision and receipt.

The first pattern of note is that respondents from France and the Netherlands were less likely to have engaged in exchange with their most intimate social network, that is, with their named confidants. This was true for both giving and receiving. It seems, therefore, that the older cohorts in these particular countries tend not to exchange practical care and assistance of any kind with those they deem to be their close personal ties.

Another pattern worthy of attention is that respondents in two countries – Spain and Slovenia – were less likely to have given substantial support to members of their closest personal social network. Yet, the respondents from these same countries were not less likely to have received substantial support from their confidants. A more definitive pattern was observed among the respondents from Austria and Hungary. They were more likely to have received substantial assistance from their closest ties and to have provided help to close ties in most types of help (Hungary), or in all of them (Austria). This particular set of findings suggests that the older cohorts in Austria and Hungary, unlike their counterparts in France and the Netherlands – actively engage in exchange with the members of the personal social networks.

25.7 The exchange of support with members of the personal social network and well-being

In order to clarify whether there are indeed differential implications of the exchange of support with members of one's personal social network for one's well-being in the second half of life, in comparison to the exchange of help with others, we examined the association of such exchange with two outcome measures – the CASP Scale and a life satisfaction measure. For this purpose, each of the well-being outcomes was regressed on the six types and directions of transfer, controlling for the demographic background and health variables mentioned earlier, and for country. We employed effect coding to observe the differences among the country mean scores on the respective well-being outcomes, in relation to the overall unweighted sample mean. As recalled, each dichotomous exchange variable in the analysis reflected the exchange of the help in question with a social network member as opposed to the exchange of help with others.

As can be seen in Figure 25.5, only the financial transaction type was accompanied by better well-being when the persons engaged in the exchange were members of the personal social network. Respondents who gave money to their social network members had higher CASP scores and higher life satisfaction than respondents who gave money to more distant relationships, persons who were not considered to be confidants. In addition, the receipt of money from a social network member rather than from someone else was also correlated with higher life satisfaction. These findings are of particular note when considering the distribution of the financial transfers with confidants versus transfers with more emotionally distant relationships. The data show that while the vast majority who had received financial assistance got such help from persons who were not considered to be members of their personal social network, those who did engage in financial exchange with their most intimate relationships experienced greater life satisfaction, controlling for all other variables. As for the other types of transactions, Figure 25.5 shows that there was no difference in the well-being level between those who exchanged practical support and personal care with persons considered to be members of their social network and with others.

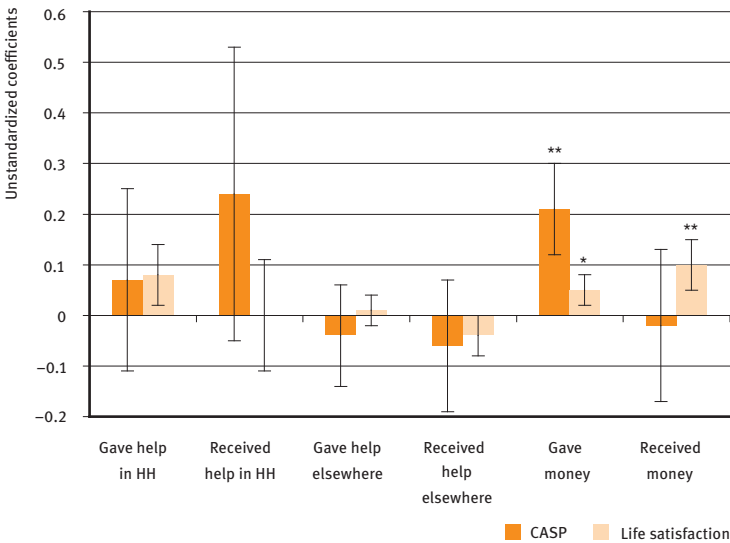


Figure 25.5: The association between exchange of support with network members versus the exchange of support with others and well-being: Unstandardised coefficients and standard errors
Significance: *=10%; **=5%; ***=1%

Notes: Gave care in HH (n=3,580), Received care in HH (n=2,419),
Gave care elsewhere (n=10,023), Received care elsewhere (n=7,674),
Gave money (n=11,888), Received money (n=8,169)

Source: SHARE Wave 4 release 1

25.8 The role of the social network in the exchange of help and its correlation with well-being

This study examined the role of the personal social network in the exchange of practical care, help and financial assistance, and its correlation with well-being. The results revealed that the exchange of support with someone within the household and the receipt of practical or personal care from someone elsewhere indeed took place mainly with members of the personal social network. In comparison, the receipt and giving of money and providing support to someone not in the household occurred more frequently with those who were not considered to be part of the personal social network.

The findings further revealed that there were relatively few country differences in the exchange of support with someone within the household. There were also few country differences in the giving of help to a confidant elsewhere. But sundry differences were observed in the other areas of exchange, suggesting that this area of inquiry requires further exploration.

Our first study hypothesis, that exchange with personal social network yields more positive associations with well-being than exchanges with others, was only partly supported. This was observed in relation to the financial transfers, but not for the exchange of practical help and personal care. It seems from the data, therefore, that people are more sensitive to financial exchanges than to other kinds of assistance given or received.

The second hypothesis also received partial confirmation, this time vis a vis help and care exchanged outside of the household. The findings showed, generally, that respondents from Northern and Western countries were less likely to have received such help while those from Southern and Eastern countries were more likely. These regional differences parallel the public service divide. In the North and the West, where public services are more generous, the exchange of informal assistance with the personal social network was less likely. In the South and the East, where public services are less available, the exchange of informal assistance with the personal social network was more likely.

Despite these two key findings, more still needs to be learned about the associations that exist between personal social networks and exchange in late life. The unique cases identified in this analysis, such those observed in Austria, Hungary, and to a lesser degree, Italy, indicate that more research in this domain and new explanatory paradigms are required. The innovative panel data that SHARE makes available to social scientists will undoubtedly aid in furthering this goal.

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Christian Deindl, Karsten Hank and Martina Brandt

26 Social networks and self-rated health in later life

-
- ▶ Social integration is positively correlated with self-rated health
 - ▶ Social networks on the individual level and social cohesion on the country level promote healthy ageing
 - ▶ Policy makers should consider social ties as an important factor for health in old age
-

26.1 Older Europeans' social networks and health – an ecological perspective

The aim of the *European Year of Active Ageing and Solidarity between Generations* is to improve older people's chances and opportunities to participate fully in society. An important precondition for and consequence of elders' active participation in society is good health. The literature reveals that several mechanisms stand behind the assumed positive relationship between social connectedness and individual health. These include *social support* (where networks provide direct and indirect access to relevant resources), *social influence* (mainly affecting health behaviours), and *social participation* (being relevant for one's self-esteem or self-efficacy); see Thoits (2011) for a detailed discussion.

While there is substantial empirical evidence supporting the notion of a salutary effect of social ties and social support on health (and vice versa; e. g., Sirven & Debrand 2012), comparative studies also indicate considerable cross-cultural and cross-national variation in the scope and the strength of the observed associations, and sometimes even in their directions (e. g., Litwin 2006). This suggests that social networks are embedded in larger social and cultural contexts, arenas in which *social cohesion* plays an important role (e. g., Kawachi & Berkman 2000).

Previous research using data from the *Survey of Health, Ageing and Retirement in Europe* (SHARE) has revealed substantial cross-national differences in elders' social networks (e. g., Kohli et al. 2009, Litwin & Stoeckel 2013) and in their health (e. g., Jürges 2007, Hank 2011). Moreover, some of the SHARE-based studies examined the association between older Europeans' social network characteristics and their social capital endowments, on the one hand, and various health and health-related well-being outcome measures, on the other hand (e. g.,

Litwin 2009, Sirven & Debrand 2012). The study reported upon in this chapter advances the research on the association between social networks and health in a number of ways.

We note, first, that our empirical analysis considers the relationship between selected state-of-the art social network variables and self-rated general health. Self-reports of general health have been shown to be useful indicators of various dimensions of individuals' health, including mortality (e. g., Jürges 2007; also see Litwin 2006). In addition, we employ for the first time data from SHARE's new ego-centred 'social networks' module, which was introduced in Wave 4 of the survey (see Litwin et al. 2013 for a detailed description). Compared to previous analyses of SHARE, in which the social network variables largely reflected a role relational approach, these new data allow taking into account respondents' subjective appraisal of their interpersonal environment and its relationship to their health. In this way, we are able to consider elements of one's most intimate personal social network as well as information on social network structure and the exchange of social support. Finally, following from the idea of an ecological model of social integration and health, as proposed by Berkman and colleagues (2000), we estimated a multilevel model of self-rated health that takes into account measures of social cohesion at the country-level, that is, indicators of the level of income inequality and of general social trust (e. g., Brandt et al. 2012).

26.2 Measurement and analysis

The analytic sample on which the present analysis is based comprises 51,280 respondents aged 50+ who were interviewed in SHARE's Wave 4. The dependent variable is individuals' *self-rated health* (SRH), where respondents self-assess their own general health on a 5-point scale ranging from poor [1] to excellent [5]. Treating SRH as a continuous outcome, we estimate hierarchical linear models accounting for a set of standard *socio-demographic control variables* (age, sex, socio-economic and employment status) and *health behaviours* (smoking, physical activity) as well as for an array of *social network* and *contextual* (i. e. country-level) characteristics of individuals. Baseline information from Wave 1 and 2 was used to construct smoking histories and education. We consider three aspects of elders' *social networks* (SN), namely structure, support, and quality:

- *Structure* is measured by the number of people with whom respondents reported to have discussed important things most often during the 12 months preceding the interview. Respondents were allowed to name up to seven different network partners. We further consider the geographic proximity to social network members (assessed by a binary variable indicating whether

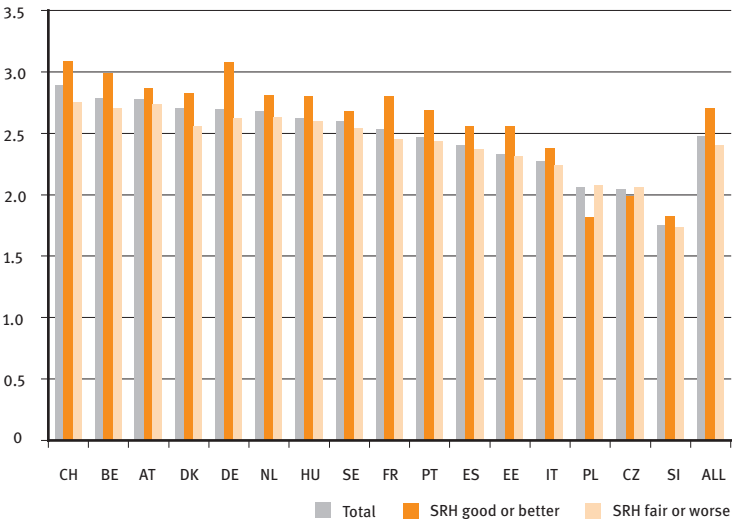
anybody with whom the respondent had discussed important things lives within a range of one kilometre).

- When measuring the exchange of *social support*, we distinguish between (a) financial or material gifts of at least 250 Euro and (b) help with personal care or household chores which the respondent might have given or received in the 12 months preceding the interview. Another aspect of social support considered in our model is respondents' social participation in the community during the past 12 months (volunteering, participation in clubs, attending activities of religious or political organisations, etc; binary: any vs. none).
- Network *quality* is assessed by three indicators: overall satisfaction with relationships to social network members (ranging from completely dissatisfied [0] to completely satisfied [10]), closeness to network members (a binary variable that equals 1, if 'extreme' closeness to at least one member is reported, 0 otherwise), and contact with network members (a binary variable that equals 1, if the contact frequency with at least one network member is at least 'several times a week', 0 otherwise).

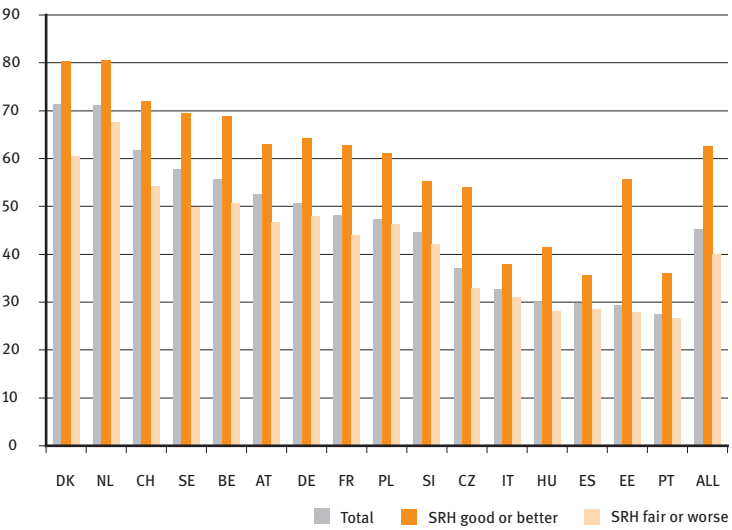
Finally, our model includes two continuous country-level indicators of *social cohesion*: income inequality (measured by Gini coefficients derived from 2011 OECD statistics) and general social trust (percentage of respondents in a country who agreed that most people can be trusted; derived from the 2008 European Value Study). Both indicators are available for all 16 countries that participated in SHARE's Wave 4: Sweden, Denmark, the Netherlands, Belgium, France, Germany, Austria, Switzerland, Spain, Italy, Portugal, Czech Republic, Poland, Hungary, Slovenia and Estonia.

26.3 Associations between social network characteristics and health in Europe

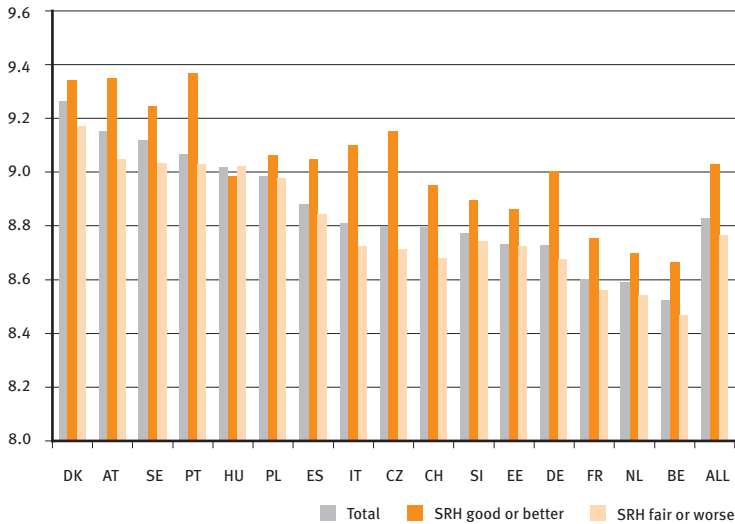
For illustrative purposes, we present first selected bivariate associations of the following aggregate indicators with elders' self-rated health, by country: (a) social network structure (size of the personal social network), (b) social support (proportions participating in community social activities), and (c) network quality (satisfaction with the network) (see Figure 26.1). While these aggregate social network characteristics differ significantly across countries (see Stoeckel and Litwin, in this volume, for a detailed discussion), we observe a universal pattern of associations suggesting higher levels of social connectedness (both in terms of quantity and quality of social relations) among older people reporting good or better health.



(a) Structure: Size of SN and SRH (n=58,142)



(b) Support: Social participation (%) and SRH (n= 58,142)



(c) Quality: Satisfaction with SN and SRH (n= 56,993)

Figure 26.1: Bivariate associations between selected social network (SN) characteristics and elders' self-rated health (SRH), by country

Source: SHARE Wave 4 release 1

In a next step, we estimated three different multivariate models of self-rated health, the first of which includes the social network variables only, without any additional control variables. The second model controls for health behaviours and socio-demographic variables in addition to accounting for individuals' social network characteristics. The correlations of the control variables with self-rated health are as expected and therefore not discussed here. The third and final model adds the two country-level indicators of social cohesion, as detailed earlier (see Table 26.1).

When interpreting the coefficients of these models, it is important to keep in mind that the data in this analysis are cross-sectional. Consequently, we cannot actually identify the causal mechanisms underlying the observed correlations. Thus, for example, while the positive association between network size or participation in community social activities and self-rated health – which we observe in all models – is intuitively consistent with assumptions about a salutary effect of greater social integration, the negative correlation between self-rated health and having a network member living within a range of one kilometre might seem, at first sight, counterintuitive. It is plausible to assume, however, that the causal relationship here is a different one. That is, greater proximity to members of your personal social network does not cause poor health, but if one's health is poor, he or she is more likely to reside in closer geographic proximity to those in the personal network who are able to help.

Table 26.1: Results of hierarchical linear regression models for elders' self-rated health

	SN characteristics	... plus control variables	... plus context variables
Network characteristics			
<i>Structure</i>			
Size	0.02*** (0.003)	0.01*** (0.003)	0.01*** (0.003)
Proximity	-0.03*** (0.011)	-0.06*** (0.010)	-0.05*** (0.010)
<i>Support</i>			
Gift given	0.12*** (0.010)	0.01 (0.009)	-0.00 (0.009)
Gift received	0.02 (0.017)	-0.01 (0.016)	-0.03* (0.016)
Help given	0.16*** (0.010)	0.06*** (0.010)	0.04*** (0.010)
Help received	-0.47*** (0.011)	-0.29*** (0.011)	-0.31*** (0.011)
Social participation	0.34*** (0.009)	0.19*** (0.009)	0.19*** (0.009)
<i>Quality</i>			
Satisfaction with network	0.04*** (0.003)	0.04*** (0.003)	0.04*** (0.003)
Emotional closeness	0.12*** (0.009)	0.07*** (0.009)	0.06*** (0.009)
Contact frequency	-0.10*** (0.010)	-0.05*** (0.009)	-0.05*** (0.009)
Health behaviours			
Never smoked (ref.)		0.00	0.00
Stopped smoking		-0.05*** (0.010)	-0.05*** (0.010)
Current smoker		-0.07*** (0.011)	-0.07*** (0.011)
Physically active		0.43*** (0.009)	0.43*** (0.009)
Socio-demographics			
Age		-0.01*** (0.000)	-0.01*** (0.001)
Sex (female)		-0.00 (0.009)	-0.00 (0.009)
Low education (ref.)		0.00	0.00
Medium education		0.16*** (0.010)	0.16*** (0.010)
High education		0.29*** (0.011)	0.29*** (0.012)

Employed		0.26*** (0.011)	0.27*** (0.011)
Perceived income adequacy		0.28*** (0.009)	0.27*** (0.009)
Social cohesion			
Income inequality			-2.40*** (0.136)
General social trust			0.01*** (0.000)
Constant	1.96*** (0.028)	2.39*** (0.043)	2.25*** (0.063)
Model			
n (individuals)	51,280	51,280	51,280
n (countries)	16	16	16
LL	-71,041	-67,389	-67,403
AIC	142,109	134,822	134,853

Significance: *p < .10; **p < .05; ***p < .01

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1; OECD 2011 & EVS 2008, unweighted

This same kind of ‘reverse causality’ might also explain the negative association found between receiving help and self-rated health. Whereas those giving help are more likely to report better health (because they have the resources to do so), those receiving help may be receiving such help precisely because they are ill. Turning to the exchange of gifts, the findings show an initially observed positive relationship between giving a gift and self-rated health. However, it loses its significance once we control for individuals’ socio-demographic characteristics and health behaviours. We note also that alternative model specifications (not shown in Table 26.1) distinguishing between the exchange of social support within and outside of one’s personal social network did not provide any evidence of differential associations with elders’ self-rated health (see Roll and Litwin in this volume for greater specification of this latter point).

The results of the multivariate analysis also show that all the indicators of network quality obtained significant associations with self-rated health. The propensity to rate one’s health more positively increases, if individuals are satisfied with their personal social network or if they feel extremely close to one or more of their network members. There is a negative correlation between self-rated health and frequent contact to network members, which suggests that elders suffering from poorer health may turn more often to their confidants for emotional and/or practical support.

Finally, both country-level indicators of social cohesion exhibit the expected associations with individuals' self-rated health: higher levels of income inequality are paralleled by poorer health, whereas older people living in countries where social trust is more widespread tend to report better health. Accounting for these contextual variables does not reduce the strength of the correlations between characteristics of individuals' personal social networks and self-rated health.

26.4 Individual and societal responsibilities

Taking advantage of data from SHARE's new ego-centred 'social networks' module, we investigated how older Europeans' self-rated health is associated with their personal network structure, the exchange of social support, and network quality. We demonstrated that close correlations exist between self-rated health and almost all the network characteristics considered here, suggesting a salutary effect of social integration. In addition, our multilevel analysis showed that a country's level of social cohesion matters as well. It is clear, therefore, that establishing and maintaining health promoting social relationships in later life is a matter of both individual *and* societal responsibility. It is particularly important that "policy makers use the scientific findings on social ties and health to advance population health and to reduce social disparities in health" (Umberson & Montez 2010: 60). Our current research adds important additional evidence for the debate concerning this critical area of interest.

Future research should aim at exploiting more fully the potential of Berkman et al.'s (2000) ecological model of social integration and health by accounting for cross-level interactions between societal context and elders' social network characteristics. Although previous research has demonstrated the value of self-rated general health information, further analyses should also consider more specific health outcomes (e. g. functional limitations or depression) and their relation to individuals' social network characteristics. Finally, more detailed longitudinal information on the dynamics of elders' social networks, which will be collected in future waves of SHARE, will allow us to better identify the causal mechanisms underlying the social networks-health-nexus in the older population (e. g., Sirven & Debrand 2012).

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27 Social networks and everyday activity limitations

-
- ▶ Network size increases with the onset of limitations, but only for the less limited
 - ▶ The severely limited 80+ group, especially men, have the most limited networks
 - ▶ Higher education protects against social isolation among severely limited persons
 - ▶ Respondents in Switzerland, France and Belgium have the most diverse networks, while those in Hungary have the most familialistic network
-

One of the implications of individualism and demographic transformation is that ties between generations and family members become weaker. At the same time the social relationships that remain, become more complex. The meaning and outcomes of these changing relationships for the well-being of older people, as well as for the functioning of the society as a whole, requires more research.

With ageing, chronic diseases accumulate and health conditions appear more frequently (Verbrugge 1997). Thus, in an era of increasing life expectancy, disability might become more prevalent. Conversely, higher educational levels, technological advancements and behavioural changes may lead to decreasing disability in later life. Whatever the case, the role of network resources and the support they may or may not provide for older persons should be high on the research agenda.

This chapter reports the results of a study that analysed the relationship between social network characteristics and disability outcomes of persons aged 50 and older. We looked at limitations in everyday activities as measured on the Global Activity Limitation Index (GALI), an objective and validated disability status measurement (Verbrugge 1997, Jagger et al 2010). Different types of social networks, contact frequency and quality of relationships can yield different outcomes for the well-being of older persons, especially with the onset of activity limitations. Therefore, the study of social contacts is an important means for gaining a better understanding of well-being and functioning among members of the older cohorts.

The size of networks is one of the determinants of well-being (Cornwell 2009). Mobile societies and active people tend to have larger networks, but these often consist of so-called weak ties, i. e. those that provide new information but do not supply on-going care (Granovetter 1973). Knowledge about the social networks of older people is important because with increasing functional disability strong ties remain whereas weak ties drop out of the network (Cornwell 2009).

The composition of networks is another important aspect in determining the well-being of older people and their coping with everyday activities when limitations set in. Marital status has been found to have a protective effect on one's physical ability. At the stage of limitations with daily activities, the most frequent source of support tends to be a spouse, followed by children (Wenger 1997). Spouses of physically disabled persons tend to be equated with the availability of strong emotional support, but considerable numbers of married people often lack such support. Also, the number of friends and relatives decreases with age, due to their own declining health and death, and because weaker ties - such as friends - drop out of the network when activity limitations emerge. Closer ties are easier to maintain as these are often embedded in familialistic environments, requiring less reciprocity (Cornwell 2009).

Another aspect presented in this chapter focuses on the frequency of contacts. Older people having fewer contacts with both family and friends have indicated lower scores on several scales of health-related quality of life (Lopez Garcia et al. 2005). People with severe health problems and disabilities may have trouble reciprocating in basic social exchanges. This introduces an element of inequity which can jeopardise social relationships and reduce the size of networks, while at the same time increasing the number of contacts that one has with those who remain in the network (Cornwell 2009, Oishi et al. 2013).

All of these factors tend to characterise the social network as a protector against loneliness. Other research has revealed that experiencing loneliness and social isolation results in worse health outcomes, especially poor mental health and depression (Cornwell 2009, Greenfield & Russell 2010, Moor & Komter 2011, Oishi et al. 2013). In this study we model general satisfaction with relations in the social network as a proxy for not feeling loneliness and social isolation despite the size, type and frequency of contacts one may have. In general, our main research interest derives from the assumption that the characteristics of social networks have protective effects for people who are limited in their activities. However, owing to the different evolution of societies, the nature of the network effects may differ between countries.

27.1 Limitations in everyday activities

The distribution of limitations in everyday activities according to GALI is distinguished by three levels (severely limited; limited – but not severely and not limited). Estonia, Poland and the Netherlands have the biggest reported proportions of severely limited respondents among the SHARE countries. Only in the

Czech Republic the majority (40%) are limited to some extent, but not severely. Moreover, in Germany and the Czech Republic, the differences in the proportions of not limited and less limited are the smallest.

Partly due to its having the largest share of severely limited respondents, and because it is one of the new countries participating in SHARE, Estonia was used as the reference country in the regression models of the current research. We should point out as well that Estonia holds the middle position on several other variables and is thus a good reference base to see the variety among the countries.

27.2 Network size

Descriptive analysis shows that within most of the SHARE countries, the severely limited respondents tended to have a smaller average network size, and those that were less limited had the largest (Figure 27.1). In Italy, Spain and Germany, the largest networks were among the not limited. In Spain and Italy there were large internal differences between the limitation categories. Networks of the severely limited were smallest in East and South European countries. The severely limited in Italy, Spain, Slovenia, Poland and the Czech Republic reported having less than two network members, on average, corresponding to these countries smaller networks overall.

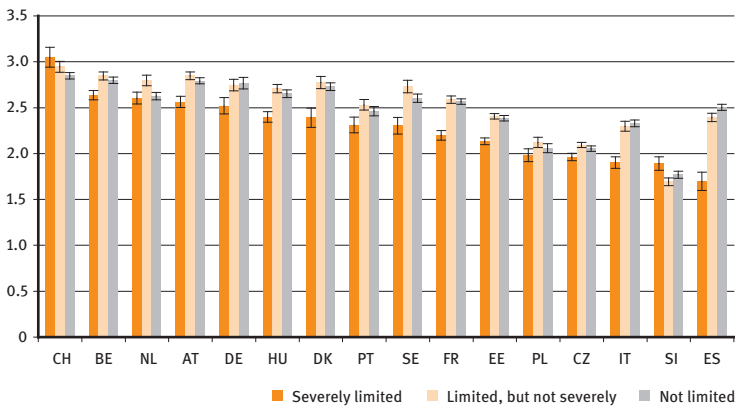


Figure 27.1: The mean size of social networks, by limitations of everyday activities

Notes: Number of observations: 56,367

Source: SHARE Wave 4 release 1

We also found that network size was smaller in older age, which may be related to decreasing survival rates of network members and to a higher likelihood of developing limitations. Respondents aged 50–64 years had larger networks than the 80+ year olds in most of the countries. Respondents aged 80 and above in Slovenia, the Czech Republic, Poland and Italy had, on average, fewer than two network members, corresponding once again to their smaller overall networks.

Multinomial logistic regression results (not shown, available on request) revealed that respondents from Austria, the Netherlands, Denmark and Hungary had the highest overall chance of having any network (at least one member) across all the limitation groups. The lowest chance was observed in Italy and Slovenia. The highest possibility of having a network among the severely limited group was in Switzerland, and lowest in Spain and Italy compared to Estonia. Spanish respondents showed large differences again across the three limitation groups – the not limited seem to have had a five-fold higher chance of having a network than the corresponding Estonian population whereas the chance of having any ties was one of the lowest among the severely limited Spaniards. However, Spain having the smallest share and Estonia the largest share of severely limited respondents might explain some of these differences. Also, men had a lower chance of having networks than women across all the limitation categories.

27.3 Network composition

Further analysis showed that the majority of respondents (above 80%) had at least one family member in their network. Only severely limited 80+ year olds had a slightly lower proportion (78%). In general, the proportion of family members such as spouses, siblings and parents in networks falls with age owing to their survival rates, while younger generations of relatives replace them. Although a clear pattern of the decreasing share of siblings with age can be seen across all limitation groups, it is not as remarkable for the 50–64 year olds as might have been expected, due to demographic shifts. The proportions of those having children and grandchildren in networks increased with age. However, the share of people having grandchildren in the network remained below ten per cent among the 80+ year olds across all the limitation groups. Thus, replacement by grandchildren is not yet predominant.

Regression analysis showed a 1.2–1.4 times lower likelihood for men to have any family members in their network compared to women across all the limitation categories, but it was lowest for the severely limited. In addition, having family in the network was less common for severely limited respondents with low

or medium level education compared to those with high education (but these differences were not significant). The oldest severely limited respondents reported no family ties in their networks most often. Married respondents and those in registered partnerships were more likely to have networks consisting solely of family ties than the other marital status groups. The chances of having any family ties in one's network were highest in Austria, Hungary and Estonia across all the limitation groups. The Netherlands showed highest likelihood of having family ties among the less limited. This might point towards these countries being more familialistic. Severely limited respondents from Spain, Belgium, Slovenia, the Czech Republic and France indicated the lowest chance of having family ties in their networks. Despite their having the largest shares of formal helpers (except Slovenia and the Czech Republic), however, these proportions are still too low to replace family ties.

The proportion of severely limited respondents having children in their networks increased from 47.9 per cent among those aged 50–64 to about 56 per cent among those aged 65 and higher. According to the regression results, the likelihood of having children among one's social ties was almost two times smaller for severely limited men than for women. This decreased to 1.8 times lower among the less limited and not limited men. This finding suggests different communication patterns between men and women and their children. For example, relationships between fathers and their children can be particularly less common after partnership dissolution (Kalmijn 2007, Dykstra & Keizer 2009). The likelihood of having children in the network was higher for the 80+ age group. Respondents from Hungary, Austria and Portugal showed the highest chances of having children in their networks across all the limitation groups. Severely limited Slovenian respondents had the smallest likelihood of having children in their networks, but it was low also among Slovenians in other limitation groups.

Some 58 per cent of the severely limited 50–64 year olds had a spouse or a partner in their network while among the less limited the figure was 64 per cent, and 67.7 per cent among the not limited. The severely limited clearly have a worse 'starting point' in terms of partner availability and it deteriorates with age – by age 80+ the share of severely limited respondents with a partner in their network was the smallest (29.6 %) compared to the same age groups among the less limited (36.4 %) and the not limited (38.1 %). Within family ties, men had a much higher possibility of having a spouse or a partner in their networks than women across all the limitation groups, being the highest in the less limited group (2.1 times that of the women). Men live more often with a partner until the end of their lives and benefit from having had an important support resource. The likelihood of having a partner decreased in older ages, owing to different survival rates of spouses. In most countries the possibility of having a spouse decreased with the onset

of more severe limitation, reflecting the smaller proportions of severely limited persons with a spouse or a partner overall.

The proportion of people having friends in their network also decreased with age. Moreover, a smaller proportion of severely limited 50–64 year olds (31%) had friends in their network than their peers had (31.9% among the less limited and 32.6% among the not limited). By the age of 80+, the proportion of respondents with friends was smallest among the severely limited (14.8% compared to 18.7% among the less limited, and 22.7% among the not limited). As friends tend to be of the same age, their existence in networks in later life depends also on their survival. Having friends in one's network was 1.7 times less likely for men than women, according to the regression results. Being married and living together with a partner decreased the likelihood of having friends in the network. Marriage provides a strong tie but having others in the network brings other benefits. Highly educated respondents had a higher likelihood of having friends compared to other education levels across all the limitation categories. Severely limited respondents with low education had a 2.4 times lower likelihood of having friends than those with high education. Respondents from Eastern Europe together with Portugal differed by having less likelihood of reporting friends than the rest of Europe, especially among those with no limitations. Among the severely limited, respondents from Hungary and Spain showed the lowest likelihood of having friends in the network compared to Estonia, followed by those from the Czech Republic, Italy, Portugal and Slovenia. The likelihood of having friends decreased as the functional level moved towards the severely limited in Spain and Hungary. Within Spain, the likelihood of having friends was one of the highest among the not limited while it became the lowest for the severely limited Spaniards.

27.4 Frequency of contacts

Figure 27.2 shows descriptive results of the average frequency of contact within the network by the three limitation categories. In most countries, the severely limited had the least average frequency of contact. Respondents from Hungary and Portugal had the highest contact frequency overall, including among the severely limited. While Spanish respondents had the second highest contact frequency among the less limited and the not limited, they had the lowest average contact frequency among the severely limited (a score of 4.1 or slightly less than once a week). This underscores the great internal differences across limitation groups regarding social network characteristics in Spain.

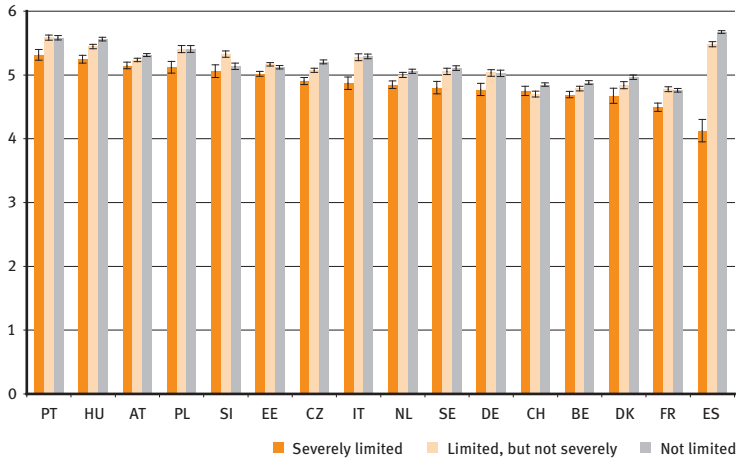


Figure 27.2: Average frequency contact with social network, by limitations of everyday activities

Notes: Number of observations: 54,756

Source: SHARE Wave 4 release 1

Logistic regression of contact frequency (with daily/several times a week as the reference category) revealed that men were 1.7 times more likely than women to have had no contact with their social network (Table 27.1). This supports the idea of men's higher vulnerability. Women are likely to communicate with their network members more often. Also, the 80+ age group was more likely to have had no contact with its networks. Taking into account that this age group has also smaller networks makes them needing the most attention. Severely limited respondents had 1.6 times the possibility of the not limited to have had no contact with their network. Highly educated respondents had a higher likelihood of having sometimes contact with their networks than less educated people compared to the likelihood of interacting daily or several times a week. Older respondents from Italy, Slovenia, France, Poland, the Czech Republic and Belgium were more likely to have had no contact with their networks than those from Estonia while in Portugal, Hungary, the Netherlands and Austria respondents were significantly less likely to have had no contact with their networks. The latter three countries also had the greatest number of family and children ties (strong ties) in their networks, which results in having more frequent interaction.

Table 27.1: Multinomial logistic regression of average frequency of contact with social networks

	Never Exp(B)	S.E.	Sometimes Exp(B)	S.E.
Male	1.738***	(0.0435)	0.993	(0.0262)
50–64	0.528***	(0.0628)	0.726***	(0.0426)
65–79	0.616***	(0.0575)	0.932	(0.0402)
Married and living together	0.430***	(0.0577)	0.482***	(0.0371)
Registered partnership	0.375***	(0.2261)	0.695***	(0.1040)
Married, living separated	0.977	(0.1733)	1.035	(0.1038)
Never married	1.459***	(0.0846)	1.586***	(0.0546)
Divorced	1.124	(0.0808)	1.236***	(0.0481)
(Pre) primary	1.348***	(0.0646)	0.576***	(0.0346)
(Post) secondary	0.985	(0.0661)	0.683***	(0.0323)
Severely limited	1.621***	(0.0532)	1.079**	(0.0365)
Limited, but not severely	0.829***	(0.0511)	1.115***	(0.0286)
AT	0.554***	(0.1138)	0.750***	(0.0565)
DE	1.127	(0.1549)	1.377***	(0.0782)
SE	0.792	(0.1506)	1.338***	(0.0723)
NL	0.633**	(0.1510)	2.008***	(0.0606)
ES	0.966	(0.1103)	0.302***	(0.0991)
IT	2.095***	(0.0912)	0.436***	(0.0865)
FR	1.887***	(0.0854)	1.906***	(0.0499)
DK	1.168	(0.1311)	1.645***	(0.0649)
CH	1.237	(0.1127)	2.556***	(0.0533)
BE	1.240**	(0.0950)	1.951***	(0.0502)
CZ	1.529***	(0.0856)	0.953	(0.0543)
PL	1.348**	(0.1296)	0.503***	(0.1102)
HU	0.635**	(0.1304)	0.523***	(0.0778)
PT	0.727**	(0.1472)	0.345***	(0.1118)
SI	2.331***	(0.0957)	0.480***	(0.0867)

Significance: *** = 1%; ** = 5%; * = 10 %

Source: SHARE Wave 4 release 1

Notes: Reference categories: daily/several times a week; female; 80+ year olds; widowed; tertiary education; Estonia; Number of observations: 53,917.

27.5 Satisfaction with networks

Although satisfaction with networks was generally high, the severely limited were the least satisfied (mean=8.6; scale range 0–10) (Figure 27.3). Given the smaller networks and lesser diversity in the networks of the severely limited, especially among those who are 80 and above, this assessment reflects their more disad-

vantaged position. Also, among the severely limited only those in Denmark and Portugal had an average satisfaction score above nine points. The lowest evaluation score was observed among severely limited German respondents (8.5). Less limited and not limited 50–64 year olds were less satisfied with their networks than were older respondents even though their networks were relatively better off (larger, more diverse and having more frequent interaction). Respondents from Sweden and Denmark indicated having the highest satisfaction levels among both the less limited and the not limited, while those from the Netherlands, France and Belgium showed the lowest satisfaction levels compared to Estonia. It seems, therefore, that greater satisfaction with networks is not always related to better social network parameters.

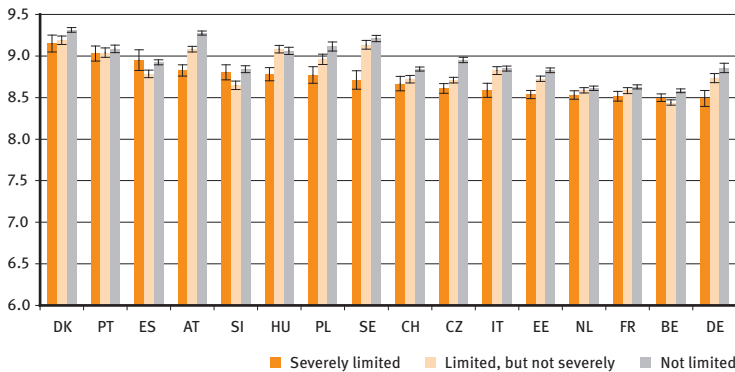


Figure 27.3: Average satisfaction with social networks, by limitations of everyday activities

Notes: Number of observations: 55,252

Source: SHARE Wave 4 release 1

27.6 Influence of social networks on limitations of everyday activities

Network size increases with the onset of limitations (Cornwell 2009), but this is confirmed only for the less limited group. The severely limited older population tends to have the smallest networks. Moreover, while the networks of older Europeans are largely composed of family members, the severely limited are less likely to have family ties (or friends) among their network contacts. In addition, the number of friends and siblings in the network decreases with age, as the proportion of children increases. However, the effect of major demographic shifts is not fully apparent in the present analysis, probably due to large shares of the

older European population still belonging to the baby boom generation. As such, the new challenges for older people that are posed by recent demographic shifts might not yet be reflected in the social network dynamics of the SHARE Wave 4 sample.

Older men, especially those who are severely limited, stand out as a vulnerable population group, reflecting similar findings in earlier research (Kalmijn 2007, Dykstra & Keizer 2009). Even though they are more likely to have a spouse nearby, their spouse is often their only network member. Similarly, the severely limited 80+ group is vulnerable in terms of its having fewer people to communicate with, less diverse networks, lesser interaction and lower satisfaction with the networks, corroborating similar findings elsewhere (Litwin 2011). It might be that those in the severely limited 80+ group have difficulties with maintaining reciprocal relationships due to having limitations, but the underlying mechanisms to explain this need further analysis.

Education indicated some protective effects against the social isolation of severely limited older people as the more highly educated benefited from having both more family members and more diverse ties in their networks. This finding is in line with earlier research results (Greenfield & Russell 2010, Oishi et al. 2013). Nevertheless, this association, as well as the role of education in bringing together different networks, needs more exploration.

The severely limited tend to have lower satisfaction with their networks than the less limited and the not limited in most countries. Also, the less limited and not limited among the 50-64 year olds were less satisfied with their networks than the corresponding older groups of respondents. Moreover, in several cases better network characteristics did not always go together with higher satisfaction levels.

Switzerland, Belgium and France seem to provide a more mobile environment for limited older people to maintain their social relationships. Most East European and South European countries are less mobile socially, with Slovenia, Spain and Italy standing out in particular. Spain and to some extent Italy exhibited large internal differences between the not limited and the severely limited groups, explained possibly by the stigmatisation of the latter.

Hungary, Austria, Estonia and Portugal can be considered as more familialistic in that family ties were the dominant relationship categories found in the networks in these countries. Conceptually, familism assumes that family ties remain or become stronger with the development of severe limitations. However, in several countries replacement by either children or formal helpers is not taking place among the severely limited. This makes familism a vulnerable concept as people lean on family ties too extensively. The gap between the need and the availability of family support should be addressed by development of better formal care. Different communication opportunities should be developed for

the vulnerable groups. Educational policies may help in preventing social isolation in later life. On the other hand, including older people in different activities where new skills can be acquired can keep their sense of engagement. Participating in activities has the potential to enlarge one's network and thus prevents social isolation. Those who benefit from more mobile ties maintain them even when severely limited.

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Viola Angelini and Anne Laferrère

28 Friendship, housing environment and economic resources: what influences social network size after age 50?

-
- ▶ People do not compensate for low income by having more friends or family ties
 - ▶ Cities are not anonymous places for older people
 - ▶ Crime-ridden neighbourhoods diminish social network size among women
 - ▶ Recent mobility increases family ties while immobility reduces ties with friends
-

28.1 Social networks, housing and economic resources

“No man is an island” wrote the poet John Donne. Even economists, the champions of atomistic agents maximising their utility, have developed formal models of altruism, household bargaining, reciprocity, or peer effects. More simply, social ties have been shown to be important for a variety of economic and non-economic outcomes and they are likely to be particularly relevant in old age when help from others becomes a necessity. Bonsang and van Soest (2012) motivate their study of the satisfaction with social contacts of older Europeans by referring to various studies on the strong link between satisfaction with social life and subjective well-being (Van Praag & Ferrer-i-Carbonell 2008).

In this chapter we take a different perspective. Rather than assessing the importance of social networks, we focus on the determinants of their size. Are social networks a purely personal affair, or are they influenced by factors such as the housing environment where a person lives? From the novels of Dickens and the reports of Villermé in the 19th century to the fundraising of Abbé Pierre in post WWII France, many have stressed the morbid influence of slums, or of lack of sun and space. More recently the “Moving to Opportunity for Fair Housing” randomised experiment in the U.S.A. demonstrated the programme’s greater long term beneficial impact on health and subjective well-being rather than on economic outcomes (Ludwig et al. 2008).

Studies on the influence of the environment on older individuals’ well-being are less common (Cagney et al. 2009, Everson-Rose et al. 2011). If well-being depends on having many social ties and if the environment influences the number of social ties, an issue for economic policy, especially in a time of economic crisis,

is how to promote good environments in order to increase them. To answer this question, we use information from the social network and housing modules of the fourth wave of the Survey of Health, Ageing and Retirement in Europe (SHARE), in addition to demographics, health and socio-economic status.

The variable of interest – social network size – is derived from a series of probes in which respondents are asked to name up to seven people with whom they most often discuss important things. The “social network” in question does not encompass all possible social relationships but is limited to seven confidants, by design (see Stoeckel and Litwin in this volume).

We characterise the housing environment by the type of building (from farm house to high rise building), location (from rural area to big city), tenure (owner, tenant, free occupation) and mobility. The nature of the association between social network size and location or type of building where one lives is not clear *a priori*. On the one hand, living in a city makes the potential network larger (e. g. living in an apartment building increases the number of neighbours). On the other hand, cities lead to more anonymity and high rise buildings may have adverse consequences on trust and friendship, due to their impersonality and potential for crime. Moreover, having many neighbours does not turn them into confidants.

As for housing tenure, the associations with the social network size are likely to be multiple. First, home-ownership is a sign of a higher permanent income; to the extent that the social network is linked to income, it might be linked to home ownership as well. Second, housing tenure is linked to family formation (Öst 2011) and most network members are the children. Although we control for the number of children, home-ownership might capture unobserved preferences for both family life and socialisation. In the same vein home-owners are considered to be better citizens (DiPasquale & Glaeser 1999), which could increase their sociability. Third, home-ownership increases mobility costs and is linked to less residential mobility, which, in turn, might foster long term links with those who live nearby. Thus, home-ownership and immobility should be linked to a larger social network. Alternatively, one might move in order to get closer to family or friends. In that case, home-ownership and immobility might be linked to a smaller social network.

28.2 The Matthew effect

We carry out simple OLS regressions to analyse the relation between the economic resources and the housing environment of respondents and the size of their social network, controlling for demographics [age groups, gender, number of children (dummies), number of grandchildren, absence of brothers and of sisters, household size and marital state], self-reported health and the country of residence.

Table 28.1: Economic and housing determinants of the size of the network

Variables	Whole sample (1)	Longitudinal sample (2)	Whole sample (3)
<i>Income per consumption unit</i>			
First quartile	ref	ref	ref
Second quartile	0.191*** (0.019)	0.225*** (0.032)	0.192*** (0.019)
Third quartile	0.291*** (0.020)	0.276*** (0.034)	0.292*** (0.020)
Fourth quartile	0.291*** (0.021)	0.312*** (0.037)	0.292*** (0.021)
Years of education	0.026*** (0.002)	0.023*** (0.003)	0.026*** (0.002)
<i>Making ends meet</i>			
With great difficulty	ref	ref	ref
With some difficulty	0.091*** (0.023)	0.085* (0.047)	0.091*** (0.023)
Fairly easily	0.132*** (0.024)	0.127*** (0.047)	0.133*** (0.024)
Easily	0.216*** (0.027)	0.193*** (0.051)	0.216*** (0.027)
Household size	0.037*** (0.009)	-0.025 (0.016)	0.036*** (0.009)
Farm	ref	ref	ref
House	0.043 (0.029)	-0.051 (0.052)	0.044 (0.029)
Row house	0.077** (0.034)	-0.034 (0.058)	0.078** (0.034)
Flat - 3 to 8 floors	0.055 (0.036)	-0.042 (0.064)	0.057 (0.036)
Flat - 9 or more floors	0.141*** (0.035)	0.046 (0.065)	0.143*** (0.035)
High rise	0.246*** (0.049)	0.006 (0.098)	0.247*** (0.049)
Big city	0.203*** (0.025)	-0.021 (0.045)	0.203*** (0.025)
Large town	ref	ref	ref
Suburban	0.048* (0.027)	-0.121*** (0.043)	0.048* (0.027)
Small town	0.077*** (0.022)	-0.109*** (0.036)	0.077*** (0.022)
Rural area	-0.018 (0.023)	-0.132*** (0.038)	-0.018 (0.023)
Number of rooms per person	0.040*** (0.009)	0.002 (0.015)	0.039*** (0.009)

Variables	Whole sample (1)	Longitudinal sample (2)	Whole sample (3)
Rent-free Owner	ref -0.016 (0.028)	ref 0.028 (0.055)	ref -0.016 (0.028)
Tenant	-0.095*** (0.036)	-0.084 (0.067)	-0.094*** (0.036)
Submarket rent	0.097*** (0.035)	0.115** (0.059)	0.097*** (0.035)
Own second home	0.221*** (0.017)	0.260*** (0.030)	0.221*** (0.017)
Mobile	0.007 (0.049)	-0.070 (0.081)	0.046 (0.051)
Length of tenure - 1st quintile			0.035 (0.024)
Length of tenure - 2nd quintile			0.011 (0.022)
Length of tenure - 3rd quintile			0.039* (0.022)
Length of tenure - 4th quintile			0.014 (0.022)
Length of tenure - 5th quintile			ref
Length of tenure	-0.001* (0.000)	-0.000 (0.001)	
Pollution		0.091*** (0.033)	
Crime		-0.118*** (0.038)	
Constant	0.682*** (0.101)	1.172*** (0.164)	0.640*** (0.099)
Observations	53,140	17,618	53,140
R-squared	(0.028)	(0.055)	(0.028)

Significance: *p < .10; **p < .05; ***p < .01

Notes: Standard errors in parentheses. The OLS regressions also control for age, gender, marital status, number of children and grand-children, whether the respondent had no brothers or no sisters, health status and country of residence. Column (2) focuses only on the longitudinal sample. Source: SHARE Wave 4 release 1

The first column of Table 28.1 shows that social network size is strongly correlated with the respondent's economic resources. Being able to make ends meet "easily" adds 0.22 confidants compared to being able to make ends meet "with great difficulty". Being in the bottom quartile of income by consumption unit (defined as

the square root of household size) is associated with 0.19 fewer confidants compared to being in the second lowest quartile. In addition, each year of education adds 0.03 confidants. These associations point to the so-called “Matthew” effect from the Gospel “whoever has, will be given more”. People do not make up for low income by having more friends to talk to.

Social network size might be a social construction, at least partly. That is, the very enumeration of one’s confidants might be linked to one’s awareness of their importance, which, in turn, may be a function of economic status. Such *valuation neglect*, to borrow Sen’s term, may lead to an overestimation of the association between social network size and socio-economic status (Sen 1985). Thus, not only do richer and more educated people have more social ties, but they are more likely to say that they do. In comparison, poorer and less educated persons tend to be less verbally fluent, and hence less expressive of feelings with family and friends. In France or French-speaking Belgium, for example, the latter group would be called “taiseux” or quiet. In a separate analysis using self-assessed verbal fluency at age ten for the sub-sample from the SHARELIFE study, we found that this was indeed the case – the less fluent had a smaller network. However, the verbal bias seems small as it hardly reduced the Matthew effect.

28.3 The housing environment

Table 28.1 also shows that social network size is correlated with various housing environment conditions. Three variables can be interpreted as proxies for a “supply” of close neighbours:

- Social network size is positively correlated with household size, once we control for income by consumption unit and housing conditions.
- Social network size increases with the size of the building. It is higher for respondents who live in high rise buildings or with nine or more floors compared to those living in smaller apartment buildings. Living in a row house is associated with a larger social network than living in an isolated house or on a farm.
- Social network size is positively correlated with local population density on a more general level, growing from rural areas and villages to big cities. One exception is that small towns yield bigger social networks than large towns; it might be because they can be closer to big cities.

Thus, all things being equal, people are apparently more likely to “discuss important things” when living in an apartment building, and in a big town, than in a less dense area or an isolated house. This might be the effect of the higher probability that apartment dwellers have someone with whom to discuss things, tele-

phone and internet notwithstanding. Hence the importance of neighbourhood effect even when “neighbours” are mostly relatives. The effect of geography might be linked to transportation costs.

If we run separate regressions for the number of family members in the network and the number of “friends” (defined as all network members that are not relatives), the above “neighbourhood supply” results are modified (Figure 28.1). The number of friends increases significantly with population density, while we observe a more moderate effect and a non-linear relationship for the size of family network, which is lowest in large towns, suburbs and rural areas, from which the children might have moved to a big city or a small town. It could also be that people self-select into quiet or more deserted places when they do not want or need to talk. Two countries are different: in Sweden only living in a big city has a significantly negative effect (it might be the effect of living in Stockholm) and in the Netherlands only small towns and rural areas have a positive influence on social network size.

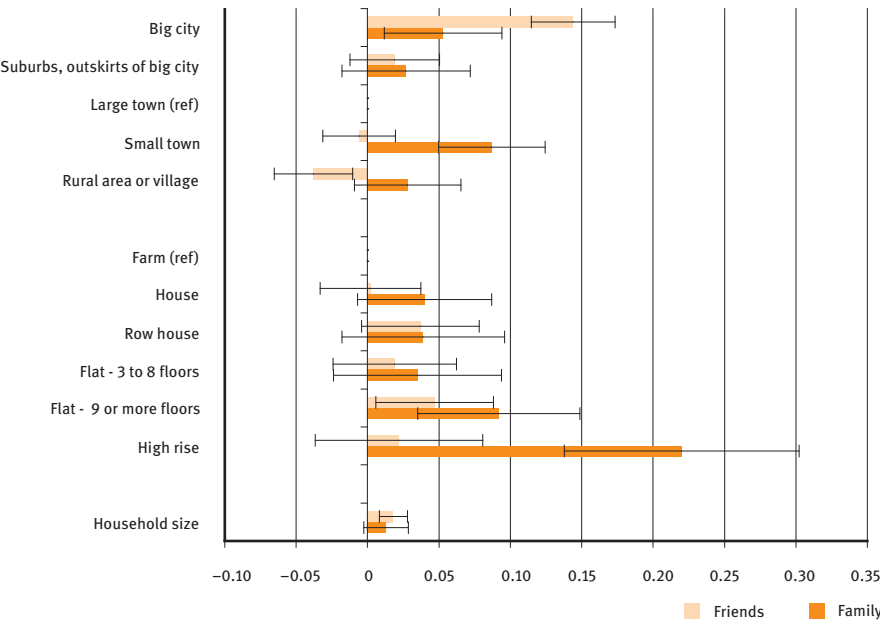


Figure 28.1: Effect of neighbourhood density on the number of friends and family members in the social network

Notes: Wave 4 respondents (n=53,140). Effects are extracted from the models in Table 28.2 (col. (1) and (2)) and controlled for all the variables in these models. Horizontal brackets indicate 95 per cent confidence intervals.

Source: SHARE Wave 4 release 1

In column two of Table 28.1 and columns three and four of Table 28.2 we focus on the longitudinal sample, for which we have additional information on the characteristics of the neighbourhood in which respondents lived, specifically whether the area suffered from “vandalism or crime” or from “pollution, noise or other environmental problems”. A crime ridden neighbourhood was detrimental to social network size and this effect was rather large (–0.12). It is the same for males and females as far as the number of family members in the network is concerned, but non-significant for the number of friends among the men. Only women are penalised by vandalism and crime in their friendship ties; security aspects seem more relevant to them and, probably, to their friends (analyses available on request). Complaining about neighbourhood noise or pollution has a positive effect on the number of friends but not on the number of family members in the network. We interpret this as an alternative channel for the city density effect, or as another sign of the education effect, insofar as more highly educated people are more likely to complain of pollution *ceteris paribus*.

Table 28.2: Economic and housing determinants of the size of the social network by type of network

Variables	Whole sample (1) friends	Whole sample (2) family	Longitudinal sample (3) friends	Longitudinal sample (4) family
<i>Income</i>				
First quartile	ref	ref	ref	ref
Second quartile	0.084*** (0.012)	0.108*** (0.016)	0.088*** (0.021)	0.137*** (0.027)
Third quartile	0.114*** (0.012)	0.177*** (0.017)	0.098*** (0.022)	0.177*** (0.029)
Fourth quartile	0.136*** (0.013)	0.155*** (0.018)	0.135*** (0.024)	0.177*** (0.032)
Years of education	0.019*** (0.001)	0.007*** (0.001)	0.015*** (0.002)	0.008*** (0.003)
<i>Making ends meet</i>				
With great difficulty	ref	ref	ref	ref
With some difficulty	–0.006 (0.014)	0.097*** (0.020)	–0.003 (0.030)	0.088** (0.040)
Fairly easily	–0.009 (0.015)	0.141*** (0.021)	0.018 (0.030)	0.109*** (0.040)
Easily	0.027 (0.017)	0.189*** (0.023)	0.052 (0.032)	0.141*** (0.043)
Number of rooms per person	0.032*** (0.006)	0.008 (0.008)	0.036*** (0.010)	–0.034*** (0.013)

Variables	Whole sample (1) friends	Whole sample (2) family	Longitudinal sample (3) friends	Longitudinal sample (4) family
Own second home	0.088*** (0.010)	0.134*** (0.014)	0.105*** (0.019)	0.155*** (0.025)
Mobile	-0.041 (0.030)	0.048 (0.042)	-0.079 (0.052)	0.008 (0.069)
Length of tenure	-0.002*** (0.000)	0.001** (0.000)	-0.001*** (0.000)	0.001 (0.001)
Pollution			0.051** (0.021)	0.040 (0.028)
Crime			-0.039 (0.024)	-0.079** (0.032)
Constant	-0.036 (0.062)	0.718*** (0.086)	0.190* (0.104)	0.982*** (0.138)
Observations	53,140	53,140	17,618	17,618
R-squared	0.131	0.101	0.121	0.084

Significance: *p < .10; **p < .05; ***p < .01

Notes: Standard errors in parentheses. The OLS regressions also control for age, gender, matrimonial status, number of children and grand-children, whether the respondent had no brothers or no sisters, health status, country of residence, the neighbourhood density variables (household, building and city sizes, presented separately in Figure 28.1) and tenure status (presented separately in Figure 28.2). Columns (3–4) focus only on the longitudinal sample.

Source: SHARE Wave 4 release 1

28.4 Being a tenant decreases the size of the social network, except in social housing

Globally home-owners or rent-free occupants have a larger social network than tenants (Table 28.1). More precisely, occupying a dwelling rent-free increases the number of family members in the network; it is a sign of close family relationships as such living arrangements are likely to be provided by the children. However, tenants whose rent is below the market level have a larger social network than other tenants (Figure 28.2). Rent level is linked to the length of dwelling tenure for several reasons (e. g. rent regulation, landlord/tenant relationship). In many countries, new tenants pay higher rents than current tenants. The extent of this difference is determined by the length of time that the current tenant has resided in her dwelling. Having a below-market rent might also mean being less mobile as well as living in subsidised social or public housing.

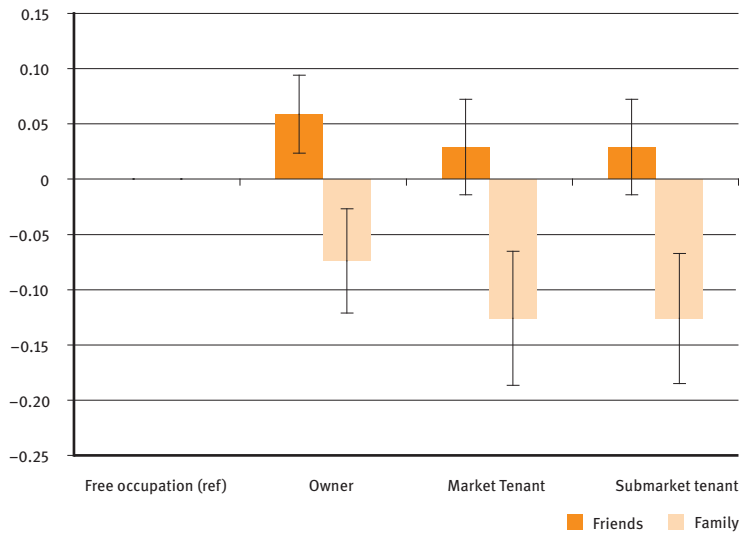


Figure 28.2: Effect of home tenure on the number of friends and family members in the social network

Notes: Wave 4 respondents (n=53,140). Effects are extracted from the models in Table 28.2 (col. (1) and (2)) and controlled for all the variables in these models. Vertical brackets indicate 95 per cent confidence intervals.

Source: SHARE Wave 4 release 1

The explanation for all this, in terms of social ties, is twofold. First, unobserved characteristics associated with lower rent may also be responsible for having a larger social network after controlling for length of tenure and recent mobility. Alternatively, the rent rebate provided by social housing may be seen as an increase in permanent income, and is to be interpreted in line with the positive economic endowment effect on social network size. Similarly, the effect of home ownership on the social network might be reduced once imputed rent is taken into account. We should keep in mind that a minority of our non nursing home respondents are tenants (16%), but a third of them claim to benefit from an under market rent, akin to social housing or rent control. Two other variables linked to housing conditions confirm the Matthew effect: owning a second home and having more rooms per person both increase the size of the network. Other wealth variables behave in the same direction as well: wealthier respondents have a larger social network (not shown).

28.5 Are moves made in order to increase the family ties?

To estimate the effect of residential mobility on social network size we introduced a measure for the length of tenure, the number of years the respondent had lived in the home. As length of tenure might capture country specificities in the housing market, we also defined quintiles of the same variable *at the country level*, with a “quintile zero” for those who moved recently (mobility within the last two years). We found out that mobility had not much effect on the overall size of the social network (Table 28.1, column three).

Separating the network of family members from the network of friends, we find that both extreme immobility and to a lesser extend recent mobility decrease the number of friends while both rather increase that of family confidants (Figure 28.3). The decrease in friends for those who are immobile might stem from the friends’ mobility. That is, one must follow one’s friends not to lose them.

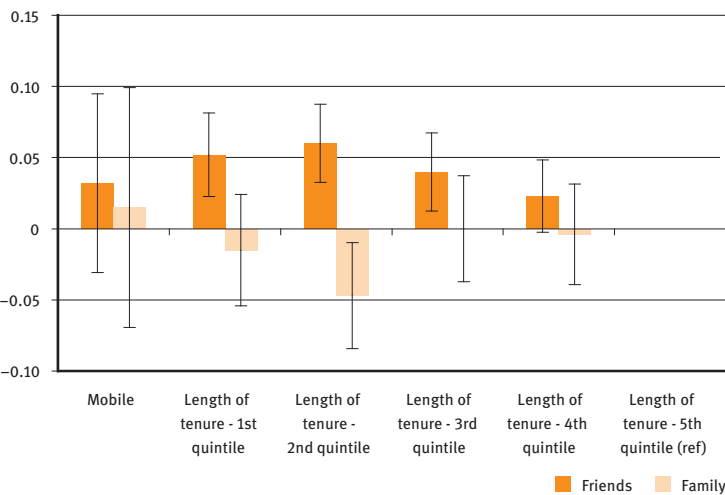


Figure 28.3: Effect of length of tenure and residential mobility on the number of friends and family members in the social network

Notes: Wave 4 respondents (n=53,140). Effects are controlled for all the variables of Table 28.2 (except length of tenure). Length of tenure is divided in quintiles at the country level. Those who moved in the last two years are excluded from the 1st quintile; they make up the “mobile” category. Vertical brackets indicate 95 per cent confidence intervals.

Source: SHARE Wave 4 release 1

To get more insight into the effect of residential mobility on the size of family network we concentrated on the sub-sample of those who have at least one child and who answered the question on the location of their children. For them, recent mobility significantly increases the number of family members in the network (not shown). One possible explanation might be that the move was made in order to get closer to a child. The data do not allow us to easily check this point, because it might be the child who has moved close to the parent. However if we add distance to the nearest child in the regression we find that the optimal distance, in terms of size of family network is close (less than 5 kilometres) but not too close (not co-residing or living in the same building) (Figure 28.4).

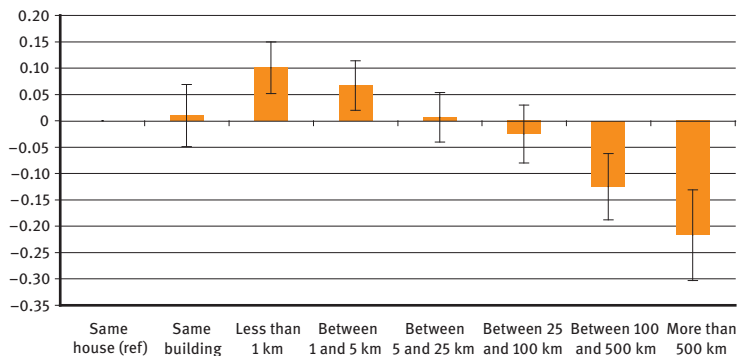


Figure 28.4: Effect of distance to closest child on the size of the family network of a parent
 Notes: Wave 4 respondents with at least one child and for whom the distance to the nearest child is not missing (n=43,145). Effects are controlled for all the variables of Table 28.2. Vertical brackets indicate 95 per cent confidence intervals.
 Source: SHARE Wave 4 release 1

Bonnet et al. (2010) found that mobile French widows were likely to get closer to their family. The SHARE data add further evidence: the move does increase the family network and, presumably, the mover's well-being, all else considered. On the whole, we find no sign that immobility helps to build friendship ties, but rather the contrary. Evidence is more mixed for family ties: residential immobility helps to build up family ties, but recent mobility also increases the size of the family network among those who have children.

28.6 A materialistic approach to friendship?

The positive correlation between income and wealth and the size of the social network confirms the so-called Matthew effect of the Gospel. People do not seem to compensate for low resources by having more friends. On the contrary, being educated and not income- or asset-deprived contributes to friendship and, even more, to family ties. The Gospel hints at the dynamic of reinforcement: an open and outgoing person is more likely to have friends, get married and have children, and to be rewarded as a good employee. Part of this might be either a valuation neglect effect (I am less likely to mention a confidant if I am poor), or a “verbal” bias. However, the bias seems small. It could mean that the economic crisis will have a negative effect on friendship ties.

This being acknowledged, the housing environment has an effect, *ceteris paribus*. We find that cities are not anonymous places where older people are lost or lonely, but that living in a flat and even in a high-rise building favours sociability. So does living in a row house rather than a free standing house. Our results should be taken with caution, however, as most of the members of the social network are family. The correlation might stem from a higher probability of having a family member nearby when living in a city (even controlling for number of children, grandchildren, presence of siblings, spouse, and household size), and not from the effect of the “big city” *per se*. When we separate family from non-family members of the social network, the density effect is found to be clearer and more important in relation to friends. In addition, crime-ridden neighbourhoods diminish social network size among women. Hence improving security has both a direct and an indirect positive effect on the welfare of women.

We also find some signs that residential mobility is beneficial for the number of family members in a parent’s social network, and that immobility might decrease ties with friends. Tenants have a smaller social network than those who own or are in a rent-free dwelling; however it is not the case for those who benefit from submarket rents. The latter do not differ from home owners in this respect.

As we mentioned in an earlier work (Angelini & Laferrère 2008) a majority of those aged 50 or more live in houses (65%), many live in rural areas (35%), and their mobility rate is low. This may challenge their well-being, not only because houses are more difficult and expensive to maintain, less adapted to physical disabilities, and further away from potential care providers, but because they also reduce the size of the social network.

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29 Early retirement, mental health and social networks

-
- ▶ Early retirement enables more leisure and relieves stressful job conditions
 - ▶ But early retirement also accelerates cognitive decline
 - ▶ This decline is related to fewer social contacts, especially with friends
 - ▶ Social contacts are a side effect of employment that keeps workers mentally agile
-

29.1 Pleasant and unpleasant consequences of early retirement

This paper explores the inter-relationships between early retirement, mental health – including cognition and subjective well-being – and the size and composition of social networks among older people. We argue that early retirement has side effects on the retirees' social networks. These side effects appear to explain part of the accelerated cognitive ageing that occurs after early retirement.

Early retirement is popular in Europe. It is seen as a much appreciated social achievement which increases personal well-being, particularly among employees who suffer from work-related health problems. First introduced in the 1970s and 1980s, generous early retirement provisions in most European countries were instituted with few actuarial adjustments, if any (Gruber & Wise 1999). But times have changed since then. In response to the growth of the older segment of the population and to the precarious financial state of the public pension system, the costs of early retirement have come under increased scrutiny. This has led to a string of pension reforms in Europe, since the 1990s, reducing pay-as-you-go pension benefits and introducing multi-pillar pension systems with supplemental occupational and individual pensions, in addition to the traditional unfunded retirement insurance (Börsch-Supan 2012).

Despite the enormous increase in life expectancy all over Europe, policymakers are still largely unwilling to challenge the widely popular early and normal retirement ages. Politically speaking, reducing the generosity of early retirement is often seen as “touching the third rail,” with a fatal shock delivered at the next election. A case in point is France, where a timid increase in the retirement age, from 60 to 62 years, was partially reverted after the most recent presidential elections.

While many studies have addressed the macro connotations of early retirement, particularly its large costs, another body of literature has looked at the individual implications of early retirement. An immediate benefit from early retirement is the receipt of income support without the necessity to continue working, enabling individuals to enjoy more leisure. Moreover, early retirement relieves workers who feel constrained in their place of work, whether due to stressful job conditions or to work-impeding health problems. For such individuals, early retirement should manifest itself in an improvement of well-being and, potentially, also health. On the other hand, early retirement might also be harmful, because individuals who stop working may lose a purpose in life. This might, in turn, decrease subjective well-being and mental health.

Research on these issues is complicated by the fact that the measures of well-being and health which are commonly available in general purpose surveys may suffer from justification bias (Bound 1991). That is, early retirees may report worse health in order to justify their early exit from the workforce. Moreover, early retirement is not an exogenous outcome, but is likely to be related to ill health and lower cognitive abilities. For example, persons in bad health are likely to retire earlier but also to report worse life satisfaction. Finally, those that hope or believe that life satisfaction will increase after retirement are more likely to retire at any age. We thus face the usual task of disentangling cause and effect.

The separation of selection effects and reverse causality from the genuine impacts of early retirement on well-being and health requires advanced econometric techniques which sometimes make results controversial. The econometric problem is to find a counterfactual value for well-being and health had a person not taken early retirement. The usual instruments for identifying such a counterfactual are policy changes in early retirement rules, such as changes in the pensionable age or changes in the actuarial adjustments. SHARE is useful, in this respect, as it gives institutional variation across countries to provide the necessary counterfactual. Moreover, since SHARE is a panel, the data also include conditioning variables describing health and well-being in earlier stages of life.

Börsch-Supan and Jürges (2006), using the German Socio-Economic Panel data, found that individuals were less happy in the year of early retirement than in the years before and after retirement. Moreover, individuals generally attained their pre-retirement satisfaction levels relatively soon after retirement. Hence, the early retirement effect on well-being appears to be negative and short-lived rather than positive and long-lasting, similar to what occurs in the set point model of happiness by Clark et al. (2003). Charles (2002) studied the effect of retirement on depression and Lindeboom et al. (2002) studied the effect of retirement and other factors (a significant decrease in income, death of the spouse, disability and a move to a nursing home) on the mental health of individuals, using data from the Longitudinal Aging Study Amsterdam (LASA).

A seminal paper by Adam et al. (2007) based on SHARE found that cognition – measured mainly by memory abilities such as delayed word recall – declined during retirement. This controversial finding has sparked an entire literature. While there are a few papers with the opposite result (Coe et al. 2012), most studies confirm the early findings (Bonsang et al. 2010, Rohwedder & Willis 2010, Mazzonna & Peracchi 2012) and show that the negative effect on cognition increases with the time in retirement. For a given age, early retirees suffer more from cognitive decline than later retirees, even after correcting for selection and reverse causality effects.

Why does retirement affect cognition and is cognitive decline a reason for declining health and well-being? These are the questions underlying the research in this paper. Its central hypothesis is derived from the anchoring function of employment. Work, even if unpleasant and arduous, provides social contacts. Even disliked colleagues and a bad boss, it may be assumed, are better than social isolation because they provide cognitive challenges which keep the mind active and healthy.

The current analysis takes advantage of a major innovation in SHARE Wave 4, the social network data based on a name generator which identifies those persons with whom the respondents “discuss things that are important to them,” e.g. “good or bad things that happen to you, problems you are having, or important concerns you may have”. In the first step, we find significant correlations among early retirement, mental health and social networks, which give first evidence for our line of reasoning (29.2). This explanation is confirmed and strengthened in the second step when we control for other possible determinants (29.3). Chapter 29.4 concludes the presentation.

29.2 The triangle of early retirement, mental health and social networks

Figure 29.1 depicts the correlations in the triangle of early retirement, mental health and social networks. Each domain is characterised by a set of variables. Individuals are categorised as retired either when they self-report as “retired” or when they receive an old-age pension. We measure the time elapsed since the earlier of the two events has taken place. This variable is of particular interest since it best describes the “dose” of retirement exposure which may have triggered a “response” in terms of social networks and mental health, using the parlance of epidemiology. For both status and time elapsed, we distinguish three retirement pathways: normal retirement at or after the pensionable age as defined by the OECD (2011) (“NORMret” and “NORMtime”), retirement due to receipt of disability insurance (DI) benefits at an age before this pensionable age (“DIret” and “DItime”) and early retirement for all

other labour force exits before the pensionable age that are not related to receiving disability benefits (“EARLYret” and “EARLYtime”).

Mental health is measured by five variables: the number of words recalled from a list of ten – both immediately (“ImmRecall”) and delayed (after about 30 minutes) (“DelRecall”) – and a composite indicator of numeracy (“Numeracy”). We add a 12- item composite scale (CASP-12) designed to measure the quality of life in (early) old age, adapted by SHARE from the original 19-item scale (Hyde et al. 2003) and a depression scale targeted at mild or severe depression symptoms – the EURO-D (Prince et al. 1999).

Finally, social networks, the key domain in this paper, are characterised by their size (number of individuals mentioned as close confidants) and their composition, focusing on non-family members including friends and colleagues. More precisely, the variable “Size” counts all members of the social network, “Colleagues” the number of colleagues in the network, “Friends” the number of friends, “FrndsCollgs” their combination, “Helpers” the number of formal helpers and “NonFam” the number of non-family members mentioned in the name generator without including formal helpers.

Figure 29.1 reports the correlations among these variables, based on our working sample which includes all individuals who have retired by Wave 4 and are below age 80. Asterisks mark statistically significant relationships between the variables (at 1 %).

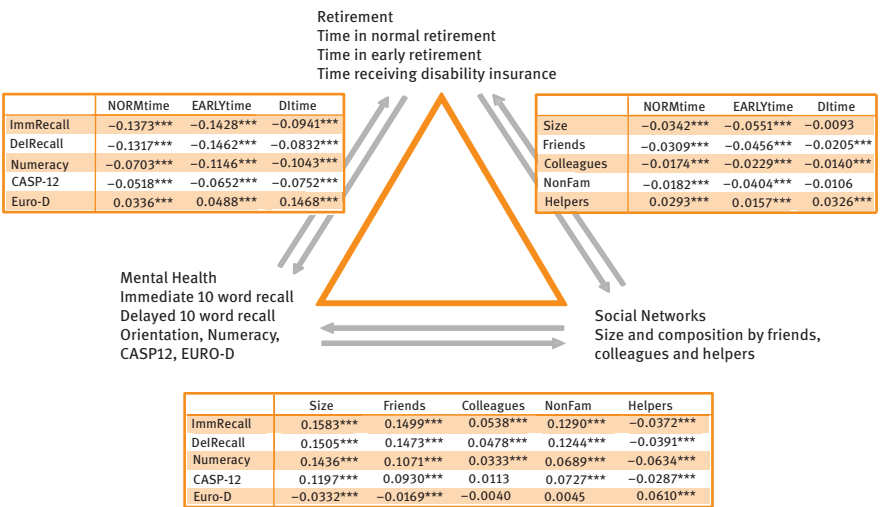


Figure 29.1: Correlations in the triangle of early retirement, mental health and social networks (sample size varies across variables)

Significance: ***=1%

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1

The correlations in Figure 29.1 show that the time since retirement is significantly related to all mental health variables: it affects cognition and well-being negatively and increases the measure of depressive symptoms. Moreover, the time elapsed after an early retirement has stronger associations with worsening mental health than the time elapsed since normal retirement although individuals retiring early are almost always younger than those retiring at the pensionable age. Time elapsed since retirement is also correlated with smaller social networks, both overall and concerning colleagues, friends and other non-family members. Again, this time effect is stronger for early retirees than normal retirees. Correlations with the number of formal helpers have, as expected, exactly the opposite pattern. Finally, the association between social networks and mental health is highly significant. Larger social networks are strongly associated with better cognitive abilities, higher subjective well-being (CASP-12) and less depression (EURO-D).

29.3 Controlling for other determinants

The correlations depicted may have many reasons. An underlying common cause could be physical health. Individuals with worse physical health tend to retire earlier. They may have mobility problems and therefore less ability to maintain their social network. Suffering from bad physical health is likely to reduce well-being and increase depression, and to reduce mental health and cognition either directly (biologically) or indirectly (psychologically).

Demographic variables such as age, gender and marital status also affect all three variables. Retirement rules are age and gender specific in all SHARE countries; age, gender and marital status are significant factors influencing morbidity; and they are associated with the size and closeness of social networks. Also education is likely to modify all the observed associations.

Given all the above, the following regression analyses control for these background variables. Health is characterised by functional abilities (basic activities of daily living, denoted by “adl”, and the global activity limitation indicator developed by van Oyen et al. 2006, denoted by “gali”), the presence of one or more chronic illnesses (“longill”), and the objective measure of grip strength (“maxgrip”) measured in kilogram. We do not correct for subjective health (“How do you rate your health”) as this is highly correlated with well-being once objective health is controlled for.

Table 29.1: The influence of retirement on cognition

	Immediate Recall	Delayed Recall	Numeracy	CASP-12	EURO-D
Early retirement (dummy)	0.041 (-0.032)	0.100** (-0.040)	0.068*** (-0.026)	0.152* (-0.082)	-0.095** (-0.040)
Years since early retirement	-0.012*** (-0.002)	-0.019*** (-0.003)	-0.010*** (-0.002)	-0.026*** (-0.005)	0.013*** (-0.003)
Disability retirement (dummy)	-0.098** (-0.045)	0.075 (-0.057)	-0.027 (-0.040)	-0.510*** (-0.124)	0.437*** (-0.062)
Years since disability retirement	0.009*** (-0.003)	-0.018*** (-0.003)	0.010*** (-0.002)	-0.003 (-0.008)	0.005 (-0.004)
Female (dummy)	0.756*** (-0.029)	0.866*** (-0.035)	0.143*** (-0.024)	0.820*** (-0.077)	0.178*** (-0.038)
Age (years)	-0.037*** (-0.002)	-0.040*** (-0.003)	0.002 (-0.002)	-0.025*** (-0.005)	-0.017*** (-0.003)
Couple (couple)	0.110*** (-0.023)	0.049* (-0.028)	0.092*** (-0.019)	0.786*** (-0.060)	-0.227*** (-0.031)
Years of education	0.098*** (-0.002)	0.113*** (-0.003)	0.059*** (-0.002)	0.082*** (-0.006)	-0.038*** (-0.003)
Grip strength	0.023*** (-0.001)	0.026*** (-0.002)	0.019*** (-0.001)	0.033*** (-0.004)	-0.033*** (-0.002)
Longterm illness (dummy)	-0.070*** (-0.023)	-0.136*** (-0.029)	-0.107*** (-0.019)	-0.462*** (-0.06)	0.528*** (-0.029)
ADL (0–6)	-0.163*** (-0.018)	-0.176*** (-0.019)	-0.100*** (-0.013)	-0.427*** (-0.048)	0.540*** (-0.026)
GALI (dummy)	-0.127*** (-0.023)	-0.179*** (-0.029)	-0.038** (-0.019)	0.097 (-0.061)	0.600*** (-0.030)
Constant	5.649*** (-0.174)	4.247*** (-0.215)	2.342*** (-0.141)	20.300*** (-0.456)	4.389*** (-0.232)
Observations	25,591	25,598	15,988	25,666	25,463
Adjusted R ²	0.16	0.14	0.13	0.05	0.20

Significance: *** = 1%; ** = 5%; * = 10%, respectively

Notes: Robust standard errors in parentheses

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1

Table 29.1 reproduces the findings quoted in the introduction to this chapter that retirement affects cognition, even when holding other potential determinants constant. Noteworthy is the difference that emerges between retirement status and the time elapsed since retirement. Cognition is mainly affected by the time

elapsed, while well-being and depression differs by the type of retirement. For those who receive disability benefits it is this fact which carries the effect, while in early retirement, the effect depends on the time elapsed. While we are aware that such a regression may possibly reflect reverse causality, the literature cited in the introduction contains fairly convincing arguments that this relationship is actually causal. Table 29.2 shows that part of the explanation may be social networks.

Table 29.2: The influence of retirement and social networks on cognition

	Immediate Recall	Delayed Recall	Numeracy	CASP-12	EURO-D
Early retirement (dummy)	0.032 (-0.032)	0.090** (-0.041)	0.062** (-0.027)	0.106 (-0.083)	-0.110*** (-0.041)
Years since early retirement	-0.011*** (-0.002)	-0.018*** (-0.003)	-0.009*** (-0.002)	-0.022*** (-0.005)	0.014*** (-0.003)
Disability retirement (dummy)	-0.0908** (-0.046)	0.0853 (-0.058)	-0.0364 (-0.040)	-0.531*** (-0.125)	0.405*** (-0.063)
Years since disability retirement	-0.009*** (-0.003)	-0.018*** (-0.003)	-0.008*** (-0.002)	-0.001 (-0.008)	0.006 (-0.004)
No. of persons in social network	0.063*** (-0.008)	0.085*** (-0.009)	0.044*** (-0.006)	0.184*** (-0.019)	-0.038*** (-0.009)
No. of colleagues in social network	0.065 (-0.041)	0.048 (-0.054)	-0.052 (-0.033)	-0.072 (-0.106)	0.090* (-0.050)
No. of friends in social network	0.100*** (-0.012)	0.127*** (-0.016)	0.039*** (-0.011)	0.224*** (-0.031)	0.050*** (-0.016)
No. of formal helpers in social network	-0.066*** (-0.025)	-0.107*** (-0.033)	-0.124*** (-0.021)	-0.175** (-0.068)	0.159*** (-0.035)
Female (dummy)	0.696*** (-0.029)	0.793*** (-0.036)	0.114*** (-0.024)	0.685*** (-0.078)	0.199*** (-0.039)
Age (years)	-0.037*** (-0.002)	-0.040*** (-0.003)	-0.002 (-0.002)	-0.025*** (-0.005)	-0.018*** (-0.003)
Couple (couple)	0.123*** (-0.024)	0.056* (-0.030)	0.078*** (-0.020)	0.757*** (-0.061)	-0.174*** (-0.032)
Years of education	0.093*** (-0.002)	0.108*** (-0.003)	0.057*** (-0.002)	0.073*** (-0.006)	-0.038*** (-0.003)
Grip strength	0.0222*** (-0.001)	0.0244*** (-0.002)	0.0185*** (-0.001)	0.0316*** (-0.004)	-0.0324*** (-0.002)
Longterm illness (dummy)	-0.080*** (-0.023)	-0.158*** (-0.029)	-0.116*** (-0.019)	-0.489*** (-0.06)	0.523*** (-0.029)

	Immediate Recall	Delayed Recall	Numeracy	CASP-12	EURO-D
ADL (0–6)	–0.161*** (–0.018)	–0.178*** (–0.02)	–0.097*** (–0.013)	–0.407*** (–0.049)	0.535*** (–0.027)
GALI (dummy)	–0.121*** (–0.024)	–0.171*** (–0.029)	–0.034* (–0.019)	0.112* (–0.061)	0.599*** (–0.030)
Constant	5.548*** (–0.177)	4.132*** (–0.218)	2.280*** (–0.143)	19.990*** (–0.460)	4.397*** (–0.237)
Observations	24,753	24,759	15,456	24,824	24,638
Adjusted R ²	0.17	0.15	0.14	0.05	0.20

Significance: *** = 1%; ** = 5%; * = 10%, respectively

Notes: Robust standard errors in parentheses

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1

Adding the social network variables to the earlier regression increases the fit of the regression and reduces the coefficients of the early retirement variables. The social network variables have significant effects on cognition: network size in general and the number of friends in particular significantly increase cognition, while the number of helpers is associated with lower cognition. The latter effect is most likely one of reverse causation.

Indeed, as Table 29.3 shows, early retirement has a direct effect on the total size of the social network, and also on the number of friends, colleagues and other non-family members in the social network.

Table 29.3: The influence of retirement on social networks

	Number of social network persons				Total without family members and formal helpers
	Total	Colleagues	Friends	Friends and colleagues	
Early retirement (dummy)	0.103*** (–0.033)	0.017*** (–0.005)	0.015 (–0.019)	0.032 (–0.019)	0.020 (–0.021)
Years since early retirement	–0.014*** (–0.002)	–0.001*** (0.000)	–0.005*** (–0.001)	–0.006*** (–0.001)	–0.006*** (–0.001)
Disability retirement (dummy)	0.070 (–0.046)	–0.013* (–0.007)	0.043* (–0.025)	0.030 (–0.026)	0.041 (–0.029)

Years since disability retirement	-0.005*	0.000	-0.005***	-0.004***	-0.004**
	(-0.003)	(0.000)	(-0.002)	(-0.002)	(-0.002)
Female (dummy)	0.482***	0.003	0.136***	0.139***	0.135***
	(-0.028)	(-0.004)	(-0.016)	(-0.016)	(-0.018)
Age (years)	0.002	-0.001*	-0.003***	-0.004***	-0.003**
	(-0.002)	(0.000)	(-0.001)	(-0.001)	(-0.001)
Couple (couple)	0.181***	-0.020***	-0.284***	-0.304***	-0.429***
	(-0.023)	(-0.004)	(-0.014)	(-0.014)	(-0.016)
Years of education	0.025***	0.004***	0.022***	0.025***	0.024***
	(-0.002)	(0.000)	(-0.001)	(-0.001)	(-0.002)
Grip strength	0.003**	0.000	0.000	0.000	0.000
	(-0.001)	(0.000)	(-0.001)	(-0.001)	(-0.001)
Longterm illness (dummy)	0.129***	0.015***	-0.002	0.013	0.008
	(-0.023)	(-0.004)	(-0.013)	(-0.013)	(-0.015)
ADL (0-6)	-0.007	0.001	-0.010	-0.009	0.000
	(-0.015)	(-0.002)	(-0.008)	(-0.008)	(-0.009)
GALI (dummy)	-0.054**	-0.006*	-0.056***	-0.062***	-0.049***
	(-0.023)	(-0.004)	(-0.013)	(-0.014)	(-0.015)
Constant	1.574***	0.042*	0.636***	0.678***	0.852***
	(-0.172)	(-0.025)	(-0.095)	(-0.098)	(-0.109)
Observations	25,715	25,715	25,715	25,715	24,852
Adjusted R ²	0.03	0.01	0.04	0.05	0.06

Significance: *** = 1%; ** = 5%; * = 10%, respectively

Notes: Robust standard errors in parentheses

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1

Of note in Table 29.3 is the weak influence of retirement due to the receipt of disability insurance. Disability actually is a reason for more formal help, increasing rather than decreasing network size. This is shown in Table 29.4 which relates the number of formal helpers and other non-family network members to disability retirement. Note that disability status, health and time since receiving disability benefits are highly collinear.

Table 29.4: The influence of disability retirement on the number of formal helpers in the social network

	No. of formal helpers and other non-family members ¹ in the social network					
	(1)	(2)	(3)	(4)	(5)	(6)
Disability retirement (dummy)	0.042*** (0.007)	0.044*** (0.007)	0.032*** (0.008)	0.036*** (0.013)	0.032*** (0.008)	0.032** (0.013)
Years since disability retirement				0.000 (0.001)		0.001 (0.001)
+ Demographics	no	yes	yes	yes	yes	yes
+ Health	no	no	yes	yes	yes	yes
+ Country/time FE	no	no	no	no	yes	yes
Observations	26,977	26,574	24,852	24,852	24,681	24,681
Adjusted R ²	0.002	0.015	0.017	0.017	0.026	0.026

Significance: *** = 1%; ** = 5%; * = 10%, respectively

Notes: Robust standard errors in parentheses; ¹Other non-family members without including colleagues, friends and ex-spouses/ partners. Variables controlling for demographics, health, education, time and country included but not shown.

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 3 release 1, Wave 4 release 1

Finally, we tested the robustness of these results against unobserved effects in specific countries at specific times. First, we found large differences in all three domains across the SHARE countries. The Northern countries are healthier, while the social networks in the Southern countries are larger. We note, furthermore, that retirement rules are very different across countries. These differences may reflect cultural and historical differences common to the three domains and might thus cause the significant correlations in Tables 29.1 through 29.4 without a genuine relationship actually at work. Similarly, calendar time effects may have created spurious correlations, especially since the field work in Wave 4 stretched over almost 1.5 years, a time with violent ups and downs due to the financial, economic and debt crises. Moreover, time effects may also reflect interviewer effects since different interviewers were in the field at different times of the survey. We therefore re-estimated all the above regressions with country and time fixed effects. Even then, the results change only very little.

29.4 Early retirement reduces the size of the social network and the cognitive stimulation through them

Is early retirement bliss? Evidence from earlier studies has placed this assumption in doubt. Early retirement may actually be a mixed blessing because cognition declines. Moreover, the effect of early retirement on subjective well-being seems to be negative and short-lived rather than long lasting and positive. This paper has explored one mechanism that may explain why early retirement contains negative effects: the erosion of social networks after retirement. Social isolation, in turn, diminishes the day-to-day challenges that keep people mentally fit and well because, ultimately, human beings are social entities. We find evidence that retirement in general, and early retirement in particular, reduces the size of the social network, and in particular the number of friends and other non-family contacts in the interpersonal milieu (and not only the number of immediate colleagues).

While it appears far-fetched that the size of the social network precipitates the decision to retire early, we have only limited possibilities to econometrically establish that the negative influence of early retirement on the size of social networks is indeed causal. SHARE provides some helpful exogenous variation through cross-national differences in pension policies. The pensionable age provided by the OECD (2011), however, has very little variation in order to serve as an instrument for the decision to retire early. SHARE also contains some indicators of social isolation in earlier waves, but since the sample size of the prototypical earlier waves was much smaller and we require transitions into retirement for identification, this strategy fails due to too few observations. A desirable future research strategy, therefore, is to observe social networks over time. SHARE will include the extensive social network measures again in Wave 6.

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30 Confidant networks and loneliness

-
- ▶ Loneliness exists in all of the SHARE Wave 4 countries
 - ▶ Older people who have no confidants are also the loneliest
 - ▶ Having a spouse as a confidant is the most influential factor against loneliness
-

30.1 The phenomenon of loneliness

Reports on feelings of loneliness have been found across different countries and societies. In that sense, loneliness can be considered a universal phenomenon (Perlman 2004). However, the prevalence of loneliness varies across countries, and even in countries on the same continent. For instance, a contemporary study that addressed the prevalence of loneliness across Europe using SHARE Wave 1 data revealed that the prevalence of loneliness among older adults aged 65 and over ranged from only 25 percent in Denmark to more than 60 percent in Greece (Sundström et al. 2009). A similar trend was found among people aged 50 and over in a more recent study that used data from SHARE Wave 2 (2006–2007) (Fokkema et al. 2012). The findings from both studies revealed that loneliness is more prevalent in Southern countries, which have a familistic orientation, than in Northern countries, where people are more individualistic. This counter-intuitive trend is consistent with the results of other studies, and is often attributed to the different social expectations that prevail in different social contexts. That is, in more familistic, collectivist societies there are higher expectations of connectedness that can often lead to feelings of loneliness, in light of the social losses experienced more frequently in old age (Johnson & Mullins 1987).

The growing interest in loneliness among researchers, practitioners, and policy makers derives not only from its prevalence but also from consistent evidence of the negative consequences that accompany loneliness. There is an abundance of findings attesting to the deleterious emotional and physical consequences of loneliness, which include depressive symptomatology (Van der Weele et al. 2011), sedentary life style in old age (Netz et al. 2012) and increased odds for all-cause mortality (Shiovitz-Ezra & Ayalon 2010).

Loneliness is defined as a sense of distress caused by perceived dissatisfaction with one's social relationships. The sense of subjective dissatisfaction derives from a gap between desired social relationships and the relationships

that one actually has (Peplau & Perlman 1982). According to the deficit model (Perlman & Peplau 1998), feelings of loneliness are experienced when one's social needs are not met. The perceived social deficits can be in terms of quantity (e. g., a limited number of social members and infrequent social contacts) and especially in terms of quality. It has been argued that qualitative assessments of social relationships are more closely linked to well-being outcomes such as loneliness than are objective aspects such as the nature of one's social environment (Cutrona 1982). De Jong Gierveld (1987) proposed a theoretical model of loneliness which underscores the importance of the qualitative aspect of social networks. The model encompasses two sets of characteristics as potential determinants of loneliness. The first includes objective characteristics of the social network, such as its size; and the second relates to subjective evaluations of the social network, which include the perceived availability of support and satisfaction with social contacts.

Several empirical studies, as well as Pinquart and Sorensen's meta-analysis (2001), have supported the argument that subjective assessments play a more important role in determining loneliness than do objective characteristics. In one study, which was conducted among a representative sample of older Americans aged 57–85, the quality of social relationships was measured on the basis of perceived support and strain from family members and friends. These variables explained a significantly higher amount of the variance in loneliness of married and unmarried respondents than did the objective social network indicators (Shiovitz-Ezra & Leitsch 2010). Moreover, married persons were protected against loneliness only when the spouse was defined as a confidant (Hawkey et al. 2008). Similarly, both negative and positive markers of marital quality were found to be closely associated with loneliness (de Jong Gierveld et al. 2009).

However, the above-mentioned studies showed that the importance of subjective assessments of social relationships is limited by the number and variety of subjective indicators that exist. Most studies have employed between 2 to 6 indicators relating to limited aspects of social network quality. SHARE Wave 4 used the name generator method, which enables in-depth empirical examination of confidant network characteristics and their associations with loneliness. As in the National Social Life, Health and Aging Project (NSHAP), SHARE Wave 4 participants were asked to name people with whom they discussed important matters. This screening question was followed by a series of questions that included detailed information on the confidant network members listed in the name generator. These included questions about the participant's relationship with the confidant member (e. g., spouse, child, grandchild, friend, etc.); how close the participant feels to the confidant; and how close the confidant lives to the participant. Therefore, the name generator produced a broad spectrum of qualitative measures.

The current study was based on the new SHARE 4 data. Based upon previous findings, it was hypothesised that older adults who reported having no confidant network would experience greater loneliness. Furthermore, the study evaluated the relative importance of different qualitative measures among older adults with confidant networks.

30.2 Studying loneliness

The study employed data collected in SHARE Wave 4 (2010) among older people aged 50 and over in 15 countries ($N = 50,552$). This allowed us to assess loneliness in a large number of European countries, and provided a basis for expanding current knowledge about the phenomenon. Although Estonia participated in the SHARE Wave 4 countries, its drop-off data were not available in Release 1. Insofar as the loneliness measures were asked in the drop-off questionnaire, Estonian respondents were not included as part of the present analysis.

30.3 The measures employed in this study

Loneliness. Loneliness was measured through the short form of the well-known R-UCLA loneliness scale. Participants were asked how much of the time they felt a sense of being left out, a lack of companionship, and isolation on a 3-point scale ranging from 1 (*hardly ever*) to 3 (*often*). The three items were summed up to create a scale ranging from 3–9. Higher scores represented a greater extent of loneliness. In the SHARE Wave 4 sample, the internal reliability of the loneliness scale was found to be sufficient ($\alpha = .78$).

Confidant network indicators. In the current study, several variables were derived to measure confidant networks: *confidant network size* (based on counting the names of the social network members listed in the roster); *the composition of the social network* (using six categorical variables to represent different network members: spouse, children, grandchildren, parents, siblings, and friends); *global satisfaction with the social network*; *average proximity and frequency of contact* with social network members, and *average emotional closeness* with social network members.

Demographic variables. Age (>50), gender (men/women), and country were control variables.

30.4 The means of analysis in the present study

The loneliness mean was calculated across SHARE countries. ANOVAs were used to examine country differences. Among participants who reported having a confidant network, bivariate associations between network measures and loneliness were analysed using unadjusted linear regressions. In the adjusted model, all confidant network measures were included, with age, gender, and country as controls. In the unadjusted and adjusted models, the reference categories for the social network composition measures were the participants without a given type of relationship. For example, “no children” served as the reference category for “children” in the confidant social network. In the case of parents and friends in the network, the reference categories were no confidant parents and friends, because the question of “having parents who are alive” was not asked of all respondents and “having friends” was not asked at all. The statistical program STATA 10 was used for the analysis.

30.5 How prevalent is loneliness in Europe and what explains it?

Table 30.1 presents the mean for loneliness among the overall SHARE Wave 4 sample of persons aged 50+, and across the 15 European countries that participated in SHARE Wave 4 and had loneliness data. The overall mean for loneliness was relatively low ($M = 3.73$, $St.D = 1.26$), although the loneliness scores varied across countries. The three nations at the top of the table – the Czech Republic, Hungary, and Italy – showed the highest mean scores for loneliness. Conversely, the lowest mean scores for loneliness were found in Switzerland, Austria, and Denmark. Scheffe post-hoc tests revealed that the differences between the top and bottom countries were significant.

Bivariate associations between confidant network measures and loneliness are presented in Table 30.2. First, the association of having a confidant network (as opposed to not having a confidant network) with feelings of loneliness was examined (not shown). People aged 50 and over without a confidant network were significantly more lonely ($M = 4.01$; $SE = .04$, 95% $CI = 3.97, 4.13$) than their counterparts with a confidant network of any size ($M = 3.42$; $SE = .00$, 95% $CI = 3.41, 3.43$). In the next stage, associations between confidant network characteristics and loneliness were examined among people who reported having one or more confidants. Regarding the composition of the confidant network, both positive and negative associations with loneliness were found. Compared to

Table 30.1: Mean of loneliness across European countries

Country	N	Mean	St.D
1. CZ	4,126	4.11	1.29
2. HU	2,759	4.08	1.54
3. IT	3,123	4.07	1.55
4. BE	3,689	3.97	1.39
5. PL	1,441	3.85	1.40
6. FR	4,609	3.84	1.39
7. SE	1,652	3.67	1.09
8. PT	1,292	3.66	1.31
9. SI	2,570	3.59	1.06
10. ES	3,263	3.54	1.18
11. DE	1,329	3.52	1.00
12. NL	2,402	3.50	.99
13. DK	1,874	3.45	.95
14. AT	4,343	3.45	.98
15. CH	3,533	3.38	.91
Overall 50+sample	42,005	3.73	1.26

Notes: Excluding respondents aged <50 and respondents with no loneliness data. The loneliness scale range is 3–9, higher score presents greater loneliness.

Source: SHARE Wave 4 release 1

people with no children, having a confidant child was negatively associated with loneliness. Nonetheless, having no children in the confidant network was still negatively associated with loneliness. This trend repeated itself with regard to siblings and spouses. However, the strongest negative association with loneliness ($\beta = -.65, p < .001$) was found among those with a confidant spouse. In other words, people with a confidant spouse felt least lonely. Similarly, people with a confidant friend, were less lonely than people with no confidant friends. Surprisingly, people without grandchildren felt less lonely than people with grandchildren regardless of whether or not the grandchild was mentioned in the confidant network.

Other confidant network characteristics were found to be variously associated with loneliness. Network size, emotional closeness and satisfaction with the network were negatively associated with loneliness. That is, the greater the number of confidants, the closer they were emotionally and the greater the satisfaction with them, the less the sense of loneliness was. However, more frequent contact and greater physical proximity to one's confidants were both positively associated with loneliness.

Table 30.2: Confidant social network characteristics: Descriptive and bivariate analysis (sample size varies across variables)

	Frequencies %	Mean (SE), [95%CI]	Loneliness β (SE)
No children – ref. ¹	9.3		
Confidant child	52.7		-.21(.02)***
No confidant child	38.0		-.34(.02)***
No spouse – ref.	26.5		
Confidant spouse	61.2		-.65(.01)***
No confidant spouse	12.3		-.38(.02)***
No grandchildren – ref.	31.8		
Confidant grandchild	3.7		.23(.03)***
No confidant grandchild	64.5		.03(.01)**
No sibling –ref.	19.0		
Confidant sibling	17.8		-.11(.02)***
No confidant sibling	63.2		-.15(.02)***
No confidant parent – ref.	93.9		
Confidant parent	6.0		-.05(.03)
No confidant friend – ref.	69.8		
Confidant friend	30.2		-.02(.01)
Size of the SN ²		2.48(.01), [2.46, 2.49]	-.06(.00)***
Proximity with SN		3.14(.01), [3.13, 3.16]	.07(.00)***
Freq. of contact with SN		1.86(.00), [1.85, 1.87]	.10(.01)***
Satisfaction with SN		8.86(.01), [8.85, 8.88]	-.15(.00)***
Emotional closeness with SN		3.30(.00), [3.29, 3.31]	-.20(.01)***

Significance: ***= 1%; **= 5%

Notes: Excluding respondents aged < 50 and without a confidant social network. ¹ref. – is abbreviation for reference group; ²SN – is abbreviation for social network.

Source: SHARE Wave 4 release 1

In the adjusted model, all confidant network characteristics were taken into account as well as the control variables (age, gender, and country). The dominance of having a spouse (confidant or not) in the relationship with loneliness was still evident after the control variables and other network characteristics were taken into account. Having a spouse was significantly negatively associated with loneliness compared to not having a spouse. Moreover, a confidant spouse was found to be the most protective factor against loneliness in the model. Other characteristics that were negatively associated with loneliness were having children, and having a confidant friend. With regard to children, having children who were not mentioned in the confidant network was more protective against loneliness than having a child/children in the confidant

network. Moreover, having grandchildren in the confidant network was associated with greater loneliness.

Other characteristics of the confidant network were also found to be either negatively or positively associated with loneliness. Whereas a larger confidant network, higher satisfaction, and greater emotional closeness with the social network decreased feelings of loneliness, more frequent contact with confidant members and greater proximity to them increased loneliness.

Table 30.3: Confidant social network correlates of loneliness: Multivariate analysis (N = 39,186)

	Beta coefficient (SE)	95% CI
No children – ref. ¹		
Confidant child	-.06(.02)***	[-.11, -.07]
No confidant child	-.13(.02)***	[-.18, -.08]
No spouse- ref.		
Confidant spouse	-.48(.02)***	[-.51, -.45]
No confidant spouse	-.37(.02)***	[-.42, -.33]
No grandchildren – ref.		
Confidant grandchild	.08(.03)**	[.01, .15]
No confidant grandchild	.01(.02)	[-.02, .04]
No sibling – ref.		
Confidant sibling	-.02(.02)	[-.06, .02]
No confidant sibling	-.00(.02)	[-.03, .03]
No confidant parent – ref.		
Confidant parent	.03(.03)	[-.02, .08]
No confidant friend – ref.		
Confidant friend	-.08(.02)***	[-.11, -.05]
Size of the SN ²	-.04 (.01)***	[-.06, -.03]
Proximity with SN	.01(.01)**	[.00, .02]
Freq. of contact with SN	.05(.01)***	[.03, .07]
Satisfaction with SN	-.13(.01)***	[-.14, -.13]
Emotional closeness with SN	-.06(.01)***	[-.08, -.04]
R ²	0.12	

Significance: ***= 1%; **= 5 %

Notes: Controlled for age, gender and country. ¹ref. – is abbreviation for reference group;

²SN – is abbreviation for social network.

Source: SHARE Wave 4 release 1

30.6 Summary and conclusions

The population examined in this chapter included 15 of 16 European countries from the SHARE Wave 4 sample. Three of the included countries were new participants in the SHARE survey, which thus provided a basis for expanding the examination of loneliness in Europe. Consistent with previous studies that addressed the prevalence of loneliness in different geographic locations (Perlman 2004), the data showed evidence of its occurrence in each of the 15 participating countries. On the whole, loneliness was more widespread in Southern and Eastern Europe than in Northern and Western European countries. This finding is consistent with a previous contemporary analysis of SHARE Wave 2 data (Fokkema et al. 2012), despite the different measures of loneliness used in Waves 2 and 4. Whereas loneliness was measured using the single direct measure adopted from the CES-D depression scale in SHARE Wave 2, the Wave 4 questionnaire introduced a more comprehensive scale of loneliness.

In addition, the name generator mechanism that was introduced in the fourth wave of SHARE provides more insights into loneliness, particularly regarding qualitative protective factors. Notably, people with no confidant network at all felt lonelier than people who had at least one confidant. Moreover, examination of different qualitative components of the confidant network revealed different patterns of effects on loneliness. The composition measures – particularly having a spouse – were most strongly associated with loneliness. The role of having a spouse as a dominant protective factor against loneliness has also been found in previous studies (e. g. Shiovitz-Ezra & Leitsch 2010). However, having a confidant spouse with whom one can discuss important matters was the most influential factor. Having a confidant spouse was also negatively associated with loneliness in a recent study conducted in the U.S. (Hawkey et al. 2008).

Relationships with children and grandchildren, however, appear to be more complicated. Having a child (whether confidant or not) was negatively associated with loneliness compared to the “not having a child” status. However, not having a confidant child was a stronger negative predictor of loneliness. In other words, having a child who wasn’t mentioned in one’s confidant network was associated with feeling less lonely than having a confidant child. One possible explanation for this surprising finding is that although having children might serve as a protective factor against loneliness, when one’s children are included in the confidant network there might be additional tension and conflicts in this close emotional relationship which, in turn, can reduce the protective impact of having a child on loneliness. In the same vein, the analysis revealed that having a confidant grandchild was positively associated with loneliness. It is possible that the need to consider one’s grandchildren as con-

fidants is indicative of restricted emotional relationships, which can increase feelings of loneliness.

Other confidant network indicators were also related to loneliness. Specifically, a larger confidant network, satisfaction with the network, and greater emotional closeness with the network were all related to lower feelings of loneliness. Negative associations between satisfaction with the social network and loneliness have also been found in a previous study (Hawkey et al. 2008). In contrast, frequent contact with confidants and living near them was associated with increased loneliness. These unexpected findings could be explained by the disadvantages of social relationships. Aside from the support that can be generated by close emotional contact, these relationships might also be accompanied by demands and criticism (Ruehlman & Wolchik 1988). When the relationship with one's confidants is characterized by close physical proximity and frequent contact, the increased intensity of the relationships might lead to more negative emotions, which are frequently followed by greater loneliness. Ill health might also force older people to have emotionally close ties with those who live close by, but they are not necessarily pleased with this restriction.

The current study is restricted, to some degree, by its cross-sectional design, based only on SHARE Wave 4 data. It might be that lonely people establish different confidant networks. Therefore it will be useful to obtain longitudinal data in this area. When the next round of SHARE network data collection is completed, it may be possible to examine causal relationships between confidant networks and loneliness, yielding new insights into the phenomenon.

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31 Intergenerational support: the role of gender and social networks

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- ▶ Thirty five per cent of women aged 50 and over help their parents/parents-in-law
 - ▶ Women who help parents/parents-in-law present different social network types
 - ▶ European familialism regimes affect helpers' social network types
-

31.1 Intergenerational support in Europe

Older people are at the centre of a complex exchange network within the family, giving and receiving many types of practical help and support. Everyday support provided by the family is an essential contribution to the sustainability of long-term care systems in all European countries. It is predicted that in the years to come we will witness a significant increase in the number and the average age of informal helpers (Hoffmann & Rodrigues 2010). A better understanding of the characteristics of these individuals becomes crucial, including the conditions under which they provide support. Care research has pointed systematically to the importance of the association between the provision of care to older adults and social variables such as kinship, gender, provision of formal support or even cultural norms. Also, the capacity of providing help and care can be constrained and facilitated by caregivers' social resources including those within their personal network (Carpentier & Ducharme 2003).

We argue that studying the characteristics of social networks of helpers is an important contribution to further the understanding of the conditions under which intergenerational support is provided. In this chapter we focus on the intergenerational support in the ascendant direction, that is, on the women that provide care to their parents (including parents-in-law) or help them with household tasks.

This chapter has two main goals. First, to identify types of social networks of women aged 50 and over, who provide support to their parents in different European settings. Second, to consider the association of specific network types and contextual characteristics (familialism regimes). The chapter proceeds with the presentation of the key ideas from the theoretical and empirical studies that ground our research in two domains related to intergenerational support: intergenerational relations and social networks.

31.2 Intergenerational relations and intergenerational support

Being older does not inevitably lead to being dependent. Nonetheless, there are a number of factors underlying the ageing process that involve a probable increase in the need for support in both health issues and carrying out daily activities. Family is still an essential source of informal care for older relatives (Hoffmann & Rodrigues 2010), a source of care in which gender plays an important role. Several studies confirm that women provide more intense and frequent care than men (Schmid et al. 2012). However, this gender inequality, as well as the importance of family in the provision of informal care to family members, can be mitigated or strengthened by the social context or the state (Leitner 2003, Schmid et al. 2012).

Several approaches have been proposed to account for the variability of the social functions of the family. Esping-Anderson (1999) distinguishes familialistic from de-familialistic regimes, describing the first as a regime where the public policy assumes that it is the responsibility of the household to ensure the welfare of their members, whereas in the second the policies are in place to reduce the individual's dependence on household and kinship. Leitner (2003) describes familialism types considering not only the policies to relieve families from providing care, but also the ones that actively promote family care. His clustering exercise is particularly relevant to our study, because it is based on a gender-sensitive theoretical concept of familialism and it is applied to the variety of policies on older population care in Europe.

Leitner (2003) identifies *explicit*, *implicit* and *optional familialism regimes* in the countries of Europe. *Explicit familialism regimes* assign the responsibility of care for older individuals to the family, to which benefits are paid, and they provide few formal support services, such as domiciliary care (Austria, Belgium, France and Germany). In *implicit familialism* welfare regimes, the state neither supports family care through cash payments nor provides generous public care services. In such settings, support between adult children and their parents is encouraged through a strong normative system that is based on filial and moral obligations (Greece, Italy, Portugal, Spain and the Netherlands). Finally, in the *optional type* of familialism regimes, generous professional and financial services are provided to dependent older people through cash-for-care programmes, relieving families of the responsibility of caring for their older members (Denmark, Finland and Sweden). Eastern European countries, which formerly were part of the socialist block, do not yet have a fully defined system. Consequently, in the research that is presented in this chapter they will be grouped separately, as proposed by other authors in similar realms of inquiry (Requena 2010).

31.3 Social networks and intergenerational support

According to the Convoy Model, social networks are constellations of social relations. They are comprised by people who are important for the individual, and who may provide support and protection over the life course. This constellation of social ties can be characterised by objective and subjective features. It also has a dynamic character, inasmuch as it responds to different phases, situations and roles experienced by the individual at different points in the life course (Fiori et al. 2007).

Multiple pathways through which social networks can influence individuals have been identified in social research – such as the provision of social support, the facilitation of resources and material goods, the sharing of information, norms and values (social influence) or even positive appraisals or the promotion of a sense of identity (Gibney & McGovern 2011). These pathways have been found to be relevant for caregivers (in terms of their own health and wellbeing), as well as for sustaining the caregiver role. There is evidence that social networks are related to the type of care provided and the support received by the caregivers and that they can be an important tool in coping with the demands of such a role. On the other hand, some features of social networks can have moderate negative health effects on care providers (Carpentier & Ducharme 2003).

To describe variations that may exist in individuals' social networks, it is important to consider the structure, the function and the quality of social relations that compose the convoy (Fiori et al. 2007). Structural aspects are related to variables such as the size of the network, physical proximity of social network members, frequency of contact or participation in social activities. Functional aspects include such dynamics as the exchange of support between members and the level of emotional closeness. Finally, the quality dimension of social networks concerns the way in which the relations are experienced by the individual and can be assessed by subjective evaluations (Fiori et al. 2007).

Berkman and collaborators (2000) draw attention to the relevance of macro-level factors in shaping and determining the form and functioning of social networks. For example, aspects such as gender, country or welfare regime have been linked to differences in the characteristics of social networks (Litwin 2009, Requena 2010). Therefore, it is of particular relevance to consider this contextual dimension, already mentioned in the previous section, in a cross-national analysis of helpers' social networks. Recent research on the subject has made clear that in order to effectively account for the complex nature of social networks, it is necessary not to discard the multidimensionality of the concept. In addition, several authors have shown the benefits of following a pattern-centred approach

to analyse social networks in older sectors of the population, where the implications of network types in health, activity and other indicators of successful ageing were considered (Fiori et al. 2007, Litwin 2009, Gibney & McGovern 2011).

31.4 Defining social networks profiles

The current analysis addresses a sample of 2,235 female SHARE survey respondents, aged 50 or older ($M = 58.40$, $SD = 4.80$) who indicated that they provided help to their parents or parents-in-law outside the household in the previous twelve months. Data are from the fourth wave of the Survey of Health, Ageing and Retirement in Europe (2010–2011). We consider any kind of help because the probe in the SHARE questionnaire – Wave 4 asked: “In the last twelve months, have you personally given personal care or practical household help to a family member living outside your household, a friend or neighbour”. The survey instrument identifies to whom help was given, thus allowing us to focus on the help provided to parents or parents-in-law outside the household. In this chapter, the individuals who answered this question affirmatively will be called “helpers”. Since the survey does not have a uniform sampling design, calibrated individual weights were used in the sample descriptive analyses.

Based upon the consulted literature on social network types among older adults (Fiori et al. 2007, Litwin 2009, Gibney & McGovern 2011) and the quality of the data available, seven social network variables were employed in the current research to define social network profiles. These included: ‘Percentage of Family’ (in the social network), ‘Percentage of Friends’, ‘Percentage of Women’, ‘Emotional Closeness’ (average perceived emotional closeness provided by social network members), ‘Physical Proximity’ (proportion of social network members living at a distance less than five km), ‘Social Integration’ (number of social activities in which the respondent had been engaged in the previous month, from a list of seven activity areas, for example, voluntary work and going to a social club), and ‘Network Size’ (the number of named members in the personal social network). All the variables were introduced in the analysis in their standardised form. The identification of different social network types was conducted by cluster analysis, combining a hierarchical method (Ward’s Method) and a non-hierarchical method (k-means). The minimum number of clusters with the power to explain a relevant percentage of total variance of the seven variables was retained. Finally, a discriminate function analysis was performed to distinguish the different clusters (identified by the association between the social network variables and the more relevant discriminate functions in each cluster). The clusters were described taking into account the more discriminatory features.

The relationship between social context and social network type was studied with multinomial regression models. Social network types were regressed on familialism regime, controlling for socio-demographic variables (age, marital status, perceived economic difficulties – assessed by responses to the question ‘*Is the household able to make ends meet?*’). The model was replicated three times by changing the dependent variable reference category in order to compare the four network types with each other. The comparison between familialism regimes was based on the main effects of each category (explicit, implicit and Eastern Europe in reference to optional familialism) on social network type.

31.5 Social network types and social context

31.5.1 Social networks types of women who provide help to parents/parents-in-law

Thirty five per cent (34.9%) of women aged 50 or older, who reported having provided help or care to others outside the household in the last twelve-month period, gave such support to their parents or parents-in-law. These women tended to be under 65 years old (89.4%), married (71.4%) and employed (49.0%). They usually had upper secondary education level (39.5%) and lived in a household that was able to make ends meet “fairly easily” (36.3%) or “easily” (32.4%).

The cluster analysis identified four distinct groups that correspond to different social network types (Table 31.1). The first cluster, which accounted for 18.4 per cent of the study sample, was positively associated with the percentage of friends and female members, but negatively associated with the percentage of family members, social integration and emotional closeness. Consequently, we named this cluster the *unsupportive friends network*. The second cluster, which we called *the distant members network*, was the most frequent in the sample (34.5%). It was positively associated with the size of the network, but negatively associated with the physical proximity variable. To a smaller extent, this cluster was also positively associated with the percentage of family members (and negatively with the percentage of friends members). The third cluster, accounting for 18.5 per cent of the sample, was positively associated with the percentage of friends, social integration and emotional closeness, and negatively associated with the percentage of family members and of women in the network. It was termed as the *supportive friends network*. The fourth and final cluster (28.6% of the sample) was positively associated with the percentage of kin members and with physical proximity. In this group, which we named the *neighbouring family network*, there was also a negative association with the percentage of friends and the size of the network.

Table 31.1: Social network types as a function of their component variables

Social network types	Unsupportive friends		Distant members		Supportive friends		Neighbouring family	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Percentage of friends	0.57	(0.66)	-0.31	(0.51)	1.76	(0.77)	-0.63	(0.36)
Percentage of family	-0.75	(0.62)	0.29	(0.57)	-1.59	(0.64)	0.73	(0.39)
Percentage of women	0.43	(0.79)	0.01	(0.73)	0.51	(0.74)	-0.70	(1.09)
Emotional closeness	-0.53	(0.96)	0.01	(0.84)	-0.30	(0.92)	0.51	(0.87)
Physical proximity	-0.49	(0.94)	-0.49	(0.80)	-0.40	(1.04)	0.74	(0.65)
Social integration	-0.57	(0.51)	0.58	(0.93)	0.66	(0.90)	-0.52	(0.79)
Network size	0.18	(0.86)	0.61	(0.92)	0.23	(1.03)	-0.46	(0.70)

Notes: All variables are presented in the standardised form.

Source: SHARE Wave 4 release 1, unweighted data, N= 2,147

31.5.2 Social networks types and familialism regimes

The analysis revealed that social network type varied in relation to familialism regime ($\chi^2_{(9)}=179.458$; $p=0.000$). By observing the graphical representation of this relationship, it is possible to identify the main differences (Figure 31.1). Within the explicit regimes, the *distant members* network was the most frequent profile found, whereas all the other types had less prevalence. The same pattern was observed in the optional regimes sample, but in this context the *supportive friends* network type was somewhat more frequent than the *unsupportive friends* or *neighbouring family* types. In implicit and Eastern European regimes, the *neighbouring family* stood out as the most frequently observed network type, followed by the *distant members* network. Friends networks were much less common in both of those settings.

To study the accuracy of these differences, the odds ratio of having a given social network type was calculated in relation to welfare regimes, controlling for marital status and perceived economic status (age was removed from the analysis because it did not reach significance). The adjusted model attained statistical significance ($G^2_{(29)}=353.684$; $p=0.000$) and all the variables considered showed significant effects on social network type odds ($p<0.001$). There were significant differences between familialism regimes concerning the probabilities of having given network types. For a more parsimonious presentation of the results, only the estimates calculated for the different familialism regimes are shown. For this same reason, we show only once the odds ratios for the comparison of two given network types.

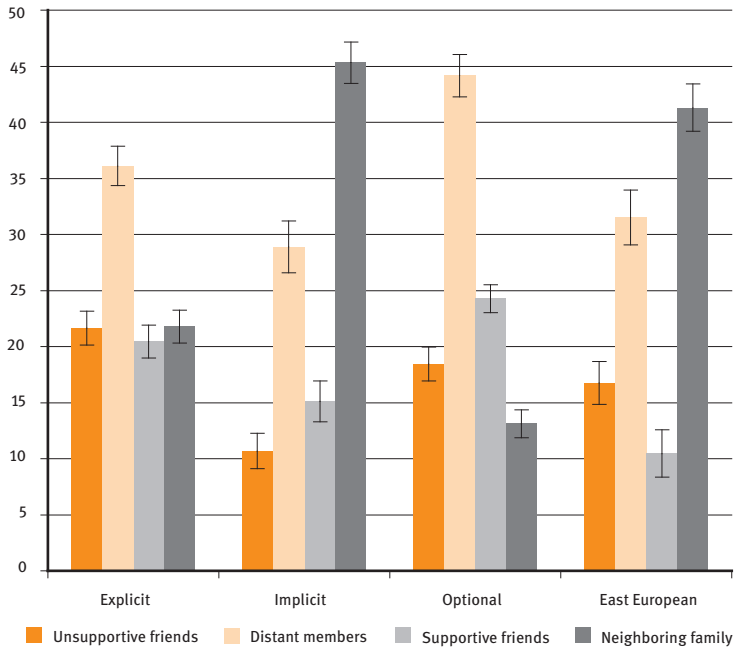


Figure 31.1: Social network types by familialism regimes

Source: SHARE Wave 4 release 1, unweighted data, N= 2,147

The results presented in Table 31.2 show that, in general, respondents from explicit and optional regimes did not differ much in the probability of having a specific social network type, except in the case of *neighbouring family networks* which were more frequent in explicit regimes compared to *distant members* and *supportive friends* networks. Being from an optional regime was related to fewer probabilities of having *neighbouring family networks* and with higher probabilities of having *supportive friends* networks, when compared with *distant members* or *unsupportive friends* networks. Living in an implicit familialism regime was associated with the highest probability of having a *neighbouring family network* in comparison to all the other network types, except in comparison with *supportive friends* where Eastern European women had the highest likelihood of having *neighbouring family networks*. Living in an Eastern European regime was associated with increased chances of having *neighbouring family networks* and also with a decreased chance of having *supportive friends* networks, compared with *distant members* and *unsupportive friends* network types.

Table 31.2: Social network types as a function of familialism regimes: Multinomial regression models

Network types	Familialism regimes	Coefficients	Standard Error	Exp(B)	C.I.95 % Exp(B)	
					Low	High
Model 1						
Distant family	Explicit	−0.200	(0.175)	0.818	0.580	1.154
	Implicit	0.117	(0.235)	1.124	0.709	1.782
	East-Europe	0.050	(0.200)	1.051	0.710	1.556
Supportive friends	Explicit	−0.261	(0.195)	0.770	0.526	1.127
	Implicit	0.172	(0.261)	1.187	0.712	1.981
	East-Europe	−0.614***	(0.237)	0.541	0.341	0.861
Neighbouring family	Explicit	0.376*	(0.216)	1.456	0.954	2.224
	Implicit	1.559***	(0.256)	4.755	2.881	7.846
	East-Europe	1.223***	(0.230)	3.399	2.167	5.332
Model 2						
Supportive friends	Explicit	−0.061	(0.168)	0.941	0.677	1.307
	Implicit	0.055	(0.213)	1.056	0.696	1.602
	East-Europe	−0.664***	(0.209)	0.515	0.342	0.775
Neighbouring family	Explicit	0.576***	(0.187)	1.779	1.232	2.569
	Implicit	1.442***	(0.201)	4.229	2.851	6.272
	East-Europe	1.173***	(0.194)	3.233	2.212	4.726
Model 3						
Neighbouring family	Explicit	0.637***	(0.211)	1.891	1.251	2.859
	Implicit	1.387***	(0.236)	4.004	2.522	6.358
	East-Europe	1.837***	(0.238)	6.278	3.941	10.002

Significance: *** = 1%; ** = 5%; * = 10 %

Notes: All models controlled for marital status, and perceived economic status. The reference category for familialism regimes variable is “Optional familialism” in all models. Social network type reference categories: Unsupportive friends (Model 1), Distant members (Model 2) Supportive friends (Model 3).

Source: SHARE Wave 4 release 1, unweighted data, N= 2,147

31.6 Individual and contextual variation in social networks types

The present chapter focuses on the women, aged 50 years and older, who provide help for their parents or parents-in-law. A typology of social networks was developed and the probabilities of having a specific network type was compared in

different European settings. Four types of social networks were identified: unsupportive friends, distant family, supportive friends, and neighbouring family. Although focused on a very specific sample, the identified network types can be considered to be similar to previous studies on social networks of European older adults. To some extent, they appear to correspond to a combination of four relatively robust network types: family/friends and diverse/restricted type (Fiori et al. 2007).

The multidimensional approach that was employed in the current study allowed important differences to be identified in terms of the derivation of social network types, as well as in terms of contextual variation. In particular, we found, that helpers from an optional familialism regime have a lesser likelihood of having a *neighbouring familiar* network. Analysing the results in more detail, we note that explicit and optional familialism regimes appear to be close in terms of the network type distribution, except in the prevalence of *neighbouring family* networks (more probable in the explicit regimes). These similarities can be related to the characteristics of these settings, which are close in terms of the provision of care services allowing less family dependent social networks of parents' helpers.

The Eastern European and implicit familialism regimes also share some resemblances. *Neighbouring family* network type is the most frequent in both settings and is much more prevalent than in optional regimes when controlling for socio-demographic factors. The Eastern European familialism regime is also associated with a lower likelihood of having *supportive friends networks*. It is plausible to assume that the similarities between implicit and Eastern European regimes can be related to the scarce provision of care services in both settings, while the distinction can be related to the difference in their cultural norms and family values. This explanation should be investigated further in future research.

Some limitations of the current study need to be considered. The data available did not allow distinguishing between those who gave personal care, such as help in bathing and dressing, and those who provided practical household help to their parents and parents-in-law. It was similarly impossible to differentiate between instrumental care and emotional support. Another limitation was that the dimensions considered for the derivation of the network types were constricted by data availability. Although the SHARE survey instrument includes a very complete social network module, high levels of missing values in the sample of helpers prevented the use of some theoretically relevant variables.

Future research should complement these findings with consideration of the implications of helpers' social networks on the care that they provide. Another important area of interest is the association between helpers' social networks and the quality of life of both helpers and dependent adults. It would also be of inter-

est to consider a male sample using this same analytical approach, in order to better understand how men who act as caregivers differ in respect to their social networks.

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32 Long-term care and reciprocity: does helping with grandchildren result in the receipt of more help at older ages?

-
- ▶ In four out of ten households, older adults provide help to their grandchildren
 - ▶ Caring for grandchildren increases the likelihood to receive help from adult children later in life
 - ▶ Substantial in-kind transfer of care services between generations is likely to benefit welfare state budget
-

32.1 Why do adult children care for older parents?

In the last century, European countries experienced a spectacular demographic transition. A sharp decline in fertility rates was paired with a steady decrease in mortality. This dual dynamic has progressively increased the proportion of people aged 65 and over, to the point that recent projections estimate they will comprise more than 30 per cent of the population by 2050 (Eurostat 2008). One consequence of an ageing population is an increase in the need by older people for care services, due to the limitations that they may experience in performing daily activities (i.e. basic tasks such as personal care, moving around the house and so on). Family members, and in particular adult children, are the ones who most frequently provide the bulk of care for older adults (see e.g. Kalwij et al. 2012, for recent evidence based on SHARE data).

Understanding the determinants of care provision by adult children is of paramount importance from a public policy point of view. It has been claimed that informal care from children reduces the probability of nursing home entry (Charles & Sevak 2005). Others see the care supplied by adult children as a net substitute for publicly provided home care (van Houtven & Norton 2004, Bonsang 2009). As such, informal care provision might decrease the fiscal cost of public long-term care expenditure programmes. At the same time, however, the provision of long-term care by adult children can have a negative impact on their labour market participation and career prospects, especially for women (Pezzini et al. 1999, Bolin et al. 2008).

Why do adult children care for older parents? They might do so out of pure altruism or rather because they are, or expect to be, compensated by their parents. This latter type of motivation has been discussed in the literature on exchange motives for bequest, as for example in early works by Bernheim et al. (1985) and Cox (1987). More recently, using SHARE data, Alessie et al. (2011) have shown that both altruism and exchange motives matter for long term care provision and inter-vivos financial transfers.

Within family in-kind transfers are not limited to informal care provided by adult children to their parents. Older individuals quite often engage in grandchildren care, thus alleviating the burden of family duties on their adult children, especially their daughters. Childcare is a time consuming activity, and despite the spectacular improvement of labour market performance of women in the last century, still leads mothers to experience lower labour market involvement and worse career prospect than desired. Public supply of such a care service is heterogeneous both across European countries and within each country (childcare facilities' provision is often part of regional or even municipal duties), and often it does not satisfy households' needs. Blau and Currie (2006), among others, underlined that help from older parents as grandchildren care providers can contribute to reduce the gender gap in labour market outcomes associated with fertility decisions. Such a within-family source of childcare is likely to expand in the near future, because a larger fraction of older people are now in relatively good health and, as a result, more of them are able to provide grandparental childcare (Mackenbach et al. 2008, present a comprehensive survey on the topic). While a high proportion of grandparental childcare is observed throughout Europe, the intensity of provision varies across countries, with Mediterranean countries displaying higher frequency rates than Continental and Nordic countries (Albertini et al. 2007, Hank & Buber 2009).

In this chapter we investigate whether parents who have provided help by taking care of their grandchildren receive more informal care from their children when they experience the onset of limitations in performing activities of daily living. Such an association may be the result of reciprocal altruism, a concept often labelled in evolutionary psychology and experimental economics as “delayed reciprocity” (see e.g. Neo et al. 2013), or it may be a “repayment” for previous informal care received. From a behavioural point of view the difference is that delayed reciprocity does not require parents and children to agree upon the exchange beforehand: children react to an “act of kindness” received from the parent with an altruistic behaviour later in life when their parents are in need. In comparison, an exchange motive does not require altruism in individual behaviour, but an implicit or explicit “contract” taking place between parents and children over time.

From a policy perspective, whether high involvement in long term care by adult children is the result of delayed reciprocity or whether it is part of an

exchange agreement has a relevant role. In the former case, children are not likely to respond to economic incentives to change their caring and labour market patterns. If, on the other hand, informal care by adult children is the result of exchange considerations, economic incentives might be effective. From a life cycle perspective, the combination of informal grandchild care and long-term care provision might decrease the overall fiscal cost of public care expenditure programmes. Moreover, such savings may be attained without jeopardising the daughters' early career and labour market prospects.

32.2 Grandparent childcare as a determinant of informal long term care provision

We used data from Waves 1, 2 and 4 of SHARE. The key idea was to investigate whether the provision of informal childcare by grandparents, as observed in the first two waves of data collection (in 2004 and 2006) was significantly related to the prevalence (probability of receiving care) and the intensity (number of days of care received) of informal long term care provided by adult children living outside the household at the time of Wave 4 (in 2011). In order to achieve our purpose, it was necessary to limit the sample to respondents who participated in Wave 4 and in at least one earlier wave of data collection (Wave 1 and/or Wave 2). In constructing the dataset, our first target was to link the information regarding the grandchild care that respondents' adult children received from their parents in the earlier waves to the information about the help that adult children supplied to their parents in Wave 4 (to the respondent, to his or her spouse, or both). While the information about grandchildren assistance is individual (both respondent and spouse/partner individually answer the related questions), the data on the care received from children regards the overall family (both respondent and spouse). For this reason we combined the relevant information in such a way as to get one record per household. This operation reduced the dimension of our database, but made the variables on help given and help received comparable. Finally, we focused exclusively on those respondents that resided as a couple or alone in all the three waves considered. That is, we did not include respondents who had lived in extended family households at any time. We also excluded respondents who had been in receipt of personal help from their children already in Waves 1 or 2.

Tables 32.1 and 32.3 show the ratios of respondents' households that gave help to their children and received help from them, respectively. Tables 32.2 and 32.4 display the mean frequency of such help, expressed as total days per month of help (the sum of days of help provided by each parent in the household). We can

observe that while the prevalence of giving help to grandchildren or receiving help from children is similar in all European countries, the mean frequency of care is higher in Mediterranean countries and Poland with respect to Nordic or Central European countries (even if these differences are not statistically significant).

Table 32.1: Help given with grandchildren care

Country	Min	Max	Mean	Std. Dev.	Nr obs
Austria	0	1	0.354	0.479	268
Germany	0	1	0.372	0.484	522
Sweden	0	1	0.494	0.500	765
Netherlands	0	1	0.478	0.500	709
Spain	0	1	0.422	0.495	287
Italy	0	1	0.454	0.498	456
France	0	1	0.416	0.493	847
Denmark	0	1	0.442	0.497	781
Switzerland	0	1	0.325	0.469	530
Belgium	0	1	0.462	0.499	769
Czech Republic	0	1	0.349	0.477	447
Poland	0	1	0.393	0.489	346
Total	0	1	0.424	0.494	6,727

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

Table 32.2: Total days of help to grandchildren conditional on giving help

Country	Min	Max	Mean	Std. Dev.	Nr obs
Austria	0.5	30	9.795	11.593	95
Germany	0.5	30	8.812	10.758	194
Sweden	0	30	4.290	6.598	378
Netherlands	0.5	30	5.080	5.728	339
Spain	0.5	30	16.087	13.245	121
Italy	0.5	30	19.041	13.073	207
France	0	30	6.173	8.975	352
Denmark	0	30	3.730	5.315	345
Switzerland	0	30	5.180	6.562	172
Belgium	0	30	10.620	11.335	355
Czech Republic	0	30	6.917	9.634	156
Poland	0	30	13.886	13.310	136
Total	0	30	8.056	10.359	2,850

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

Table 32.3: Help received from children in Wave 4

Country	Min	Max	Mean	Std. Dev.	Nr obs
Austria	0	1	0.086	0.281	268
Germany	0	1	0.082	0.275	522
Sweden	0	1	0.071	0.256	765
Netherlands	0	1	0.035	0.185	709
Spain	0	1	0.087	0.282	287
Italy	0	1	0.064	0.244	456
France	0	1	0.053	0.224	847
Denmark	0	1	0.092	0.289	781
Switzerland	0	1	0.040	0.195	530
Belgium	0	1	0.057	0.232	769
Czech Republic	0	1	0.183	0.387	447
Poland	0	1	0.087	0.282	346
Total	0	1	0.073	0.261	6,727

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

Table 32.4: Days of help received from children living outside the household given that help was received

Country	Min	Max	Mean	Std. Dev.	Nr obs
Austria	0.5	30	8.261	10.388	23
Germany	0.5	30	4.384	7.461	43
Sweden	0.5	30	4.352	6.835	54
Netherlands	0.5	30	4.760	7.991	25
Spain	0.5	30	17.160	13.806	25
Italy	0.5	30	18.845	12.836	29
France	0.5	30	4.367	7.378	45
Denmark	0.5	30	4.639	8.660	72
Switzerland	0.5	30	7.619	11.291	21
Belgium	0.5	30	11.295	12.442	44
Czech Republic	0.5	30	9.634	11.566	82
Poland	0.5	30	16.233	13.368	30
Total	0.5	30	8.463	11.221	493

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

As it is the standard in the long term care economic literature, we ran a two part model. We examined both the probability of receiving informal care from children, and the number of days of care conditional on receiving help. Therefore, the first part of the model was a probit regression in which the dependent variable was a dummy that took value one if any of the respondent's adult children gave help in Wave 4 to the respondent or to his/her spouse. The second part of the analysis was a linear regression run on the subsample of those who received help from their children. The regressand in that analysis was the total number of days per month in which parents received care from at least one adult child living outside the household. The key regressor in both cases was a dummy variable that took value one if the respondent or spouse provided help to grandchildren in Wave 1 or Wave 2. We then controlled for a full set of informal care determinants: a quadratic in age (mean age for couples), whether a given observation represented a single or a couple household, the maximum level of limitations in activities of daily living (ADL) among the parents in Wave 4, the maximum variation in the ADL status between Wave 1 or 2 and Wave 4, the household income and the number of sons and daughters separately. We also included a full set of country dummies to account for heterogeneity in institutions and in cultural traits that may affect caregiving decisions.

As a control for robustness we considered a set of variables that describe the type of family from a "caring" perspective. For this purpose, we used three variables that are available in the "drop-off" SHARE questionnaire, combining them in a "care" coefficient through a summative rating scale. On these items, respondents were asked to express their attitude (agreement or disagreement on a scale from one to five) towards the following statements: i) "Grandparents' duty is to contribute towards the economic security of grandchildren and their families" ii) Grandparents' duty is to help grandchildren's parents in looking after young grandchildren and iii) the family should provide "help with household chores for older persons who are in need such as help with cleaning, washing". It is important to specify that lower scores in the caring variables and hence lower values of the care index stand for stronger family solidarity. Table 32.5 reports the mean and the standard deviation of the "caring" index. As we expected Mediterranean countries are characterised by stronger family values than Central and Northern European countries.

We did not include this "caring family" control in the baseline specification of the two part model, since the relevant questions are part of the drop-off questionnaire which was subject to a higher non-response rate than the main questionnaire.

Table 32.5: Care index by country

Country	Min	Max	Mean	Std. Dev.	Nr obs
Austria	1	4.857	2.790	0.735	243
Germany	1	4.571	2.632	0.594	340
Sweden	1	5	2.801	0.757	530
Netherlands	1	5	3.077	0.611	492
Spain	1	3.857	2.363	0.637	157
Italy	1	4.143	2.281	0.608	291
France	1,286	4.286	2.548	0.585	455
Denmark	1	5	3.195	0.641	339
Switzerland	1	5	2.756	0.682	477
Belgium	1	5	2.750	0.744	542
Czech Republic	1,286	4.571	2.905	0.583	287
Poland	1	4	2.333	0.618	221
Total	1	5	2.744	0.706	4,374

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

32.3 Reciprocity within European families

Table 32.6 reports the results from the two part model in its baseline specification (first two columns), and with the “caring family” index as an additional control (last two columns). Columns corresponding to the probit regressions report marginal effects. As the table shows, having had previously provided childcare to the grandchildren was highly significant and points to an increase of 15.3 per cent in the probability of receiving informal care by adult children. This value increased to 19.4 per cent when we controlled for the “caring attitude” of the family (column 3). Care needs (measured by the number of ADL limitations) were an important driver both of the probability and of the amount of care received (even if the latter was not precisely estimated when caring attitude was included). However, the extent of changes in ADL functioning between the waves seems to have been less important.

Couples were significantly less likely to have received care from adult children living elsewhere than singles: the 44.8 per cent to 53.4 per cent decline in the probability of adult children providing care to a couple household suggests that the cohabiting partner plays a major role as informal care provider, or that married couples are healthier. While the income coefficient was not significant, the probability of care provision as well as the amount of care received were higher the older the care recipient was. Also, the greater the number of children, the more

likely it was to have received care from them. In the baseline specification having one extra daughter increased the chances of receiving care from children by 15.6 per cent, while one extra son induced a 13.9 per cent increase. These figures rose to around 17 per cent and the difference between the two diminished when we controlled for the caring attitude, even though the difference between the marginal effects was not significant in the baseline or in the extended specification.

Table 32.6: Two part model

Variable	CARE PROVISION BY ADULT CHILDREN			
	Baseline		Caring family	
	Probability (Probit) (1)	Extent (OLS) (2)	Probability (Probit) (3)	Extent (OLS) (4)
Care for grandchildren in w1 or w2	0.153***	-0.203	0.194***	1.767
Log income	0.022	-0.81	-0.035	-1.351
ADL_w4	0.134****	1.164**	0.171****	0.92
Delta_adl (increase in ADL-dummy)	0.214**	-1.542	0.144	0.666
Couple household	-0.448****	-0.656	-0.534****	-0.891
No. of male children	0.139****	0.129	0.172****	0.215
No. of female children	0.156****	0.43	0.170****	0.755
Mean age	0.020****	0.136***	0.022****	0.169**
Mean age squared	0.000****	0.000***	0.000****	0.000**
Care coefficient			-0.062	0.405
Austria	-0.12	3.126	0.019	2.372
Sweden	-0.238**	-0.594	-0.113	-2.312
Netherlands	-0.525****	0.252	-0.562***	1.006
Spain	-0.289	8.463***	-0.143	7.703**
Italy	-0.284**	12.669****	-0.146	9.415***
France	-0.396****	-0.877	-0.310**	-1.72
Denmark	0.022	0.146	-0.065	-1.559
Switzerland	-0.540****	2.013	-0.424***	0.193
Belgium	-0.359***	5.781***	-0.267	3.194
Poland	-0.247	15.309****	0.227	15.082***
Czech Republic	0.492****	4.398**	0.497****	3.156
Intercept	-2.913****	-3.241	-2.064**	-3.207
N	6,521	490	4,254	311

Significance: **=5%; ***=1%; ****=0.1%

Notes: Germany is the excluded country. The regression also includes a dummy which takes value one for families observed in Waves 2 and 4, and zero for those observed in Waves 1 and 4.

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

As noted earlier in this chapter, provision of childcare by grandparents and subsequent parent care receipt might be shaped by a positive cultural attitude toward caring for family members. If this were the case, despite the different timing of grandchildren and elder care, the significant parameters of interest could not be given a causal interpretation. We attempted to capture part of the difference in the cultural attitudes towards long term care by including in the analysis a set of country dummies. However, the country variables did not exhibit a clear pattern that may be easily interpreted. As we already explained, we went further into this issue by including the caring family index in the two part model proposed in columns (3) and (4). This additional control did not change the broad picture of the analysis, that is, caring for grandchildren early in life still positively affected the probability of receiving care. If anything, the effect seems stronger in column (3) compared to column (1). The caring family index per se was not found to be significant. The same was true also for the single items included in the index when they were used directly in the regression (the results of these regressions are not reported).

32.4 Importance of in-kind care transfers within families

In this chapter we exploited the longitudinal dimension of SHARE data to investigate the presence and intensity of reciprocity in informal care provision in eleven European countries, including Mediterranean, Continental and Nordic countries. We estimated a two part model to analyse both the propensity to provide care and the amount of care provided by children. The results consistently show that previously provided grandparental childcare results in a higher probability that adult children will later reciprocate providing informal care to their older parents, but does not affect the extent of informal care provision to the same degree.

Understanding the dynamics of reciprocity in the provision of informal care among families represents a timely and highly relevant policy issue. Active childcare provision by grandparents might reduce the cost of raising children and, in turn, both influence the fertility decisions of young adults and foster their labour market participation. Previous informal care provision by active grandparents seems to result later in a reciprocated provision of informal care by the adult children, once their older parent experience the onset of care needs. Such an informal delayed transfer of in-kind services is likely to reduce the burden on welfare state budgets.

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Jim Ogg and Sylvie Renaut

33 Ageing and intergenerational support: the role of life course events

-
- ▶ Older Europeans continue to be ‘givers’ rather than ‘receivers’ of support
 - ▶ Support received by older Europeans from their family involves mainly care, not cash
 - ▶ Ill health and poverty place high demands on intergenerational support
-

33.1 How do life course events change intergenerational patterns of support?

Previous research on European intergenerational relations using SHARE data has demonstrated that older people are at the centre of a complex exchange network that involves both the giving and the receiving of support (Attias-Donfut et al. 2005a, 2005b, 2008, Hank & Stuck 2008). For example, adult children give help regularly to parents when they live close by, are not working and when the health status of the parents indicates that help is needed (Ogg & Renaut 2006). Moreover, most grandparents are involved in looking after their grandchildren from time to time (Hank & Buber 2009). Such support within families enables many older people to preserve their autonomy and remain active for as long as possible.

The SHARE data have also revealed how different types of support are rooted in family cultures and the institutional frameworks of different European countries. Although the general pattern is that intergenerational support within families remains strong, the regularity and intensity of this support differs across countries. Caring tasks are more intense in the Southern Mediterranean countries, for example, where families cohabit to a greater degree than in Northern Europe (Litwin 2009). These differences are largely due to influences at the macro level, i.e. the presence or absence of developed social protection systems and welfare states, and previous research using the SHARE data has shown how the welfare state can contribute to supporting families in their social care tasks (Attias-Donfut et al. 2005a). However, less is known about the micro level factors that may determine how ageing affects whether individuals give or receive support and in particular the role of life course events.

Do important events that people experience impact on patterns of intergenerational support? Theoretical perspectives on how intergenerational rela-

tions change over time have stressed the importance of the timing of individual changes relative to family life stages (Elder 2004). The changing circumstances of individuals occur in conjunction with changing family structures, and these transformations converge with historically created opportunities or constraints. The panel data of SHARE allow these different influences on intergenerational relations to be studied in detail, taking into account *biographical time, family time and historical time* (Putney & Bengtson 2004).

The SHARE data are particularly suited to address the impact of these dimensions on intergenerational support. The longitudinal dimension of the survey can be used to identify key events that have occurred in the lives of the respondents over a period of approximately six years (Waves 1 and 4). These life events include situations where individuals are more available to provide support, such as after exiting the labour market through retirement, as well as help and assistance that may be required due to the onset of disability, deterioration in the household's financial situation, or a change in the household composition. Using information on the health, economic, and environmental aspects of people's lives that forms the holistic dimension of the SHARE approach and focussing on support received, this chapter presents first findings on how changes in individual's circumstances are related to wider family changes and historical circumstances.

The chapter is organised as follows. First, we examine the current extent of intergenerational support in Europe, as reflected in the latest Wave 4 data. We consider, in this regard, whether the new participating countries in SHARE (Portugal, Hungary, Slovenia and Estonia) reveal different trends in relation to intergenerational support. Second, we present the results of longitudinal analyses that examine intergenerational support from the perspective of a sub-sample of SHARE respondents that participated both at Wave 1 and Wave 4. This time period (approximately six years) is sufficiently large to capture changes in individual circumstances and developments in family life stages. The period also covers some major transformations in the economies of European nation states. Third, we look at key life course events that may alter the pattern of intergenerational support, focussing on support that individuals received at the time of the latest Wave of SHARE. We wish to clarify, in this regard, whether respondents who experienced important life course events were more or less likely to receive support from their family and from others in their social milieu than respondents who did not experience such events.

33.2 Locating social support and life course events in SHARE

The SHARE survey contains two modules that cover questions relating to intergenerational transfers – time transfers (i.e. personal care, practical household help and help with paper work) and financial transfers (i.e. money or gifts exchanged with a value of 250 € or more) within the last twelve months or (for panel respondents) since the last interview. Questions relating to these items are sometimes asked individually. At other times, one designated member of the couple (financial respondent, family respondent) gives the response. This occurs when the help in question reflects assistance that is given by the household, *per se*. In this latter case, we have copied the response to the other member of the couple as well, so that information is complete for all the respondents on all the items of intergenerational support. In the current analysis, we created an indicator to mark the presence or absence of practical help and/or financial help given or received by combining the different elements of time and financial transfers. These variables are summarised in Table 33.1. For the purpose of this chapter, these two indicators are labelled ‘support given’ and ‘support received’.

Table 33.1: The two indicators – support received and support given

Support received	Support given
personal care from someone living within or outside the household	personal care to someone living within or outside the household
practical household help from someone living outside the household	practical household help to someone living outside the household
help with paperwork from someone living outside the household	help with paperwork to someone living outside the household
financial or material gift or support (250 € or more) from someone living outside the household	financial or material gift or support (250 € or more) to someone living outside the household

Notes: The time frame for both support received and support given is within the last twelve months or (for panel respondents) since the last interview.

Source: Wave 1 release 2.5.0

For the life course events, selected elements relating to the health, economic and home environment dimensions of older people’s lives were tracked across Waves. This enabled us to identify respondents for whom changes occurred in

these respective dimensions. The change variables are summarised in Table 33.2. They include changes in: 1) ability to perform basic functional activities because of a health problem; 2) job status; 3) self-perceived ability for the household to financially make ends meet; 4) household composition; and 5) residential location.

Table 33.2: Life course events experienced between Wave 1 and Wave 4

Dimension	Indicator	Wave 1	Wave 4
Disability	1. Severely limited in doing activities for the past six months at least because of a health problem	No	Yes
Economic	2. Current job status	Retired; employed; unemployed; permanently sick or disabled; homemaker	Status at Wave 4 not the same as Wave 1
	3. Self-perceived ability for household to make ends meet with total monthly household income	Fairly easily or easily	With some difficulty or with great difficulty
Home environment	4. Household composition	Live alone	Lives with others
		Lives with others	Lives alone
	5. Residential location	Different than Wave 4	Different than Wave 1

Source: Wave 1 release 2.5.0, Wave 4 release 1

33.3 Older Europeans continue to be ‘givers’ rather than ‘receivers’ of support

We first examine the patterns of support given and received at Wave 4. The results shown in Figure 33.1 confirm the patterns observed in previous SHARE data – just under half (47 %) of older Europeans were engaged in providing practical and/or financial support. This support was mainly directed towards other family members, with parents and children being the main recipients (not shown here,

data available on request). The new country entrants had rates that were slightly lower than the average. In general, countries in the same regions had similar rates (for example Sweden, Denmark and Germany where rates were higher, Spain and Portugal where rates were lower). However, there were some exceptions. The Czech Republic had a rate that was higher than the average, while its near neighbour Hungary had a low rate. Similarly Spain had a higher rate than Italy. Overall, the trend of support given was the same as that observed in previous SHARE Waves, i. e. descending rates along a North/South divide, with East European countries situated in between.

The overall rate of support received (27%) was much lower than support given, reflecting the possible association of receiving help with poor health and disability and the greater likelihood of such problems increasing with age. We conclude this because the Wave 4 respondents were generally in good health: 58 per cent reported their health as good, very good or excellent and 51 per cent were not limited in undertaking daily activities. It seems that the need for support is mostly concentrated in the older age groups and, therefore, Europeans aged 50 and above as a whole tend to be support 'givers' rather than 'receivers'. For the new country entrants, Estonia had a slightly higher rate than average (32%) and Slovenia a significantly lower rate (17%). Most countries were situated within a few percentage points of the average, with the exceptions being the Czech Republic and Denmark where rates were high, and Slovenia and Switzerland where rates were low.

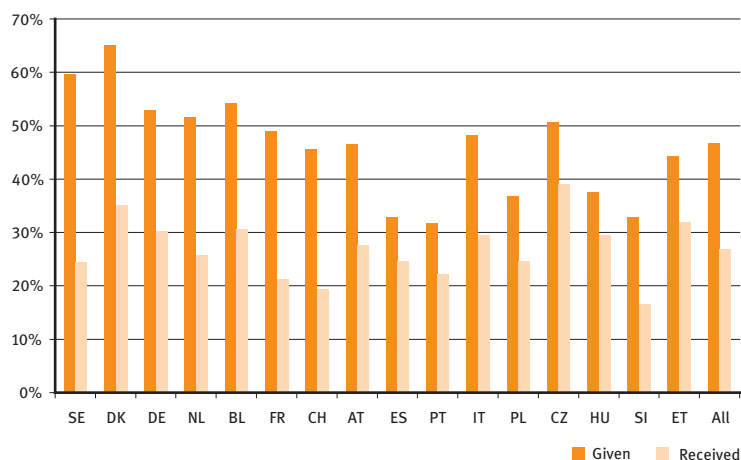


Figure 33.1: Rates of practical and/or financial help by country at Wave 4

Source: SHARE Wave 4 release 1. Respondents aged 50 and above. Weighted data (individual). Unweighted base n=56,854.

We turn now to the longitudinal sample, i.e. respondents who participated at both Waves 1 and Wave 4. The average age of these respondents was approximately four years higher than all respondents who participated in Wave 4 (69.2 years compared to 65.4 years). In this longitudinal sample, rates of support given were slightly higher than in the cross-sectional sample at Wave 4. However, these rates fell significantly in all countries over the time period observed. At the individual level, this fall is explained partly by the fact that practical help given to a parent or a parent-in-law at Wave 1 was no longer present because this parent or parent-in-law was no longer alive at Wave 4, and partly by the fact that as the panel members of SHARE age they in turn moved from being 'givers' to being 'receivers'. As far as rates of support received are concerned, different patterns are observed. Rates fell in Sweden, the Netherlands and Switzerland and rose in Spain, Italy and France. In Denmark, Germany, Austria and Belgium, rates of support received remained unchanged over time. Although these differences are not large, it is interesting to note that countries where the economic recession has hit the hardest, such as Spain and to a lesser extent Italy, had the largest increase in support received between Waves 1 and 4. Although individual circumstances are most likely to have been the main triggers for changing patterns of intergenerational support, it is possible that for some older Europeans, these were combined with the unfavourable economic circumstances that occurred over the time period observed.

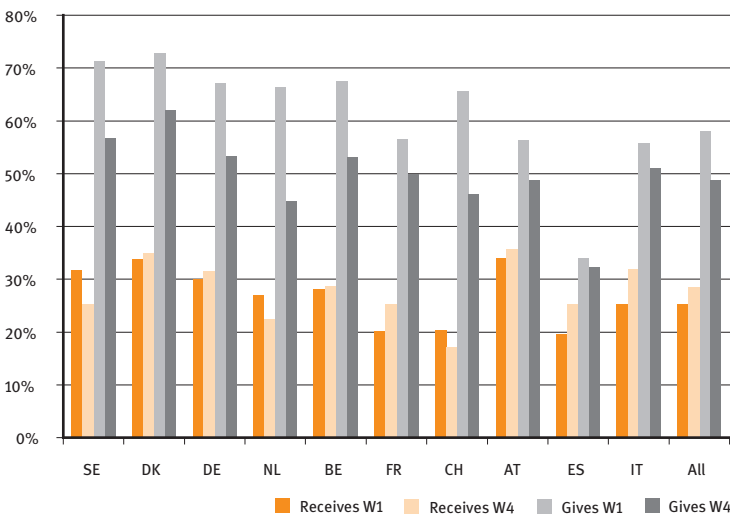


Figure 33.2: Rates of practical and/or financial help by country at Waves 1 & 4 (longitudinal sample)
Source: SHARE Wave 1 release 2.5.0, Wave 4 release 1. Weighted data (individual). Unweighted base n=12,222.

33.4 Support received by older Europeans from their family involves mainly care, not cash

In order to explore further these country differences in the level of support received over time, we next introduced the key life events at a bivariate level to examine how they may impact on intergenerational support. Table 33.3 shows the relative odds of receiving support at Wave 4 according to the three domains of major life course events identified in Table 33.2. On the whole, in each country the onset of disability was the factor strongly associated with receiving support from a family member or other person within the social milieu. This was especially the case for the two Mediterranean countries, Spain and Italy, but the effect was also strong for France and Denmark. With the exception of Sweden, Switzerland and Italy, economic and home environmental changes did not have a major effect on the likelihood of receiving support although it is interesting to note that this effect tends to be negative. These findings remain to be explored further, but they do suggest that the determinants of intergenerational support may be less related to economic circumstances that impinge on households and more related to the individual circumstances of individuals within households. As mentioned above, although the hypothesis that families step in to help their older members when economic conditions are harsh is plausible, these first results also suggest that families do not necessarily respond by providing practical and/or financial support due to economic changes experienced by individuals as they move into retirement and are likely to have reduced incomes.

The results shown in Table 33.3 show clearly that a deterioration in health which leads to the onset of disability is associated with receiving higher levels of support, confirming once again previous results from SHARE (Attias-Donfut et al. 2008). To examine this association further we introduced a multivariate logit model for the probability of receiving support at Wave 4 that takes into account the respondent's situation at that time as well as the major life events that have occurred since Wave 1. In this model, we retained the five original indicators of individual change between Waves 1 and 4 (a change to experiencing financial difficulties, in job status, to experiencing severe limitations in activities, in living arrangements, and in moving home). Fixed variables from Wave 4 that were taken into account include gender, age, country, living arrangements, self-perceived health, employment status, and self-perceived financial situation. The results are shown in Table 33.4. As expected, the probability of receiving support is greater for men, at advanced ages, when severe limitations in activities are present and when living alone. As for the country differences, Danish, German and Austrian respondents were significantly more likely to have received support than respon-

Table 33.3: Bivariate odds ratios for receiving support at Wave 4 by life course events occurring between Waves 1 & 4

Country	Disability	Economic	Home Environment	(N)
Sweden	2.90***	0.55***	0.48***	1,488
Denmark	2.76***	0.82	0.73	930
Germany	3.49***	1.10	1.05	1,040
Netherlands	1.89***	1.17	0.83	1,389
Belgium	2.40***	0.72*	1.10	2,091
France	3.90***	0.71**	1.21	1,602
Switzerland	2.78**	0.67	0.46**	521
Austria	2.18***	0.95	0.76	707
Spain	7.64***	0.96	0.99	1,138
Italy	4.00***	0.91	0.61**	1,356

Significance: *** = 1%; ** = 5%; * = 10 %

Notes: Longitudinal sample of respondents in Waves 1 & 4. Unweighted data (n=12,222)

Source: Wave 1 release 2.5.0, Wave 4 release 1

dents in other European countries. Life course events that were associated with a greater likelihood of receiving support included a change towards having severe limitations in daily activities and moving home.

These longitudinal country differences need to be explored further, but as mentioned in the introduction it should be pointed out that earlier research on how intergenerational exchanges operate has stressed that the regularity and intensity of support is higher in Southern Mediterranean countries. A deterioration in the self-perceived ability of the household to make ends meet financially is notably not associated with a greater probability of receiving support. In general, these results confirm the significant rise in the probability of receiving support that is associated with advanced age and the onset of disabilities, suggesting that families continue to be involved in the social care of their older members when their health deteriorates.

Table 33.4: Multivariate (logistic regression) for receiving support at Wave 4 by characteristics at Wave 4 and life course events occurring between Waves 1 & 4

Variables	Parameter estimates	Standard error
Gender (female)	-0.144***	(0.0464)
Age 64–69 (ref.)		
50–54	-0.192**	(0.0927)
55–59	-0.242**	(0.0803)
60–64	-0.172**	(0.0760)
75–79	0.413***	(0.0774)
80+	0.916***	(0.0754)
Country (France ref.)		
Austria	0.514***	(0.1050)
Germany	0.445***	(0.0947)
Sweden	0.087	(0.0911)
Netherlands	0.060	(0.0926)
Spain	0.078**	(0.0982)
Italy	0.258	(0.0922)
Denmark	0.719***	(0.1000)
Switzerland	-0.234	(0.1354)
Belgium	0.220**	(0.0818)
Living arrangements (Couple or 2 people ref.)		
lives alone	0.222***	(0.0536)
lives with others (3+)	0.054	(0.0704)
Self perceived health (fair health ref.)		
Good	-0.025	(0.0614)
Bad	0.488***	(0.0517)
Job situation (employed ref.)		
Retired	0.016	(0.0879)
Other inactive	0.091	(0.0609)
Self-perceived financial situation manages fairly easily ref.)		
With difficulty	0.147**	(0.0630)
Easily	0.030	(0.0530)
Life events between Waves 1 & 4		
Moves home (dummy)	0.220**	(0.1073)
Change in household composition (dummy)	0.011	(0.0530)
Change towards severe limitations in activities (dummy)	0.701***	(0.0627)
Change in job status (dummy)	-0.018	(0.0530)
Changes to experiencing financial difficulties (dummy)	-0.057	(0.0896)
Wald coefficient	1024.33***	

Significance: *** = 1%; ** = 5 %

Notes: Longitudinal sample of respondents in Waves 1 & 4. Unweighted data (n=12,222)

Source: Wave 1 release 2.5.0, Wave 4 release 1

33.5 Ill health and poverty place high demands on intergenerational support

Intergenerational exchanges of practical and financial support continue to exercise an important role in the context of Europe's population ageing. Families respond to the needs of their older members that arise following the onset of an illness, disability or frailty, and changes in living arrangements. The SHARE data show that changes in health and environmental conditions are more likely to trigger support within families than changes in the economic conditions of households such as the self-perceived ability to make ends meet or the passage to retirement. Although it is too early to know whether families will step in to support older Europeans who are at a greater risk of poverty due to the economic crisis, the results presented in this chapter suggest that changes in economic circumstances are not currently associated with increased family solidarity. More long term research is needed to determine whether the economic crisis has precipitated levels of illness and disability that would not normally have been observed within the older population and whether therefore, families will be under increasing pressure to provide social care for their older members.

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Simone Croezen, Mauricio Avendano, Alex Burdorf and Frank J van Lenthe

34 Does social participation decrease depressive symptoms in old age?

-
- ▶ Participation in social activity predicts decline in depressive symptoms over time
 - ▶ Engaging in religious and church activity reduces depressive symptoms the most
 - ▶ Voluntary and charity work do not seem to affect a change in depressive symptoms
 - ▶ Policies that enhance social participation may prevent late life depression
-

34.1 Social participation and depressive symptoms in old age

Late life depression is one of the most common mental health problems affecting older individuals. A study comparing ten Western European countries reported that the prevalence of depressive symptoms of clinical significance ranges from 18 per cent in Denmark to 36 per cent in Spain in persons aged 50 years and older (Castro-Costa et al. 2007). According to projections by the World Health Organization (WHO), depression will be the leading cause of Disability Adjusted Life Years (DALYs) lost in high income countries in 2030 (Mathers & Loncar 2006). Research suggests that a range of late-life events and experiences faced by older individuals have an impact on depression including the onset of a medical condition or disability, the loss of a family member, friend, work or social status, and the general loss of independence and control. In addition, a decrease in social interactions and social participation, elements of active ageing, is a leading risk factor of depressive symptoms in old age. An extensive body of research suggests that higher participation in religious or church activities, clubs, political groups, and volunteering, are all predictive of reduced depressive symptoms at old age (Abu-Rayya 2006, Sirven & Debrand 2008, Chiao et al. 2011, Baetz et al. 2012, Lou et al. 2012, Taylor et al. 2012). The causal mechanisms linking social participation and depressive symptoms, however, are not well understood. In addition, the social significance of different forms of social participation may be context-dependent, so that the mental health benefits of social participation may vary across countries.

Multiple causal mechanisms may explain the association between social participation and depressive symptoms. First, contact with others and engagement

in social or productive activities may provide a sense of purpose and meaning in life. Sharing interests, thoughts and difficult life events with others may stimulate individuals mentally and encourage them to remain connected to their family and community. Social engagement may thus decrease the risk of loneliness, a risk factor for depressive symptoms, and help older individuals to maintain high levels of life satisfaction. A second explanation is that reverse causation, or the impact of depressive symptoms on social participation, explains this association. That is, older individuals facing depressive symptoms may be less likely to engage in social activities. It has been suggested that both mechanisms may operate in a spiralling cycle: as older individuals engage in meaningful social activity and contact with others they accumulate positive experiences and are less likely to develop depressive symptoms. At the same time, having fewer depressive symptoms motivates one towards engaging in more social activities. A third explanation is that social engagement and depressive symptoms are not causally related, but share a common cause. For instance, the onset of a major chronic condition may lead to both depressive symptoms and reduced social engagement. In order to disentangle these three mechanisms, it is necessary to use longitudinal data to assess how changes in social participation may affect the development of depressive symptoms, and how these changes are independent from initial levels of depressive symptoms and confounding factors such as physical health.

Toward this end, we use the SHARE data to assess the link between different forms of social participation and depressive symptoms across ten countries. Our contribution is twofold. First, we implement an individual-fixed effect approach to assess whether individual changes in social interaction lead to changes in depressive symptoms. Individual fixed effects enable us to control for all time-invariant covariates that may bias the association between social participation and depressive symptoms. To assess the potential role of reverse causality, we control for individual levels of social participation and assess how changes in participation relate to changes in depressive symptoms.

Our second contribution is to examine whether the institutional context influences the way social participation relates to depressive symptoms. Most research examining the association between social participation and depressive symptoms has focused on a single population or has relied on cross-sectional data (Abu-Rayya 2006, Sirven & Debrand 2008, Chiao et al. 2011, Baetz et al. 2012, Lou et al. 2012, Taylor et al. 2012). We assess whether there are cross-national differences in how changes in social participation influence changes in older Europeans. We hypothesise that the association between social participation and the reduction of depressive symptoms is stronger in Northern and Western European countries where the role of families is weaker, and where formal participation in activities may be the most important source of social engagement at older ages. In turn, we

assume that respondents from Southern Europe, where family ties are stronger and opportunities to engage in volunteering or clubs is more limited, exhibit a weaker association between social participation and depressive symptoms.

34.2 Social participation and depression: measurement and analysis

Our study draws on data from the waves of SHARE collected in 2004/5, 2006/7, and 2010/11 (the data from 2008/9 did not include measures of social participation). We constructed a panel dataset that contained information on social participation, depression, and time-varying confounders for each wave. The analysis was limited to respondents who participated in all three waves and had valid weights for the balanced panel ($N = 9,491$). Small differences in sample size occurred depending on the valid values for all the variables included in a given model.

Social participation was measured by asking individuals to report whether they had engaged in any of the following activities: 1) voluntary or charity work; 2) educational or training course; 3) sport, social or other kind of club activities; 4) religious organisations; and 5) political or community organisations. For each of these activities, participants were then asked to report the frequency of their participation in the last month (almost daily, almost every week, and less often). We used the information on social participation in Waves 1 and 2 to examine how changes in participation between these two waves related to changes in depressive symptoms over the short- and medium-term, as determined by Waves 1–2 and Waves 1–4, respectively.

Depressive symptoms were measured based on the Euro-Depression scale (EURO-D), an instrument designed to compare mental health symptoms across European countries (Prince et al. 1999). The EURO-D consists of twelve items: depression, pessimism, death wish, guilt, sleep, interest, irritability, appetite, fatigue, concentration, enjoyment, and tearfulness. Each item is scored 0 (symptom not present) or 1 (symptom present), and item scores are summed (0–12). Previous studies have demonstrated validity for this measure against a variety of criteria for clinically significant depression, with an optimal cut-off point of 4 or above (Prince et al. 1999). We employed this cut-off point in the analysis.

SHARE includes a comprehensive set of potential confounding variables of the association between changes in social participation measures and depressive symptoms. We controlled for basic demographics, as well as for the following time-varying covariates updated at every wave: marital status, employment status, and limitations with activities of daily living.

34.2.1 Statistical analysis

We started by assessing mean and prevalence of depressive symptoms and social participation variables by country standardising by age and sex in each wave. To control for all time-invariant confounders, we then implemented fixed effect linear models that related changes in social participation between Waves 1 and 2 to changes in depressive symptoms between Waves 1 and 2 (short-term effect), as well as between Waves 1 and 4 (medium-term effect). We used these two specifications to assess whether the impact of changes in social participation is short-lived, or remains over a longer period of time, extending for four more years.

In order to measure change in social participation activities, we entered each of the variables in a model indicating for each wave whether respondents had engaged or not in each of the activities. Fixed effect estimates in models based on these variables can be interpreted as the impact of initiating a social activity on the depressive symptom scores. In separate models, we also constructed a score based on the sum of activities in which individuals engaged during the last month. Fixed effect estimates in this case can be interpreted as the impact of initiating a new activity on depressive symptom scores.

We began with analyses for all countries, incorporating country as a fixed effect term. Subsequently, we conducted separate analyses by country. In all analyses we used appropriate weights to account for the sampling design, non-response and attrition.

34.3 Variation in social participation and depression in old age

Social participation levels varied markedly across countries. On average, participation in sport, social and club activities was the most common form of social participation (23.7 percentage points), while participation in political or community organisation activities was the least common (4.7 percentage points). Social participation levels were generally higher in Denmark, Switzerland, Sweden and the Netherlands, and were typically lower in Spain and Italy. In general, at the population level, the proportion of citizens engaged in social participation remained stable over Waves 1 and 2, except for a large decrease in religious activities in Austria (18 percentage points) and large increases in sport, social and club activities (8 percentage points) in Denmark and Austria.

In Wave 4, some 30 per cent of the total SHARE sample was classified as experiencing depressive symptoms, but levels varied from 17 per cent in Denmark to 35

per cent in Italy, with patterns showing a North-South/East gradient (Figure 34.1). From Wave 1 to Wave 2, the prevalence of depression seemed to have declined in most countries, although the decrease in prevalence was only statistically significant in France. In five of the ten countries depressive symptoms occurred most frequently in Wave 4 compared to its prior waves.

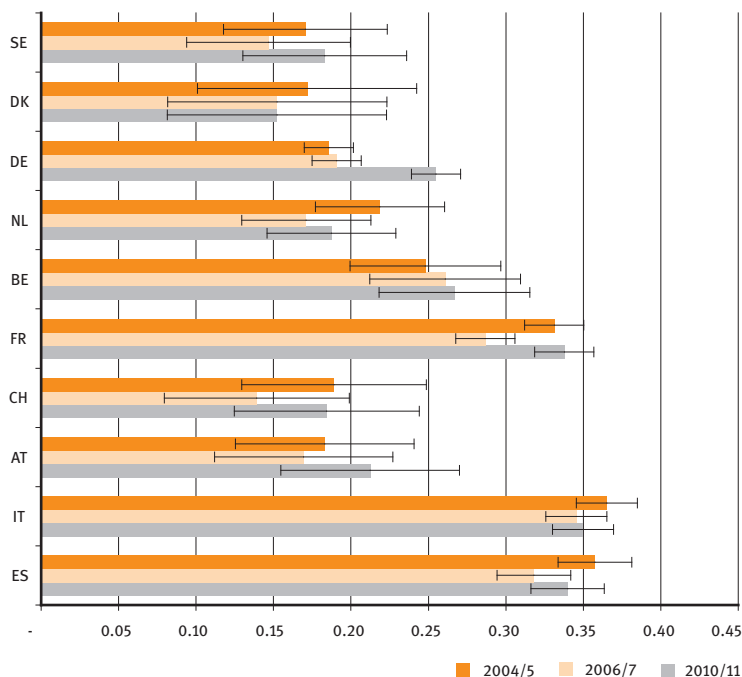


Figure 34.1: Prevalence of depressive symptoms in ten European countries across three waves, 2004/5, 2006/7, 2010/11 (n=9,483)

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

34.4 Social participation as predictor of depressive symptoms

After adjusting for age, initiating a social activity predicted a decline in depressive symptoms in the short term (Table 34.1). However, when controlling for the socio-demographic and health related variables, the estimate of initiating social activities decreased by twelve per cent and did not reach con-

Table 34.1: Effect of a change in contemporaneous social participation on short term change in depressive symptom score, 2004/5 and 2006/7 (n=9,350)

	Model 1 estimate	SE	Model 2 estimate	SE	Model 3 Estimate	SE	Model 4 Estimate	SE
<i>Social participation</i>								
Score social participation	-0.059***	0.027	-0.052	0.027	-0.022	0.061	-0.026	0.060
Voluntary/charity					0.024	0.076	-0.009	0.075
Educational/training					-0.094	0.050	-0.066	0.049
Sport/social club					-0.138**	0.068	-0.154**	0.067
Religious/church					0.005	0.095	0.065	0.092
Political/community								
<i>Socio-demographics</i>								
Age	-0.037****	0.011	-0.070****	0.012	-0.036****	0.011	-0.070****	0.012
Household size			-0.069**	0.035			-0.071**	0.035
Separated/divorced/unmarried			-0.627**	0.284			-0.600**	0.285
Widowed			1.209****	0.183			1.22****	0.183
Unemployed			0.363****	0.106			0.365****	0.107
Retired			0.032	0.064			0.029	0.064
<i>Socio-economic</i>								
Log household income			-0.010	0.022			-0.008	0.022
Log household wealth			-0.065****	0.018			-0.064****	0.018
<i>Health related</i>								
Disabled			0.193	0.142			0.195	0.142
Number of IADL			0.359****	0.037			0.360****	0.037
Number ADL			0.016	0.043			0.015	0.043
Self-rated health			0.247****	0.024			0.247****	0.024
GALI limitations			-0.218****	0.032			-0.218****	0.032
Heart attack			0.194**	0.075			0.194**	0.075
Hypertension			0.131**	0.053			0.134**	0.053
Stroke			0.066	0.130			0.066	0.131
High blood sugar/diabetes			0.096	0.101			0.093	0.101
Chronic lung disease			0.096	0.094			0.097	0.094

Significance: **=5%, ***=1%, ****=0.1%
Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

Table 34.2: Effect of a change in lagged social participation on medium-term change in depressive symptom score (n=9,373)

	Model 1 estimate	SE	Model 2 estimate	SE	Model 3 Estimate	SE	Model 4 Estimate	SE
<i>Social participation</i>								
Score social participation	-0.059**	0.030	-0.036	0.029	-0.037	0.067	-0.009	0.066
Voluntary/charity					-0.016	0.083	-0.013	0.082
Educational/training					-0.087	0.055	-0.049	0.054
Sport/social club					-0.183**	0.074	-0.160**	0.075
Religious/church					0.158	0.104	0.149	0.102
Political/community								
<i>Sociodemographics</i>								
Age	0.035****	0.004	0.001	0.010	0.035****	0.004	0.002	0.010
Household size			-0.050	0.032			-0.049	0.032
Separated/divorced/unmarried			0.051	0.275			0.065	0.276
Widowed			0.384***	0.141			0.391***	0.141
Unemployed			0.236	0.121			0.239**	0.121
Retired			-0.023	0.054			-0.024	0.054
<i>Socio-economic</i>								
Log household income			-0.035**	0.017			-0.035***	0.017
Log household wealth			-0.012	0.013			-0.013	0.013
<i>Health-related</i>								
Disabled			0.391***	0.141			0.389***	0.141
Number of IADL			0.258****	0.030			0.258****	0.030
Number ADL			0.016	0.035			0.015	0.035
Self-rated health			0.406****	0.025			0.406****	0.025
GAI limitations			0.014	0.025			0.015	0.025
Heart attack			0.051	0.069			0.047	0.069
Hypertension			0.157***	0.051			0.160***	0.051
Stroke			-0.183	0.120			-0.180	0.120
High blood sugar/diabetes			0.068	0.088			0.066	0.088
Chronic lung disease			0.111	0.089			0.112	0.089

Significance: **=5%, ***=1%, ****=0.1%

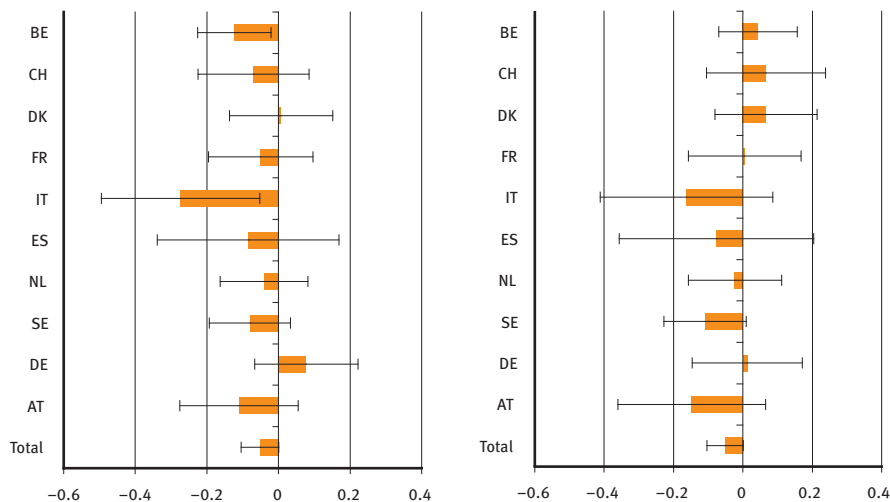
Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

ventional levels of statistical significance ($p = 0.06$). The largest influence on the increase in depressive symptoms during the two year follow-up was observed for losing a spouse, becoming unemployed, and increasing the number of limitations in instrumental activities in daily living. Among the types of social activities, initiating religious/church activities predicted a decline in depressive symptoms in the short term, even after controlling for a wide range of potential confounding factors.

Over a medium period of time (an additional 4 years follow-up), findings were remarkably similar (Table 34.2). Changes in social participation predicted a change in depressive symptoms, but after including control variables the estimate decreased by 39 per cent and was no longer statistically significant. Among the social activities, only changes in religious/church activities predicted changes in depressive symptoms after taking into account all control variables. In general, baseline variables with the highest influence on increase in depressive symptoms after two years were less predictive of changes in depressive symptoms during another four years.

34.5 Social participation and depressive symptoms: does country context matter?

In most countries, except for Denmark and Germany, initiating social activities over the short term was related to declines in depressive symptoms during the two-year follow-up (Figure 34.2). But, only in Italy and Belgium did contemporaneous changes in social participation have a significant impact on changes in depressive symptoms. The overall impact of a change in social activities was of borderline significance after controlling for other factors. Moreover, the geographical pattern could not be explained by the proportion of respondents engaged in social participation activities or by prevalence of depressive symptoms. In the lagged analysis with an additional four-year follow-up, the influence of social activities was smaller in most countries and not significant.



(a) Effect of a change in contemporaneous social participation on a change in depressive symptoms, 2004/5 and 2006/7 (n=9,346)

(b) Effect of a change in lagged social participation on a change in depressive symptoms, 2004/5, 2006/7, 2010/11 (n=9,373)

Figure 34.2: Effect of a change in social participation on a change in depressive symptoms
Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

34.6 Religious and church activities reduce depressive symptoms most

Our study showed that initiating social participation activities predicted a decline in depressive symptoms in the short-term. But adjustment for socio-demographic and health-related factors attenuated the association between increased social activities and decreased depressive symptoms. A follow-up analysis showed, moreover, that the influence of new social activity on the decrease in depressive symptoms during the first two years was not maintained over four more years. In-depth analysis of the types of social activities showed that becoming engaged in religious and church activities reduced depressive symptoms, both in the short and medium term. Countries varied markedly in their levels of social participation and prevalence of depressive symptoms, and changes over time in participation and depression were mostly modest. In contrast to our initial hypothesis, no clear geographical pattern in the associations between social participation and depressive symptoms could be discerned.

The longitudinal analysis on change in social participation and depressive symptoms during the first two years of follow-up suggests that participation does influence the presence of depressive symptoms. However, this association was primarily determined by becoming engaged in religious and church activities. The same associations were not found in other social activities, namely sport, social and club activities and voluntary and charity work. There are compelling suggestions from several studies that religious involvement (e. g. service attendance, religious guidance, religious coping) has a protective effect against the incidence and persistence of depressive symptoms and depressive disorders (George 2011) and is associated with fewer depressive symptoms overall (Holt et al. 2011). It may be concluded that providing a sense of purpose and meaning in life is an important principle for preventing depression. However, the influence of religion may also be the result of strong social ties and social support in religious communities. In this respect, it is also of interest to note that the short-term effect of becoming engaged in religious activities was sustained in a medium-term effect after four more years. More in-depth analyses are necessary to evaluate whether the large decrease in religious activities that was observed in Austria biased these findings and whether the observed increase in religious activities over time in most countries depends on health status and depressive symptoms at baseline.

Voluntary and charity work as a form of social participation was not associated with any change in depressive symptoms. This finding seems to be in contrast with the results from previous research (Piliavin et al. 2007, Li & Ferraro 2011). A potential explanation for differences across longitudinal studies is that it may be questioned whether in this population clear changes in volunteering behaviour can be expected. Indeed, in most countries in the SHARE study the proportion of respondents involved in voluntary and charity work was remarkable stable during the two year period and, thus, the change in this type of social participation may have been too small to detect any meaningful influence of presence of depressive symptoms.

As for involvement in sport, social and club activities, the observed associations suggest at best a modest reduction of depressive symptoms, but statistical significance could not be demonstrated. It is of interest to note that in all but one country the proportion of respondents engaged in sport, social, and club activities increased by one per cent to eight per cent. It is not possible to disentangle whether this reflects a true change in participation or whether the inhabitants with a more active lifestyle were more likely to participate in the follow-up waves of SHARE. Selective attrition may bias any association between this type of participation and change in depressive symptoms towards a null association.

Several health-related variables predicted an increase in depressive symptoms in the short and longer run. Moreover, their predictive power was not influenced by adjustment for types of social participation. Thus, health status did

not confound the reported impact of becoming engaged in social activities on decrease in depressive symptoms. A similar pattern was also observed for other determinants of depressive symptoms, most notably losing a spouse, being unemployed, and having less wealth. This supports the evidence for a causal effect of participation on presence of depressive symptoms.

A strength of this study was its use of longitudinal data. Previous research has relied mainly on cross-sectional findings. Moreover, by employing a fixed approach we were able to control for time-invariant confounders. We investigated causality by relating changes in participation to changes in depressive symptoms. While reverse causality cannot be fully ruled out in a fixed effect setting, the fact that effects of some forms of social participation, and particularly participation in religious communities, remained over a four year period suggests a potential sustained effect on depressive symptoms.

Nevertheless, one shortcoming of the study should be noted. We were unable to assess changes in social participation between the first and last wave of data collection and their impact on changes in symptoms of depression due to changes in the recall period used in the question assessing social participation in Wave 4. This would have been of interest, since changes in social participation over time may also be linked to attrition from the study.

In conclusion, our results suggest that participation in religious and church activities is associated with reduced risk of developing depressive symptoms, an effect that persists over a prolonged period of at least four years. If proven causal, these results would suggest that policies that encourage or enable older individuals to maintain their affiliation to religious or church communities (e. g., by facilitating their attendance to their religious communities via public transport) may result in reduced prevalence of depressive symptoms among older persons. Further research is required to disentangle the nature of this effect, and to examine whether it is the purpose in life provided by a religious affiliation, or the community support received at church, which brings a mental health benefit. Whatever the explanation, the results suggest that places of worship may offer a relevant setting for the implementation of programmes to prevent depressive symptoms among people in late life.

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