First Results from the Survey of Health, Ageing and Retirement in Europe (2004-2007)

Starting the Longitudinal Dimension

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Axel Börsch-Supan

1 Introduction

Axel Börsch-Supan

This book presents very first insights from re-visiting the SHARE respondents. SHARE, the Survey of Health, Ageing and Retirement in Europe, is still a very young enterprise. In 2004, we started to paint a picture of the lives of Europeans aged 50 and over. Almost 28,000 persons in 11 countries from Scandinavia to the Mediterranean patiently answered our questions and formed the foundations of this ambitious study. We looked at their physical and mental health, their families and social networks, and their economic situation. We found an amazingly large variation of their life circumstances in the 11 involved countries, which we documented in our "First Results Book" that appeared in the spring of 2005 (Börsch-Supan et al., 2005).

Since then, the SHARE enterprise has grown. Re-visiting our sample members in 2006/2007 and observing the changes between the two interviews adds dynamics to an otherwise static and thus superficial picture. Ageing is a process, not a state, and re-visiting our respondents in regular intervals is an essential part of the study design in order to understand how individuals and families are affected by their own ageing, and by the social and political changes precipitated by the ageing of our entire populations.

SHARE also grew in coverage. SHARE now encompasses 16 countries. Already in 2005/2006, SHARE data were collected in Israel, adding a unique cultural, social, and economic perspective to our project. With the Czech Republic and Poland joining SHARE, two new EU member countries enrich our study with the experiences of ageing in transition countries. Slovenia, another formerly socialist country, is scheduled to follow in the fall of 2008, while data collection in Ireland is still ongoing.

Most importantly, SHARE has grown to become a veritable research infrastructure. While SHARE is still young, very young for a longitudinal study indeed, it has already created a large user community and a wealth of findings. The user community has increased in just two years to about 900 registrations at the two archives from which scientists can access the data free of charge. It is remarkable that the speed of registration has not slowed down during the last two years; rather, we expect another jump with the release of the second-wave data. More than 100 publications based on the first wave of SHARE are currently registered on the SHARE website. Again, we expect a surge of new papers once the second wave of data is released to the scientific community.

The wealth of findings is what this book is all about. We show, how SHARE compares to the U.S. Health and Retirement Study and the English Longitudinal Study of Ageing (chapter 2), what the added value created by the new SHARE countries is (chapter 3), and how older Europeans' lives have changed between 2004 and 2007. These findings are structured by domain: health and health behaviour (chapter 4), social and family context (chapter 5), work and retirement (chapter 6), and the socio-economic status of our respondents (chapter 7). We provide a comprehensive summary in section 1.6 below.

These findings do not fall from heaven. Collecting data that are useful for the research community and that are able to produce fascinating findings is a challenge and a lot of hard work. Before delving into the findings, it is therefore helpful to appreciate the four features which make SHARE unique and fascinating: the topic of ageing, SHARE's interdisciplinarity, its international point of view, and its focus on processes over time.

1.1 The Fascination of the Ageing Process

Ageing affects all of us, both as individuals and as societies. As individuals, ageing is an emotional topic because it affects us so deeply. After a period of stability for most individuals during midlife, retirement and old-age are new phases of life with renewed uncertainty. We are concerned about declining health and deteriorating productivity and worry about how life will be like after retirement. Part of this uncertainty stems from the great variety of individual ageing processes.

From the societal point of view, ageing is one of the megatrends in our century. This holds in particular for Europe. "Old Europe", as an outside observer has put it, is the continent already with the highest proportion of elderly citizens, and the population ageing process will continue for the better part of this century. Population ageing is often seen as a plague, threatening our living standards. Indeed, there are formidable challenges of our social security and health care systems, in providing care both in the family and in institutions.

Our longer lives, however, also provide fascinating chances. The overlap of four generations is a novelty in human history and will provide the younger generation with more experiences. Modern technology and the increase of professions in which experience and management abilities count more than physical strength will open new possibilities for older individuals to actively participate.

Understanding how the ageing process will affect all of us, and how it affects the people in the European countries differently, because their culture, their historically grown societal structures and their public policy approaches differ, is an important task for researchers in economics, social sciences, and public health in order to turn the challenges of population ageing in Europe into chances.

1.2 Why Do We Need More Interdisciplinary Data to Understand Ageing?

This appears an easy question, as it appears just obvious that ageing affects all domains of an individual's life. Retirement changes the economic circumstances and how time is spent. Health and health care become an increasing concern. The individual's role in the family changes as support given and received intensifies. These three domains – health, economic status, and social/family ties – are strongly linked. Economic status expressed by income and wealth is strongly correlated with health and well-being of the elderly. For example, there is much evidence that wealthier persons live longer than poorer persons. Another bi-directional link is between health and family/social networks. A "healthy" social environment keeps elderly longer physically and mentally fit. In turn, health events such as a stroke often precipitate a change in living arrangements such as a move to children or into a nursing home. Finally, income security and the social environment are linked, since a well working social network is a resource also in an economic sense, providing money and in-kind support for the less well-to-do elderly. In turn, poverty often comes with social exclusion, doubly worsening the quality of life.

While it appears so obvious that an interdisciplinary and holistic approach is the right way to go, there is a lack of such data, and in particular at the European level. One reason is the difficulty of collecting such data. One needs specialists in all disciplines, and they have to work together. Since science is strongly compartmentalised, this is not an easy task. Europe has a social survey (the ESS), a survey for economic status (EU-SILC),

and hopefully soon a European health survey. These mono-disciplinary surveys, however, teach us little about how health affects economic status, how family networks work after a health shock, and how social exclusion and economic hardship may amplify each other in old age.

This is the reason, why SHARE is a multidisciplinary enterprise with a strong emphasis on looking always from at least three angles: economics, health, and social networks, most importantly the family. This holistic approach is one of the big strengths of SHARE, created to foster cross-fertilisation across disciplines which have historically ignored each other.

1.3 Why Do We Need More International Data to Understand Ageing?

This is a much harder question. The answer is one of the roots of the European development process. One only learns from differences. If everything stays the same, we cannot understand how the world has become as it is right now. We need to see different policies, observe the different reactions to them, to at least have a chance to understand which policy element caused which reaction.

Europe has an enormous wealth in its diversity of cultures, histories, and policy approaches. More than any other continent, Europe is blessed with large cultural, historical and political differences even within short distances. Comparing countries and regions to simply observe how these differences have shaped the behaviour of the European citizens is a fascinating task; understanding the mechanisms through which culture, history, and public policy affects all of us, is even more fascinating.

We understand Europe as a laboratory of cultural and political approaches happening in our historical time. Sometimes these approaches are coordinated, but often they are not. SHARE is the observatory of the cultural and political approaches and the reactions to them. The data thus generated help researchers in the difficult enterprise to identify causes and effects. They support the open method of coordination with the indicators to compare and evaluate what is going on in the member countries.

The 16 countries in SHARE do not include all European countries, not even all EU member countries, although they represent much of the variety from South to North and West to East. Each new country enriches the SHARE data to the benefit of all other countries: the sum is much more than just the addition of the currently 16 parts. This is the essence of comparisons: the more variation among the countries, the more valuable are comparisons across countries.

It is not easy to collect international data. Languages are different, institutions are different, sometimes similar words suggest very different meanings. And answers are different, even to the very same question, because response styles differ across countries: Danes tend to give overly optimistic, Germans overly pessimistic answers. SHARE has made great efforts to deliver truly comparable data, and we provide additional data to correct for response styles, so we can reliably study how differences in cultures, living conditions and policy approaches shape the quality of life of Europeans just before and after retirement.

1.4 Why Do We Need More Longitudinal Data to Understand Ageing?

Ageing is a process, and not a state. This holds for individual ageing just as well as for population ageing. Since processes need to be observed over time, understanding individuals and population ageing needs an observatory of longitudinal data: we need to re-interview the same individuals as they retire and age; and we need to re-interview the same individuals as they are exposed to the unfolding phases of population ageing.

Why do we need the same individual? Observing two individuals of different age at the same time is no substitute for observation the same person at two ages, since the two persons have been born in different years and thus have experienced other times. We are particularly interested in understanding the transitions between three distinct phases of life:

- Phase 1 is the time before retirement. Most of these respondents are married; many have their children still at home; often, both parents are working. These respondents do not particularly like to be associated with research on the elderly and they are busy, not easily interviewed. About a third of our respondents are in this phase. Planning for retirement is an important aspect of this phase, and SHARE spends a lot of effort to understand it.
- Phase 2 is the time after retirement. Most of these respondents are still married; it is an active and mostly healthy time with some travelling, especially for the well-to-do. These respondents have time and are the most easily interviewed in our sample. Savings and consumption pattern change with the transition to retirement. SHARE tries to document these changes, and the changes in social and family life which go along with them.
- Our oldest old live in Phase 3. Diversity is largest, in particular concerning health and how respondents cope with old age and frail health. Interviews often take a long time, but most often, these respondents are alone and, once confidence is ascertained, like to talk about their lives. About a tenth of our respondents are in this phase. SHARE supplies a broad set of health and well-being measures to help researchers understand the needs of the oldest old.

Observing the transitions during and between these three phases is a major task of SHARE. It requires a steady flow of re-interviews not to loose track; we have chosen bi-annual intervals as a compromise between costs and respondents' burden on the one hand, and a steady information flow on the other hand.

Another reason for longitudinal data is equally fundamental. The time dimension provides a crucial handle to detect causality which is not possible in a single wave of data. Causality is easiest detected if one can establish that an event happened after the cause. In a single cross-sectional wave of data, with all individuals observed at the same time, a sequence of events is impossible to detect.

Finally, the European Union is undergoing rapid institutional change. Some countries have enacted dramatic pension reforms. All countries are working on health care reform. A host of incremental labour market reforms is going on. Data with time dimension lets researchers observe the reaction to those changes, e.g. the choice of a later retirement age or higher old-age savings in response to pension reform, different health service utilisation and corresponding health status changes in response to health care reform, and possibly higher labour force participation in response to labour market reforms. With longitudinal

data, Europe with its huge policy diversity represents a "natural laboratory" in which we can learn a great deal about the effects of public policy on the behaviour and the well-being of its citizens.

1.5 SHARE as an Infrastructure

Science means observing, measuring, and then explaining. Much as physicists need an infrastructure like CERN to understand particle physics, and astronomers need an infrastructure of telescopes, social scientists need an infrastructure of survey data to base their research on quantifiable and falsifiable hypotheses. Hence, research on the health, social and economic features of ageing requires an infrastructure of easily accessible micro-data on the health, work, economic, and social conditions of individuals as they age and the resulting quality of life and well-being.

The European Commission has identified population ageing and its social and economic challenges to growth and prosperity to be among the most pressing challenges of the 21st century in Europe. Responding to the March 2000 Special European Council in Lisbon, a Communication by the European Commission to the Council and the European Parliament calls to "examine the possibility of establishing, in co-operation with Member States, a European Longitudinal Ageing Survey." The SHARE data collected in the first two waves and presented in this book are the baseline for such a longitudinal survey.

The large and still increasing number of registrations is evidence that data on ageing is indeed in great demand. As mentioned before, SHARE has already attracted about 900 registrations, corresponding to more than 2500 researchers world wide who are working with the infrastructure. Over 100 scientific publications from all fields mentioned above have been registered by the SHARE office. User registrations and publications have increased more than linearly over the last two years, with large increases after each data release. We conclude that SHARE is an infrastructure with a great research potential for the years to come.

Building up a data infrastructure is a formidable task. The combination of these three design features – interdisciplinary, cross-national, and longitudinal – is a scientific challenge. We have employed state-of-the-art technology. For example, to meet all country specific institutional and linguistic requirements in a single common design, the SHARE team has developed together with CentERdata a set of innovative software instruments such as translation and survey management tools.

The task is not made easier by our open access policy for the SHARE data. We strive to release the data as early as possible to the interested research community, even before it has undergone extensive checking which easily takes more than another year. This first data release will be available to all researchers free of charge in the autumn of 2008.

SHARE has been elected to be one of the infrastructures of the European Strategy Forum on Research Infrastructures (ESFRI) in 2007. From late 2010 onwards, SHARE is scheduled to be financed through a consortium of member countries, the European Union, and the U.S. National Institute on Aging. The governance, financial, and legal foundations for this consortium are currently being established as part of a preparatory project funded by the 7th framework programme with a joint memorandum of understanding scheduled for signature by December 2009. In addition to the scientific challenge of collecting international data, the SHARE infrastructure thus also faces the management challenge of decentrally financing an international data infrastructure.

1.6 Our Main Results

The analyses in this book provide a wealth of insights about individual and population ageing. While some results may have been shown in one country or another, SHARE is able to draw an internally consistent picture throughout Europe. While some results are known to specialists, SHARE puts them into a broader context and links them to facts from other disciplines.

In order to provide a taste for the SHARE data, and to encourage researchers to download the data, the following pages provide a selection of highlights that will be spelled out in more detail in the contributions to this book.

The New SHARE Countries: Poland, Czech Republic, and Israel
- While the Czech Republic and Poland share common political and economic experiences, they are in many dimensions different from each other:
- In the Czech Republic, individuals aged 50+ have maintained a much greater labour market involvement. In Poland, not only are the levels of employment significantly lower than those of its southern neighbour, but labour market conditions of those who are working seem to be much inferior.
- In several respects the conditions in the Czech Republic are very much like those in the northern SHARE countries, while Poland resembles more the southern SHARE countries.
- A good example is income inequality among the 50+ population: In the Czech Republic, it is only slightly higher than in the Nordic countries, and lower than in almost all continental countries. By contrast, Poland is characterised by very high income inequality, higher than in any other SHARE country.
- The diversity among Israeli population groups provides many additional points on the scale of social and economic development among the SHARE countries. Life circumstances and their subjective assessment are very different across the major population groups in Israel. This is, e.g., reflected in the different ages at which Israelis exit the labour force, and is likely to have major implications for well-being in late life.
- Despite these differences, population group per se does not affect perceived income adequacy in Israel.

Quality of Life
- Subjectively assessed quality of life varies considerably across European countries. We found relatively high levels in the northern and western European countries and relatively low levels in southern and eastern European countries.
- Low income and low level of education are related to lower quality of life.
- Engaging in socially productive activities is associated with greater well-being in older age. Our results highlight the importance of analysing changes in activity over time as these were shown to be related to well-being.

Health
- Low socioeconomic status is associated with worsening health: Europeans with a low education and wealth experience more cases of cardiovascular disease, lung disease, arthritis, deterioration in health and disability, and higher mortality rates than their high socioeconomic status counterparts.

- Smoking and low physical activity were most consistently associated with health deterioration among Europeans, whereas a mixed picture emerges for the impact of overweight, obesity, and alcohol consumption on different health outcomes.

Health Behaviour

- Men are more likely to stop smoking, while women are more likely to become physically inactive and obese.
- Higher education and wealth are independently associated with changes towards a healthier lifestyle. Whereas wealth is a stronger predictor of quitting smoking, low education is a stronger predictor of becoming overweight or obese.
- Southern Europeans are generally more likely to become physically inactive than northern or central Europeans.
- While smoking, alcohol consumption, underweight, overweight, obesity, hypertension, and diabetes are associated with socioeconomic status, they explain only a small fraction of socioeconomic disparities in health.

Health Service Utilization

- There is a lower level of medical contacts and medication in the northern SHARE countries and in Switzerland, and a higher level of hospital admissions in Austria and Germany, compared with the SHARE average. Also the Czech Republic and Israel had higher health service utilization while a large proportion in Poland indicated no medical contacts, no surgery, and no medication. These cross-national differences are stable even after correcting for demographic and subjective health differences between countries.
- The occurrence of life events such as retirement or the death of a spouse, but also a reduction in economic resources such as income or health insurance coverage, precipitated higher levels of health services utilization such as ambulatory medical care, medication and hospitalizations. Reasons for these associations, however, deserve further research.

Housing

- Overall, there are good housing conditions well into old age, with size increasing, and deficiencies not much higher than among middle-aged adults. Given the higher ownership rates among younger groups, it is likely that future cohorts of elderly people will be even better off in this respect.
- The majority of the 50+ own their home. The yearly mobility rate is a low two percent. If they move, however, there are clear indications of downsizing, especially among the lower income group.
- In most countries – especially in the South and East – there is a large deficit of special provisions that assist persons with physical impairments or health problems. This creates a considerable risk of having to move out of one's home.

Family and Social Networks

- The demise of the family is a myth. The SHARE data show that time spent helping others in the family or looking after grandchildren is still substantial: About a third of the persons age 65+ reported that they helped others or looked after grandchildren on a daily basis. They spent on average 4.6 hours per day on such activities. Because

generations still live geographically close, the potential for everyday support is high all across Europe.
- While this is true for Western Europe as a whole, there are important differences among the 'strong family countries' in the South and the 'weak family countries' in the North. Of the two eastern European countries, Poland belongs to the 'strong family' regime, while the Czech Republic tends towards the 'weak family' regime.
- Mid-life European women who reported a deterioration of the health of their elderly parents between 2004 and 2006 were less likely to be working and more likely to be providing intensive informal care in 2006. These correlations grow in size and significance from North to South. This gradient mirrors the North-South gradient in the development of long-term formal care systems.
- Older Europeans continue to make gifts of money to their social network as they are ageing. This suggests the high degree of stability in the frequency of transfers. Only among very old Europeans is the likelihood of making a financial transfer decreasing.
- Important events in family life precipitate financial transfers. Older Europeans respond both to crises within the family as well as to 'happy' events, such as the arrival of a grandchild. Moving into retirement does not diminish the likelihood of making a gift of money, but on the contrary increases it.

Employment and Job Quality

- Job quality and the situation at the work place have important consequences for job satisfaction. Poor job satisfaction, in turn, leads to premature quitting of the labour force and early retirement. In fact, low subjective job satisfaction is the strongest predictor for early retirement, followed by jobs which are not sufficiently challenging.
- Low quality of work of older participants in the work force predicts a higher prevalence of depressive symptoms and a higher proportion of subjects reporting decreased self-perceived health two years later.

Employment and Health

- Changes in labour force participation do not depend in a simple way on changes in health. Although employed individuals tend to be healthier on average, many countries have large fractions of retirees in good health.
- The association between retirement and a worsening of health is stronger if health is measured by a subjective self-assessment, and weaker if measured more objectively e.g. by grip strength. This indicates "justification bias" in self-assessed health.
- Cross-national differences in disability insurance enrolment are not related to objective health measures. Institutional features of disability insurance, however, such as coverage, benefit generosity, or whether a medical examination is needed, explain more than three quarters of the cross-national differences in disability insurance enrolment rates.
- The age of labour market withdrawal is about two years later for individuals who have fair or better health as compared to workers in poor health. This means that spending up to 3% of life-time labour income on preventing poor health will pay for itself by preserving employability.
- The longitudinal SHARE data show that retirement induces, together with other determinants, the onset of depression symptoms, typically with a delay of a few years.

Volunteering

- Older Europeans who are currently entering retirement play a crucial role in the domestic economy of caring and support, not only for their own family members but also for other members of their social network and indeed even in a voluntary or semi-professional capacity.

- Formal volunteering is a dimension of 'productive ageing' characterised by greater stability over time than informal volunteering. Volunteer transitions among older Europeans were often precipitated by changes in the individual's resources (e.g. health status or time availability).

Economic Status, Income and Wealth

- Differences in household income of the 50+ across the SHARE countries are large. The eastern European countries (particularly Poland) display the lowest median incomes, followed by southern European countries.

- Retirement has different effects on income across groups of countries. In Central Europe retirement is associated with sizeable income drops, but is followed by positive income dynamics compared to those who remain employed. In Southern Europe the reverse is true: there are very small income drops at retirement, but pension incomes fall behind wages over time.

- Even though the two waves of SHARE are not that far apart in time, we observe substantial changes in household balance sheets, both in ownership and in amounts, between 2004 and 2006. Most of the changes in assets amounts are due to the house price boom, while most changes in financial asset ownership occur in Northern and Central Europe, a reflection of the more developed state of their financial markets.

- So far, the SHARE data do not show consistently that consumption drops after retirement. We find a significant difference of food consumption between newly retired and employed households only in Southern Europe.

Poverty and Inequality

- Income inequality among the 50+ follows a rough north-south gradient, being relatively low in Sweden and Denmark, and high in Spain and Greece. It is lowest in Austria and highest in Poland. In the Czech Republic, it is only slightly higher than in the Nordic countries.

- In all SHARE countries, consumption inequality is lower than income inequality, and income inequality is lower than wealth inequality.

- Living close to one's children, in the same household or the same building, remains a very important mechanism of social solidarity with an important poverty alleviation role, not only in the South but also in Germany.

- Persistent poverty among the 50+ appears to be linked closely to deterioration in health status.

1.7 Where Do We Go From Here?

These first and mostly descriptive results show the unprecedented richness of the SHARE data at two points of time and for three equally important domains of everyday life: economic circumstances, health and well-being conditions, and the integration into family and social networks. The true power of the SHARE data will unfold when researchers perform multivariate analyses which can take advantage of the richness of the SHARE data and their longitudinal dimension. We therefore encourage researchers to download the second wave data and continue with multivariate and behavioural analyses, since SHARE is meant to be an infrastructure for all researchers in public health, economics, and the social sciences.

Our next steps are the generation of a final data base of Wave 1 and Wave 2 data. The articles in this book are based on an early and incomplete release of the SHARE Wave 2 data, created in December 2007, see Chapter 8. While we have done a host of crosschecks, an extensive consistency and plausibility check of all data with a subsequent imputation process is work still to be done. All results in this book are therefore preliminary. We encourage readers to report any inconsistencies to us.

Chapter 8 in this book briefly describes the main methodological features of SHARE. Further details on the SHARE baseline sample are contained in Börsch-Supan and Jürges (2005). Some important points are worth mentioning right at this outset: All descriptive results in this book are based on weighted data; no weights have been used in the regression analyses. The weights are calibrated to reflect each country's age and gender proportions. While response rates are high and very similar across the entire age range, the baseline data did not include the institutionalised population, except for Denmark and Sweden. The second wave of SHARE did document the transitions into institutions such as nursing homes and assisted living of those who were interviewed in Wave 1.

From its beginning, SHARE was designed to be a longitudinal survey. This book documents the first longitudinal follow-up in 2006/2007. As a third wave of data, SHARE is currently establishing a retrospective baseline of life-history data. The project, funded by the 7th framework programme, is called SHARE-LIFE and will be in the field between October 2008 and May 2009. Life history data is expected to be released in early 2010.

As part of ESFRI, SHARE is scheduled to be financed through a consortium of member countries, the European Union and the U.S. National Institute on Aging from late 2010 onwards. Given that the governance, financial, and legal foundations for this consortium are successfully finished by December 2009, a fourth wave of data will be collected in 2010/2011, followed by similar waves every two years.

We envisage two further extensions. SHARE covers all regions in Europe to some extent, but misses many individual countries of the European Union, from Portugal in the very Southwest to Finland and the Baltic Countries in the very Northeast. All EU countries are invited to join the ESFRI process and participate in SHARE.

On the scientific side, we want to augment the bi-annual rhythm by in-between wave modules targeted to specific research questions, in particular innovative approaches to data collection. Examples are special modules on nutrition, on time use, or on in-depth health measures. We are very happy to invite researchers to submit innovative ideas to SHARE in order to keep it a lively and research-oriented infrastructure by researchers for researchers.

1.8 Acknowledgements

2 Comparison Between SHARE, ELSA, and HRS

Editor: Arie Kapteyn

2.1 Overview of Available Aging Data Sets

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SHARE was not developed in a vacuum. In fact, its development closely follows its sibling studies HRS (Health and Retirement Study; USA) and ELSA (English Longitudinal Study of Ageing; England). Apart from the savings on development costs, this has the important implication for researchers that we can not only compare countries within SHARE, but also compare across studies with the USA and England. Other countries have realized the same advantages and have instigated similar studies. In this chapter, we exploit this and rather than compare countries within SHARE, we compare SHARE results with results from (some of) the other studies. As an introduction to the empirical sections, which look at specific topics, in this section we give a brief overview of available and planned aging studies. We will focus on studies that have been developed after 1990 and which are intended to be closely comparable to the HRS.

Table 1 lists the most important data sets that are closely related to the HRS (and thus to SHARE) that are currently widely available, the country or countries they represent, and their websites. Note that for historical or logistic reasons, not all studies cover the whole (geographic) country represented. From this table, we see that SHARE, HRS, and ELSA represent Western developed countries; The Mexican Health and Aging Study (MHAS) adds a Latin American country, and the Korean Longitudinal Study on Aging (KLoSA) a developed Asian country.

Name	Country/countries	Website
SHARE	Continental Europe + Israel	http://www.share-project.org/
HRS	USA (excl. territories)	http://hrsonline.isr.umich.edu/ RAND-HRS: http://www.rand.org/labor/aging/dataprod/
ELSA	England (not the whole UK)	http://www.ifs.org.uk/elsa/
KLoSA	South Korea (excl. Jeju)	http://klosa.re.kr/KLOSA/default.asp
MHAS	Mexico	http://www.mhas.pop.upenn.edu/english/home.htm

Table 1 Available data sets similar to the Health and Retirement Study HRS

There are numerous aging studies that are older and less comparable to the HRS, post-1990 studies that are also less comparable to the HRS (e.g., because they mainly concentrate on health issues and do not cover socio-economic aspects in detail), and a few smaller and/or less widely available studies. Additionally, there are (of course) numerous other surveys that may contain useful information for researchers studying aging, but which were not initiated to study aging (e.g., Panel Study of Income Dynamics (PSID), The National Health Interview Survey (NHIS), Survey of Income and Program Participation (SIPP), and The Current Population Survey (CPS) in the USA). Links to the websites of several of these additional surveys are provided at http://agingcenters.org/data.html and http://www.rand.org/labor/aging/resources.html.

In addition to the studies for which data are already available, a number of additional HRS-based aging studies are being developed in other countries. These will cover more Asian countries, Russia, and African countries:

- The Japanese Health and Retirement Study (JHRS) conducted its first wave in 2007.
- The Chinese Health and Retirement Longitudinal Survey (CHARLS) is scheduled to conduct a pilot in 2008 and is planning its first full wave in 2010.
- The Longitudinal Aging Study in India (LASI) is planning a pilot in 2009 and its first full wave in 2010 or 2011.
- HART (Thailand) is "partially funded but at an early stage of preparation" (Smith, 2007).
- The WHO Study on Global Ageing and Adult Health (SAGE; http://www.who.int/healthinfo/systems/sage/) focuses more specifically on health and well-being than HRS and SHARE, which are more multidisciplinary, but it derives a large part of the questionnaire from the other aging studies. Pilot data from 2005 (1,500 respondents from Ghana, India, and Tanzania) are available. For the first full wave (2007-2008), its core countries are China, Ghana, India, Mexico, the Russian Federation, and South Africa.

For reasons of availability of comparable data at comparable time points, 2004 and 2006, we will focus on the comparison of SHARE with HRS and ELSA in this chapter, although in the current section we will present some characteristics of several of the other aging studies as well.

U.S. Health and Retirement Study HRS

The HRS is the first of the "modern" aging studies that are considered in this chapter. Earlier studies were typically limited in sample size or not nationally representative, or covered only a limited set of topics. An important example of this is the Retirement History Survey (RHS), which which was a longitudinal study conducted between 1969 and 1979 in the United States. The RHS only included men and unmarried women in a very limited age range (58-63 in 1969). It provided a lot of information about socio-economic characteristics (labor force participation, income), but did not measure other characteristics, such as health, in detail. In contrast, the HRS was set up to cover a wide range of demographic, economic, and social characteristics, as well as physical and mental health and cognitive functioning. The background of the HRS and an overview of its design is given by Juster and Suzman (1995).

The first wave of HRS (1992) sampled individuals born between 1931 and 1941 (inclusive) and also interviewed their spouses of any age, as well as any other age-eligible household members. Core interviews have been conducted biannually since then. A companion study, the Study of Asset and Health Dynamics of the Oldest Old (AHEAD), sampled the cohort born in 1923 or earlier. Two waves of these were conducted (1993 and 1995). In 1998, these two cohorts were combined and supplemented with additional cohorts to cover the whole population of 51 years and older. The combined study is also called the HRS. New cohorts have been and will be added every third wave (six years) to keep the sample representative of the population roughly 50 and older. Table 2 gives an overview of the cohorts present in Wave 8 (2006) of the HRS.

Cohort	Birth years	Year of sampling	Ages at sampling	Ages in 2006
AHEAD	- 1923	1993	70 +	83 +
CODA	1924 - 1930	1998	68 - 74	76 - 82
HRS	1931 - 1941	1992	51 - 61	65 - 75
War Babies	1942 - 1947	1998	51 - 56	59 - 64
Early Boomers	1948 - 1953	2004	51 - 56	53 - 58

Table 2 HRS cohorts and years of sampling

The HRS sample is drawn using a multistage area probability sample of households. Three groups are oversampled: African Americans, Hispanics, and Floridians, but territories (Puerto Rico, Virgin Islands, etc.) are excluded. Only noninstitutionalized individuals (but including those in retirement homes) are considered at baseline. However, respondents entering nursing homes are followed in later waves. Given the relatively young ages at sampling and higher mortality in nursing homes (and the addition of cross-sectional sampling weights for nursing home residents), recent waves of the HRS are believed to be representative of the nursing home population as well, but this does not hold for the first two or three waves of the AHEAD and CODA samples. NIA (2007) contains an introduction to the development of the HRS since 1992, its status in 2006, and plans for post-2006, as well as many descriptive statistics and references to the literature using the HRS.

The HRS covers a wide range of topics in great detail. An unfortunate result of this extraordinary richness has been that it has become very difficult to use. This problem has been tackled by the introduction of the RAND HRS. This is a user-friendly longitudinal data set containing a (large) subset of the HRS with cleaned and imputed data from all waves, consistent variable names across waves, and spousal information merged in. See St.Clair et al. (2008) for details. For researchers who need to use HRS variables that are not included in the RAND HRS, RAND also produces the RAND Enhanced Fat files. These files are wave-specific and contain all publicly available HRS variables of a wave, but already with the imputations and in a way that makes it easy to merge them with the RAND HRS. The RAND HRS web site contains more details.

The English Longitudinal Study of Ageing ELSA

Like SHARE, ELSA was designed in close cooperation with key investigators affiliated with the HRS, to make the study not only useful and important for England, but to allow cross-country comparisons as well. Hence, its design largely follows the HRS design. The first wave was conducted in 2002, and later waves are conducted biannually. Unlike the HRS, ELSA sampled from the whole 50+ population from the outset. The target sample consisted of all respondents in the earlier Health Survey for England (HSE), from the years 1998, 1999, and 2001, who were 50 years or over. The HSE interviews of these are called Wave 0 of ELSA. Like the HRS, additional cohorts will be added periodically to keep the sample representative of the 50+ population. The first such refreshment sample was drawn in Wave 3 (2006), covering the 50-53 years old. These were drawn from the 2001-2004 samples of the HSE.

ELSA samples private households and thus excludes nursing homes at baseline. However, following the HRS example, respondents are followed when they enter nursing homes,

although data of respondents in nursing homes are not available yet. As its name indicates, ELSA only covers England, and not the whole UK. When respondents move to other parts of Great Britain (Wales or Scotland), they remain in the sample, but respondents are not followed outside Great Britain.

The HSE has an equal probability design, which means that it is self-weighting, i.e., weights are not needed for statistical analyses. Because all eligible HSE respondents were in the ELSA target sample, weights are not needed to correct for the sampling design as well, unlike HRS and SHARE. However, weights are still necessary to correct for selective nonresponse in ELSA.

The background and design of ELSA is described in more detail in Marmot et al. (2003), which also contains many results from the first wave (2002). A similar description of the second wave (2004) is provided by Banks et al. (2006).

Comparison of Characteristics of Available and Planned Aging Data Sets

Here, we give an impression of some of the key characteristics of the available and planned aging data sets, and the similarities and differences between them. Table 3 gives the years in which the studies are conducted, eligibility age (for the primary respondent), and most recent household and individual sample sizes. All studies are biannual, so this is not mentioned in the table. The Asian studies use a somewhat lower age eligibility criterion, because of lower life expectancy, large labor market disturbances among employees in their forties, and comparability with each other. An interesting characteristic of SAGE is the addition of a younger comparison sample.

Study	First wave	Last wave	Eligibility age	Sample size		
				Year [a]	Households	Individuals
SHARE	2004	ongoing	50+	2006[b]	22,255	32,442
HRS	1992	ongoing	51+	2006	12,288	18,469
ELSA	2002	ongoing	50+	2006	6,484[c]	9,718[c]
KLoSA	2006	ongoing	45+	2006	6,171	10,254
MHAS	2001	2003	50+	2003	8,614	13,497
CHARLS	pilot 2008	ongoing	45+	2008	1,500[d]	2,700[d]
LASI	pilot 2009	ongoing	45+	2009		2,000[d]
JHRS	2007	ongoing	45 - 75	2007		10,000[d]
SAGE	2007	ongoing	50+/ 18 - 49[e]	2007	5,000/1,000[d,e]	

Table 3 Basic characteristics of HRS-like data sets

Note: Representative year of the latest wave (or first planned wave).

[b] Wave 2; Israel has Wave 1 interviews conducted in 2006 as well, but these are not included in the table.

[c] Excluding the institutionalized (nursing homes) who are not available yet

[d] Target. Sources: SAGE website, RIETI website (JHRS), CHARLS and LASI proposals

[e] Core sample/Comparison sample

Some design characteristics of interest, in addition to the ones mentioned for HRS and ELSA above and for SHARE in Börsch-Supan and Jürges (2005), are

- All use geographic stratification and/or multistage sampling. Often, a distinction between urban and rural areas is also taken into consideration in the sampling. MHAS oversampled six states with high migration to the USA.
- MHAS only interviewed sampled persons (primary respondents) and their spouses, not other eligible household members.
- KLoSA will add nursing home residents in Wave 2 (2008), but they are not included in Wave 1.

Table 4 presents some key statistics regarding the sample composition of the studies for which data are already available. Note that these statistics are unweighted and thus describe the sample and are not necessarily estimates of population quantities of interest.

Study	Year	Female (%)	Living with spouse/ partner (%)	Age group			
				< 50	50 - 64	65 - 74	75+
SHARE	2006	56%	75%	3%	52%	26%	19%
HRS	2006	59%	64%	3%	35%	34%	28%
ELSA	2006	56%	71%	4%	51%	24%	21%
KLoSA	2006	56%	78%	18%	42%	26%	14%
MHAS	2003	58%	70%	6%	54%	25%	15%

Table 4 Sample composition of HRS-like data sets (unweighted)

Note: "Year" defined as in Table 3, i.e., wave. waves can span multiple years and vice versa

This table mainly shows the effect of the different sampling history of the HRS, in which different cohorts were sampled in different years, thus effectively stratifying by age group. Because the sampling proportions are not proportional to the sizes of these age groups in the population, the HRS has a more equal distribution of age than the other samples, with more respondents 65 years and older. From a statistical standpoint, this has the advantage that it allows more detailed analyses of the older age groups, but it also implies that weighting the sample by age is more critical to obtain population-representative results.

Furthermore, this table shows a much higher percentage of respondents younger than 50 years old in KLoSA, which reflects the different eligibility age (45) for KLoSA. Differences in the distributions of gender and marital status are presumably mostly due to these different age compositions between the studies, and do not necessarily reflect population differences between the countries.

Versions of Data Sets Used in this Chapter

In this chapter, we use the following versions of the data sets: For the SHARE data, we use Wave 1, release 2.0.1, July 2007, and Wave 2, preliminary release 0, March 4, 2008. The latter also includes some updates and corrections to the Wave 1 data. For the HRS, we use the RAND HRS, Version H (St.Clair et al., 2008) and additional variables from the RAND Enhanced Fat files (see the RAND HRS website). For ELSA, we use the 9th

edition, which includes (in addition to Wave 1 and Wave 2 data) the Wave 3, phase 1 preliminary data set (Marmot et al., 2008).

The results presented in the remaining sections of this chapter all use sampling weights, at either the respondent or household level, whichever appropriate. Results for a specific year use that year's cross-sectional weights, except for Wave 3 results for ELSA, for which no cross-sectional weights are available yet. Therefore, following the guidelines provided with the ELSA release, we have used Wave 2 weights for that as well. This implies, however, that the refreshment sample of 50-53 year olds in ELSA Wave 3 is not included in the results. For results that are based on individual changes between waves, we use the cross-sectional weights of the earlier of the two waves.

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2.2 Health Comparisons

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As health status represents a major component of well-being, the decline in health with age is an important issue in the study of ageing. Key trends in developed countries over the course of the last half century include increased longevity, lower disability rates and growing health care sectors. While it is hypothesized that cross-country variation in health status may stem from underlying differences in social and institutional structures affecting socioeconomic status, health care systems and health behaviors, few studies have documented this empirically (Feinstein 1993; van Doorslaer et al., 1997; Banks et al., 2006; Blanchflower et al., 2007).

Several health-related measures in SHARE parallel those in HRS and ELSA or can be adapted in order to allow for cross-country comparisons. In this section we describe health status in Europe, the United States and England and the relationship with health care choices and retirement decisions. As the measures analyzed in this section are self-reported, there may be important cross-survey discrepancies in reporting due to cultural differences and survey mode. By analyzing change between 2004 and 2006 and patterns within a cross-section, we begin to investigate how meaningful cross-country comparisons can be made with these surveys.

Measures of Self-Reported Health

Respondents are asked to rank their health on a five-point scale in all three surveys. This survey question has been widely used in health surveys and is meant to reflect overall health status. In 2004, all three surveys include the US version of this self-reported health scale (excellent, very good, good, fair and poor) for all respondents, whereas in addition, SHARE also includes the European scale (very good, good, fair, bad and very bad) for all respondents. This mimics ELSA in Wave 1 (2002), which also included both scales. In 2006, SHARE and HRS use the US scale and ELSA uses the European scale, and additionally SHARE asks a general health rating on a scale from 0 (worst possible health) to 10 (best possible health). Because of easier comparability, we focus on the US scale here, and only include the European scale for ELSA in 2006 in the comparisons. From analyzing the distribution of self-reported health from both scales in Wave 1 of ELSA, we conclude that responses are partly based on the order of response options, but also partly based on the specific words in the response options. So there is not an easy mapping between the scales.

While there is no one-to-one mapping between the scales, we constructed a binary measure of self-reported health that makes the European and American scale responses as comparable as possible: Those who report excellent, very good or good health on the American scale are considered to be in "good" health, whereas those who report to be in fair or poor health are classified as being in "bad" health. Using the European scale, those in very good or good health are classified as being in "good" health while those reporting fair, bad or very bad health are considered to be in "bad" health.

Table 1 presents the percent of the population in SHARE, HRS and ELSA with "good" health by gender. The fraction of the 50+ population reporting "good" health is substantially lower in Europe than in the United States and England. A higher fraction of men report "good" health in SHARE, whereas the difference is smaller (but in the same direction) in HRS and negligible in ELSA. Fractions in "good" health are substantially lower in

2006 than in 2004 in SHARE. The difference is smaller, though still noticeable when we only include countries that are in both waves. For the HRS, we do not see such a change. In ELSA, a similar drop is observed, but this is most likely largely due to the different scale used in 2006, which has only two "good" categories and three "bad" ones, as opposed to the scale used in 2004, which has three "good" categories and two "bad" ones.

	2004		2006	
	% "Good"	***n***	**% "Good"**	***n***
SHARE (all countries)[b]				
male	67.6	13,624	62.3	14,213
female	59.8	16,252	55.0	17,116
total	63.3	29,876	58.4	31,329
SHARE (11 countries)[c]				
male	67.7	12,491	64.5	11,990
female	59.7	14,893	57.2	14,241
total	63.3	27,384	60.5	26,231
HRS				
male	74.2	8,172	74.5	7,464
female	72.7	11,090	72.1	10,449
total	73.4	19,262	73.2	17,913
ELSA				
male	71.0	4,013	66.6	3,223
female	70.6	5,029	66.0	4,165
total	70.8	9,042	66.3	7,388

Table 1 Percentage reporting "good"[a] health by gender, 2004 and 2006

[a] "Good" = very good or good (European scale, ELSA 2006) / excellent, very good, or good (US scale, all others)

[b] All countries sampled in Wave 1 and/or Wave 2 are included

[c] Only the 11 countries that are sampled in both waves are included

Figure 1 shows that the gender gap regarding the proportion reporting "good" health largely vanishes when controlling for age. However, a gender gap is still noticeable for SHARE, especially in the 65-74 age groups.
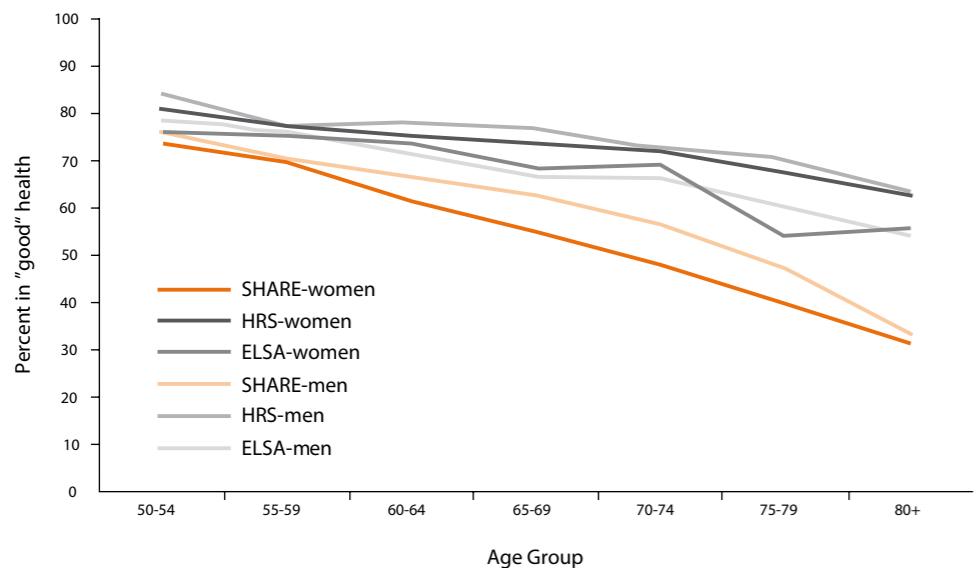
Figure 1 Percentage reporting "good" health by age group and gender, 2006

Comparing respondents who were sampled in both 2004 and 2006, we compute the fraction who reported "good" health in both waves, "good" health in the first wave but "bad" health in the second wave, "bad" health in the first wave but "good" health in the second wave, and "bad" health in both waves. Our estimates are presented in Table 2. As an individual must fall into one of the four categories, the sum of each row is 100%.

Estimates from all surveys are quite similar and we find a significant level of movement between "good" and "bad" health between 2004 and 2006. About 20% of the population in any survey experiences movement. There is a net flow into "bad" health; however, "bad" health is not an absorbing state as a significant share of the population experience a change from "bad" to "good" health. Another interpretation can be gained by calculating transition probabilities. For men in SHARE the transition probability from good to bad health is $14.1/(14.1 + 56.3) = 20\%$ as compared to $7.4/(7.4 + 22.2) = 25\%$ for the transition probability of "bad" to "good" health. Thus the likelihood from transitioning is higher conditional on the original state being "bad", but since the majority of respondents are in "good" health in 2004, the net change at a population level is from "good" to "bad".

	2004	Good		Bad	
	2006	Good	Bad	Good	Bad
SHARE					
male		56.3	14.1	7.4	22.2
female		46.6	15.0	8.8	29.6
HRS					
male		67.2	8.9	7.2	16.7
female		65.4	8.8	6.5	19.3
ELSA					
male		61.2	13.3	5.3	20.2
female		59.6	13.6	6.5	20.4

Table 2 Percentage reporting "good"¹ or "bad" health in 2004 and 2006 by gender

"Good" = very good or good (European scale, ELSA 2006) / excellent, very good, or good (US scale, all others).

"Bad" = not "good"

Measures of Disability

Measures of disability are included in all three surveys. SHARE, HRS and ELSA include questions regarding functional limitations (FLs), activities of daily living (ADLs) and instrumental activities of daily living (IADLs). The FL measure captures the physical ability of the respondent. Items in this category include difficulty walking 100 meters, sitting for 2 or more hours, climbing one or more flights of stairs, stooping, reaching, pulling, lifting and picking up a coin. ADLs are basic daily activities an individual must undertake on one's own or with the help of another. Items included in this category include difficulty dressing, walking, bathing, eating, getting in or out of bed and using the toilet. IADLs refer to skills that require skilled physical abilities as well as cognitive skills. Items in this category include difficulty using a map, preparing a hot meal, shopping for groceries, making telephone calls, taking medications, doing work around the house or garden.

There are several cross-survey differences regarding the measures of disability, but some are due to efforts to improve comparability. The net effect of the biases is unclear as some would be expected to lead to higher amounts of disability while others would be expected to give lower amounts. In both SHARE and ELSA respondents are shown visual aid cards which list the possible response options while respondents in HRS are asked about each potential difficulty separately over the telephone. Different modes of data collection may affect response choices. Slight differences in question wording may also affect responses. In SHARE respondents are asked about "any difficulty" in relation to FLs and ADLs while the preamble to these corresponding questions in ELSA and HRS is: "because of a health problem…". For IADLs, HRS respondents are asked: "Here are a few other activities which some people have difficulty with…" while SHARE respondents are asked: "please tell me if you have any difficulty…". All three surveys instruct respondents to respond only if the difficulty has lasted or is expected to last three months or more.

Another issue in comparing disability measures across surveys are the response options. "Doing work around the house or garden" is listed as an IADL in SHARE and ELSA, but not in HRS for either wave. In order to make cross-country comparisons, we exclude this IADL in our investigation. While SHARE and ELSA response options are limited to "yes" or "no" (corresponding to whether or not the option was picked from the showcard),

HRS has two additional options "can't do" and "never do". There are few responses to the HRS additional options and we fold these responses into the "no" response option. Wording of responses sometimes varies across surveys, but this appears to be due to making the surveys more comparable rather than creating bias. For example, the phrase "5p coin" is used in ELSA while "dime" is used in HRS. Similarly, "one block" in HRS and "100 yards" in ELSA are used to convey a short distance that can be readily understood by the respondent.

Table 3 presents reports of FLs, ADLs and IADLs. Respondents in HRS report considerably more difficulty with climbing stairs and stooping. Cross-country rates for ADLs are more similar, but HRS respondents are much more likely to respond that they have trouble using a map and managing money. It is unlikely that this is due to differences in cognitive abilities as HRS respondents perform relatively well on other cognitive measures (see section 3).

Do You Have Difficulty... [a]	SHARE	HRS	ELSA
Functional Limitations			
walking 100 meters	11.8	14.8	12.1
sitting for 2 hours	12.1	19.6	14.5
getting up from a chair	17.3	39.7	25.4
climbing several flights of stairs	24.4	47.5	35.0
climbing one flight of stairs	10.7	18.8	14.4
stooping or kneeling	26.0	46.0	35.7
extending arms above shoulder	9.7	15.8	11.1
pulling/pushing large objects	14.6	28.1	17.8
lifting objects	24.3	22.9	23.8
picking up a small coin	4.3	6.8	5.4
Activities of Daily Living:			
dressing	8.8	8.8	12.7
walking across a room	3.0	6.1	3.4
bathing or showering	7.2	5.9	10.9
eating	2.5	2.9	2.3
getting in and out of bed	4.5	6.0	6.2
using the toilet	2.8	5.3	3.6
Instrumental Activities of Daily Living:			
using a map	9.2	19.5	5.0
preparing a hot meal	4.5	9.3	4.7
grocery shopping	8.2	11.6	9.7
making a telephone call	2.8	3.9	2.4
taking medications	2.2	3.4	2.0
managing money	3.9	8.6	3.4

Table 3 Percentage Reporting Specific FLs, ADLs and IADLs

[a] Item wording is from the SHARE questionnaire

Table 4 presents summary measures for FLs, ADLs and IADLs. Respondents in HRS appear to have the highest level of disability followed by those in ELSA. This contrasts sharply with the previous finding that the elderly in the United States have a higher fraction reporting "good" health.

This apparent contradiction may be resolved if we consider self-reported health to be an indicator of relative health rather than absolute health. While absolute health would refer to one's health status as compared to the health of any other person in the world, relative health would be one's health relative to someone else in the same country and possibly in the same age cohort. It is generally found that response scales tend to differ by country as a result of language and cultural differences. It is for that reason that we have concentrated more on changes than levels when we compared self-reported health. The surveys contain vignette questions in which respondents are asked to rate the health of hypothetical persons. So in future work these can be used to correct for different response styles (Kapteyn et al., 2007).

	SHARE	HRS	ELSA
Average:			
functional limitations	1.6	2.6	2.0
activities of daily living	0.3	0.3	0.4
instrumental activities of daily living	0.3	0.6	0.3
One or more, %:			
functional limitation	51.6	69.3	55.8
(instrumental) activities of daily living	19.5	36.9	26.5

Table 4 Disability in SHARE/HRS/ELSA, 2006

Table 5 shows the relations between limitations and self-reported health. Within all surveys, those who report "bad" health report more disability than those in "good" health, thereby confirming the within-country validity of both measures of health.

	SHARE		HRS		ELSA	
	Good	Bad	Good	Bad	Good	Bad
Average:						
functional limitations	0.6	2.8	1.7	4.9	1.0	3.8
activities of daily living	0.0	0.6	0.1	1.0	0.1	0.8
instrumental activities of daily living	0.1	0.6	0.3	1.2	0.1	0.6
One or more, %:						
functional limitation	31.2	79.7	61.0	92.1	42.5	83.3
(instrumental) activities of daily living	7.1	36.6	26.1	33.9	12.9	53.8

Table 5 Disability in SHARE/HRS/ELSA by self-reported health, 2006

"Good" = very good or good (European scale, ELSA) / excellent, very good, or good (US scale, SHARE, HRS).

"Bad" = not "good"

Americans may report higher levels of disability because overall population health is lower, or because the decline in health is more acute for them relative to Europe and England. Figure 2 shows the change in reported functional limitations between 2004 and 2006 by age. The change in FLs increases with age group. While we would expect a close correspondence between Figures 1 and 2, this is not evident. For SHARE, there is almost no change in functional limitations regardless of age group, whereas for the HRS there is a slight increase that is not strongly related to age group. But for ELSA there is a stark and steady increase with age group, suggesting an accelerating decline in health. The trend for ELSA suggests that there may be a potential for intervention, although the lower line for the HRS may be the result of a higher level of disability to start with, so that the USA does not necessarily perform "better".
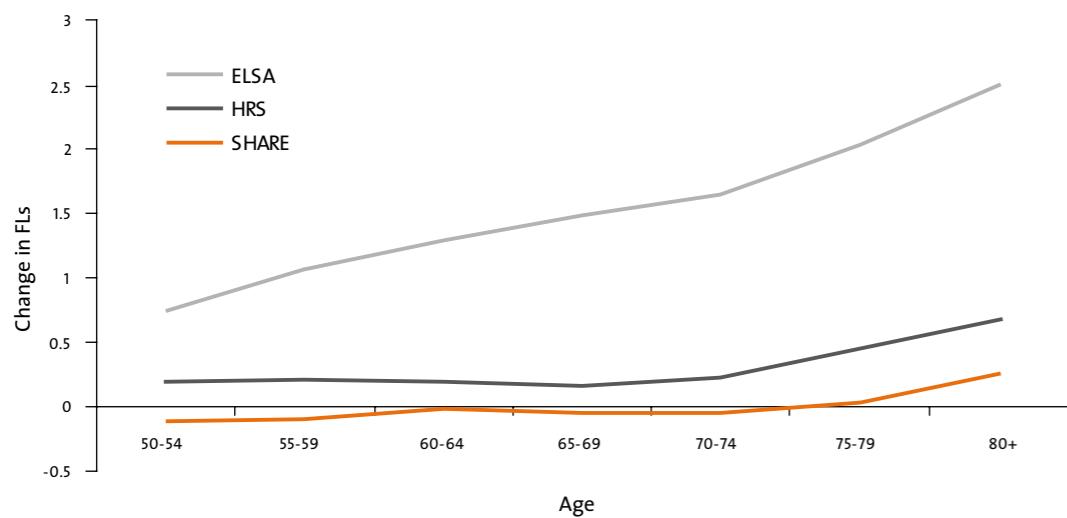
Figure 2 Change in number of reported FLs between 2004 and 2006 by age group

Relationship Between Retirement and Health

Retirement may affect health through several mechanisms. In the United States, the normal retirement age corresponds with eligibility for Medicare, the national health insurance program for the elderly. While some studies suggests that retirement worsens health (Casscells et al., 1980; Gonzalez, 1980), others studies have found that it may lead to better health (Thompson and Streib, 1958; Coe and Zamarro, 2007). Some individuals find work a source of mental or physical stress. For these, retirement may lead to better health. Alternatively, health could decline in retirement if individuals engage in physical exercise and mental stimulation at work, but not when they are home. Retirees may also suffer from feeling less engaged with society or may have changing perceptions due to different peer groups (Macbride, 1976; Bradford, 1986).

A substantial fraction of respondents from all surveys retire between 2004 and 2006 (see section 4). Figure 3 shows the percentage of "good" health in 2004 and 2006 for two sub-groups: those who reported working in 2004 and 2006 ("not retired") and those who reported working in 2004 and being retired in 2006 ("retired"). Health appears to worsen more for retirees than for the not retired across all surveys. However, the difference between the two groups is smallest in SHARE. We also see that health decline itself is more prevalent in SHARE and especially ELSA than in the HRS. Note, however, that this figure

does not control for the endogeneity of the retirement decision, and does not adjust for age. In contrast, after controlling for age and other confounding factors and taking account of the endogeneity of retirement through an instrumental variables approach, Coe and Zamarro (2007) find a significant positive effect of retirement on health.
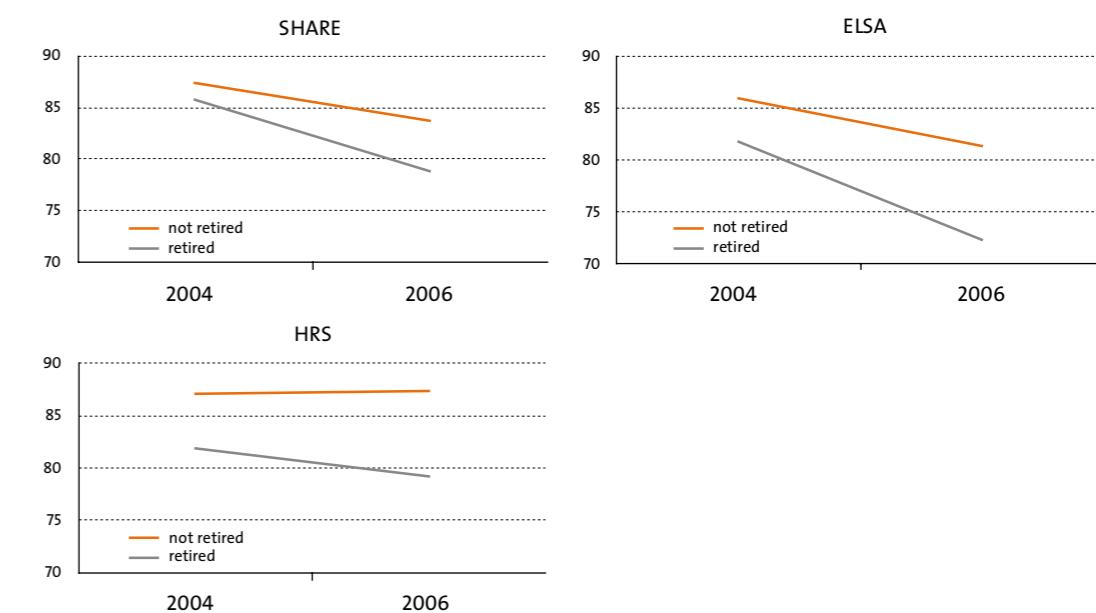
Figure 3 Percentage in "good" health by retirement status[a] in 2006

Note: The "not retired" are those who report working in 2004 and 2006 and the "retired" are those who report working in 2004 and retired in 2006

Health Care Utilization

Health care systems and utilization vary significantly across countries and may contribute to cross-country health disparities. Utilization is particularly high in the United States relative to Europe and it is unclear how this may relate to health status, because quality of care may also play a big role. For example, health care costs per person in 2003 in the United States were estimated to be $5,711 as compared to $2,317 in England, $3,048 in France and $2,314 in Italy (OECD 2006).

SHARE includes a measure on the number of doctor visits in the past year while HRS includes a measure about whether or not the respondent visited a doctor in the past year. By collapsing the SHARE measure into a binary variable, the measures are comparable. No measure on doctor visits is available in ELSA.

Table 6 shows that the vast majority of the elderly in Europe and the US visit a doctor at least once a year. Respondents in the HRS are more likely to report having gone to the doctor and women are more likely to have visited the doctor in the past year than men in both surveys. Those who have visited the doctor in the previous year are more likely to report more disabilities in both surveys. Health status appears to be stronger related to the likelihood of visiting a doctor for SHARE than for the HRS.

		SHARE		HRS	
		men	women	men	women
Self-reported health[a]					
	Good	81.3	87.8	91.6	96.0
	Bad	93.0	96.1	94.9	97.1
Functional limitations					
	No FLs	81.3	86.9	89.7	94.2
	At least one FL	92.0	94.7	94.3	96.9
(Instrumental) Activities of Daily Living					
	No ADLs/IADLs	84.6	90.4	92.4	96.6
	At least one ADL/IADL	92.9	95.3	92.6	95.8
Overall		85.7	91.6	92.5	96.3

Table 6 Percentage with at least one doctor visit in previous year by health status (2006),

Note: "Good" = very good or good (European scale, ELSA) / excellent, very good, or good (US scale, SHARE, HRS).

"Bad" = not "good"

Mortality

Mortality can be considered as another indicator of health. However while death itself implies a reduction in health, it is unclear how much age at death relates to health status at death unless we know about the quality of life. Certain measures have been designed to capture this, notably quality-adjusted life years (QALY), but we cannot construct such measures in SHARE, HRS, or ELSA. Investigating mortality by the disease burden at death and marital status, two variables available in all surveys, may provide some information regarding the quality of life prior to death.

Here we present preliminary results for mortality. Such results are not available for ELSA yet, so we limit ourselves to SHARE and HRS. However, it must be noted that due to the preliminary nature of the data, there are a large number of SHARE 2004 respondents that are not in the sample in 2006, for whom it is not yet known whether they had died in between waves, so the following results should be considered as tentative at best, see section 3.1 on the oldest old for further details. Between 2004 and 2006, a smaller fraction of SHARE respondents died as compared to HRS. Age at death for females is higher than for males in both surveys. The difference between age at death for females in HRS as compared to those in SHARE is particularly striking. Those who died had higher level of functional limitations than those who survived. Given our previous finding that HRS respondents report an overall higher level of FLs, it is unclear if HRS respondents at death had proportionally more disability than SHARE respondents at death relative to those who survived.

	SHARE		HRS	
	alive	dead	alive	dead
Gender, %				
men	43.2	2.3	43.3	2.5
women	52.2	2.3	51.9	2.3
Age, average				
men	64.0	73.5	63.3	73.2
women	65.8	80.5	64.7	77.4
Functional limitations, average				
men	1.0	2.9	1.8	4.3
women	1.9	5.0	2.8	5.3

Table 7 Characteristics in 2004 of respondents who were still alive in 2006 and those who died in between waves

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2.3 Mental Health and Cognitive Ability

Gema Zamarro, Erik Meijer, Meenakshi Fernandes

Adding life to years may be as important as adding years to life. As the population ageing process continues around the world, the relevance of quality of life, particularly in the later stages of life, is becoming more and more important for an increasing percentage of the population. Therefore, in order to gain some insight into cross-country differences in the quality of life of 50+, in this section we compare mental health and cognitive ability measures in Europe, the U.S., and England. For this we have used information from SHARE, HRS and ELSA for the years 2004 and 2006. For the case of SHARE we concentrate on information pertaining to the 11 original countries in the survey (Austria, Germany, Sweden, The Netherlands, Belgium, Spain, Italy, France, Denmark, Greece, and Switzerland).

Mental Health

Depression is currently the leading cause of disability in the world. In fact, Murray and Lopez (2006) estimate that by 2020 depression will be the second most burdensome illness in the world. Late-life depression is one of the most common mental health problems in adults aged 60 and over (Reker, 1997). Depression among the near-elderly and elderly can arise from the loss of self-esteem (helplessness, powerlessness, alienation), loss of meaningful roles (work productivity), loss of significant others, declining social contacts due to health limitations and reduced functional status, dwindling financial resources, and a decreasing range of coping options (Cole, Bellavance, and Monsour, 1999). According to the U.S. Agency for Health Care Policy and Research, depression is twice as prevalent among women as among men.

Several questions to determine mental health are included in SHARE, HRS and ELSA. Both HRS and ELSA include questions necessary for construction of the Center for Epidemiological Studies-Depression Scale (CES-D); a 20-item scale developed by the National Institute of Mental Health (NIMH). The CES-D has four separate components: Depressive affect, somatic symptoms, positive affect, and interpersonal relations. In contrast, the SHARE main interview collects the necessary information for constructing the Euro-D scale, while CES-D is asked in a separate drop off questionnaire. Unlike the CES-D, the Euro-D scale runs from 0 to 12, counting whether the individual reported having problems in a list of negative feelings. As we do not find the Euro-D and CES-D measures to be comparable, we instead consider a simple indicator variable for whether or not an individual reports being sad or depressed. For SHARE, this question is asked in reference to the last month while for HRS and ELSA it is the last week. As depression in the last week is likely to be different than depression in the last month, we do not consider the results from SHARE to be directly comparable with those from HRS and ELSA. However, we believe that important information can still be obtained by studying the patterns of responses in these three surveys. For example, we are still able to study how depression varies by gender, age, health status, etc.

Figure 1 shows the proportion of the population who stated to feel sad or depressed by gender for SHARE, HRS and ELSA for the year 2006. As we can see in this graph, these proportions are much higher in SHARE than in HRS or ELSA. This is a result we find in all our statistics on depression and that is probably due to the different time frame used in this question in SHARE (last month) in comparison with HRS and ELSA (last week).

Women are more likely to say that that they are feeling sad or depressed than men. This result is in line with the literature as we described above. Gender differences are higher in SHARE (around 19 percentage points) than in HRS (10 percentage points) or ELSA (11 percentage points). This can be due either to bigger gender differences in depression in Europe or, greater differences when reporting depression during a longer period of time.
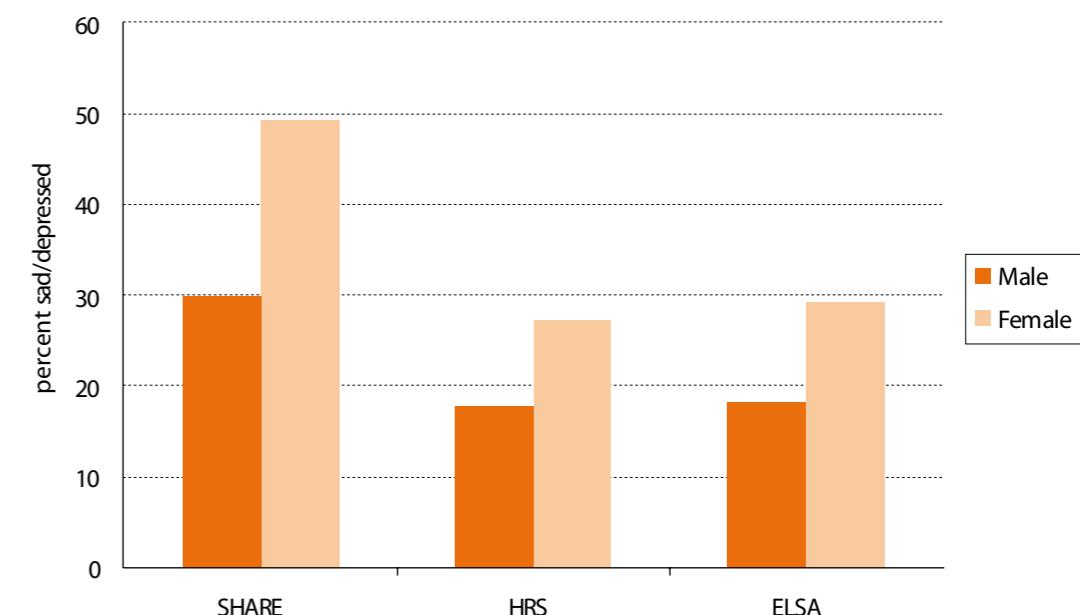
Figure 1 Percentage Sad or Depressed by gender (2006)

Figure 2 shows the proportion of the sample who reported to feel sad or depressed for different age groups. As we can see in this graph there is no clear pattern in this proportion by age. Only in Europe and England, the proportion of 70+ who declared to be sad or depressed was higher than for other age groups. This is remarkable in light of the general consensus in the literature that depression increases with age. In addition, we see that in all three studies there is a peak in the proportion of the population feeling sad or depressed in the age category 55-59.
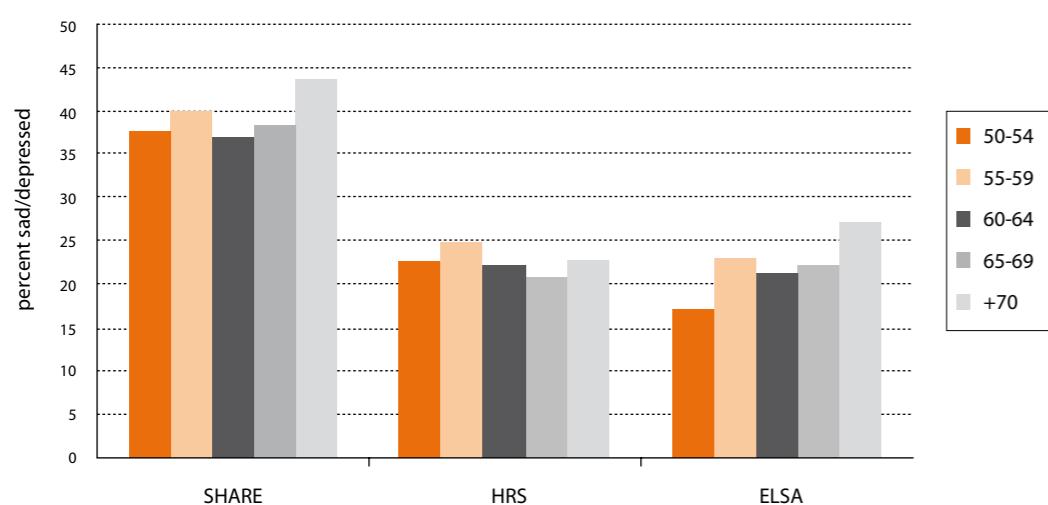
Figure 2 Percentage Sad or Depressed by age (2006)

Depression often occurs jointly with other serious illnesses, such as heart disease, stroke, diabetes, cancer, and Parkinson's disease. This may create difficulties for diagnosis of depression as both health care professionals and patients may conclude that depression is a normal consequence of these problems. Figure 3 shows the percentage of the sample who reported being sad or depressed for different self reported health status. As we can see in this graph, in all surveys, those who reported to have bad health also reported to be sad or depressed in a much higher proportion than those who reported good health. There are two possible explanations to this result: Bad health may lead to depression or, it is possible that those who are depressed have a more negative self image leading to worse health status reports.
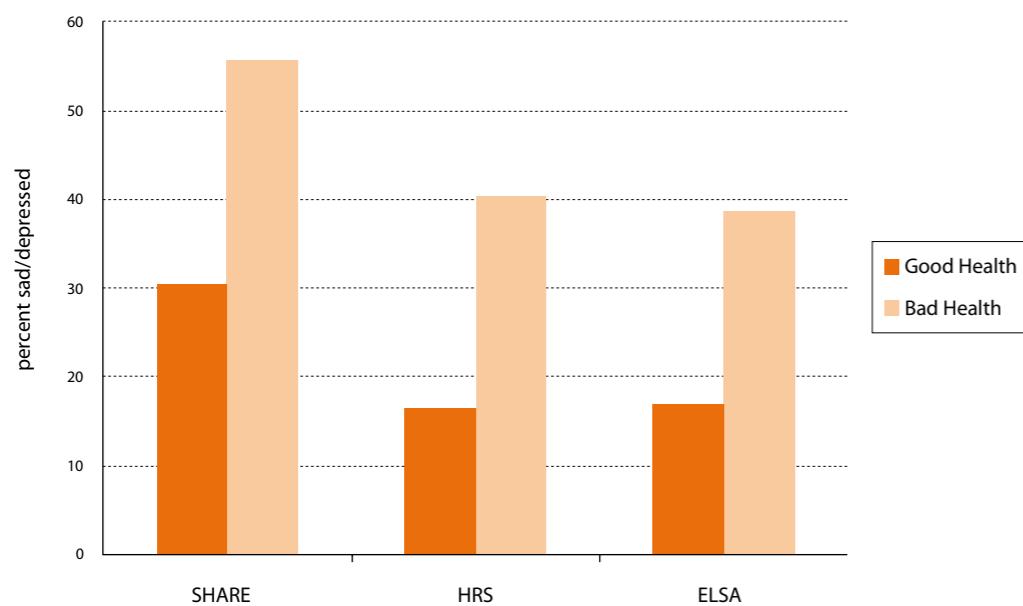
Figure 3 Percentage Sad or Depressed by self reported health status (2006)

Finally, the notion that retirement harms health is an old, and persistent hypothesis (See Minkler, 1981 for a review). Many argue that retirement itself is a stressful event (Carp, 1967; Eisdorfer and Wilkie, 1977; MacBride, 1976; Sheppard, 1976). Retirement can also lead to a break with support networks and friends, and may be accompanied by emotional or mental impacts of "loneliness," "obsolesce," or "feeling old" (Bradford, 1979; MacBride, 1976). Others believe that retirement is a health-preserving life change. Anecdotal evidence suggests that many discussions about the retirement decision include the idea that work is taxing to the individual, thus retirement would remove this stress and preserve the health of the retiree (Ekerdt et al., 1983). Figure 4 compares the proportion of people who reported feeling sad or depressed among those who retired between 2004 and 2006 with those who continued working. As we can see in the figure, the proportion of individuals who reported feeling sad or depressed is higher among those who retired than among those who continued working, in continental Europe (SHARE) and the U.S. The difference is higher in the U.S. (4 percentage points) than in Europe (2 percentage points). This suggests that in the U.S. retirement might be related with more negative feelings than in Europe. Surprisingly, the opposite pattern is observed in England. In this case, this proportion sad or depressed is higher for those still working in comparison with those who retired.
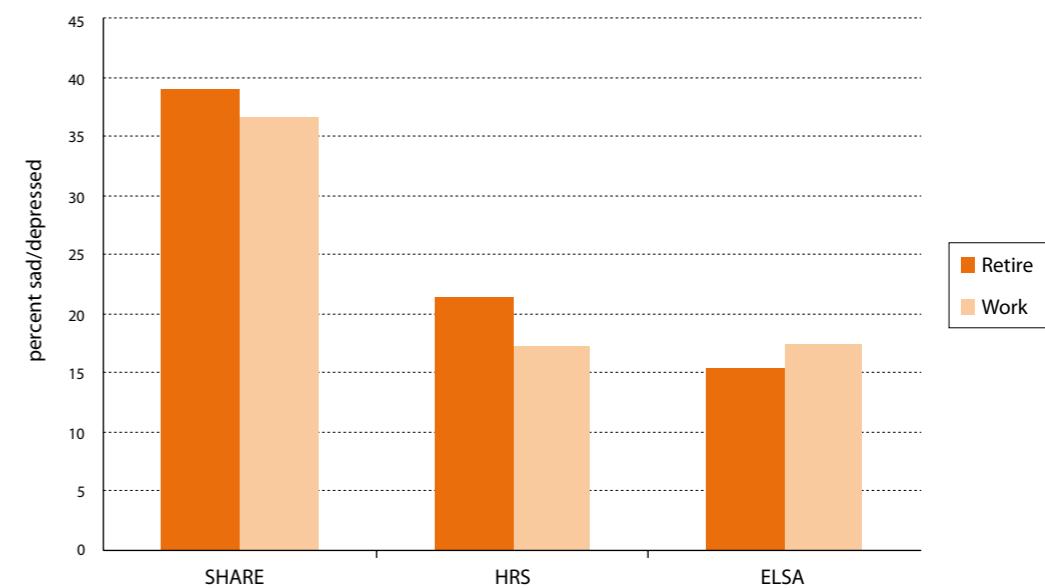
Figure 4 Percentage Sad or Depressed (2006) by retirement transition between 2004 and 2006

Cognitive Ability

The cognitive reserve is defined in the neuro-psychological literature as the individuals' capacity to use brain networks more efficiently or, in other words, to process tasks in a more efficient manner (Stern, 2002). The decline in cognitive function with age is associated with structural changes in the brain (Raz, 2004). In addition, this cognitive decline is associated with diseases such as Alzheimer's.

In SHARE, HRS and ELSA cognitive ability is measured through several questions. One of these questions measures cognitive ability in relation with memory. The episodic memory task integrated in these surveys consists of testing for verbal learning and recall, where the participant is asked to memorize a list of ten common words. In order to avoid problems of comparability due to a different number and nature of questions between the immediate recall phase and the delayed recall phase, we computed memory scores for this task considering only the number of target words recalled in the immediate recall phase (score ranging from 0 to 10). It should be pointed out that non-response was higher in HRS (10% in 2004 and 8% in 2006) than in SHARE (2% in both 2004 and 2006) and in ELSA (2% in 2004 and 3% in 2006). On the other hand, the proportion of respondents who have zero words recalled was higher in SHARE (2% in both 2004 and 2006) than in HRS (less than 1% both in 2004 and 2006) and in ELSA (also less than 1% both in 2004 and 2006).

Conceivably, these differences are due to different protocols for recording non-participation. Possibly a code of zero words indicates true zero recall or no participation in the question. In this section zero words records are considered to be true zero recall. Alternatively, we recoded zero words as missing values and patterns observed were the same. Figure 5 shows the average number of words recalled by gender in the different surveys. As we can see in this graph, the number of words recalled by people in Europe is considerably less than in the U.S. or England. No difference is observed in number of words recalled by gender in Europe while in the U.S. and England the average number of words recalled is higher for women than for men.
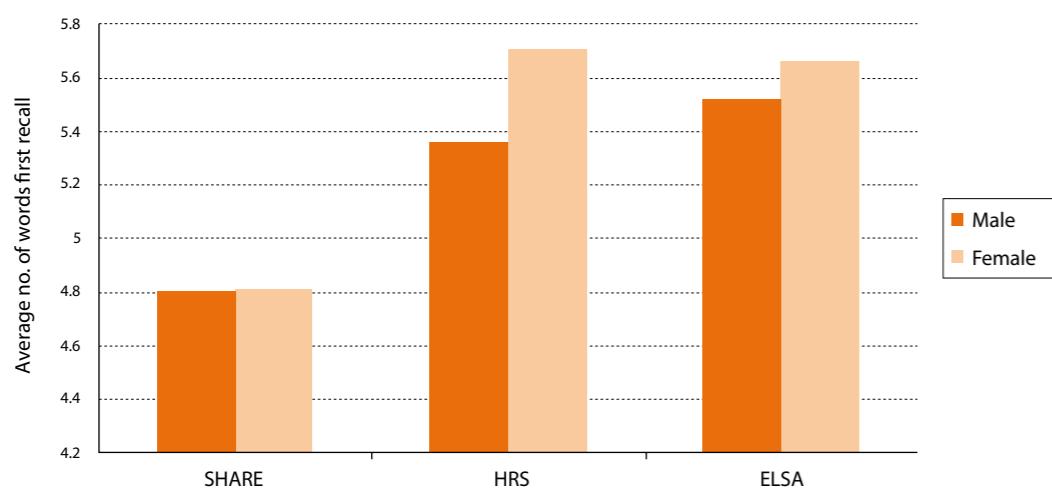
Figure 5 Average number of words recalled by gender (2006)

Figure 6 shows the average number of words recalled by age. As we can see in this graph the average number of words recalled decreases with age in a non-linear fashion. In all cases, decline is higher for those in age categories beyond 65-69.

As Figure 6 was based on cross-sectional data for 2006, the effects may include both age and cohort effects. Alternatively, one way of eliminating cohort effects consists of looking at individual changes in the number of words recalled between 2004 and 2006. Of course, with this latter approach we can only concentrate on those individuals for whom we have observations on both 2004 and 2006. Thus, attrition between the two years may influence the results.
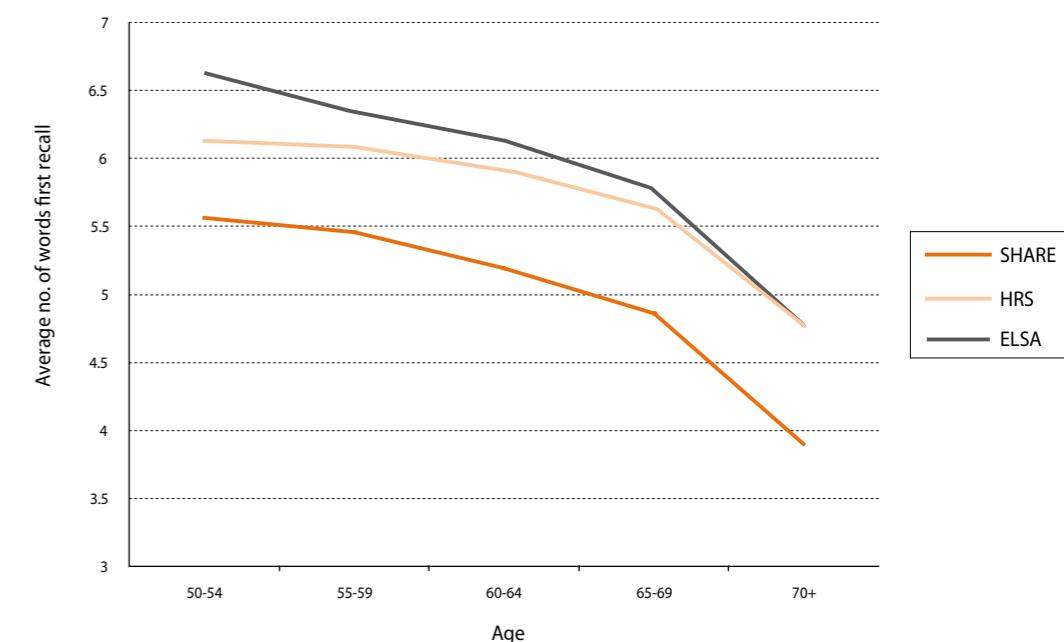
Figure 6 Average number of words recalled by age (2006)

Figure 7 shows the average individual changes in the number of words recalled between 2004 and 2006 as a function of age in 2004. As we can see in this graph, memory loss in the U.S. starts in the age category 55-59 years and increases with age. A similar pattern is observed in ELSA but only when individuals are 65 or older. Remarkably, we do not observe a similar pattern in SHARE. In this case, we observe memory gains until an individual is 75 years old. This result may be due in part to attrition of those with low memory. Those who did not reply this question in 2006 but who replied in 2004 have on average a lower memory score (4.51) than those who replied in the two waves (4.93). In addition, any differences in the interviews' protocol between 2004 and 2006 will affect the results.

Adam et al. (2005) found that occupational activities, including paid work and non paid work as well as, sport practice and other physical activities, are highly correlated with cognitive ability. Figure 8 shows the average number of words recalled by labor status. In all cases those employed recalled a higher number of words than those retired. However, this may be due in part to the decline in memory by age as those retired would be on average older than those employed.

Figure 7 Memory change 2004-2006 by age (2004)

Figure 8 Average number of words recalled by employment status (2006)

Figure 9 Average change in number of words recalled by retirement status (2006-2004)

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Finally, Figure 9 shows the average individual differences in number of words recalled between 2006 and 2004 for those working in 2004 but retired in 2006 and for those who continued working in 2006. As we can see in this graph, in all cases, those who retired are also those who experience higher losses in the number of words recalled compared to those who continued working. Especially negative is the change in number of words recalled in the case of the U.S. It should be pointed out that for those who continued working we observe an average gain in memory for both SHARE and HRS. This suggests the possibility of differences in the protocol for this question in the years 2004 and 2006. However, this does not invalidate our retire-work comparisons.

2.4 Labor Force Participation and Retirement

Gema Zamarro, Erik Meijer, Meenakshi Fernandes

Labor market participation of 50+ individuals is currently an important policy concern. While the population is ageing, many countries are introducing policies with the objective of encouraging labor force participation and/or delaying retirement. These policies include, for example, increasing retirement ages or restricting access to non-standard routes out of the labor force. In this section we compare labor market outcomes for Europeans, Americans and English using data from the 2004 and 2006 waves of SHARE, HRS and ELSA. For SHARE we concentrate on information pertaining to the 11 original countries in the survey (Austria, Germany, Sweden, The Netherlands, Belgium, Spain, Italy, France, Denmark, Greece, and Switzerland).

Labor Force Participation

Labor force participation of those 50 years and over has changed dramatically over the past four decades in the U.S. and Europe. A substantial literature on the determinants of retirement in the United States (e.g. Hurd, 1990 and Lumsdaine and Mitchell, 1999) suggests that the increasing generosity of Social Security, notably the windfall gains during the 1960s and 1970s, may have played a significant role in the trend among male workers in the postwar period toward early retirement (Costa, 1998; Hurd and Boskin, 1984; Ippolito, 1990). Recent evidence, however, indicates that labor force participation rates among older men have stabilized and have begun to increase (Quinn, 2002; Karoly and Panis, 2004). Among 55-64 year old American women, labor force participation rates increased substantially between 1950 and the mid 1970s, after which there was a period of stability followed by rapid increases again since 1990. Labor force participation rates of American women 65 and older remained stable throughout this period. Trends among women are harder to interpret, because of the presence of substantial cohort effects. Table 1 shows labor force participation rates of men and women 55 and over for the most recent decade (1995-2006) for the U.S. and The Netherlands. The Netherlands was chosen as a representative of a European country. Labor force participation rates in the Netherlands (and in Europe in general) were much lower relative to the U.S. in 1995 but have increased much faster relative to the U.S. over the last decade.

In order to have a comparable measure of labor force status in SHARE, HRS and ELSA we combined labor market information in HRS and ELSA to mimic the categories used in SHARE (retired, employed, unemployed, sick or disabled and, homemaker). Our measure of labor force status for HRS involves recoding working part time and full time as employed, retired and partly retired as retired and, not in the labor force as homemaker. In ELSA, we combined the "employed" and "self-employed" in one category "employed".

Figure 1 shows labor force status reported by men in 2006 in SHARE, HRS and ELSA while Figure 2 shows the same statistics for women. These figures corroborate that employment rates among elderly workers are much higher in the U.S. than in Europe and, conversely, that more people are retired in Europe. Other salient features are the high percentage of female homemakers and higher unemployment rates in continental Europe as well as the higher percentage of disabled in England. These results may be due to the different labor market regulations in different countries.

	Men		Women	
	Netherlands	U.S.	Netherlands	U.S.
55–59				
1995	59.3	74.6	23.4	53.7
2000	68.7	75.3	37.9	59.9
2004	73.6	74.2	45.2	62.7
2005	74.3	73.9	47.3	63.4
2006	75.4	73.7	50.7	64.8
60–64				
1995	20.5	51.3	7.9	34.6
2000	26.7	53.5	11.2	39.2
2004	30.8	54.8	16.2	43.7
2005	29.0	56.2	17.3	44.3
2006	32.4	57.0	19.8	45.6
65–69				
1995	8.2	25.8	2.1	16.9
2000	9.7	29.3	2.8	18.9
2004	11.8	31.4	4.2	22.5
2005	12.4	32.5	5.0	22.9
2006	13.0	33.3	4.8	23.5

Table 1 Employment of Men and Women aged 55 and Older

Source: Authors tabulations from OECD Labor Market Statistics
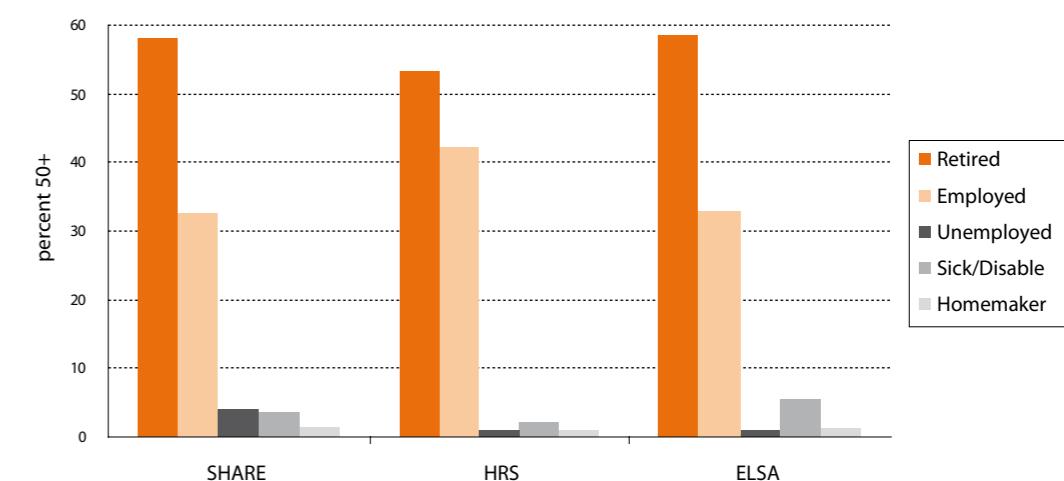
Figure 1 Labor force status (2006) Males
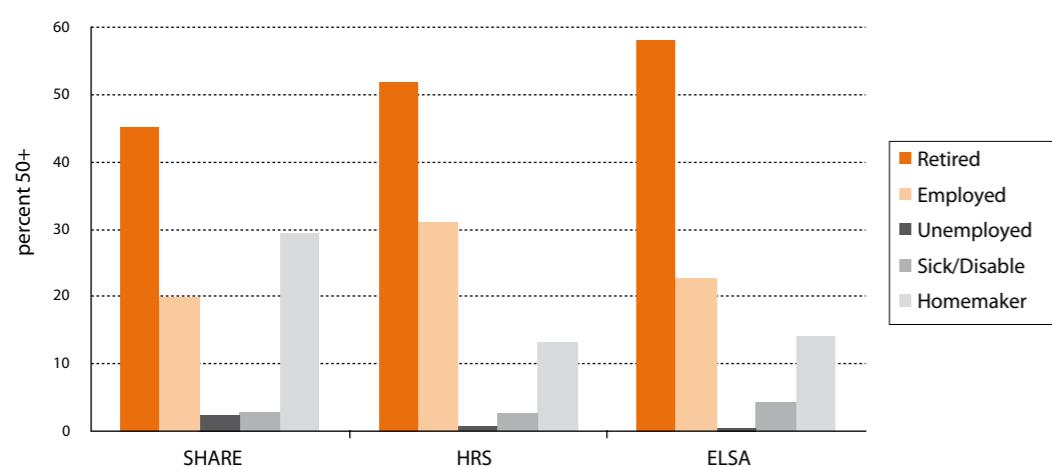
Figure 2 Labor force status (2006) Females

Figure 3 shows labor force participation rates by age for the year 2006. As we can see in this graph, labor force participation in SHARE is lower than in HRS for all age groups. The biggest difference is for those who are between 60 and 64 years old. Labor force participation in this group is 43% in HRS and only 20% in SHARE. SHARE labor force participation rates are also below those in ELSA. However, the difference narrows once respondents are 65 or more years old.
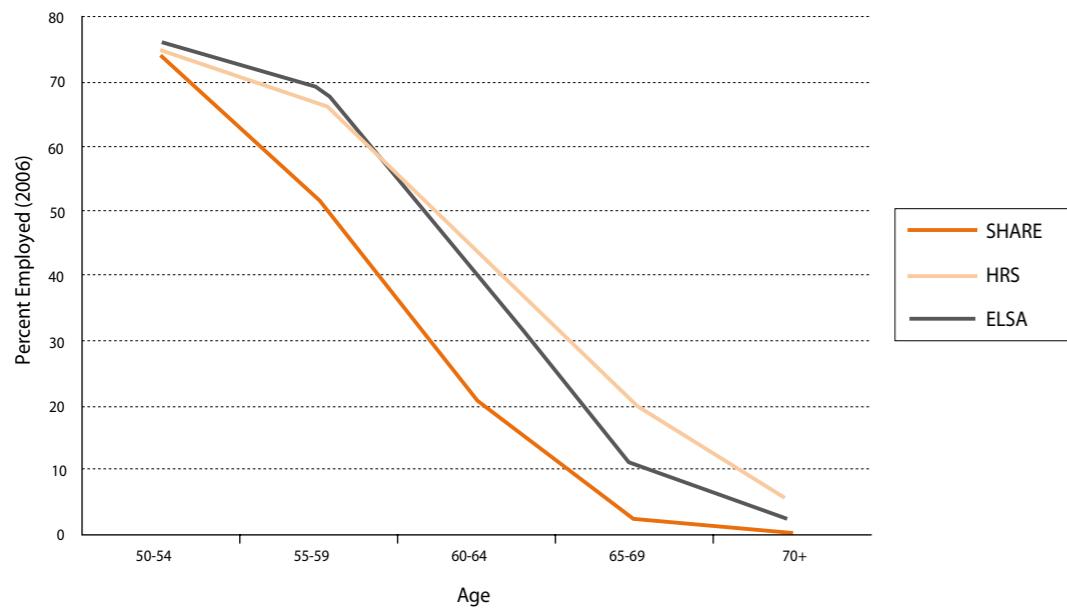
Figure 3 Labor force participation (2006) by age

Retirement Patterns

As many countries around the world face an aging population, understanding the determinants of retirement decisions is of high public policy relevance. In this section, we concentrate on those respondents who reported to be employed in 2004 and describe how their retirement hazard is related to age, health status in 2004 and eligibility rules for public pensions. We define the retirement hazard as the percentage of workers in 2004 who reported to be retired in 2006.
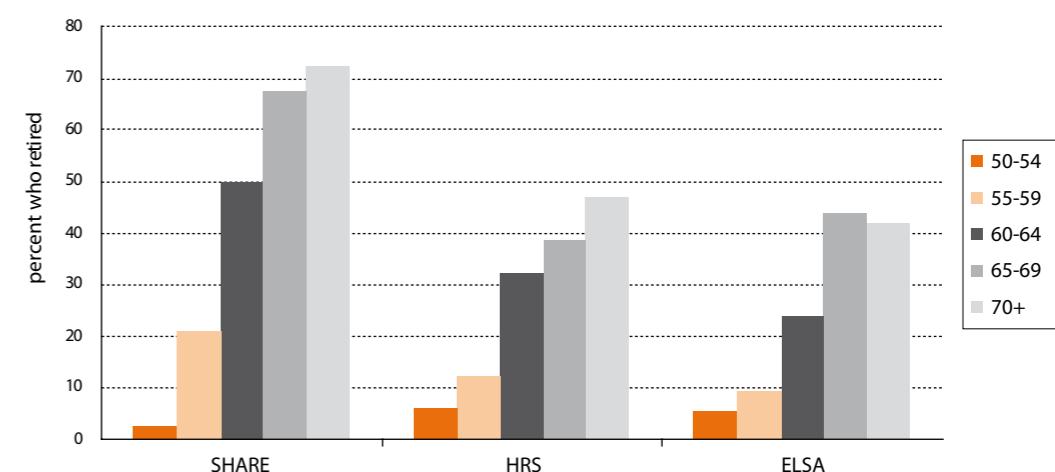
Figure 4 Retirement hazard (2004-2006) by age (2004)

Figure 4 shows for different age groups the proportion of those working in 2004 who retired in 2006. As we can see in this graph, the proportion of people who retired during this two year interval is higher in SHARE than in HRS and ELSA for all age groups except those between 50 and 54. We see a substantial increase in the retirement hazard between the age categories 55-59 and 60-64 (in 2004) in all three datasets. Moreover, particularly in ELSA we observe another substantial increase when we move from 60-64 to 65-69.
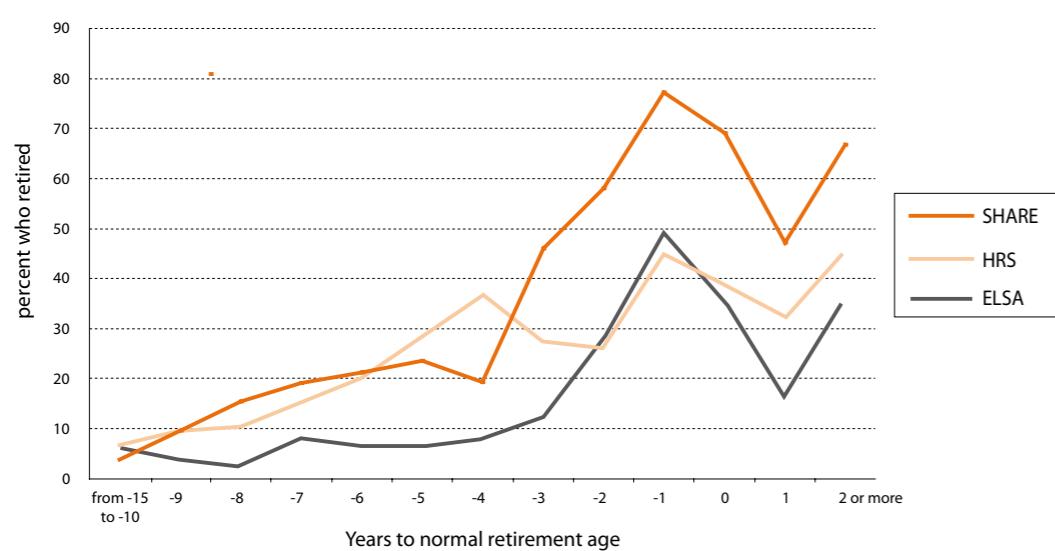
An important determinant of the timing of retirement are the incentives imbedded in the rules determining Social Security pension benefits, as well as employer-provided pension benefits (see Hurd, 1990 and Lumsdaine and Mitchell, 1999 for reviews and Zissimopoulos, Maestas and Karoly 2007; Poterba, Venti and Wise 2004; Anderson, Gustman and Steinmeier, 1999; Samwick, 1998). Likewise, the studies in the volumes edited by Gruber and Wise (1999, 2004) note that there is a strong negative correlation between labor force participation at older ages and the generosity of early retirement benefits. Table 2 shows the cross national variation in eligibility ages for public old-age benefits. These are the normal and early retirement ages used in the construction of Figures 5 and 6.

	Early (normal) retirement age for all workers	
Country	**Males**	**Females**
Austria	65 (65)	60 (60)
Belgium	60 (65)	60 (65)
Denmark	65 (65)	65 (65)
France	60 (60)	60 (60)
Germany	63 (65)	63 (65)
Greece	57 (65)	57 (65)
Italy	60 (65)	60 (65)
Netherlands	60 (65)	60 (65)
Spain	60 (65)	60 (65)
Sweden	61 (65)	61 (65)
Switzerland	63 (65)	62 (64)
England	65 (65)	60 (60)
United States	62 (65)	62 (65)

Table 2 Eligibility for Public Retirement Benefits

Source: OECD (2005). Ages in United States based on Social Security System for those retiring in 2003

Figure 5 shows how the proportion of retirees changes as a function of years to normal retirement age while Figure 6 shows how this proportion changes as a function of years to early retirement age.

Figure 5 Retirement hazard (2004-2006) by years to standard retirement age (2004)

As we can see in Figure 6 there is a jump in the proportion of people who retire when they reach the normal retirement age (-1 years to normal retirement age in 2004). The jump in this proportion is higher in England, around 21 percentage points, than in Europe and in the U.S. where it is around 19 percentage points.

Compared to England, the retirement hazard is always higher in continental Europe. The retirement hazard in the U.S. is higher than in England, until about three years before the normal retirement age. After that differences appear to be small.
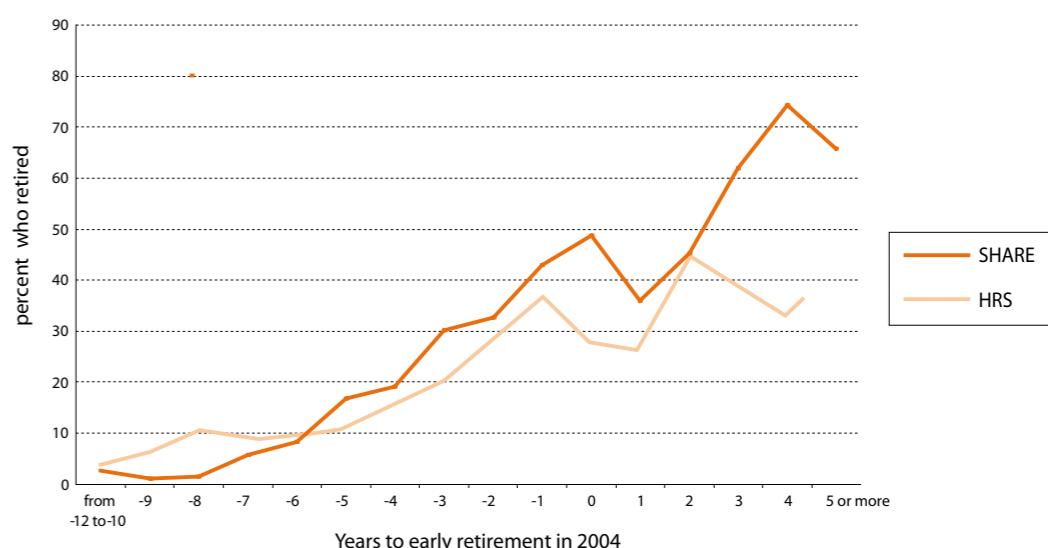
Figure 6 Retirement hazard (2004-2006) by years to early retirement age (2004)

Figure 6 shows how the proportion of retirees among those working in 2004 changes as a function of years to early retirement age. England is not included in this graph because to our knowledge there is no clear early retirement age in England. For those countries in SHARE with no early retirement age, the standard retirement age was considered instead. This has been done to avoid changes in the composition of countries included in SHARE. As we can see in this graph there is a jump in the retirement hazard once individuals reach 1 year prior to early retirement age (in 2004). The jump is 1 percentage point higher in Europe than in the U.S. A second jump is observed in continental Europe for those who are at the early retirement age in 2004 (0 years to early retirement age). Figures 5 and 6 suggest the major role of normal and early retirement ages (and the associate eligibility for several kinds of benefits) as a policy tool for influencing retirement patterns.

Another factor determining the choice of a retirement date is a worker's health. Bad health can lead to less attractive employment opportunities as a result of decreases in productivity and hence possibly lower wages. In addition, bad health can make work more burdensome, increasing the preference for retirement. On the other hand, if health insurance availability is related to employment then the effect of health on retirement becomes ambiguous. See, for example, Currie and Madrian (1999) for an overview of the literature on the relationship between health, health insurance and labor market outcomes. Figure 7 shows retirement hazard rates for those working in 2004 as a function of self reported health status in 2004. As we can see in this graph, those who reported bad health in 2004

were more likely to retire than those who reported good health, in all 3 surveys. The difference in the proportion of those retiring among the two health statuses was about 6 percentage points in SHARE and HRS and, 5 percentage points in ELSA.
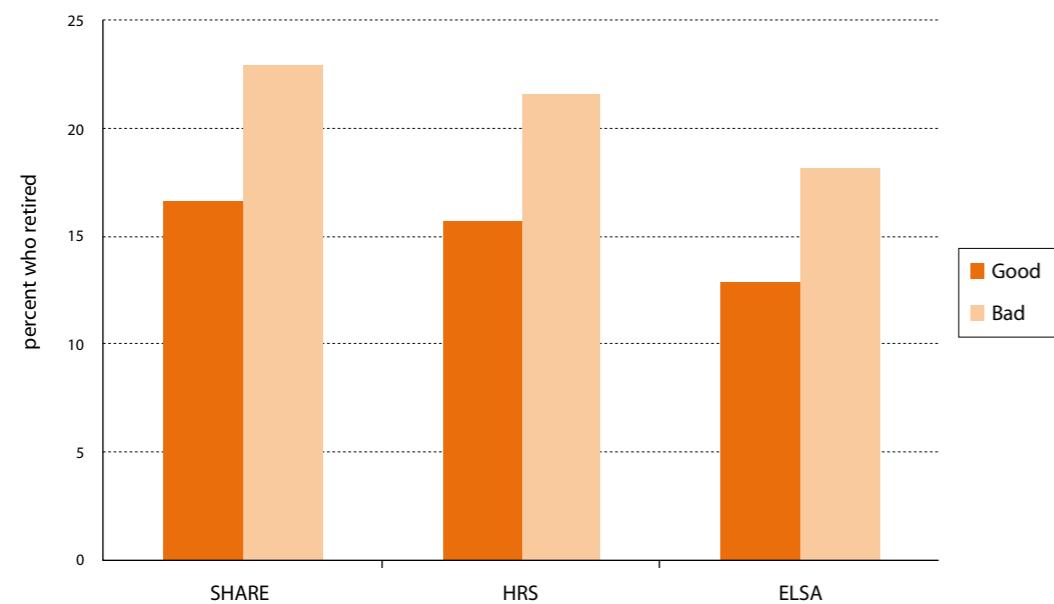
Figure 7 Retirement hazard (2004-2006) by health status (2004)

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2.5 Income and Replacement Rates

Erik Meijer, Gema Zamarro, Meenakshi Fernandes

Incomes of the elderly form one of the main research and policy issues in the area of aging. On the one hand, aging populations imply that in pay-as-you-go systems the incomes of more retirees have to be paid by fewer workers, which may put an unacceptable burden on the younger generations, and may lead to concerns about the affordability of pension systems. On the other hand, there are also concerns about whether individuals have accumulated enough pension wealth to secure an acceptable retirement income. In this section, we will compare income distributions and income changes, especially those related to retirement, in SHARE, HRS, and ELSA, and will briefly look at changes in income inequality related to retirement.

Definitions and Construction of Income Variables

In all three surveys, income is asked in great detail. Because in this section we compare overall household income, the answers to the large numbers of questions about detailed income components have to combined into a single measure. Apart from a relatively straightforward but tedious programming effort to sum the individual components, taking account of different routings through the questionnaire depending on answers to previous questions, this also requires a non-negligible amount of imputation. The latter is necessary, because respondents sometimes do not know a specific amount, in which case they often are able to indicate a range through an unfolding brackets sequence, or they refuse to answer a certain question. Given the large number of questions that the total household income depends on, even a small fraction of missing data or bracket responses implies that for a relatively large fraction of households, an exact total cannot be directly computed. Paccagnella and Weber (2005) discuss these issues in detail.

Although there are some differences, the imputation methods used are fairly similar across studies and across waves. Therefore, we will not discuss these here in detail. A description of the method used for SHARE is given in Brugiavini et al. (2005, 2008), a summary of the imputation methods for the RAND HRS is given in chapter 3 of St.Clair et al. (2008), and the imputation methods used for ELSA are documented in Taylor et al. (2003).

There are, however, substantial differences in the definitions of the income variables provided. Gross income was asked in SHARE Wave 1, which consequently provided gross household income, both nominal and purchasing power parity (ppp) adjusted, using a weighted mean of the 11 original SHARE countries in 2004 as a basis. In contrast, net income components were asked in SHARE Wave 2. From these, both nominal and ppp-adjusted net household income have been generated by the imputations team of SHARE. The basis for the ppp adjustments is Germany in 2004. The reasons for changing the basis for ppp adjustments are explained in Christelis (2008a, 2008b), who also outlines how the ppp adjustments should be performed. As argued in Paccagnella and Weber (2005), for comparisons of income levels across countries it is preferable to use ppp-adjusted income.

A preliminary version of the generated (and imputed) ppp-adjusted net income data for SHARE Wave 2 has kindly been made available to us by Omar Paccagnella. The change from gross to net and to a different base for the ppp adjustments means that the generated income variables from the public releases of SHARE Wave 1 cannot be used for compari-

son with Wave 2 data. Therefore, tentative conversions from gross to net have been made for Wave 1 by the same team, and these have been made available to us as well.

The HRS asks about gross income. The RAND version of the HRS thus includes generated (and imputed) variables for nominal gross total household income for each wave. In order to make HRS income comparable to SHARE income, we have to convert gross income to net income and then convert the latter from nominal dollars to ppp adjusted euros. The first task was accomplished for the 2000, 2002, and 2004 waves of the HRS by Rohwedder et al. (2006), who submitted HRS data to the NBER Internet TAXSIM calculator (http://www.nber.org/~taxsim/; see also Feenberg & Coutts, 1993). A preliminary version of an update of this, which includes HRS 2006 income data, was kindly made available to us by Philip Pantoja. However, several states in the USA levy state income taxes. State information is not available in the public release data of the HRS. Therefore, the resulting data set contains 51 records for each respondent (50 states and DC). By restricting the data to only those states that are in the Census Division the respondent lives in (which is available in the public data), we could narrow this down to 3-9 states per household. The statistically correct way to use these data would be to do a multiple imputation using posterior probabilities of living in each state. This, however, requires the total number of respondents from each state in the HRS, which is not available. Therefore, we have opted for a practical approximation, which treats the different records per household as independent observations, but keeps their combined sampling weight equal to the original sampling weight of the household by multiplying the original weight by a state population size (within the age-gender-race-ethnicity cell of the respondent) based proportion.

We then converted nominal dollars to ppp-adjusted euros by augmenting a spreadsheet, kindly provided to us by Dimitris Christelis, which computes the ppp adjustment factors for the SHARE countries, with OECD data on price levels, inflation rates, and exchange rates for the USA and computing ppp adjustment factors using the same formulas as used for the SHARE countries (Christelis, 2008a, 2008b).

Finally, ELSA provides net income (in English pounds per week) in its financial derived variables data set. At the time of writing, this data set was not yet available (not even a preliminary version) for 2006. Hence, when we compare cross-sectional income distributions below, we only include ELSA for the 2004 comparisons. For the income change analyses, we used the changes from 2002 to 2004 in ELSA to compare with 2004-2006 changes in SHARE and HRS. The ELSA amounts were ppp adjusted using the same OECD sources and the spreadsheet used for the HRS as well.

Despite the efforts to arrive at income measures that are closely comparable, some problems with the definitions and calculations of these variables remain. To mention the most salient of these: (1) The income measure in ELSA is more aimed at measuring disposable income than simply net (after tax) income. One of its components is "take home pay", which subtracts, among others, union fees and "etc." from gross earnings. These components are not subtracted from gross earnings in the other studies. (2) For the HRS data, the TAXSIM program occasionally returns very large (positive) tax amounts, resulting in negative incomes. Sometimes it also returns large negative tax amounts, especially of state taxes. (3) The preliminary net income variable for SHARE Wave 1 is based on very crude computations and may therefore be subject to occasional substantial errors. (4) The ppp adjustments are based on OECD estimates of price levels, inflation rates, and exchange rates. These estimates are updated frequently and occasionally result in substantial changes.

Hence, the results presented in this section are tentative and should only be used with considerable caution. As time progresses, experience with using the derived variables will probably lead to substantial improvements in these variables. Stronger conclusions about similarities and differences between countries and studies can then be drawn.

In the following, all analyses are performed at the household level, on a data set from which net household incomes (ppp adjusted towards 2004 German euros) of less than 1,000 euros or more than 1 million euros have been removed. The 1 million threshold only affects a handful of observations in the HRS, with one observation with a net income of more than 14 million euros in 2006. Although a detailed study does not give rise to a suspicion of reporting errors, and this may well reflect an aspect of the US economy that is rarely observed in Europe, this particular case increases mean income substantially (10%) and the standard deviation almost without bound, so that we cannot expect that these results give an accurate picture of the US income distribution. The restriction to only households with net incomes of 1,000 euros or more was imposed for similar reasons, although here the mere fact that incomes are below 1,000 euros is itself reason for concern about the accuracy of the data. This holds especially for incomes that are zero or negative. Small positive incomes tend to have effects on the distribution of relative income changes that are similar to the effect of the single outlier on the US income distribution, if their next wave's income is well above 1,000 euros. This restriction removes about 1.5% of HRS households, 2.5% from SHARE Wave 1 and 5.5% from SHARE Wave 2, and 2.5% from ELSA.

Income Distributions in 2004 and 2006

We first compare income distributions within the three studies separately for 2004 and 2006. Table 1 presents a few key characteristics of these distributions. The distributions all share the typical characteristics of income distributions: the mean is considerable higher than the median and the amount of variation is very large. This is the result of the asymmetry and long right tails of the distributions. The large skewnesses and kurtoses (not reported here) confirm this.

	2004				2006			
Study	Median	Mean	s.d.	Gini	Median	Mean	s.d.	Gini
SHARE	22,000	35,000	42,000	0,49	17,000	23,000	22,000	0,44
HRS	32,000	45,000	52,000	0,47	30,000	43,000	51,000	0,47
ELSA	18,000	24,000	26,000	0,41				

Table 1 Distribution of real net total household income, PPP adjusted (in 2004 Euros)

More striking in this table are, however, the sizes of the differences in the income distributions from different studies and, especially for SHARE, the large drop in incomes between 2004 and 2006. Some of the qualitative patterns in the differences are well known or easy to explain. For example, the smaller variation in ELSA and the corresponding smaller Gini coefficient (less inequality) are to be expected because the population is much more homogeneous than all SHARE countries combined or the much larger and diverse USA. Also the higher median and mean incomes and larger variation in the USA than in Europe are well known. In addition to just generally higher incomes in the USA, his also

reflects the much higher labor force participation of women in this age group, as shown in the previous section.

The drops in median and average income in the HRS do not necessarily reflect an income drop in the population, because the HRS does not contain a refreshment sample in 2006. Hence, the 2006 sample is typically two years older than the 2004 sample and contains largely the same respondents (except for some nonresponse patterns). The cross-sectional weights included with the HRS are only partially able to correct for this. In fact, we will see below that median and mean income differences at the individual level in the HRS are of a similar order of magnitude. Income drops at the individual level are to be expected, because a non-negligible fraction of the sample (and population) will have retired between waves, which is generally associated with a significant income drop. We will study this below.

The differences in median and mean income in SHARE between 2004 and 2006 are partially due to differences in sample composition, in particular the inclusion of Poland and the Czech Republic in Wave 2 of SHARE. If we exclude these from the 2006 computations, the median and mean each increase by about 2,000 euros and the Gini coefficient decreases to 0.42. However, this still leaves a large income drop to be explained. Apart from true declines in (real) income, a prime candidate explanation for this is the imperfection in the algorithm used to compute net income from gross income components in SHARE Wave 1. Indeed, there are some indications that the subtracted tax amounts are too small. Most likely, this will be improved in a future release, where more detailed tax calculations may be performed. Another potential explanation could be nonrandom nonresponse, which could make the refreshment samples in Wave 2 very different from the Wave 1 respondents who are not present in the Wave 2 sample. The latter can typically be corrected to a large extent by computing attrition-corrected weights and using these corrected weights to compute estimates of interest. This has been done for the HRS by Kapteyn et al. (2006), but they did not find any noticeable bias due to selective nonresponse that was not already corrected for by the HRS-provided cross-sectional weights. Therefore, we have used the standard HRS weights in this chapter. Perhaps such an analysis for SHARE will show that corrections are more important. We leave this for further research.

Changes in Household Income and their Relation with Retirement

Table 1 above presented differences between 2004 and 2006 that reflect differences between overall distributions, but not necessarily average differences at the household level, because the figures are based on partially different samples. Even in the HRS, where no refreshment sample was added in 2006, there are households that were present in earlier waves but not in 2004 who returned to the sample, and households that were present in 2004 but not in 2006. Different cross-sectional weights in the two waves are then used to make each sample representative of the population in the same year. In contrast, we turn our intention to income changes at the household level. That is, we select only the households that are present in both waves, compute their income changes, and study the distributions of these. Where the differences between marginal distributions mainly (should) reflect economic growth and inflation, the analyses here mainly reflect income changes as a result of the aging process, i.e., reflect income difference across the life cycle. This is especially interesting for individuals who have retired between waves. Retirement is often accompanied by a drop in income, because pensions tend to be lower than final earnings. A priori, we would expect this effect to be larger on average in the USA than in

Europe, because participation in a pension plan is often mandatory in Europe, whereas it is often voluntary in the USA, while there has been some concern about whether Americans save enough for their retirement.

Table 2 presents some overall statistics. This table and all results presented below are based on a (large) subsample of households, in which the respondent was single in both waves, or in which the respondent lived with the same spouse or partner in both waves. Hence, this filters out changes due to changes in household composition. From Table 2, we see that indeed at the median, incomes decline in the age group studied. The decline is smallest in ELSA, which may be related to the fact that income is lowest there already. The decline is largest in SHARE. The figures for percentage change are, however, somewhat difficult to interpret because the median and mean have different signs. Therefore, we have plotted the densities of percentage change for the three studies in Figure 1, separately for households in which at least one of the spouses retired between waves and for households in which this was not the case (already retired or not yet retired).

	Absolute Change			Percentage Change		
Study	Median	Mean	s.d.	Median	Mean	s.d.
SHARE	−1,100	−6,900	36,000	−8%	+27%	210%
HRS	−1,000	−3,100	46,000	−5%	+18%	140%
ELSA	−200	−1,200	25,000	−2%	+25%	190%

Table 2 Distribution of net household income changes (PPP adjusted 2004 Euros)

Note: ELSA results refer to changes between 2002 and 2004

Figure 1 shows some expected common patterns: The distribution of income change tends to peak at about 0% (no change) if there is no change in retirement status, and has more of its mass below zero (income decline) if people retired in between waves. For the "no-change" households, the HRS is most closely concentrated around zero, and SHARE has the widest spread around this number. This may be the result of the crudeness of the gross to net conversion for Wave 1 of SHARE, leading to both positive and negative errors, so that the density is more dispersed than the true density. Later refinements of this variable may shed more light on this. For the households that retired between waves, the graphs for ELSA and SHARE are qualitatively similar, with a peak at about -35% and a long tail to the right. The HRS picture is different, because the largest peak is at 0%, but with a second peak at -35%.
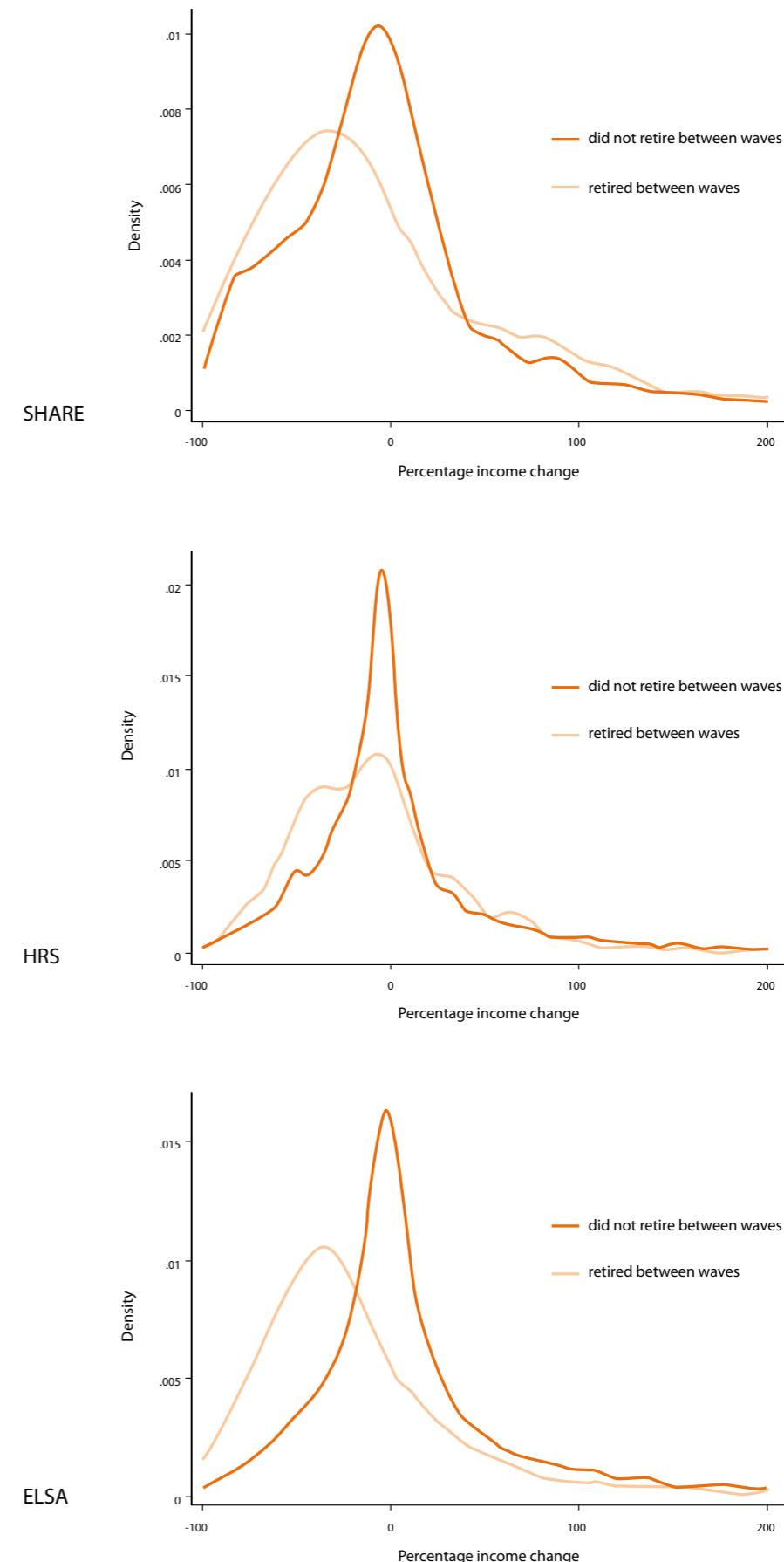
Figure 1 Distributions of relative income changes

The Relation between Retirement and Income Inequality

Retirement can have two different effects on income inequality: (1) If there is a sizeable fraction of the population without a satisfactory pension and another group that does have a decent pension, then individuals with similar earnings before retirement may have widely different incomes after retirement, and this may substantially increase income inequality. On the other hand, if either almost all individuals have a satisfactory pension, or almost all individuals only have a (usually minimal) public pension, then income inequality may decrease substantially. For the case where all individuals only receive a (usually homogeneous) public pension, this is obvious. The case where all individuals have a decent private pension also leads to a decrease in income inequality, because private pensions are typically based on a smoothed version of earnings before retirement. Earnings variations across the lifecycle may then lead to contemporaneous inequality while working, but may lead to similar pensions.

To study the net effect of retirement on income inequality, we restrict our sample to the households in which the respondent and/or the respondent's spouse retired between waves, and compute the Gini coefficient before retirement (2004) and after retirement (2006). Table 3 presents the results. Note that the Gini coefficients are smaller than the ones in Table 1, because the restricted sample is more homogeneous than the whole 50+ population. We see that retirement has no discernable effect on income inequality in the HRS and ELSA, but has a substantial inequality-reducing effect in SHARE.

	Gini Coefficient	
Study	2004	2006
SHARE	0.47	0.37
HRS	0.42	0.43
ELSA	0.37	0.37

Table 3 Income inequality before and after retirement (for those who retired between waves)

Note: ELSA results refer to changes between 2002 and 2004

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3 The SHARE Respondents

Editor Axel Börsch-Supan

The SHARE Respondents

What Has Happened to the Oldest Old SHARE Participants After Two Years?

3.1 What Has Happened to the Oldest Old SHARE Participants After Two Years?

Karen Andersen-Ranberg, Jean-Marie Robine, Mikael Thinggaard, Kaare Christensen

One of the most recent revolutionary demographic changes in industrialized countries has been the substantial decline in mortality of the oldest old (i.e. persons aged 80 and over). Not only have these changes lead to a major increase in the proportion of oldest old, they have also had as result that the oldest old are the fastest growing age segment in most European countries (Kannisto, 1994; Vaupel, 1998).

Oldest olds are in a phase of their lives where ageing processes together with greater risks of contracting diseases and experience bereavement (e.g. loss of spouse) lead to frailty and subsequent dependency of help. Consequently, the increasing proportion of oldest olds are forecasted to have major impact on national health care costs, especially when the large post-WW2 birth cohorts reach this age segment in just a few decades. Not only will they be numerous, they will also be more demanding compared to today's oldest olds who belong to the so-called "gratitude generations".

There is an ongoing debate (Parker et al., 2005; Parker and Thorslund, 2007) whether the improvements in life-expectancy have been followed by equal improvements in disability and morbidity. A recent review on health trends in the oldest old suggests that "…the prevalence of symptoms, disease, and functional limitations is expanding at the same time that disability is being compressed, or at least postponed" (Parker and Thorslund, 2007).

Nevertheless, oldest olds are a very heterogeneous group. Some are well functioning and living independently in their own homes, while others are dependent on help and care from family members and/or formal health care professionals. Many factors influence the type of help and care that can be provided: medical conditions, socioeconomic status, cultural diversities in caring for older people, and access to health care. As an example, southern European countries such as Italy and Spain have the lowest fertility rates in Europe and are also among those countries with the longest life expectancy. This will not only increase the dependency ratio, but with a growing proportion of women on the labour market together with changes in family structure and tradition of cohabiting generations, these southern European countries are facing larger challenges than their more central and northern neighbours.

Following the first SHARE survey in 2004 (Wave 1) we wrote a chapter "Who are the oldest olds?" With the data from the SHARE survey in 2006 (Wave 2) we are able to use the longitudinal results to describe: what happened over the last two years with the oldest olds of Wave 1? As morbidity and disability are highly prevalent in the oldest old and with consequent major impact on health care, we have focused on studying the following key questions: What happens in two years in terms of health and functional abilities of the oldest old SHARE participants? What are the characteristics of those who died between the two waves? And of those who survived?

Data and Methods

As this chapter has a longitudinal focus we have only analyzed the data on oldest old participating in Wave 1 and thus eligible for the two-year follow-up. Participating countries in the SHARE survey 2004 were Sweden, Denmark, the Netherlands, Belgium, Germany, Switzerland, Austria, France, Spain, Italy and Greece. We looked at the following variables: Activities of daily living (ADL) as a measure of dependency and disability defined by having

1 or more limitations in ADL (1+ADL); grip strength (grip strength) as a measure of global health, as this has previously been shown to predict disability, morbidity, and mortality. Grip strength (kg) was measured by using a handheld dynamometer and analysed using either age and gender adjusted means, or dichotomized in having a grip strength measurement performed or not (MISSING); impaired cognitive functions were defined as a score of 3 or less in orientation (<4ORI). Symptoms of depression were defined by a score of 4 or more (4+EURO-D) of depressive symptoms in the EURO-D scale. Additionally we used the number of drugs as a proxy for diseases, based on the hypothesis that in oldest olds, drugs may be a better mirror of ongoing diseases than self-reported diseases. We defined taking 4 or more different drugs (4+MED) to be an objective health measure and a proxy for high morbidity.

The odds ratios (OR) use as reference group the results of those Wave 1 participants who were alive at the two-year follow-up, irrespective of whether they participated in Wave 2 or not. All the analyses have been performed after adjustment for age, gender, and different follow-up times, and the data have been analyzed according to three geographical regions: Northern (Sweden, Denmark and the Netherlands), Continental (Belgium, Germany, Austria, France, and Switzerland), and Southern (Spain, Italy and Greece) European countries.

Results
What Happened Between Wave 1 and Wave 2?

The present results are based on the first release of Wave 2 data. A total of 2,558 (100 per cent) persons aged 80 and over participated in Wave 1, see Table 1. At follow-up two years later only about half (54 per cent) participated. Some had died (12 per cent), fewer had declined to participate (6 per cent), leaving about 28 per cent of non-participants with unknown vital status, where follow-up work in 2008 und 2009 is necessary to verify their status. This group may cover participants who may have died, been hospitalized, or have moved. However, the proportions vary by country. E.g. almost half (44 per cent) of German Wave 1 oldest old are registered as non-participants with vital status unknown, see Table 1. Other countries such as Italy, Austria and France have around one third (31 per cent, 32 per cent and 33 per cent, respectively), while the lowest proportions of non-participants with unknown vital status are found in Greece and Denmark (17 per cent each). Further data cleaning is warranted to confirm the vital status, and until this has been done the results presented here must be interpreted cautiously.

The SHARE Respondents

What Has Happened to the Oldest Old SHARE Participants After Two Years?

	Wave 1	2 years follow-up			
		Non participants in Wave 2			Wave 2
	N (%)	Dead n (%)	status unknown n (%)	Refused, alive n (%)	n (%)
SE	297 (100)	42 (14)	82 (28)	13 (4)	160 (54)
DK	169 (100)	30 (18)	29 (17)	6 (4)	104 (62)
NL	219 (100)	37 (17)	60 (27)	21 (10)	101 (46)
BE	345 (100)	24 (7)	86 (25)	20 (6)	215 (62)
DE	189 (100)	21 (11)	83 (44)	12 (6)	73 (39)
AT	171 (100)	17 (10)	55 (32)	10 (6)	89 (52)
FR	335 (100)	27 (8)	109 (33)	15 (4)	184 (55)
CH	102 (100)	12 (12)	28 (27)	7 (7)	55 (54)
ES	284 (100)	47 (17)	75 (26)	44 (15)	118 (41)
IT	170 (100)	18 (11)	52 (31)	7 (4)	93 (55)
GR	277 (100)	26 (9)	46 (17)	10 (4)	195 (70)
Total	2,558 (100)	301 (12)	705 (28)	165 (6)	1,387 (54)

Table 1 SHARE oldest old at 2-year follow-up. Numbers of Wave 1 participants and numbers and proportions (percent) (relative to Wave 1) of non-participants (dead, status unknown, refusals), and participants at 2-year follow-up.

Not surprisingly, some of the Wave 1 oldest old participants died before follow-up. At the country level, Denmark, the Netherlands and Spain have the highest proportions (17-18 per cent) of deceased participants at follow-up. The lowest proportions are seen in Belgium, France and Greece. This leaves various proportions of participants completing both waves: Germany and Spain having the lowest (~40 per cent), while Greece, Belgium and Denmark having the highest proportions (62-70 per cent) of Wave 2 participants.

What Are the Health Characteristics of Those Who Died After Participating in Wave 1 and Before Follow-Up?

A priori, one would expect that the frailest oldest olds to die before those with better health. SHARE oldest olds in all countries show no exception from this rule, whether we use 1+ADL, MISSING grip strength, 4+EURO-D, ≤3ORI, or 4+MED as independent indicators of being frail and at risk of dying, see Figure 1. Interestingly, all variables with the exception of 4+EURO-D and 4+MED, showed a north-south gradient in odds ratio, with higher odds ratios the more northern the European region. Thus these variables are stronger predictors of death the more northern the geographical region. Even among participants who actually performed a grip strength measurement, those who died had significantly lower grip strength measurement compared to the mean grip strength (adjusted by age and gender), but much more pronounced in the northern and the continental SHARE countries. The 4+EURO-D and 4+MED showed almost similar and positive odds ratios for northern and southern countries (odds ratios around 2.0), but lower odds ratios for continental countries; in fact an insignificant odds ratio for taking 4+MED (odds ratio 0.8 [0.5;1.6]). This could be explained by the fact that in Wave 1 continental SHARE countries had more participants taking 4+MED (16.3 per cent) compared to the northern (10.0 per cent) and the southern (14.6 per cent) SHARE countries. This could be explained by

cultural differences in the use of various drugs including over-the-counter drugs being self-reported as medication prescribed by a doctor.
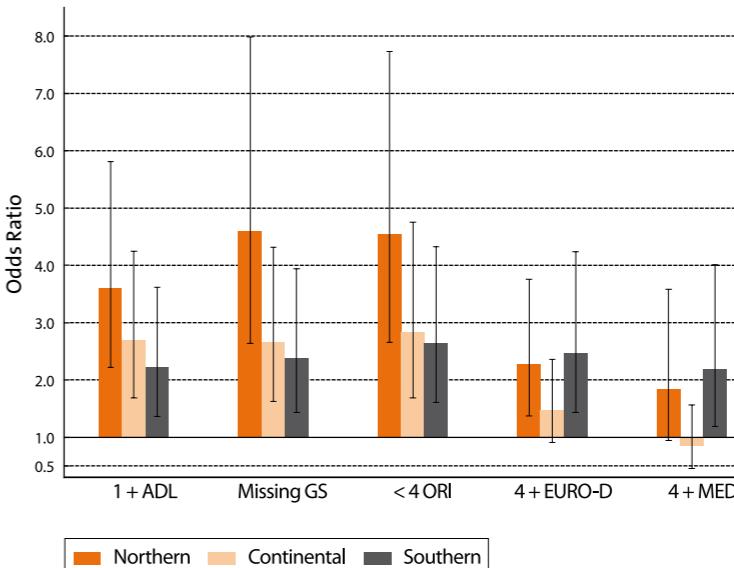
Figure 1a Odds ratios, adjusted for age and gender, for being dead within 2 years of follow-up compared to the ones who survived. Done separately by Northern (DK, SE, NL), Continental (BE, DE, AT, CH, FR) and Southern Europe (ES, IT, GR).
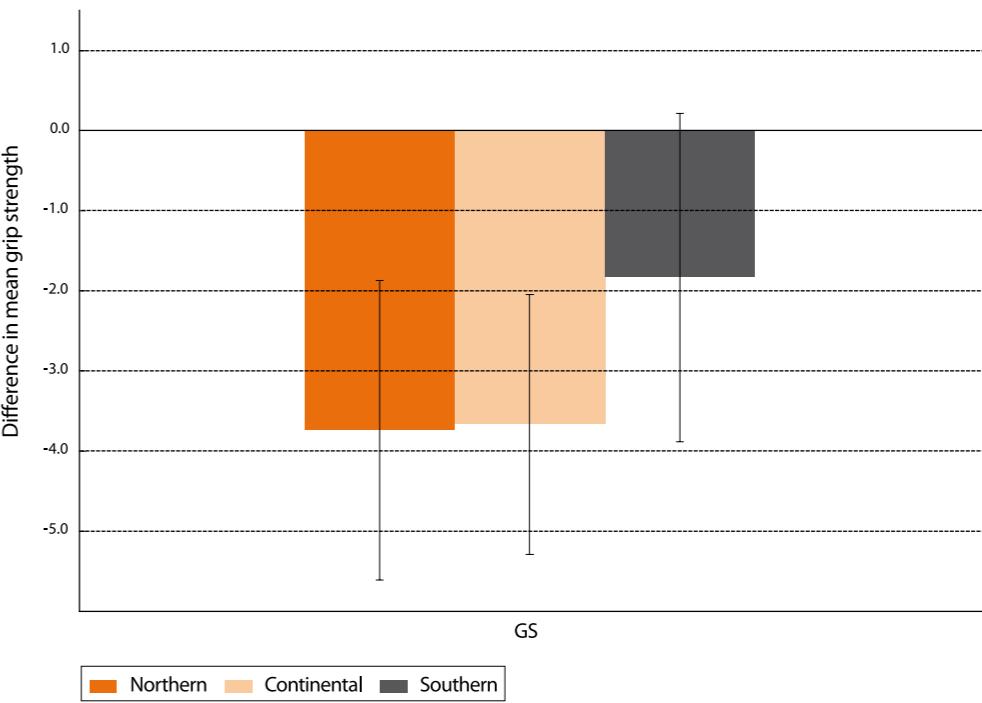
Figure 1b Mean difference in GS, adjusted for age and gender, between the ones who died within 2 years of follow-up and the ones who survived. Done separately by Northern, Continental and Southern Europe.

The SHARE Respondents

What Has Happened to the Oldest Old SHARE Participants After Two Years?

How Are the Surviving Participants in Wave 2 Doing?

A well-known concept in the gerontological literature is 'successful ageing'. It has been defined in many ways, but predominantly in relation to health and disease (Bowling and Dieppe, 2005). For the purpose of this article 'being free from impairments in physical, cognitive and mental health' may be used as a criterion for successful ageing.

Being alive and participating in Wave 2 could be a criterion of ageing which, per se, is successful, but it could also be hypothesized that Wave 2 participants were not only the most healthy participants in Wave 1, they also remained healthy during follow-up. Nevertheless, the results show that the risk (odds ratio) of having 1+ADL, 4+EURO-D, <4ORI or having MISSING grip strength is higher for Wave 2 than for Wave 1 participants, see Figure 2. In other words, the proportions are higher in Wave 2 compared to Wave 1, with significant odds ratio for having 1+ADL, MISSING grip strength, <4ORI, and taking 4+MED, but not in 4+EURO-D. However, there are some clear differences according to geographical regions. A north to south gradient is seen in odds ratio of having 1+ADL and <4ORI in the more northern countries compared to southern countries at follow-up and relative to Wave 1. odds ratio of having MISSING grip strength and taking 4+MED indicates an increasing proportion of these subjects in Wave 2 compared to Wave 1, but with no clear geographical pattern. However, among those who actually had grip strength measurement performed the difference in mean grip strength of the two waves showed a decline (from Wave 1 to Wave 2), and was large (~1,8 kg) in the northern countries and small (~0.5 kg) in the continental countries. In contrast, there was no decline in the southern SHARE countries, see Figure 2, right part of the graph.
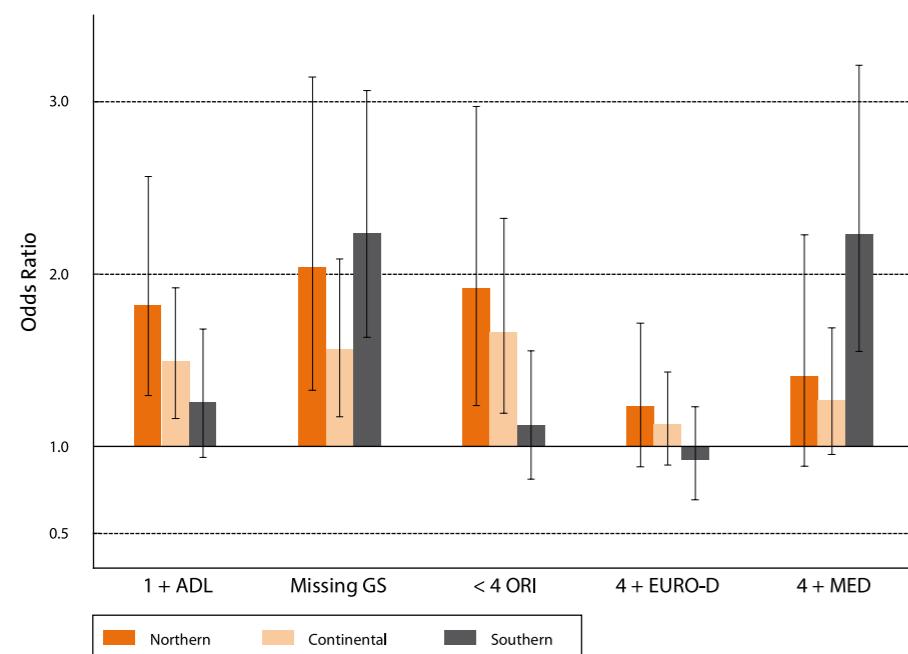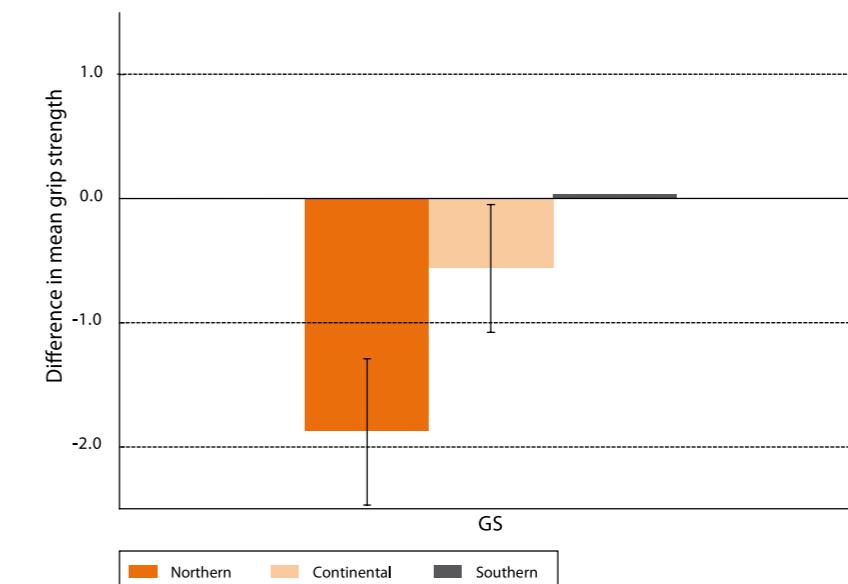
Figure 2b Mean difference in GS, adjusted for age and gender, between Wave 2 and Wave 1 for the ones who managed both waves. Done separately by Northern, Continental and Southern Europe.

Can SHARE Data on the Oldest Old Predict Declines in Physical, Mental and Cognitive Functions Over Two Years, or Death?

Having a MISSING grip strength, <4ORI or 1+ADL separately predicts death during a two-year follow-up time in all SHARE countries, but with a clear gradient of higher odds ratio in the northern European countries compared to the southern countries. The same variables also predict future limitation in their respective domains, as could be expected. However, it is noteworthy that the same variables are stronger predictors in northern compared to southern SHARE regions.

Institutionalisation

To fully understand the results, it is important to notice that in Wave 1 most participating countries excluded institutionalized persons. Thus a selection bias in the present study towards more healthy oldest olds is likely, especially in northern and continental SHARE countries, which, compared to southern SHARE countries, have a relatively high density of nursing homes and special housing units for elderly. But Sweden, Denmark, and to a certain extent the Netherlands, did include institutionalized respondents in Wave 1, thus yielding a less selected population of oldest olds, making these countries more comparable to the less selected southern European SHARE countries with their lower density of care homes and residential facilities. This may partly explain the almost identical death rates of Spain compared to Denmark, Sweden and the Netherlands, but it could also be hypothesized that death rates should have been even higher for Denmark and the Netherlands as they are among those SHARE countries with the highest oldest old mortality (Human Mortality Database: www.mortality.org). The lower death rates of oldest olds in Italy and Greece could be explained by a selection bias towards more healthy oldest olds participating in the study.

Figure 2a Odds ratios of having 1+ ADL, Missing GS, <4 ORI, 4+ EURO-D or 4+ MED at Wave 2 compared to Wave 1 for those who managed both waves. Adjusted for age, gender and different follow-up times and done separately by Northern, Continental and Southern Europe.

Comparing the two-year death rate in the SHARE oldest old with accurate population-based data on death rates derived from the Human Mortality Database (www.mortality.org) (accessed April 2008) shows almost similar ranking orders.

Ranking order	Human Mortality Database[a]	SHARE mortality[b]
1	DK	NL
2	NL	DE
3	BE	ES
4	DE	DK
5	SE	SE

Table 2 Top-5 mortality rates in the oldest old SHARE participants compared to the population-based Human Mortality

Database (1 = highest mortality). Adjusted by gender.

[a] Mortality rate in age group 80-84; [b] Median age varied between 82 and 84 years in the different SHARE countries

Conclusion

The above-mentioned assumptions are based on a preliminary data release, which includes non-participating Wave 2 respondents with yet unknown vital status. When this is known for all Wave 1 participants at 2-years follow-up, missing data on non-respondents alive in Wave 2 may be analyzed using the methods described by Little and Rubin (2002). Such analyses may give more insight into the complex pathways of functional decline and death, as survey participants have generally better health than those who decline to participate, especially in surveys including oldest olds (Frederiksen et al., 2006). The present results may thus overrate the general health of oldest olds, i.e. a best case scenario.

This said, we find that the data are in general reliable as they follow well-known patterns of decline in physical and cognitive functions, as well as low scores predicting not only future decline but also death as shown in other studies of decline in physical and cognitive functions in oldest olds (Parker and Thorslund, 2007; Bravell et al., 2008). It is interesting, though, to see that the most predictive variables, i.e. having MISSING grip strength, at least one limitation in ADL, or a bad orientation score, are stronger predictors in northern SHARE countries compared to the more southern countries.

In conclusion, during two years follow-up

- surviving participants were more likely to have disability in physical health, mental and cognitive functions at two-year follow-up compared to Wave 1
- those who died were more likely to have a) no grip strength measurement performed during the interview of Wave 1, b) at least one limitation in disability, c) low cognitive scores (numeracy and orientation), d) more than 4 drugs per day, and e) depressive symptoms
- odds ratios of having a) no grip strength measurement performed, b) at least one limitation in disability, and c) a low cognitive score (only orientation), showed stronger association with mortality in the northern compared to the more southern SHARE countries.

Further and more complex analyses are required to fully elucidate this north to south difference in predicting death and functional decline, as well as understanding possible interactions with different variables, including socioeconomic status. Future waves of SHARE may strengthen the present results and also point at predictors of successful ageing in a time of continuing decline in oldest old mortality.

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3.2 Health, Bequests, and Social Support in the Last Year of Life: First Results from the SHARE End-of-life Interviews

Hendrik Jürges

The short but comprehensive SHARE end-of-life interview (also known as the "exit" interview) gives the analyst the rare opportunity to follow the lives of people right until the time of their death. We have collected information on health, social well-being and economic circumstances in the last year of life of all our first wave respondents that have died between the first two rounds of data collection. Overall we have conducted more than 500 end-of-life interviews (for 274 men and 247 women) with so-called proxy-respondents, mostly with relatives, but also with neighbours or friends (see the appendix for a detailed description). The average time between the decedent's death and the end-of-life interview was 14 months. Average age at death was 75.1 years among men and 80.7 years among women.

One should bear in mind that what we will describe in the following as the life circumstances in the last year of life is likely to be a somewhat positively biased picture. First, almost all of our respondents have been sampled from private households in 2004. We thus miss persons who already lived in nursing homes in 2004 by our initial sample design. Second, the fact that we were able to find a person close enough to our first wave respondent who was willing to share information about a recently deceased relative, neighbour or friend implies that we miss information on persons without close relatives or friends nearby. How biased exactly our results are is yet difficult to say, because the preliminary data release on which the analyses in this chapter are based, does not allow to determine exactly how selective our sample is. Overall, exit interviews have been realised in somewhat more than 60 per cent of the cases of deceased respondents. Exit interviews are mostly missing for respondents who lived as singles. In cases where a member of the deceased's household could be contacted, exit interviews were conducted in 88 percent of the cases.

The aim of this short chapter is to give a first impression of the research potential of the SHARE exit interview. First, we will describe patterns of ill health in the last year before death, in particular with respect to limitations in performing activities of daily living. We will highlight the role of family and other persons in helping with these health-related limitations. Second, we will look at place of death and how this place is connected to health status before death and the presence of family. Although most people prefer to die in their own home, the majority of people die in institutions: hospitals, hospices, or nursing homes. Third, we will describe what happened to the assets the decedents had at the end of their lives: how is the estate distributed among family and others? Are bequests and their distribution related to family relations in the last year before death, e.g. to help the decedent received with ADLs?

With one wave of exit interview data, we only have a small number of observations available for the analyses, which precludes a fully-fledged analysis of cross-national differences that happens in the last year before death. Still, the distinction between larger European regions (Northern = Sweden, Denmark, the Netherlands; Western = Belgium, France, German, Austria, Switzerland; Southern = Spain, Greece, Italy) already bears fruitful and shows how the research potential might expand as SHARE is continued for more waves and the number of exit interviews increases.

Health and Disability in the Last Year Before Death

The question how disability rates evolve with age has attracted considerable attention in the literature (Guralnik et al., 1991). If disability rates in the last year before death increase with age at death, increased longevity can have a substantial impact on the health care costs. We measure disability in the last year of life as the ability to perform activities of daily living (ADLs) without difficulty. We asked respondents to name only difficulties the decedents had with ADLs in their last year before death that have lasted at least three months. Building on the capacity to dress, walk across a room, bathe, eat and use the toilet, we distinguish three groups of decedents: "fully functional" (no limitation), "moderately restricted" (limitations in one to four ADLs), and "severely restricted" (limitations in 5 ADLs).
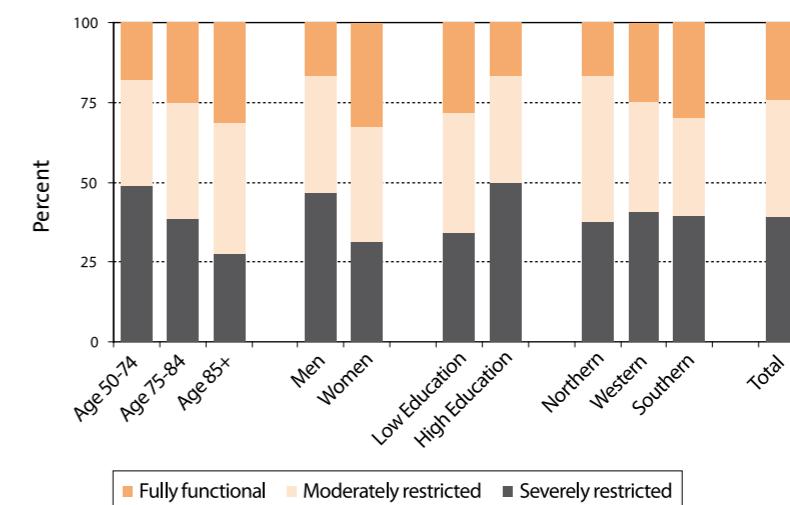
Figure 1 Disability rates in the last year of life, by age, sex, education, and country group

Figure 1 shows the percentage of fully functional, moderately restricted an severely restricted decedents by age at death, sex, education level, and country group. Overall, 40 percent of the deceased sample members are classified as having been fully functional in their last year of life, 36 percent are classified as moderately restricted and 24 percent are classified as severely restricted. These numbers vary significantly by age, sex, and country group. 49 percent of the decedents in the youngest age group (50-74) have spent their last year of life fully functional and only 18 percent have experienced severe restrictions for more than three months. In contrast, 32 percent of the decedents in the oldest age group (85+) were severely restricted during at least three months in their last year of life and only 28 percent have been fully functional. Differences between the sexes are also notable. More women than men have suffered severe restrictions (33 vs. 17 percent) and less women than men were fully functional (31 vs. 47 percent). Part of this difference is due to the fact that women die at older ages. Our results for age at death and sex are in line with earlier studies from the US (Guralnik et al., 1991).

We also find significant education differences. Earlier analyses using SHARE data have shown that the better educated are healthier than the less educated (Avendano et al., 2005). They also live longer (Lleras-Muney, 2005). Our research demonstrates that also in their last year of life, the better educated are better off. 34 percent of the low educated but 50 percent of the high educated spent their final year fully functional, whereas 28 percent

of the low educated and 17 percent of the high educated were severely restricted. Logistic regression analyses – which are not shown in detail – confirm that education differences remain significant even after controlling for age, sex, and cause of death.

Disability rates in the last year of life also differ across European regions. The lowest rates of disability were found in the Northern countries: 38 percent were disability-free and 17 percent were severely restricted. The largest rates of disability were found in the Southern countries, with 39 percent having been fully functional but 30 percent having been severely restricted. Again, these differences remain statistically significant when cause of death is controlled for.

In order to understand how much of the disability we observe among the deceased SHARE respondents is actually due to a "terminal decline", i.e. specific to the last year before death, it is useful to compare the increase in disability rates between Wave 1 and the last year before death with the increase in disability rates among those who survived and who were re-interviewed in 2006. Figure 2 shows the percentages of respondents in 2004 and 2006 (or in their last year of life) who were fully functional in 2004 and in 2006, overall and by age group. In total, of those who survived and who were re-interviewed, 91.7 percent were fully functional in Wave 1 and 90.1 percent were fully functional in Wave 2. In contrast, of those who died between Waves 1 and 2, only 62.3 percent were fully functional in Wave 1 and 40.0 percent were fully functional in their last year of life. In other words, those who died between waves were not only less functional on average in the first wave of SHARE, they also experienced a much larger decline in their ability to perform ADLs.
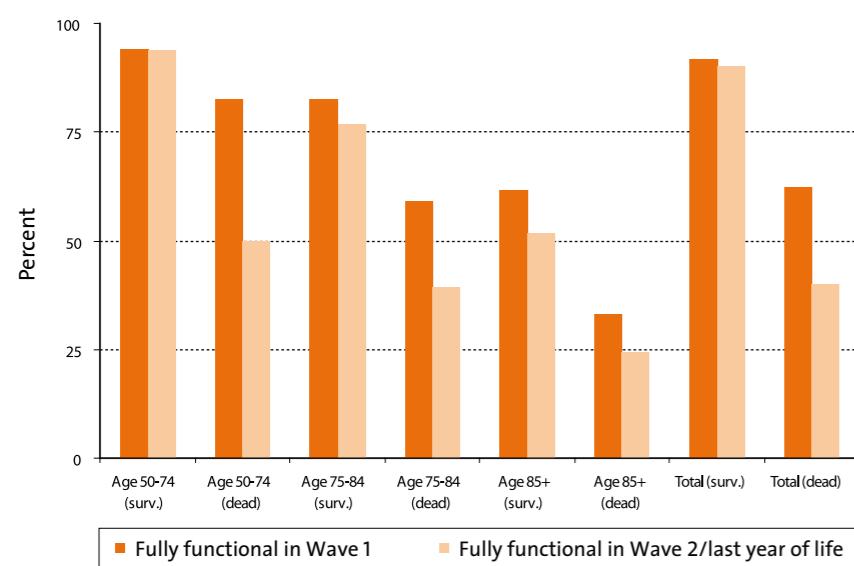
Figure 2 Functional decline between SHARE Waves 1 and 2, by survivor status and age in Wave 1

Differences by age group (in 2004) are also substantial. Surviving respondents in the 50-74 age group experienced virtually no change in their functional status (although even the small decline is statistically significant). Survivors in the older age groups experienced larger declines. Among those aged 75-84 and 85+, the percentage of respondents who were fully functional decreased by 5.6 percentage points and 8.7 percentage points, respectively.

In contrast, among the decedents, the functional decline was largest in the youngest age group, both in absolute and relative terms, and smallest in the oldest age group, which is possibly due to some ceiling effect.

Informal and Formal Help with Activities of Daily Living

How have the decedents coped with the difficulties they had in their last year before death? More than 98 percent of the decedents who were moderately or severely restricted and for which we have collected end-of-life interviews had help from family, neighbours and friends, or professional helpers. About half of them had one person that helped regularly, 30 percent were helped by two different persons, and 20 percent had at least three persons who helped regularly.

Overall, the most important source of help in the last year of life are children and children-in-law. 48.2 percent of all decedents had help from either sons or daughters or children-in-law of either sex. Daughters (30.1 percent) and daughters in law (9.1 percent) are more often named as helpers than sons (20.1 percent) and sons-in-law (3.9 percent). The second most important source of help with activities of daily living are spouses or partners (42.1 percent). Overall, 84.5 percent of the decedents have been helped by family members.

Non-family also plays an important role in caring for those who are in their last year before death. Overall, 46.3 of decedents who had problems with activities of daily living were helped regularly by professional helpers (39.5 percent) or other non-relative, i.e. friends, neighbours, or volunteers.

Details on helpers, by country group, are shown in Figure 3. The most striking difference can be found for the proportion of decedents who have been helped by professional helpers. In the Northern countries, 70 percent of the decedents had help from professionals. In Western Europe, these were 36.7 percent, and in Southern Europe, only 18 percent had help from professional helpers. In contrast, children (in particular daughters and daughters-in-law) played a bigger role in Southern Europe: whereas 38 percent of the decedents in the South had help from a daughter and 27 percent had help from a son, only 24 percent and 19 percent, respectively, in the North had. In Northern Europe, daughters-in-law and other helpers are also less likely to be among those who help. Spouses, however, are somewhat more likely to help in the North, but they are most important in Western Europe.
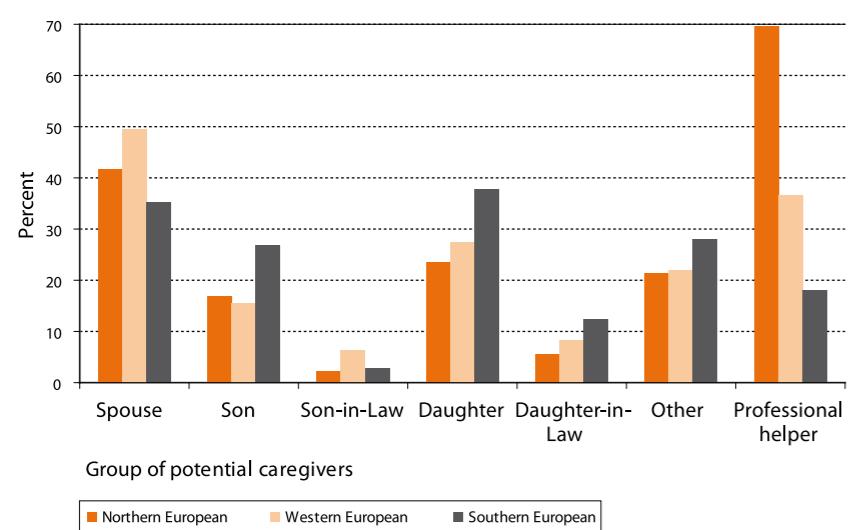
Figure 3 Help with ADLs received by decedents in the last year of life, by type of caregiver and country group

Figure 4 Place of death, by age, sex marital status, presence of children, and country group

Location of Death

Where did people die? Many people state that they prefer to die in their own homes and not in hospitals or nursing homes (Schmitz-Schetzer, 1992). But of course, not everyone dies at their own home. Figure 4 shows the distribution of places of death of the SHARE decedents. We distinguish three categories of places: outside of institutions (which in most cases means at home), in hospitals or hospices, and in nursing homes. Overall, 38.5 percent of the decedents have died outside of institutions, 47.6 percent have died in a hospital or hospice and 13.9 percent have died in a nursing home. We find a clear age gradient with respect to the probability of dying in a nursing home, see Figure 4. The probability is largest in the oldest age group and smallest in the youngest age group. The opposite trend is found for the likelihood of dying in a hospital or hospice: Whereas 58 percent of all decedents at ages 50-74 died in a hospital, only 39 percent of those aged 85 and over did. This is mostly due to the more acute causes of death at younger ages that are treated in hospitals. The probability of dying outside of institutions remains fairly constant across the entire age range.

Whether decedents have close family (spouses or children) also plays some role in determining the location of death. Married decedents had a substantially lower chance of dying in a nursing home but not higher chances of dying outside of institutions than those who were single, divorced, or widowed. Decedents with children had a lower chance of dying in a nursing home and a higher chance of dying outside of institutions.

Cross-country differences are again remarkable and in line with our earlier finding that in Southern Europe, family plays a bigger role in caring for people in their last year before death than in Northern Europe. In the South, 3.3 percent of the decedents have died in a nursing home but 49.9 percent have died outside of institutions, whereas in the North, the proportions of individuals who died in nursing homes and outside of institutions are about equally large (28.4 and 29.1 percent, respectively). Relative to the other groups of countries, dying in a hospital is most common in Western Europe.
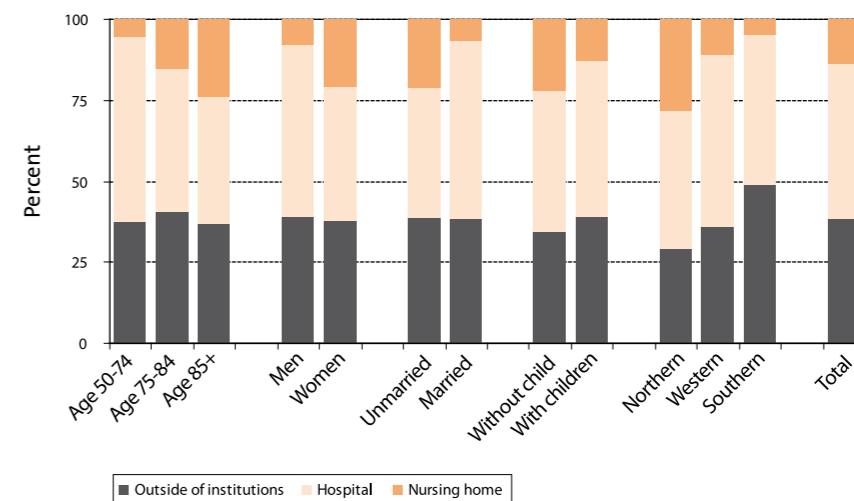
Informal Help and the Decedents' Bequest

In the SHARE end-of-life interview we also investigated who were the beneficiaries of the decedents' bequest. 11 percent of the decedents left no estate at all – according to the proxy reporters. If something was left and if the decedent was married, the spouse was named as a beneficiary in 82 percent of the cases (92 percent if the decedent had no children). Children – if present – were beneficiaries in 69 percent of the cases (89 percent if the decedent was not married at the time of his or her death). All other groups of potential heirs were mentioned rarely: siblings 9.8 percent, grandchildren 3.2 percent, and other relatives 5.8 percent. Less than 1 percent of the decedents left something to non-relatives or charities.

A recurrent theme in the sociological and economic analysis of intra-family relations is whether these relations are characterised by the altruism or reciprocity (or both). One example of reciprocity would be that those who have cared for the decedent in the last year of life have a higher chance of being a beneficiary of the estate or of being the beneficiary of a life insurance (Brown, 2006). Figure 5 shows the percentage of decedents who left part of their estate to their spouse, a child, etc. depending on whether the spouse, a child, etc. did provide help with ADLs in the last year of life. Analytical samples are restricted to decedents who were not fully functional in their last year of life and who actually had relatives who belong to the respective group. Thus the percentages for spouses are computed for decedents who were married; the percentages for children are based on decedents who had children, and so on. Only the percentages for "other" beneficiaries had to be treated differently, because the group of "other" is not well-defined. The results are surprisingly unambiguous. For each group of potential beneficiaries, help with ADLs increases the likelihood that someone of this group has actually received part of the estate. These results provide indirect evidence for the prevalence of reciprocity within and beyond the family. What we cannot infer from this result is that the deceased actually left something to specific individuals "because" these individuals have helped with ADLs. It is also possible that individuals have helped "because" they expected an inheritance and felt obliged to help, or that bequests and help are jointly determined by a particularly close relationship between the deceased and the helper. Of course, these alternative explanations can still be

interpreted as reciprocal. More elaborate analyses – which are beyond the scope of this overview paper – would be needed to disentangle cause and effect. Moreover, part of the strong correlation between help and inheritance, especially for grandchildren and siblings, might simply be due to the fact that who helps and who inherits is also driven by a "lack of alternatives". If, say, the only living relative of the deceased was a sister, it might sound not too surprising that she has helped but also inherited from the decedent. However, when in this case the analysis is restricted to unmarried decedents without children, the pattern of reciprocity becomes even stronger. In this case, only 10 percent of the deceased left something to siblings if they had not helped with ADLs and 82 percent left something to siblings if they had helped.
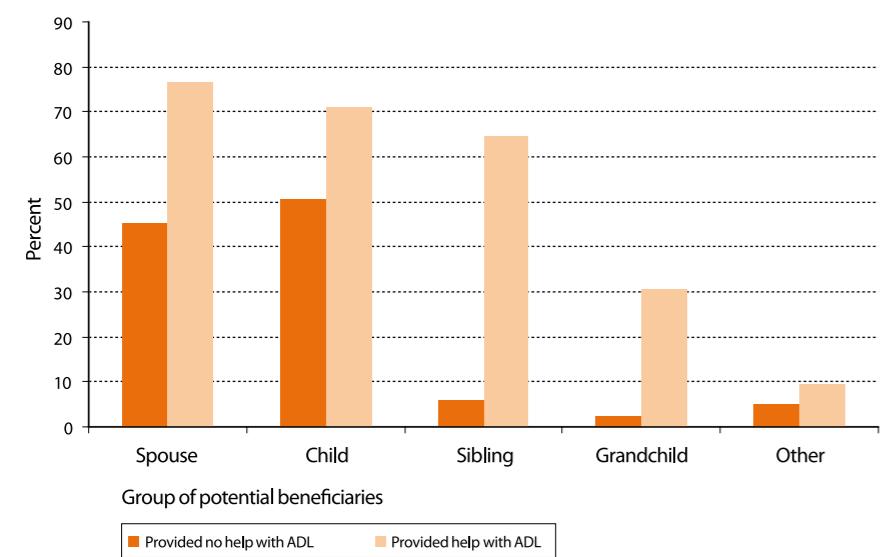
Figure 5 Beneficiaries of the decedent's estate, by group of beneficiary and help provided to decedent in the last year of life

In the SHARE end-of-life interview, we followed yet another approach to find out whether bequests are driven by a altruism or reciprocity. We asked whether the estate was divided about equally among the decedent's children, or whether some children received more than others to make up for previous gifts, to give financial support, because they helped the deceased to wards the end of his/her life or for other reasons. Here we also find striking results. According to the information given by the proxy reporters, if children received anything, the estate was divided about equally in 87.6 percent of the cases. The remaining 12.4 percent are distributed equally across the remaining categories. Although this confirms earlier findings in the literature (Wilhelm, 1996), it is somehow at odds with the results discussed in the preceding paragraph. Since it seems unlikely that all children provide about the same amount of care, reciprocity would predict a higher prevalence of unequal division (because of help given by some children) if there was any help given by the children. This, however, was not the case in our data. We leave the solution of this puzzle to future research.

Conclusion

This chapter gives a brief introduction into the topics covered by the SHARE exit interview and its research potential. Many more interesting analyses, uncovering health, social and economic issues in the last year of life of older Europeans, are to be expected, in particular when the exit interview information is linked to the detailed information that we obtained from the preceding regular interviews with the decedents – a source that we have not yet fully tapped in this chapter. The key findings are:

- There is a high prevalence of disability in the last year of life which varies by gender and age groups.
- The most important source of help in the last year of life are children and children-in-law, but non-family also plays an major role, particularly in Northern Europe.
- Two fifths of the decedents have died outside of instutions. In Northern Europe, many more have died in a nursing home than in Southern Europe.
- Most decedents leave bequests, which are almost always equally divided between the children.
- Individuals who help a decedent with ADLs are more likely to receive a bequest.

Appendix: Respondent's Characteristics.
Who Answered the End-of-life Questionnaire?

Here we briefly describe the respondents to our end-of-life questionnaire. Figures A1 and A2 show some detail on the relationship of the respondents to the decedents. 41.4 percent of the proxy reporters were spouses and 39.5 percent of the proxy reporters were children or children-in-law of the deceased. 10.8 percent were other family (siblings, nieces and nephews, grandchildren), and 8.3 percent were non-family (neighbours, friends, social workers, nursing home and community officials). The proxy reporter's relationship with the deceased varies greatly by age at death and sex of decedent. For instance, for those who died at age 50 to 74, the surviving spouse answered the exit interview in nearly two thirds of the cases, whereas children were proxy reporters in only 20 percent of the cases. For those who died at ages 85+, the percentages are nearly reversed. The numbers on respondent type by sex of decedent are in line with this result. For 58.6 of the deceased men but only for 22.3 percent of the deceased women, the surviving spouse informed us about the last year of life of our initial sample member. Again, the numbers are virtually reversed for children. They acted as proxy informant for 23.7 of the deceased men but 57 percent of the deceased women.
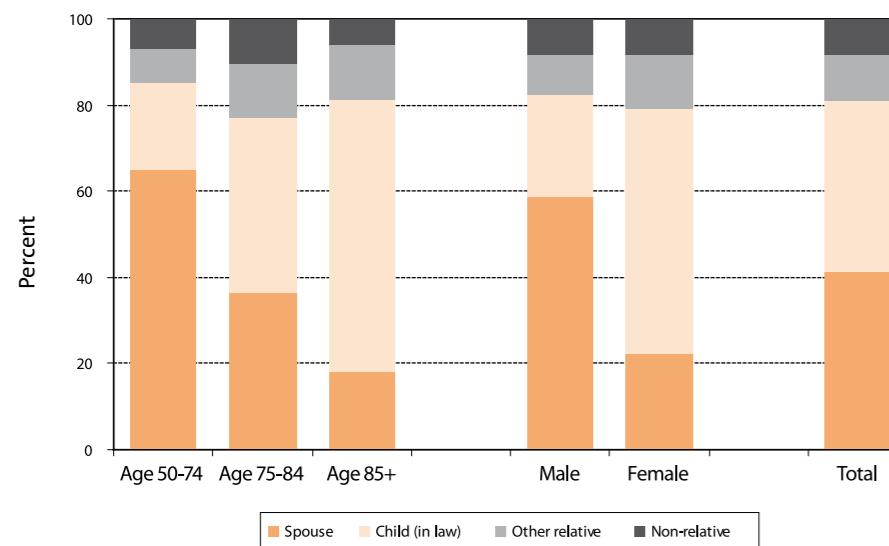
Figure A1 Type of proxy reporter, by age and sex of decedent

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It is noteworthy that our proxy respondents had very frequent contact with the decedent. Across all respondent types, 75.7 percent had daily contact with the deceased in the last year of his or her life. 13.3 percent had contact several times a week and only 11 percent had less frequent contact. Frequency of contact clearly varies by proxy reporter type (i.e. relationship to the deceased). Quite naturally, immediate family had the most frequent contact with the decedent. However, even among other relatives and non-relatives, more than 40 percent of the proxy reporters had daily contact.

Figure A2 Frequency of contact in last year of life, by type of proxy reporter

3.3 Czech Republic and Poland – the 50+ on Labour Markets in Transition

Radim Bohacek, Michał Myck

Extension of the SHARE sample to include two of the "new" European Union countries – the Czech Republic and Poland – is of important value not only as it represents an enlargement of the pool of countries where SHARE data is collected, but also because of the particular histories of the two countries, and thus of the histories and experiences of the populations represented in the data. In no other country which participated in the first wave of SHARE, with the exception of the German population which lived in the former GDR, have the populations gone through as major a shake-up of the political and economic systems as in the Czech Republic and Poland.

Although the two countries joined the European Union in 2004, their level of economic prosperity is still much lower compared to the EU average. The PPP-adjusted GDP per capita in the Czech Republic is 76.6 per cent of the EU-15 average, that of Poland 51.3 per cent. Moreover, the key health indicators are also lagging behind – for example life expectancy at birth is 73.4 and 79.7 years for men and women in the Czech Republic and 70.9 and 79.6 in Poland. In Germany these figures are respectively 76.4 and 82.0, in Spain 77.1 and 84.1. By extending SHARE to include the Czech Republic and Poland, the project has gained both in width and in depth, and the potential of the data for analytical purposes has been greatly enriched.

No other part of the population has been more significantly subjected to the "shock therapy" of the economic transition than the cohorts represented in the SHARE data. The youngest individuals sampled in SHARE were born in 1956. By the time of the collapse of respective communist regimes in 1989 almost all of them have completed their education, and started their professional careers. Many have established marriages or long-term partnerships and families. Therefore individuals observed in the Czech and Polish SHARE data made most important decisions and investments with consequences for their skills and economic potential under the old system of central planning and political oppression. Following the collapse of the regimes they then came to live in circumstances of the free market, with different structure of returns to their qualifications and a much higher degree of economic uncertainty especially in the first years of the transition process.

While the Czech Republic and Poland have shared the experiences of central planning and extensive political control, the two countries differ in many respects. The PPP-adjusted GDP per capita in the Czech Republic is significantly higher compared to Poland. In turn, Poland is much larger and much more populous with a higher share of agricultural population. The two countries have also differed in their approach to transition as well as in the depth of the recession following the collapse of the old regime. In Poland, the trough of the recession occurred earlier in 1991 compared to 1993 in the Czech Republic. It was also more pronounced with the GDP in 1991 at 81 per cent of the 1989 level. In 1993 in the Czech Republic the GDP fell to 87 per cent of the 1989 level.

All these points make the comparative analysis of the Czech Republic and Poland with each other and with other SHARE countries particularly interesting. The differences between the two transition countries and other SHARE populations in various spheres of lives of individuals aged 50+ are made clear throughout this book. While many aspects of people's lives follow a clear north-south pattern, we shall see in this chapter that in spite of its geographic location, the Czech Republic is more similar to the northern EU15 countries represented in SHARE, while Poland is closer to the southern countries.

This chapter will focus on the differences relating to the labour market with particular attention given to job characteristics. On the one hand, the purpose is to find reflections of the transition process and its effects on the current 50+ populations in the Czech Republic and Poland. On the other hand, we shall identify potential features of the labour market which could be of interest to policy makers. Our analysis is based on the SHARE data collected in 2006/07. We compare the Czech Republic and Poland with two groups of the so-called EU15 countries, of which ten are represented in SHARE (from now on labelled as "EU10"). We divide these ten countries into EU10-North (includes Austria, Belgium, Denmark, France, Germany, the Netherlands and Sweden) and EU10-South (includes Greece, Italy, and Spain).

Employment and Retirement Age

In Figures 1 and 2 we present the distribution of a self-declared employment status distinguishing between EU10-North, EU10-South, the Czech Republic and Poland. The data is given separately for men and women, aged 50-64.
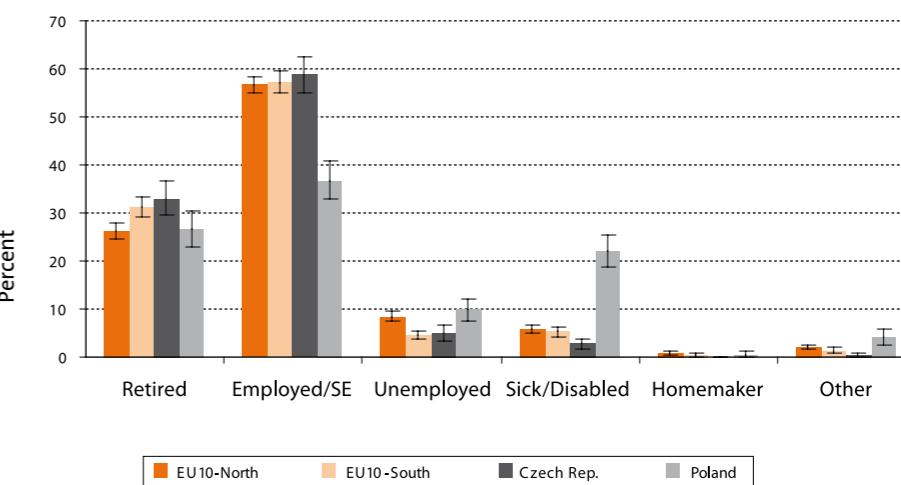
Figure 1 Employment status – men (50-64)
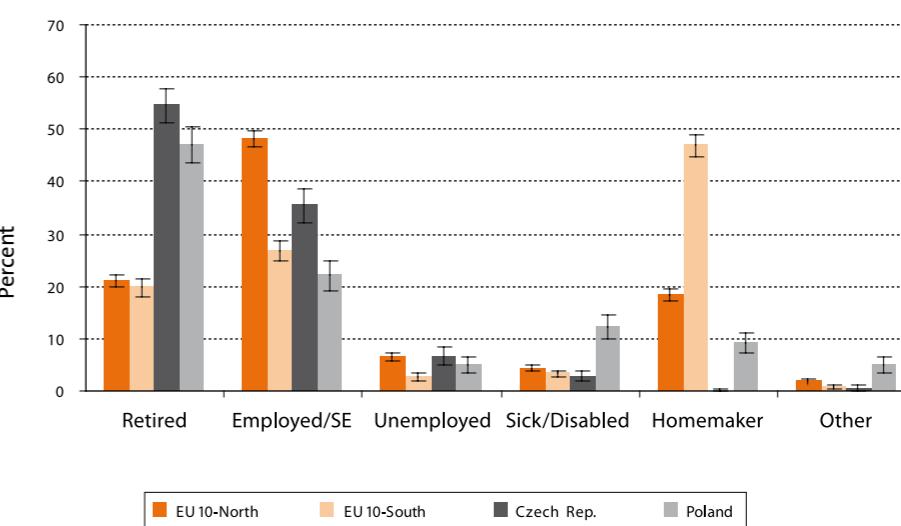
Figure 2 Employment status – women (50-64)

The figures reflect several striking characteristics. First of all we can see a very high proportion of retired women in the age-group 50-64 in the two transition countries (54.6 per cent in the Czech Republic and 47.1 per cent in Poland). Secondly there is a high proportion of permanently sick and disabled people in Poland (22.0 per cent of men and 12.0 per cent of women). The high proportion of homemakers among females in EU10 countries is also notable in comparison to the Czech Republic and Poland. This is most probably the consequence of high female labour market participation during the communist times which facilitated accumulation of right to retirement or disability social insurance benefits.

Perhaps the most worrying feature of the comparison is the low level of employment among men and women in Poland. While employment level among men aged 50-64 in the Czech Republic is almost identical with that in EU10-North and EU10-South countries (at 58.9 per cent compared to 56.6 per cent and 57.1 per cent respectively), it is as low as 36.8 per cent in Poland. Female employment level Poland is only 22.0 per cent and is again below that in the Czech Republic (35.4 per cent). Female employment in the EU10-North countries is more than double the level in Poland at 48.3 per cent, while in the EU10-South countries it is in between the Polish and the Czech levels at 26.8 per cent.

With respect to the labour market status of the 50+ population, the Czech Republic can also be distinguished by the fact that a great majority of both men and women fall into either the working or retired category. Such distribution would suggest that individuals retire relatively early, and that the transition is a direct one, from work to retirement. Such pattern is confirmed when we look at the age of retirement among those who are already retired. The cumulative distribution of retirement ages is plotted in Figures 3 and 4 for men and women respectively. The striking feature of the figures for men is the apparent similarity between Czech Republic and EU10-North countries and between Poland and the EU10-South countries. However the retirement ages of Czech and EU10-North retirees diverge at the age of about 60, when the Czech retirement legislation grants retirement benefits to a large proportion of men. While only 34 per cent of retirees retired before reaching the age of 60, over 90 per cent retired before they reached the age of 63. For EU10-North countries the figures are respectively 33.3 per cent and 74.4 per cent. A similar divergence of retirement ages can be noticed in the age range between 60 and 65 for Poland and EU10-South. Age-profile of retirement in the Czech Republic is very different for women, which can be seen in Figure 4. This to a large extent relates to the reduction of retirement age conditional on the number of children a woman has had in her life. While about 19 per cent of Czech female retirees retired before reaching the age of 55, 88.9 per cent retired prior to reaching the age of 60. In EU10-North the numbers were respectively 7.0 per cent and 26.3 per cent, in EU10-South 22.3 per cent and 47.4 per cent and in Poland 22.4 per cent and 66.3 per cent.

There is no easy way to explain the differences in the patterns of labour market status and labour market dynamics between the Czech Republic and Poland. Certainly conditions on the labour market and the systemic differences concerning the availability of early retirement and/or disability pension have both played important roles. Below we turn the focus on those currently working and the "objective" characteristics of their employment. The data stresses the high degree of transformation that the Czech economy has gone through and once more points to features which distinguish the Czech labour market from that in Poland, and to differences with the other SHARE countries.
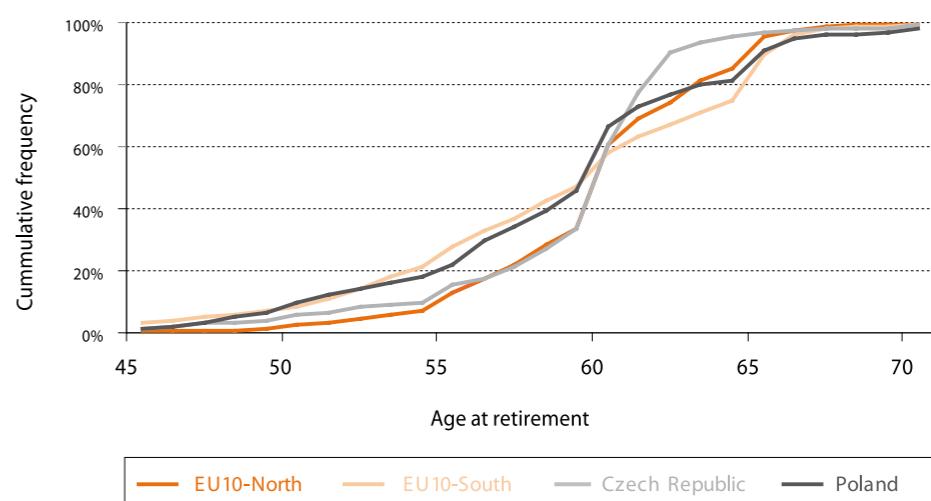
Figure 3 Age at retirement – men (for Poland and Czech Republic only those who retired after 1989)
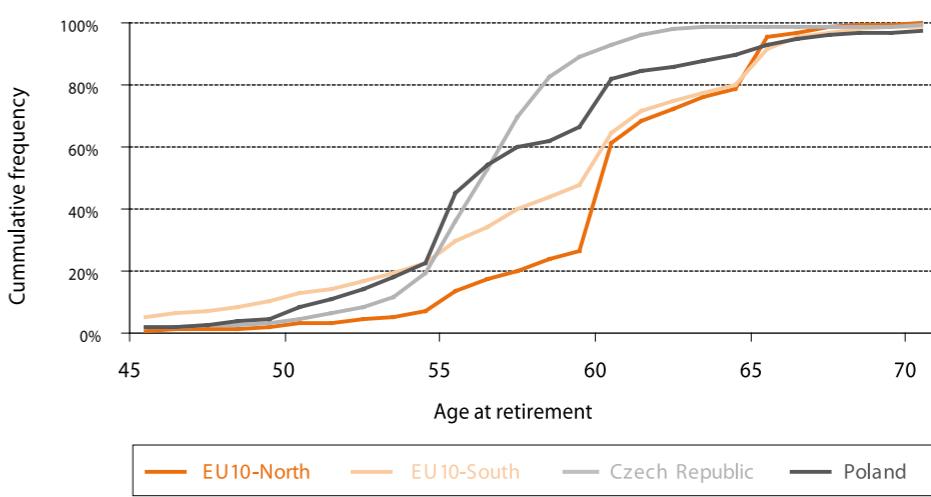
Figure 4 Age at retirement – women (for Poland and Czech Republic only those who retired after 1989)

The Working 50+

In Figure 5 we show characteristics of jobs among working SHARE participants in the 50-64 age group. Figure 6 reports information on the tenure in individuals' current jobs. Tenure is divided into four groups in such a way that for Poland and the Czech Republic those belonging to the highest group are those who started their current jobs before 1989. Combining this with information on the proportion of individuals employed in the public sector, see Figure 5, shows how different the labour market experience of the cohort has been in the two transition countries. The proportion of those with tenure of 19 years or more is about 50 per cent higher in Poland than in the Czech Republic, at the level of 45.3 per cent and 28.2 per cent respectively. It is also notable that the proportion of tenure levels in the range between 11 and 17 years in the Czech Republic is almost double that observed for the Polish sample. This suggests that individuals had to (or decided to) change their jobs in the early 1990s but could have maintained relatively stable jobs thereafter. Such pattern is probably also a reflection of the dynamics of the Czech transition with the trough of the recession in 1993.

In Poland a much higher proportion of the jobs of the 50+ population originates from the pre-transition period. This combined with much lower employment levels than in the Czech Republic suggests that those who lost their jobs following the regime change were much less likely to find jobs in the early 1990s and have since remained outside of the labour market. A large proportion of those are either disability or early-retirement pension claimants.
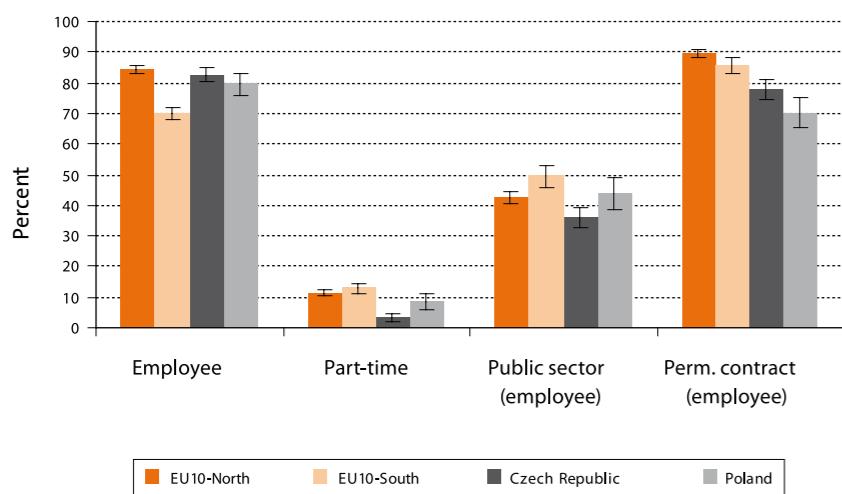
Figure 5 Job characteristics of working individuals aged 50-64

Figure 6 also suggests that the job stability among those aged 50+ in Europe is highest in the southern countries. 67.0 per cent of working individuals in the SHARE data in Italy, Spain and Greece have tenure levels of 19 years or more, i.e. about 23 percentage point higher than older workers in EU10-North countries. The lowest proportion of older workers started their current job less than 6 years ago – only 14.4 per cent compared to about 25 per cent in the EU10-North countries, Czech Republic and Poland. This may on the one hand reflect high levels of job stability – confirmed in Figure 5 in the high proportion of permanent contracts among employees – but it can also imply significant rigidities on the labour market. Judging labour market stability by the proportion of permanent job contracts there seems to be significant differences between the SHARE countries and Czech Republic and Poland with the proportion of permanent contracts in the last country at 70.2 per cent compared to 89.4 per cent in EU10-North countries.
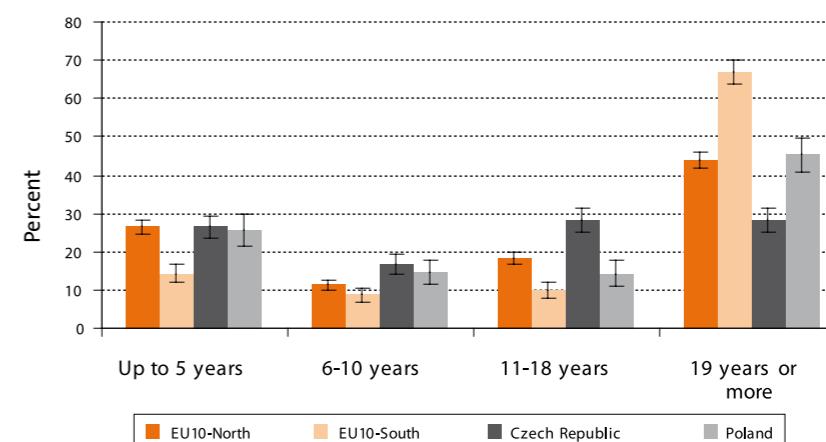
Figure 6 Proportion of tenure among working individuals aged 50-64

The depth of transition in the Czech Republic is also reflected in the proportion of employment in the public sector which again is much lower for both men and women than in Poland, and in fact significantly below the levels in EU10-North and EU10-South. Only 36.0 per cent of Czech employees are employed in the public sector, compared to 42.6 per cent in EU10-North, 49.4 per cent in EU10-South and 43.9 per cent in Poland. Despite a very significant change that the Czech labour market has gone through two other "objective" labour market characteristics which may reflect the quality of work among those aged 50+ speak further to its advantage. Relative to those working in Poland and the EU10-South countries the Czech 50+ individuals are more likely to be employees, and as we pointed out above among employees the proportion of those on permanent contracts is much higher in the Czech Republic than in Poland.

Job Quality Assessment in SHARE

We now turn to the subjective assessment of jobs by individuals. These judgements reflect the perceived quality of the working environment in more detailed aspects than the indicators presented in the preceding section. They can be important determinants of individuals' retirement plans.

Respondents of the SHARE questionnaire have been asked to refer to several statements relating to their jobs by saying whether they strongly agree, agree, disagree or strongly disagree with them. While these questions have been asked specifically to address the so-called demand-control model and the effort-reward imbalance model (see Siegrist et al., 2005; Siegrist and Wahrendorf in Chapter 6.7 in this volume), the individual questions can provide interesting insights into the nature of jobs of individuals aged 50+ and can be helpful in guiding labour market policy to improve labour market conditions for older workers.

We group answers to these questions in such a way that we assign value 1 if an answer indicates high quality and 0 indicates low quality. In some cases value 1 is assigned if a person agrees or strongly agrees with a positive statement (for example "I have an opportunity to develop new skills"). In others, value 1 is assigned if someone disagrees or strongly disagrees with a negative statement (for example "I am under constant time pressure due to a heavy workload"). Average values of 10 quality indicators composed in this way have been calculated for working individuals aged 50-64 and are presented in Figures 7 and 8.
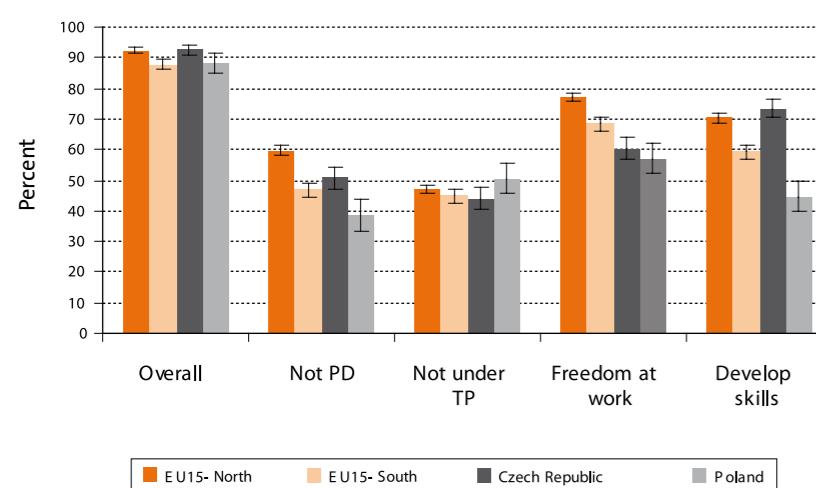
Figure 7 Proportion of working individuals aged 50-64 who are overall satisfied with the job (Overall), work not physically demanding (Not PD), are not under time pressure at work (Not under TP), have freedom to decide how to do the work (Freedom at work) and have opportunity to develop skills at work (Develop skills)
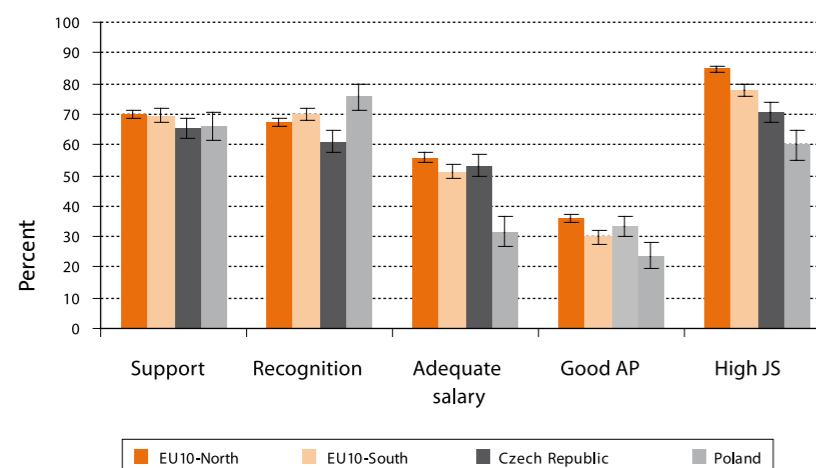
Figure 8 Proportion of working individuals aged 50-64 who receive support in difficult situations, receive deserved recognition for work, adequate salary or earnings, good promotion or job advancement prospects (Good AP), high job security (High JS)

The first thing to note is that in all cases a great majority of individuals agree that they are overall satisfied with their current jobs. The proportion is slightly higher in EU10-North and in the Czech Republic (92.4 per cent and 92.5 per cent) compared to EU10-South and Poland but is high in the latter two as well (87.7 per cent and 88.3 per cent respectively).

In the Czech Republic and Poland working individuals perceive to have less freedom to decide on how to do their jobs and find their jobs less secure in comparison to the other SHARE countries. Only 57.1 per cent of workers in Poland agree that they have freedom to decide on how they do their jobs, and only 60.1 per cent perceive their job security as high. In these two categories job quality in the EU10-North countries is clearly distinguished from the rest with 77.3 per cent agreeing that they have a lot of freedom at work, and with 84.8 per cent of workers perceiving their job security as high.

Jobs of the 50+ seem most physically demanding in Poland and the perception of adequacy of salaries is considerably lower in Poland in comparison to either EU10-North, EU10-South or the Czech Republic (31.6 per cent in Poland compared to respectively: 55.7 per cent, 51.3 per cent and 53.0 per cent). Out of nine specific quality assessment questions (i.e. all those shown in Figures 7 and 8 except for the overall assessment) the self-assessed quality of jobs in Poland comes last in six categories. Apart from the already mentioned ones, individuals find that their jobs offer little opportunities to develop skills at work and find they have poorest advancement prospects. It is notable that in these two categories the Czech Republic looks very similar to EU10-North countries.

As far as job quality assessment is concerned there are many similarities between the EU10-North and the Czech Republic. EU10-South countries are placed somewhere in between the two with Poland performing poorest in most of the categories. Perhaps it is thus not surprising that most of the working individuals in the Polish SHARE sample express a desire to retire as soon as possible from their jobs (63 per cent).
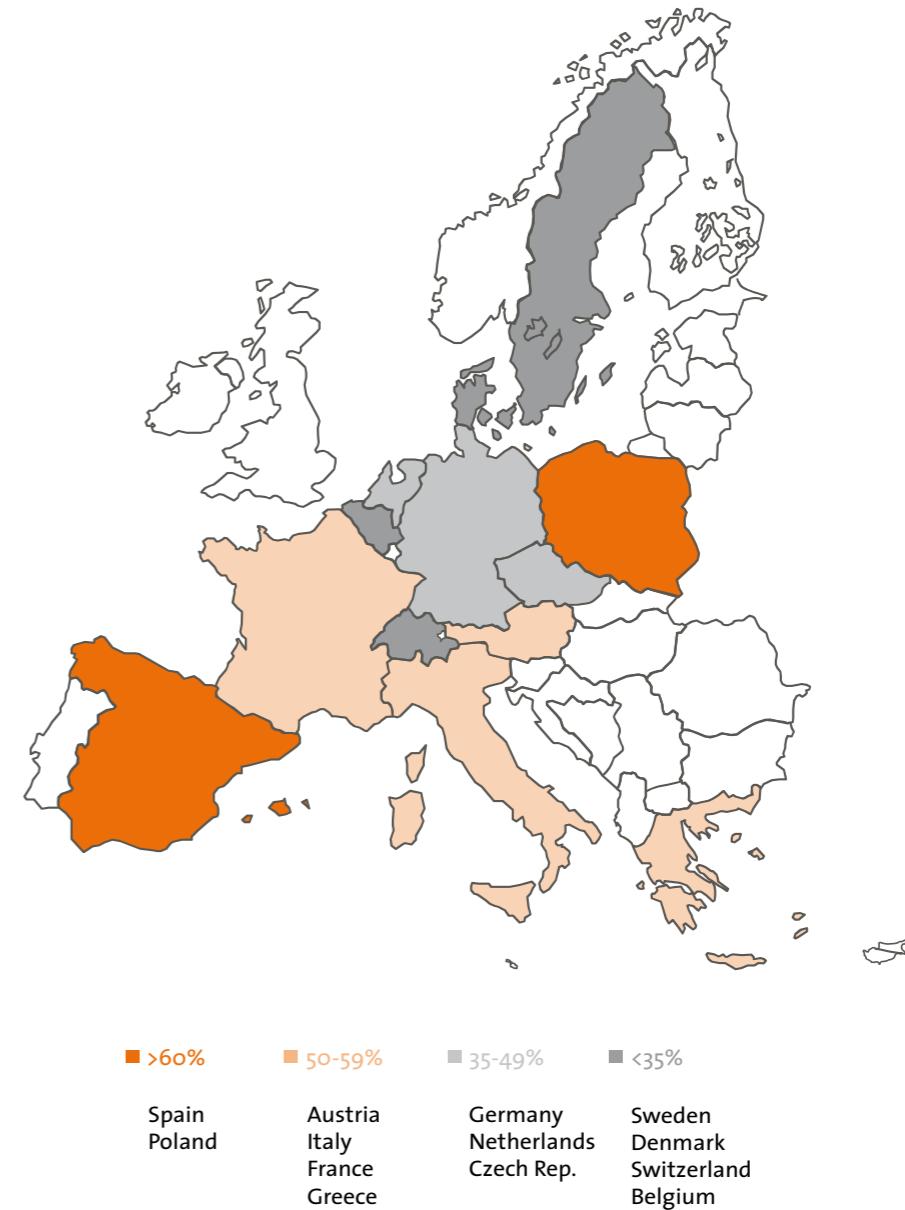
Figure 9 Proportion of working 50+ individuals desiring to retire as early as possible

Figure 9 displays the proportion of those wishing to retire as soon as possible. This proportion is also very high in Spain (66 per cent), while in contrast, in Belgium, Denmark, Sweden and Switzerland it is below 35 per cent. Also in this respect, the Czech Republic seems to be closer to EU10-North countries than to Poland with only 38 per cent of working individuals wishing to retire as soon as possible.

Conclusions

In this chapter we looked at the working 50+ populations of the Czech Republic and Poland in a comparative context with ten countries representing the EU15 in SHARE. Extension of the SHARE sample to include the Czech Republic and Poland significantly enriches the research potential of the data by adding to it two populations in which the living conditions of the current 50+ have been very different than in all other SHARE countries.

- The 50+ generations in the Czech Republic and Poland have lived through very demanding and difficult times in their whole life during the communist regime as well as in the democratic period afterwards. Both the Czech Republic and Poland face important policy decisions related to the labour market, retirement system, social security and fiscal reforms.
- While these two countries shared common political and economic experiences for the large part of the 20th century, they are in many dimensions different from each other. They should not be aggregated into a "transition group" of countries in order to avoid false generalizations.
- While the transition from central planning to the free market has significantly affected both the Czech and the Polish current 50+ individuals, the Czech population has maintained a much greater labour market involvement. In Poland not only are the levels of employment significantly lower than those of its southern neighbour, but labour market conditions of those who are working seem to be much inferior.
- In many aspects of job quality both transition countries lag behind compared to other SHARE countries. However, in several respects the conditions in the Czech Republic are very much like those in EU10-North countries. This similarity is also very clear in the expressed desire to retire as early as possible from the current job, a dimension in which Poland also remains far behind the Czech Republic.

The SHARE data presented in this chapter offers a large potential for analyses of important determinants of labour market activity of the 50+ generation. Especially in countries such as Poland, where levels of employment of this population group lag far behind the rest of Europe, understanding these determinants will be a crucial step to and improve the position of older individuals at the workplace and increase their labour market activity.

References

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3.4 Israel: Diversity Among Population Groups

Howard Litwin, Eliyahu V. Sapir

Israel joined the SHARE enterprise in late 2004, through special grants from the U.S. National Institute on Aging, the German-Israeli Foundation for Research and Development and the Israeli National Insurance Institute. Data from 2598 individuals residing in 1771 households were collected between late 2005 and mid 2006.

SHARE-Israel enriches the cross-national SHARE data through its diversity among three major population groups that comprise the population in Israel: 1) the Hebrew speaking Jewish majority who make up almost three quarters of the older cohort, 2) Russian speaking new immigrants (mostly Jews) who arrived after 1989 and account for almost a fifth of the cohort, and 3) Arabic speaking non-Jewish Israeli citizens who are about a tenth of the 50+ population. As was necessitated, the SHARE-Israel survey instruments were constructed and delivered in all three languages. Weights based upon national statistics of age, gender, population group and stratified statistical areas yielded a representative sample of the 50+ population.

This chapter presents selected salient findings from the first wave of the Israeli SHARE survey. Additional results can be found in a "First Results Book" of the Israeli data that was published in Hebrew as a special double issue of the journal Social Security (ביטחון סוציאלי) (Achdut and Litwin, 2008).

Israelis Aged 50 and Older

Israel has a younger age structure than in the European countries of SHARE – only 23 per cent of its population is aged 50 and older. However, its older cohort is aging quickly. For example, the proportion of persons aged 75 and over within the 65+ population has risen from 39 per cent to 46 per cent in the past 20 years. In addition, the nature of older Israelis and the circumstances in which they live differ across the three major population groups. Figure 1 presents key data on these differences within the 50+ cohort. As may be seen, Russian immigrants are older than their counterparts from the Jewish majority, and Arab-Israelis are younger. Moreover, while about three quarters of Jewish Israelis live with a partner and about 9 out of 10 Arab Israelis do, only some two thirds of Russian immigrants have a live-in partner. As for family size, the average number of children among Jewish Israelis is 3, among Arab-Israelis the number is 8 and among the Russian immigrants it is between 1 and 2. Figure 1 also reveals that almost two thirds of Jewish Israelis have 3 or more children compared to less than 5 per cent among the Russian immigrants. In contrast, more than 90 per cent of Arab-Israelis have 3 children or more. Despite these differences in family size, the great majority of Israelis aged 50 and over co-resides with children, or has contact with them on a daily basis: 95 per cent of the Arabs, 84 per cent of the Jews and 80 per cent of the Russian immigrants. Finally, most Arabs and Jews in the 50+ cohort own their own dwelling, but only a third of the Russian immigrants do. In sum, Jewish Israelis and Arab Israelis are mostly situated in contexts of relative familial and household security. In comparison, recent Russian immigrants to Israel aged 50 and older have less such security.
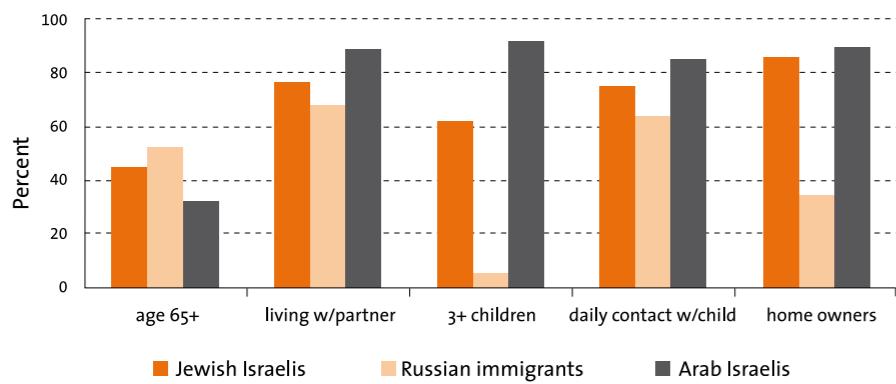
Figure 1 Age, family and home ownership by population group
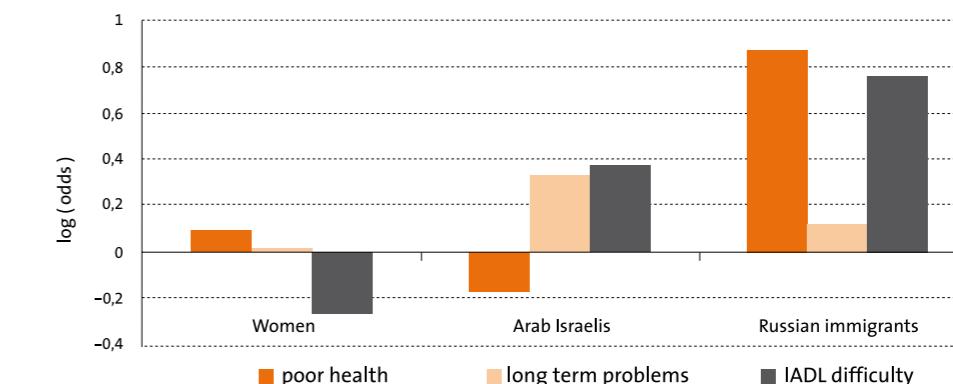
Figure 2 The likelihood of poor health by gender and population

Note: Based on logistic regression analysis

Variations in Health Status

A preliminary look at the health rankings in SHARE indicates that "less than good" perceived health is more frequent in Israel (53 per cent) than in the corresponding European countries, on average (46 per cent). Within Israel, moreover, perception of less than good health is highest among the Russian immigrants (77 per cent) and lowest among Arab-Israelis (37 per cent). The frequency of reported long term problems in Israel is similar to the European average, but Arab-Israelis report a higher frequency (67 per cent). As for functional capacity, 26 per cent of older Israelis have 1 or more difficulties in instrumental activities of daily living (IADL), compared to the European SHARE average of 18 per cent. However, more than a third of the Russian immigrants report having IADL difficulties and more than a third of Arab Israelis as well.

In order to better understand the state of health of older Israelis, we draw upon an analysis executed by Shmueli (2008), who related health outcomes to gender, population group, age, education and income. Figure 2 presents the likelihood of having poor health in Israel by gender and population group, controlling for the effects of age, educational level and income level. The figure shows that women are more likely to report less than good health, when compared to men (who serve as the gender reference category), but less likely to report IADL difficulties. However, they report about the same degree of long term problems, holding all else constant.

As for population group differences, Russian immigrants are more likely than the Jewish-Israeli reference group to report less than good health and to have difficulty in instrumental functioning (and to a lesser degree, long term problems). Arab Israelis are also more likely than their Jewish-Israeli counterparts to report long term problems and IADL difficulty, all things considered. This is particularly noteworthy, because Arab Israelis are less likely to report their health as less than good. These findings suggest that cultural norms and interpretations may affect self perceived measures of health. It is necessary, therefore, to utilize multiple measures of health in determining the state of health of people from different backgrounds, precisely as is done in SHARE.

Work Force Participation

The rate of employment among Israelis aged 50 and older is relatively high, due, in part, to the somewhat younger distribution of the age structure and to the comparative lack of incentives for early retirement. About 43 per cent of the men in this age group and some 29 per cent of the women are employed. The average rate of employment among women is reduced, however, by the limited participation of Arab-Israeli women, the vast majority of whom are housewives. Russian immigrant men report relatively high rates of unemployment (16 per cent) and Arab Israeli men report high rates of disability (21 per cent) (Achdut and Gharrah, 2008).

Given the substantial overall rate of employment in Israel, we sought to understand the predictors of participation in the labor force among persons aged 50-64. Toward this end, we related work force participation to population group, age, education and income, separately for men and women. Age was considered in 3 groups: 50-54, 55-59 and 60-64. It should be noted that until recently, minimum age eligibility for public retirement benefits in Israel was 65 for men and 60 for women. The age of retirement eligibility has now been extended to 67 for men and will eventually reach 64, for women. In the current analysis, Jewish-Israeli men and women aged 50-54 serve as the respective reference categories.

Figure 3 shows the likelihood of participating in the work force by gender, age group and population group, controlling for the effects of educational level and income level. The figure shows that Jewish-Israeli men aged 55-59 are about as likely as the men in the youngest age group (the reference category) to be employed, but those aged 60-64 are less likely. Arab-Israeli men show a lower likelihood of being in the work force compared to their respective Jewish-Israeli age peers. Among Russian immigrants, on the other hand, a different pattern emerges. As may be seen in the figure, Russian immigrant men in the youngest age category are much more likely to be employed than Jewish-Israeli men of the same age. Moreover, even the older Russian immigrant men show a higher likelihood of being in the work force than the youngest Jewish-Israeli reference category, when holding education and income constant.
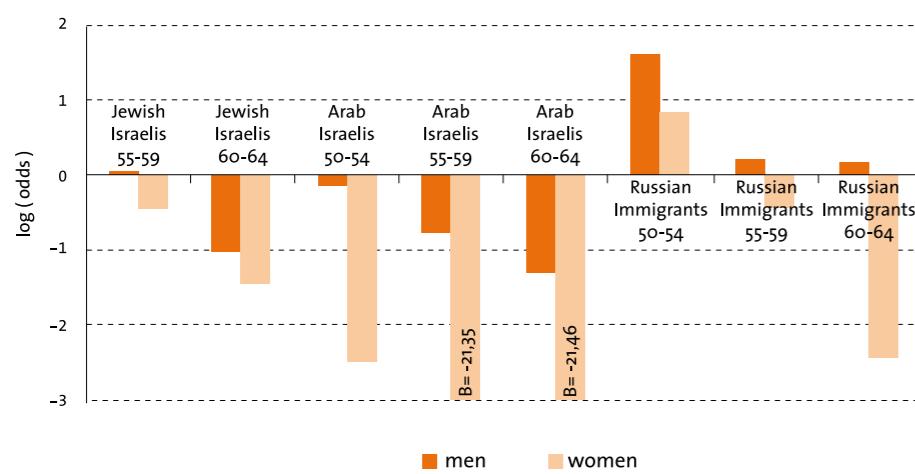
Figure 3 The likelihood of participating in the work force

Note: Based on logistic regression analysis

Turning to the labor force participation of women in Israel, the figure shows that Jewish-Israeli women aged 55-59 are less likely than those aged 50-54 to be in the work force, and women aged 60-64 in this same population group are much less likely. However, Arab-Israeli women of all ages are very much less likely to be employed when compared to their Jewish-Israeli counterparts. On the other hand, Russian immigrant women aged 50-54 are more likely to participate in the work force than are Jewish-Israeli women of the same age. But older Russian immigrant women are not. As noted earlier, these population group differences in relation to work force participation exist above and beyond the effects of education and income.

In sum, the SHARE-Israel survey findings show that participation in the work force differs significantly across different groups in the population and by gender. Of particular note is the higher rate of employment seen among the Russian immigrants. Late-life immigration apparently encourages continued employment as a means to compensate for the lack of occupational pension accumulation. It will be useful to examine future retirement trends in light of the noted graduated delay of pension eligibility in Israel that was recently legislated. The SHARE project provides the unique capacity to undertake such follow-up.

Making Ends Meet

Israelis aged 50 and over have slightly lower median household incomes (17,800 €) than the SHARE median (18,300 €). When corrected for purchasing power parity, however, the median in Israel (25,400 €) rises considerably above the SHARE baseline. In addition, household incomes vary significantly across population groups within Israel. Jewish Israelis report median incomes of some 22,000 €, but Russian immigrants and Arab Israelis have lower medians (14,800 € and 11,000 €, respectively). As was noted earlier, Russian immigrants have smaller households than the Jewish majority, but Arab Israelis have much larger households together with having lower household incomes.

These income discrepancies are underscored by the relative poverty rate found among the 50+ population. Considering the poverty line as 60 per cent of the median individual (that is, total household income, excluding imputed rents, attributed in equal part to all

household members) (Lyberaki and Tinios, 2005), 32 per cent of the Israeli sample are below the poverty cut-off (Endveld and Cohen, 2008). This is higher than the corresponding poverty rate found in the SHARE countries, including nearby Greece (25 per cent) and Italy (28 per cent). Moreover, poverty is distributed unequally across the population groups that comprise the older cohort in Israel. Some 30 per cent of Jewish Israelis aged 50 and over are below the poverty line, as compared to 16 per cent of Russian immigrants, on the one hand, and 64 per cent of Arab Israelis, on the other.

In addition to the objective measures of income and wealth gathered in the SHARE questionnaire, the survey also asks about one's subjective perception of household income, that is, whether the household is able to make ends meet. About 61 per cent of Israeli households claimed that it was somewhat difficult or very difficult to manage their household finances. Israel is, thus, among the countries with the highest reported rates of difficulty making ends meet. Accordingly, we sought to understand the factors that stand behind the negative evaluation of our respondents' ability to manage economically.

Perceived income adequacy correlates with sociodemographic background; measures of actual and relative income, wealth and consumption; personal capacity indicators; and psychological orientation (optimism and pessimism) regarding one's financial future, among others. We related the subjective income outcome, difficulty to make ends meet (yes/no), to this varied set of predictive variables, all available in the SHARE survey instrument. The results are presented in Figure 4.
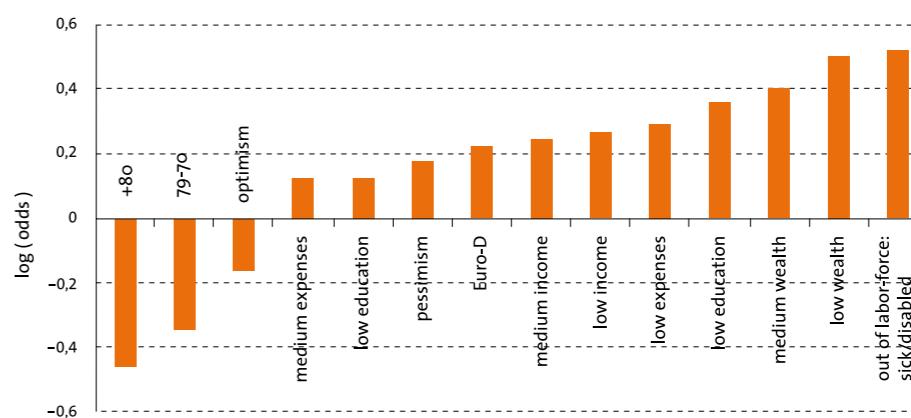
Figure 4 Predictors of difficulty making ends meet.

Note: Reference categories: age 50-59; high education; work status: employed; high wealth; high consumption; high income;

not depressed; low pessimism; low optimism

The results in Figure 4 show that older age and positive expectations for the future are inversely related to a sense of financial difficulty among Israelis aged 50 and over. However, the greatest predictors of perceived financial difficulty are being out of the labor force due to disability, lower wealth and lower education. Lower levels of consumption, depression and having negative expectations regarding one's financial future are additional predictors of perceived income inadequacy, but to a lesser degree. Notably unrelated to the subjective income measure, after controlling for the effects of the other variables, are population group, gender and relative income.

Stated differently, the analysis demonstrates that perceived difficulty in making ends meet in the older Israeli cohort is explained mainly by objective economic measures and

by status indicators (education and work disability) that reflect income-producing potential. Poor mental state (depression) and psychological orientation also explain one's perceived difficulty to manage with one's available household finances. The analysis points out, moreover, that when controlling for the other study variables, population group differences did not retain significance. In sum, despite the comparable mean income level reported in Israel and its favorable purchasing power, the majority of the 50+ population in the country still feels economically challenged. The SHARE data suggest that this perception is based mostly upon objective indicators.

Conclusions

This chapter documents several significant trends in the lives of Israelis aged 50 and over, trends that have important implications for the development of public policy.

- There are notably different life circumstances across the major population groups in Israel, circumstances that may well have significance for well-being in late life.
- Different population groups in Israel tend to rate subjective health differently, making it necessary to view such ratings in concert with objective health indicators.
- Exit from the labor force in Israel seems to be mediated by occupational pension coverage. Late life immigrants who lack sufficient coverage in the new country tend to remain in the labor force at older ages.
- Despite these differences, population group per se does not affect perceived income adequacy. Subjective economic status is explained mostly by accumulated wealth and other factors.

The findings presented in this chapter underscore the many benefits that SHARE-Israel can offer. The diversity among Israeli population groups provides additional points on the scale of social and economic development among the SHARE countries, thus enriching the SHARE "laboratory" as a resource for scientific inquiry into the life circumstances and their changes in an ageing world.

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3.5 Home, Houses and Residential Mobility

Viola Angelini, Anne Laferrère

When traveling across Europe, even the most uninformed visitor cannot but be struck by the variety in housing architecture, from stately 19th century apartment buildings, to medieval villages, from rows of narrow houses to large villas or the high rise public housing of the 1960s. Housing seems to summarize the variety of European history, even more than languages, or social insurance systems. Besides, housing is a most important feature of the life of the 50+. Retiring from work and getting older may mean being more sedentary and having to adjust housing consumption.

The 50+ Live in Houses They Own

In many continental languages, the words for home and house are the same. Indeed a majority of Europeans aged 50 and over[1] live in a house, i.e. in a building with less than three dwellings, rather than in a flat. The rate ranges from around 80 percent in Belgium, the Netherlands and Denmark, down to 1 in 2 in Spain and Switzerland, or 1 in 3 in the Czech Republic. Generation effects play in opposite directions. The decline in agriculture translated into a movement from rural to more urban areas from the older generation to the younger ones, and into a parallel move out of farmhouses, which can still be seen for Poland, Greece and Spain in Figure 1. An inverse movement towards houses in the Netherlands, Denmark, Sweden, and Belgium is linked to a shift from renting towards owner-occupation. In countries where less clear age/cohort evolution is seen, the two types of change may have occurred simultaneously and cancelled out, as in France for instance.
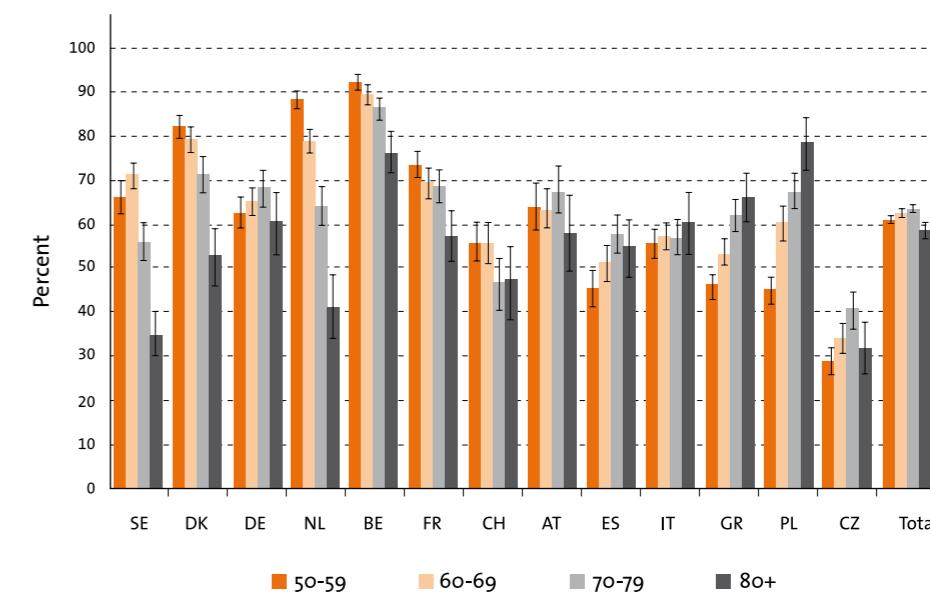
Figure 1 Houses by country and age group

Note: Unless otherwise stated all figures are at the individual, not the household level

[1] Unless otherwise stated, all figures are on the individual level, not the household level. Hence, they are not directly comparable to the SHARE First Results Book, Wave 1.

In all countries home ownership is higher for people living in a house. The difference is striking as more than 80 percent of those living in a house own it, compared to only 46 percent for those living in a flat. The regularity can be explained by various reasons. On the supply side, houses are more costly to maintain for a landlord than the same number of flats in one building (Hilber, 2007). In continental Europe, the 19th century witnessed the construction of rental "vertical" apartment buildings, as opposed to the "horizontal" developments of Britain, which so much struck visitors from the continent. Most of the supply of rental social (subsidized) housing has been and still is in apartment buildings (Massot, 2007). On the demand side, a taste for more space and privacy, provided by houses, may be linked to a taste for home ownership. Moreover, low-income people might not be able to afford the higher maintenance costs of houses and, therefore, choose flats; since they are also more likely to be credit constrained to buy, the rental demand would be higher for flats than for houses. Indeed among the 50+, a higher income usually goes with living more frequently in a house. This is not so in the Southern countries, in Austria and in the two new Eastern countries, where a house is often more likely to be an old farm than a modern construction.

Most houses are detached except in the Netherlands, where row houses predominate. Row houses are also frequent but to a lesser extent in Belgium and Spain, while they hardly exist in Poland and Greece. As for flats, a majority is located in small buildings of 3 to 8 units, in all countries, except Sweden, Denmark, France, Austria, Spain, the Czech Republic and Poland where larger low rise buildings predominate. Only in the Czech Republic and to a lesser extent in France and Poland a significant proportion of the 50+ live in a high-rise building. The taste for living in houses may pose two types of problems. One is general: the higher maintenance cost of houses often goes with higher energy consumption, both in heating and transportation costs. The internalization of these costs by the consumer may be only partial. One could probe deeper into the elderly taste: is it taste for houses, or desire for ownership, taste for space and garden or wish for privacy? This should be taken into account if the housing supply is to become more environmentally friendly. The second problem is more specific to an ageing population: a house may be less convenient than a flat to an invalid elderly. Either because it involves stairs, is less easy to maintain, or because it is situated further from services. Retirement homes provide mostly flats and we expect moving elderly would choose flats.

Subsidized rental housing goes under various names (social, public, non-profit) and exists in most countries. Even if each system differs with respect to eligibility or rent level, the subsidized supply has an important effect on local housing markets. Social housing is important in the Netherlands, where it makes up to 35 percent of the overall stock, and in Austria, Poland, Sweden, Denmark, France and the Czech Republic, where it is between 15 and 20 percent of the housing supply. It is around 6 percent in Germany and Switzerland, 5 percent in Italy and Belgium, 2 percent in Spain, and is nonexistent in Greece (Ball, 2007; Federcasa, 2006). Moreover, in most countries tenant protection is high, and the evolution of rents is somewhat controlled. For many elderly Europeans renting can be just as secure as owning, and the benefits of home ownership in that respect should not be overstated.

We mentioned that houses are more likely to be owned than flats, but the rate of home ownership is also the result of both life-cycle and cohort effects. If a dwelling is seen as an investment, the life-cycle effect predicts an increasing rate of home ownership with age as saving increases and then a declining rate in old age when the elderly start to run down their assets to support consumption as they age. The positive age gradient is mitigated by

the existence of credit markets and by inheritances, both of which allow owning a home without waiting to build up savings. The decline in old age is mitigated by the fact that living in one's home is directly consuming its rent, just as one would consume the income from an asset without selling it. Overall in most SHARE countries we find a slightly hump shaped age profile for home ownership. Age has a positive effect up to 58 years old, as most of the first purchases occur before 50. Then the effect is negative but the decline "with age" is mainly an increase "with cohort", as in many countries home ownership developed after World War II when credit became available and rental public housing declined at the end of the 20th century. Indeed switching from owning to renting is uncommon before age 80. Home ownership is rising among the 50+ from one generation to the next in all countries. The trend is spectacular in the Netherlands where the rate nearly triples between the 80+, born before 1925 (25 percent) and the 50-59, born after 1945 (72 percent). In this country, part of public housing has been sold and the 50+ benefited from it. Hence, in the Netherlands home ownership rate declines linearly with age. The same evolution happened in many other countries, although it often stops with generation aged 60-69 and then home ownership remains stable for the following generations.
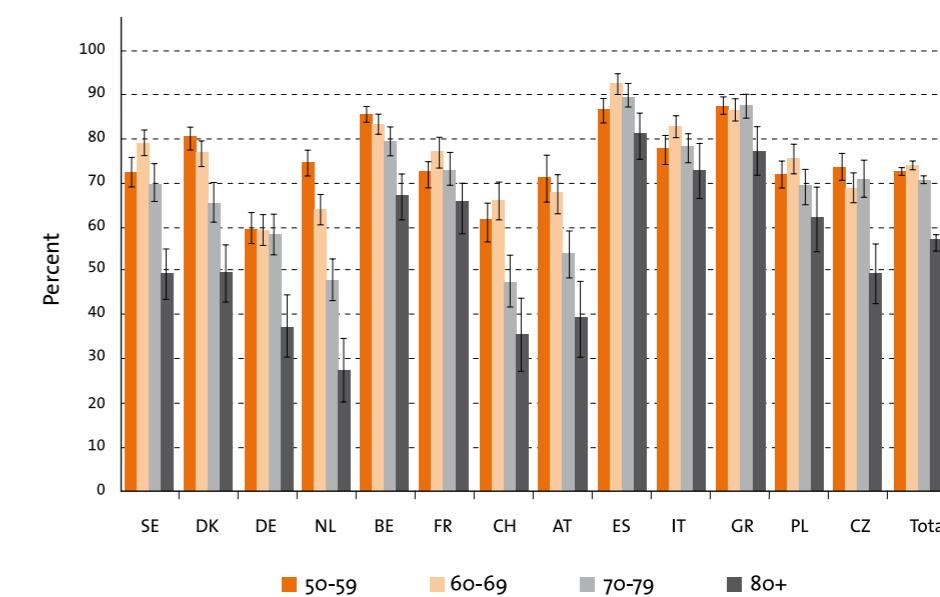
Figure 2 Homeownership by country and age group

There are also important wealth effects. In nearly all countries a higher household income increases the likelihood of ownership, except in Spain (where home ownership is the norm), in Belgium and in the Czech Republic (where home-ownership was granted to many former tenants). Price effects are captured through the urbanization variable: the less urbanized the more ownership.

"Taste" plays an important role as home ownership usually goes with being family oriented. Being married rather than in a partnership increases home ownership, except in the Netherlands and Switzerland, where it does not make any difference, in Poland, where partnership is rare, and in the Czech Republic, where tastes do not play any role. Living in a couple, too, or being widowed rather than single or divorced have a positive effect on ownership. The stability of marriage allows this long-term investment and a taste for

stable marriage may be linked to taste for a home ownership. We would have expected the taste for children to be linked to taste for ownership. However, the effect is counter acted by the income effect as having more than two children means fewer opportunities to save for a home in many countries, such as Denmark, the Netherlands, Belgium and France. Another sign of resource constraint is the negative effect of current household size in some countries, especially France, Spain and Greece. This may point to additional income constraints preventing home ownership by the 50+ in those countries. Note that at a given age women are less likely to own their home than men (in all countries except Spain) but they are not so when controlling for income. This means that if women own less it is because they are poorer.

Home ownership divides Europe into three clearly defined groups of countries, see Figure 2. It is almost universal in the three Southern countries (Greece, Spain and Italy) and in Belgium. Poland and the Czech Republic, where rental housing has been turned to owner occupation, can be included in this high ownership group. At the other extreme, four "central" countries, Austria, Switzerland, Germany and the Netherlands, have a large rental sector (between 43 and 47 percent). These countries offer a good supply of rental units, with high tenant protection, or a supply of social or rent-controlled units that increases the relative cost of owning. Even taking into account observed differences in income, demographics, urbanization or dwelling types, most of the striking country differences remain striking. They capture unobserved heterogeneity, and differences in local housing markets, taxation of home ownership and other institutional features. The opposition remains between on the one hand Germany and the Netherlands, with low ownership rates and a large rental housing supply (large public housing in the latter, large affordable private sector in the former), and the three Southern countries and the Czech Republic with no or little organized rental market on the other. Other countries are characterized by some equilibrium between rental and ownership housing market, even if Switzerland, Denmark and Austria lean toward low-ownership, while Sweden and Poland lean toward high-ownership.

Nearly a third of European elderly live either in the same dwelling or in the same building as their children, see Figure 3. They are more likely to share a building without co-residing when they live in a house (10 percent) rather than in a flat (5 percent). The two ways of close family life seem quite distinct, as for instance co-residence goes with more home ownership and is often associated with a widowed mother, while "child-in-building" goes with less home ownership, other things being equal. Co-residing is common in Spain, Italy and Greece. In a large group of Central-Southern European countries (Austria, the Czech Republic, Poland, Germany, Greece, and Italy) between 14 and 20 percent of the elderly living in a house have a child living in the same building. This form of living, which seems to characterize older middle class households outside large cities, hardly exists in all the other countries, except Switzerland (7 percent) and Spain (5 percent). It provides occasions for family exchanges of services, which might be important for both the 50+ and their children.
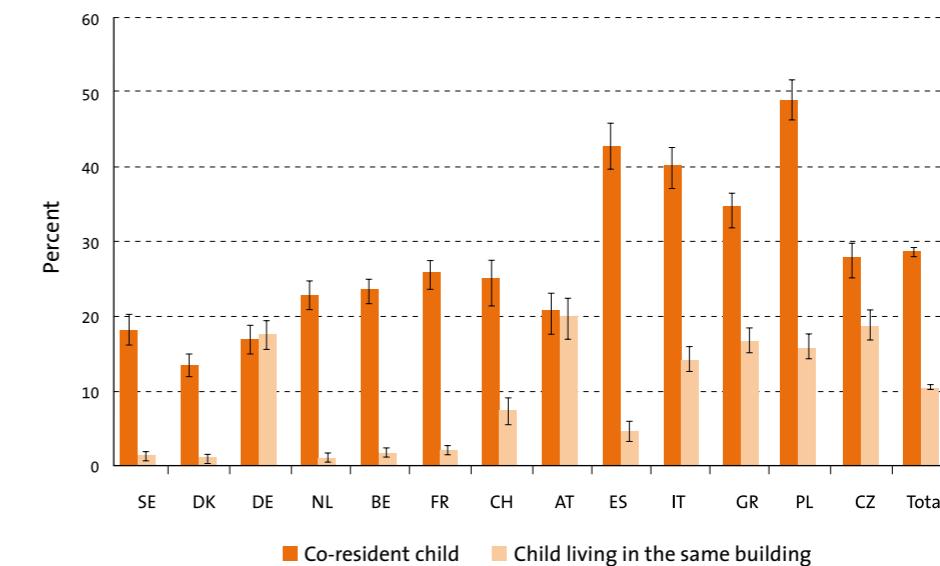
Figure 3 Individuals living in a house with a co-resident child or a child living in the same building (per cent by country)

Residential Mobility of the Elderly is Low

Beyond describing where the 50+ live, it is crucial to assess what their future housing choices will be as they may have large effect on the European housing markets. SHARE respondents where followed after the first interview, providing an opportunity to measure the mobility rate of the 50+ and probe into their choices. The proportion of mobile 50+ individuals can be estimated in various ways. First, we can look at those who have been living in their present abode for less than 2 years. The rate is a low 2.2 percent at the individual level and around 2.7 at the household level. Residential mobility between the 2004 and the 2006 wave, as declared by the respondents, is another means to get at a yearly mobility rate[2]. However, it is not straightforward as there are significant differences in the time span between interviews, both within and across countries. The time separating Wave 1 and Wave 2 interviews goes from a minimum of 11 months to a maximum of 40 months and we need to correct for it. With due adjustment for the time distance between interviews, the estimated mobility rate is 2 percent at the individual level (weighted, Figure 4). However, the respondents who moved between the two waves might have been particularly difficult to retrieve; hence, this 2 percent may underestimate the true mobility rate. We then try to identify those households who were not retrieved in Wave 2 but presumably moved and include them in the calculation of the mobility rate. If we add them to those who moved between private residences and to those who moved to nursing homes, we arrive at an estimated yearly mobility rate around 2 percent at the household level (Figure 5, unweighted). Hence, all measures converge to a low residential mobility rate somewhat above 2 percent per year. The rate ranges from around 3-3.5 percent in Denmark and Sweden to less than 0.5 percent in Greece.

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[2]They answered yes to "Since [{month year previous interview}], have you moved to another residence, house, or flat?" or they moved from a private residence in Wave 1 to a nursing home in Wave 2.

Mobility is found to decrease with age with an important rebound after age 80, as people move to nursing homes, see Figure 4. Mobility rate above 80 is 3 percent. In some countries, such as the Netherlands and Belgium, the mobility rate is higher among the 60-69 than at younger ages, which may be due to moving on retirement. However, we should remain prudent in the interpretation of this result, as it does not translate into a decrease in the number of years in accommodation. Note also the case of Greece where mobility rate is lower than in Italy and Spain, while the number of years in accommodation is very similar.
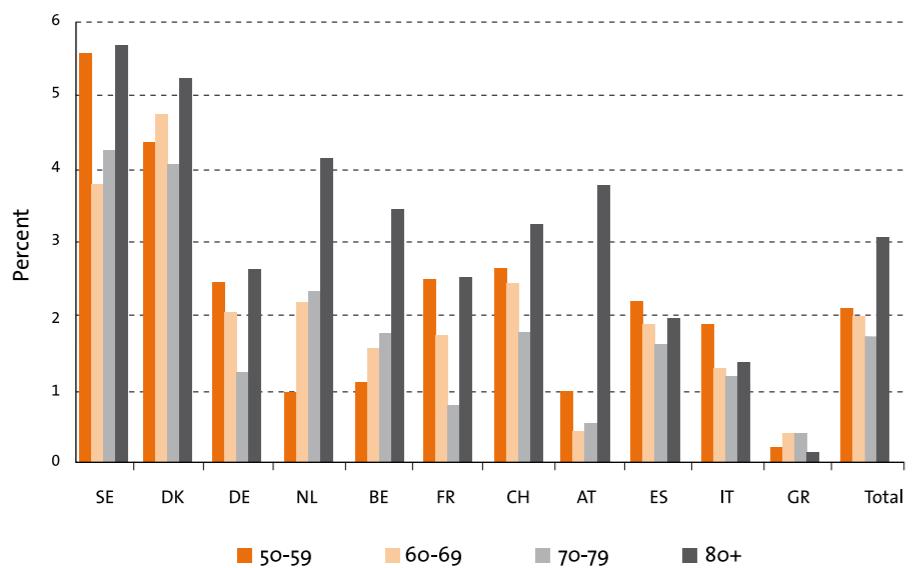
Figure 4 One-year mobility rate by age group (individual level - weighted)
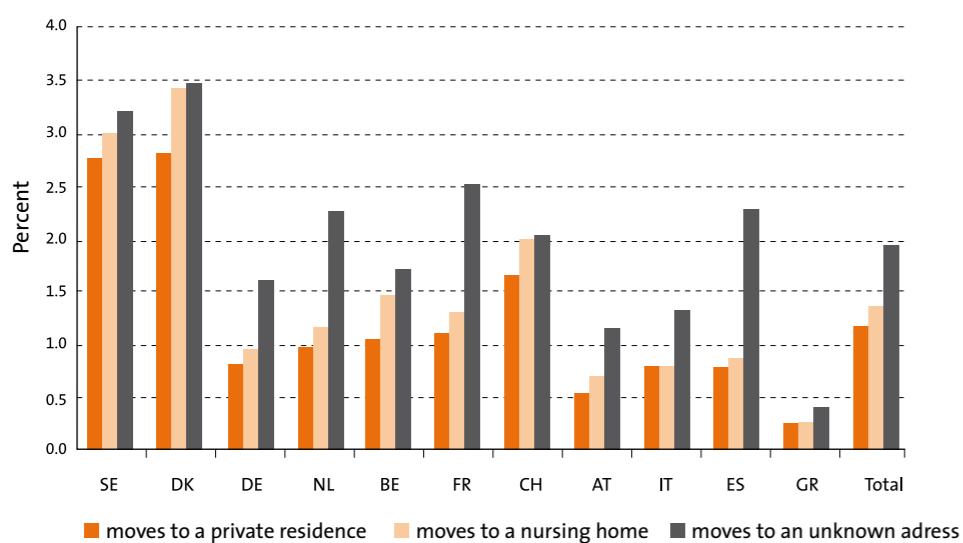
Figure 5 One-year mobility rate (household level - unweighted)

Changing Home Before 80…

The longitudinal nature of SHARE and the unique feature that individuals were followed into nursing homes provide precious information on what determines residential mobility and the choices made by those who move. Moving between private homes is definitely very different from moving to a nursing home. The former is determined by the quality of housing and neighborhood, and mobility costs, whereas moves to a nursing home are determined by age and health. Moreover, the economic situation plays in different directions. Let us look more precisely into both mobility types.

Residential mobility between private homes is usually found to decline with age as housing consumption is progressively adjusted along the life-cycle; but it is also time dependent as the more years spent in an accommodation, the less likely to leave it (Boehm and Schlottmann, 2006). For the 50+ most age adjustments have been made already and, controlling for the time spent in the accommodation, which has a strong negative effect, age has absolutely no effect on mobility, except above age 80 where some decide to move. Even this old age effect disappears when controls other than the number of years in accommodation are added. The elderly who own their home are less likely to move. Mobility costs are higher for them than for tenants as they include higher transaction costs. Besides a home is likely to be more adapted for owners, who can arrange it as they like, than for tenants. Of course, one also selects into owner occupation if one expects not to move. A higher income level helps to move, especially for tenants. So does a higher wealth level, especially for owners who become tenants. Most of the wealth of the European 50+ is embedded in the home (Christelis et al., in this volume). Hence, a higher wealth means a higher home value, which induces owners to release home equity and move out ceteris paribus. A change of home can also be a response to shocks in income, household size, health, or to changes in tastes and preferences that make current accommodation less adapted to new circumstances. Both being divorced and divorcing since Wave 1 have a positive effect on residential mobility, so has being or getting widowed. Other changes in household size, such as the last child moving out, also increase the likelihood to move home. Some factors are clearly linked to age or ageing. Retirement can trigger a move for homeowners, while it has no significant effect for tenants. For owners there is no sign that a decline in income would force them to move, but on the contrary moving seems to be linked to better economic conditions. For tenants, neither a deterioration nor an amelioration in economic conditions are associated to moves. The difference may be linked to higher mobility costs for owners. Among owners, those who have no child and those who are widowed are more mobile. However, widows with no children are less mobile than when they have children, which may be linked to inheritance laws or care giving (Bonnet et al., 2008). As far as living conditions are concerned, complaints of neighborhood crime in the 2004 wave also induce more mobility but only for those who rent, as they may live in the worse neighborhoods. Living in a house, rather than in a flat induces to move. This is a first sign that a house may be not suited for old age.

When all these controlling factors are introduced, Sweden and Denmark are still the most mobile countries. Then by declining mobility rate, we find Switzerland, Spain, France, Belgium, Italy, Germany, the Netherlands, Austria and finally Greece.

... Is Very Different from Moving to a Nursing Home

By contrast, mobility to a nursing home is triggered by age, ill health and the absence of close family (note that none of the respondents moved to a nursing home in Italy and in Greece). Some may be able to adapt their dwelling and "age in place" (see Kohli, Künemund, and Vogel, this volume) but often this is not possible. As is clear from Figure 4, moving to a nursing home begins only after 80. It is more likely for those who have physical health mobility problems and for those who have neither a spouse nor any living child. Becoming widowed since Wave 1 is an important factor of a move to a nursing home; thus, moving to an institution can follow bereavement quite closely. Becoming disabled and having neither spouse nor child are the two main determinants usually found in the literature (Gaymu et al., 2007). Interestingly SHARE allows adding a third element, a low income. Indeed moving to a nursing home is more likely for those in the lowest income quartile. Even if more should be known on long term care availability and financing, it seems likely that both economic and family circumstances play a role in the housing choices of the frail elderly.

Movers Reduce the Number of Rooms and Choose to Rent a Flat

Along the life cycle, adjustments first go from small apartments to bigger houses with marriage and the arrival of children. Then the adjustments are very rare, but one would expect that they would be to smaller homes as children move out, or a spouse dies, especially if the home was a saving device. Indeed, independently of moving, the number of rooms per person increases with age because household size decreases with age. There are two stages. Among the 50-69, most of the increase in rooms per person with age is due to children moving out. This is an important phenomenon in the life of the 50-69: among the 40 percent of the respondents who co-resided with a child in Wave 1, 28 percent had their last child moving out between the two waves. In terms of space, the departure of the children increases parents' welfare. In a second stage, the death of a spouse is a rarer event, which affected only 6 percent of the 70-79 married respondents, and 15 percent of those aged 80 or over.

More generally, whether the elderly downsize is still debated (Banks et al., 2007). Indeed we find that on average moving implies a negative adjustment and that the older the mover the more important the adjustment is. Among those aged 50-59, the movers lose 0.3 room on average; among the 60-69 they lose 0.7 rooms; they lose 0.8 rooms if aged 70-79 and as much as 1.4 rooms if aged over 80. Even if the movers are not very numerous, their demand is clearly for smaller dwellings, but not much before age 70 or 80. However, even if on average those who change place of residence reduce the number of rooms, still 20 percent of them move to larger homes. Reducing the number of rooms is not linked to income or health, but to a decrease in household size. When the elderly move, a majority choose a flat rather than a house. Both choosing a flat and leaving a house for a flat increase with age. Indeed, 47 percent of movers aged 50-59 choose a flat and the proportion increases to 52 percent when aged 60-69, 57 when 70-79 and a high 63 percent for the 80+. Hence, part of the decline in house living with age is indeed an age effect, even if very small. Moving to a flat is more likely for those in the low-income quartile and for widows, but is not linked to a change in household size.

Even if overall the rate of owner-occupiers does not decline much between the two waves, among those who move, 32 percent of owners move out of ownership, while only 24 percent of renters move to ownership. Overall the rate of owners among movers

declines from 57 percent to 50 percent. So again the trend is clear. Controlling for home ownership in Wave 1, ownership declines with age after 69 and with mobility at all ages, even more at older ages. The move out of ownership is less likely as income increases.

Conclusions

- The majority of the 50+ own their home. This is an insurance against rent risk in case their pension income is not indexed to rents. However, if all saving is in the house, the elderly are vulnerable to house price downturn. Among tenants, some of those who do not benefit from social housing may be at risk.
- The majority of the 50+ live in houses. While houses are linked to home-ownership, hence to security and probably to some other aspects of individual and collective well being, a house can be ill suited to very old age. Indeed, many turn to apartments and/or to renting as they get older, especially over 80 years old. The consequences on the housing market, both in terms of supply and demand, might be important.
- The yearly mobility rate is a low 2 percent. However, signs pointing to downsizing are clear, especially among the lower income group. Whether this is linked to reduced housing expenses remains to be seen.
- Becoming disabled, having neither spouse nor child, having a low income, all make moving to a nursing home more likely.

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3.6 Staying or Moving? Housing and Residential Mobility

Martin Kohli, Harald Künemund, Claudia Vogel

The Increasing Importance of Housing in Old Age

Sometimes there are indeed identical goals in social policy and among the elderly themselves. One example is the preference for staying at home as long as possible. "Ageing in place" allows maintaining everyday routines as well as contacts with friends and neighbours and with the embodied memories that anchor one's biography and identity. It is thus an essential part of the "moral ordering of later life" (Gilleard et al., 2007: 591). Moving may establish a new home closer to one's children or in a better location, or may give access to less expensive or more amenable space, but it also carries the risk of loss of biographical memory, disorientation, isolation and loneliness. By preserving social networks beyond the family, ageing in place may help to reduce health care spending. However, staying at home requires a home environment that supports independent living. The desire to remain in one's familiar surroundings may be counterproductive if these surroundings are ill adapted to the needs of advancing age.

Housing and living arrangements provide action spaces and dimensions of meaning all through the life course, but with varying emphasis in the different stages of life. The transition to retirement greatly increases the importance of one's home because the references and daily routines of the world of employment disappear. This is even more the case in advanced age when restrained physical mobility increasingly makes for a concentration of daily activities in and around the home. Everyday life in old age is above all life at home.

Housing thus becomes a primordial concern for the elderly. Young and old adults attach different meanings and projects to their accommodation (Dittmann-Kohli, 1995): For the young, the projections are positive (a larger apartment, a house of one's own), while for the old, thinking about the future revolves around the fear of loss. Loss of one's home is linked to loss of one's independence, and the dominant concern becomes one of attempting to keep both as long as possible. There are exceptions such as those of retirement migration – people actively embracing the new possibilities for mobility offered by retirement, and moving to more attractive (usually more southern) destinations (King et al., 2000). But for them as well the new home in the sun – and the fear of having to relinquish it eventually – becomes the centre of gravity.

The home is moreover the place where the family convenes. It may be a family home acquired from previous generations or furnished with their belongings, and which may eventually become the centrepiece of the bequest to one's own descendants. Investing in home ownership may be a specific form of family investment.

At present there exist only very few cross-national studies that allow for a comprehensive assessment of these issues. SHARE presents a unique opportunity for studying housing and its most important correlates in a strictly comparative frame across Europe. The task of this chapter is to give some basic information on housing and living arrangements of the elderly European population covered by SHARE. We will present descriptive findings on size and equipment of residences – and thus of the potential for remaining in one's home even with some physical impairments – and a multivariate analysis of residential mobility. Most of the presentation is cross-sectional for Wave 2. This includes the three new countries (the Czech Republic, Poland and Israel) that can now be compared to the eleven included in Wave 1. For the latter, we expect most values to have remained fairly stable across the two waves. We point out cross-sectional differences where appropriate.

The panel data now also allows for first longitudinal analyses in view of uncovering causal mechanisms. We present an analysis of the correlates of change in place of residence between the two waves.

Size of the Accommodation

Size as a key feature of one's accommodation is associated with costs. To adjust the size of the accommodation is one of the stated reasons for moving: For example, an elderly person may downsize after her spouse has died. In SHARE, the respondents were asked about the number of rooms for the household members' personal use, excluding bathrooms, kitchen, hallways, or rooms which are let, see Figure 1. Since only one person per household (the "housing respondent") had to answer this question, we assigned these answers to the other household members as well.
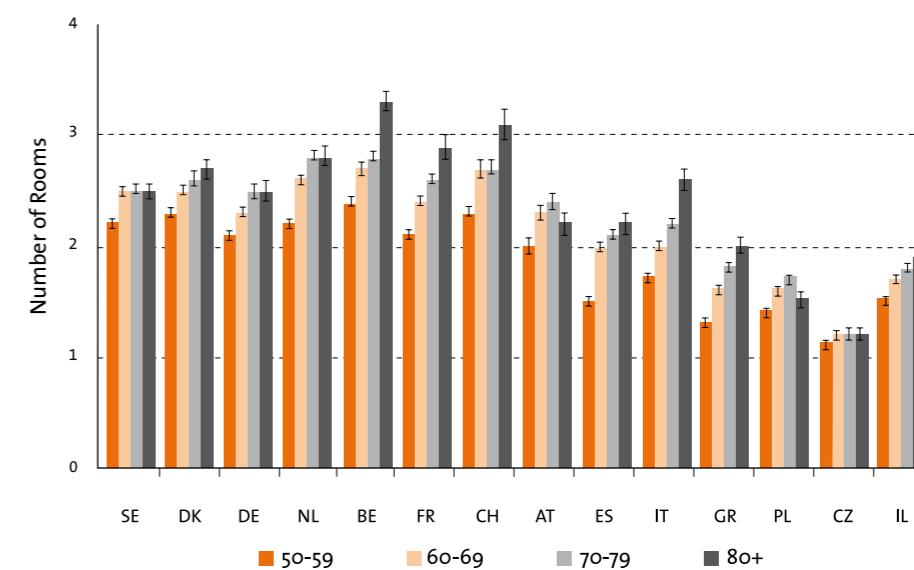
Figure 1 Rooms per person (means and standard errors by country and age group)

Our findings show that the number of rooms per person generally increases with age. This pattern is an effect of having the children move out, and especially of becoming widowed. The age gradient is strong in Belgium and Switzerland where those aged 80 or older have on average more than three rooms at their disposal, and in the Mediterranean countries where it reflects both the later age of children at leaving the parental home and the more massive onset of widowhood. In Italy, the 50-59 year olds have only 1.5 rooms per person at their disposal, compared to 2.2 rooms for those aged 80 and over; in Spain, these numbers are 1.7 and 2.6, and in Greece, 1.3 and 2.0.

If we define undersupply as less than one room per person, we find that in Greece more than a quarter of the 50-59 year olds live in a situation of undersupply. This again decreases by age, so that in the oldest age group the rate of undersupply is down to less than 5 percent. The highest rate of undersupply is found in Poland, with 39 percent of the population aged 50-59 and little improvement with advancing age. This finding corresponds to the lowest average number of rooms per person, 1.1.

Oversupply may seem to be a happier situation, but it also may present problems of social isolation or excessive costs for individuals, or of poor allocation of available resources

at the aggregate level. The proportion living in a situation of oversupply (defined as having three or more rooms per person) is highest in Belgium, Switzerland and the Netherlands, which may reflect the special features of their housing market.

Special Provisions for Coping with Physical Impairments

In the perspective of ageing populations, a further important point covered by SHARE concerns the supply with special provisions that assist persons having physical impairments or health problems. As mentioned above, this is also a key question for the elderly themselves: whether they can remain in their home even with limited physical mobility.
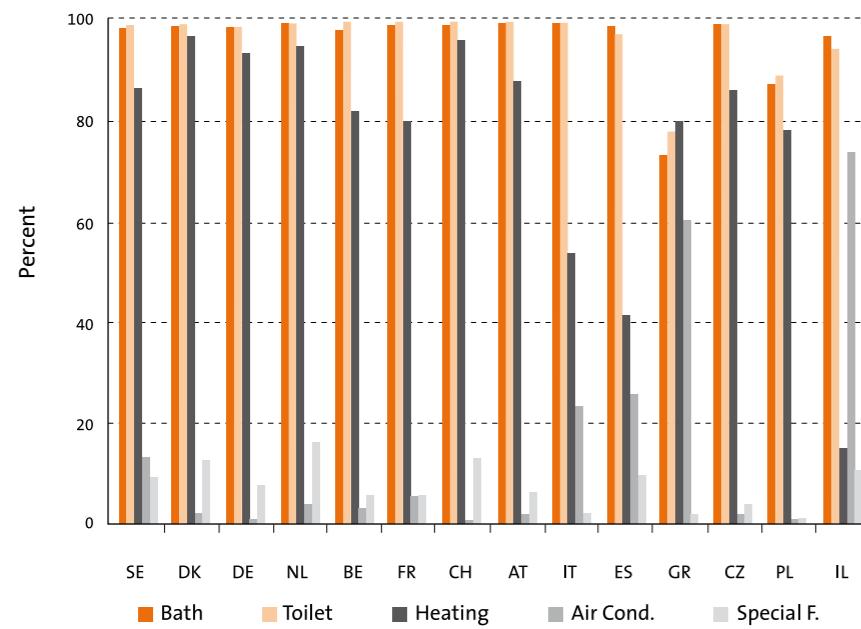
Figure 2 Amenities (percentages and standard errors by country)

SHARE asks a general question on the presence of special features. Not surprisingly, those 80 and over on average live three times more often in households with special features than those aged 50-59, but even for the former the overall proportion with 15 percent remains fairly low. This overall proportion hides important differences between countries. The highest provision for physical impairments is found in the Netherlands where a sixth of the total elderly population and almost half of those aged 80 and over live in accommodations thus equipped, followed by Denmark and Switzerland. Israel shows a high level of provision for physical impairments especially among the oldest group. On the other hand, Poland, Italy and Greece have almost no accommodations with special features among their elderly populations (1-3 percent), and not much more among their oldest age groups (2-3 percent). This may again be linked to the strong family tradition in the South, where services provided by co-residing or close family members (or migrant domestic carers) are expected to make up for disability instead of any technical features of the home.

Another dimension concerns more general housing amenities which may also be critical for the ability of the elderly to remain in their home: an indoor bath or shower, an indoor toilet, central heating, and/or air conditioning. In this respect our results paint a surprisingly positive picture. Almost 100 percent of our respondents have an indoor bath

or shower and toilet for their household's personal use. The only exceptions are Greece, where the proportion of indoor bath or shower amounts to 78 percent, and Poland with 88 percent. The other differences between countries and age groups are obviously rather small. More variation exists with regard to central heating facilities, but the differences between countries correspond closely to the variation in climates and needs, so that one would not readily rate them as indications of deficiencies. While in the Central and Northern countries central heating exists in nine tenths of the cases or more, the corresponding figure for Italy is 54 percent, for Spain, 41 percent, and for Israel, 15 percent.
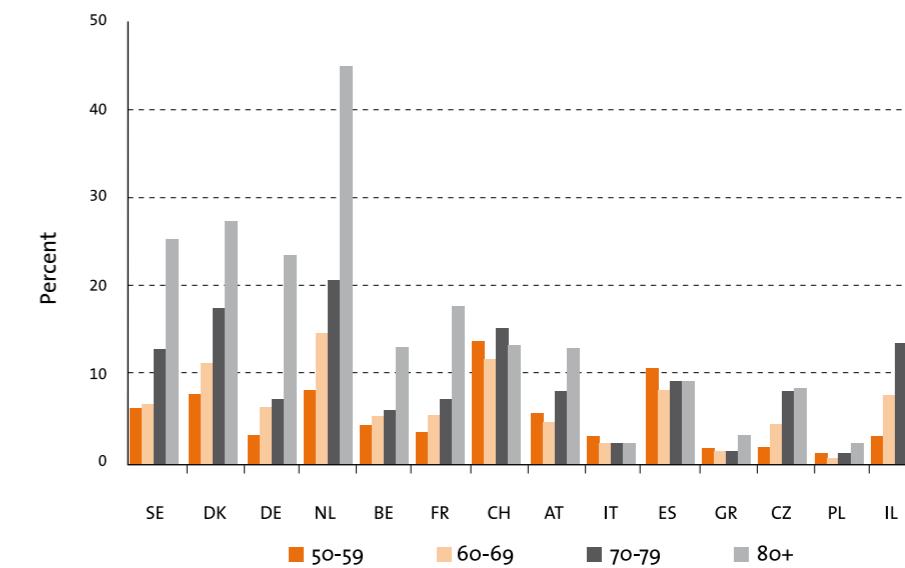
Figure 3 Special features for persons with physical impairments or health problems (percentages and standard errors by country)

Residential Mobility

Although ageing in place is generally preferred, some elderly move. The main reasons differ across age groups – for amenity reasons immediately after retirement, to move closer to a potential caretaker when health becomes problematic, and to a nursing home when staying at home becomes impossible (Litwak and Longino, 1987). Moving closer to children may also be motivated by a desire to help with grandchildren. The motives that influence the decision to move or stay are thus manifold, but declining health and changes in marital status, as well as less income or too much room to take care of, are usually identified among the main driving factors that promote a residential change (Sabia, 2008).

In SHARE, residential mobility may be assessed directly (cf. Angelini and Laferrère, in this volume) or indirectly by asking for years spent in the present accommodation see Figure 4. Results show the obvious age effect, but it is smaller than expected, with a mean difference of 14 years between the oldest and the youngest group. Overall the elderly Europeans have been living for 27 years in their present home, with Sweden, Denmark and the Netherlands at the lower end, and Poland at the upper end.
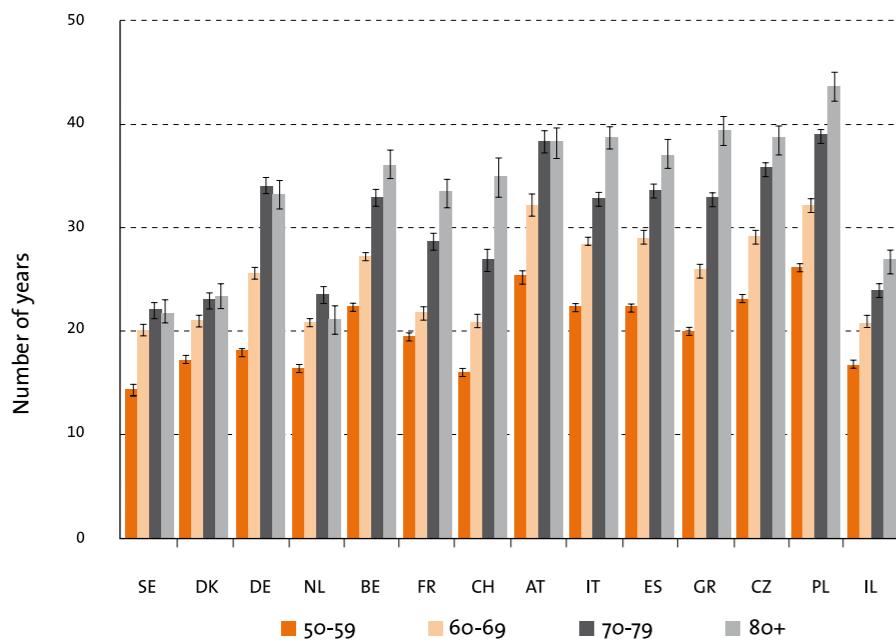
Figure 4 Years Living in Accommodation (Means and Standard Errors by Country and Age Group)

The factors accounting for a change in residence can now be analysed longitudinally by combining the two waves of SHARE. A multivariate analysis of the likelihood to move reveals a negative association with age: older age groups are less likely to move. Contrary to expectations, self-reported health does not have a significant impact here, see Figure 5, (non-significant variables not shown). Tenants are significantly more likely to move than owners who acquired their housing property by own means, and even more than owners who inherited their property. This points to the importance of attachment to place. The likelihood of moving also increases with wealth. This suggests that moving is less driven by economic necessity than by the availability of resources. Family reasons come into play as well. Proximity to children does not yield a consistent pattern, but a change in marital status significantly increases the likelihood of moving.
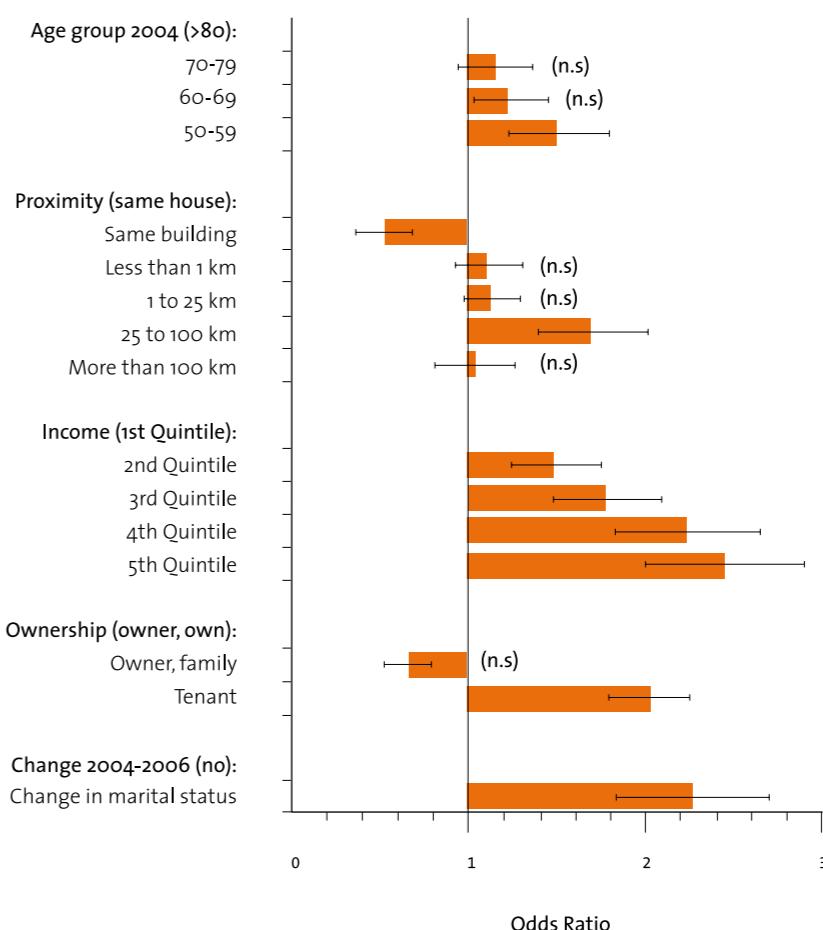
Figure 5 Change of residence (odds ratios and standard errors)

Conclusion

In conclusion, it should be noted that housing patterns differ considerably among countries but have remained fairly stable over the two-year period between Waves 1 and 2. We again emphasize three points:

- Overall there are good housing conditions well into old age, with size increasing, and deficiencies not much higher than among middle-aged adults.
- Home owners are least likely to move. Ownership – typically associated with larger and better-equipped homes – may provide an important form of economic and social security (cf. Angelini and Laferrère, in this volume). As ownership rates are lower in older age groups, there is less security for the current elderly. Given the higher rates among younger groups, it is likely that future cohorts of elderly people will be better off in this respect.
- In most countries – especially in the South and East – there is a clear deficit of special provisions that assist persons with physical impairments or health problems. This creates a considerable risk of having to move out of one's home. Housing policy should focus on making up for this deficit.

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4 Health and Health Care

Editor: Johan Mackenbach

4.1 Changes in Physical Health Among Older Europeans

Mauricio Avendano, Johan Mackenbach

At the turn of the 21st century, life expectancy in western European countries ranked among the highest worldwide. In 2005, an average man in a European SHARE country could expect to live 76 to 79 years, and an average woman 80 to 84 years (World Health Organization, 2007). However, the number of years Europeans can expect to life in poor health remains substantial (World Health Organization, 2007). This largely reflects the fact that as individuals age, their health deteriorates. Describing the magnitude of this age-related deterioration in health for different health outcomes among Europeans is crucial for the development of prevention and healthcare policies.

Besides age, gender has also a major influence on health changes. It is well known that men experience a higher risk of dying than women. Paradoxically, data from the first Wave of SHARE and other studies indicate that women report more health complaints and experience more disability than men (Arber and Cooper, 1999; Börsch-Supan, et al., 2005). Longitudinal data from SHARE provide an opportunity to examine these gender variations in the European population, and to explore how they vary for different health outcomes. In the context of these gender and age differences, however, it is also important to bear in mind that health changes may occur differently across countries. Switzerland, Sweden and Italy have considerably higher life expectancy than countries such as Denmark and the Netherlands (World Health Organization, 2007). These differences may stem from variations in the prevalence of risk factors such as smoking and the delivery of healthcare, but may also be the consequence of differences in broader economic and political factors. Understanding these differences can contribute to the development of policies that can help us preventing disease, disability and death.

In an attempt to address these questions, we used longitudinal data from SHARE to examine variations in the incidence of chronic diseases, poor self-perceived health, disability and death according to age, gender and country, and explored the potential role of risk factors in explaining these differences.

Methods

Participants who took part in the 2004 Wave of SHARE were interviewed two years later to examine the occurrence of new health events. We measured a wide range of health outcomes, including: (1) Chronic diseases: Participants were asked whether they had had a heart attack, stroke, cancer or hip fracture since the last interview. In addition, respondents were asked whether they had ever been diagnosed by a doctor with other chronic diseases including hypertension, diabetes, lung disease, high cholesterol, arthritis and cataracts. Those who did not report these conditions in Wave 1 but reported having been diagnosed with these conditions by Wave 2 were classified as incident cases. (2) Self-perceived health: This was measured by a single item with 5 answer categories ranging from 'excellent' to 'poor'. (3) Disability: Participants were asked whether they experienced difficulties with one ore more activities of daily living (ADL) e.g., dressing, getting in and out of bed; instrumental activities of daily living (IADL) e.g., using a map, preparing a hot meal; and mobility and motor function, e.g., walking 100 meters, climbing stairs. (4) Death: Vital status was ascertained based on reports from proxy respondents.

Data from SHARE comprise information on risk factors defined as: smoking (current, former or never), excessive alcohol drinking (>2 drinks 5 or more days a week), physical activity (dichotomised based on one to three times a month or more vs. never or hardly ever engaging in vigorous or moderate physical activities), and body mass index, reclassified into underweight (BMI < 18.5), normal (BMI between 18.5 and 24.9), overweight (BMI between 25 and 29.9), and obese (BMI 30 or above).

Analysis on chronic diseases, self-perceived health and disability were restricted to participants who responded to the SHARE survey both in 2004 and 2006, and who had no missing values for outcomes measures (n=17,353). Analyses for each of these outcomes were restricted to sub-samples of participants who reported in the first Wave that they were free of the respective outcome. Analyses on mortality included individuals who responded to the survey in Wave 1 and for whom vital status was ascertained (n=18,344). We used Poisson regression to model the 2-year incidence rate of chronic diseases, poor self-perceived health, disability and death according to age, gender and country. In addition, we calculated Poisson-regression based rate ratios to examine the impact of gender and risk factors on the incidence of diseases, disability and death. When interpreting results, it is important to bear in mind that the present analysis is based on preliminary data, as records for all participants are not yet complete. Results should therefore be interpreted cautiously.

Results

Men Have Higher Incidence of Fatal Diseases and Death, But Women Experience More Disability

Many health changes occurred in SHARE participants who were healthy in 2004, see Table 1. Overall rates of stroke were higher than rates of heart attack. In a two-year period, the incidence of first heart attack was 1.4 in men and 0.6 in women, and the incidence of stroke was 1.9 for men and 1.0 for women per 100 individuals. After adjusting for age and country, rates of stroke, heart attack and lung disease in women were about half of those in men. About 14 per 100 participants reported a new diagnoses of hypertension, and about 3 per 100 a new diagnosis of diabetes.
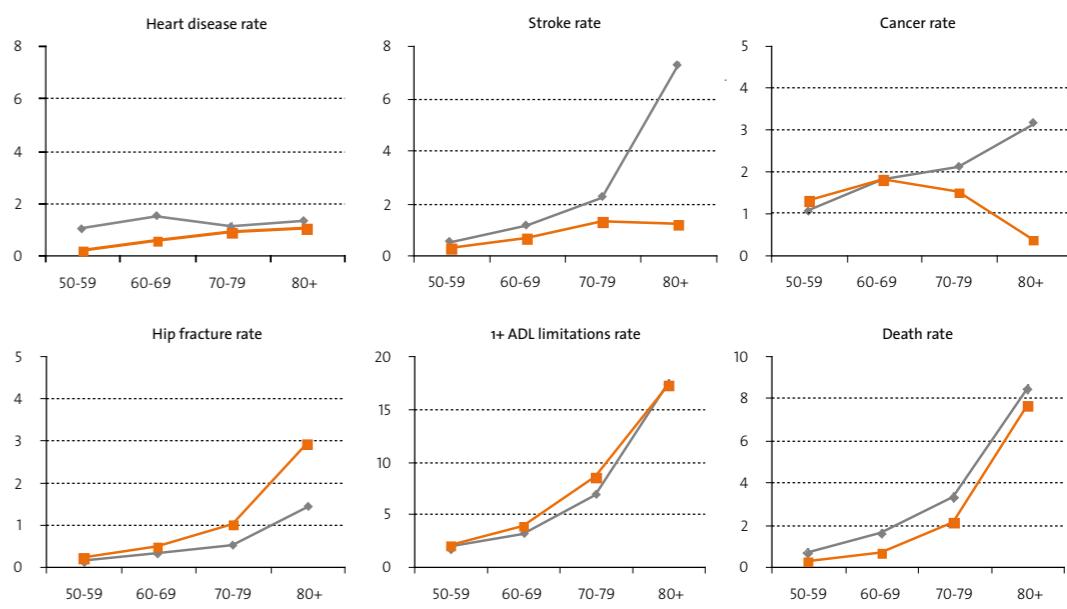
Despite having a lower risk of dying, women were almost twice more likely to have a hip fracture, and had 77 percent (95 percent CI 1.60, 1.95) higher rates of arthritis than men. The rate of developing cataracts was about a third higher in women than in men. These three conditions are unlikely to result in death, but have a major impact on individual's ability to perform basic activities and in their quality of life. Consistently, women were about 20 percent (95 percent CI 1.10, 1.29) more likely to change from good to poor self-perceived health, and to develop disability as compared to men. Rates of developing new limitations with instrumental activities of daily living and mobility were about 50 percent higher in women than men.

Health outcome	Health	Population	Men		Women		Rate ratio
			Rate	95% CI	Rate	95% CI	(95%CI)
Heart attack	159	15,313	1.4	(0.9, 1.6)	0.6	(0.3, 0.7)	0.42 (0.31, 0.57)
Stroke	212	16,752	1.9	(1.7, 2.2)	1.0	(0.8, 1.2)	0.41 (0.32, 0.53)
Cancer	327	16,483	1.7	(1.5, 2.0)	1.4	(1.2, 1.7)	0.83 (0.66, 1.03)
Hip Fracture	118	17,033	0.9	(0.7, 1.0)	0.4	(0.3, 0.5)	1.89 (1.28, 2.83)
Hypertension	1,662	11,794	14.4	(13.5, 15.4)	14.2	(1.2, 1.7)	0.92 (0.85, 1.02)
Diabetes	519	15,759	3.6	(3.2, 4.0)	3.5	(3.1, 3.8)	0.90 (0.77, 1.05)
Lung disease	476	16,501	3.7	(3.3, 4.1)	2.3	(2.1, 2.6)	0.56 (0.48, 0.67)
High cholesterol	1,410	13,653	8.4	(7.7, 9.1)	9.0	(8.4, 9.6)	1.07 (0.96, 1.19)
Arthritis	1,556	13,882	7.6	(7.1, 8.3)	14.2	(13.4, 15.0)	1.77 (1.60, 1.95)
Cataracts	631	16,111	2.7	(2.4, 3.1)	4.2	(3.9, 4.6)	1.34 (1.14, 1.57)
Poor health	2,403	12,605	16.6	(15.7,17.7)	21.1	(20.1, 22.2)	1.19 (1.10, 1.29)
1+ ADL	889	15,863	4.6	(4.1, 5.1)	6.3	(5.9, 6.8)	1.16 (1.02, 1.32)
1+ IADL	1,458	14,925	7.0	(6.5, 7.6)	11.7	(11.1, 12.4)	1.50 (1.35, 1.65)
1+ mobility	2,152	9,098	17.2	(16.1, 18.3)	28.2	(26.7, 29.8)	1.58 (1.45, 1.72)
Death	762	18,344	4.1	(3.8, 4.6)	3.0	(2.7, 3.3)	0.63 (0.55, 0.73)

Table 1 Two-year incidence of chronic diseases, poor-self-perceived health, disability and death per 100 individuals

Note: Rate ratios are adjusted for age and country and compare men (reference) vs. women

The Age-Related Increase in Incidence Differs for Men and Women and Across Different Health Outcomes

As expected, the incidence of most chronic diseases increases dramatically with age, but the magnitude of this increase differs for men and women, and across different chronic diseases, see Figure 1. Among men, a sharp increase with age was observed in the incidence of stroke, cancer and hip fractures. For instance, at ages 50-59, the two-year incidence of stroke was only 0.5 (95 percent Confidence interval 0.3, 0.7) per 100 men, but increased by a factor of 15 at ages 80+ (7; 5.2, 10.0). On the other hand, the incidence of heart attack among men did not increase after ages 60-69. This flattening in the incidence of heart attack is unexpected, as we would expect a sharper increase at older ages. Our results may be partly explained by underreporting of this condition at older ages, or by the fact that the SHARE sample interviewed in 2004 comprised only the non-institutionalised population, which may be a selection of healthy survivors. Among women, there was a marked age-related increase in the incidence of heart attack, stroke and hip fractures. To illustrate, the incidence of hip fractures was only 0.2 (0.1, 0.4) per 100 women at ages 50-59, but was about 15 times higher at ages 80+ (2.9; 2.0, 4.3).

In contrast to other chronic diseases, the incidence of cancer in women increased up to ages 60-69 and decreased sharply thereafter, whereas the incidence of cancer in men increased sharply with age, particularly among men aged 80+. These gender differences in the age patterning of cancer incidence are most likely attributable to cancer screening (Verkooijen, Koot, Fioretta, van der Heiden, Schipper, Rapiti et al., 2008). About half of cancers reported among women were breast tumours. In many European countries, women are screened for breast cancer after age 50 and up to about age 69, which may

explain the high incidence of cancer at these ages. Similarly, opportunistic screening for prostate and colorectal cancer in men is most marked at older ages, which may account for the large increase in incidence beyond age 80.

Figure 1 Two-year incidence of chronic diseases, disability and death per 100 individuals according to age and sex (adjusted for country) in the period 2004-2006

Rates of reporting 1+ limitation with ADLs increased sharply with age in both men and women. At ages 50-59, only about 2 per 100 individuals developed at least one new limitation in a two-year period, as compared to about 17 per 100 at ages 80+. As expected, death rates increased linearly with age. At ages 50-59, death rates were 0.7 (0.5, 0.9) in men and 0.3 (0.2, 0.4) in women, but at ages 80+ rates increased to 8.4 (7.1, 10.1) in men and 7.7 (6.6, 8.9) in women. At any age, men experienced a higher risk of dying than women.

Smoking and Low Physical Activity – Major Determinants of Health in Europeans

Figure 2 shows that participants who smoked in 2004 were more likely to develop a heart attack, poor self-perceived health, and disability, and had higher death rates, compared to those who did not smoke. For instance, the rate of heart attack was 2.5 (1.7, 3.6) times higher in smokers as compared to non-smokers. Low physical activity in 2004 was strongly associated with higher risk of reporting new health problems or dying two years later. Those who did not engage in vigorous or moderate physical activities were 3 (2.6, 3.5) times more likely to die than those who engaged in some level of physical activity. As compared to those having a normal weight, participants who were overweight were more likely to report poor health, but did not have an increased risk of death or other health problems. Obese participants had considerably higher rates of reporting poor health and disability than those with normal weight, but they had also a lower risk of dying. Participants who reported drinking 2 or more alcohol drinks 5/6 days per week had lower rates of health problems as compared to those who drank less.
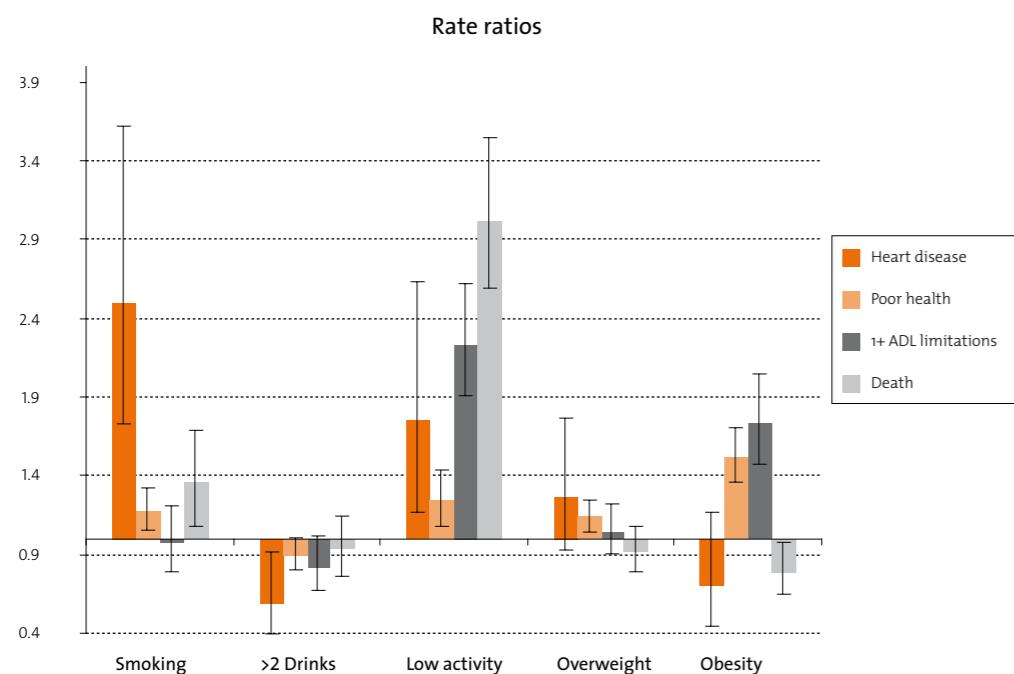
Figure 2 Rate ratios of the association between risk factors and the incidence of new health problems

Note: Rate ratios compare smoking vs. non-smokers; >2 alcoholic drinks vs. other; no physical activity vs. other; overweight vs. normal weight; and obesity vs. normal weight. All estimates are derived from a single model adjusted for age, sex, country, educational level, smoking, excessive drinking, physical activity, and body mass index

Differences in Health Among Countries Are Not Fully Explained by Cross-Country Differences in Known Risk Factors

Figure 3 shows that there are large variations across countries in health outcomes. Swiss and Greeks stand out as having the lowest mortality rates, as well as the lowest rates of incident poor self-perceived health. Belgium, Sweden and Italy have also relatively low mortality rates. France, Italy and Spain had the highest rates of incident poor self-perceived health, but death rates in these countries do not differ significantly from those in other populations. The incidence of reporting a new limitation with ADL is highest in Belgium, France and Spain, and lowest in the Netherlands and Greece. There is not a clear pattern of variation in the incidence of a new heart disease or stroke, with only Greece and France showing lower rates than other European countries.

The second bar for each country in Figure 3 shows what the two-year incidence of health problems would be if all countries had the same prevalence of smoking, excessive alcohol use, low physical activity, overweight and obesity. Strikingly, the pattern of variations in health across countries remained largely unchanged, which suggests that these factors do not fully explain why some countries are healthier than others.
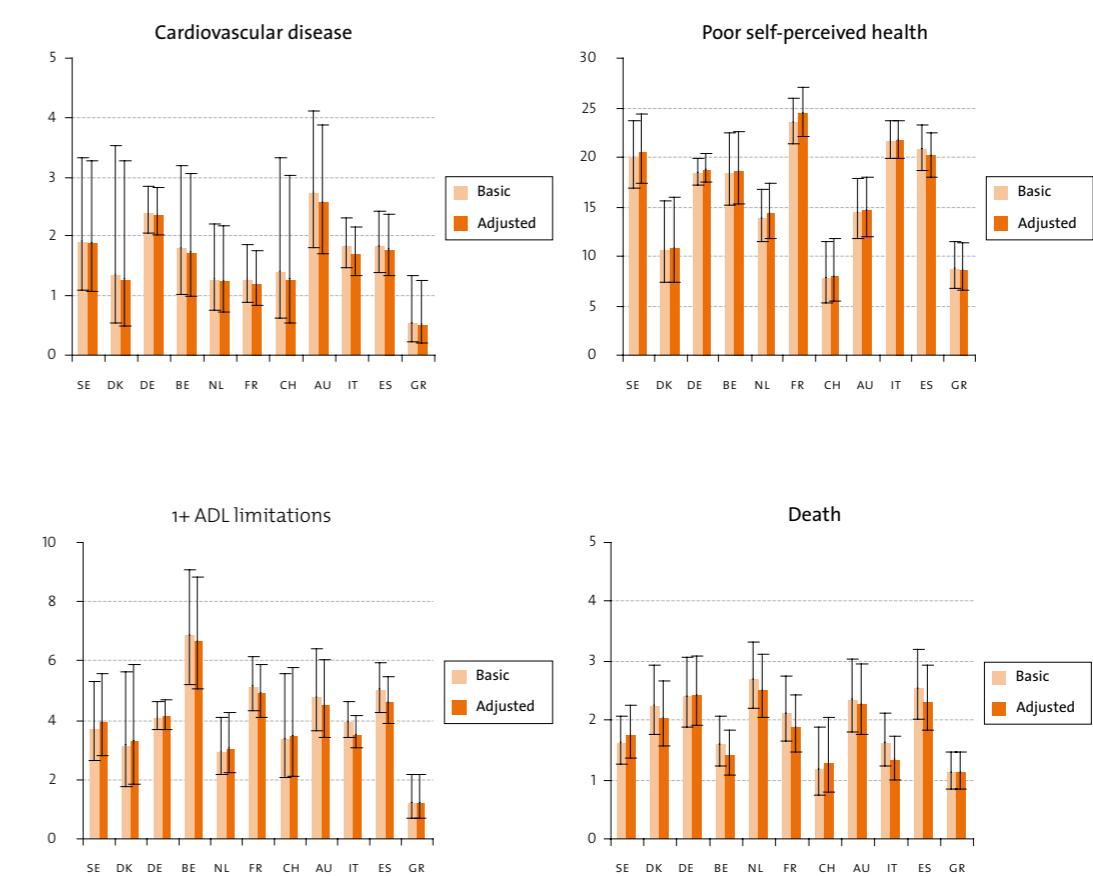
Figure 3 Two-year incidence of health problems in 11 European countries in the period 2004-2006, before and after adjusting for baseline prevalence of risk factors

Note: Basic model is adjusted for age and sex; adjusted model is adjusted for age, sex, smoking, excessive drinking, body mass index and physical activity

Conclusions

The SHARE study provides a unique opportunity to examine health and its determinants across Europe. Consistent with much previous research (Arber and Cooper, 1999), our data suggest that men are at higher risk of dying than women, but women experience more disability than men. Our data shed some light into this paradox: It would appear as if women are more likely than men to experience diseases that have a large impact on mobility, disability and quality of life, such as arthritis, cataracts, and hip fracture. On the contrary, men are at increased risk of developing fatal conditions such as heart disease and stroke. Two possible explanations are possible for this pattern: On the one hand, exposure to risk factors for fatal and non-fatal diseases may differ by gender. Whereas men are more likely to behave poorly, e.g., they smoke and drink more and have a less healthy diet, women may have a higher prevalence of risk factors for musculoskeletal disorders. On the other hand, this difference may be an artefact of selective survival. Because men are more likely to die than women across the age-span, men who survive into old age are a selection of the healthiest, and no longer comparable to women of the same age. Data from SHARE for later waves will provide an opportunity for testing these hypotheses.

Cross-country variations in the incidence of diseases, disability and death should be interpreted with much caution, as they may reflect variations across countries in reporting,

attrition and non-response rates. Future analyses should develop methods to account for these potential sources of bias. Despite these limitations, our data are consistent with estimates from the World Health Organization (World Health Organization, 2007) suggesting that health varies across European countries. Some countries such as Greece and Switzerland tend to be healthier than other countries regardless of the health outcome examined. This advantage might reflect the relatively healthy life style and diet among Greeks, and the relatively favourable social and economic conditions among the Swiss. On the other hand, a puzzling pattern emerges when examining variations in outcomes for other populations. To illustrate, although France had a lower incidence of cardiovascular disease, we did not observe a north-to south gradient as observed for ischaemic heart disease mortality in previous studies (Sans, Kesteloot, and Kromhout, 1997). Further inspection of the data is necessary to examine whether these differences are real or due to variations in response rates or diagnosis practices.

In conclusion, data from two waves of the SHARE study provide a unique source of information on the health of Europeans, along with extensive data on the economic and social context of health variations. A main challenge will be to examine how these contextual factors interact to explain why some populations are healthier than others, and thus develop policies to increase life expectancy in the European region.

Key Points

- Men have a higher risk of fatal diseases and death than women, whereas women are more likely to experience less fatal but more disabling diseases that result in a higher prevalence of disability as compared to men.
- The incidence of many chronic diseases increases dramatically with age, but the magnitude of this increase differs for men and women, and across different health outcomes.
- Smoking and low physical activity were most consistently associated with health deterioration among Europeans, whereas a mixed picture emerges for the impact of overweight, obesity and alcohol consumption on different health outcomes.
- There are large variations among European countries in the prevalence of smoking, alcohol consumption, overweight, obesity and physical activity, but these factors do not fully explain why some countries are healthier than others.

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4.2 The Association Between Socioeconomic Status and Changes in Health in Europe

Renske Kok, Mauricio Avendano, Johan Mackenbach

Numerous studies have found disparities in health between socioeconomic groups in modern societies (van Doorslaer, Wagstaff et al., 1997; Huisman, Kunst et al., 2004; Dalstra, Kunst et al., 2005). Many international studies targeted at measuring disparities in morbidity use self-perceived health as outcome, which is a broad, generic measure of health. Although many studies found that self-perceived health is a good predictor of mortality (Idler and Benyamini 1997), differences in reporting and expectations may influence this outcome. A more specific measure of morbidity is self-reported chronic diseases. Several country-specific longitudinal studies have examined socioeconomic disparities in chronic diseases such as heart disease and stroke (Mackenbach, Cavelaars et al., 2000; Avendano, Kunst et al., 2005). However, there are few European overviews of disparities in chronic disease incidence, as existing studies are based on cross-sectional data (Cavelaars, Kunst et al., 1998; Dalstra, Kunst et al., 2005) or mortality as an outcome (Mackenbach, Bos et al., 2003; Huisman, Kunst et al., 2004; Avendano, Kunst et al., 2005).

Based on data from two waves of the SHARE study, this paper examines disparities between socioeconomic groups in incident chronic diseases, death, poor self-perceived health and disability. It is generally known that risk factors are not spread evenly over socioeconomic groups (Cavelaars, Kunst et al., 1998). Therefore, we also examined the association between socioeconomic status and incident health outcomes adjusting for modifiable risk factors.

Methods

Data are restricted to respondents included in both waves of the SHARE survey; respondents with missing data on demographics or morbidity are omitted from the analysis. Two measures of socioeconomic status are used to asses disparities in health: level of education and wealth. Socioeconomic status is identified by the highest level of education reported, classified into three categories: levels 0-2 (pre-primary, primary and lower secondary education), 3 (upper secondary education) and 4-6 (post-secondary education) of the ISCED (international standard classification of education). Wealth is also used as it is an appropriate indicator of socioeconomic status of the elderly and retired. Wealth was defined as the sum of all financial and real assets. Wealth values were adjusted by purchasing power parity and subsequently reclassified into country-specific tertiles.

Two-year incidence rates and odds ratios are estimated using logit regression, and are adjusted for age, sex, country, and time-interval between waves. A variable indicating the number of months between waves is included into the estimation, since the time-interval between Wave 1 and Wave 2 is not identical to all respondents across countries. A healthy baseline population is used in all calculations. Odds ratios compare the incidence of health events between socioeconomic groups, taking the highest educational level or wealth as reference category.

Results

Health Disadvantages Among the Low Socioeconomic Groups in Europe

Table 1 presents the two-year incidence of chronic diseases, death, poor self-perceived health (defined as deterioration from good/moderate to poor/very poor health), and reports of new limitations with one or more activities of daily living (ADL). Europeans with a low educational level or wealth have higher incidence of heart attack and stroke than their higher educated and wealthy counterparts. For example, 1.45 percent of Europeans with low wealth reported a stroke compared to 0.85 percent of the wealthiest. These results are confirmed in Figures 1 and 2, which present odds ratios that compare incidence rates in the high education or wealth groups, with rates in the middle and low education and wealth categories. The figure shows that the odds of getting a heart disease is more than double for low educated as compared to high educated.

		Education			Wealth	
Heart attack	low	0.98	(0.43, 2.27)	low	0.86	(0.38,1.97)
	middle	0.68	(0.27, 1.71)	middle	0.79	(0.33, 2.00)
	high	0.48	(0.17, 1.39)	high	0.70	(0.28, 1.79)
Stroke	low	1.42	(0.64, 3.15)	low	1.45	(0.64, 3.28)
	middle	0.94	(0.38, 2.27)	middle	1.18	(0.51, 2.72)
	high	0.85	(0.31, 2.30)	high	0.85	(0.35, 2.07)
Cancer	low	1.70	(0.97, 3.01)	low	1.85	(1.04, 3.32)
	middle	2.03	(1.15, 3.56)	middle	2.00	(1.16, 3.47)
	high	2.31	(1.31, 4.08)	high	1.92	(1.10, 3.35)
Poor/very poor health	low	35.26	(31.82, 38.86)	low	35.64	(32.02, 39.41)
	middle	22.68	(19.69, 25.95)	middle	24.80	(21.85, 27.99)
	high	15.25	(12.85, 17.98)	high	21.08	(18.40, 24.02)
1+ ADL	low	21.06	(18.24, 24.17)	low	20.94	(18.01, 24.18)
	middle	12.21	(10.03, 14.76)	middle	14.86	(12.53, 17.51)
	high	8.38	(6.58, 10.60)	high	11.60	(9.61, 13.91)
Death	low	5.09	(3.79, 6.77)	low	6.09	(4.55, 8.08)
	middle	3.16	(2.23, 4.45)	middle	3.52	(2.51, 4.90)
	high	2.78	(1.85, 4.13)	high	2.52	(1.76, 3.59)

Table 1 Estimation of two-year incidence of chronic diseases between both waves

Note: Incidence rates are adjusted for sex, age, and country, and the time-interval between the waves is set to 24 month.

Confidence intervals are displayed between brackets

The gradient is reverse for cancer when using education; the largest incidence rate is found for the high educated group, and the smallest incidence rate for the lowest educated group. No differences in cancer incidence among wealth tertiles were observed. As shown in Figure 1, no association was found between hip fractures and education. However, low wealth seems to be associated with higher incidence of hip fractures; those in the lowest wealth tertile have 1.5 larger odds of hip fracture than wealthy Europeans. Finally, education level is associated with the odds of getting arthritis.

The more generic measures of morbidity, self-perceived health (SPH) and limitations in activities of daily living (ADL) show also a marked socioeconomic gradient both for education and wealth. For example, from the low educated group 35.3 percent is estimated to rate their health as bad or very bad in Wave 2 while rating their health as moderate or better in Wave 1. This is relatively high compared to the high educated group, among whom only 15.3 percent reported a deterioration in their health.

Similarly, 20.9 percent of those in the low tertile of wealth who had no ADL limitations in 2004 reported at least one ADL limitation in 2006, as opposed to only 11.6 percent of those in the highest tertile of wealth.
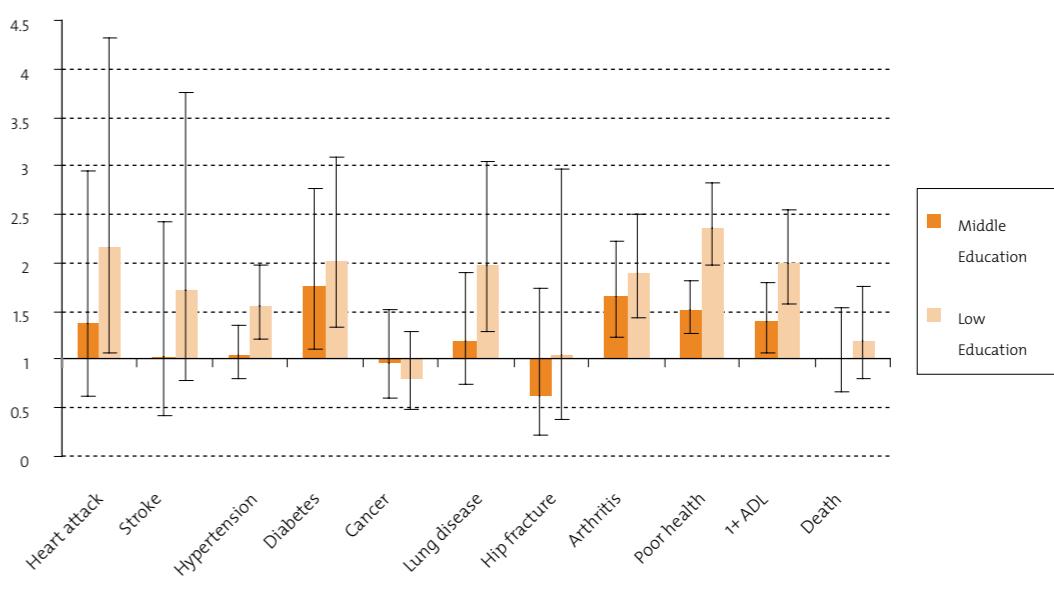
Figure 1 Odds ratios of having a chronic disease between 2004 and 2006 comparing low and middle with high education

Note: The odds are adjusted for age, gender, country, and the time-interval between waves
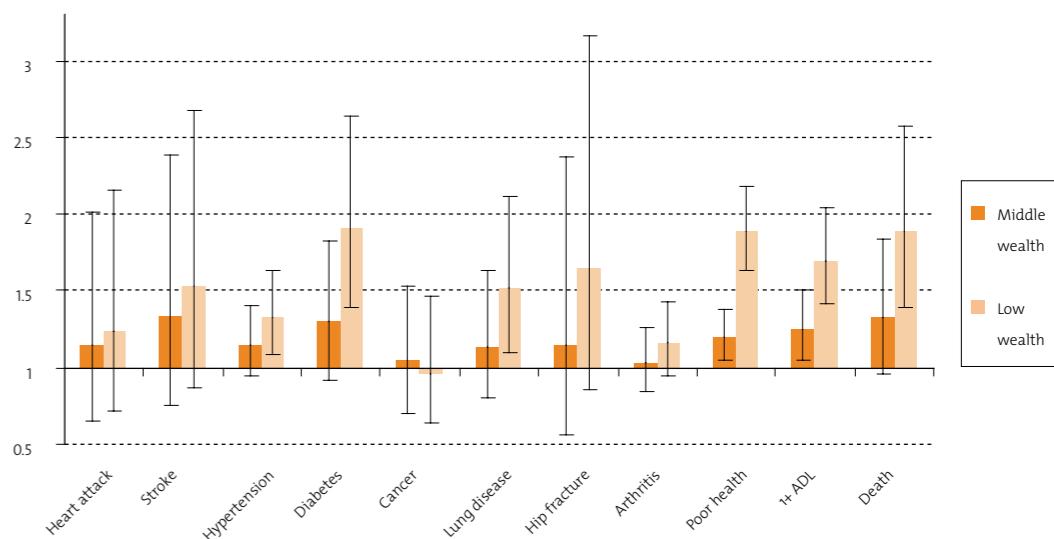
Figure 2 Odds ratios of having a chronic disease between 2004 and 2006 comparing low and middle with high wealth

Note: The odds are adjusted for age, gender, country, and the time-interval between waves

As shown in Figure 1, the odds of self-perceived health deterioration is more than twice higher in low educated Europeans as compared to their high educated counterparts. Consistently, those with a low educational level and low wealth have higher mortality rates than their higher education and wealthy counterparts, and the odds of dying is almost twice as large for Europeans with low wealth compared with the highest tertile of wealth. Differences between the middle and high socioeconomic status groups are less pronounced, both groups showing relatively similar incidence rates. In conclusion, Europeans with a low socioeconomic status experience a disadvantage in the incidence of most chronic diseases, self-perceived health and limitations with daily activities, as well and their risk of dying in a two-year period.

Behavioural Risk Factors Explain Only a Small Fraction of Health Disparities

Risk factors for chronic diseases are not evenly spread over socioeconomic groups, and could thereby explain the disparities we observe. Data from the first Wave of SHARE indicates that lower educated Europeans are generally more likely to smoke, to be physically inactive, and to be overweight. Furthermore, smoking, physical activity and obesity in 2004 were related to several health outcomes two years later. We calculated odds ratios that compare the highest and lowest educational levels, see Figure 3, and wealth tertiles, see Figure 4. Models are adjusted for baseline smoking (current and former), underweight, overweight, obesity, excessive alcohol consumption, hypertension, and diabetes. Both figures show that these risk factors have little influence on odd ratios, which suggest that they account for only a small fraction of health disparities. The adjustments have most influence on the odd ratios for self-perceived health and activity limitations, which are slightly attenuated after adjusting for risk factors. Overall, however, most of the effects of wealth and education on health remain unchanged in a model adjusted for all risk factors.
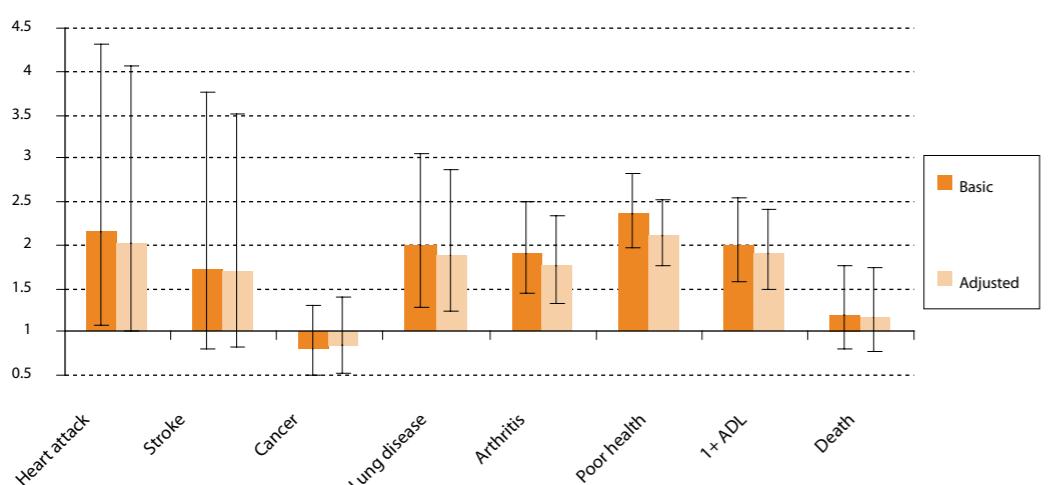
Figure 3 Odds ratios of having a chronic disease between 2004 and 2006 corrected for risk factors comparing low with high education

Note: Basic model is corrected for: age, gender, country, and time-interval between waves. The adjusted model is corrected for: age, gender, country, time-interval, hypertension, diabetes, smoking (current and former), underweight, overweight, obesity, and alcohol consumption in Wave 1
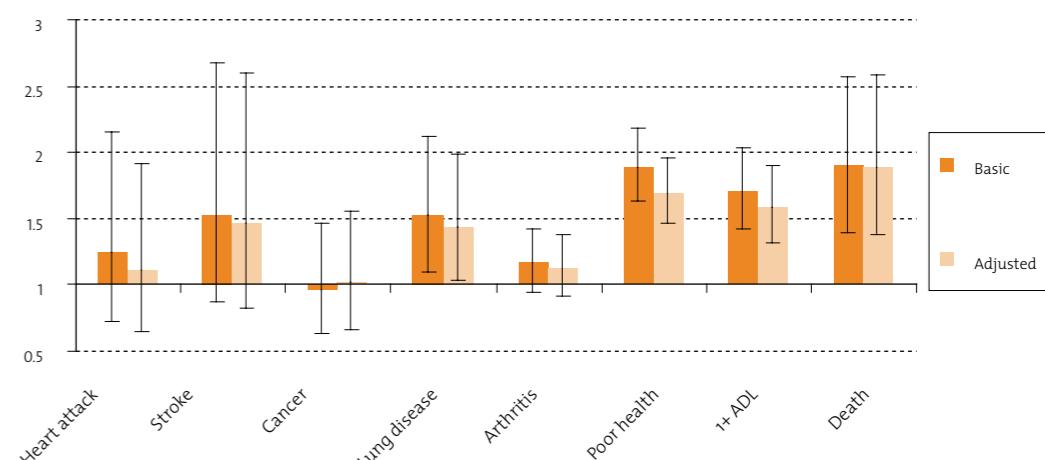
Figure 4 Odds ratios of having a chronic disease between 2004 and 2006 corrected for health behaviour comparing low with high education.

Note: Basic model is corrected for: age, gender, country, and time-interval between waves. The adjusted model is corrected for: age, gender, country, time-interval, hypertension, diabetes, smoking (current and former), underweight, overweight, obesity, and alcohol consumption in Wave 1

Conclusions

The results illustrate the persistence of socioeconomic disparities in health in European countries. The burden of both mortality and morbidity is generally larger for the low socioeconomic groups than for the rest of the population. These findings are consistent with earlier European studies, where similar socioeconomic gradient in prevalence of chronic diseases (Dalstra, Kunst et al., 2005), self-perceived health, limitations in daily activities (Huisman, Kunst et al., 2003), and mortality (Huisman, Kunst et al., 2004) were found.

The effect of education on health tended to be stronger than that for wealth. However, this is due to the fact that the high educated group is a smaller group of respondents and is therefore a more extreme category than their low educated counterparts, whereas wealth tertiles were all of equal size. Furthermore, confidence intervals are wide, and mostly suggest that both education and wealth are equally important determinants of health. The small number of new cases of chronic diseases led to lack of statistical power.

Adjusting for risk factors did not attenuate odds ratios substantially. Risk factors measures in our study were very generic and may not fully capture the complexity of health behaviour. For instance, alcohol consumption patterns are complex and vary dramatically across countries, and our instrument may not fully capture this complexity. It should be noted that risk factors in our study cannot be expected to completely explain the disparities in health, which is consistent with findings from cohort studies in localized populations; the British Whitehall study found that risk factors explained a small part of disparities in self-reported morbidity (Breeze, Fletcher et al., 2001) and the Dutch GLOBE study found similar results in disparities in mortality (van Oort, van Lenthe et al., 2005). Other determinants including psychosocial and nutritional risk factors, as well as exposures across the life course, may account for part of the unexplained effect of socioeconomic status on health. Data from SHARE will provide opportunities to further examining these hypotheses. Information about pathways in the explanation of socioeconomic differences

in health is essential for public health policy. Diminishing the disparities can potentially increase (healthy) life expectancy in Europe substantively, since the burden of morbidity and mortality is the largest for low socioeconomic groups.

Key Points
- Low socioeconomic status is associated with worsening health: Europeans with a low educational level and wealth experience more cardiovascular disease, lung disease, arthritis, deterioration in health and disability, and higher mortality rates than their high socioeconomic status counterparts.
- Smoking, alcohol consumption, underweight, overweight, obesity, hypertension and diabetes are associated with socioeconomic status, but explain only a small fraction of socioeconomic disparities in health.

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4.3 Changes in Health-Behaviour Related Determinants

Farizah Mohd Hairi, Mauricio Avendano, Johan Mackenbach

Smoking, a sedentary lifestyle and obesity are major determinants of cardiovascular disease, cancer and death (Murray, 1997). Positive changes in these determinants can improve the physical health of the elderly, and many of these improvements can be achieved by changes in behaviour (Ngaire M Kerse, 1999). Many theories and models have been developed on why people adopt, maintain and change their behaviour (Norman, 2000). Furthermore, governments have introduced policies such as smoke-free environments, 'move for health' campaign and encouraging physical activity.

The likelihood of adopting change in behaviour is likely to be influenced by demographic characteristics, factors in the social environment and national level-policies (Norman 2000). For instance, as people age the prevalence of health problems increases, which can motivate changes in health behaviour. Consequently, we would expect older age to be associated with changes in factors such as smoking. Similarly, the extent of changes in behaviour may differ between countries with different policies. For example, in Spain where a smoking ban was recently introduced, we would expect more smokers to stop smoking. Studies have also shown that Europeans with lower socioeconomic status are less aware of the risks of unhealthy behaviour and have less control over their unhealthy habits (Bobak 2000). Therefore, we would expect lower education or wealth to be associated with fewer changes towards a healthier lifestyle. Understanding these health-behaviour related determinants is essential to develop effective policies targeted towards high-risk populations.

The aim of this chapter is to examine the impact of demographic characteristics, socioeconomic status and country of residence on the likelihood of changes in health-behaviour related determinants. To address this question, we examine how these factors influence the likelihood of quitting smoking, becoming physically inactive and developing overweight and obesity among the elderly population.

Methods and Measurements

Respondents without missing values on all variables who participated in both waves of SHARE were included in our sample (n=17,607). Four outcomes were analysed in four separate sub-samples:

1. Quitting smoking: Smokers in Wave 1, i.e. those 'having ever smoked (cigarettes, cigars, cigarillos, or pipe) at least for a year were asked whether they had stopped smoking since last interview (i.e. stop smoking in Wave 2). In France, reports of current smoking in both waves were used to determine changes in smoking.
2. Physical inactivity: Physically active respondents in Wave 1 (who were able to do 'moderate physical activity' (such as gardening, cleaning the car, or walking) and 'vigorous physical activity' (such as sports, heavy housework, or job that involves physical labour) but became sedentary in Wave 2, i.e. who hardly ever, or never engage in 'vigorous physical activity'; and also hardly ever, or never engage in 'activities that require a moderate level of energy'.
3. Overweight: Normal weight respondents in Wave 1 (with BMI between 18.5-24.9) who exceeded their BMI beyond 25 in Wave 2 were classified as having become overweight.

4. Obesity: Overweight respondents in Wave 1 (with BMI between 25-29.9) who had a BMI of 30+ in Wave 2 were classified as having become obese.

We used two indicators of socioeconomic status: education and wealth. Education was classified into three levels i.e., 0-2 (low), 3 (middle) and 4-6 (high) of the ISCED (International standard classification of education). Wealth was defined as the sum of all household financial and housing wealth (total net worth). To account for differences in household size, wealth was divided by the square root of the number of household members. Data on wealth was adjusted for purchasing power parity and transformed into euro in all countries. Wealth values were subsequently reclassified into tertiles.

Analysis

We used logistic regression to model two-year changes in health-behaviour related determinants as a function of age, gender and country. Figures present changes in determinants as predicted by the model. Subsequently, we incorporated both educational level and wealth into the models, and calculated odds ratios that compare the odds of changes in determinants in the highest against the middle and low education and wealth groups.

Results

Variations in Health Determinants: Changes by Gender, Age and Country

Major changes in health-behaviour related determinants were observed within this two-year period in the SHARE population. 3,188 SHARE respondents smoked in 2004. Among these, 413 (13.1 percent [95 percent CI, 11.8 percent - 14.2 percent]) had stopped smoking 2 years later. 16104 participants were physically active in 2004. Among these 993 (6.2 percent [95 percent CI, 5.8 percent - 6.6 percent]) became less active. 6,701 SHARE respondents had normal body weight in 2004. Out of these, 1046 (15.8 percent [95 percent CI, 14.9 percent - 16.7 percent]) became overweight or obese.

Men and Older Smokers Are More Likely to Stop Smoking

In 2004, 22.2 percent of men and 14.7 percent of women aged 50+ in Europe smoked daily. Figure 1 shows that female smokers at baseline were significantly less likely to stop smoking two years later when compared to male smokers at baseline (OR=0.80, 95 percent CI 0.64, 0.99), and this pattern was consistent across the entire age span. A possible explanation of this gender difference is that female smokers are heavier smokers than their male counterparts. Furthermore, as male's health deteriorates as a consequence of smoking, they may become more determined to stop smoking than their female counterparts, who may be less likely to perceive an immediate health threat and thus be less likely to quit smoking.

The probability of giving up smoking increased significantly with age. For instance, men and women at ages 75+ had twice the odds of stopping smoking as compared to those aged 50-64 (95 percent CI 1.45, 2.88). It is postulated that as individuals get older and the prevalence of multiple health problems increases, their determination to stop smoking might become higher, which may explain why older age is associated with more changes in smoking behaviour.
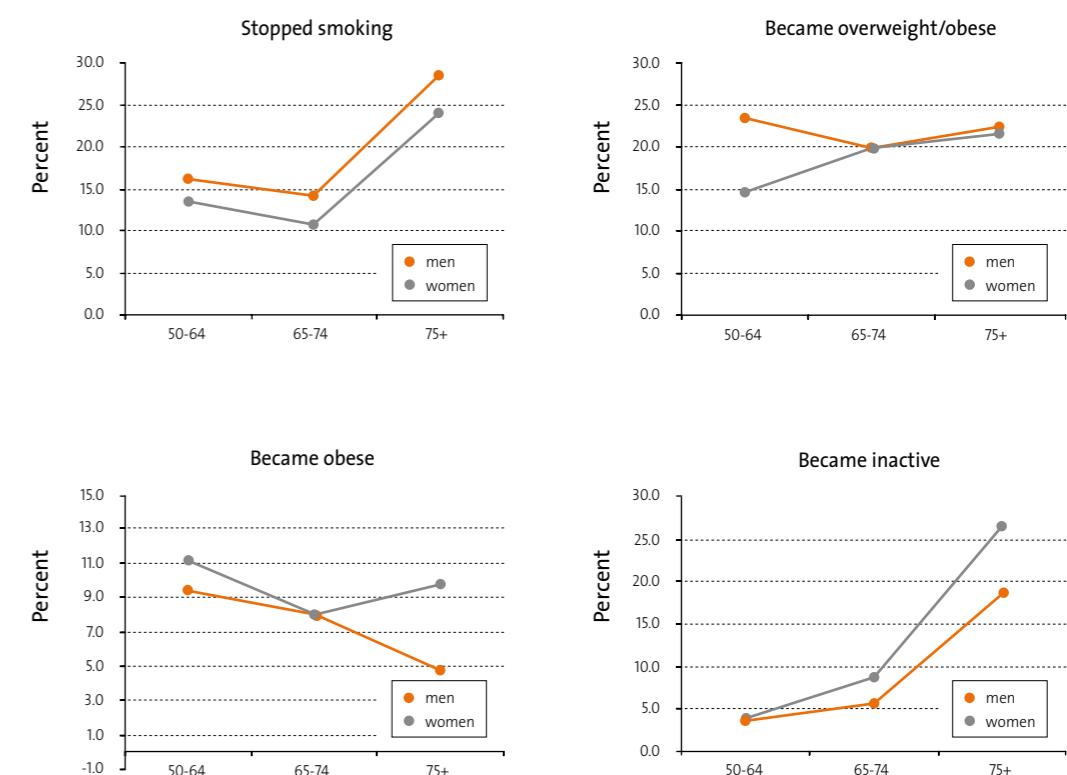
Figure 1 Changes in behavioural risk factors by gender and age group

Overweight Women Are More Likely to Become Obese

Figure 1 illustrates that among those with normal weight, women were less likely to become overweight or obese than men (OR=0.72, 95 percent CI 0.64, 0.82). However, this advantage among women was only present up to ages 50-64; beyond this age, the chance of becoming overweight was similar in men and women. This was due to a significant age-related increase in the probability of becoming overweight or obese in women, whereas among men the chance of becoming overweight or obese did not change with age. On the other hand, overweight women are more likely to become obese than overweight men (OR=1.26, 95 percent CI 1.07, 1.48), particularly at very old ages, at which point a significant decline in the risk of becoming obese was observed for men, but not for women.

Women and Older Europeans Are More Likely to Become Inactive

As shown in Figure 1, the probability of becoming physically inactive increased dramatically with age. For instance, Europeans at ages 75+ had eight times higher odds (95 percent CI 7.04, 9.47) of becoming inactive than those aged 50-64. Women were overall more likely to become physically inactive than men (OR=1.43, 95 percent CI 1.26, 1.62). This disadvantage among women was not present at age 50-64, but was already evident at ages 65-74 and increased significantly beyond age 75. This was due to the fact that women had a sharper age-related increase in the transition to inactivity than men (p<0.05).

Cross-Country Differences in Changes of the Health-Behaviour Related Determinants Over Time
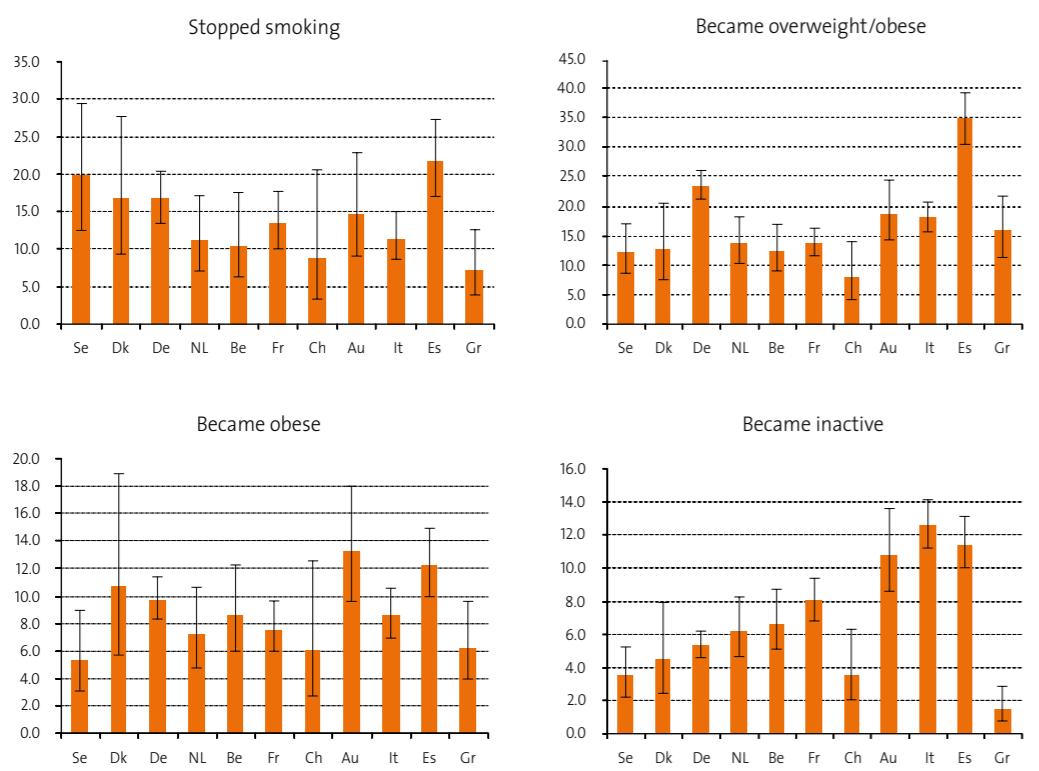
Figure 2 *Changes in behavioural risk factors by country*

Figure 2 shows that there was no clear pattern in the probability of giving up smoking across countries, i.e. no significant differences. Only Spain had slightly (but not significantly) higher rates of quitting smoking. This could reflect the impact of a recently implemented policy to ban smoking in public places, introduced in Spain in 2005. If a higher quit smoking rate in Spain is due to this policy, then this would indicate that smoking-ban policies are effective.

We observed a North to South gradient in the probability of becoming physically inactive, see Figure 2. Southern Europeans (except Greeks) were more likely to become physically inactive than their counterparts in the Scandinavian countries or most other European populations. There are many reasons why southern Europeans may be more likely to become inactive, including more deterioration in their health status, as well as less availability of spaces and opportunities to be active as opposed to other countries. Overall, however, these differences across countries in physical activity did not translate in cross-country variations in the risk of becoming overweight or obese, see Figure 2.

Higher Education and Wealth Are Associated with More Changes Towards a Healthier Lifestyle

In Wave 1, we saw a clear social disparity in the determinants of health. In particular, Europeans with higher educational level and income were less likely to smoke, more likely to be physically active, and less likely to be overweight or obese (Börsch-Supan et al., 2005). Two waves of the SHARE data allowed us now to examine whether socioeconomic status

is associated with changes in health-behaviour related determinants. As expected, Figure 3 indicates that the odds of stopping smoking decreases as education and wealth decreases. For instance, those with lower education or wealth had lower odds of stopping smoking than those with high education or wealth, although this effect was only significant for wealth (OR=0.72, 95 percent CI 0.56, 0.94). Similarly, low education and wealth were both independently associated with higher odds of becoming overweight or obese, and higher odds of becoming physically inactive.
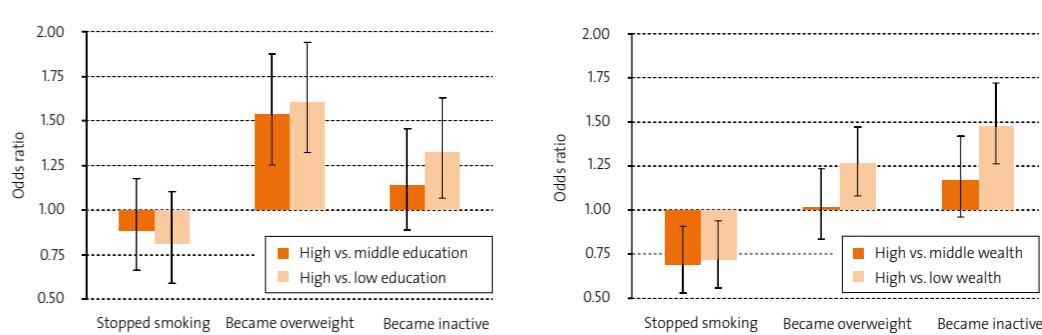
Figure 3 Odds ratio of the health-behaviour related determinants comparing high vs. low and middle educational levels (3a) and wealth tertiles (3b) in men and women aged 50+ in 11 European countries

Note: All models were adjusted for age, sex, country, education and wealth

Conclusions

Our results suggest that the likelihood of changes in health behaviour are strongly dependant on age and gender, and vary considerably across different European countries.

An interesting finding of our study is that higher rates of quitting smoking were observed in Spain, where a smoking ban policy was recently implemented. This result coincides with a reduction of smoking observed in other countries that have introduced a ban on smoking, such as Ireland and Norway (Braverman et al. 2007). Although smoking ban targets primarily second-hand smokers, our results suggest that it may also contribute to reduce smoking prevalence. However, such policies should be accompanied by additional interventions facilitating access towards effective therapies to stop smoking, such as evidence-based counselling and support (Siahpush et. al. 2006).

We found that women were more likely than men to become physically inactive. In terms of health status, women are more likely to develop physically limiting health and disability problems whereas men tend to develop other types of diseases such as cardiovascular problems (Börsch-Supan, 2005). The lower average exit age from the labour force among women could also explain their transition to lower physical activity. Slingerland found that retirement introduces a reduction in physical activity from work-related transportation that is not compensated for by an increase in sports participation or an increase in non-sports leisure-time physical activity (Slingerland et al., 2007). Another possible explanation is the different life-course trajectories of physical activity between men and women. Men experience greater declines in physical activity levels during adolescence, whereas women experience more declines in activity throughout adulthood (Weiss et al., 2007).

We also found that southern Europeans are generally more likely to become physically inactive than Northern or central Europeans. The North-South gradient in poor physical health could be one of the explanations of this phenomena (Börsch-Supan et al., 2005).

Other studies found that there is lack of good opportunities for physical activity within the residential environment in Southern Europe (Zunft et al., 1999; Rutten et al., 2001).

Our results provide input for the development of preventive measures targeting specific determinants and sub-populations. For example, more efforts will be needed to target the 50-64 age group and women to stop smoking. Physical activity should be promoted in both men and women, but particular efforts need to be implemented to encourage women in Southern European countries to be physically active. Although only indirectly, our results suggest that implementing a ban on smoking in public places may encourage smokers to quit, and thus reduce the burden of this risk factor in the population.

Key Points
- Men are more likely to stop smoking, while women are more likely to become physically inactive and obese.
- Older Europeans are more likely to stop smoking, but they are also more likely to become physically inactive than their younger counterparts.
- Higher education and wealth are both independently associated with more changes towards a healthier lifestyle. Whereas wealth is a stronger predictor of quitting smoking, education is a stronger predictor of becoming overweight/obese.
- Southern Europeans are generally more likely to become physically inactive than Northern or central Europeans.

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4.4 The Effects of Ill Health on Displacement from the Labour Market and Potential Impact of Prevention

Alex Burdorf, Tilja van den Berg, Mauricio Avendano, Anton Kunst, Johan Mackenbach

In many industrialised countries the population is ageing, due to increasing life expectancy and falling birth rates. A rather paradoxical development is that, despite the increased life expectancy, the average time people spend in paid work has decreased in most European countries. Young people enter the labour market at later age due to prolonged education and most older workers exit the labor market before the statutory retirement age. Thus, many countries are developing policies to increase the duration of working life, especially among older workers. Clearly, the success of these policies will depend on a better understanding of aging in the work force and the particular role of health in continuing work or withdrawal from the labour market.

There is ample evidence on the relation between unemployment and ill-health, showing that unemployment may affect people's health but also that health may determine the selection into and out of the workforce (Bartley, 1994). There is an increasing awareness that among older workers ill-health does not only affect unemployment, but may also drive selection out of the workforce into other forms of non-employment, such as early retirement and staying home to take care of the family. A cross-sectional analysis of the baseline date from the Survey on Health and Ageing in Europe (SHARE study) showed a large variation across European countries in the proportion of persons 50-65 years with paid employment. Furthermore, a perceived poor health was strongly associated with non-participation in the labour force in most countries. Long-term illnesses such as depression, stroke, diabetes, chronic lung disease, and musculoskeletal disease were significantly more common among those persons not having paid employment (Alavinia, M., Burdorf, 2008). A longitudinal study among European countries showed that ill health was a risk factor for transitions between paid employment and various forms of non-employment, including retirement, unemployment, and taking care of a household (Schuring, Burdorf, Kunst, and Mackenbach, 2007).

Against this background, the aims of this study were (i) to assess the strength of the association between ill health and becoming unemployed, retired, homemaker, or disabled in Europe, and (ii) to investigate the potential impact on withdrawal from paid employment or health prevention policies that would completely eliminate the adverse effects of ill health on labour market participation.

Methods

Study Population

The study population consisted of participants of the Survey on Health and Ageing in Europe (SHARE). The first Wave of data was collected by interviews between April and October 2004 and the available dataset (SHARE Release 2.0) contains 27,617 participants, with 14,833 subjects (54percent) aged between 50 and 65 years. For 269 persons employment status was unknown and for another 45 persons not clearly defined, resulting in a study population of 14,564 subjects. Individuals aged 65 years and older were excluded for the current study, since it was assumed that workers normally retired when they became 65 years old. Of those 9,682 subjects participated again in the second Wave of SHARE. Complete information on employment status in 2006 was available for 9,485 subjects. For

the longitudinal analysis of the influence of ill health on displacement of the labour market, a cohort of 4,746 subjects with paid employment at baseline in 2004 was available.

Labour Force Participation

The outcome of this study is work status, which was based on self-reported current economic status with five mutually exclusive categories: paid work, retired, unemployed, disabled, or homemaker. The definition of being employed in SHARE encompasses all individuals with paid employment, including self-employed work for a family business. Unemployed were those who were laid off from their last job before being able to benefit from normal pension benefits, and therefore were forced to spend some time in unemployment before effectively being retired. The category of disabled participants predominantly includes persons whose health problems at work were an eligibility criterion for receiving a disability pension.

Health Measurements

Four different measures of health were defined in order to present different aspects of health. The first measure was the European version of self-perceived health, with a single 5-point scale ranging from 'very bad' to 'very good', whereby the answers 'very bad', 'bad' and 'fair' were collated into the category less than good health. The second health measure was the occurrence of at least one chronic disease, defined as a chronic disease diagnosed by a doctor during lifetime and an affirmative answer on a limitative list of 14 chronic diseases. The third measure of health was the presence of clinically relevant symptoms indicating depression, based on at least 4 affirmative answers on the EURO-D 12 items scale of depression. The fourth measure of health was the presence of mobility problems based on the presence of at least one physical limitation with mobility, arm function, of fine motor function lasting longer than 3 months, derived from a limitative list of 10 items, such as walking 100 meters, climbing stairs without resting, and reaching with arms above shoulder level.

Individual Characteristics

Education was coded according to the 1997 International Standard Classification of Education (ISCED-97) and categorized as low (pre-primary, primary and lower secondary education), intermediate (upper secondary education) and high (post secondary education). Body mass index (BMI) was calculated by dividing body weight in kilogram by the square of body height in meters. According to the BMI, persons were defined as normal (BMI below 25), overweight (BMI from 25 to 30), or obese (BMI above 30). Marital status was used to categorize individuals into those who were living with a spouse or a partner in the same household (reference category) and those living as a single. Smokers were subjects who were currently smoking; all others were categorized as non-smokers. Problematic alcohol use was defined as drinking more than two glasses of alcohol at least 5 days a week in the last six months. Physical activity was dichotomised, and defined individuals without any physical activity in leisure time.

Statistical Analysis

The statistical analysis was restricted to the study population with paid employment at baseline (first Wave). In logistic regression analyses odds ratios were calculated for the risk of ill health at baseline on becoming unemployed, retired, disabled, or homemaker during the 2 year follow-up. The associations between ill health and employment status were adjusted for socio-demographic variables, lifestyle factors, working conditions, and country. Since the number of male subjects was too small in the category homemakers (i.e. taking care of a household), the analysis on the association between ill health and homemaker was performed only in women. All statistical models were based on the (varying) number of persons available for the four different measures of non-participation in the workforce without weighing the regression coefficients according to attrition rate in the country sample or population size in each country. Since the health measures of interest were strongly interrelated, different measures of health were never included simultaneously in the same multivariate model. The statistical analyses were carried out with SAS Release 8.02 for Windows.

The potential effects on withdrawal from paid employment of policies which would eliminate the adverse effects of ill health on labour market participation were estimated with a multistate life table, describing for each age the distribution over the 5 possible states: employment, retirement, unemployment, homemaking, and disabled. In order to investigate the theoretical benefits of elimination of the influence of ill health on paid employment two populations were compared: a reference population reflecting the labour participation in the study population of the first Wave of data collection (n=9,485), and an intervention population for which the contribution of ill health to withdrawal from the labour market was eliminated. The multi-state life table of the reference population started at age 50 with all subjects in paid employment and presented the proportion of workers with paid employment for each following year and the relative contribution of unemployment, retirement, disability, and homemaker to the annual proportion of workers that had quit paid employment. In the intervention population the relative contribution of unemployment, retirement, disability, and homemaker in this annual proportion was adjusted for the population attributable fraction of ill health. This analysis was conducted for one definition of ill health (less than good health), without taking into account possible additional effects of other measures of ill health.

Results

Large Variation in Labour Force Participation Across Europe

Figure 1 shows a large variation across European countries for the proportion of persons aged below 65 years with paid employment, varying from 43 percent in Austria to 80 percent in Switzerland among men, and from 22 percent in Italy to 71percent in Sweden among women. In some countries there was little difference in labour force participation between men and women, such as Sweden, France and Denmark, whereas in other countries the relative labour force participation among women was much lower, most notably in Italy, Greece, and Spain. The proportion of homemakers among men was extremely small in all countries. Among men, the proportion of employed was inversely associated with the proportion retired (Pearson coefficient $r = -0.94$) and unemployed ($r = -0.28$). Retirement and disability were inversely associated among men ($r = -0.27$) and women ($r = -0.57$).

During the two year follow-up period 20 percent of employed workers quitted the workforce, primarily due to retirement, see Table 1. A large proportion of disabled and unemployed subjects retired during the follow-up period. Entering paid employment (again) was generally rare, varying from 21percent among unemployed persons at baseline to 2 percent among retirees.
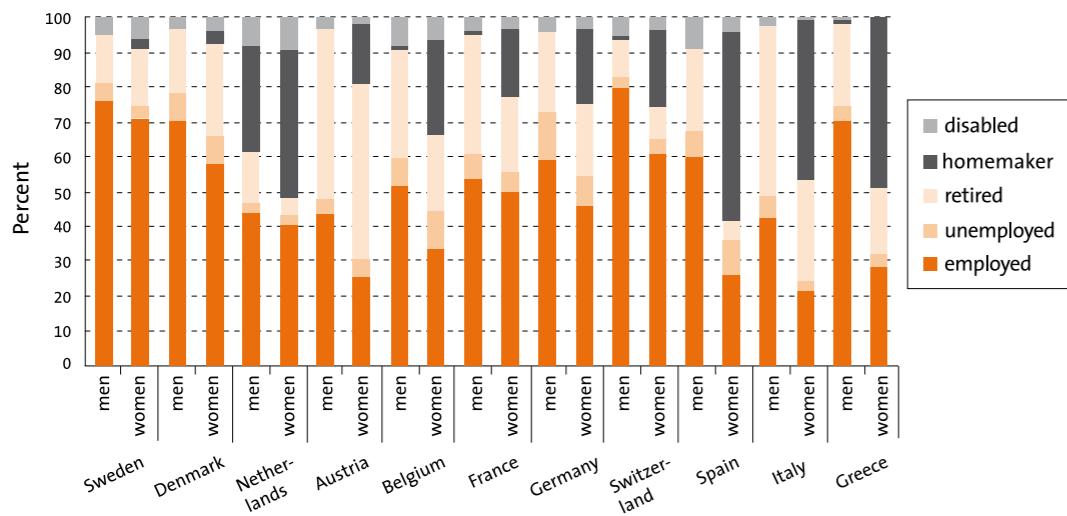
Figure 1 Distribution of persons aged 50-64 years, stratified by sex and country, over employment, unemployment, retirement, homemaker, and disability among 11 European countries in the study population of the SHARE-study, 2004

2004 \ 2006	Employed (n=4054)	Retired (n=3130)	Unemployed (n=386)	Disabled (n=482)	Homemaker (n=1433)
Employed (n=4,746)	80.2%	13.3%	2.7%	1.8%	2.0%
Retired (n=2,288)	1.5%	90.7%	0.5%	4.1%	3.2%
Unemployed (n=542)	20.5%	26.0%	39.1%	5.0%	9.4%
Disabled (n=415)	7.0%	30.8%	1.4%	57.1%	3.6%
Homemaker (n=1494)	5.1%	10.3%	1.8%	2.6%	80.2%

Table 1 Changes in labour status between 2004 and 2006 among persons in the SHARE-study (n=9,485)

Ill Health Predicts Displacement from the Labour Market

Figure 2 shows the associations of ill health with transitions into different states of non-participation in the labour market. Ill health was strongly associated with becoming disabled (ORs from 3.30 to 4.56) and with becoming unemployed (ORs from 1.09 to 2.09). The decision to retire was not influenced by depressive symptoms and mobility problems. None of the measures of ill health was associated with becoming a homemaker among women who had had paid employment at the start of the study.

A less-than-good self-perceived health had the strongest effect on becoming disabled (OR=4.56, 95 percent CI 2.88-7.22), unemployed (OR=2.09, 95 percent CI 1.39-3.13), or retired (OR=1.31, 95 percent CI 1.02-1.67). The corresponding population attributable fractions of ill health for these transitions were 32.3 percent, 16.1 percent, and 5.1 percent, respectively. Displacement from the labour market was also higher, apart from ill health, among lower educated persons, persons not living together, persons with overweight or obesity, and workers with lack of control at work.

Figure 2 The effects of different measures of ill health in 2004 on early retirement, unemployment, disability, homemaker, and disability in 2006 in 11 European countries, expressed by adjusted Odds Ratios

Potential Impact of Prevention of Ill Health

The hypothetical effect of a complete elimination of the effects of ill health on labour market displacement among men with paid employment at the age of 50 years is shown in Figure 3. For women a very similar pattern was observed. The potential impact of prevention of ill health on labour force participation could increase the average age of quitting paid employment from 60.4 to 61.5 years (13.2 months) among men and from 59.2 to 60.5 years (16.2 months) among women.
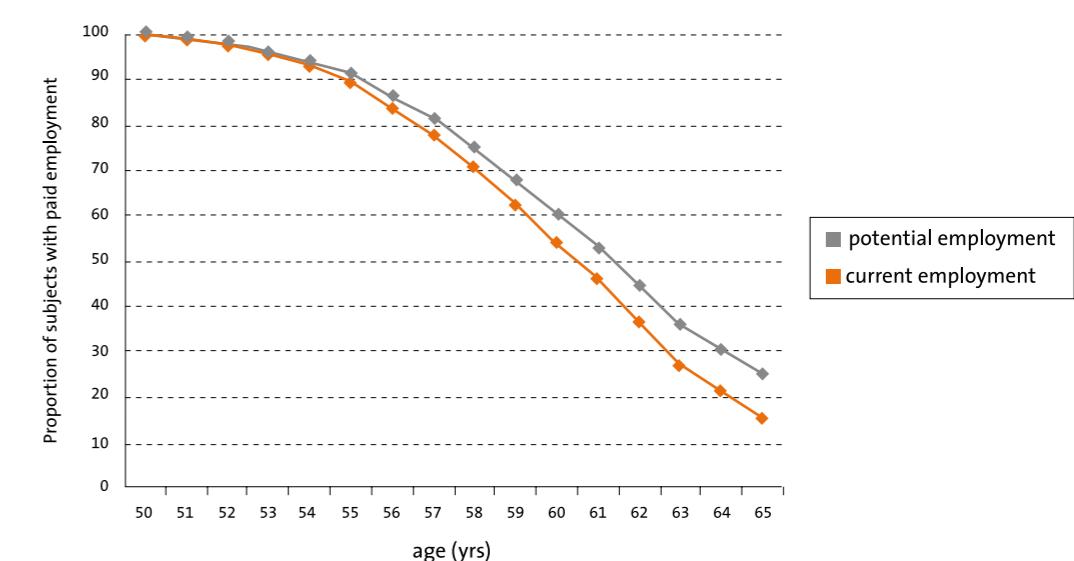
Figure 3 Theoretical effect of elimination of health problems through preventive efforts aimed at important health determinants on the labour force participation among men who have paid employment at the age of 50 years

Health and Health Care

Do New Countries Joining SHARE Experience a Different Level of Health Services Utilization?

Key Points

- There are large variations between European countries in patterns of withdrawal from paid employment among persons aged 50-64 years. This variation does not only lead to very different proportions of persons aged 50-64 years who are in paid employment, but also to large variations in exit routes (unemployment, early retirement, homemaking, or disability benefit). Differences between European countries in institutional arrangements are likely to play an important role in explaining these variations, which clearly show that high rates of non-participation in the labour force among 50-64 year olds are not inevitable.

- Ill health is an important predictor of withdrawal from paid employment among 50-64 year olds. This was most evident for those who become dependent on a disability benefit, but ill health also increased the likelihood of becoming unemployed or retiring early. The multi-state life table approach showed that there is a large potential for increasing the labour force participation by health interventions. If (the effect of) ill-health (on withdrawal from the labour market) among 50-64 year olds could be eliminated, the average duration of working life would increase by 13-16 months.

- Given well-established determinants of ill health, important entry-points for health-related policies could be lifestyle interventions, improvements in working conditions, and social policies to encourage employment among older persons with health problems. Further study of the determinants of withdrawal from paid employment, and the role of ill-health, is necessary to develop effective policies which will increase labour force participation among 50-64 year olds. The SHARE study provides excellent opportunities to contribute to this endeavor, particularly when more longitudinal data will be collected.

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4.5 Do New Countries Joining SHARE Experience a Different Level of Health Services Utilization?

Jacques Spagnoli, Sarah Cornaz, Brigitte Santos-Eggimann

The association between health services utilization and countries was briefly commented on in the first results book, which was based on release 0 data from the SHARE main test performed in 2004 within 10 countries. Analyses showed that all indicators of health services utilization (i.e. ambulatory medical care, medication, hospital stays and surgeries) differed significantly between the 10 countries included in the SHARE study. The number of ambulatory medical consultations was rather low in Sweden, Denmark and Switzerland, and higher in Germany, France, Italy and Spain. Variations also characterized the distribution of the number of drugs categories taken at least once a week, with large proportions of individuals reporting no medication in Sweden, Denmark, the Netherlands and Switzerland., while numerous categories were frequently reported in France, in Spain and, to a lesser extent, in Greece. Proportions of persons reporting one or more overnight hospitalizations were higher in Austria and in Germany. This last country was also characterized by the highest proportion of individuals who mentioned at least one inpatient or outpatient surgery in the past twelve months.

This chapter has the objective to compare the crude level of health services utilization in the three new countries added in SHARE in 2005-2006 (Poland and Czech Republic in 2006 and Israel in 2005) and to examine to what extent differences are explained by populations' gender and age distributions or by their level of overall subjective health.

Measures and Analysis

Analyses were performed on 50+ years old community-dwelling populations participating in the SHARE Wave 2, except Israel for which 2005 data were used. Crude proportions of health services utilization were first estimated in the 14 participating countries. Subsequently, the country effect on each indicator of health services utilization (i.e. proportions with any medical contact, a high number of medical contacts, any current medication, any hospital stay and any surgery) was analyzed in multivariate models, adjusting first for gender and age, and then for gender, age and subjective health. For each outcome, the country which crude level of use was the closest to the overall use estimated across the 14 participating countries was selected as the reference. Analyses were all conducted using weighted data. For the logistic regressions relative weights were used instead of absolute weights to obtain unbiased results.

As indicated in the first results from the Survey of Health, Ageing and Retirement in Europe all data collected in the health care section of the SHARE survey were self-reported. Medical contacts were dichotomized using two different strategies: the first distinguished between respondents with at least one medical contact and respondents with no medical contacts during the last twelve months; the second separated respondents with 12 medical contacts at most and respondents with 13+. Participants were also asked about the drugs currently taken at least once a week, from a list of 14 drugs classes, and categorized in 0 vs 1 medication or more. Furthermore, we distinguished between respondents with at least one overnight stay in hospital and those with none during the last twelve months, as well as respondents with any in- or outpatient surgery and those with none within the same time frame.

Health and Health Care

Do New Countries Joining SHARE Experience a Different Level of Health Services Utilization?

Age was expressed with 5-year categories, except the last one (85+), based on the year of birth (age achieved by the end of 2006 and 2005 for Israel). Subjective health was evaluated by a single question "Would you say your health is… excellent, very good, good, fair or poor?" and answers were categorized into excellent-very good / good /fair-poor.

Analyses were performed on release 0 of the SHARE Wave 2. The level of health services utilization was estimated overall in the 14 participating countries, and in each of them separately.

Results

Sample Characteristics

Our working sample – derived from release 0 of the SHARE Wave 2 database – counted 25,814 participants (incl. 5,731 respondents from the three new countries Czechia, Poland, and Israel). It was characterized by one half aged 50-65 years and by a higher proportion of women (54.3 percent).

Ambulatory Medical Care

At Least One Medical Contact in the Past Twelve Months

Figure 1 shows that proportions with at least one medical contact ranged from 78.2 percent to 93.8 percent ,with an overall proportion of 88.7 percent. It was lower in PL (81.8 percent) as in several other countries included in the first Wave (SE, DK, NL, CH, GR), whereas CZ (92.1 percent) and IL (92.6 percent) were characterized by higher proportions as were DE, BE and FR. AT, IT and ES were close to the average.

Multivariate analyses (see Appendix), here with IT as the reference, pointed to some significant differences, with higher proportions reporting at least one medical contact in DE, BE, FR and one new country, CZ, while lower proportions were observed in SE, DK, NL, CH, GR and PL. IL, however, did not differed significantly from the reference. The observed differences persisted with adjustment for subjective health.
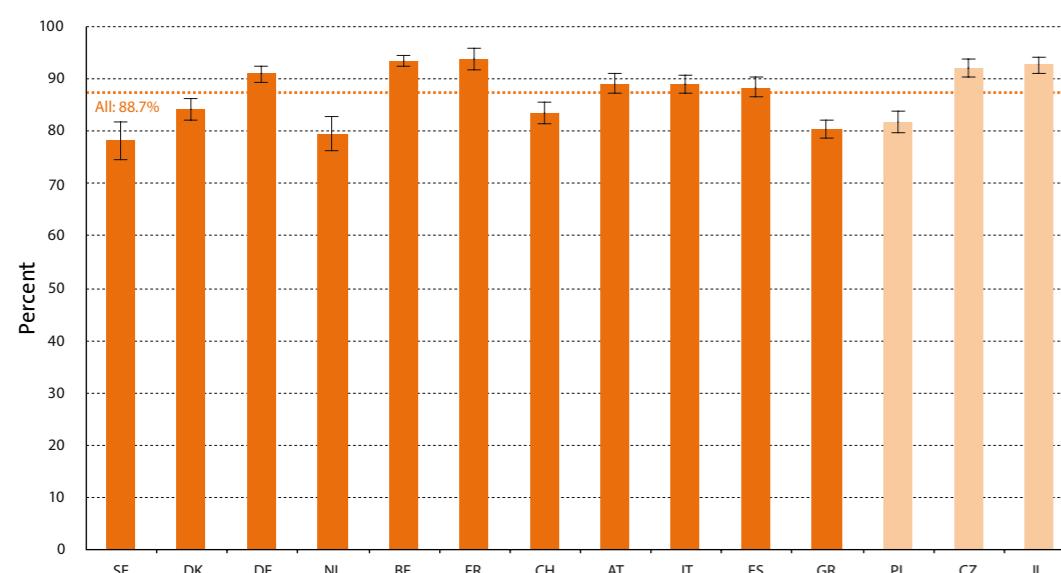
Figure 1 Proportion with at least one medical contact during the past twelve months, by country

High Number of Medical Contacts in the Past Twelve Months

The proportion reporting 13+ medical contacts in the past year varied significantly, ranging from 1.7 percent in Sweden to 21.6 percent in IL, see Figure 2. It was under the average in PL (13 percent) as in SE, DK, NL, FR, CH and GR, while CZ (18.1 percent) and IL (24.6 percent) were over the average like BE, AT, IT and ES.
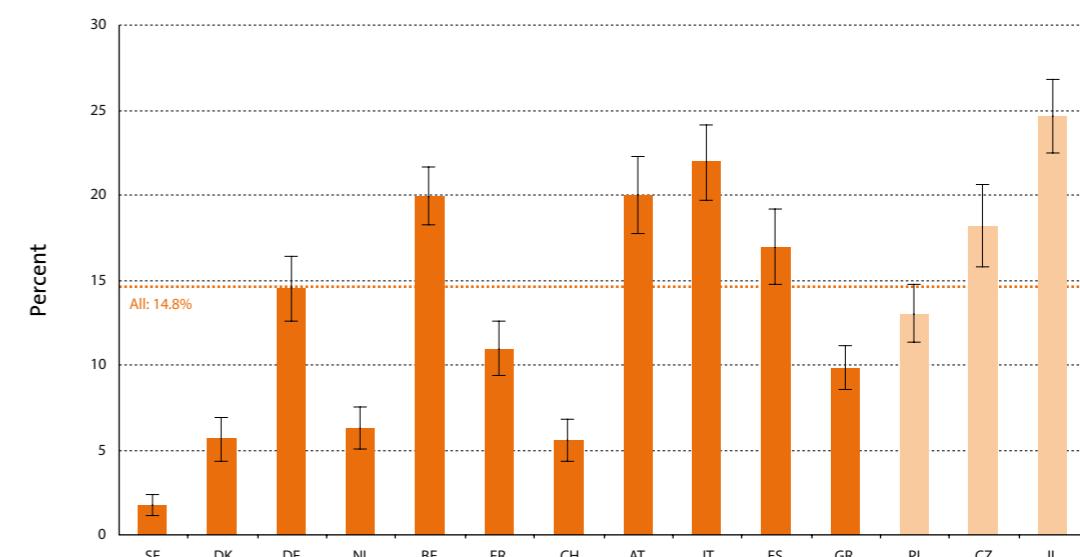
Figure 2 Proportion with 13+ medical contacts during the past twelve months, by country

Demographic characteristics did not explain the significantly higher proportions reporting 13+ medical contacts in BE, AT, IT, ES and in two new countries, CZ and Il, or lower proportions in SE, DK, NL, FR, CH and GR. With further adjustment for subjective health, PL joined the group of countries with a significantly lower probability to report 13+ medical contacts.

At Least One Current Medication

Proportions of the population taking at least one drug varied from 53.7 percent to 72.9 percent in BE, with an average of 66 percent , see Figure 3. Lower proportions observed in Northern countries and in CH were already noted in Wave 1. The three new countries had quite similar proportions as initial countries, all were slightly over the average, with 68 percent for PL and 70 percent for CZ and IL.

Taking into account age and gender characteristics of the populations, a higher proportion reporting some medication was observed only in BE, while lower proportions were found in DE and CH. When subjective health was also considered in multivariate analyses, lower proportions were also noted in IT, in ES and in PL.
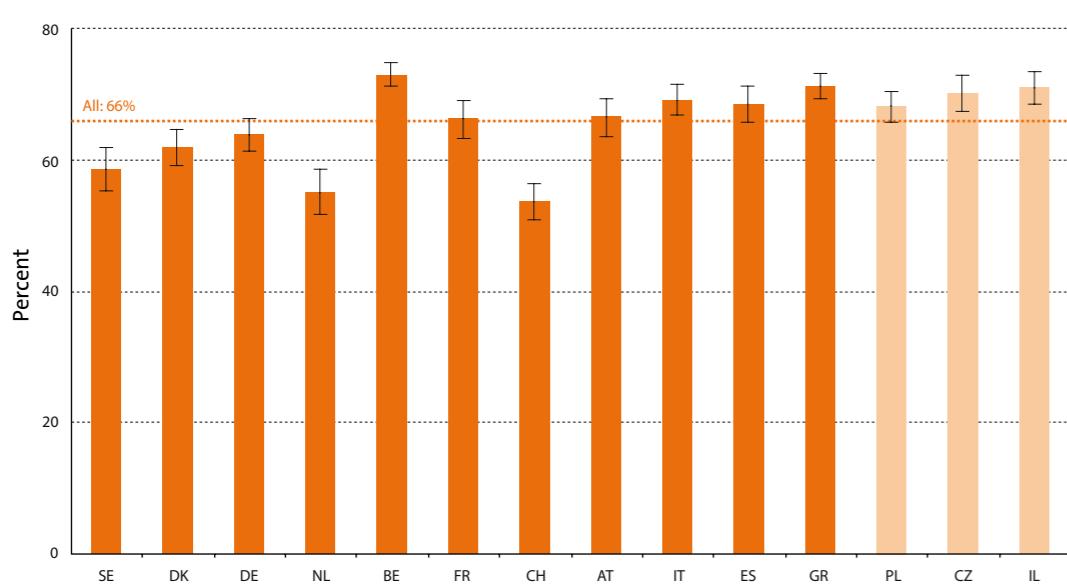
Figure 3 Proportion with at least one current medication, by country

At Least one Overnight Hospital Stay in the Past Twelve Months

The proportion with at least one hospital stay differed significantly, ranging from 7.6 percent in GR to 22.2 percent in AT, with an average of 15.7 percent, see Figure 4. The highest proportions were observed in two countries that already ranked at the top in Wave 1: AT and DE. Among the three new countries, CZ was close to the average with 16 percent, while hospital admission was slightly more frequent in PL and IL with respectively 17.9 percent and 17.6 percent.

Figure 4 Proportion hospitalized at least once during the last twelve months, by country

Multivariate models confirmed significantly higher proportions of the population admitted at least once in hospitals in DE and AT that were not explained by an unfavorable age and gender structure, while lower proportions were observed in ES and GR. After controlling for subjective health as an additional factor, BE also had a higher frequency of hospitalization than the reference country (IT).

At Least One In- or Outpatient Surgery in the Past Twelve Months

The proportion with at least one surgery ranged from 2.3% in GR to 12.5% in NL, with an average of 6.7 percent, see Figure 5. All countries already included in the first Wave had lower proportions than in 2004, except NL which saw its proportion reporting at least one surgery increase slightly (from 11.6 percent in 2004 to 12.5 percent in 2006) and ranked first in Wave 2, followed by BE, DE and CH. Among the new SHARE countries, CZ was close to the average, while PL and IL were lower.

Multivariate analyses adjusting for age and gender confirmed the significantly lower proportions with at least one surgery in IT, GR and PL, and the higher ones observed for NL. With additional adjustment for subjective health, BE was also characterized by a higher frequency of surgery.
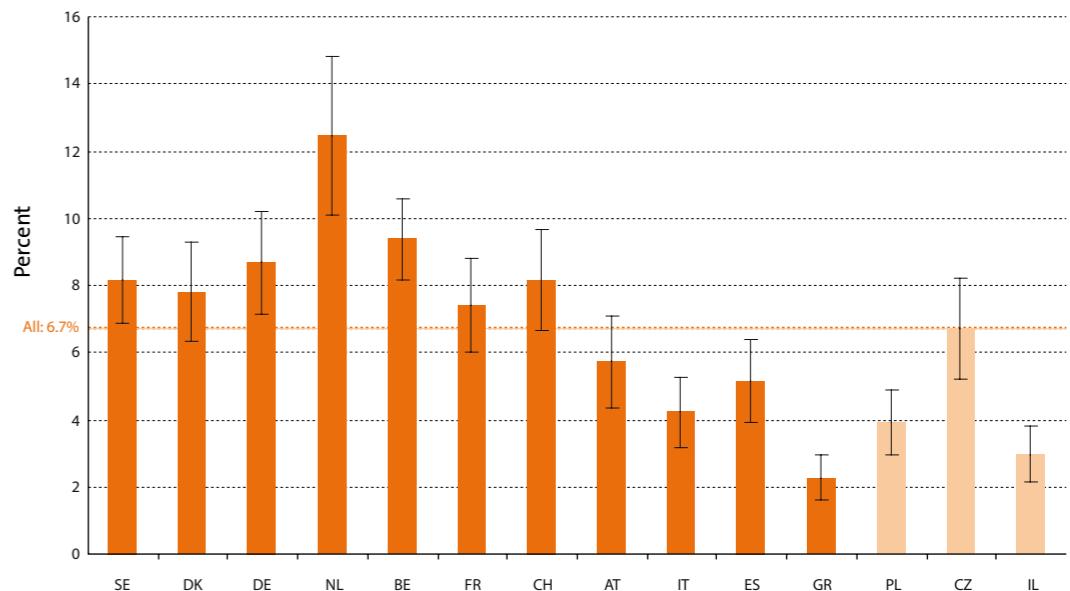
Figure 5 Proportion reporting at least one in- or outpatient surgery during the last twelve months, by country

Conclusions

- Data from the second wave of SHARE showed variations between initial and new countries, but also between initial countries themselves, for several indicators of health services utilization. Most of them were not explained by demographics. CZ and IL had higher proportions with a large number of medical contacts and, in CZ, more respondents reported at least one medical contact in the past year. By contrast, larger proportions of the population in PL indicated no medical contact and experienced at least one hospital stay within a year. Taking into account subjective health differences between countries, PL also had a lower proportion reporting any surgery, any medication, or a large number of medical contacts.

- Data from Wave 2 also confirmed results already found in Wave 1, such as a lower level of medical contacts and medication in Northern countries and in CH, or a higher level of hospital admission in AT and DE, that were not explained by demographic characteristics.
- Subjective health was considered as a global, integrative indicator of health that includes both mental and physical health dimensions and predicts unfavorable evolutions such as the mortality. It was used essentially as a control variable in the preliminary analyses presented in this chapter. However, subjective health is also known to have different meanings in different countries. For this reason, further research should integrate other indicators of health status in order to explain variations in the level of health services utilization in SHARE countries.
- Interpretations of variations observed between initial countries and between initial and new countries require an extensive knowledge of health systems in each participating country; the SHARELIFE module will produce contextual variables necessary for a careful discussion of the more definitive results.

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4.6 Life Events and Change in Economic Resources as Predictors of Change in Health Services Utilization

Sarah Cornaz, Jacques Spagnoli, Brigitte Santos-Eggimann

Many factors may influence health services utilization. In the first results book, we explored its cross-sectional relationships with age, gender, subjective health or education in Europe, based on release 0 data from the SHARE main test performed in 2004 in 10 countries (Santos-Eggimann, Junod, Cornaz, 2005). First data confirmed the high level of health services utilization in the old age. Subjective health was associated with all measures of health services utilization, except for dental care. Women reported significantly more medical consultations and medications than men, whereas hospital use was not significantly associated with gender. There was a strong relationship between the level of education and several, but not all, indicators of health services utilization in Europe: the better educated consumed a significantly lower number of medications while participants in the lowest educational category reported significantly less hospital admissions and surgeries.

Previous reports from other sources also suggest that unfavorable social and economic circumstances may affect the level of health, the consequences of chronic diseases and the use of healthcare (Montgomery, Cook, Bartley, and Wadsworth, 1999; Bazin, Parizot, Chauvin, 2005). For example, children leaving home and bereavement induce a reduction of the household size, and the consequent decrease in social ties may result in a higher consumption of health care. The loss of employment, due to retirement or other causes, may also be related to an increase in health services utilization. Variations in economic resources, such as income and health insurance coverage, are other possible causes for changes in the level of health care consumption. In this chapter, we explore the hypothesis that such life events and changes in economic situation between SHARE waves 1 and 2, which are likely to occur with some frequency in middle-aged and older populations, predict a change in health services utilization when demographics and initial characteristics (subjective health, socio-economic) are taken into account.

Measures and Analyses

Analyses were conducted on the whole sample of community-dwelling individuals aged 50+ who participated in the two waves (2004 and 2006) of the SHARE project, using unweighted data.

The effects of four major life events or changes in economic resources were investigated. Reduction in household size was computed for individuals living in a household of at least 2 persons in Wave 1. Cessation of work was defined, within the group of subjects who were professionally active in Wave 1, by inactivity in Wave 2, irrespective of the cause and the perspective of finding a new job in the future. An increase or a reduction in income was defined by the transition from one country-specific income quartile (household income adjusted for the household size) to another between waves 1 and 2. Finally, a change in health insurance was defined by the self-report of improved or worsened coverage by all private or social insurances for specific elements of care (i.e. ambulatory medical care, medication, hospitalization).

We selected five dichotomous outcomes regarding the evolution of health services utilization between waves 1 and 2, based on self-report. Two of them related to changes in the number of medical contacts in past twelve months: transitioning from none in Wave 1 to at least one in Wave 2, and from less than 13 to 13 or more contacts, respectively. The

next two outcomes referred to changes in the number of current medication reported, out of a list of 14 drug categories: transitioning from none in Wave 1 to at least one in Wave 2, and from less than 3 to 3 or more medications, respectively. The last outcome concerned overnight hospital stays in the past twelve months; it was defined by transitioning from no stay in Wave 1 to at least one stay in Wave 2.

Relationships between each life event and each of these five outcomes were tested in multivariate models of logistic regressions, adjusting for gender, age, income, education, subjective health, and the number of months separating the two waves. Age was calculated based on the year of birth (age achieved by the end of 2006). Income was categorized in quartiles taking into account the household size and education was defined by the number of years. Subjective health was evaluated by a single question "Would you say your health is…very good, good, fair, bad or very bad?" and answers were dichotomized into very good or good versus the three last answer categories. An indication of the number of months separating the two interviews (2004 and 2006) was also added in the analyses. In each analysis, only individuals at risk for experiencing both the life event and the outcome were included (e.g. in analysis of the effect of work cessation on the probability to evolve from no medical contact to at least one, only individuals working and having reported no medical contact in Wave 1 were included). Analyses were performed on release 0 of the SHARE Wave 2006 associated with release 2 of Wave 1, taking into account the 11 countries included in both waves.

Results

Sample Characteristics and Distribution of Life Events

The overall working sample counted 17,544 individuals, 7,986 male (45.5 percent) and 9,558 female (54.5 percent), with more than half aged 50-64 years (55.2 percent), one third aged 65-79 years (36.8 percent) and a low proportion aged 80+ years (8 percent). Two thirds of respondents rated their health as very good or good in 2004 and one third reported a fair (27.5 percent), bad (6.6 percent) or very bad (1.4 percent) health. The frequency of life events and changes in economic resources recorded between waves 1 and 2 is summarized in Table 1.

Table 1 shows that out of 17,544 individuals in our sample, 13,805 were living in a household of size 2 or more in Wave 1; 15.7 percent (n=2'173) of them experienced a reduction in household size between the two waves of the SHARE project. This reduction was attributed to widowhood in 12 percent and to divorce in only 1.2 percent. Like all other changes presented in this table, it was significantly related to age. Work cessation concerned essentially the 50-64 years category, which was expected on the basis of usual retirement age in most countries. Changes in income quartile were more frequently to the better than to the worst. By contrast, changes in health insurance coverage were more frequently in a negative direction; however, only a small proportion of respondents (at most 5 percent for each type of insurance) reported a change in whatever direction.

	Evolution		Age			
	Wave 1 → 2	n (%)	50–64	65–74	75+	p
Household size (living with others, N=13,805)						
	Reduction	2,173 (15.7%)	1.556	397	220	0.000
			71.6%	18.3%	10.1%	
Work (employed, N=4,955)						
	Cessation	1,083 (21.9%)	992	80	11	0.000
			91.6%	7.4%	1.0%	
Income (N=17,544)						
	Improvement	5,690 (31.9%)	2.960	1.695	1.035	0.000
			52.0%	29.8%	18.2%	
	Deterioration	4,625 (25.9%)	2.800	1.176	649	
			60.5%	25.4%	14.0%	
Insurance, medical ambulatory care (N=17,544)						
	Improvement	314 (1.8%)	200	84	30	0.000
			63.7%	26.8%	9.6%	
	Deterioration	565 (3.2%)	341	156	68	
			60.4%	27.6%	12.0%	
Insurance, drugs (N=17,544)						
	Improvement	145 (0.8%)	116	44	15	0.004
			66.3%	25.1%	8.6%	
	Deterioration	578 (3.2%)	340	145	93	
			58.8%	25.1%	16.1%	
Insurance, hospitalization (N=17,544)						
	Improvement	165 (0.9%)	111	38	16	0.000
			67.3%	23.0%	9.7%	
	Deterioration	236 (1.3%)	159	51	26	
			67.4%	21.6%	11.0%	

Table 1 Frequency and distribution by age category of selected life events and changes in economic resources between Waves 1 and 2

Effects on Ambulatory Medical Contacts in Past Twelve Months

Transitioning from No Medical Contact to 1+

In Wave 1, 2438 individuals (13.9 percent) reported no medical consultation in the past 12 months. Of these, 58.7 percent had one or more medical consultations in Wave 2. The proportion increased across age categories, from 53.3 percent at age 50-54 to 68.4 percent at age 75+.

Multivariate models suggested that both a reduction in household size and a change in health insurance for ambulatory medical care (either to a better or a worse coverage) significantly increased the probability of transitioning from no medical contact to at least

one, after controlling for demographic and baseline subjective health and socio-economic factors, see Figure 1. By contrast, changes in income and work cessation did not contribute to this evolution.

Transitioning from <13 Medical Contacts to 13+

The probability to evolve towards a high level of medical contacts (percentile 90 and over in the distribution of the number of contacts) within the subset of individuals who reported at most 12 consultations at baseline also increased with age. It ranged between 5.3 percent at age 50-54 and 12.8 percent at age 75+.

Once age, gender and baseline socio-economic characteristics were taken into account in multivariate models, significant, positive effects of household reduction and work cessation were detected, see Figure 1. Reported positive and negative changes in insurance coverage for ambulatory medical care also influenced this outcome by increasing the probability of a transition to a high level of medical contacts in Wave 2. Changes in income category, either to an increase or to a reduction, did not influence the probability of a transition to the highest level of use of ambulatory medical care.
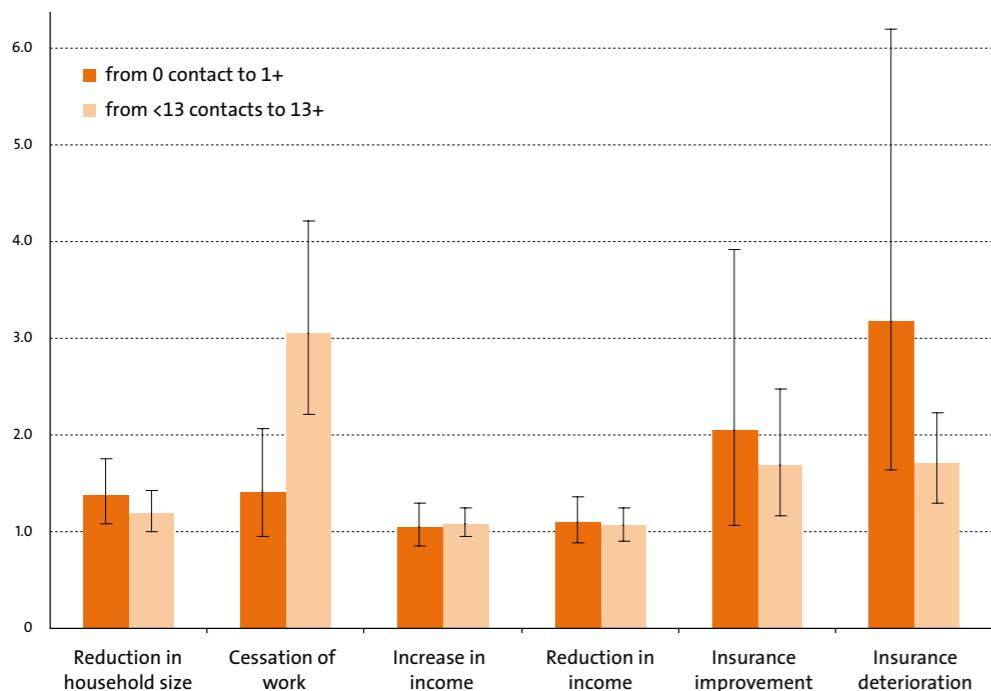
Figure 1 Odds ratio, for transitioning from 0 medical contact in past twelve months to 1+, and from <13 medical contacts to 13+ between waves 1 and 2, related to life events and changes in economics resources (adjusted for age, gender and baseline socio-economics characteristics)

Effects on Current Medications

Transitioning from No to Some Medication

Overall, 6,475 subjects (36.9 percent) did not report any medication in Wave 1 and were eligible for the analysis of transition to new medication in Wave 2. Of these, six out of ten still reported no medication in Wave 2 while one or more medications were recorded in 40.6 percent of them. The proportion transitioning to medication was 32.0 percent in the

first age class while it amounted to 58.3 percent at the age of 75+.

Multivariate analyses showed a positive effect of work cessation and of changes in the reported coverage of drugs by health insurances on the probability to evolve from no medication to at least one between waves 1 and 2, see Figure 2. A reduction in household size or changes in income quartile were not significantly related to this outcome.

Transitioning from Less Than to Three or More Medications

The proportion of individuals reporting less than 3 medications in Wave 1 (i.e. under the percentile 90 of the number of current drugs) who became high consumers in Wave 2 increased regularly across age categories, from 7.8 percent at age 50-54 to 26.3 percent at age 75+.

Controlling for age, gender as well as for subjective health and socio-economic characteristics recorded in Wave 1, work cessation and reported changes in specific health insurance coverage between the two waves were both positively associated with an evolution towards a high level of medication, see Figure 2. A smaller household size or a change in income of whatever direction were not related to this outcome.
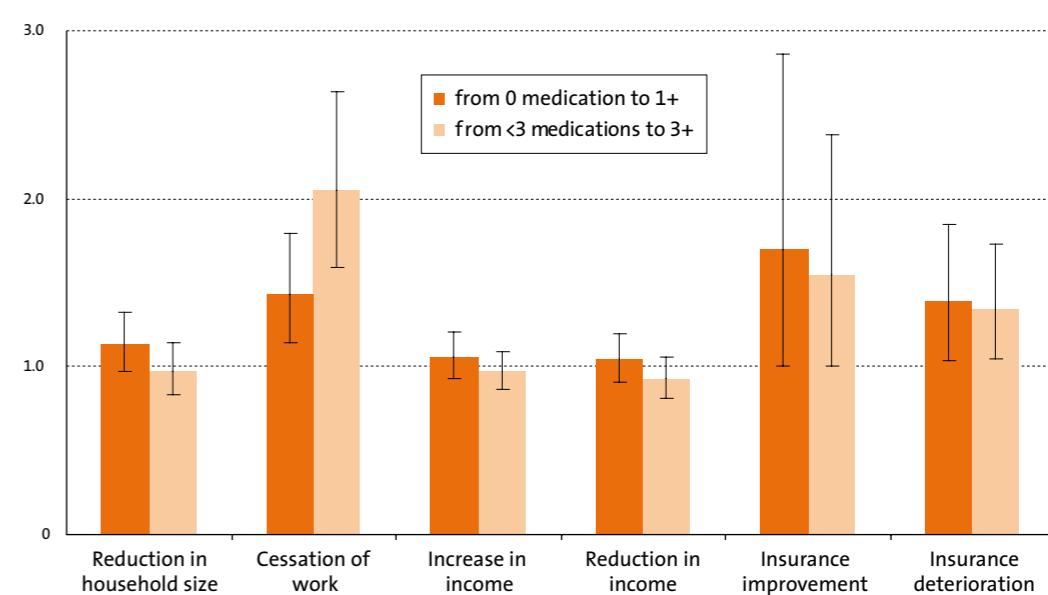
Figure 2 Odds ratio, for transitioning from 0 medication in past twelve months to 1+, and from <3 medication to 3+ between waves 1 and 2, related to life events and changes in economics resources (adjusted for age, gender and baseline socio-economics characteristics)

Effects on Hospital Stays in the Past Twelve Months

In 2004, 15,333 subjects (87.4 percent) did not report any overnight hospital stay within the past twelve months. Of these, 12.5 percent declared at least one hospitalization in Wave 2. Like other outcomes, this evolution was positively related to the age category. It ranged from 7.4 percent in the 50-54 age class to 19.6 percent at age 75+.

In multivariate models, transitioning from no hospital stay in Wave 1 to at least one stay in Wave 2 was positively associated with work cessation, with income reduction and with reported worsening of the coverage of hospitalization by health insurances, see Figure 3. Changes in household size or an increase in income were unrelated to this outcome.
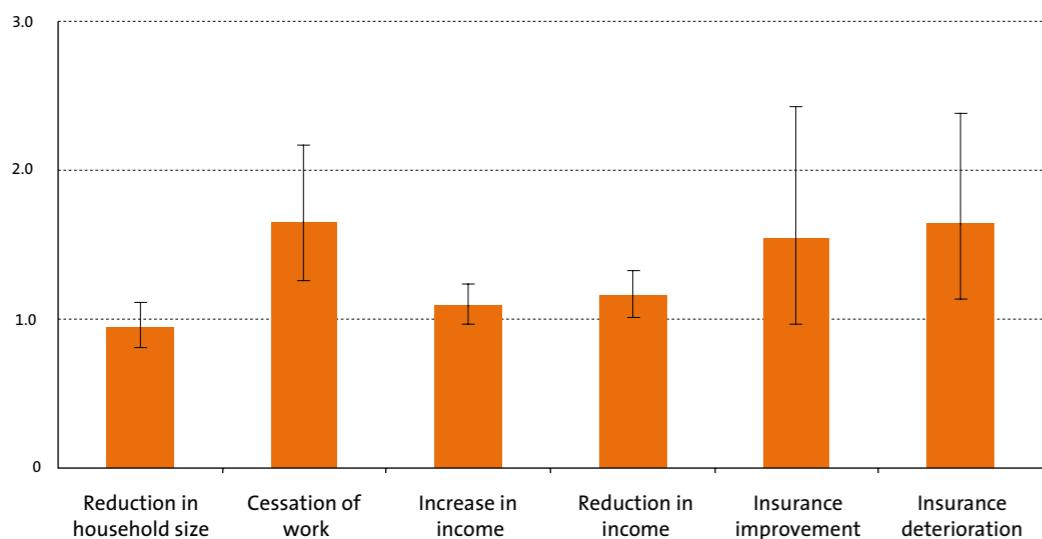
Figure 3 Odds ratio, for transitioning from 0 hospital stay in past twelve months to 1 between waves 1 and 2, related to life events and changes in economics resources (adjusted for age, gender and baseline socio-economics characteristics)

Conclusions

- The occurrence of life events such as household reduction or work cessation and changes in economic resources such as income or health insurance coverage were found related to age. This variable also positively influences the probability of transitions to higher levels of health services utilization such as ambulatory medical care, medication and hospitalizations.

- A reduction in household size predicted essentially a higher use of ambulatory medical care but it had no effect on medication or hospital admission. A higher level of medical contacts might result from less social support available in front of health problems, or from health perturbations (e.g. depression) related to the loss of close relatives.

- Work cessation increased the probability of transitioning to a high level of medical contacts, to medicament consumption, and to hospitalization. Reasons for this association, however, deserves further research. Although initial subjective health was taken into account, new health problems occurring between waves 1 and 2 might have resulted both in work cessation and in a higher level of healthcare use. An alternative hypothesis could be that of a lower level of health resulting from involuntary retirement or unemployment.

- Changes in income category did not seem to influence the use of new health services (except for transition to hospitalization in case of income reduction) or the probability to evolve towards a high level of use. By contrast, reported changes in health insurance coverage, in either direction, were found related to all types of transition towards more healthcare use. Relationships with health insurance should, however, be interpreted with caution since information regarding changes in coverage was self-reported. The need for more health care may influence the perception, and consciousness, of insurance coverage while an increasing volume of co-payment may induce some resentment and the feeling of a decreased coverage. Further investigation of these associations would request objective data on health insurance contracts.

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4.7 Changes in Health Out-of-Pocket Payments and Health Care Utilization in the Early Post-Retirement Period

Alberto Holly, Karine Lamiraud, Karine Moschetti, Tarik Yalcin

This chapter analyzes to what extent retirement may affect health care use expressed in either monetary or level units. More precisely, our analysis looks at how out-of-pocket (OOP) payments and health care utilization have been changing in the early post-retirement period among the elderly in Europe. Most individuals identify themselves as "retired" when they retired from full-time work in their primary occupation. These people may still be working, on a part-time or project basis. However, most individuals are likely to experience changes during this phase. Retirement may be associated with a change in insurance coverage, a change in income or/and a change in health status. The Share longitudinal data offer a unique opportunity to study the impact of such factors on OOP expenditures and health care utilization around retirement. Our analysis focuses on the following questions. How do OOP and health care utilization evolve around retirement? What are the equity impacts of health care use around retirement?

Before addressing these specific questions, we briefly present the methodology of analysis as well as some descriptive statistics concerning possible changes that might have occurred around retirement.

Methods

We used a longitudinal sample of the SHARE data including all the respondents who where interviewed in Wave 1 and Wave 2 (N=18,285). 832 individuals retired between Wave 1 and Wave 2. Among them, 691 had an economic activity in 2004, the others (141) were on sickness leaves in 2004.

Health care use was captured through both OOP and level variables. OOP payments included non-refunded expenses for inpatient care, outpatient care, prescribed drugs and nursing homes. Monetary values were expressed in Euros adjusted by the purchasing power parity. Level variables referred to the number of contacts with a general practitioner during the past 12 months, the number of contacts with a specialist physician during the past 12 months, whether the individual was hospitalized during the previous year and the length of hospital stays.

For comparative purposes, descriptive statistics (means, standard deviations, statistic tests) were computed for three groups of people: people who retired between Wave 1 and Wave 2 (N=832), people who stayed in the workforce between Wave 1 and Wave 2 (N=4,204), people who were retired in both waves (N=7,935). The remaining groups (people who returned to working status between both waves and people who were neither workers nor retired at Wave 1 or Wave 2) were not considered here due to the scope of our analysis.

In order to estimate the impact of retirement on health care use, we performed a difference in differences (DiD) analysis (Meyer, 1995). The idea of such an analysis is the following. If we simply performed a "before and after" analysis on the subgroup of people who retired between both waves, we could not identify whether the change in OOP payments (if any) was attributable to a time change or to a job situation change. One way to identify the impact of retirement is to identify a group of people who did not experience a job change during the period of analysis (control group) in order to compare the changes in health care use between this group and the group of new retirees between the two waves.

The control group was composed of the individuals who were in the work force at both Wave 1 and Wave 2 (N=4,204). The treatment group was composed of the individuals who retired between Wave 1 and Wave 2 (N=832).[1]

Changes in Possible Determinants of Health Care Use

This section investigates changes related to health insurance coverage, health status and income in the early post retirement period.

Very few people experienced a change in health insurance coverage after a change in labor market status. 8.2 percent of new retirees were affected by a drop in insurance coverage whereas 3.7 percent could rely on a more generous insurance coverage after they retired.

A majority of individuals (62 percent) who left the workforce declared to experience no change in their health conditions whereas for 20 percent of them retirement was associated with a decline in their perceived health status. Note however that the relationship between retirement and health status may be complex and bi-directional. On the one hand, poor health may affect retirement decisions (Miah and Wilcox-Gök, 2007; Bound et al., 1999; Hagan et al., 2006). One the other hand, poor retirement conditions (e.g. lower income) may have a negative impact on health status. Moreover, for some people, leaving the workforce generate anxiety or depression. These psychological changes due to retirement may lead to a decline in self reported health.

Looking at the income, we observed that about half of the people (47 percent) moved down to a lower income quintile after they retired. About one fifth of the European retirees moved up into a higher income quintile and 32 percent remained in a same income quintile. Moreover, people who retired between waves experienced on average a significant (p<0.001) decline in their total income. This mean reduction of income was higher than one third between Wave 1 and Wave 2.

The health-related findings are in line with the analysis of Hyde et al. (2004) who showed that retirement, per se, is not associated with a significant change in health status. However, in contrast with Hyde et al. (2004), our data suggest that retirement may be associated with a change in financial situation.

We may wonder whether such changes may have impacted health care use in the early post retirement status. We could expect health care use to decline because of a decline in income or insurance coverage. However, the decline in health status could lead to an increase in health care use. Furthermore, subsidies targeted at retired people could well be imagined to mitigate the impacts of changes in insurance, health or income.

How Does Health Care Use Evolve Around Retirement?

In this section we investigate changes in OOP payments and health care utilization around retirement. We address the two following questions. Do OOP payments and health care utilization increase or decrease in the early retirement period? Does the distribution of OOP evolve in the early retirement period?

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[1] The following DiD equation was estimated on the subpopulation composed of the control and treatment groups.
$$OOP_{it} = \beta W_2 + \lambda T_i + \gamma W_2 \times T_i + \alpha X_{it} + \varepsilon_{it}$$
W_2 is a time dummy for W2, T is a dummy for the treatment group, W_2*T is the interaction of the time dummy and the treatment group dummy. X_{it} is a vector of covariates including age, gender, health status, income and health care utilization. γ represents the difference in the changes over time (i.e. the DiD estimator).

Do OOP Payments and Health Care Utilization Increase or Decrease in the Early Retirement Period?

The proportion of people with positive OPP payments remained stable between both waves in the group of new retirees (71 percent). However, Table 1 suggests that there has been a substantial decrease in mean OOP (if OOP > 0) for people who retired between both W1 and W2 (p = 0.08). Furthermore, it is worth mentioning that the decrease in mean OOP resulted from the decrease in all types of OOP expenditures (inpatient, outpatient, drugs, nursing home). Note that a similar pattern was observed in the other two groups of people: those who remained in the workforce and those who were retired at both waves also exhibited a stability in the proportion of people with positive OOP together with a decline in mean OOP (p = 0.02; p<0.01, respectively).

	People who retired between W1 and W2		Working people at W1 and W2		Retired people at W1 and W2	
N	832		4204		7935	
Proportion of women	40%		48%		45%	
	W1	**W2**	**W1**	**W2**	**W1**	**W2**
% with positive OOPs	71	71	68	68	73	74
% with positive OOPs at W1 and W2	59		56		64	
Mean of OOP if OOP>0	553	410	404	317	611	511
Std Dev.	1,225	1,370	1,038	935	1,803	2,000

Table 1 OOP payments at Wave 1 and Wave 2 for the three groups

In terms of health care utilization, Figure 1 suggests that the mean number of contacts with a general practitioner and a specialist physician remained stable between both waves for people who retired between Wave 1 and Wave 2. For both GP and specialist types of care, the average number of visits recorded at Wave 1 and Wave 2 was equal to 5. The percentage of hospitalization also remained stable. About 13 percent of the individuals who left the labor force between Wave 1 and Wave 2 had an inpatient stay. However, the length of stay declined. The total number of night stayed in hospital declined from fourteen days to ten days on average. Though this drop was not significant, it might partly explain the drop in health OOP payments previously observed. Note that health care utilization was similar at both waves for the other two groups of people for outpatient and inpatient care.

Figure legend:
- Mean of visits if GP visits >0
- Std dev. of GP visits
- Mean of visits of spe. visits >0
- Std dev. of spe. visits
- Mean number of inpatient nights
- Std dev. of inpatient nights

X-axis: W1, W2 — People who retired between W1 and W2; W1, W2 — Working people at W1 and W2; W1, W2 — Retired people at W1 and W2
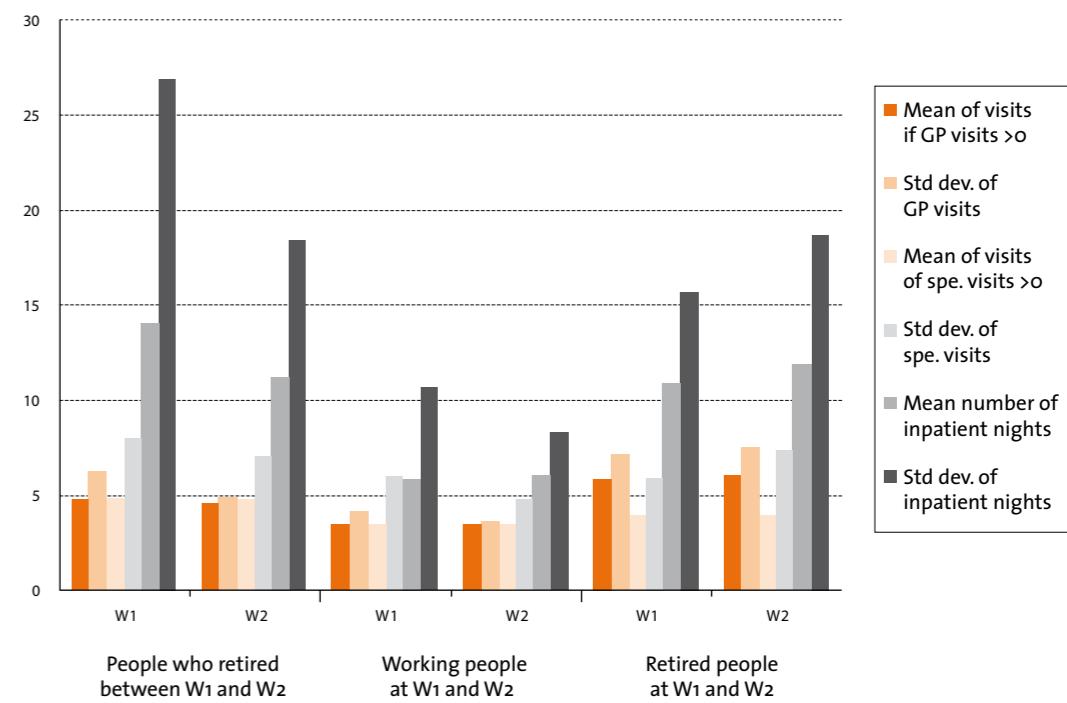
Figure 1 Health care utilization for the three groups

To What Extent is Retirement Responsible for the Observed Changes?

Concerning the decline in mean OOP payments, the results of the DiD equation indicated a reduction of Euros 43 in the mean of OOP payments between 2004 and 2006 (coefficient gamma). Note however, that this difference was not significant, meaning that there was no significant impact of retirement on OOP payments even after controlling for age, gender, subjective health status, income and health care use. The DiD analysis excluding OOP payments with a null value provided similar results. The results of the regression also showed that lower income levels were significantly associated with lower OOP payments. Moreover, higher health care utilization was significantly associated with higher OOP payments. Finally, the time dummy for Wave 2 was associated with significant lower OOPs after controlling for covariates. The understanding of the decline in OOP payments between both waves is out of the scope of the present analysis and would deserve further investigation.

Does the Distribution of OOP Evolve in the Early Retirement Period?

Another question of interest is whether the new retirees spend differently at Wave 1 and Wave 2. In order to give some insight into this question we looked at the structure of the OOP payments at Wave 1 and Wave 2 for people who retired between Waves. As shown in Figure 2, OOP payments at Wave 1 and Wave 2 for outpatient and medicines contributed to a very large part (more than 88 percent) of the medical expenditures borne by people who retired between Wave 1 and Wave 2. The part of outpatient OOP, representing more than half of the total expenditure, remained quite stable between the two waves. However, the part of inpatient OOP decreased between both waves from 9 percent to 3 percent while the share of drug OOP increased from 33 percent to 38 percent. However, none of these differences were significant. The share of day care with a low level slightly increased from 2 percent to 4 percent. These results are consistent with the previous re-

sults on health care indicating a stable number of contacts with practitioners (generalists and specialists) and a decline in the length of stay for inpatient care.
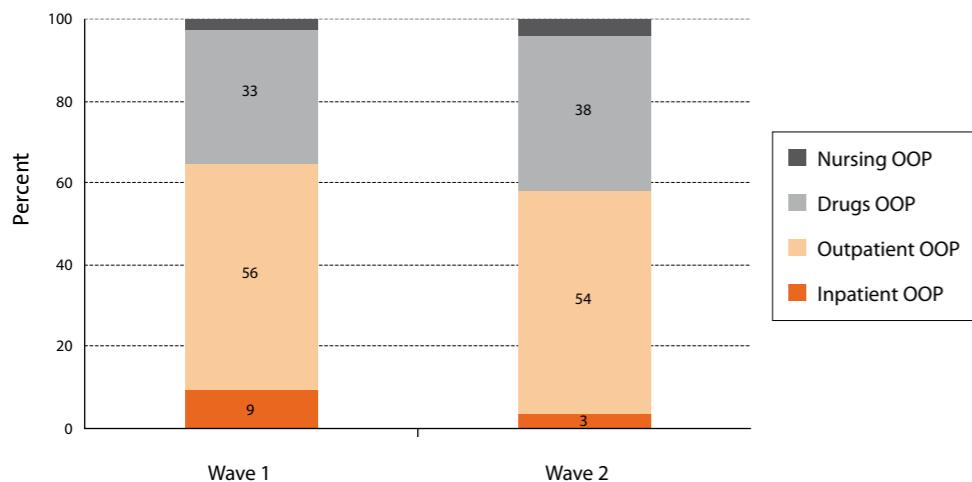
Figure 2 Structure of the OOP payments for people who retired between waves

What Are the Equity Impacts of Health Care Use in the Early Post-Retirement Period?

From an equity perspective, it is interesting to analyze to what extent health OOP are related to individual ability to pay, especially around the retirement which is generally associated with a reduction in income. This is the case of the group of people under study who experienced on average a substantial decline in their total income close to 33 percent.

Figure 3 displays, for people who retired between waves, total OOP payments for health as a percentage of income before and after retirement. At both waves, the shares of OOP payments as percentages of income decrease with total income. For instance, the share of OOP payments at Wave 2 varies from to a minimum of 1 percent for the richest respondents (fifth quintile) to a maximum of 8 percent for the poorest (first quintile). A similar pattern is observed at Wave 1. As previously mentioned (Holly et al., 2005), this indicates a regressive financing system for OOP expenditure.

When comparing OOP as shares of total income between waves, Figure 3 shows two opposite trends. For the first and the second quintiles of income we observed a substantial decrease in the shares of OOP payments between waves. There is a decline of around 8 percent and 3 percent in the OOP share between Wave 1 and Wave 2 for the poorest and the second poorest respondents respectively. The decline is very small for the third quintile. The other quintiles are characterized by a slight increase of the shares of OOP. This result may have different interpretations.

First, this might suggest that due to the decline in their income, the poorest forgo certain types of care paid OOP thus decreasing the share of their income allocated to health care expenditure. Second, retired people may have access to certain types of health care that become free or partially paid by a social coverage. For instance, influenza vaccination is free for people over 65 years old in France. Finally, although we could have expected a more regressive system one may see in this Figure that the system becomes less regressive as the individual retired. One explanation is that retirement reduces the financial differences (heterogeneity) between individuals.
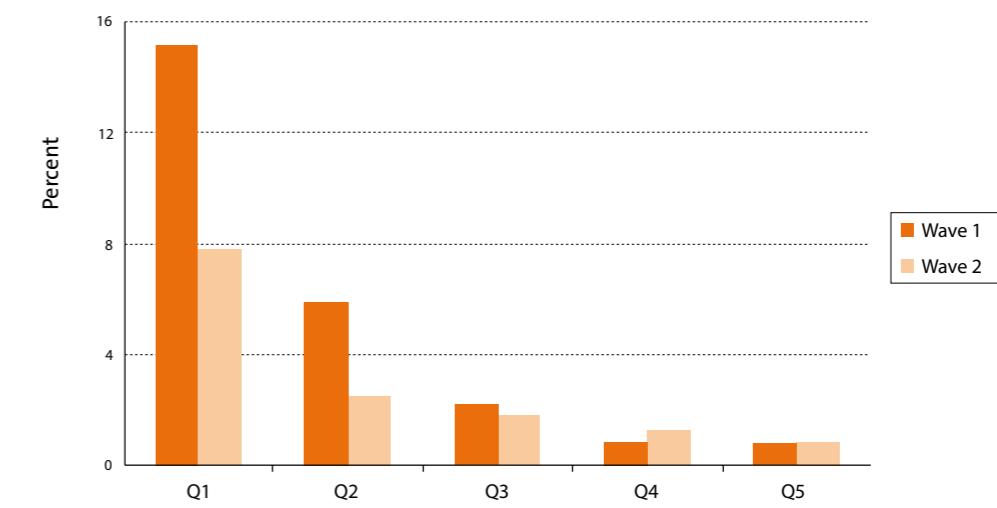
Figure 3 Distribution of OOP (as shares of total income) by income quintile for people who retired between waves

Further results suggest that health care expenditures may represent a higher burden for those who underwent a decline in income around retirement. Indeed, in the group of people who retired between waves and moved down to a lower income quintile (ΔQ<0), we observed that the share of income attributed to OOP expenditure increased between both waves from 1.5 percent to almost 4 percent see Figure 4. Note however that the increase is not very important. Conversely, we observed declines in the shares of OOP expenditure for the rest of people who retired between Wave 1 and Wave 2. Substantial reduction in the shares of income attributed to OOP payments was observed for people who retired and moved up (35 percent) to an upper income quintile (ΔQ>0) whereas a lower decline were found for retirees that remained in the same income quintile (ΔQ=0). These results suggest that those who underwent a decline in income may be impoverished around retirement due to health care expenditures. This result is of interest for policy makers.
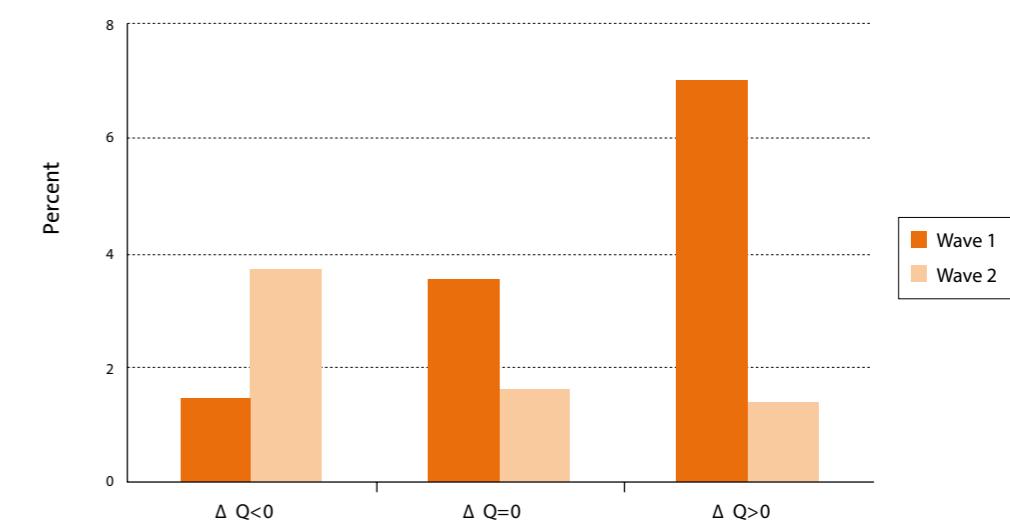
Figure 4 OOP as shares of income by changes in income quintile for people who retired between waves

Conclusion

- Generally, this analysis contributes to a better understanding of the impact of retirement on OOP payments and health care utilization.
- Although health OOPs were not affected by retirement, our results suggest that some new retirees were impoverished even slightly by health care expenditures paid out of pocket. This result may be worth considering from a policy point of view.

Two caveats are in place: First, the size of the studied sample is small. Attrition between both waves may also be a limitation. Second, the duration of analysis may be too short to observe the impacts associated with retirement. The availability of additional data for the panel on the 50-years-old and more would be very helpful to perform further investigations.

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5 Social and Family Context

Editor: Johannes Siegrist

Social and Family Context

Shrinking Families? Marital Status, Childlessness, and Intergenerational Relationships

5.1 Shrinking Families? Marital Status, Childlessness, and Intergenerational Relationships

Martin Kohli, Harald Künemund, Claudia Vogel

Common Themes and National Differences

Research on the family is sometimes like fighting against windmills: raising empirical arguments against myths that seem to remain untouched by them. It is, for example, widely assumed that the modern welfare state has undermined family solidarity and the family itself. Increasing childlessness and fewer births, decreasing marriage and increasing divorce rates, increasing numbers of singles and the decrease of multigenerational co-residence – to name just a few widely known facts – may indeed indicate a weakening of the family and its functions. But despite the high intuitive plausibility of such interpretations in which large parts of the social sciences meet with common sense, it turns out that the family has in fact changed but not diminished its role, and that the purported causal link from welfare state expansion to family contraction is a modern myth (cf. Kohli, 1999; Künemund and Rein, 1999).

Speculation about the future of the family has been a regular feature of modernization, mostly with the assumption of a general decline of family bonds. This restrictive view was first transcended by research on the emotional and support relations between adult family generations. But it is only during the last decade that we have discovered again the full extent of the family as a kinship and especially a generational system beyond the nuclear household (Bengtson, 2001) which ranges across several different types of "solidarity": spatial and emotional closeness, frequent contact, personal and instrumental support as well as massive flows of money and goods.

Families in Europe today present many features common to all countries as well as massive differences among them. As to commonalities, we expect to find a weakening of marriage with increasing age but stability of intergenerational bonds. As to differences, we expect to find patterns of "weak" and "strong" family regimes.

SHARE provides the first possibility to chart commonalities and differences in a strictly comparative frame across Europe, and to muster the evidence for the assumptions regarding the decline of the family. The task of this chapter is to present some basic descriptive information on family structure and relationships of the elderly European population covered by SHARE (also see Kohli et al., 2005): on marital status, generational structure, residential proximity to other generations and frequency of contact with them. Most of the presentation is cross-Sectional for Wave 2. This includes the three new countries (the Czech Republic, Poland and Israel) that can now be compared to the eleven included in Wave 1. For the latter, we expect most values to have remained fairly stable across the two waves, and point out cross-Sectional differences where appropriate. But the panel data now also allow for some longitudinal information about individual change from Wave 1 to Wave 2 and its correlates.

The Ambivalence of Marriage

We first examine to what extent elderly Europeans are living together in bonds of marriage. In recent decades, the institution of marriage has been weakened by diminishing rates of ever getting married and increasing rates of divorce. Our findings show that the current elderly have not yet been strongly touched by this evolution, see Figure 1. Among the 50-59 year olds in 2006, 76 percent of the men and 70 percent of the women live in a

married couple – proportions that are almost identical to those of 2004. Of the three new countries now included, the Czech Republic and Poland have marriage shares below this average, while Israel is substantially higher – it has the highest proportion of married people in this age group (83 percent) as well as in the total elderly population (74 percent).
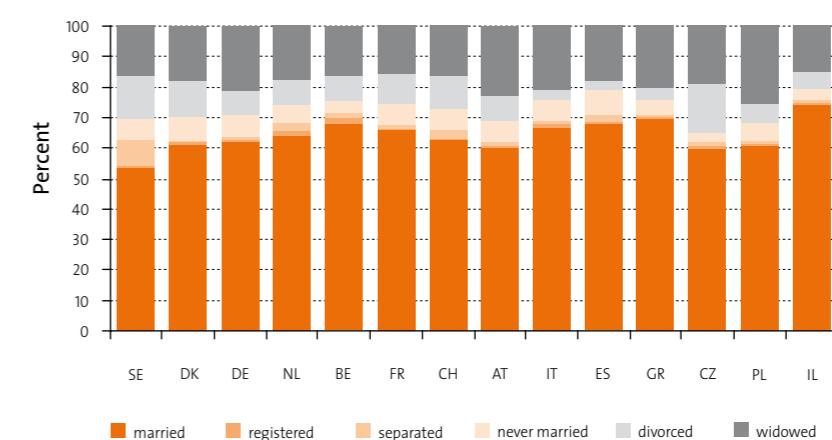
Figure 1 Marital status (percentages by country)

There is a rise of divorce in the younger cohorts, see Figure 2, but with ten percent of the 50-59 year olds currently divorced it is still far below the levels of those now in their 30's or 40's, and has not increased since 2004. There is also a rising proportion of never-married men, while for women this is not the case. But the most drastic pattern is that associated with the death of the marriage partner. The higher longevity of women – for life expectancy at birth it is currently about 7 years – and the fact that men in couples are on average about 3-4 years older than their wives translate into highly divergent trajectories for the two sexes as they grow older. The proportion of widowed men increases from 2 percent (50-59) to 30 percent (80 and older), that of widowed women from 9 to 73 percent. As a result, 63 percent of men but only 17 percent of women of age 80 or older still live with a (married or registered) spouse.
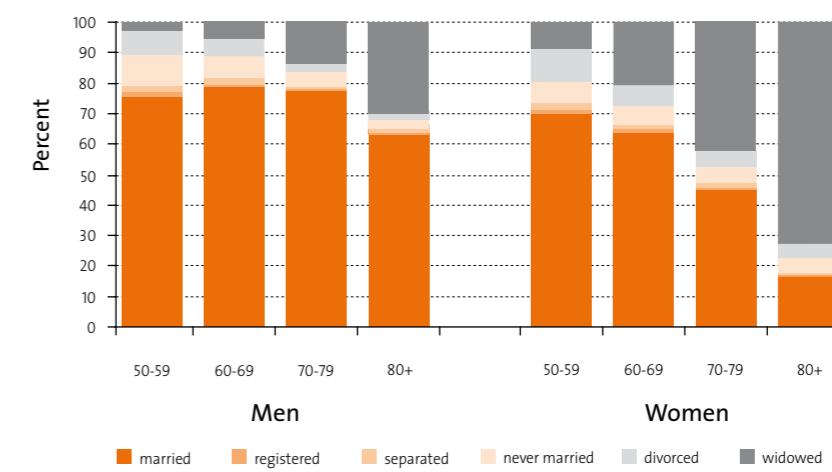
Figure 2 Marital status (percentages by age and gender)

Social and Family Context

Shrinking Families? Marital Status, Childlessness, and Intergenerational Relationships

Of those who were married in 2004, less than three percent experienced a change in marital status until 2004. Divorce accounts for 15 percent of these changes, widowhood for 85 percent. Widowhood is thus the predominant reason for such changes, and even more so with advancing age. Among those aged 80 and above in 2004 and still married, 11 percent (8 percent of the men, 19 percent of the women) suffered a change in marital status, all of them into widowhood.

The Power of Generations

The family nucleus thus loses its impact with increasing age, especially among women. This is not the case, however, for the generational structure. Even after several decades of low fertility most European elderly still have a family that extends to the next generation. The proportion of those without living children varies between 15 percent in Switzerland and 6 percent in the Czech Republic, with Israel, Poland, Sweden and Denmark also below 10 percent, see Figure 3. Having no living children stems in part from children's mortality; we would thus expect it to increase with advancing age. The fact that some countries (Italy, Spain, Israel, Germany and Switzerland) show the opposite age pattern indicates that childlessness is on the rise here; but the proportion of the childless among those aged 50-59 nowhere reaches twenty percent.
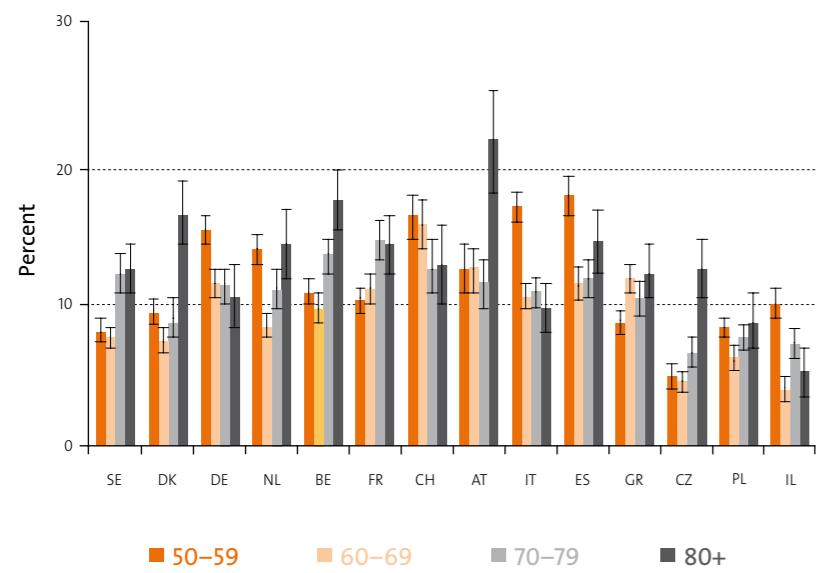
Figure 3 *Childlessness (percentages by country)*

The 'second demographic transition' to low fertility has thus not yet left a strong mark on parenthood among our cohorts in most European countries and will not be relevant for old age in the near future. However, it does show in grandparenthood to some degree, see Figure 4. The largest shares without living grandchildren obviously occur among the youngest age group, especially in the Southern European countries and in Switzerland; it is unclear how many of the 'missing' grandchildren will still be born. The longitudinal perspective takes this potential into account: Among the 50 to 59 year olds without grandchildren in 2004, 12 percent report at least one grandchild in 2006; among those aged 80 and over it is 9 percent.
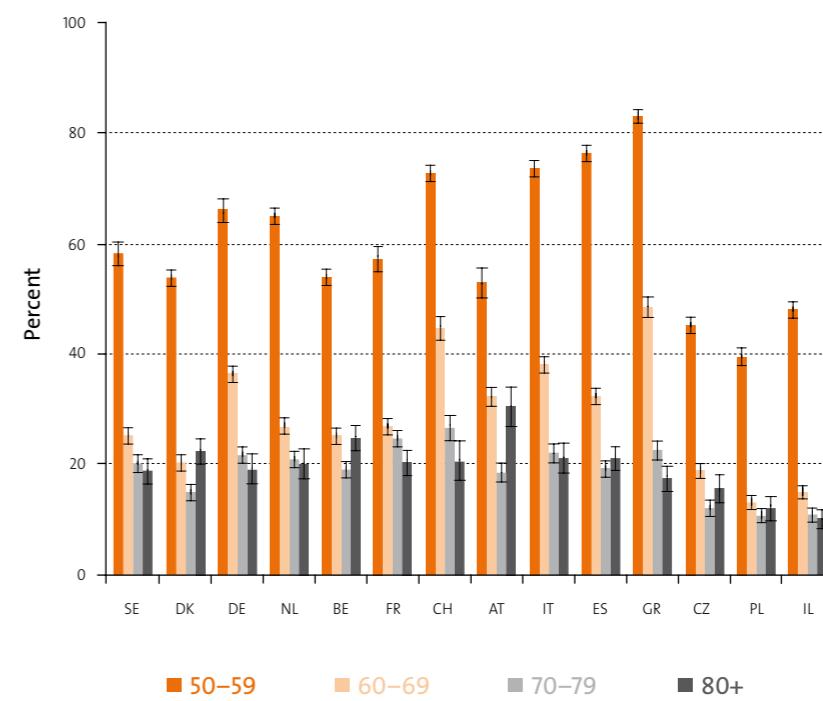
Figure 4 *Without Grandchildren (percentages by country)*

How does this translate into actual exchange and support? The first question here is about co-residence with and geographical proximity to these other generations. This is the one piece of evidence that seems to support the 'modernization' claim: In all Western societies, co-residence among adult family generations has decreased massively. Today, among the Europeans aged 80 or more who have at least one living child, only 17 percent live together with a child in the same household. But by extending the boundaries of „togetherness" the situation turns out to be very different. If one includes parents and children living not only in the same household but also in the same house, the proportion rises from 17 to 32 percent, and by including the neighborhood less than 1 km away, to 53 percent. 84 percent have a child living no farther away than 25 km. The preference now seems to be for 'intimacy at a (small) distance' – small enough so that relations of exchange and support may function easily across the boundaries of the separate households (cf. Hank, 2007; Kohli et al., 2005). Thus, even the living arrangements are not very good evidence for the claim of a dissociation between parents and adult children.

Weak and Strong Family Countries

In these dimensions, however, it is the variation among countries that comes into focus. At the European level, there are considerable differences between Scandinavia, Central and Western Continental countries, and those of the Mediterranean. The latter are often grouped together as 'strong family countries', and contrasted with the 'weak family countries' of Western and Northern Europe and North America (Reher, 1998). The strength or weakness refers to cultural patterns of family loyalties, allegiances, and authority but also to demographic patterns of co-residence with adult children and older family members and to support for the latter (Albertini et al., 2007). The 'strong family countries' have had high fertility in the past but today, paradoxically, are those with the lowest fertility – a state of affairs that is directly linked to the strength of their family tradition. While they have

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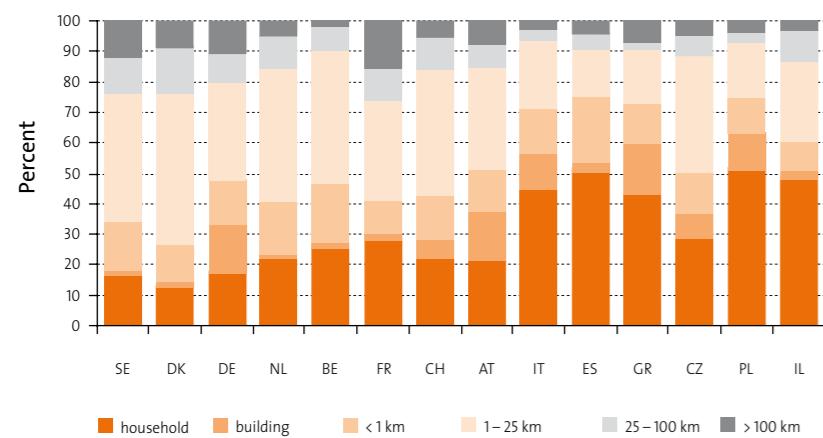
Figure 5 Proximity to nearest living child (percentages by country)

evolved, in conjunction with the other advanced countries, towards higher gender equity in education and the labor market, gender equity in the family and in public provisions for the family remains low. The dominant model, both culturally and in terms of welfare state incentives, is still that of the male breadwinner. The ensuing cultural lag in gender equity between the 'individual-centered' and the 'family-centered' worlds increasingly turns women away from motherhood.

As mentioned above, these trends have mostly not yet directly affected the SHARE cohorts. For them – and therefore also for the elderly in the near future – the pattern remains one of comparatively high marriage rates and low rates of childlessness. But they are affected in an indirect way, through the decreasing prevalence of marriage and childbearing among their children.

Our data demonstrate that there is not only a 'weak'-'strong' dichotomy but a North-South gradient, with the Scandinavian countries generally having the least traditional family structure, the Mediterranean countries (Spain and Italy more so than Greece) the most traditional one, and the other continental countries lying somewhere in-between. Of the two transition countries of Eastern Europe, the Czech Republic tends towards the non-traditional side, Poland towards the traditional one. Israel also approaches the "Mediterranean" pattern in many respects. This already shows for the variation in marital status, e.g., divorce. The Czech Republic, Sweden and Denmark are at the top with 16, 14 and 13 percent currently divorced, followed by Switzerland, Germany, Austria, France, the Netherlands and Belgium with 11 to 8 percent, and Israel, Poland, Greece Italy and Spain with 6 to 3 percent.

Massive differences occur with respect to co-residence, see Figure 5. The Mediterranean countries are characterized by very late (and increasing) ages of leaving the parental home among adult children. This is often interpreted solely as an effect of opportunity structures (employment and housing markets), but the variation among countries may also be explained by a cultural tendency towards closer intergenerational ties. The overall proportions are striking. In Denmark 13 percent of our respondents who have at least one living child live with a child in the same household, in the 'center' countries this amounts to between 17 and 28 percent, but in Greece, Italy, Israel and Spain to 43, 44, 48 and 50 percent. Poland has the highest rate of co-residence (51 percent), whereas the Czech pattern (28 percent) is close to the Western Continental countries.

In the longitudinal perspective we are able to show that proximity between parents and children changes as a function of critical life events. For those who have become widowed or disabled between 2004 and 2006, proximity to children increases. It may be either the child or the parent that moves closer (cf. Attias-Donfut and Renaut, 1994). The same applies for respondents who have become grandparents, indicating that the proximity between parents and children also reacts to critical events in the life of the child (such as giving birth).

Similar results as for proximity obtain for frequency of contact between children and parents (also see Hank, 2007). As a whole, results show that the adult generations in the family, even in countries with comparatively weaker family traditions and larger geographical distance, remain closely linked. Contact with the most contacted child, see Figure 6 is daily for 28 and 31 percent in Denmark and Sweden, respectively, and for between 33 and 46 percent in the Continental countries; Italy, Greece and Israel stand out with 73, 71 and 69 percent. In all countries two thirds or more have contact at least several times a week; in the Mediterranean countries (including Israel), the proportion is 90 percent or more. There are those who have no contact at all to their living child or children but in no country do they make up more than two percent.
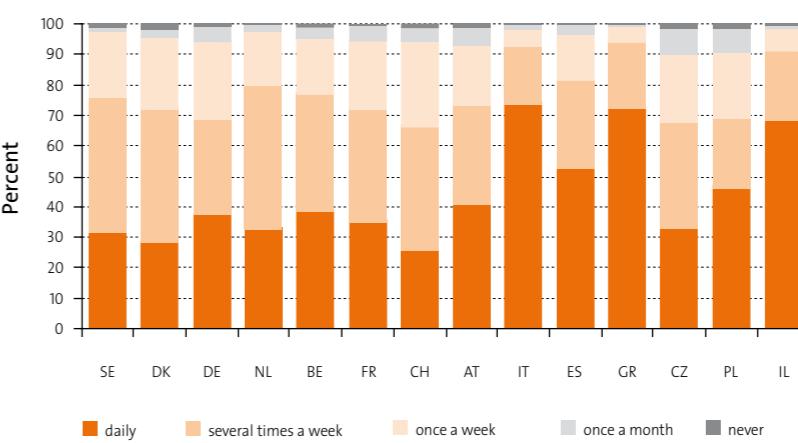
Figure 6 Frequency of contact to most contacted child (percentages by country)

Contact with parents, see Figure 7, is somewhat less frequent, partly because there are often several children of which only one lives close to their parents (cf. Konrad et al., 2002) and remains in close contact. There may also be some tendency to overreport contact with children and/or underreport contact with parents – a response pattern associated with the often-observed difference in the 'developmental stake' of parents and children (Giarrusso et al., 1995). As to differences between countries, the Mediterranean countries (including Israel) again stand out, while there is no noticeable gap between Scandinavia and the Continent. Switzerland has the lowest proportion of contact with parents at least several times a week – corresponding to the fact that parents here most often live farther away as a result of international migration.

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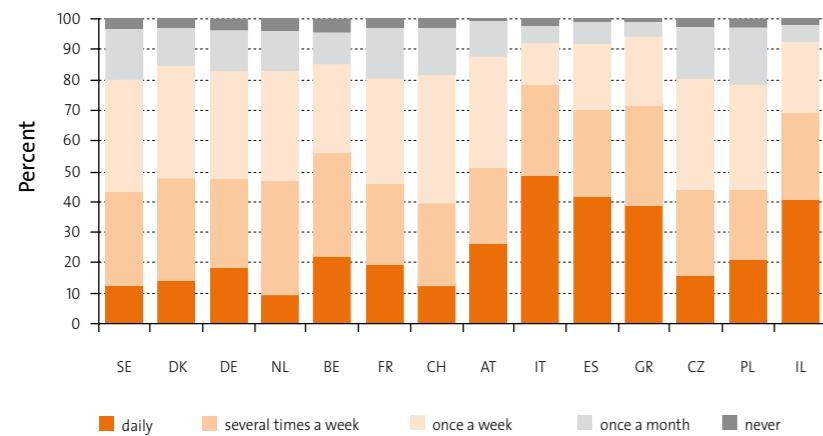
Figure 7 Frequency of contact to most contacted parent (percentages by country)

Conclusion

We emphasize four points:

- For present elderly Europeans the family has remained a strong provider of institutional and everyday integration. The historical decline of marriage has not yet reached them directly.
- The marriage bond weakens however with increasing age, and dramatically so for women.
- On the other hand, the multi-generational structure of the family remains strong. Even though co-residence of the elderly with their adult children has decreased, geographical proximity – and thus the potential for everyday support – is high, and increases in the wake of critical life events. There are moreover high rates of frequent contact between parents and children.
- While this is true for Western Europe as a whole, there are important differences among the 'strong family countries' in the South and the 'weak family countries' in the North. Of the two Eastern European countries, Poland belongs to the 'strong family' regime, while the Czech Republic tends towards the 'weak family' regime. The North-South gradient is especially noticeable with respect to rates of co-residence and frequency of contact among adult family generations.

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5.2 Evolution of Social Support

Claudine Attias-Donfut, Jim Ogg, Francois-Charles Wolff

Findings from the first wave of SHARE showed how older people are at the centre of a complex exchange network within the family, giving and receiving many types of practical help and support (for overviews see Albertini et al., 2007; Attias-Donfut et al., 2005). European grandmothers for example, from the north to the south, are largely involved in looking after grandchildren (cf. Hank and Buber, 2008). As they move through retirement, the help they give decreases (with the exception of care-giving) and older Europeans become recipients of family transfers. Country differences in the regularity of transfers and the intensity of support networks exist, a finding that is strongly linked to patterns of intergenerational cohabitation and residential proximity between family groups. These results provide a snap-shot of the social support networks of older Europeans at the time of the first wave around 2004.

With the addition of a second wave of data, we are able to test a number of hypotheses concerning social support networks. Does the 'snap-shot' of Wave 2 social transfers follow the same trends as in Wave 1, thereby confirming the robustness of the data? Do patterns of country variation remain the same in Wave 2 as in Wave 1? How do major life events, such as the transition to retirement, the onset of an illness, or the loss of a spouse, alter the type and direction of social support exchanges between family members? And what happens to the balance of family and professional support over time – if one source increases, does this have an impact on the other?

Globally, and although not reported in detail, the patterns of social support that were found in Wave 1 are repeated in Wave 2 – about one quarter of older Europeans gave help to a family member or other social network person in the past 12 months (or time since the last interview) and just under one third received help. Since the majority of respondents are two years older at Wave 2, the effects of ageing on transfers are observable, with rates of support given tending to be slightly lower than at Wave 1 (especially for care given to someone within the household) and rates of support received tending to be slightly higher at Wave 2 than at Wave 1. As far as the two new entrant countries are concerned, older people in the Czech Republic had higher rates of giving help, whereas Poland had slightly lower rates of both giving and receiving help than the average.

In this chapter, we focus on the longitudinal aspect of the SHARE data, i.e. selecting only respondents who took part in both waves. To illustrate how important changes in one sphere of the respondents' lives impact on other domains, we choose not only events that have occurred to respondents themselves between the two waves, but also to members of their social network. We begin the chapter with an important component of intergenerational transfers that can affect decision making around the time of retirement – responding to the needs of an elderly mother in failing health.

The Impact of Retirement on Help Given to an Elderly Mother

With increased life expectancy, many Europeans who are in or approaching retirement, have an older parent who is in need of help and support. How do these adult children respond to the needs of ageing parents? In our previous work on the direction of family transfers in Wave 1 of SHARE, we showed that "family help in the form of time transfers is directed to older parents in ill health, or to the care of grandchildren by grandparents, and that these transfers also have important consequences on the labour supply as well as

capital accumulation of the helpers." (Attias-Donfut et al., 2005) At the same time, rates for helping other people outside the household were lower than average in the southern European countries, and in particular Spain. However, although overall Spanish respondents had low rates of giving social support, they invested significantly more time than any other country – including Italy and Greece – with a mean of 26 hours of time transfers given on monthly basis.

Although these results clearly showed inter-country variation, their interpretation is not straightforward. The SHARE questions on time transfers given are only recorded for recipients outside the household (with the exception of personal care). If intergenerational cohabitation or close proximity between family members is considered to be a de facto form of support, the inter-country pattern changes and the southern European countries have substantially higher rates. We have also suggested that country differences in rates of help given may in part be due to interpretation differences. This is especially the case where cohabitation exists. Another explanation may relate to the need for a certain social distance between donors and recipients before help and social support can be identified (Ogg and Renaut, 2006). This is especially the case for helping parents. It should also be noted that the SHARE survey does not contain a direct question on help given to parents (e.g; do you or have you helped your parent). Help given to a parent can only be flagged if this parent appears in the social network of helped persons given by the respondent. It may be the case that because the social distance between children and parents is very close, 'true' rates of support given to parents are underestimated in the SHARE survey.

These first results from Wave 1 lead us to suppose that indicators of help given to a parent exist at three levels. First, at the level of the social network there is the general question, "In the last twelve months, have you personally given any kind of help listed on card 28 to a family member from outside the household, a friend or neighbour?". This is the key question in SHARE's 'social support' (SP) module designed to open the way for measurement of the social network of recipients. If, and only if, the respondent answers "yes", does the questionnaire continue to ask who this person is, the type of help and the regularity. Parents living outside the household can be located on this routing, but as noted above, some caution must be applied in the interpretation of the answers of these questions by respondents as far as help given to parents is concerned. Second, there is the question on personal care given inside the household: "is there someone living in this household whom you have helped regularly during the last twelve months with personal care, such as washing, getting out of bed, or dressing?" Parents living in the household receiving personal care can be identified on this routing. Third, less direct measures of helping can be considered. In the 'demographics & networks' (DN) module, a series of questions are posed for each parent – including whether they live in the household of the respondent and the regularity of contact.

Rates of help given to a mother at both Wave 1 and Wave 2, using the questions in the SP module (points one and two above) are shown in Figure 1. Our first observation is that generally, countries have more or less the same rates at each wave, and that for seven out of the eleven countries, rates increase between waves. As mentioned above, our previous work has shown that when indicators of help given are measured only at levels one and two (SP module), rates are lower in the southern European countries than in the northern European countries. This finding is confirmed, as is also shown in Figure 1. Clearly, one important question that arises is why rates of helping a mother are low at both waves in

Spain and Greece (less than 20 per cent) and double (at around 40 per cent) in Sweden and Denmark?

To answer this, we need to incorporate rates cohabitation and rates of contact with a mother into an overall indicator of 'support'. Rates of intergenerational cohabitation (respondent and mother living either in the same house or same building) are high in Spain, Italy and Greece – at around 15 per cent, and very low in all other countries (mostly less than 5 per cent and in some countries non-existent, such as the Netherlands and Sweden). However, Austria and Germany have relatively high rates of cohabitation between a respondent and her/his mother – at around 10 per cent. But it is the regularity of contact between the respondent and her/his mother which changes the inter-country pattern completely. The regularity of contact is significantly higher in Spain, Italy and Greece than other countries – for example, in Wave 2 the range of daily contact with a mother is from 53 per cent in Italy compared to 12 per cent in Switzerland. Spain and Italy also have high rates of daily contact with a mother – above 40 per cent.
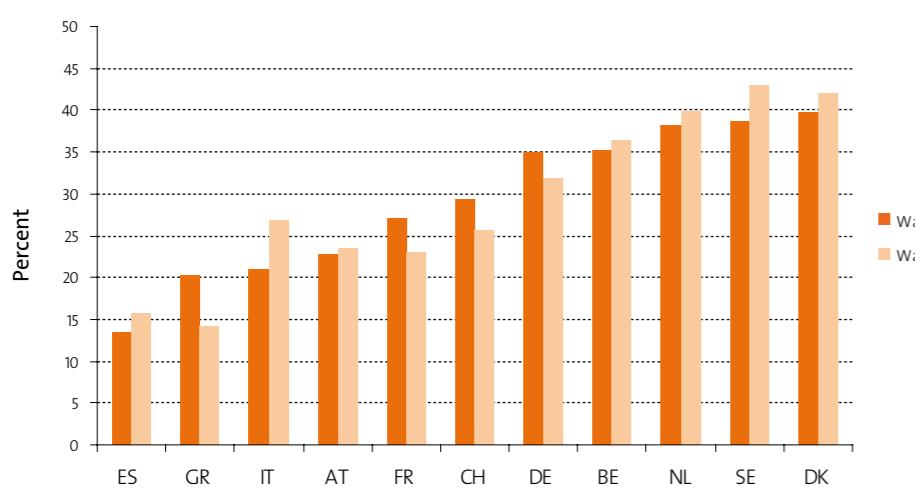
Figure 1 Percentage of respondents who gave practical help or care to their mother in the past 12 months or since the last interview (base=respondents with a mother alive)

Building on the findings from Wave 1, and in order to examine the possible determinants of giving regular help to a parent, we therefore combine the four indicators of help – practical help given to a mother who lives outside the household, personal care to a mother living inside the household, cohabitation and daily contact – into a single indicator which identifies 'practical support given to a mother'. From the SHARE data, we estimate that 27 per cent (base=3,442) of respondents with a mother alive at Wave 2 were engaged in this type of practical support at both waves. In other words, these are respondents who over time consistently provide practical help and support.

What are the characteristics of respondents who are engaged in this regularity of support to their mothers? First, and not unsurprisingly, women are more engaged than men (32 per cent compared to 19 per cent). Second, the country divide is clearly discernible as is shown Figure 2. The southern European countries have higher rates of consistent care given to a mother across both waves.
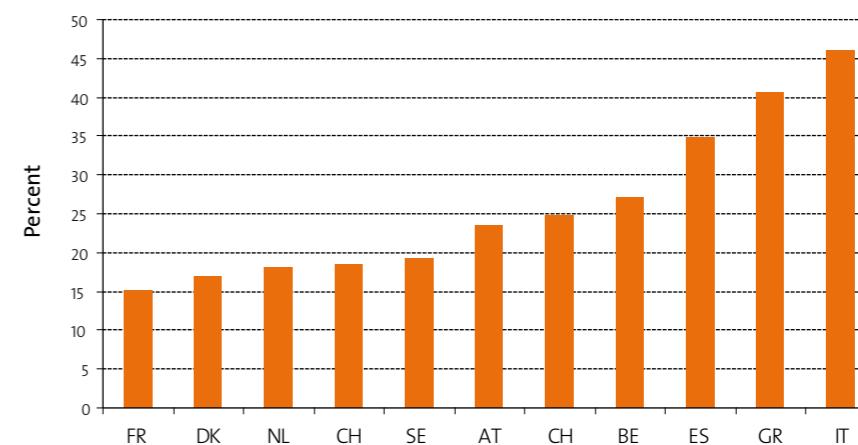
Figure 2 Percentage of respondents who are engaged in supporting their mother at both waves (base=mother alive)

Gender and country are variables that, of course remain constant between waves. The challenge of the longitudinal data is to explain the factors behind this consistency, or those that lead to changes in the level of practical support given to a mother between waves. These factors relate both to the changes in the situation of the respondent and those of the mother. In SHARE there is of course a lot of information on changes in the circumstances of the respondent between waves, much less for those of the mother. In fact, for the mother we know only if she died between waves (information not treated here, as our base is respondents with a mother alive at both waves), changes in the health status of the mother as perceived by the respondent, changes in the distance the mother lives from the respondent and changes in the regularity of contact that the respondent has with her/his mother (this latter variable being incorporated in the response (dependent) variable).

We turn now to examine some of the associations of these longitudinal changes on the likelihood of giving support to a mother. Using the above indicator of 'regular support given to a mother' we create a variable that indicates whether respondents give this amount of practical help at both waves, whether they increase the help given to a mother, whether they decrease the help given to a mother, or whether rates are below regular at either wave. We then examine changes in the rates of practical help given to a mother in relation to changes in the mother's health, and changes in the occupational, marital and health status of the respondent. We find that:

- There is no association between a mother's deterioration in health (as perceived by the respondent) and fluctuations in the existence of practical help given (as measured by help given to a mother outside the household, cohabitation and daily frequency of contact); this trend applies equally to men and women.
- There is however, some evidence that moving into retirement (from active to inactive between waves) has an effect on the intensity of help given to a mother – for some respondents the passage to retirement increases the intensity, but for others it decreases.

These preliminary findings suggest that it is above all the characteristics of the respondent (supply) that that influence patterns of caring for a parent. For some respondents the passage to retirement seems to make them more available to support their elderly mother. Their labour is thus transferred from the wider economy to the domestic economy. For others, the decrease in the intensity of support may be due to factors relating to their mother, such as a move to a residential home – information that is not included in the SHARE data.

Family Support in Response to Increasing Needs

As the SHARE respondents age, they will be facing increasing needs due to the onset of disability and ill health. Family sources of help will be important elements in maintaining the autonomy of older people during the final years of their life. Here, we examine whether changes in the self-reported health status of the respondents changes the likelihood of receiving family support.

Practical support received from outside the household is measured in the SP module at the household level. Only a minority of respondents consistently received practical help from outside the household at both waves – ranging from 18 per cent in Greece to 3 per cent in Spain. Given that at each separate wave, rates of practical support from outside the household were generally at around 20 per cent, we need to explore further the reasons why the informal help network diminishes over time – is this due to changes in the characteristics of the respondent and his or her household, or changes in the informal network, such as the loss of siblings and friends?

Here we examine what is likely to be one of the most important factors linked to receiving help and support – a deterioration in health. We have taken a subjective health indicator (For the past six months at least, to what extent have you been limited because of a health problem in activities people usually do?). Responses are coded as 'severely limited' 'limited but not severely' and 'not limited'. If we examine rates of respondents who receive practical help from outside the household (or not) at both waves, there are some interesting findings.

Among respondents who rate their health as 'severely limited' at both waves, about one-third received practical help from outside the household, and more than two-thirds have been helped by members of their social network since the SHARE survey began. At the same time, about one-third also received no practical from outside the household at both waves. At the other end of the scale, among respondents who had no disabilities at both waves, about two thirds received no practical help – rates of practical help received at both waves were very low (7 per cent) among non-disabled respondents. In between these two extremes, trends are difficult to discern, but it is interesting to note that rates of practical help received at both waves among respondents who showed an improvement in their self-rated disability status were slightly higher than among those who became more disabled. This may indicate that the informal help network needs some time to activate and also that it continues to be in place during a convalescence period. The improvement of their health condition may also be the consequence of help received.
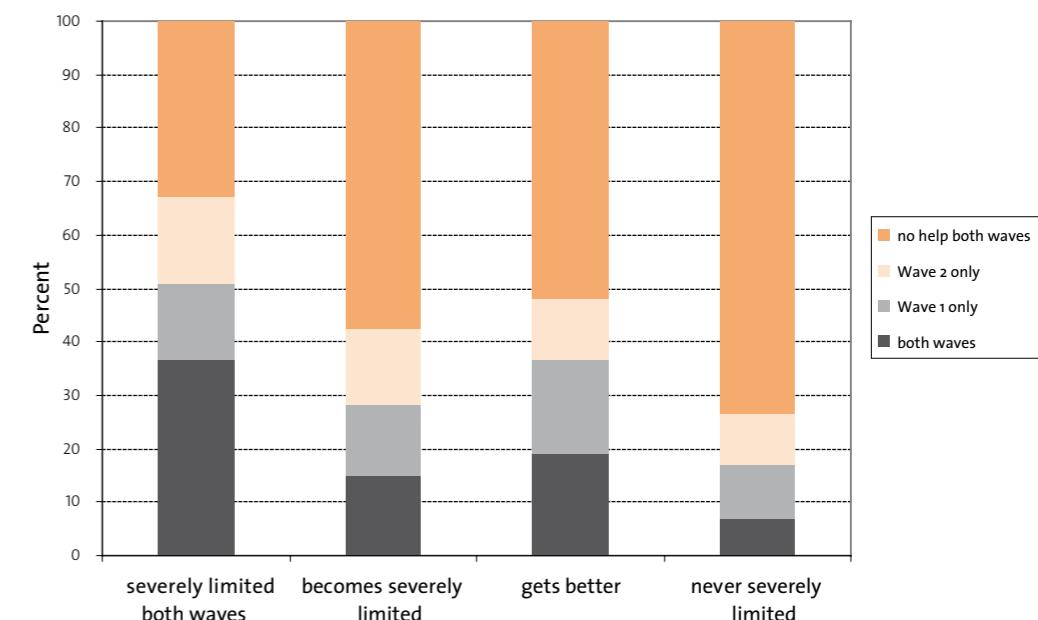
Figure 3 Changes in practical support received from outside the household by disability status

Working Together – Family and Professional Sources of Help

When the needs of older Europeans change over time, they are in part met by increased support from within the family. But how does this effect the provision of formal support services? This is a large question and one for which there has been conflicting evidence between different countries and researchers. With longitudinal data it is possible to take a tentative look at this important social policy issue. We have taken three measures of professional help – nursing care, home help and meals on wheels – and examined whether respondents received one or more of these forms of help over the two waves.

The results show that when professional help is received consistently, one third of respondents also received family help consistently and about two-thirds of respondents received family help at some point since the beginning of the SHARE survey. Conversely, among respondents who never received professional support, rates of family support were very low, again suggesting that where there are needs these tend to be met by a combination of family and professional support.

Receives professional support at both waves

■	Family support both waves
■	Family support Wave 1 only
■	Family support Wave 2 only
■	No family support

34,8%   36,2%
15,5%   13,5%

Receives professional support at Wave 1 only

■	Family support both waves
■	Family support Wave 1 only
■	Family support Wave 2 only
■	No family support

17,2%
55,3%   18,9%
8,6%

Receives professional support at Wave 2 only

■	Family support both waves
■	Family support Wave 1 only
■	Family support Wave 2 only
■	No family support

16,4%
9,8%
57,0%
16,8%

Never receives professional support

■	Family support both waves
■	Family support Wave 1 only
■	Family support Wave 2 only
■	No family support

5,8%   7,9%
8,0%
78,3%

Figure 4 *The combination of professional and family support over time*

Conclusion

This brief excursion into some of the longitudinal aspects of social support in the SHARE survey has explored how different domains in the lives of older Europeans affect their capacity to give or receive social support. The findings confirm the general trends that intergenerational family transfers and support depend on resources of the givers, needs of the receivers and closeness of the relationship (e.g., Albertini et al., 2007). The transition to retirement appears to have an impact on the amount of social support that is given to other family members, such as elderly parents or young grandchildren.

This concentration of time and energy poses some interesting questions that warrant further research. Does active ageing in the domain of family support enhance a healthy lifestyle and possibly act as a buffer against premature ageing? With future waves of SHARE

data, this question can be fully addressed. For more older retired Europeans, the onset of illness for many older Europeans is accompanied by an increase in support from their family members, in conjunction with professional services. In countries where rates of intergenerational cohabitation and proximity are high, the support given to less independent older parents is high.

With population ageing at the forefront of many policy European policy initiatives, these results provide a clear message.

- Older Europeans who are currently entering retirement play a crucial role in the domestic economy of caring and support, not only for their own family members but also for other members of their social network and indeed even in a voluntary or semi-professional capacity.
- The increased demand for carers can in part be met by recently retired persons who for the most part remain active and in good health.
- At more advanced ages however, the heavy tasks of caring that are undertaken by spouses will require a complement of more flexible quality professional services. If these services are not developed in line with increasing demand, older carers themselves risk health problems that could lead to the loss of their autonomy, thereby adding to the already increasing demand for care services.

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5.3 Changes in Financial Transfers: Do Family Events Matter?

Claudine Attias-Donfut, Jim Ogg, François-Charles Wolff

Over the last twenty years, both sociologists and economists have stressed the importance of financial transfers that flow between generations and within families. It has even been suggested that total inter vivos transfers (including material gifts) have become quantitatively more important than bequests. Empirical results from Wave 1 of SHARE have shown that financial transfers are indeed important. Among the selected countries, more than one quarter of the respondents reported making at least one gift of 250 euros or above to their family members or other members of their social networks within the last 12 months, while the rate of financial transfers received was much lower, about 4 per cent (Attias-Donfut et al., 2005; also see Albertini et al., 2007).

A challenging issue is to understand the motives for such transfers. In the economic literature, two main motives have been suggested (see Laferrère and Wolff, 2006). On the one hand, people may be altruistic and account for the well-being of the recipient. They will then give money when they have resources and when recipients are in a needy situation. On the other hand, transfers may be related to an exchange between generations. This will occur for instance if parents decide to give money to their children only when the latter provide them with services and other time transfers. Another situation is where parents make a loan to their children, for example to finance educational expenditures, and receive a repayment with additional interest once the children have grown up.

Interestingly, transfers are expected to strongly depend on the demographic and economic situation of both the recipient and the donor under altruism. Conversely, when transfers are explained by an exchange within the family, then transfers may be given independently of individual situations. Children who have benefitted from parental loans will have to honour their debt whatever their situation. The second wave of the SHARE data provides thus the unique opportunity to study how financial transfers depend on changes in the individual situation of respondents in different European countries.

A Stable Pattern of Financial Transfers

When using a panel of respondents who took part in both waves 1 and 2, we find very similar rates of transfers given over the period. The proportion of respondents having made a gift of at least 250 euros was 29.2 per cent in Wave 1, while it amounts to 30 per cent in Wave 2. Nevertheless, we also note that the range between the lowest and highest rates increased during the period, from 25.9 per cent in 2003 to 40.9 per cent in 2007.

The relative ranking of the European countries in terms of prevalence of transfers has not really changed between the two waves. On the lower part of the distribution, Spain is characterized by the lowest proportions of donors, about 12 per cent, which is 17 points of percentage less than the average rates. In a similar way, Netherlands, France and Belgium are countries with a lower than the average proportion of gifts made to others. At the top, Germany and Sweden have among the highest rankings at both waves (respectively 1st and 3rd for Germany, 2nd and 1st for Sweden). We observe more significant changes in the proportion of gifts made to others in two countries – Greece where the rate of transfer is much lower in 2007 than in 2003 (from 3rd to 7th) and Italy with an opposite pattern (from 6th to 2nd).

The situation is rather similar when turning to transfers received, although the proportion of respondents claiming the benefit of a gift from others is much lower. First, the rate of transfers received is remarkably stable over the period, 6.1 per cent in 2003 and 6.4 per cent in 2007. Second, the relative ranking in Europe of countries has not changed for almost all countries. For instance, the probability for a respondent to receive money is the highest for Greece (1st rank in both years), and Austria is in the second position in 2003 and third in 2007. In contrast, Spain, the Netherlands, France and Belgium have the fourth worst ranks over the period. Third, albeit the discrepancy remains of small magnitude, it is of interest to note that the countries with the most significant variations are Italy and Greece and that these changes – which need to be examined further in future research – go exactly in the same way as those observed with transfers given.

In the SHARE survey, respondents are asked about the main motives of the transfers. As shown in Figure 1, we note differences in the self-reported motives depending on whether transfers are received or given. When transfers are given and thus essentially benefit younger generations, respondents most often claim that their gifts are related to basic needs (between 20 and 25 per cent) or large expenditures (about 20 per cent), and to a lesser extent to family events (less than 15 per cent) and education (around 8 per cent). In about one-fourth of cases, respondents who receive money from other people quote basic needs, while the proportion of transfers related to large expenditures is much lower for those who are receiving than giving. In one-third of the cases, there is no specific reason provided by the respondent.
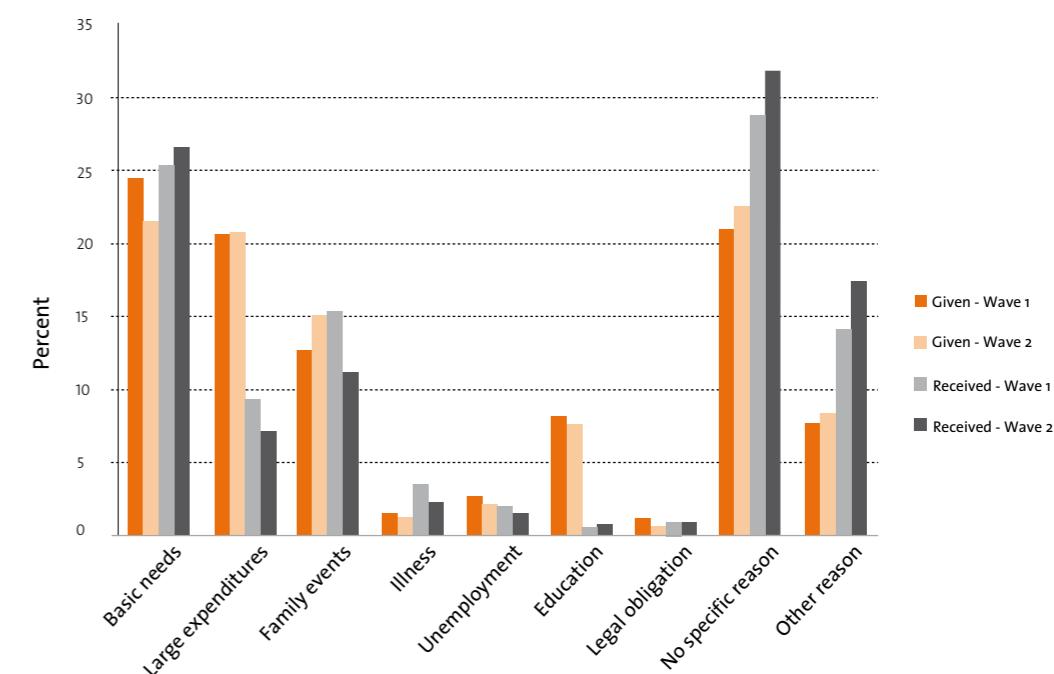
Figure 1 Self-reported motives for transfers given and received

Interestingly, as for the rates of transfers, we observe little change over the period in the pattern of self-reported motivations. Differences are not really significant for transfers received, as the proportion of recipients remains limited. Concerning transfers given, we only observe a decrease of about 3 point of percentage in the 'basic needs' explanation, while the frequency related to 'family events' is slightly higher. Events that occur later in the life cycle like marriage of children or birth of grandchildren could explain the increasing weight of the 'family' events motive.

According to the SHARE data, the bulk of transfers made to others is received by younger generations since about 7 transfers in 10 are made to children and 1 in 10 to grandchildren. Transfers made to children amount to 70.2 per cent in Wave 1 and 69.9 per cent in Wave 2, the same figures being respectively 10 per cent and 9.9 per cent for transfers to grandchildren. Data also exhibit a few differences by country. Transfers are made more often to children in Northern European countries like Sweden, Netherlands and Denmark, where more than 80 per cent of the transfers flow to children. On the opposite, in Southern European countries (Italy, Spain and Greece), the average rate of transfer to children is much lower than the average rate, but there are more gifts made to more distant family members (other than parents, siblings or children).

While the pattern of recipients is remarkably stable for almost all countries and all types of recipients, two exceptions are noteworthy. Both in France and in Switzerland, we observe a shift from transfers to children to transfers to grandchildren. In these two countries, the proportion of gifts to grandchildren increases by about 4 points of percentage from Wave 1 to Wave 2, while the proportion of transfers to children reduces by 9 points in France and 3 points in Switzerland. However, these changes remain somewhat limited. So, a first finding from the SHARE longitudinal data is that on average, there has been little change in the pattern (rates of transfers, self-reported motives, types of recipients) of private inter vivos transfers in the form of money.

Changes in Private Transfers and Family Events

Two explanations are consistent with these constant rates of transfers observed over the period with the SHARE data. While transfers may always concern the same households, it may also be that some respondents who were giving in Wave 1 are no longer giving money in Wave 2. The use of longitudinal data allows us to investigate further whether these are the same households (or not) who are involved in private transfers at both waves. Using the matched sample of respondents who took part in both waves, we construct transition matrices both for transfers given and transfers received. The results for each country are shown in Figures 2 and 3.

When taking all European countries into account, we find that 57.3 per cent of the respondents have never made any gifts to other persons. Among the 43.6 per cent who have at least given once, 38.9 per cent of them have given money both in Wave 1 and Wave 2. The proportions of respondents who have made only one transfer, either in Wave 1 or in Wave 2, is almost equally distributed between the two years (12.7 per cent in Wave 1, 13.4 per cent in Wave 2). Clearly, these are not always the same households who take part in private transfers, and it is therefore of interest to know how changes in individual characteristics may influence the decision to help others.

Nevertheless, there are large differences among the selected countries, see Figure 2. By definition, when the rate of transfers given is low, the probability not to observe any transfers over the period is much higher. It amounts for instance to nearly 80 per cent in Spain. In contrast, in countries like Germany, Sweden or Switzerland, more than half of the respondents participate at least once in such financial transfers. Another difference lies in the persistence of the transfer decision. Among those who have given money, the proportion of respondents having given money at both years is much higher in Greece (52.7 per cent) and to a lesser extent in Sweden in Germany, Sweden and Denmark. In Belgium and in the Netherlands, this proportion is lower than the average proportion (around 33 per cent instead of 39 per cent), but it is in Spain that the financial support is the more versatile.
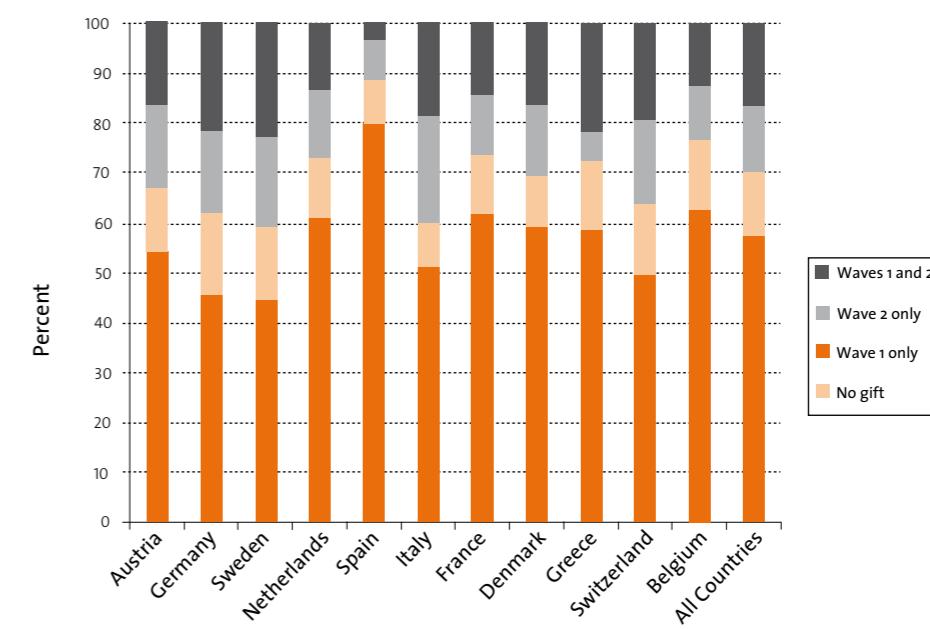
Figure 2 State dependence in transfers given, by country

We obtain very different results when turning to transfers received, see Figure 3. As we have shown that the receipt of transfer was much less frequent than the gift decision, it follows that about 9 households over 10 never benefit from a financial support (89.6 per cent). Among those who are recipients at least once, only 20 per cent of these respondents have received money both in Wave 1 and Wave 2. Again, there are large differences among the selected countries. In the Netherlands, Germany, Spain and Italy, less than 10 per cent of the recipients have been helped at both waves. Conversely, in Greece, the same proportion amounts to 46 per cent.

It is clear from our results that different factors influence the pattern of financial transfers given and received. While decisions to give money are more permanent, the benefit of transfers is certainly more related to negative shocks (like widowhood or health problems) or poor economic circumstances experienced by the households. At the same time, Greece is really an exception in this European comparison, as state dependence is much stronger in this country. An explanation could be the role of family norms of intergenerational support in Greece, so that Greek households have to care both for the younger and older family members by providing them with some money.

We finally attempt to link the changes in the provision of financial support evidenced over the period and changes in the situation of the respondent. We choose to focus on a few events that are related to various aspects of the life-cycle of the respondents, i.e. family situation, grandparenthood, health, job status, and financial situation. Before turning to the role of these events on the transfer pattern, it should be noted that some of them remain scarce. To quote a few figures, 96.3 per cent of the respondents did not change of family situations, while 0.6 per cent has been faced with a separation and 2 per cent with widowhood. In the sample, 70 per cent of the individuals have grandchildren both in Wave 1 and Wave 2, and only 4.7 per cent of them become grandparents during the period. Changes in illness concerned more than 10 per cent of the respondents, and 8.5 per cent of them become inactive. So, as transfers are themselves not so frequent (especially

gifts received), then our results have to be interpreted with caution. Our different results, both for transfers given and received, are reported in Table 1.
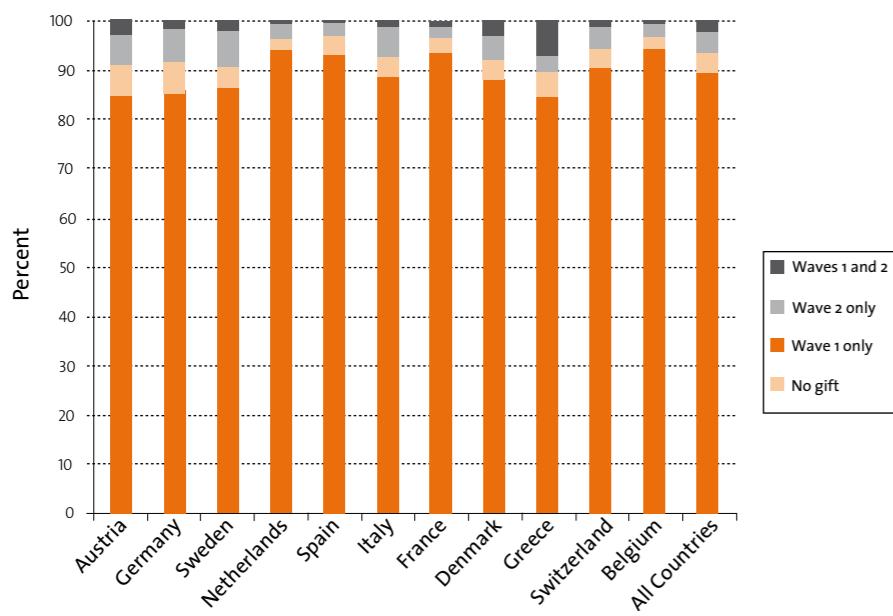
Figure 3 State dependence in transfers received, by country

Happy family events are expected to enhance the propensity to help others. The SHARE data suggest that when the respondent becomes a grandparent, she or he is more likely to make a gift to their children or the grandchildren. In this case, the proportion of those who have made a gift only in Wave 2 is 16.7 per cent, 4 points higher than when respondents have grandchildren over all the period. Negative family events should reduce the capacity of the respondent to give money. Results are not so clear here. On the one hand, those who have experienced a separation or a widowhood between the two waves have a higher propensity to receive money from others. At the same time, we also note that in such situations, the respondent is also more likely to give money. An explanation could be the duty to care for children through alimony in the case of a divorce. Concerning widowhood, the surviving spouse will certainly inherit part of the spousal wealth.

Curiously, we observe little effect of transfers received on changes in health, although those who become disabled or in poor health should a priori be in a more needy position. This finding stems in fact from the trade-off between financial and time transfers. As shown in Attias-Donfut et al., (2005), upstream transfers related to old-age care mainly occur through the provision of time-related services. Our results thus do not indicate that there will be no family support to disabled older persons, but instead that this support will not take a financial form. At the same time, it is important to note that at this stage in the analysis we have not examined respondents who entered into residential or other care homes between waves 1 and 2. Older people who receive formal care are much more likely to receive financial transfers to pay for this care.

Concerning transfers given, Table 1 shows that respondents who become disabled or report a long term illness during the period are more likely to give money in Wave 2 only,

although the differences remain limited. As illness is strongly related to the receipt of informal support (in particular from children), it is plausible to explain these transfers as exchange-motivated, where respondents pay for the services provided by their children.

Variables	Transfers given				Transfers received				in %
	Never	in W1 only	in W2 only	in W1 and W2	Never	in W1 only	in W2 only	in W1 and W2	
Family situation									
New Couple	51.9	17.6	13.0	17.6	91.6	0.8	6.1	1.5	1.2
Separated	61.5	12.3	15.4	10.8	81.5	7.7	9.2	1.5	0.6
Widowed	61.3	11.7	14.4	12.6	90.2	3.1	5.8	0.9	2.0
No change	57.4	12.6	13.3	16.7	89.6	4.1	4.2	2.1	96.3
Grandparent									
Never	48.5	14.5	14.7	22.3	86.8	5.6	4.8	2.7	24.7
In Wave 2 only	47.6	12.6	16.7	23.2	89.6	3.4	4.7	2.4	4.7
In both waves	61.2	12.0	12.7	14.2	90.6	3.5	4.1	1.8	70.6
Become long term ill									
No	57.2	12.8	13.0	17.0	89.5	4.1	4.3	2.2	88.2
Yes	58.9	11.8	15.8	13.5	90.7	3.9	4.3	1.2	11.8
Become disabled									
No	57.4	12.7	13.1	16.9	89.4	4.1	4.3	2.2	86.5
Yes	57.3	12.7	15.2	14.8	90.8	3.8	4.0	1.4	13.5
Job change									
Had a change	65.2	12.6	11.0	11.2	86.4	5.7	6.0	2.0	9.8
No change	56.6	12.7	13.5	17.2	90.0	3.7	4.1	2.2	81.7
Active to inactive	55.7	12.8	15.0	16.5	89.2	5.3	4.5	1.0	8.5
Deterioration in financial situation									
No	57.1	12.2	13.5	17.2	89.5	4.2	4.2	2.2	80.3
Yes	58.6	14.4	12.7	14.3	90.1	3.3	4.9	1.7	19.7
All	57.4	12.7	13.4	16.6	89.6	4.0	4.3	2.1	–

Table 1 Changes in individual situation and financial transfer given

It is difficult a priori to know how the transition from activity to retirement will influence the pattern of private transfers. Since the amount of pension is lower than the earnings under activity, this could negatively influence the decision to help others. On the other hand, people sometimes receive lump sums when retiring. They also have more leisure time to devote to their family, which could increase the opportunity to give money. According to the data, the transition from activity to inactivity is more often accompanied by an increase in the provision of financial support to others. Nonetheless, as for other life events, changes in the private support remains of low magnitude.

Finally, the situation is more clear when taking economic considerations into account, measured here through a self-reported question on financial situation. When respondents benefit from additional resources, they should be able to give more money to others. We find that households whose situation has deteriorated over the period are significantly less

likely to make a transfer in Wave 2. The proportion of those having given money in Wave 2 only or both in Wave 1 and Wave 2 amounts to 30.7 per cent when the respondent reports no deterioration in their financial situation, while the same figure is only 27 per cent otherwise. Additional results show a slight increase in the financial support received when the respondent reports having fallen into poverty over the period.

As they stand, our results show some influence of the changes in the respondent's individual situation on the pattern of financial transfers in Europe. The family situation, demographic events, health as well as economic resources affect the propensity both to give and receive money, although the SHARE data evidence a limited role for all these factors. Several concerns have to be kept in mind when interpreting these results.

First, we have examined changes in transfers during a short period of time. Decisions to give money remain rather infrequent, and the transfers that are recorded in the survey are only recorded in the time period between the two waves. Second, we only focus on the propensity to give or to receive money and not on the amounts transferrred. We chose to do that as amounts are much more subject to measurement errors and transitions are much more difficult to study. Of course, it is very likely that family events will also influence the amount of transfers given (or received). Nevertheless, such changes in family support remain difficult to observe in such a short space of time. For instance, a respondent could decide to help each year a child with a limited amount of money, or to postpone her transfer decision during a few years and then make only once a large gift. Clearly, depending on how transfers are measured in the survey, this could have an impact on our interpretation of the results.

Finally, we have only taken into account here the situation of the respondent. The theorerical models of private transfers have shown that transfers were expected to dependent not only on the characteristics of the donor, but also on the characteristics of the receiver. While our results suggest that the situation of the recipient is not so important when explaining financial transfers received by older respondents, other studies have reached different conclusions when considering transfers from older adults to younger generations. Financial gifts made to young adults, for example, are most often devoted to those with low incomes, unemployed, or still in education.

Conclusion

These first results from the SHARE longitudinal data on financial transfers point to a number of preliminary findings as well as areas for future research. First, the robustness of the data is confirmed, since overall rates of financial transfers given and received do not vary much between the two waves.

- Older Europeans continue to make gifts of money to their social network as they are ageing. This suggests the high degree of stability in the frequency of transfers.
- Only among very old Europeans is the likelihood of making a financial transfer decreasing .
- Important events in family life do matter, as can be seen not only from the explicit motives for making a financial transfer, but also by the events that occur over time to both older Europeans and their family.
- Older Europeans respond both to crises within the family as well as to 'happy' events, such as the arrival of a grandchild.

In this volume's Chapter 5.2 on social support, it was found that the passage to retirement appears to have a positive impact on the amount of time transfers given to other family members. The importance of retirement is also made evident in transfers of money.

- The move into retirement does not diminish the likelihood of making a gift of money, but on the contrary, the overall trend is rather an increase. Altruistic motives may be at work, especially if retirement is accompagnied by one-off lump sum payments from previous employers or insurance policies.
- Many older Europeans contribute in important ways to domestic economics. These first results suggest that their withdrawal from the labour force does not imply a withdrawal from economic processes. Further research needs to be undertaken on the impact of retirement for social and financial support within the family.

These findings have consequences for social policies, in so far as the flow of financial transfers to younger family members depends upon retirees having an adequate income. Pensions of course have a clear role in this domain, and it may be that a significant part of downward financial transfers can be explained by relatively high levels of retirement income. But leaving aside this complex process and the social policy implications of pensions being used to help younger as well as older family members, the SHARE data provide evidence of how families continue to respond to different life events, both 'happy' events and crises. These transfers represent an important financial sum and should not be ignored in the development of policy measures concerning the income and resources of older Europeans.

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5.4 Social Productivity and Quality of Life – First Prospective Findings

Morten Wahrendorf, Olaf von dem Knesebeck, Johannes Siegrist

An important facet of the demographic changes in Europe is the rapid increase of life expectancy in the older age groups during the last century. In 2002, according to Eurostat a 60 year old man in the EU-25 can expect to live for another 20 years, a woman for 24 years (Commission of the European Communities 2005). In consequence, a new stage of the life course has emerged during the last decades, situated between labour market exit at one end and the onset of physical dependency at the other end: the third age (Laslett, 1996). Compared to former generations this stage of life is characterized by reasonable health status and by increased personal freedom. This has led to wide interest in studying this stage of life and to understand which aspects are important to guarantee well-being and quality of life of older people. From a sociological perspective, beside demographic and socioeconomic conditions, one aspect is of particular interest: productive activities, defined as activities that produce goods or services. A large number of studies could demonstrate that participation in such activities promotes health and well-being in older age (Bath and Deeg, 2005; Mendes de Leon, 2005). Yet, the complex association between productive activities and well-being is still relatively unexplored. In particular, results from former studies are difficult to compare, as a homogenous definition and measure of productive activities is missing that allows disentangling different forms of productive activities together with specific characteristics.

Against this background, using data of the SHARE study, conditions of quality of life in older age are studied across 14 European countries. In particular, in addition to demographic and socioeconomic conditions, we explore how three types of socially productive activities (productive activities performed in a social context) are related to quality of life in older age. As for most countries (11 countries) data from two waves are now available, we study effects of productive activities on prospective quality of life. Moreover, effects of changes in social productivity on quality of life are analyzed. Three questions are addressed:

- How is quality of life in early old age distributed in the countries under study?
- How are demographic and socioeconomic conditions associated to quality of life in older age?
- How is social productivity associated to quality of life in older age?

Measuring Quality of Life in Older Age and its Determinants

One of the innovations of SHARE is the inclusion of a newly developed measure of quality of life in early old age, the CASP-12 questionnaire. The CASP-12 questionnaire represents a psychometrically validated short version of the original 19 item version (CASP-19) (Hyde et al., 2003). It identifies those aspects of quality of life that are thought to be specific to early old age. In this perspective, quality of life refers to four conceptual domains of individual needs that are particularly relevant in early old age: control (C), autonomy (A), self-realization (S), and pleasure (P). Items measuring the four respective scales assess the degree to which these aspects are perceived as being satisfied on a four-point Likert scale. The first letter of each domain and its 12 items create the acronym CASP-12 that names the measure. Psychometric properties of CASP-19 are fully described elsewhere

(Hyde et al., 2003). A summary measure of the 12 items is used to assess quality of life in this study where the total sum score ranges from 12 to 48, with higher scores indicating better well being.

As demographic and socioeconomic measures, we include age and gender, as well as income and education in the analyses. Income information is based on the total annual household income composed of the sum of different income components assessed in the questionnaire, which we adjusted for household size and categorised into country specific tertiles. Education is measured according to the International Standard Classification of Educational Degrees (ISCED-97) that we categorised into 'low education' (pre-primary, primary or lower secondary education), 'medium education' (secondary or post-secondary education), and 'high education' (first and second stage of tertiary education). Three different types of social productivity are included: 1. doing voluntary or charity work (voluntary work), 2. caring for a sick or disabled adult (care for a person) and 3. providing help to family, friends or neighbors (informal help). Respondents were asked for each activity whether or not they were involved during the last month.

The analyses are based on release 2.0.1 data of Wave 1 and preliminary data of the second wave (release 0) of the SHARE study. To explore effects on prospective quality of life the analyses are limited to the longitudinal data. In the results, we present findings from bivariate analyses and also discuss additional results derived from multivariate analyses.
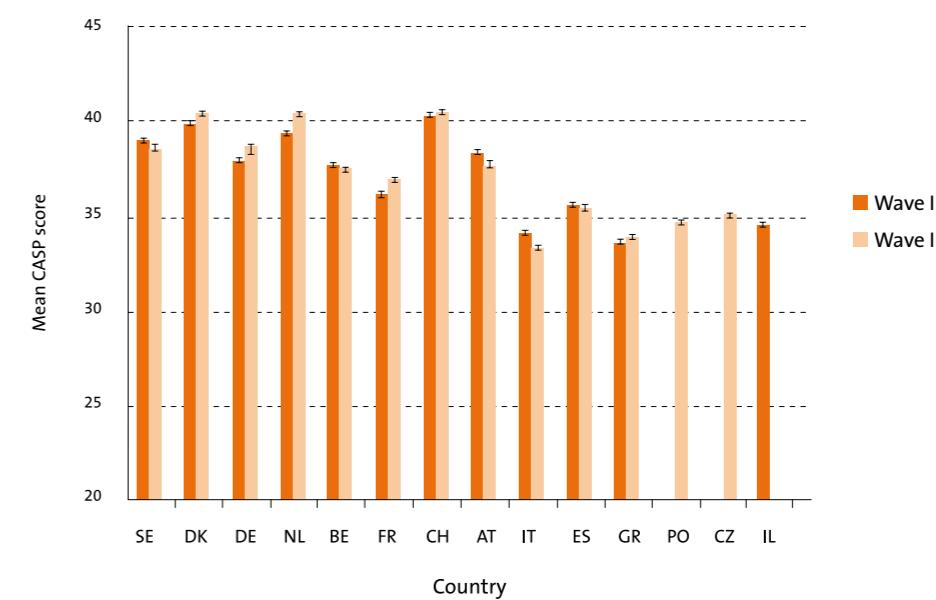
Figure 1 Quality of life across SHARE countries (mean scores of CASP-12 (range 12-48) and standard errors) in Wave 1 and Wave 2

Quality of Life within the SHARE Sample

An answer to the first question of whether quality of life varies between the different countries within SHARE is given in Figure 1. It presents mean CASP scores for both waves across the countries under study. As can be seen, in both waves quality of life scores are comparatively low in Greece, Italy, and Spain and comparatively high in Switzerland, the Netherlands and Denmark. Moreover, there are no substantial changes in quality of life from Wave 1 to Wave 2. These results confirm former results showing a north-south gradient (Knesebeck et al., 2007). However, together with the findings from the two Eastern countries of Wave 2, the North-South distribution must be supplemented by a West-East gradient, with lower levels in the Eastern countries. In the following analyses, we categorize the countries into four European regions, the Northern countries (Sweden, Denmark, the Netherlands), the Western countries (Belgium, France, Germany, Austria, Switzerland), the Southern countries (Spain, Greece, Italy) and Eastern countries (Poland, Czech Republic).

Quality of Life According to Demographic and Socioeconomic Conditions
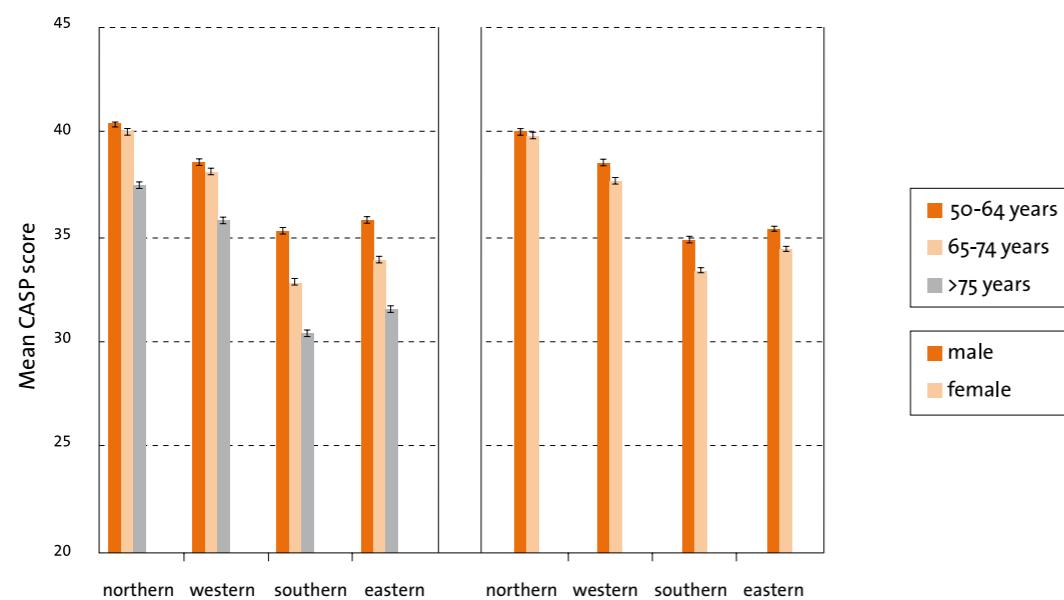
Figure 2 Quality of life (mean scores of CASP-12 (range 12-48) and standard errors) according to age and gender

The second question of interest is whether quality of life varies within the countries under study according to demographic and socio-economic factors. To answer this question we compared mean scores of quality of life in Wave 2 according to demographic, see Figure 2, and socioeconomic, see Figure 3, characteristics. With regard to gender, we find that differences in quality of life are small in most, with largest differences in the Southern countries. With respect to age, we observe lower mean scores, the older the respondents are. However, for the Northern and Western countries differences between the two youngest age-groups are relatively small. Moreover, we explored socio-economic differences in quality of life. Note that socio-economic predictors were taken from Wave 1, whereas for the Eastern countries information on education and income were based on second wave data. For both socio-economic indicators we observe a clear social gradient. People with higher education and higher income report a better quality of life. These findings hold true for all countries under study.
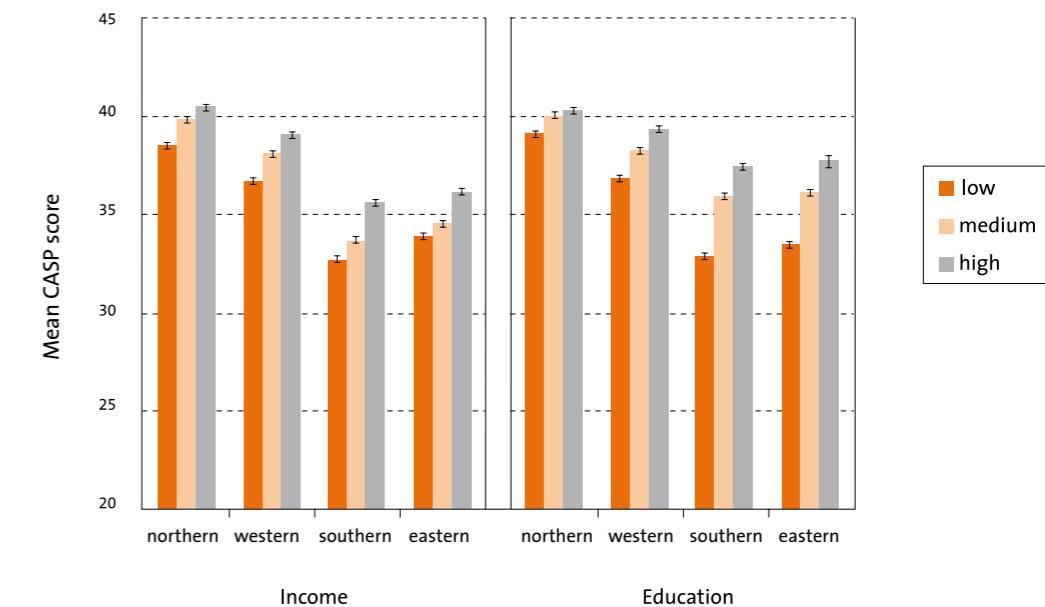
Figure 3 Quality of life (mean scores of CASP-12 (range 12-48) and standard errors) according income and education in Wave 1 (for Eastern countries taken from Wave 2)

Quality of Life According to Social Productivity

To explore the third question, that is the relationship between social productivity and quality of life, we present the CASP mean scores in Wave 2 according to activity status in Wave 1, see Figure 4.
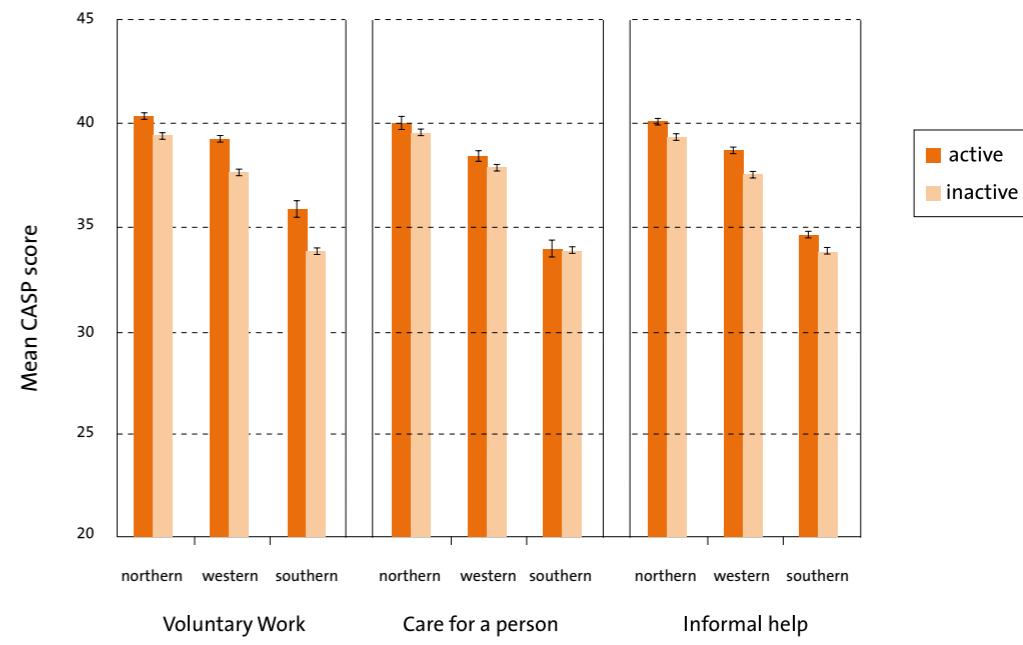
Figure 4 Quality of life (mean scores of CASP-12 (range 12-48) and standard errors) according to social productivity in Wave 1

Social productivity is apparently associated with higher quality of life in Wave 2 across the countries under study. Differences between active and inactive people appear largest for voluntary work, followed by informal help. With respect to caring for a person, no marked differences are found.

Further multivariate analysed were conducted to test whether quality of life varies according to socio-economic conditions, as well as activity status in Wave 1 (results not shown). In these models all explanatory variables were taken from Wave 1 as well as prior level of quality of life to predict quality of life in Wave 2. Again, both indicators of socio-economic position were significantly related with quality of life in Wave 2. Additionally, results for social productivity remain stable: People volunteering in Wave 1 report better quality of life in Wave 2. Results were less consistent in case of informal help (significant on a 10 per cent level) and absent for the care for a person.

Does quitting or taking up an activity affect changes in quality of life? A first answer to this question is given in Figure 5 reporting mean differences of CASP scores between Wave 1 and Wave 2.
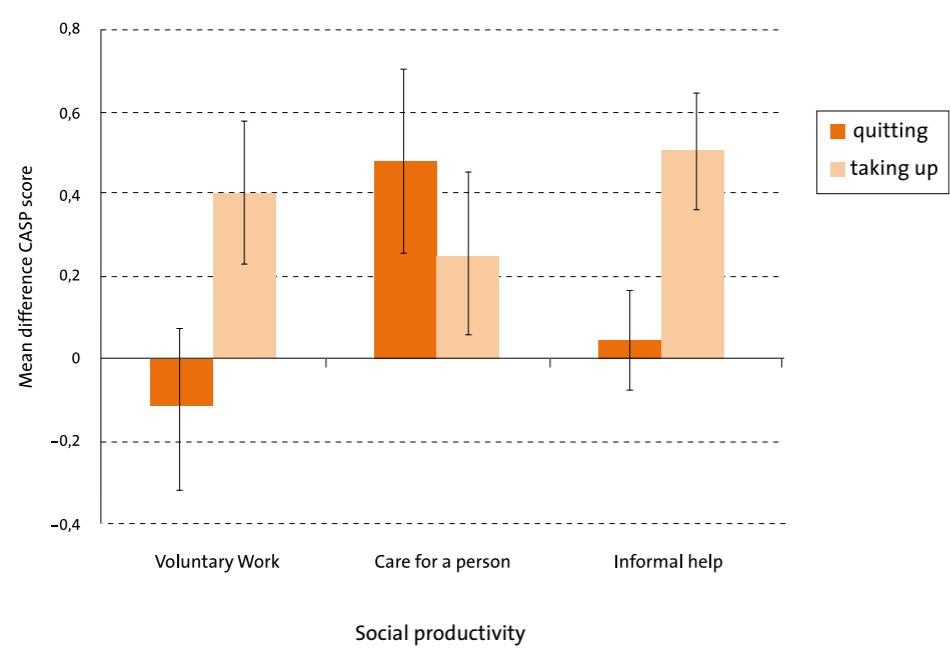
Figure 5 Changes in quality of life (mean differences CASP score and standard errors) according to dynamics of social productivity between Wave 1 and Wave 2 (all countries)

As can be seen, people who stopped volunteering between the two waves show a slight decrease of quality of life, whereas those who start volunteering exhibit an increase in quality of life. Interestingly, quitting care giving is associated with an increase. With respect to informal help, those who start with an activity exhibit an increase in quality of life. Additional support for these findings was again found in multivariate analyses (results not shown).

Conclusion

This chapter uses available data from 14 European countries of the first two waves from the SHARE study to explore conditions of quality of life in older age. Beside demographic and socioeconomic variations, we were particularly interested, how investments in three types of socially productive activities were associated with prospective quality of life. Moreover, changes of quality of life are analyzed according to dynamics in social productivity. As an indicator of quality of life, we used the CASP-12 questionnaire.

While no substantial variations between the waves were found, we observe clear variations of quality of life across the countries under study. At first, a clear North-South gradient was found where quality of life was higher in Northern countries and lower in Southern countries. Moreover, we found an indication of an East-West gradient, with lower quality of life in the Eastern countries (Czech Republic and Poland). With respect to age, in countries with relative high quality of life differences are relatively small up to the age of 75 years, whereas a constant decline goes along with age in Southern and Eastern countries. In all countries under study a low level of education and a low level of income were found to be related to lower prospective quality of life. Results concerning the three types of socially productive activities confirm findings of former analyses (Wahrendorf et al., 2006). As previously documented associations were strongest in case of volunteering, less consistent in case of informal help and absent for the care for a person. In addition with respect to dynamics of social productivity the present findings indicate that taking up voluntary work or informal help between the two waves leads to an increase of quality of life. Moreover, withdrawing from voluntary work was related to lower quality of life. Interestingly, people who gave up caregiving between the two waves showed increased quality of life in Wave 2. All results could be confirmed using regression analyses which controlled for important confounders including prior level of quality of life.

Key Findings

- Quality of life varies considerably across European countries: We found relatively high levels in the Northern and Western European countries and relatively low levels in Southern and Eastern European countries.
- Quality of life is strongly associated with education and income: Low income and low level of education are related to lower prospective quality of life.
- Associations between social productivity and quality of life vary according to type of the activity: Associations were strongest in case of volunteering, less consistent in case of informal help and absent for the care for a person.

Our results support the notion that engaging in socially productive activities is beneficial for well-being in older age, in particular if voluntary investments are provided. Moreover, our results highlight the importance of analyzing changes in activity over time as these were shown to have direct effects on well-being.

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5.5 Informal Care and Labour Force Participation: The Economics of Family Networks

Lisa Callegaro, Giacomo Pasini

An aging society raises the problem of long term care for older individuals. In many European countries such a burden lies on family members, in particular on adult female children: informal care is widely spread and formal state-provided care is not a perfect substitute for it. Bonsang (2008), using data from the first wave of SHARE found that the receipt of paid help and informal care are interrelated, but that this relation holds only for certain types of formal care and changes along a North-South gradient. Such a result underlines that while individual choice to provide informal care and household spending on formal care are correlated, it is not clear whether they are complements or substitutes. This might be due to the institutional setup – i.e. on the health care system and on the incentives to provide informal care – but also to cultural differences. Reher (1998) underlines that what drives differences in time spent caring between Continental and Mediterranean Europe are cultural attitudes towards family ties. Informal care choices have an impact on parents' well-being, but also on labour force decisions of individuals: based on SHARE, Crespo (2006) finds that labour force participation is significantly reduced if individuals have to care for their parents. Thus, cost and effectiveness of formal care as well as labour force participation policies depend crucially on the decision mechanism behind informal care provision. Pezzin and Steinberg Schone (1999) as well as Callegaro and Pasini (2007) found that adult children behave strategically when facing a caring decision: each child chooses how much to care, taking into account its siblings' choices.

The next Section outlines the main implications of a game theoretical approach to informal care provision. Section 2 provides an overview on institutional differences across Europe with regard to long term care. Section 3 describes the children dataset obtained from the second wave of SHARE; Section 4 is devoted to the analysis of cross-Sectional evidence and cross-country comparison of informal care, while Section 5 exploits the longitudinal dimension of the survey. Conclusions are made in the last Section.

A Game Theoretic Framework

Informal care involves a decision on how to allocate time, which is a scarce resource. Callegaro and Pasini (2007) develop a game theoretic framework in which adult children allocate their time to work and care simultaneously, taking into account siblings' choices. Total care provided to parents is a public good within the family; it is made up of formal care bought by parents and care provided by each child. Children's satisfaction depends on their consumption and on parents' well-being: since the available time for caring or working is finite, they face a trade-off between going to work and thus increasing disposable income, and helping their parents. Such a choice depends on the wage each individual can obtain on the labour market, on material costs of caring (e.g. transportation costs), on price and availability of formal care, but also on brothers' and sisters' choices. If individuals are purely altruistic, help provided by siblings is a potential substitute for individual help: ceteris paribus, given the total amount of care the more other siblings help, the lower will be individual help provision. In other words children behave strategically: they coordinate and those for whom care provision is cheaper reduce time spent working in favour of time spent caring. Children may behave differently if they compete for a reward. Suppose a parent commits himself to split the future bequest among his siblings proportionally to

the relative amount of care provided by each child. In this case in order not to reduce the future transfer, the more other siblings help, the higher is individual provision. This is the strategic bequest described by Bernheim et al. (1985), which has been directly tested by Angelini (2007) on SHARE data. The author finds that the number of contacts between parents and children increases if there is a bequest to compete for. Such a result does not hold for care provision: the altruistic motive dominates the strategic bequest one.

Long Term Care Across Europe

As we already stated in the introduction, there is a great heterogeneity among European countries as regards long term care. Institutions can directly provide services and benefits to the elderly or sick individuals, but they can also induce informal care provision by means of incentives to family members. Long-term care is provided by different institutions: national government, local administrations, regional health care offices or health insurers. Services and benefits vary as well: Table 1 summarizes them.

Countries	Benefit for sick and/or elderly			Benefit for family carers		
	monetary transfer	domestic care	nursing homes	leave of absence	monetary transfer	tax allowance
Sweden	yes	yes	yes		yes	
Denmark		yes	yes		wage compensation	
Germany	yes	yes	yes			
Netherlands	means tested	yes	yes			
Belgium	means tested	yes				
France	yes		yes			
Switzerland	means tested	yes	yes		wage compensation	
Austria	yes	yes	yes			
Italy		partial	yes	yes		
Spain	yes	yes		yes		
Greece	yes	yes	yes			yes
Poland	yes	yes	yes		yes	
Czech Republic	yes	yes	yes		means tested	
Israel	yes	yes	yes	yes	indirect support	yes

Table 1 Long-term care across SHARE countries

Source: MISSOC tables for EU countries, national SHARE team for Israel

Benefits towards the elderly are quite widespread. Monetary transfers, either means-tested or not are present in 12 countries out of 14. We divide services in two broad categories: nursing homes and formal care. The latter accounts for any kind of service the elder receives at home: nursing, personal care, housekeeping, meals on wheels and so on.

Some European institutions recognize the role of adult children or other family members in the provision of care. Incentives to provide informal care tackle the trade off between time spent caring and time spent working with wage compensations, monetary transfers or allowing (non-paid) leaves of absence.

Sample

Two main implications result from the theory outlined in Section 1. First, labour force participation and informal care decisions are simultaneous and should be studied jointly. Second, children behave strategically: other siblings' choices matter on individual decisions. In order to verify them we extract a children file from SHARE 2006 data. The survey has information on three generations: the respondents, their parents and their children. Health status is available only for the respondents, thus selecting only their children dataset allows us to control for parents' health measures. This choice could lead to a distortion: the sampling is based on the respondents and it is not given that our dataset is representative of their siblings' population. In particular, treating respondents only as parents returns us a sample on average younger than the population we want to do inference on. In a similar setting Crespo (2006) shows this is not a problem. Moreover, we want to put ourselves in a "worst case scenario": care needs from parents are likely to be increasing with age, thus finding evidence on younger children, suggests that we can safely expect to obtain the same or even stronger evidence on an older children sample.

Observations came from families with at least two siblings. We include at most the older four children of each family since we do not have information on labour force participation of younger siblings. We exclude as well households with co-residing children: we consider living arrangement decisions as predetermined: this is equivalent to assume that the game described in Section 1 takes place only among non co-residing children. The motivation for such a choice is that adult children living with their parents are likely to share their labour income and living costs, thus some determinants of their caring choices are not directly comparable with siblings living outside their parents' house. Living arrangement decisions have been studied among others by Alessie et al. (2006) and are beyond the scope of the present paper.

We end up with a sample of 25,319 adult children, with a country size ranging between 927 of Spain and 2746 of Sweden. Mean age is around 40 throughout Europe, and the sample is almost equally split between men and women. Labour force participation rate is well above 70 per cent, but the percentage of people working part time and full time varies across countries: part time workers in the Netherlands are 20.4 per cent of the whole sample, while they are less than 3 per cent in Spain, but the overall labour force participation rate is similar in those countries.

The 'social support' module of SHARE asks about three types of help received from each child since the previous interview: personal care, help in housekeeping and paperwork. We rescale each type of help in order to be measured in hours per week and then aggregate them in a unique "hours of informal care" measure.

Probability of Helping and Hours of Help: Differences Among Countries

Figure 1 reports the proportion of children providing help and the average number of hours per week provided by each child. Germany, Greece and Czech Republic are the countries with the highest proportion of children helping (left panel). Czech Republic fraction in particular is remarkably higher than the rest of SHARE countries. This rate is in line with other surveys run in the same country: a substantial amount of care within the family is traditionally expected and delivered in this country. Moreover, institutional changes occurring in a coutry that undergoes transition are demanding in terms of cognitive ability and paperwork, therefore parents might ask their children for extra help in this respect. Turning to the intensive margin of help, i.e. to the number of hours spent providing infor-

mal care, a clear North-South gradient arises: this is consistent with the sociological literature (see as an example Reher, 1998): family ties are stronger in Mediterranean countries, and they induce adult children to think to formal care as something to avoid as long as family members are able to help for their elderly relatives.

Both panels of Figure 1 reflect substantial cross-country heterogeneity. Cultural differences explain part of it, but individual choices are likely to depend on differences in institutional long term care systems as well. The two effects are difficult to disentangle: costs for nursing homes and professional in-house services, but also the strength of family ties, increase along a North South gradient.
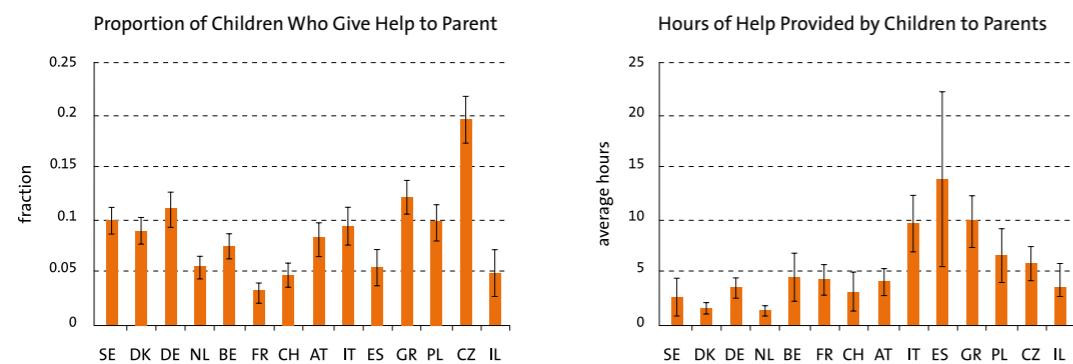
Figure 1 Informal care provision: the choice of help. Weighted observations

Labour Force Participation and Caring Choices Are Simultaneous

Informal care provision and labour force participation are simultaneous choices: Figure 2 reports the fraction of people helping conditional on labour force participation. Again, there is stark cross-country heterogeneity: Greece, Sweden and Denmark exhibit a weak dependence, while in many other countries workers provide significantly less care. Comparing Sweden and Denmark on one side with Spain and Italy on the other, this is consistent with evidence in Figure 1: in Mediterranean countries those who decide to help spend a large fraction of their time on this activity, while in Northern Europe children are able to work full time and provide 3-4 hours of care per week. Nevertheless, results are affected by poor significance due to the small sample size. We do not investigate further the simultaneous choices of hours of work and informal care provision based on a multivariate analysis since the focus here is on the strategic behaviour of siblings.
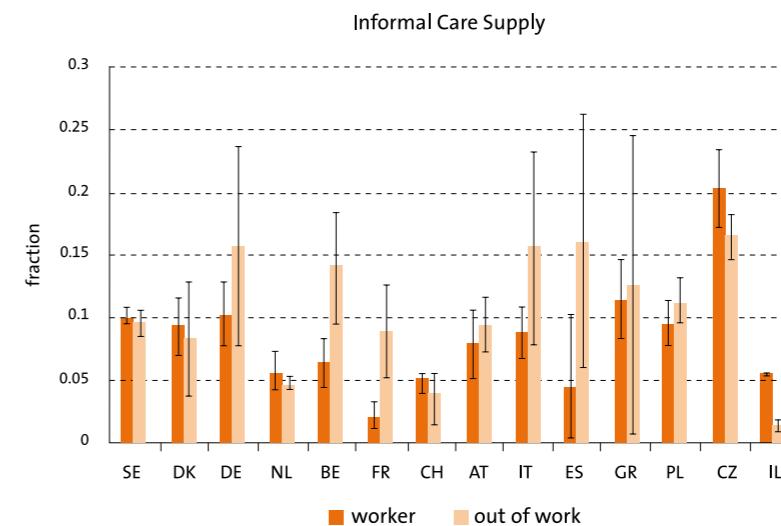
Figure 2 The choice of help conditional on labour force participation decision. Weighted observations

The More Other Siblings Help, the Lower Is Individual Help Provision

The second testable implication from the theory is that children choose strategically: the probability of helping depends on the number of siblings providing care. In Figure 3 we restrict to households where at least one child helps: the dark bar is the unconditional probability of helping. The lighter bar is the same probability given that at least two siblings in the family provide help. The presence of other children providing care reduces the probability of helping. While consistent with the altruistic motive of caring outlined in Section 1, this results do not rule out strategic bequest á la Bernheim et al., Nevertheless, it tells us that if there is competition for a bequest, it's effect on individual choices is dominated by altruism.
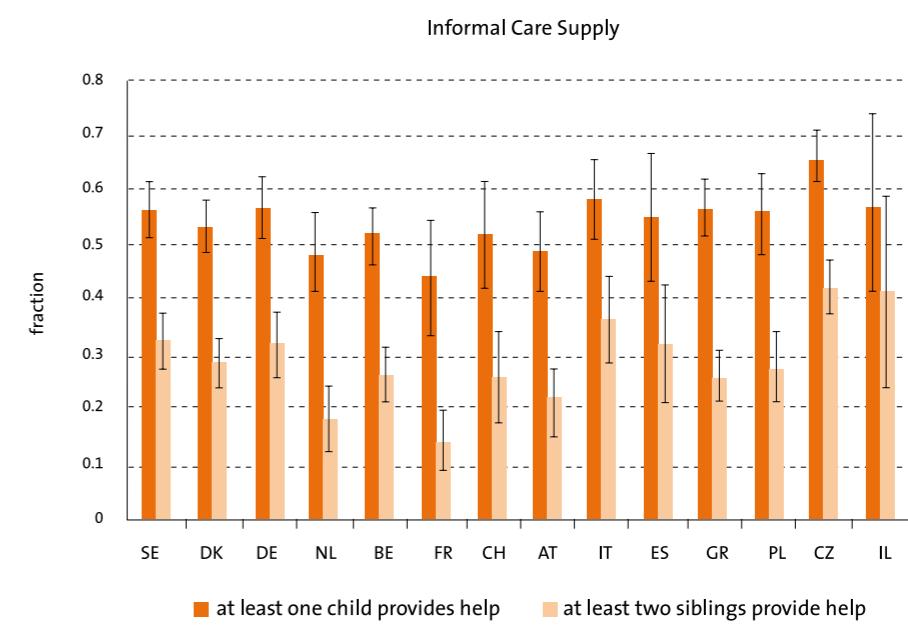
Figure 3 Interactions among siblings: probability of caring. Weighted observations

Figure 4 reports the total (left panel) and per capita (right panel) hours of help provided by children conditional on the number of brother and sisters helping. As in Figure 3, the dark bar refers to households where just one child helps, the lighter one to households where at least two children provide care. Results are in line with the implications of the game theoretic model of Section one: total amount of care do not change or increases if there is more than one child providing help, and the burden of each carer is reduced. Again, this is consistent with the altruistic motive: hours of care provided by each child are substitute.

■ only one child provides help   ■ at least two children provide help
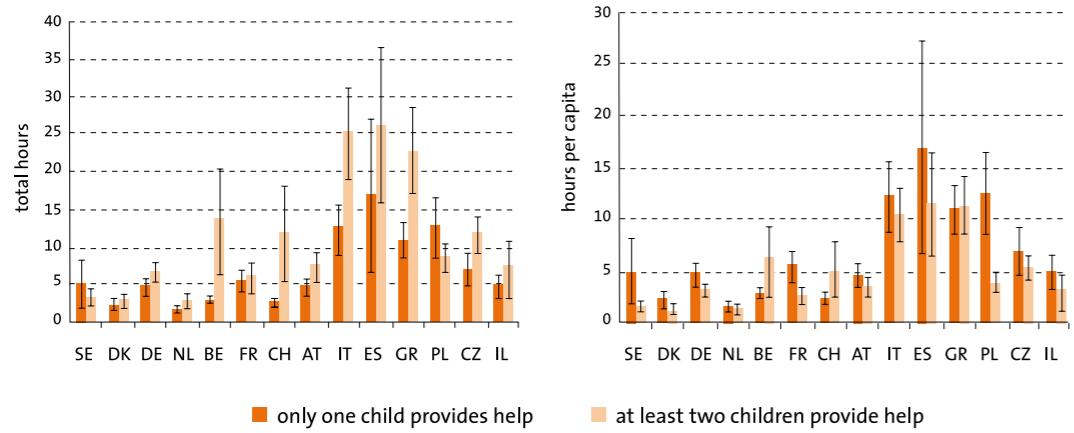
Figure 4 Interactions among siblings: hours of care provision

Parents' Health Worsening and Informal Care Supply in a Longitudinal Analysis

By now we focused on the second wave of SHARE. In order to exploit the effect of parents' health on informal care provision decisions, we exploit the panel structure of the survey. The probability that at least one child in the family provides help (phelp) depends on the health status of the parents, but also on how their conditions evolve along time. Therefore, we restrict to the panel sample and we run a probit regression of phelp in 2006 on the health status in 2004, measured as the number of limitations in ADL (activities of daily living), on health worsening, i.e. on the difference between ADL limitations in 2006 and 2004, and on a number of controls. Marginal effects are reported in Figure 5: every limitation in ADL in 2004 augment the probability of helping by 4.7 per cent, while every additional limitation appearing between waves raises phelp by 3.4 per cent. The interaction between the two is negative, though not statistically significant: thus as we expected the worse the starting health conditions of the parents, the less relevant is the dynamic term.
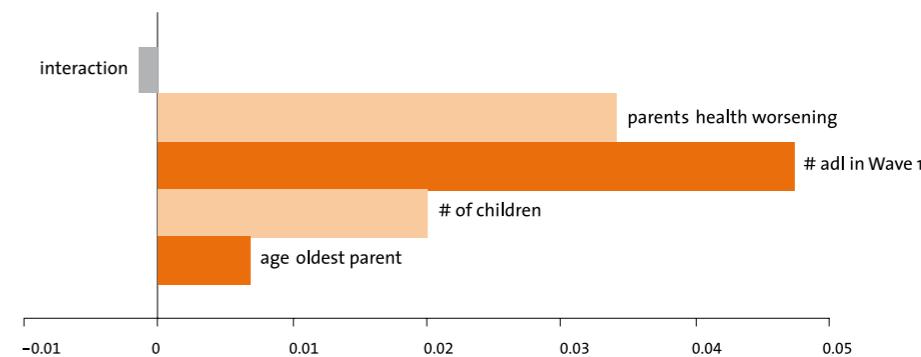
Figure 5 The choice of help in a multivariate analysis

Conclusion

We analysed the determinants of adult children choice to provide care to their parents.

- First, we found that children choose simultaneously how much time to spend working and caring. Such a result has important policy implications: as an example, a public intervention in favour of female labour market participation is likely to reduce the amount of care provided to elderly people, thus from a global perspective it may not be welfare enhancing.
- Other siblings' help reduce each child propensity to provide care. With respect to care provision the altruistic motive dominates the strategic bequest one. From a policy point of view, such a result has two implications. First, any targeted intervention on wages or informal care provision of a particular group of citizens is likely to have an impact on the whole population via this substitution effect. Second, changing the laws ruling bequests – in particular sharing of it among direct inheritors – has little effect on care provision.

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6 Work and Retirement

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6.1 Exits From the Labour Force

Agar Brugiavini, Giacomo Pasini, Franco Peracchi

This section describes the labour market activity of the elderly in the SHARE sample using both the cross-sectional and the longitudinal dimension of the survey. Although increasing the working lives of current and future cohorts is a priority in the European agenda, it is not entirely clear yet how retirement decisions are affected by the institutional setup in the different countries, in particular by social security and pension arrangements. In fact, while the available evidence suggests a direct relation between "unused labour capacity" and the incentives to retire early embedded in the social security and pension system (Gruber and Wise, 1999, 2004), other determinants of early retirement should also be considered, such as the health status of an individual. Because of its design, SHARE is especially suited to shed light on these issues.

Labour Force Participation in the 2006 Sample

Our analysis is 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". The question about labour market status is asked to all age-eligible individuals (including the first respondent's spouse, irrespective of age).

Figure 1 presents the fraction of respondents aged 50+ who report themselves in the labour force (working or unemployed), retired or disabled, or in other conditions (homemaker and "other" in the original classification). A first striking result of Figure 1 is that in Austria, Italy and Poland, the fraction of retired men is much higher than in the other countries (above 60%). Overall, the percentage of people in the labour force is high in Sweden, Denmark, Switzerland and Czech Republic. As for gender differences, a general pattern is that the fraction of people who report to be in the labour force (employed or unemployed) is always higher for men than for women. This is partly true also for self-reported retired, although there are several exceptions. In Sweden, Denmark, Germany and Israel, for example, the differences by gender in the fraction of retirees are barely statistically significant, while in Poland and the Czech Republic the fraction of retired women is higher than that of retired men. The "other" category is especially important for women in Mediterranean countries (Italy, Spain, Greece) and in the Netherlands. In these countries, the "other" category contains a substantial fraction of women who report themselves as "homemaker" and have had limited or no labour market experience during their lifetime. These differences in labour market status across countries are likely to arise from differences in institutions and social norms.

Figure 2 presents the employment rate of people aged 50-64, by country and gender. We focus on individuals in this age group because, unlike older respondents in SHARE, they are likely to face important labour force participation decisions. The aim is to measure the fraction of people employed, but various definitions of employment are possible. Figure 2 considers three alternative definitions: the first definition (orange bar) is based on people who report themselves as employed or self-employed, the other two definitions are both based on (self-reported) usual hours of work per week. In particular, the second case (pink bar) corresponds to working fifteen hours or more per week while the third case (grey bar) corresponds to working a positive number of hours. Cross-country differences are little affected by the precise definition adopted: employment rates in this age group are lower for women than for men in all countries. Sweden and Switzerland stand out for the particularly

high employment rate of both men and women. Employment rates are instead very low in Poland. Although cross-country differences may be partly driven by cohort and composition effects, the fact that we control for age by restricting attention to people aged 50-64 suggests that institutional features are important. As already mentioned, this age group largely consists of individuals whose labour force participation decisions are most likely affected by the generosity and eligibility rules of the social security and pension system.

Besides financial incentives and institutional rules, other determinants of early retirement should also be considered. Especially important is the health status of an individual. Figure 3 focuses on people aged 50-64 who are in the labour force, disabled or retired, and presents the distribution of current activity, by country. The top-left panel of the figure considers all individuals irrespective of their health, whereas the other three panels consider only "healthy people". The top-right panel defines as healthy an individual who is "functioning", i.e. does not have any limitation out of six activities of daily living, the bottom-left panel defines as healthy an individual with no symptoms, while the bottom-right panel defines as healthy an individual who reports no chronic diseases.

Figure 1 Labour Market Status by FGender

Note: Sample Size: Men = 15,227; Women = 18,266. Brackets on top of each bar represent 95% confidence intervals

Figure 2 Employment Rates by Gender

Note: Sample size: Men = 7635; Women = 9465. Brackets on top of each bar represent 95% confidence intervals

Full sample

Sample size: 14,859

Functioning

Sample size: 14,020

No Symptoms

Sample size: 3,421

No Chronic Diseases

Sample size: 3,494

employed   retired   unemployed   disabled

Figure 3 Distribution of Labour Market Status by Health Status

Note: Sample Size: Men = 15,227; Women = 18,266

Comparing the various panels of Figure 3, it appears that people in good health tend to work more. However, there are significant differences both depending on the health definition and, given the same health definition, across countries. In particular, the fraction of people in good health who report themselves as fully retired is strikingly high in Austria and Poland. A comparison can be drawn between the different sub-samples and the full sample: there is little difference in employment rates between the full sample (top-left panel) and the sample in "good health" when good health is defined as absence of limitations (top-right panel) . On the other hand, employment rates are approximately 5-10% higher when health is defined as absence of symptoms (bottom-left panel) or chronic diseases (bottom-right panel), suggesting that important differences emerge in the health measure to be used when studying labour market decisions. Interestingly, there is a non-negligible fraction of individuals who report themselves as disabled in Poland, Spain, the Netherlands and Denmark, but have no limitations in daily living activities (top-right panel). One explanation is that in these countries disability is used as a pathway to retirement. Of course, the relationship between labour market status and health may be more complex than it appears from our descriptive evidence, as retirement decisions depend in a complex way on pain perception and the number and type of limitations on activities of daily living.

Longitudinal Analysis: Labour Market Transitions

The dynamic features of the data can be studied by using both the 2004 and the 2006 SHARE samples. However, care is needed when interpreting the results because of the attrition problem: if the longitudinal sample is self-selected with respect to some dimension of interest, results may be biased. As an example, if only the healthy individuals remain in the sample, then the panel is no longer representative of the underlying population. A detailed discussion of the panel dimension of SHARE and of the potential attrition problems in the data can be found in the methodological chapters in Section 7 of the book. Because the panel SHARE sample provides information on the economic status of individuals two years apart, we can study the patterns of labour market transition over a two-year period. In what follows, we analyse three of these transitions, namely the transition out of the labour force, the transition out of employment, and the transition into retirement. Labour market participation, and its relation to incentives and health status, is intrinsically a dynamic problem. For example, because retirement decisions depend on health status, a worsening of health may be relevant. This is the issue tackled by the multivariate analysis at the end of this section. As already mentioned, retirement decisions also depend on the incentives that individuals face during their career, including eligibility conditions and benefits calculation rules. Table 1 contains the transition matrices for men and women aged 55-64, which is the age band where transitions are most likely. The labour force states considered are those of Figure 1, namely in the labour force, retired or disabled, and other. The rows and the columns of the table correspond to the labour market conditions in 2004 and 2006, respectively, and the entries to the fraction of people moving from one state in 2004 to the same or another state in 2006.

| | LABOUR MARKET STATUS 2006 | | | | | | | |
| | MEN | | | | WOMEN | | | |
LABOUR MARKET STATUS 2004	In labour force	Retired or disabled	Other	Total	In labour force	Retired or disabled	Other	Total
In labour force	1,157	465	38	1,660	902	316	108	1,326
	69.7	28.0	2.3	100	68.0	23.8	8.14	100
Retired or disabled	29	1,244	17	1,290	25	1,002	90	1,117
	2.2	96.4	1.3	100	2.2	89.7	8.1	100
Other	6	10	7	23	52	175	867	1,094
	26.1	43.5	30.4	100	4.7	16.0	79.2	100
Total	1,192	1,719	62	2,973	979	1,493	1,065	3,537
	40.1	57.8	2.1	100	27.7	42.2	30.1	100

Table 1 Transition Matrix, Self Reported Labour Market Status in 2004 and 2006

The fraction of people moving out of the labour force into disability or retirement is substantial: over a 2-year period 28% of the men and 23.8% of the women do so. A notable feature, highlighted by the column labelled "In labour force", is that retirement is not a completely absorbing state: over a 2-year period, 2.2% both of men and women move back from retirement or disability into the labour force.

Figure 4 provides additional information on the transitions out of employment. Each bar represents the fraction of men and women employed in 2004 who are in any other state in

2006. There seems to be a stark heterogeneity in exit rates from employment, which range from 14% for Greek men to 61% for Austrian women. Moreover, there is no common pattern of gender differences across countries. Nevertheless, the small sample size in each country limits the statistical significance of these cross country differences.
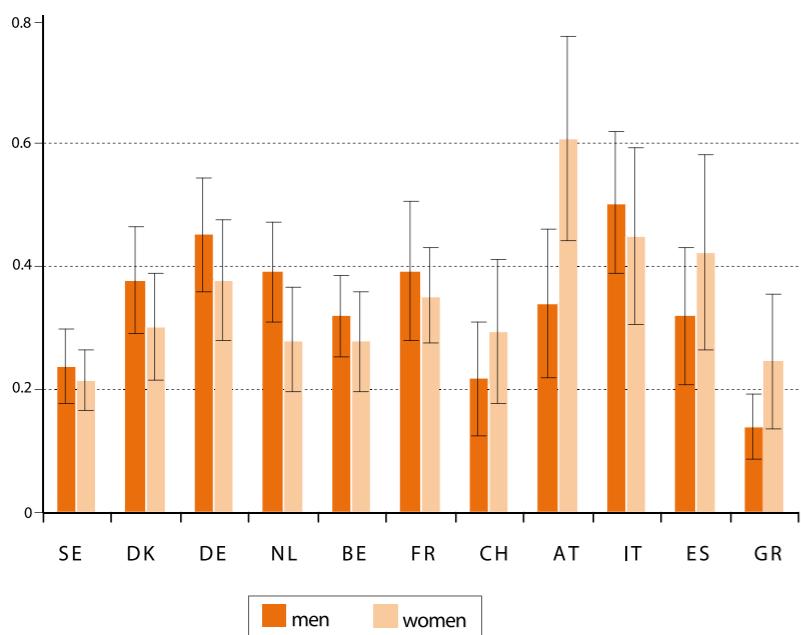
Figure 4 Transition out of Employment by Country and Gender
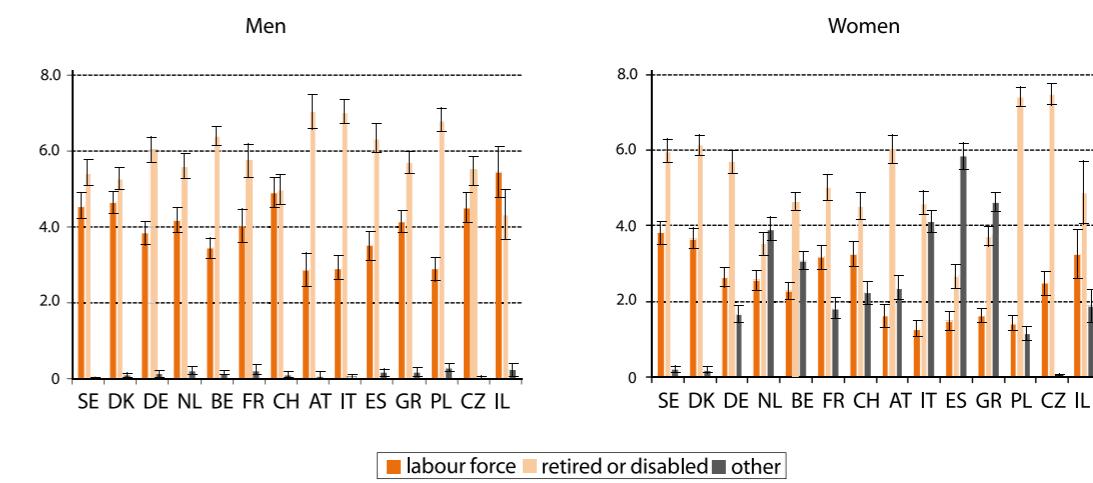
Sample Size: Men = 15,227; Women = 18,266. Brackets on top of each bar represent 95% confidence intervals

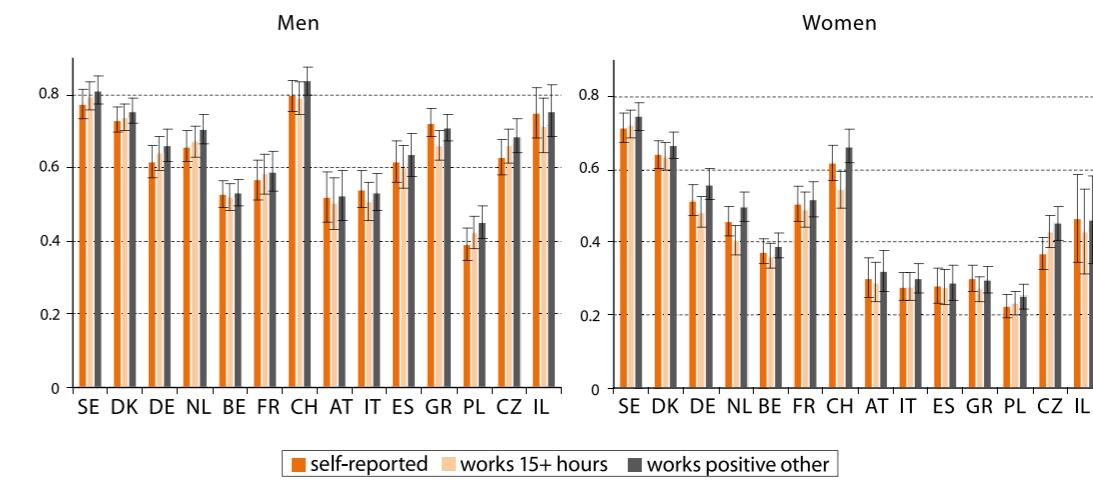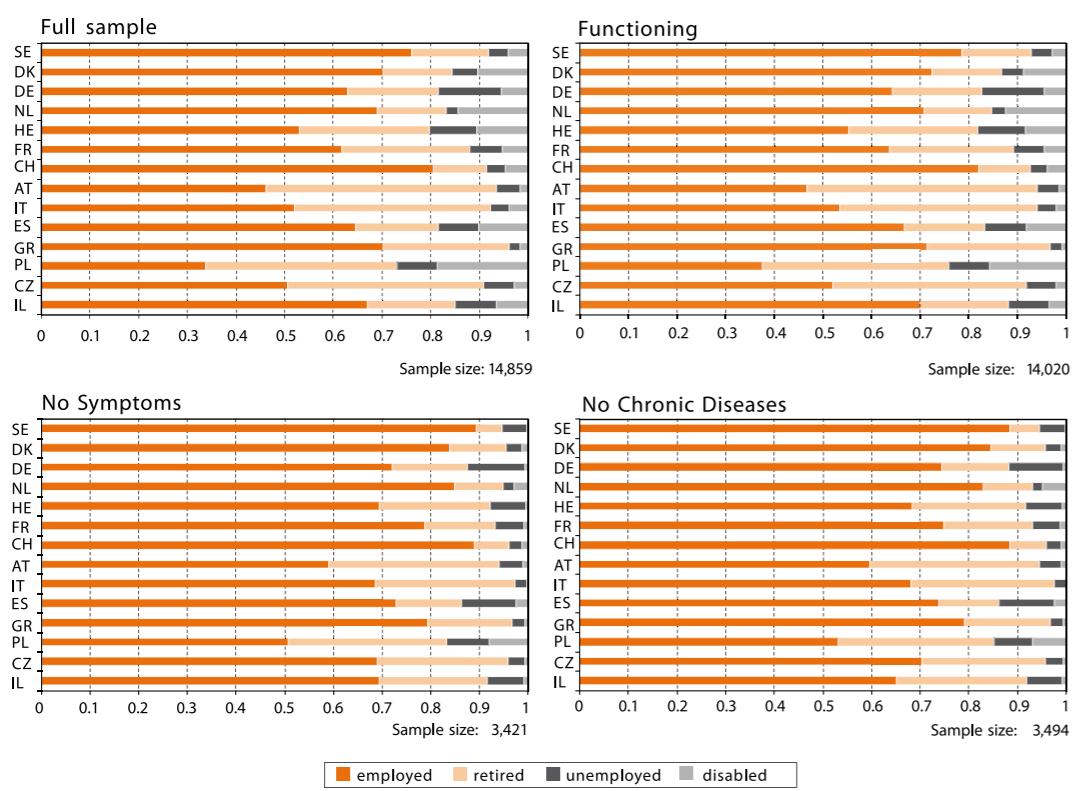Figure 5 illustrates the patterns of exit from employment, by country and gender. While men generally report moving into retirement, a substantial fraction of women reports moving into "homemaking", especially in Switzerland, Belgium, the Netherlands, and the Mediterranean countries.
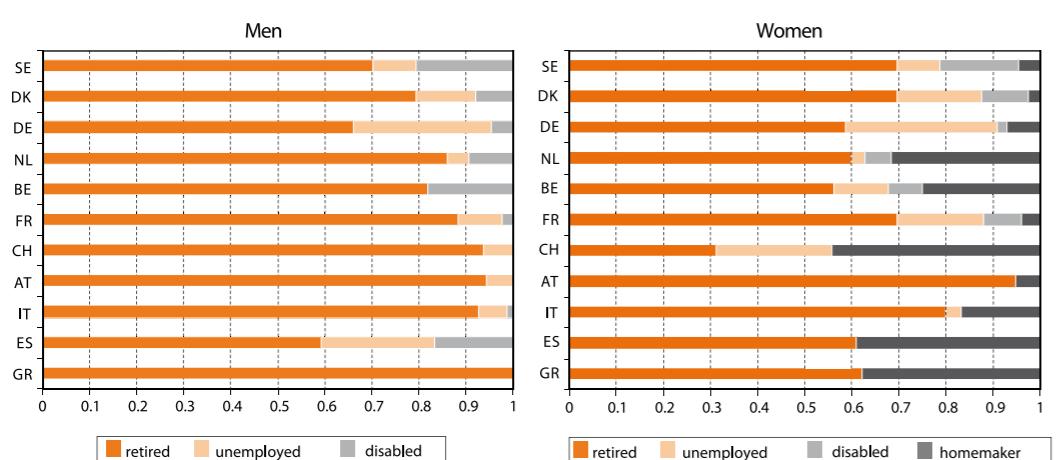
Figure 5 Transition Out of Employment to Different Labour Market States by Country and Gender

Further, as it also emerges from the first column of Table 1, individuals do not always move directly from employment into retirement. For example, a non-negligible fraction of Belgian and Swedish men move from employment into disability before ending up into retirement. While this may be driven by the incentives provided by the welfare state, the large fraction of transitions through unemployment in Germany and Spain (especially for men) cannot simply be considered as the result of individual choice. In the case of women, the homemaker category turns out to be important, although transiting through disability is still a choice, especially in Sweden.

In studying transitions out of employment, health also matters: Table 2 restricts attention to individuals working and in good health in 2004, and shows their labour market transitions, distinguishing by health status in 2006. Table 2 shows that health conditions are relevant in the dynamics of labour market choices: while 78.1% of people in good health in both 2004 and 2006 remain employed, this percentage falls to 72.0% if health deteriorates between 2004 and 2006.

	LABOUR MARKET STATUS 2006						
LABOUR MARKET STATUS 2004	Retired from work	Employed or self employed	Unemployed	Permanently sick or disabled	Home-maker	Other	Total
Employed or self-employed (good health in 2004 and 2006)	68	321	6	0	9	7	411
Percentage	16.5	78.1	1.5	0	2.2	1.7	100
Employed or self-employed (good health in 2004 and bad health in 2006)	102	373	12	6	15	10	518
Percentage	19.7	72.0	2.3	1.2	2.9	1.9	100
Total (good health in 2004)	170	694	18	6	24	17	929
Percentage	18.3	74.7	1.9	0.6	2.6	1.8	100

Table 2 Transition Matrix: Employment and Health

To exemplify the role of health and the richness of the SHARE sample, we present a multivariate analysis of the determinants of the transition probabilities out of work. Figure 6 looks at the probability of leaving the labour force and reports the marginal effects obtained by a "probit regression". Explanatory variables are: the health status in 2004 (measured by the number of chronic diseases), the difference between the number of chronic diseases in 2004 and 2006, "poor quality of work" in 2004, and a set of controls (age, gender, a self employment dummy, years of education, a full set of country dummies, and a dummy for the year of interview to account for different time effects). The interaction between the number of chronic diseases and the difference in the number of chronic diseases is also added. The marginal effects of health and of "poor quality of work" have the expected sign and are statistically significant. As for health, one additional chronic disease increases the probability of leaving the labour force by 3.5 percentage points. Further, the

dynamic effect of health is positive (i.e. a worsening of health implies a higher probability of leaving employment) and statistically significant: this result is in line with the intuition given in the previous section. The negative coefficient on the interaction is also as expected: the worse the initial health status, the less relevant is the effect of the change in health between 2004 and 2006.
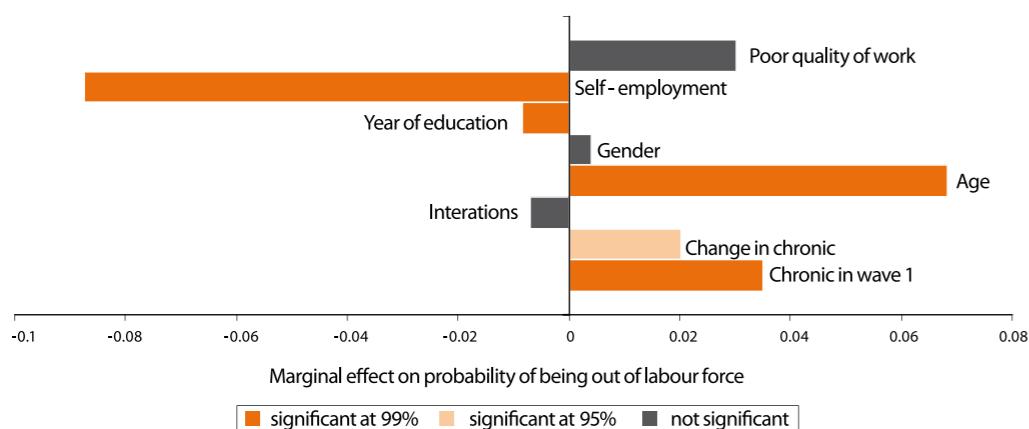
Figure 6 Multivariate analysis of probability of leaving employment

Note: Sample size 2,532

Interpreting Transitions

The panel structure of SHARE helps us overcome, at least partially, the identification problems arising with cross-sectional data. The aim of this section is to isolate the age-profile of incentives a given cohort of individuals faces over its life cycle. In order to do so, we first use a simple "probit" model to estimate the cross-sectional probability of being out of the labour force conditional on age (from now on, CS probability). We then compare the age-profile of these CS probabilities with a set of generated steady-state probabilities of being out of the labour force (from now on, SS probability).

CS probabilities are the result of, amongst other things, cohort and age effects: they depend on the different pension and social welfare rules that each cohort faced during the lifetime. For example, the observed CS probability for the cohort who is currently 55 years old depends on the incentives to retire that its members faced at younger ages. The same is true for those who are currently 65 years old. The two cohorts faced different incentives due to the changes in the institutional and legislative setup. In particular, it is likely that those who are currently 65 years old found it easier to retire early and, therefore, it is likely that they had higher transition probabilities into retirement than those who are currently 55 years old.

SS probabilities are generated "as if" labour market transition probabilities were fixed at their 2006 values for an entire cohort. They are computed exactly as a demographer would compute life expectancy. In fact, instead of using the patterns of mortality experienced by a given cohort, life expectancy is based on the cross-sectional age-profile of mortality rates, thereby mixing age and cohort effects. Because of this, life expectancy does not represent a forecast of residual life length for people of a given cohort and would forecast a person's residual life length only if mortality rates would remain fixed at their current level.

Thus, starting from the probability of being in the labour force for those aged 55 years in 2004, we recursively generate the age-profile of the SS probabilities for this cohort using the transition probabilities observed in 2006. As discussed by Deltas and Kim (2007), these

age-profiles are "reference probabilities", not forecasts of future state probabilities. A comparison of the SS and the CS probabilities helps the researcher to draw inferences about the kind of social welfare a country is moving towards. For example, if the SS probability for a 60 year old male in a given country stays below the corresponding CS probability, then this would imply that the probability of being out of the labour force at age 60 is going to decline, provided that transition probabilities remain close to their current values. This can be interpreted as a tendency of the current pension system to favour labour force participation at older ages, compared to the regimes faced by previous cohorts. Vice versa, if the SS profile lies above the CS curve, social welfare in 2006 looks more "generous" than in the past, since it discourages labour force participation.

A cross country comparison of these differences gives us some insight into the effectiveness of different pension reforms. Figure 7 reports CS and SS probabilities of being out of the labour force for males in three SHARE countries, namely Denmark, Germany and Italy (since we are trying to isolate institutional differences, cross-country aggregation would be meaningless). Despite the social security reforms of the past decade, the current social welfare seems still generous towards males: if transition probabilities do not change in the future, the probability of being out of the labour force for either a Danish, a German or an Italian male is going to increase.
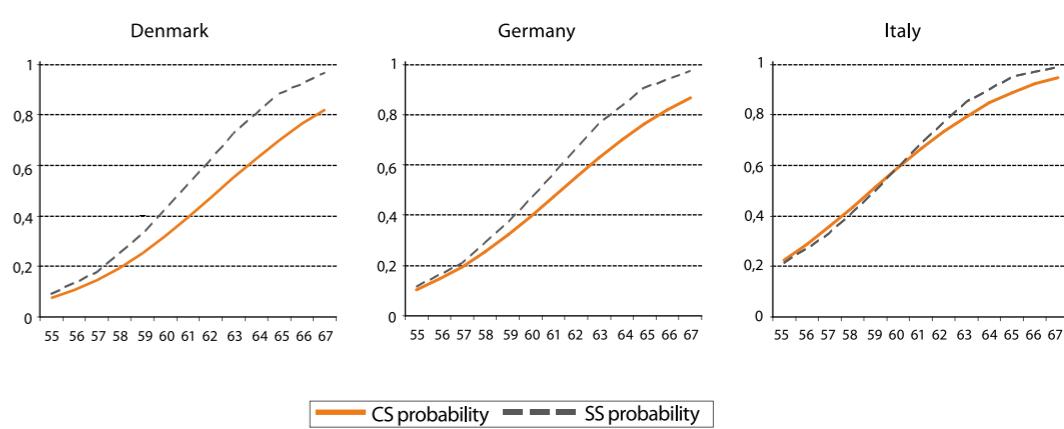
Figure 7 CS and SS Probabilities of Being Out of the Labour Force, Men

Note: CS probability = Cross-sectional probability of being out of the labour force, conditional on age

SS probability = generated steady-state possibilities of being out of the labour force

Conclusions

In this chapter we described the cross-sectional and longitudinal relation between labour force participation and health. Although those who are employed tend to be healthier on average, there are countries where a large fraction of retirees are in very good health. Moreover, the comparison of the cross-sectional and the steady-state probabilities of being out of labour force suggests that current institutional setups provide little incentives to labour force participation at older ages. This empirical evidence has important policy implications:

- The SHARE 2006 sample confirms the presence of a large "unused labour capacity": across countries a significant fraction of individuals aged between 50 and 64 is out of the labour force despite their good health status. This may be a motive to revise the incentives to retire early embedded in social security and pension systems.

• Current institutional setups allow for several pathways to retirement and, at the same time, do not incentive to work at older ages. Thus, social security and pension reforms may take some time to exert the desired effects.

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6.2 Job Quality and Retirement Decisions

Mario Schmalzenberger, Nicole Schneeweis, Rudolf Winter-Ebmer, Martina Zweimüller

Given the ongoing demographic transition caused by decreasing fertility rates and an increasing life expectancy, the currently high proportion of persons in some form of retirement in the age group 55-65 observed in most European countries is one of the major challenges to European policymakers in the 21st century. In order to design policies that increase the participation rates among those 55 years and older, policymakers should be aware of the factors that influence the decision to stop working or to retire. Past research has shown that macroeconomic and institutional conditions, such as the incentives created by the pension system have a strong influence on retirement decisions (Gruber and Wise, 1999; Sousa-Poza and Fischer, 2006). Furthermore, the decision to stop working is influenced by health conditions (Kalwij and Vermeulen, 2005), such as chronic illness or disability, and job quality. First results from SHARE 2004 have shown that there is a strong association between poor job quality and poor health (Siegrist et al., 2005), and that both, poor job quality and reduced well-being are positively related to the intention to retire (Siegrist et al., 2006). Therefore, job quality may have both a direct and an indirect effect – by affecting health – on the decision to stop working or to retire.

In this contribution we use data from SHARE 2004 and 2006 to explore the relationship between job quality and the decision to stop working or to retire. As job quality is a collective term for various working and employment conditions, such as the physical work load, the imposed work pressure, the incentive structure and the perceived job stability, we use three different approaches to measure it. Our first measure of job quality is an individual's subjective overall job satisfaction, which is meant to capture all dimensions of job quality, but is not very operative from a policy perspective. Therefore, we use two additional measures of job quality that should be easier to manipulate and therefore more relevant for policymakers. The first one is whether an individual is overeducated, undereducated or adequately educated for the job he or she holds. Tsang et al. (1991) have shown that overeducated male workers are less satisfied in their job and have a higher intention to leave the firm. The second one is derived from the effort-reward imbalance model (Siegrist et al., 2004) and measures the imbalance between a worker's effort and the rewards he or she receives in turn.

Sample and Methods

In SHARE 2004, 51 percent of all individuals between 50 and 64 were working. Since we are interested in whether job quality has an influence on the decision to stop working later on, we reduced the data set to those individuals. Of those 8259 persons, 4920 were reinterviewed in the 2006 wave and 4889 completed the questions on their employment status.

As shown in Figure 1, the majority of those working individuals was still working two years later. About 15 percent of women and 19 percent of men retired or partly retired between 2004 and 2006. Nearly 7 percent of the female workers changed their employment status to other destinations (more than 80 percent of which are homemakers).
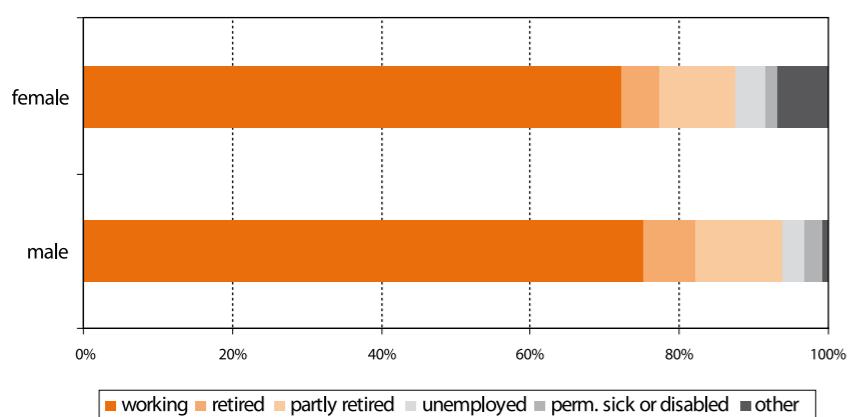
Figure 1 Employment status by gender in 2006

Differences among European countries are highlighted in Figure 2. While more than 85% are still working in Greece, in Spain, Italy, Austria and Germany less than 70% are still classified as working. The retirement and partial retirement rates vary a lot between European countries. In Austria, Italy and Sweden, more than 20% switched to retirement and partial retirement. While most of them are fully retired in Austria (nearly 18% of all individuals), Swedes opt more often for partly retirement (nearly 20%). The Austrian workers seem to give up working immediately when they start receiving public pensions. This phenomenon might be explained by differences in the pension systems and especially regulations concerning the compatibility of work and claims for public pensions.
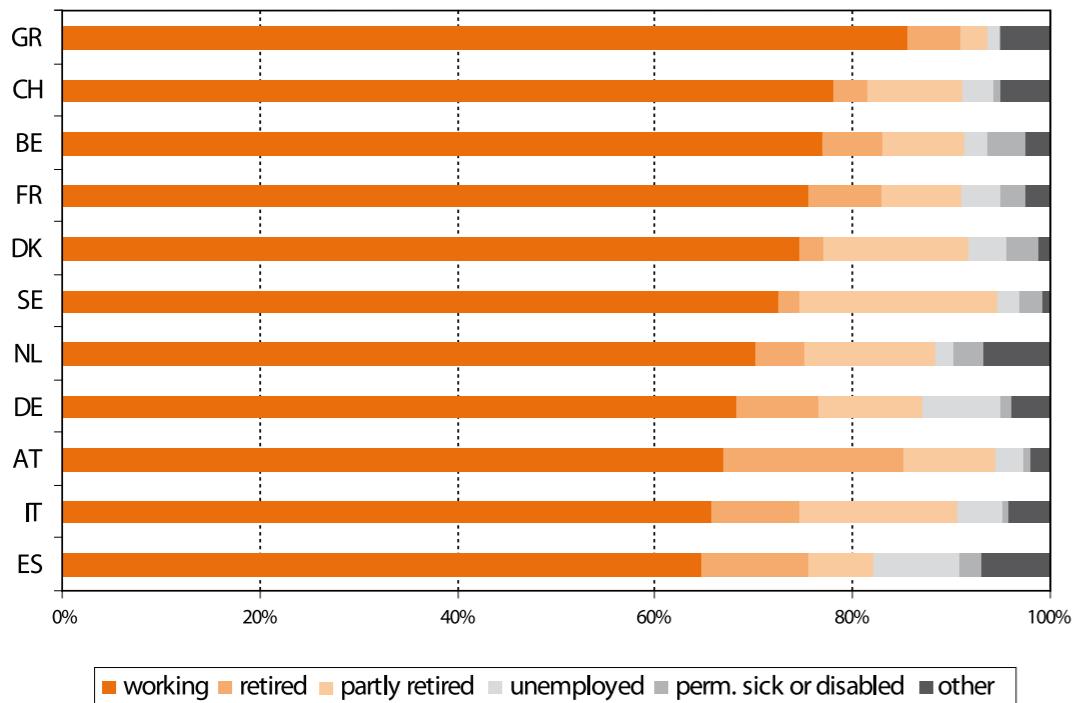
We are particularly interested in whether the characteristics of the jobs, people hold in 2004, have an influence on the decision to stop working two years later. Thus, the dependent variable in our estimations is a binary variable, indicating whether a person gave up his or her job. Partly retired people are at the same time working and getting public pensions, therefore they contribute on the one hand to a countries' GDP but on the other hand they are costly to the welfare state. We thus define two retirement indicators where we first classify partly retired individuals as still working and second as not working anymore. 15 percent of all individuals gave up their job between 2004 and 2006 (excluding partly retired) and 26 percent when including partly retired.

In SHARE 2004, the individuals completed questions on their job including a subjective measure of job satisfaction ("All things considered, I am satisfied with my job": strongly agree – agree – disagree – strongly disagree). Nearly all individuals (about 92 percent) state that they are either strongly satisfied or satisfied with their job. This variable is meant to capture all dimensions of job quality. Since this information can not be leveraged by policy makers, we use two further measures or job quality, first, whether people are adequately educated for the job they hold and second, whether the effort they put into their work is balanced with the rewards they finally get.

Based on country- and occupation-specific education information we constructed binary variables for over- and undereducation. Overeducation means that a person has undergone more years of education than the mean value (plus one standard deviation) in the one-digit ISCO group in a country. Accordingly, undereducation is defined as having more than one standard deviation less years of education than the mean in the corresponding group. This approach is based on the work of Verdugo and Turner Verdugo (1989). About 11 percent of our sample was overeducated and 12 percent undereducated for their job, with male workers being slightly more overeducated and female workers slightly more undereducated.

The effort-reward imbalance ratio (ERI), developed by Siegrist et al. (2004), consists of two effort related dimensions (physical demand and time pressure) and five reward measures (support, recognition, adequate earnings, advancement possibilities and job security). According to Siegrist et al. (2006), we calculated tertiles of the ratio for each country separately, where people located in the third tertile are characterized by high effort and rather low rewards. Figure 3 shows the positive association in country means of overall job satisfaction and over– and undereducation and effort–reward imbalance, respectively.

Figure 2 Employment status by country in 2006

Job satisfaction and effort-reward imbalance

Job satisfaction and education
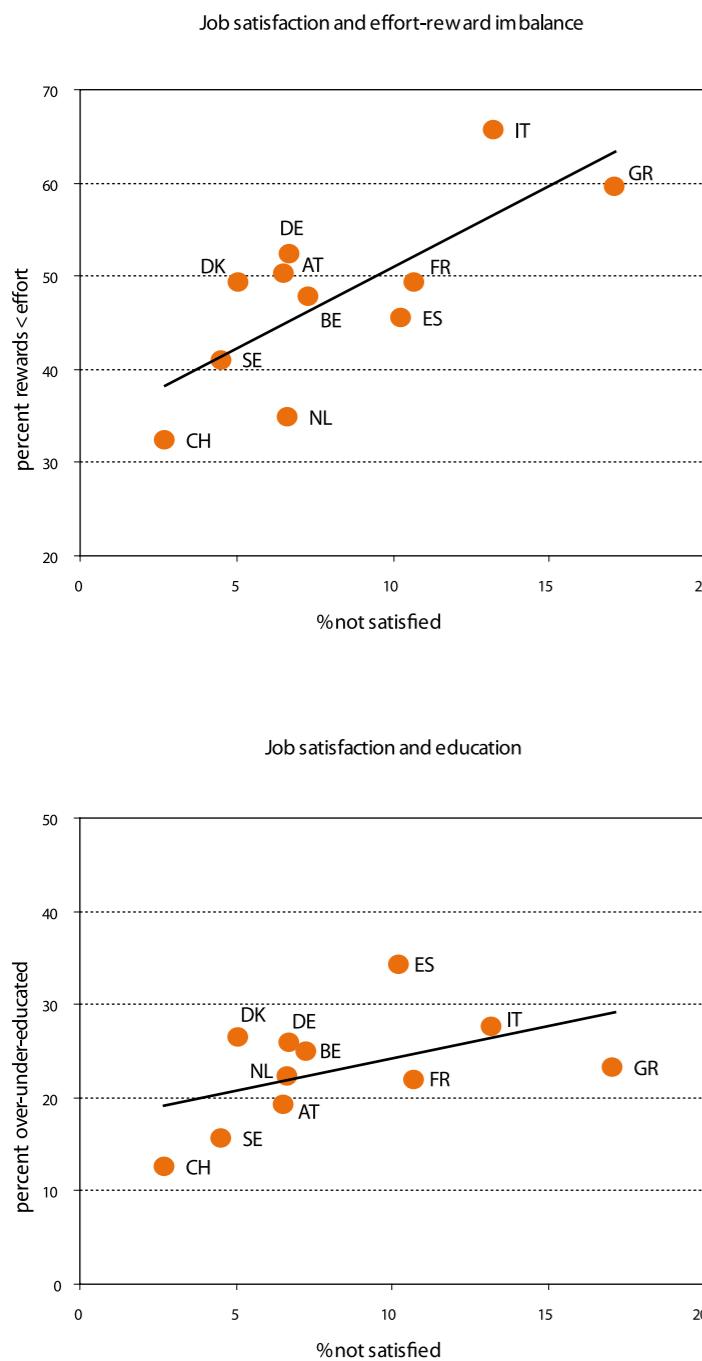
Figure 3 Association of job satisfaction, over– and undereducation, effort-reward imbalance

We use logit regressions to estimate the relation of job quality and the probability to stop working. Individuals are weighted and cluster robust standard errors are estimated, accounting for differences in the sampling probabilities and non-independent standard errors among individuals from the same household.

Beside job quality, the following control variables are included in our regressions: sex, married or having a partner, years of education, self reported health and a binary variable for any activity limitations in daily life. We include country dummies and 14 age dummies to account for the heterogeneity in legal regulations concerning the minimum age of (early) retirement in the different countries. Furthermore, since some of our independent variables

are missing, we set these values to zero and include missing dummies in the regressions. The number of missing values is small and ranges from 0.02% to 4.8%.
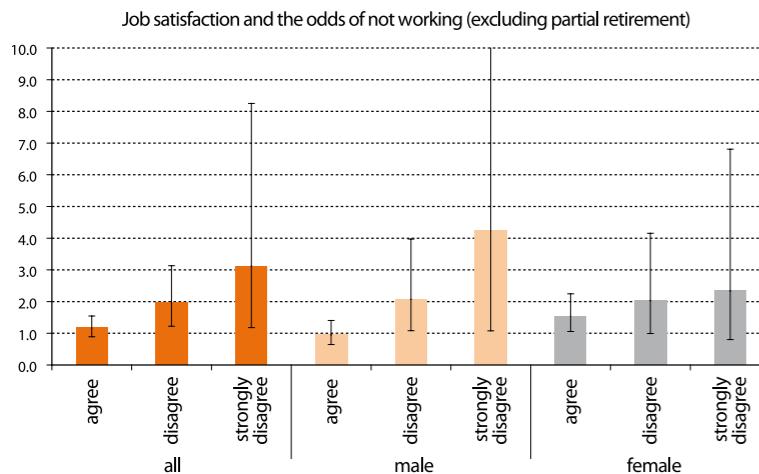
Results

In Figures 4-6 we present our results for the influence of (bad) job quality on retirement. We only show here the results for the case where partial retirement is coded as still working. The results are given in an odds-ratio format and can be interpreted as follows: An odds ratio of 1 indicates that the event under study is equally likely in both groups. An odds ratio greater than 1 indicates that the event is more likely in the first group.
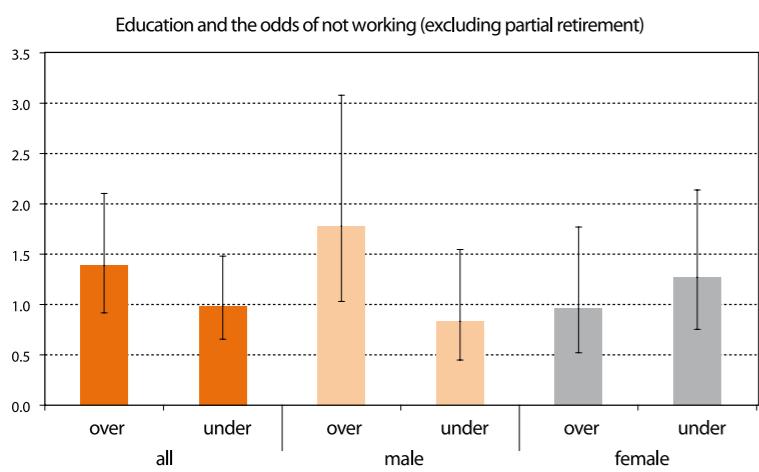
Figure 4 uses subjective job satisfaction as an indicator for job quality. For the full sample workers not satisfied with their job are twice as likely to retire within two years; those (in the minority) who were strongly dissatisfied with their job were even three times as likely to retire – as compared to those who are strongly satisfied and also to those who are satisfied with their current job. These results point toward a very strong influence of job quality on retirement. While the impact of dissatisfaction with the job is still more pronounced for male workers, female workers do not react so much to bad job quality: Odds ratios for the case of strong dissatisfaction are 4.2 for men and 2.3 for women. Still, it is remarkable, that female workers who are not fully satisfied with their jobs – they are only satisfied but not strongly satisfied – react with a 50 percent higher flight into retirement. This somewhat quicker reaction of females points toward a looser attachment to the workforce. Coding also partial retirement as "non-working" gives us very similar results, but numerically somewhat smaller effects.

In Figure 5 we use the prevalence of overeducation or undereducation as an indicator of bad job quality. It turns out that in the whole population overeducation leads to increased odds of early retirement: workers who have jobs requiring less education and training as the worker has acquired, quit into early retirement 40 percent more often than those with an adequate education. By contrast, undereducation does not increase the odds of (early) retirement. By gender, the results are somewhat mixed: whereas males suffer particularly from overeducation, there is no such reaction for females.
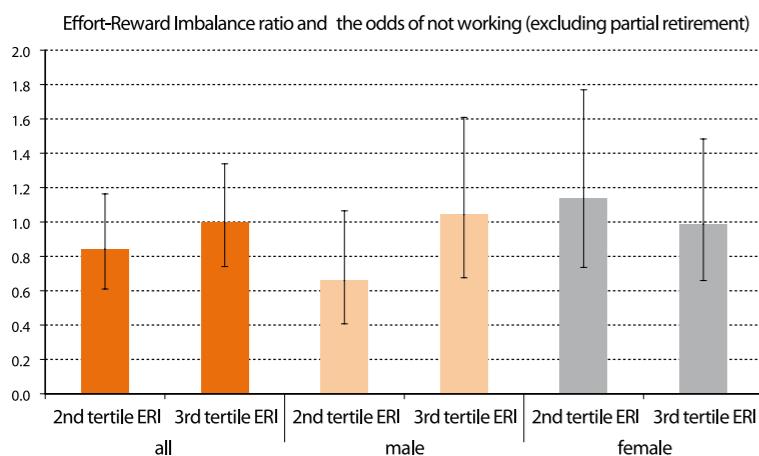
Finally, in Figure 6 we use the effort-reward imbalance ratio as an indicator of bad job quality. Individuals in the first tertile of the ERI ratio are those with disproportionally high rewards relative to the effort exerted. Contrary to expectations, the effort-reward imbalance has no significant relation to actual retirement.

Job satisfaction and the odds of not working (excluding partial retirement)

Figure 4 Job satisfaction and retirement

Note: Base category: strongly agree to the question: "All things considered, I am satisfied with my job"

Education and the odds of not working (excluding partial retirement)

Figure 5 Over- and Under-education and Retirement

Note: Base category: adequately educated for the job

Effort-Reward Imbalance ratio and the odds of not working (excluding partial retirement)

Figure 6 Effort-Reward Imbalance and Retirement

Note: Base category: 1st tertile ERI

Conclusions

- Job quality and the situation at the workplace can have important consequences for job satisfaction, which, in turn, can lead to premature quitting of the labor force and early retirement.
- We model job satisfaction with three different indicators and look at retirement behavior using SHARE 2004 and 2006.
- We find subjective overall job satisfaction to be the strongest predictor for early retirement, along with the fact, that the actual job is not challenging enough; i.e. the individual is overeducated for the position.

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6.3 Public, Occupational and Individual Pension Coverage

Lisa Callegaro, Christina Benita Wilke

In Europe as well as in most of the industrialized world, ever-rising life expectancies paired with low fertility rates have led to an ongoing process of population ageing. In addition many countries have to cope with the large baby-boom cohorts of the 1950s and 1960s that will drastically reduce the size of the labour force and increase the number of pensioners once these retire. As a consequence, during the last two decades, pension systems in Europe and worldwide have been subject to fundamental pension reform. In general, three main reform trends can be perceived: the increasing importance of supplementary private pension schemes as an answer to projected decreases in future public pensions, a trend away from traditional defined-benefit to defined-contribution systems and an effort to further extend social security coverage to the most "needy" parts of the population in order to better cope with poverty in old-age. In this article, we will focus on the first trend, the increasing role of supplementary pensions.

Pension systems can be described in pillars where the first pillar refers to the public pay-as-you-go system, the second pillar to private company pension schemes and the third pillar to private individual pensions. Public pension systems usually are mandatory and public and do not only provide old-age pensions but also disability and survivor pensions. Company pension schemes are usually voluntary, offered by the employer and are mostly capital-funded. Private individual pensions basically can be any kind of regular payments from some annuitized capital stock. The second and third pillar pensions are referred to as supplementary pensions.

While most public pay-as-you-go systems in Europe have universal coverage, coverage within the second and third pillar can vary immensely across countries and across demographic groups. This article looks at a) what differences in coverage rates can be found for selected European countries, b) which dynamics can be observed here for the most recent years and c) how these coverage rates differ across certain demographic groups. All these questions are of great importance for the current political debate in many European countries where the effects of alternative pension reform measures that lead to a stronger policy mix of the three pillars are still widely being discussed.

Measuring Pension Coverage

In the literature, the term pension coverage usually refers to the percentage of working individuals covered by and participating in a certain pension scheme. In this article, we use a broader definition of the term coverage in the sense that we do not only look at the pension claims of today's working individuals and future pensioners but also at those of today's pensioners.

In its section on employment and pensions (EP), the Survey of Health, Ageing and Retirement in Europe (SHARE) provides detailed information on individual pension coverage, both for existing pensioners and future retirees. We combine this data with selected demographic and socio-economic characteristics provided by the cover screen, the demographic module (DN) and the asset section (AS). All calculations are weighted with individual weights according to age and income. Even though there is additional information on income sources in other modules of SHARE, such as the household section (HH), we do not use this data as our analysis is based on individual variables only. In SHARE, all individual information is derived from separate interviews with each eligible person in the household instead of a single interview with one reference person. Studies on U.S. survey data showed that this method in general yields to higher and more accurate rates on pension coverage than if interviews are restricted to one reference person.

We look at cross-sectional data from the two SHARE waves in 2004 and 2006. Eleven of the European SHARE countries participated in both waves and for them we also look at panel data. In contrast to previous studies on pension coverage using data from SHARE (see Brunner et al., 2005) this newly available longitudinal data allows us to analyse the very recent dynamics in pension coverage across Europe. For Israel, where data was collected during the years 2005-06 as well as the Czech Republic and Poland, which only joined SHARE in 2007, we restrict our descriptive analysis to the 2006 wave.

The SHARE dataset as a European dataset is unique in that it addresses both today's and future pensioners while still allowing for a very detailed composition of pension income according to the three pension pillars. However, it is a survey, thus responses can be inaccurate or missing. It has been shown for other datasets that this may lead to an underestimation in pension coverage. For the 2004 wave, we thus use an imputed dataset (Release 2) that corrects for these flaws. For the 2006 wave, thorough imputations are not yet available and we therefore must base our analysis on a only preliminary version (Release 0) of the original dataset.

Pension Coverage Across Countries and Dynamics Among Today's Pensioners

We begin our analysis with a description of the coverage situation of today's pensioners. We define a pensioner as a person who responds to be retired from work (EP005=1) and who receives at least one pension from one of the three pillars.

Pensioners are covered by the first pillar if they receive an old-age pension, an early retirement pension and/or a survivor pension. Persons who receive some kind of disability pension or unemployment benefits and consider themselves to be retired are also included in this category. In many countries such as Sweden, Germany, the Czech Republic and Spain, these last two benefit types have been extensively used as an alternative pathway to retirement and can thus be regarded as a substitute for early or pre-retirement pensions. Pensioners who receive some kind of company pension are covered by the second pillar. Covered by the third pillar are all pensioners who receive regular life insurance payments, regular private annuity and/or private personal pension payments. Figure 1 shows the pension coverage rates for all three pillars across countries separately for SHARE 2004 and SHARE 2006.

First, if we look at the first pillar we can see a very homogenous picture across countries. In most SHARE countries, more than 90 percent of the pensioners receive some kind of public pension with the only exception of the Netherlands, Switzerland and Israel where it's only around 85-86 percent. One explanation could be that some respondents do not perceive the public base pension in these countries as a pension but rather as a kind of social assistance (see OSE 2004). The pattern for first pillar coverage has not changed significantly across the two SHARE waves.

For the second pillar the picture is a totally different one. Here, large differences can be found among countries. While in Sweden, the Netherlands and Switzerland at least half of the pensioners received a company pension in 2006, coverage was less than 10 percent in most of the remaining SHARE countries except for Denmark, Germany and Israel where it was between 20 and 40 percent. Studies for the OECD showed comparable figures of around 50 percent for the Netherlands and 21 percent for Germany (see Whitehouse,
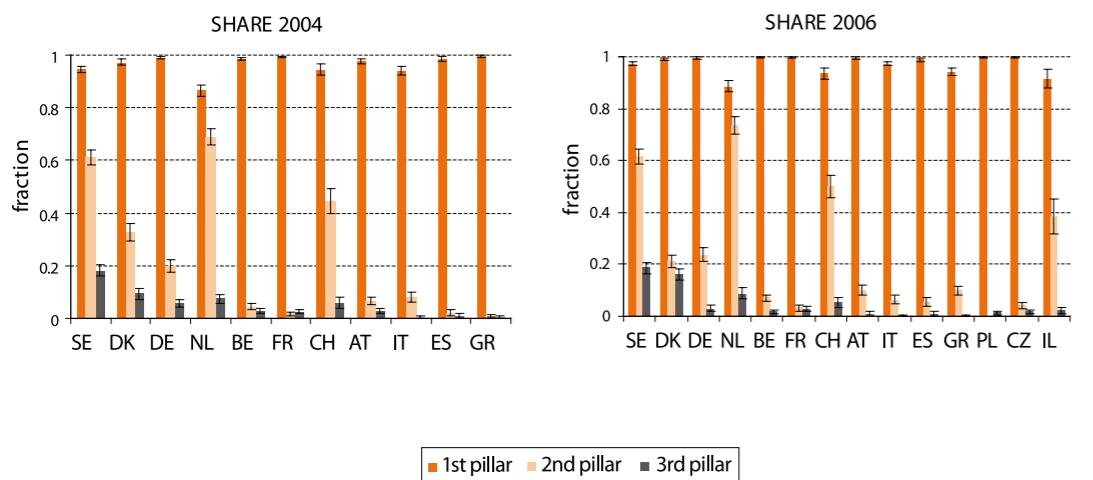
2003), studies for the EU partly found higher rates, e.g. around 20 percent for Belgium (European Commission, 2006). Some countries such as Spain may show comparably low company coverage rates since pensioners choose a lump sum payment instead of a regular pension income at the point of retirement. Both second and third pension pillars are not well developed in Poland and in Czech Republic (below the 5 percent level). In Poland, on March 2004, the Parliament adopted two new acts concerning company and individual level pension programmes. In both cases the main ambition was to increase the importance of supplementary and voluntary schemes. France is a special case. The relevant dichotomy is not between public and private pensions, but between basic and complementary pensions: the former are generally co-managed by the State and social partners, the latter are organised on a professional basis, exclusively managed by social partners, but both forms of pensions are considered as public. The second and third pillars are represented by supplementary and voluntary funded schemes planed at the company level.

Across the two waves, almost all countries show some dynamics of increasing company pension coverage. However, most of these dynamics are due to a change in the corresponding question between the two waves. A panel analysis on pensioners in SHARE 2004 and 2006 shows that true increases in company pension coverage over the past three years can only be found for Germany and Switzerland. Indeed, a major pension reform in Germany in 2001 has spurred company pension coverage ever since.

Last, individual pensions seem to play only a minor role for today's pensioners anywhere in the SHARE countries. With the exception of Sweden and Denmark where roughly 20 and around 16 percent of the pensioners, respectively, receive an individual pension, coverage rates in all other SHARE countries are below 10 percent.

Pension Coverage Across Countries Among Tomorrow's Pensioners

We will now turn to the coverage situation of future pensioners that is today's working population. We consider employed, self-employed and unemployed individuals as well as civil servants. Figure 2 shows the coverage rates for all three pillars for the 2006 wave. Note that for the third pillar, we only have information on participation in individual retirement accounts and therefore cannot account for life insurance claims that could be turned into an annuity at retirement.
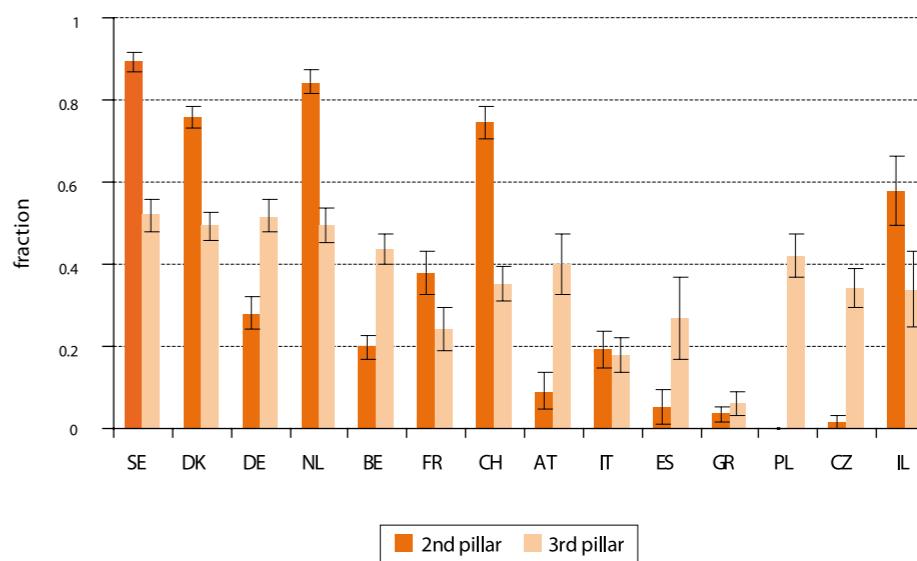
In all SHARE countries, it can be seen that coverage rates of both second and third pillar pensions are considerably higher among future pensioners than they were for today's pensioners. For the second pillar, Sweden and the Netherlands again show the highest coverage rates (participation in the second pillar has become mandatory in Sweden with the 2000 pension reform), followed by Denmark and Switzerland (all above 70 percent). Israel follows the Northern Countries' trend with a rate around 60 percent. For Germany, Belgium and Italy, company pension coverage of the working population is between 20 and 30 percent. These rates are low compared to recent figures by the European Commission that report 46 percent for Germany and between 40 and 45 percent for Belgium (see European Commission, 2006). However, this can be explained by the fact that SHARE only covers the population 50+ and thus only captures the older part of the working force.

The importance of the third pillar for future pensioners compared to that for today's pensioners increases largely across all SHARE countries except Greece. Sweden, Denmark, Germany, the Netherlands, Belgium, Poland and Austria all record coverage rates above 40 percent, Switzerland and the Czech Republic above 30 percent. These figures seem roughly in line with recent EU data (e.g. 40 percent for Sweden, see again European Commission, 2006) even though figures on individual pension coverage can vary greatly depending on the underlying definition of the third pillar. For Poland and the Czech Republic, coverage of the second pillar for future pensioners – as for existing pensioners – is basically nonexistent.

Portfolio Composition Across the Three Pension Pillars

Before we look at some selected demographic characteristics of recipients of second and third pillar pensions, we want to find out whether these pensioners are separate groups or largely overlap.

Table 1 shows the pension portfolio composition of all persons who reported to be pensioners in the 2006 wave. In 2006, 12,498 persons received only a public pension, 383 only a company and 26 only an individual pension. 328 persons received pensions from all three pillars and 807 persons did not receive a pension from any of the three pillars. Of those who received a public pension, roughly 17 percent also received a company pension and barely 5 percent an additional individual pension. Only 2 percent of all persons and 10 percent of pensioners with at least one supplementary pension received both forms of supplementary pensions (company and individual pensions).

Thus, even though there is some overlapping, pensioners with a company and pensioners with an individual pension can be considered as two separate groups.

	Participant in 3rd pillar			
	No		Yes	
Participant in 2nd pillar	No	Yes	No	Yes
Participant in 1st pillar				
No	807	383	26	26
Yes	12,498	2,624	419	328

Table 1 Pension portfolio composition of today's pensioners (SHARE 2006)

Company and Private Pension Coverage Across Ages

Company as well as private pension coverage rates seem to follow an inverted-u-shaped pattern across age groups among today's pensioners, see Figure 3. While the fact that older pensioners are less covered could be explained by the rising trend towards supplementary pension coverage during the last two decades, it is somewhat striking that younger pensioners also seem to be covered less than pensioners from age 65 on. One explanation could be that among the younger pensioners the share of those receiving disability pensions or unemployment benefits as a kind of early retirement pension is larger and the recipients of these benefit types are less likely to engage into a second or third pillar private pension arrangement. Another explanation could be that the younger pensioners are not yet drawing on their company or private pensions.

However, this European-wide pattern does not apply to all SHARE countries equally. For second pillar coverage, the Netherlands and Belgium show the quasi opposite pattern where the relatively young and old pensioners respectively are better covered by supplementary pension schemes. This pattern seems difficult to explain. For Switzerland, France, Spain and Greece company pension coverage rates among pensioners decrease with age as expected. Regarding individual pension coverage, patterns across countries are more similar, but often on such low levels that a direct comparison of patterns seems difficult.
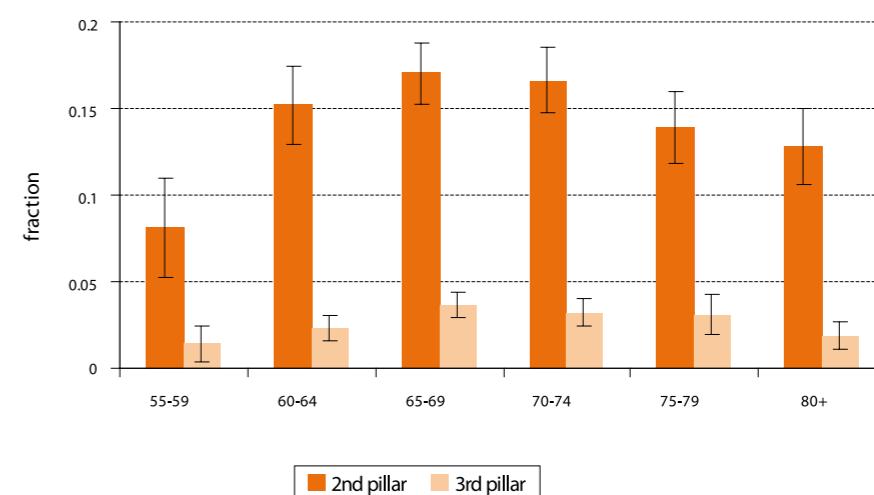
Figure 3 Company and private pension coverage across ages (SHARE 2006). Sample size 16,126. Weighted observations.

Still, it can be seen that coverage of supplementary pension schemes varies greatly across ages. Younger pensioners in general are more likely to receive a second or third pillar pension than older pensioners.

Is There a Gender Gap in Company or Private Pension Coverage?

Figure 4 shows company and individual pension coverage rates, according to gender. For company pension coverage among today's pensioners, there clearly is a gender gap in SHARE countries with considerable participation. Men are more likely to receive a supplementary pension than women. In the Netherlands as well in Switzerland almost twice as much male as female pensioners received company pension payments, for Germany this ratio is roughly the same. For Sweden, in contrast, the ratio seems to be the same among male and female pensioners. For individual pensions, no significant differences between coverage rates of male and female pensioners can be found in most SHARE countries.
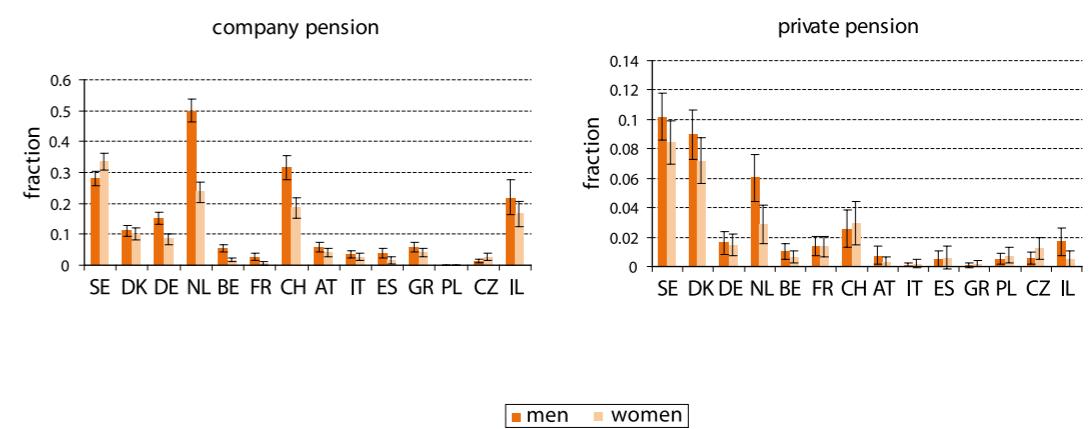
Figure 4 Company and private pension coverage by gender (SHARE 2006). Sample size 16,279. Weighted observations.

Once looking at future pensioners, this picture changes greatly. There seems to remain hardly any gender gap neither within the second nor within the third pillar and this despite the enormous increases in individual pension coverage rates in almost all SHARE countries for future retirees.

The Role of Gender and Education in Company and Private Pension Coverage

Table 2 shows the share of today's and tomorrow's pensioners respectively of the second and third pillar both by gender and education group. First, both for men and women and both for existing and future pensions, coverage rates are highest for the highly educated and lowest for the less educated. If one looks to education as a proxy for income, this means that individuals with a higher income during their career are better covered by supplementary pension schemes than low-income earners.

Today's pensioners	Primary		Secondary		Tertiary	
	Man	Woman	Man	Woman	Man	Woman
2nd pillar	10.83	8.17	22.26	13.95	26.75	17.24
3rd pillar	1.76	2.76	2.84	2.43	4.97	6.24
Obs. tot	1,789	1,902	1,320	1,347	943	767

Future pensioners	Primary		Secondary		Tertiary	
	Man	Woman	Man	Woman	Man	Woman
2nd pillar	24.93	30.20	32.98	27.60	42.47	35.97
3rd pillar	23.39	27.49	41.44	38.94	46.85	38.31
Obs. tot	1,246	1,176	1,662	1,668	1,496	1,589

Table 2 Share of pensioners of 2nd and 3rd pillar by gender and education group (in %)

Note: We purge age effects considering today's recipients with age between 55 and 70 (SHARE 2006)

Second, the gender gap for second pillar coverage of today's pensioners clearly shows within each education group. Similarly, the vanishing of this gap for future retirees also seems to apply equally to all education groups. Thus, while the gender gap seems to vanish for future retirees, differences among education groups in supplementary coverage rates seem to persist. These findings are basically true for all SHARE countries.

Conclusions

Supplementary pension schemes

- are still more spread in the Northern European SHARE countries,
- are in most countries more common among younger and future pensioners,
- still generally imply a gender gap (at least for the second pillar) among today's pensioners while this gap quasi vanishes for future retirees, and
- are still more common among the higher educated.

The degree at which countries allow for a policy mix of the three pillars still varies greatly in the European SHARE countries. Here, the SHARE data provides a unique opportunity to better understand how different demographic groups would be affected by certain reforms and which incentives could be set.

In this chapter we focused solely on coverage rates of the three pension pillars. Two issues will be addressed in later research. First, coverage does not necessarily reflect the income situation in old-age. The SHARE dataset with its detailed section on earnings and pensions will allow a thorough analysis of this topic. Second, pension issues always relate to a life-course-perspective. Thus, more waves of SHARE data are needed for deeper insights in this field.

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6.4 Changes in Health Status and Work Disability

Axel Börsch-Supan

One of the great advantages of the SHARE data is the combination of very detailed data on health and equally detailed data on employment status. This permits innovative analyses of the bi-directional interaction between health and employment: deteriorating physical and mental health precipitates early retirement; on the other hand, having a place in life and doing a good job appears to be a source of subjective and objective good health. From a societal point of view, maintaining good health, e.g., through prevention, is an investment in employability; preventing work disability may offset, through the additional labour income, part of the costs associated with the health care system.

A second advantage of the SHARE data is their cross-national breadth, reflecting the different health and employment institutions in 15 countries. In the midst of the intersection of health and employment institutions is the disability insurance, the insurance against the loss of the ability to work due to health reasons. The SHARE data are ideal to study transitions between employment and work disability, to understand the causes for such transitions, and to explore the effects of the different health and employment institutions in the 15 SHARE countries on transitions from employment to work disability.

In an earlier analysis (Börsch-Supan, 2005), we have shown that there is a striking variation across European countries in the number of persons who receive disability insurance benefits. Figure 1 augments these earlier findings with new SHARE data collected after 2004, and merges data from the British and American sister surveys, ELSA and HRS:
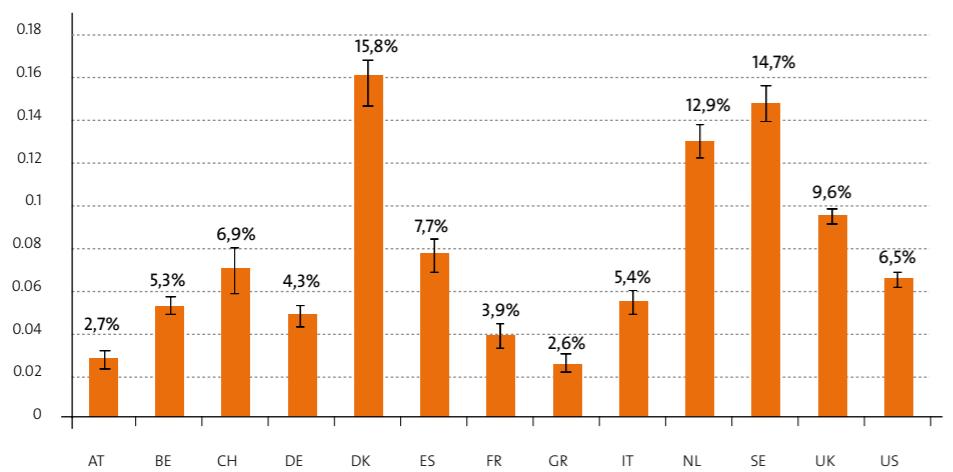
Figure 1 Disability insurance enrolment in Europe, 2004

Note: SHARE 2004, ELSA 2004 and HRS 2004. Age 50-65. Weighted data

Figure 1 and the data in this paper are based on comparable definitions of disability insurance institutions, see Box 1. Nevertheless, disability insurance take-up various enormously between the very high enrolment rates in Denmark, Sweden and the Netherlands (between 14 and 16 percent of individuals aged between 50 and 65, the age group in which disability insurance may serve as an early retirement device) and rather low rates in Austria and Greece where less than 3 percent of individuals in this age group receive disability insurance benefits.

Austria (AT): Staatliche Invaliditätspension
Belgium (BE): Assurance invalidité légale/Wettelijke uitkering wegens arbeidsongeval of beroepsziekte; Pension de maladie, d'invalidité, maladie professionnelle/Wettelijke uitkering wegens ziekte of invaliditeit of tegemoetkoming aan personen met een handicap
Denmark (DK): Offentlig sygedagpenge, offentlig førtidspension
England (UK): Incapacity benefits
France (FR): Prestation publique d'invalidité
Germany (DE): Erwerbsminderungsrente, Beamtenpension wegen Dienstunfähigkeit
Greece (GR): Σύνταξη αναπηρίας
Italy (IT): Assicurazione pubblica di disabilità (anche assegno di accompagnamento), pensione pubblica di invalidità o di inabilità
Netherlands (NL): Waz of invaliditeitspensioen, algemene bijstandswet, aanvullende bijstandsuitkering, toeslagenwet
Spain (ES): Pensión pública contributiva y no contributiva de invalidez/incapacidad
Sweden (SE): Förtidspension (sjukersättning), yrkesskadepension, sjukbidrag
Switzerland (CH): Invalidenrente aus IV/assurance invalidité légale/Rendità invalidità
United States (US): SSDI and SSI disability pensions

Box 1 Disability Insurance in Europe and the United States

Cross-National Differences in Disability Insurance and Health

A thorough understanding why these strikingly different enrolment rates have emerged is of obvious policy relevance. Did preventive health policies fail in the high-enrolment countries and generate high prevalence of work disability? What are the economic costs of work disability – the direct cost of disability insurance, but also the loss of employment? And, analogously to the widely quoted OECD and NBER studies by Blöndal and Scarpetta (1998) and Gruber and Wise (1999): have the complex institutional arrangements for early retirement (old-age pensions, special arrangements for older unemployed, and disability insurance) created incentives to claim work disability status even if health is reasonably good?

The earlier study by Börsch-Supan (2005) based on the first wave of SHARE data in 2004 could not explain the large cross-national differences in disability insurance take-up by equally large differences in health. As a matter of fact, the opposite could be shown: countries with high disability insurance enrolment – the Scandinavian countries and the Netherlands – had, on average, better health than the countries with low enrolment, e.g., in the Mediterranean South. Hence, differences in disability insurance take-up are even larger, once differential health has statistically been corrected for. This finding is reproduced with the additional countries in Figure 2.

It is based on a two-stage procedure. First, we exploit the richness of the SHARE data to relate individual disability insurance enrolment probabilities to age, gender and a broad set of health measures ranging from self-reported health to more objective measurements of the functional physical and mental health status. We then predict how enrolment rates would look like if age, gender and all health measures were equal across the 13 countries. If

age, gender and health differences were the main cause to enrol in disability insurance, enrolment rates should be very similar after taking health and demographic differences out.

As one sees in Figure 2, this is not the case at all. This gives rise to the speculation that institutional differences, such as the generosity of disability insurance benefits and the ease by which one can obtain those, are more important determinants of disability insurance enrolment than failing physical or mental health.
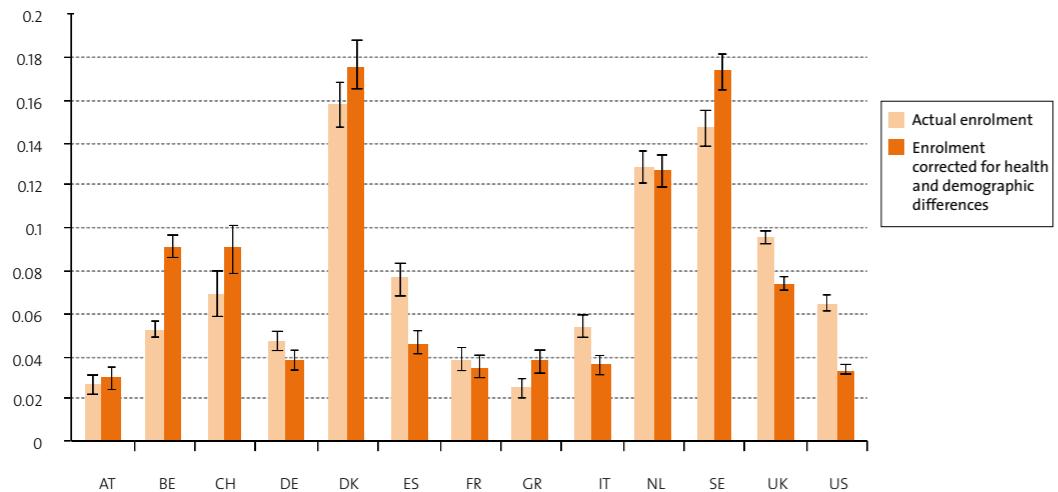
Figure 2 Predicted disability insurance enrolment if age, gender and health status were identical in all countries

Note: Based on logistic regression of disability insurance enrolment on demographic and health variables

We continue our analysis in this paper by adding two further steps. First, we use another great advantage of the SHARE data, its emerging longitudinality, to follow individuals who where enrolled in disability insurance over time and observe their changing health status. We also look at the transitions between 2004 and 2006: Who became enrolled into disability insurance during those two years, and who exited from disability insurance? Secondly, rather than speculating about incentive effects exerted by the generosity of, and easy eligibility for, disability insurance benefits, we use new data merged to SHARE to actually prove that case.

Transitions

The longitudinal feature of SHARE gives insights in the dynamics of disability insurance enrolment. More than two thirds of the individuals who were enrolled in disability insurance in 2004/05 remained enrolled also in 2006/07. 28.4%, however, left disability insurance. What happened to these individuals? How many managed to return to work? How many transitioned into old-age pensions or other transfer programs?

In turn, about 4.3% of the individuals who were not enrolled in 2004/05 took up disability insurance two years later. What happened to those who newly enrolled? How many experienced a shock of bad health?

We will first look at those who left disability insurance, and then turn to the new entrants.

Exits from Disability Insurance

Only few individuals leaving disability insurance go back to the labour market: 13.6% are working and 1.7% actively seek work. The largest category consists of individuals who transit from disability insurance into old-age pensions (almost 43%). Another 31% remain sick or disabled and rely on family transfers. The remaining 11% are homemakers.

Figure 3 shows the distribution of those who left disability insurance.
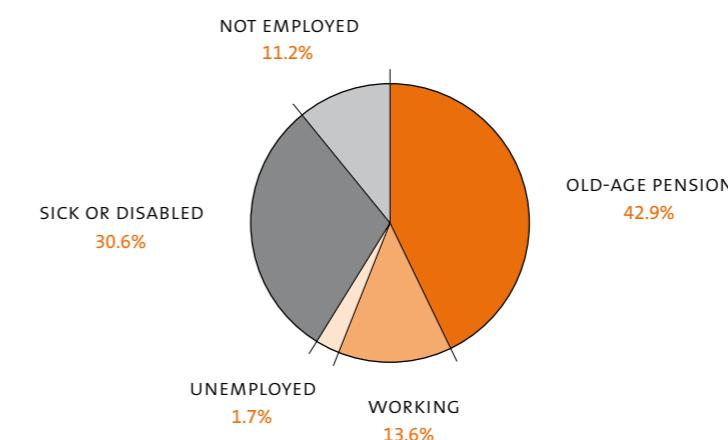
Figure 3 Predicted disability insurance enrolment if age, gender and health status were identical in all countries

Note: Based on 8942 individuals of the relevant age range (50 to 64 years in Wave 1) with observations in both waves

Entries Into Disability Insurance

Of those who were not enrolled in disability insurance in the first wave of data, 4.3% took up disability insurance two years later. This percentage is an average over all involved SHARE countries. It was much higher in Sweden; also Austria, Greece, Switzerland and Belgium show significant increases, while France experienced a significant decline in disability insurance enrolment. Why did these individuals take up disability insurance?

Figure 4 depicts the relationship between disability insurance entrance and changes in self-rated help. Negative numbers represent a worsening of the self-assessed health status, positive numbers an improvement. There are, as one might expect, more individuals reporting a worsening of health who enter disability insurance. The differences between those who entered disability insurance, however, are not very large compared to those individuals who exited disability insurance: in both groups, the most frequent category is no change at all.

The influence of more objectively ascertained health measures is even weaker. Figure 5 displays the change in grip strength, a measure which has proven to be an excellent indicator of declining health. Negative numbers indicate weaker grip strength, positive numbers a tighter grip. The correlation is very weak, and only visible in the categories -5 and +3.
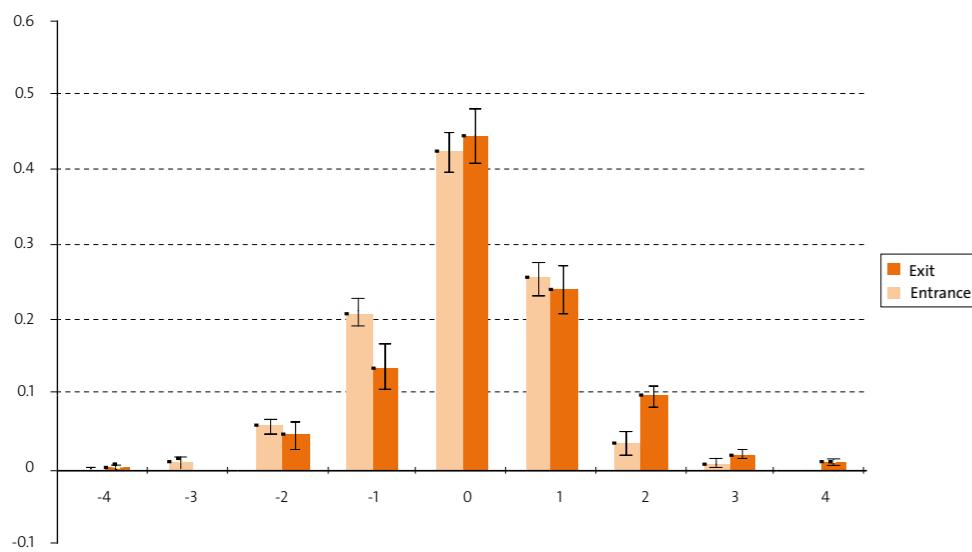
Figure 4 Disability insurance enrolment and changes in self-rated health

Figure 5 Disability insurance enrolment and changes in grip strength

A similarely weak association emerges from the EURO-D depression test:

Figure 6 Disability insurance enrolment and changes in depression

A more formal multivariate analysis confirms the results of Figures 4-6. Self-assessed functional limitations and self-reported health have significant effects on new disability enrolment. Objective measures, however, such as a test for depression symptoms and the grip strength measure, do not contribute in explaining disability insurance entrance. Moreover, the significance of the subjective health measures is driven by a very few countries (Denmark, Belgium, Spain, and Greece).

It is not unlikely that the difference between objective and subjective health differences is generated by "justification bias", i.e., the desire by respondents to motivate their entrance into disability insurance by reporting a subjectively felt worse health status.

Summarizing the results of this section, changes over time, like changes across countries, do not show any convincing case for a significant correlation between health and disability insurance enrolment.

Institutions and Incentives

Demographic and health-related differences do not explain the cross-national differences in disability insurance enrolment. This puts more weight on the speculation that institutional differences are their cause, specifically the enrolment and eligibility rules that make disability insurance benefits easier to receive and more generous in some countries than in others. Such rules may create incentive effects similar to those exerted by old-age pensions which often provide a financial incentive to retire early. In many countries, health requirements for disability insurance eligibility are weak. Under such circumstances, disability insurance may work as a labour market exit route to early retirement. Many countries have established very lenient work disability eligibility rules under the conditions of high unemployment.

In order to go beyond speculation, we use a set of variables characterizing the institutional features of the disability insurance in each country (coverage, minimum disability level required for full benefits, benefit generosity, medical assessment, vocational assessment, generosity of unemployment benefits). These variables have been computed by OECD (2003, Annex A.2.1) for a few countries. They are scored between 0 (no support) to 5 (generous benefits and/or lenient eligibility). We extend these variables to all 13 countries in SHARE, ELSA and HRS by using national descriptions of disability insurance.

We then apply the same methodology as in Figure 2 and relate individual disability insurance enrolment probabilities to age, gender, a broad set of health measures, and this set of institutional features. The institutional variables are jointly highly significant in explaining disability insurance take-up. For instance, the strictness of a medical exam significantly reduces disability uptake. Similarly, countries which have enacted a low minimum disability level to be eligible for claiming benefits have higher disability insurance take-up.

Coverage is a particularly interesting variable. The highest score for coverage is given if disability insurance covers the entire population; the lowest score if only employees are covered. A broad coverage increases disability enrolment, as expected, but the effect is smaller than those of medical examination and minimum disability benefit. The influence of coverage, however, is very large for women and individuals with poor health. The large impact for women is most likely the result of low labour force participation of European women who have difficulties to be eligible for a normal old-age pension and thus seek disability pensions. This corresponds to the very high female enrolment in some countries, especially Sweden and Denmark, where enrolment is almost twice as high among women as among men; in Germany, a lenient eligibility to disability insurance for women was explicitly a policy instrument in the early 1980s. The interaction between coverage and poor health indicates that disability insurance does work as designed in protecting workers with poor health.

Another interesting finding is the large positive effect of the generosity of benefits for the older part of the sample (age 60 and over), once health is taken into account. Most of these individuals are also eligible for old-age pensions; however, they choose disability benefits because they are more generous.

The interaction with other branches of the social security net is an important consideration when analysing disability insurance. We therefore also measure the duration and benefit level of unemployment compensation, a possible alternative to disability insurance as an early retirement device. We find that tight unemployment insurance increases disability insurance enrolment in a highly significant and quantitatively important way.

Quite clearly, the institutional design of disability insurance plays an important role in explaining disability insurance enrolment – but does it also explain the cross-national differences depicted in Figure 1? We follow the methodology applied in Figure 2 and predict how enrolment rates would look like if all individuals in our cross-national sample were facing the same institutional features. In other words, we predict the enrolment into disability insurance by counterfactually giving all sample individuals the same scores for coverage, minimum disability level, benefit generosity, medical assessment, etc. of their national disability insurance system. The results are striking, see Figure 7:
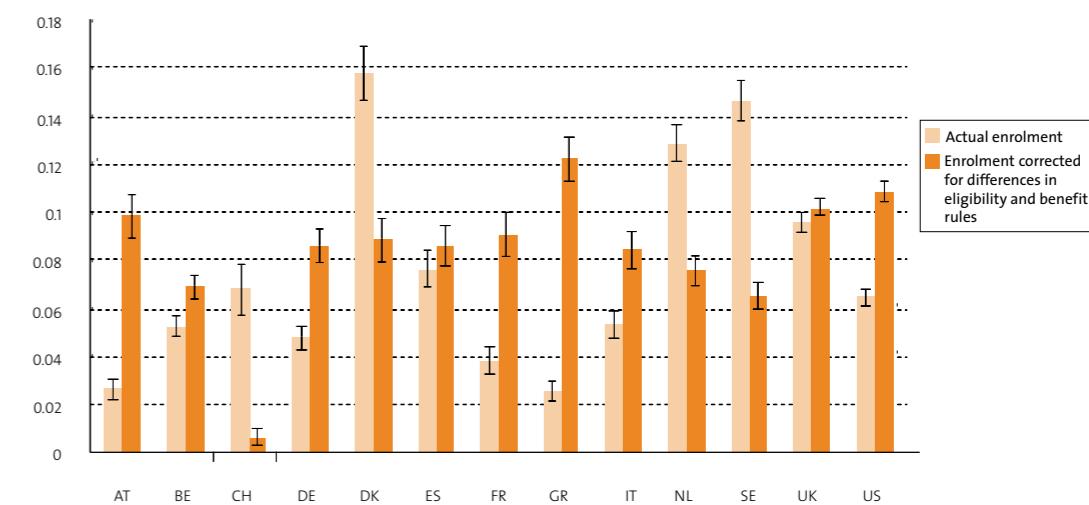
Figure 7 Predicted disability insurance enrolment if eligibility and benefit rules were equally generous in all countries

The counterfactual simulation, holding eligibility and benefit generosity constant across countries, produces much more similar disability enrolment rates than correcting for demographics and health. The only outlier is Switzerland, where uptake rates would be very low if Switzerland had average generosity.

In fact, relating the enrolment rates in the 13 countries on the five most important institutional indicator variables (coverage, minimum disability level required to receive benefits, benefit generosity, medical assessment, and vocational assessment) explains 78 percent of the cross-national variation in enrolment rates, see Figure 8:
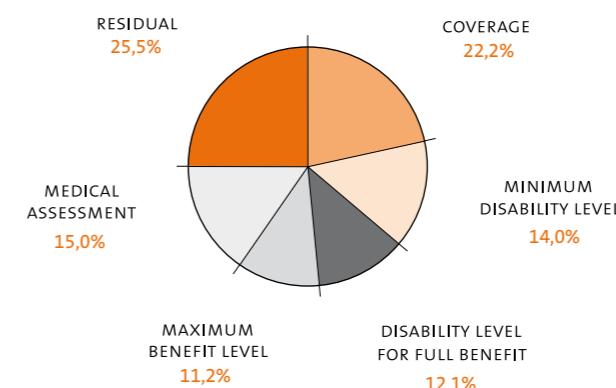
Figure 8 Cross-national variation in disability insurance enrolment as explained by institutional features of national disability insurance systems

Note: Based on the 13 countries depicted in Figures 1, 2 and 3

Conclusions

- The variation in disability insurance take-up rates across European countries is striking. It reaches from some 15 percent of individuals aged between 50 and 65 in Denmark, Sweden and the Netherlands to less than 3 percent in Austria and Greece.
- The relationship between entrance into disability insurance and health changes over time does not show any convincing case for a causal role of health in explaining the striking cross-national differences in disability insurance enrolment. There is no significant correlation with objective health measures. The weak correlation with self-rated health, however, is influenced by "justification bias", i.e., the desire by respondents to motivate their entrance into disability insurance by reporting a subjectively felt worse health status.
- Institutional features, in turn, have a very large explanatory power. Coverage, minimum disability level required to receive benefits, benefit generosity, medical and vocational assessment explain more than three quarter of the cross-national variation in enrolment rates.

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6.5 Dynamics of Volunteering

Karsten Hank, Marcel Erlinghagen

Spawned by the greater availability of adequate micro-data sources and a growing interest in the topic of 'productive ageing', the number of empirical studies dealing with elders' formal and informal voluntary engagement has been increasing rapidly. Two strands of this research seem of particular interest:

First, recent cross-national studies showed that the individual-level determinants of activity are fairly stable across different institutional contexts, but that older people's overall probability of engaging in non-market productive activities varies substantially by country (e.g., Erlinghagen and Hank, 2006; Hank and Stuck, forthcoming). Irrespective of the specific activity under investigation, similar cross-country patterns were found, which have been suggested to result from differences in a variety of contextual factors affecting individuals' productive engagement in general. More specifically, Hank and Stuck (2007) showed that higher levels of religious and political freedom as well as government social spending bear a positive relationship with older European's propensity to engage in non-market productive activities.

Second, research taking a life-course perspective on individuals' decision to volunteer (e.g., Rotolo, 2000) investigated the role of life events, such as changes in partnership, health, or employment, with the transition into retirement being of particular interest in the context of analysing engagement at older ages. The scarce empirical evidence dealing with the latter issue suggests that entering retirement has some positive effect on the probability of taking up (formal) volunteer work, but shows that previous civic engagement has an even stronger influence on elders' receptivity to volunteering in the immediate postretirement period (cf. Erlinghagen, 2008; Mutchler et al., 2003).

Newly available longitudinal data from the 'Survey of Health, Ageing and Retirement in Europe' (SHARE) allow us to combine both of these perspectives in our study of the dynamics of volunteering in the population aged 50 or older across eleven Continental European countries. Our descriptive analysis also includes cross-sectional information from three countries that did not participate in the 2004 baseline data collection and could thus not be considered in previous studies of voluntary engagement using SHARE (e.g., Erlinghagen and Hank, 2006): data in Israel were collected during the years 2005-06 and are available with the most recent public release of SHARE, while fieldwork in the Czech Republic and Poland was conducted in parallel to the first longitudinal round of SHARE in 2006-07.

Measuring Dynamics of Volunteering and Their Determinants

The analysis of volunteer dynamics we present here is based on the question "Have you done any of these activities in the last month?" referring to a list of possible answer categories which included "done voluntary or charity work" (formal volunteering) and "provided help to [family,] friends or neighbours" (informal volunteering). Note that help provided to family was included SHARE's definition of informal volunteer activities in Wave 1 only and was dropped for reasons of greater conceptual clarity in the distinction between support for kin and non-kin social networks in Wave 2. This change in the questionnaire needs to be taken into account when interpreting the empirical findings on the dynamics of informal volunteering described below.

To identify the role of specific individual characteristics in determining the dynamics of volunteering net of effects that confounding characteristics might have, we ran multivariate logistic regressions on a set of binary dependent variables indicating transitions from active volunteering to inactivity, and vice versa. The selection of explanatory variables was guided by previous research suggesting that individual resources are important determinants of voluntary engagement (e.g., Erlinghagen, 2008; Hank and Stuck, forthcoming). All these variables were coded as binary time-constant (gender, cohort, level of education) or time-varying (partnership, employment, self-rated general health) indicators. We also take into account the potential role of societal contexts by including three binary indicators of the individual's country (region, respectively) of residence, distinguishing clusters characterized by overall 'high', 'medium', or 'low' levels of volunteering (see Hank and Stuck, 2007, for a detailed discussion). Finally, we control for the time-lag (in months) between Wave 1 and Wave 2 interviews. While in the majority of countries the average time between baseline and longitudinal interview was 30-32 months, this lag was substantially shorter in Belgium and France (21-22 months).

Patterns of Continuity and Change in Volunteering

As expected, substantial changes in the magnitude of formal volunteering or in the rank order of countries with regard to elders' civic engagement did not occur between the first two waves of SHARE, although the proportion of volunteers in some countries is somewhat higher in Wave 2, see Table 1. On average, 10 percent of the population 50+ engaged in formal volunteer activities during the month preceding the SHARE interview(s). The highest rates of volunteering are observed in Denmark, Sweden, and the Netherlands, whereas the Mediterranean countries are characterized by clearly below-average proportions of older volunteers (cf. Erlinghagen and Hank, 2006). While the share of older Israelis performing voluntary work corresponds to the Continental European average, the respective numbers in Poland and the Czech Republic are very close to those observed in Greece and Spain.

Greece and Austria exhibit the greatest instability of formal voluntary engagement across time. Only about one-third of those who volunteered in Wave 1 also did so in Wave 2. This is very different in the two Scandinavian countries as well as in Belgium and the Netherlands, where about two-thirds of volunteers were continuously active. These countries are not only characterized by the greatest stability of engagement, but also exhibit the greatest dynamics in the sense that as many as 9-10 percent of the population aged 50+ took up voluntary work between waves (compared to merely 1-2 percent in Greece and Spain).

Country	Active in Wave 1[a]	Active in Wave 2[a]	Active in both waves[b]	Inactive in both waves[b]	Inactive → active[b]	Active → inactive[b]
Sweden	17.8	21.5	11.7	70.3	9.7	6.6
Denmark	17.4	21.2	11.7	66.9	10.9	7.2
Germany	10.1	13.1	7.5	78.0	7.3	5.9
Netherl.	20.8	25.5	16.2	65.2	9.5	7.7
Belgium	15.5	17.3	11.0	75.7	6.1	6.0
France	14.1	15.3	8.8	75.5	6.2	7.2
Switzerl.	14.5	16.6	7.8	73.6	9.1	7.9
Austria	8.3	8.7	3.3	84.2	5.2	6.5
Italy	6.8	8.3	3.7	88.0	4.2	4.0
Spain	2.4	2.7	1.1	94.7	1.9	1.6
Greece	2.9	2.3	1.2	95.8	0.8	2.1
Israel[b]	12.1	–	–	–	–	–
Czechia	–	3.0	–	–	–	–
Poland	–	2.0	–	–	–	–
All countries	*10.0*	*10.8*	*7.9*	*79.2*	*6.1*	*5.6*

Table 1 Participation in formal volunteering across SHARE Waves 1 and 2 in percent

Note: a) Cross-sectional weights applied, b) No weights applied

Most of the decline in informal volunteering suggested by the numbers in Table 2 – down from an average of 18 to 14 percent across all countries – should be attributed to the change in the related question in SHARE's Wave 2. The cross-country pattern of engagement remained unaffected, however: in both waves we observe much higher proportions of informal volunteers in northern Europe than in the South, which matches almost exactly with the regional pattern identified in our analysis of formal volunteering (for detailed investigations using the SHARE baseline wave see Hank and Stuck (2007); forthcoming). Israel and the Czech Republic match the average observed in Wave 1 and Wave 2, respectively, whereas the share of Polish elders being engaged in informal voluntary activities is among the lowest in Continental Europe.

While the overall stability in informal volunteering is substantially lower than for formal volunteering, similar differences between groups of countries are found. Among those who were active at baseline in Belgium, Denmark, and the Netherlands about 40 percent, and even 60 percent in Sweden, also reported to be active in the consecutive wave. In contrast, only slightly more than 10 percent of previously engaged Spaniards and about 20 percent of older Italians exhibited continuous engagement across both waves. Moreover, higher percentages of northern Europeans started to perform informal voluntary work than their southern European counterparts.

Country	Active in Wave 1[a]	Active in Wave 2[a]	Active in both waves[b]	Inactive in both waves[b]	Inactive → active[b]	Active → inactive[b]
Sweden	37.4	40.0	22.7	41.6	16.9	17.1
Denmark	32.2	26.8	14.2	49.6	12.8	20.1
Germany	16.1	15.2	5.1	65.8	11.0	17.0
Netherl.	29.0	24.2	13.3	54.7	10.2	20.4
Belgium	28.0	23.9	12.5	57.4	11.2	17.8
France	24.3	21.2	9.2	60.3	10.2	18.0
Switzerl.	21.5	19.3	6.0	62.7	13.8	16.0
Austria	21.6	17.6	7.1	65.2	9.7	17.2
Italy	12.4	6.8	2.9	82.0	4.0	10.9
Spain	5.7	3.4	0.7	91.0	2.3	5.3
Greece	15.1	7.0	5.5	83.7	1.1	9.6
Israel[b]	17.1	–	–	–	–	–
Czechia	–	14.8	–	–	–	–
Poland	–	4.7	–	–	–	–
All countries	*17,6*	*13,7*	*9,6*	*64,6*	*9,1*	*15.4*
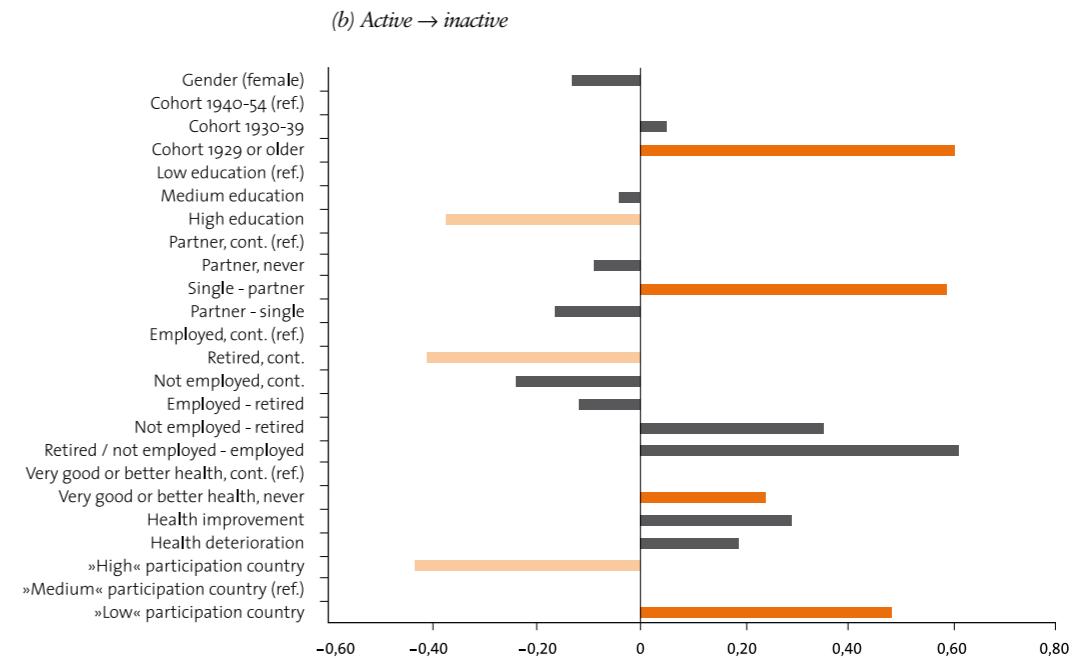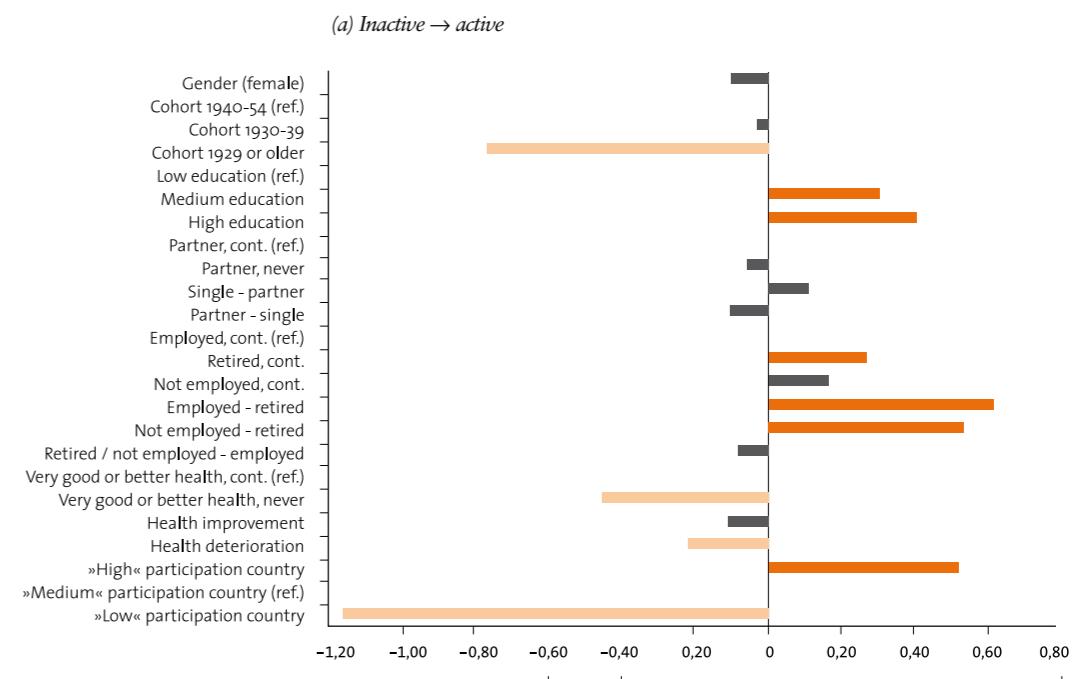
Table 2 Participation in informal volunteering across SHARE Waves 1 and 2 in percent

Note: a) Cross-sectional weights applied, b) No weights applied

Determinants of Volunteer Dynamics

Our findings on the determinants of (formal and informal) volunteer dynamics are consistent with expectations derived from both cross-sectional analyses of SHARE data (e.g., Hank and Stuck, forthcoming) and longitudinal single-country studies (e.g., Erlinghagen, 2008).

The probability of taking-up formal voluntary work was lowest among those who were born in the oldest cohorts (1929 or earlier), whose health was less than very good in both waves (or whose health deteriorated between waves), and among those living in Mediterranean countries (that is, in a social context characterized by overall 'low' levels of voluntary participation), see Figure 1a. More highly educated individuals as well as those being retired in both waves (or those who entered retirement between waves), and those living in one of the 'high' participation countries (Denmark, Sweden, and the Netherlands) exhibited a higher propensity to start formal volunteering than their counterparts in the reference categories. Turning to giving-up formal volunteering, see Figure 1b, we find that a high level of education, being retired in both waves, and living in the Netherlands or Scandinavia is associated with a reduced probability of quitting. Older respondents, those who newly entered a partnership, whose health was less than very good throughout and those living in Greece, Italy, or Spain, however, were more likely to withdraw from formal volunteering.

(a) Inactive → active

(b) Active → inactive

Figure 1 Dynamics of formal volunteering between SHARE Waves 1 and 2 – results of multivariate logit models (log odds)

Note: Light orange (dark orange) bars indicate negative (positive) correlations significant at levels of 5% or higher; coefficient of control variable for time between interviews not displayed

(a) Inactive → active

(b) Active → inactive
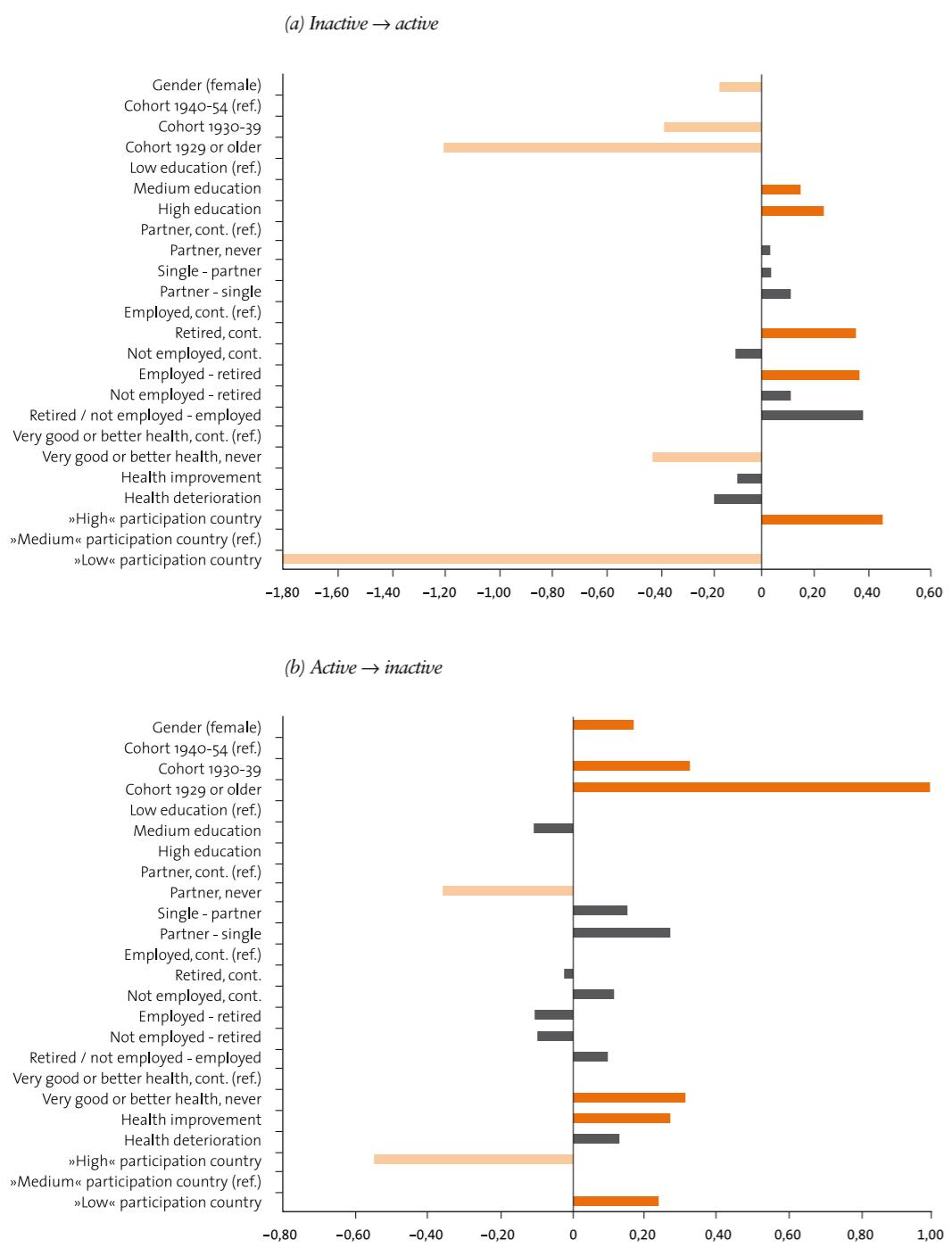
Figure 2 Dynamics of informal volunteering between SHARE Waves 1 and 2 – results of multivariate logit models (log odds)

Note: Light orange (dark orange) bars indicate negative (positive) correlations significant at levels of 5% or higher; coefficient of control variable for time between interviews not displayed

Taking-up informal voluntary work, is positively related to having a higher educational degree, to having been retired in both waves (as well as to having entered retirement from paid work between waves), and is also more likely to happen, if the respondent lives in Denmark, Sweden, or the Netherlands, see Figure 2a. Respondents from 'low' participation countries, with relatively 'poor' health across both waves, who were born in older cohorts, and women exhibited lower probabilities to start informal voluntary activities than

the reference group. The gender effect observed here is likely to result – at least in part – from the exclusion of family support in the definition of informal volunteering in Wave 2. The same holds for the corresponding effect in our model for giving-up informal volunteering, see Figure 2b. In addition to women's higher probability of quitting, we detect positive associations between stopping to be active and age (cohort, respectively), continuously 'poor' health (as well as improvements in self-rated health!), and living in a Mediterranean country. Those who lived without a partner in both waves and those residing in 'high' participation countries exhibited the lowest propensity to terminate their engagement.

Conclusions

This analysis of longitudinal data from the first two waves of the 'Survey of Health, Ageing and Retirement in Europe' provided us with three main findings:

- Formal volunteering is a dimension of 'productive ageing' characterized by greater stability over time than informal volunteering.
- Volunteer transitions among older Europeans were affected by both time-invariant individual resources, such as one's level of education, as well as by changes in the individual's resources (e.g. health status or time availability).
- The societal context in which older persons live not only has a significant impact on the prevalence of volunteering at a given point in time, but the dynamics of volunteering also vary by country. Comparing, for example, Scandinavian and Mediterranean countries suggests that social environments characterized by higher proportions of older volunteers cross-sectionally also fare well in establishing opportunity structures which stabilise elders' voluntary activity and foster taking-up new engagement.

Future studies should address three issues in particular:

- The relationship between life-course transitions at older ages, such as entering retirement, and earlier life events and experiences in determining elders' voluntary engagement deserves further attention (cf. Erlinghagen, 2008). Future waves of SHARE, and especially the retrospective SHARELIFE data, will provide an important basis for such research.
- The dynamics of volunteering in the context of changes in older people's partnership status – when, for example, entering widowhood – are yet underinvestigated. SHARE is a particularly suitable data source for this kind of analyses, because full interviews are conducted with both partners in a household.
- The relationship between health and volunteering – with the former being both a barrier to and a benefit resulting from the latter – remains an important topic that has rarely been addressed in cross-national research. The SHARE data provide unique opportunities to study the role of different social and welfare state contexts in shaping the relationship between productive ageing and individuals' well-being.

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6.6 Retirement and Mental Health

Agar Brugiavini, Enrica Croda, Michael Dewey

Poor health has long been established as one of the most critical determinants of retirement behaviour and more generally a clear pattern emerges of inactivity being associated to poor health conditions. The existing literature has focused primarily on the role of physical health. Although physical health is certainly important for a person's functioning in daily life, including working for pay, mental health also plays a role. More than 27% of adult Europeans are estimated to experience at least one form of mental ill health during any one year. Mental ill health is estimated to cost the EU about 3-4% of GDP, mainly trough lost productivity. The most common form of mental illness in the EU is anxiety and depression. By 2020, depression is expected to be the highest ranking cause of diseases in the developed world (WHO, 2001).

Few studies have documented the relationship between mental health (defined either as clinical depression, depressive symptoms, or self assessed mental health) and labour force participation, particularly retirement behaviour. Given the wave of pension reforms in Europe, establishing the nexus between mental health and labour market status is particularly relevant.

To date, the research on mental health and retirement behaviour has been limited by the availability of datasets containing the necessary information. SHARE uniquely resolves these data limitation problems because it includes rich information on mental health and other health domains as well as a wide array of socioeconomic status and demographic characteristics on individuals aged 50 and over, in thirteen EU countries ranging from Scandinavia, through Western and Central Europe, to the Mediterranean, to Israel. Moreover the panel design of SHARE allows the exploration of dynamic processes relating health and labour force participation of older adults.

Mental Health and Employment Status

One underlying question is whether individuals who are more likely to exhibit symptoms of depression are also more likely to be out of the labour force or, in a dynamic context, to exit the labour force. However we cannot rule out an alternative interpretation by which the onset of depression follows retirement in a significant number of individuals.

Figure 1 shows the prevalence of depression by gender and country, based on the 2006 SHARE sample for the age group 50-64. It is this group that is particularly relevant in this paper as it is at risk of retirement. Depression is defined on the basis of the EURO-D symptom scale which measures current depression and can be constructed from questions in the mental health module of the SHARE questionnaire as a composite index of twelve items covering the following domains: depressed mood, pessimism, suicidality, guilt, sleep, interest, irritability, appetite, fatigue, concentration, enjoyment and tearfulness. The index is scored by summing binary items. We construct a binary indicator which takes value one if the EURO-D scale is above three and zero otherwise, which has been demonstrated to indicate a clinically significant level of depression.

In all countries, women are consistently more likely to be depressed than men. This is an empirical regularity, consistent with other findings in psychiatric epidemiology (Dewey and Prince, 2005). However, there exist important cross countries differences captured by the EURO-D. Poland stands out as the country with the largest fraction of older adults showing clinically significant symptoms of depression (more than 50% of women, com-

pared to about 33% of men). Poland, together with most Mediterranean countries (Italy, Spain and Israel), France and Belgium shows significant higher levels of the EURO-D score than Nordic countries both for men and women. At the other extreme we find Greece, with 19% of women, and 8% of men showing symptoms of depression. It is interesting to notice the difference in the prevalence of depression between Poland and the Czech Republic, which shows rates similar to the Nordic countries in the sample.
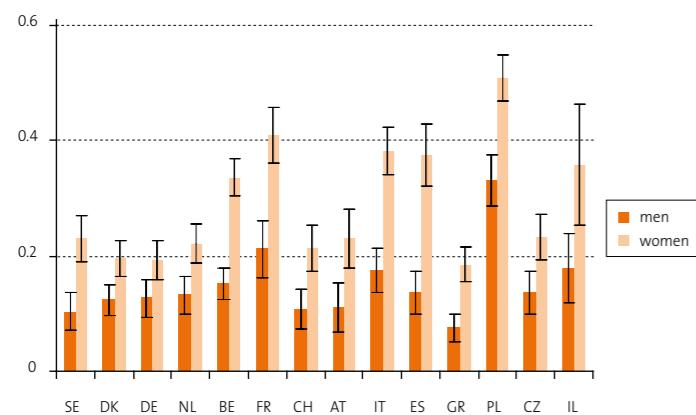
Figure 1 Prevalence of depression by country and gender

Note: Sample of 16,852 SHARE 2006 respondents aged 50-64, 7,511 men and 9,341 women, who self report as being

retired, employed, unemployed, disabled and homemaker. Brackets on top of each bar represent 95% confidence intervals.

Weighted observations

The gender difference is apparent also in the prevalence of depression by self-reported labour market status, depicted in Figure 2 for five possible states: retired, employed, unemployed, disabled and homemaker ("other" is not shown). Not surprisingly, depression is prevalent amongst the sick and disabled, followed by people who are not engaged in labour market activities: unemployed, homemakers and retired individuals show all higher rates of prevalence than those who are still working.
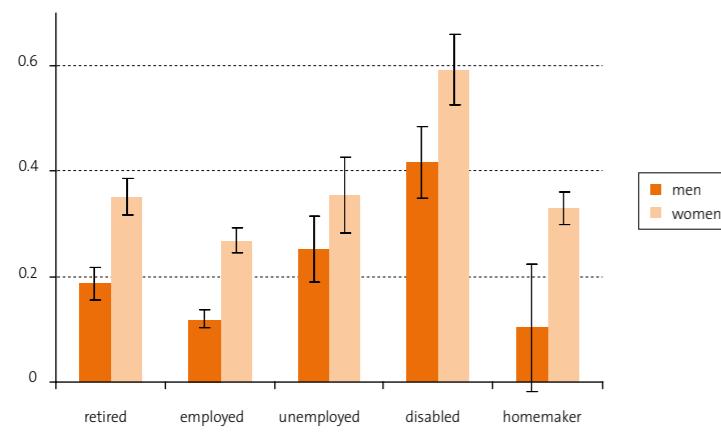
Figure 2 Prevalence of depression by self reported employment status

Note: Sample of 16,852 SHARE 2006 respondents aged 50-64, 7,511 men and 9,341 women, who self report as being

retired, employed, unemployed, disabled and homemaker. Brackets on top of each bar represent 95% confidence intervals.

Weighted observations

Focusing on retirees only, Figure 3 shows the main reasons why they retired. The SHARE questionnaire contains a set of not mutually exclusive reasons, which we aggregated in four categories: becoming eligible for a (public or private) pension, being offered some form of early retirement, retiring because of own health problems, and retiring to enjoy life. In most countries, becoming eligible for a pension is the prevalent reason for retirement, cited by at least one of two retirees as a reason for retirement, with Greece and Italy standing out by having almost 9 out of 10 retirees citing it. Institutions definitely play a role, as confirmed, for instance, by the fact that in the Netherlands the most cited motive for retirement is being offered early retirement. In many countries, "health problems" also play a role, being cited, for instance, by more than one every four retirees in Sweden and Austria. These health problems may include mental health problems. Of those who retired for health problems, retired individuals in Poland, France and Belgium are more likely to suffer from depression as shown in Figure 4.
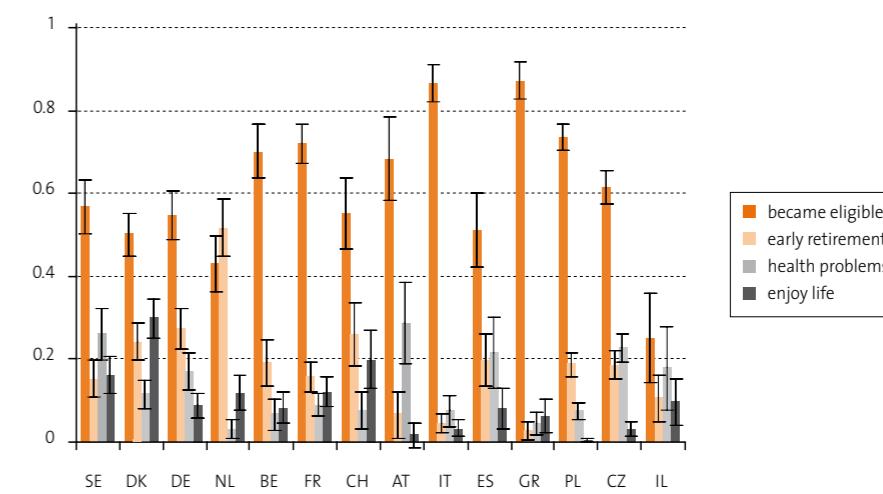
Figure 3 Reasons for retirement by country

Note: Sample of 5,349 SHARE 2006 respondents aged 50-69 who self report as being retired. Brackets on top of each bar

represent 95% confidence intervals. Weighted observations

Figure 4 Prevalence of depression among retirees who retired for health reasons

Note: Sample of 664 SHARE 2006 respondents aged 50-69 who self report as being retired and retired for own health pro-

blems. Brackets on top of each bar represent 95% confidence intervals. Weighted observations

A more direct way to investigate the relationship between labour market status and mental health is provided in Table 1 where we selected only respondents who are either retired or employed and cross-tabulate this characteristic with a binary indicator denoting whether respondents manifest signs of clinically significant depression, "depressed" (EURO-D score > 3) or not, separately for men and women.

	Male				Female		
	Not Depressed	Depressed	Total		Not Depressed	Depressed	Total
Retired	3,356	602	3,958	**Retired**	2,820	1,216	4,036
	84.79%	15.21%	100%		69.87%	30.13%	100%
Employed	4,394	518	4,912	**Employed**	3,325	997	4,322
	89.45%	10.55%	100%		76.93%	23.07%	100%
Total	7,750	1,120	8,870	**Total**	6,145	2,213	8,358
	87.37%	12.63%	100%		73.52%	26.48%	100%

Table 1 Labour force participation and depression by gender

Note: Sample of 17,228 SHARE 2006 respondents aged 50-69 who self report as being either retired or employed and for whom the information regarding the components of the EURO-D score is not missing

Each cell contains the frequency (count) and percentage of respondents in an employment status (retired or employed) who are depressed or not. Again, women are more likely to be depressed than men, across employment states: 26 percent of women, compared to 13 percent of men in this sample show significant signs of depression. The percentage of depressed individuals is significantly higher amongst the retirees if compared with the working population, both for men and women: 30 percent of retired women show signs of depression, compared to 15 percent of retired men. These percentages become 23 percent for women and 11 percent for men among the employed respondents. Obviously these results may be dominated by age and cohort effects, which is why we resort to the probit analysis summarized in Figure 5, which reports the marginal effects of a probit regression to study the static determinants of the probability of suffering from depression. The explanatory variables included in the analysis are an indicator for whether the respondent is retired, an indicator for whether the respondent has at least one limitation with an activity or with an instrumental activity of daily living, the respondent's years of education, a set of demographic characteristics such as respondent's age, gender (equal to 1 if respondent is male), an indicator for whether the respondent is married, and a set of country dummies. All the explanatory variables in Figure 5 have a statistically significant effect on the probability of suffering from depression. In particular, after controlling for all the other characteristics, being retired increases the probability of suffering from depression by about 4 percentage points. Having a functional limitation strongly increases the probability of being depressed. The probit results confirm that men are less likely than women to show signs of depression, and that married individuals are also less likely to be depressed.

Figure 5 Static probit analysis of the probability of suffering from depression

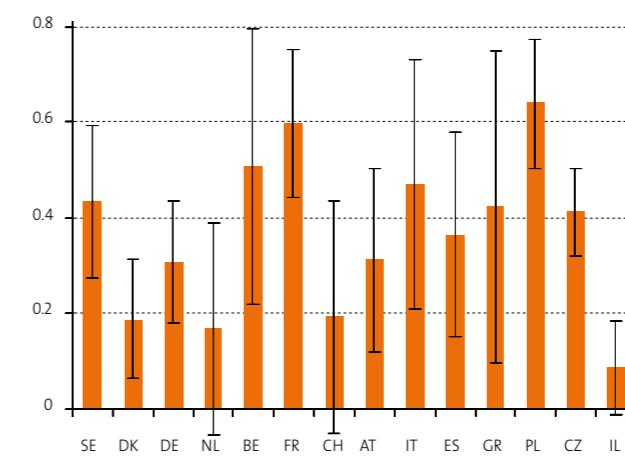*Note: Marginal effects obtained from a probit regression on a sample of 15,948 SHARE 2006 respondents aged 50-69 who self report as being either retired or employed and for whom the information regarding the explanatory variables is not missing. The probit regression includes also a set of country dummies.*

Retirement and Mental Health

The cross-sectional analysis is bound to be affected by the age composition and more generally by the demographic characteristics of the sample, also across the different countries. Turning the attention to the panel data of 2004 and 2006 we examine transitions from employment to other labour market states and also changes in mental health controlling for these characteristics. We consider the sample of individuals observed both in SHARE 2004 and SHARE 2006: this induces problems of selection that may affect the representativity of the sample, though results will be internally consistent.
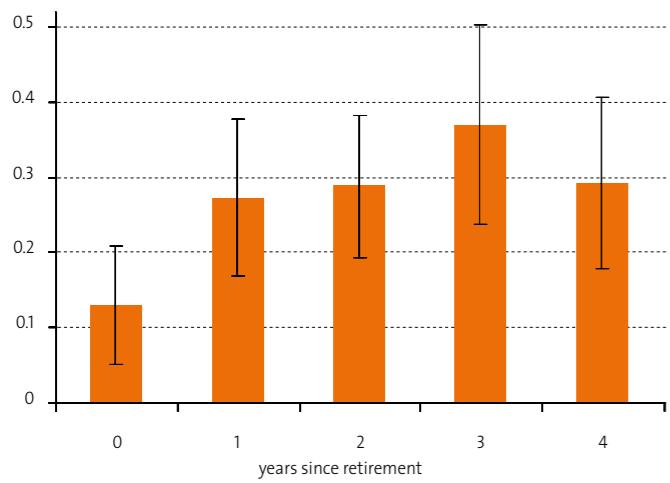
Table 2 shows the distribution (frequencies and row percentages of transitions) of individuals according to the "depressed" or "not depressed" characteristics in the 2004 (rows) and in the 2006 wave of SHARE (columns) by distinguishing two groups: respondents who were (observed as) employed in 2004 and are again (observed) in employment in 2006 (left panel) and those who change from (being observed as) employed in 2004 to (being observed as) retired in 2006 (right panel). The relevant figure is the percentage of those who change mental health status and at the same time change employment status (8.67%, in the left panel) as opposed to the same figure for those who do not change employment status (8.68%, in the right panel). The difference between these two figures is not significant (also due to the small sample size) and we cannot conclude that there are important concomitant effects from changes in employment status to changes in symptoms.

Transitions from Employed in the 2004 wave							
to Employed in the 2006 wave				to Retired in the 2006 wave			
	Not Depressed	Depressed	Total		Not Depressed	Depressed	Total
Not Depressed	3,018	287	3,305	**Not Depressed**	527	50	577
	91.32%	8.68%	100%		91.33%	8.67%	100%
Depressed	409	289	698	**Depressed**	55	41	96
	58.60%	41.40%	100%		57.29%	42.71	100
Total	3,427	576	4,003	**Total**	582	91	673
	85.61%	14.39%	100%		86.48%	13.52%	100%

Table 2 Depressions Transition by Employment Transitions

Note: Balanced sample of 4673 SHARE respondents aged 50-69 in the 2006 wave who self report as being employed in the 2004 wave and either retired or employed in the 2006 wave and for whom the information regarding the components of the EURO-D score in both waves is not missing. Respondents from Poland, the Czech Republic and Israel are excluded because only one wave is available for these countries.
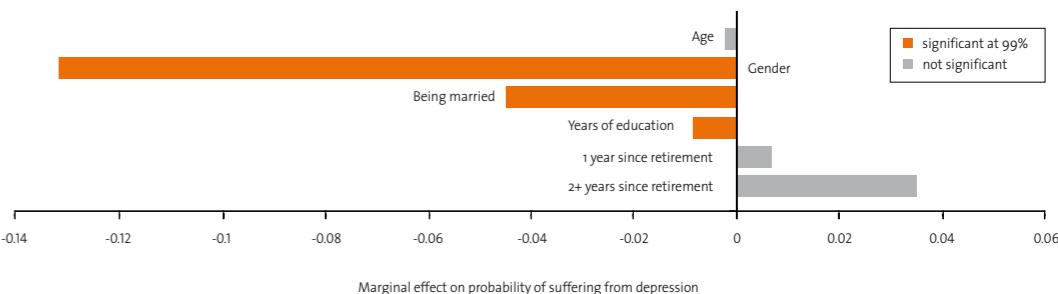
However, the time elapsed between the two first waves of SHARE might be too short a time-lag to capture any significant change, hence we resort to an additional source of information that comes from a retrospective question asked in SHARE 2006 on the year in which retirees actually retired. Figure 6 shows the prevalence of significant symptoms of depression among young retirees (aged 50-59) as a function of the years passed since they retired. The evidence suggests that depression may kick in with some delay after retirement.

Figure 6 Prevalence of depression by years since retirement

Note: Sample of 709 SHARE 2006 respondents aged 50-59 who self report as being retired. Brackets on top of each bar represent 95% confidence intervals. Weighted observations

To investigate further this issue, we resort to a probit analysis of the probability of suffering from depression as a function of the time elapsed since retirement, in addition to other variables. The explanatory variables included in the analysis are indicators for whether the respondent has been retired for one year or for 2 years or more (using as reference the

fact that the respondent has retired in the same year of the SHARE 2006 interview), the respondent's years of education, a set of demographic characteristics such as respondent's age, gender, marital status, and a set of country dummies. The results of the probit analysis, reported in Figure 7, show that the probability of being depressed increases as time since retirement elapses, even after controlling for other factors. However, the statistical significance of this finding is not too strong. The effect of gender, marital status and years of education are consistent with the results discussed in the static analysis, providing additional evidence that men are less likely than women to show signs of depression, married individuals are less likely to be depressed than unmarried ones, and that additional years of education are associated with a lower probability of being depressed.
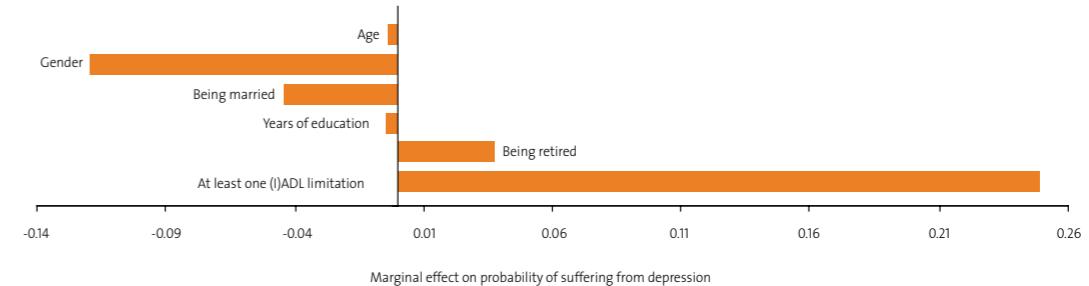

Figure 7 Probability of suffering from depression as a function of retrospective information

Note: Marginal effects obtained from a probit regression on a sample of 7,384 SHARE 2006 respondents aged 50-69 who self report as being retired and for whom the information regarding the explanatory variables is not missing. The probit regression includes also a set of country dummies.

Conclusions

- This contribution shows that – as found in previous studies – depression is more prevalent amongst women than amongst men and that Mediterranean countries seem more affected by symptoms.
- An interesting finding is that the prevalence of depression observed in Poland is similar to that of the Mediterranean countries, while this is not the case for the Czech Republic.
- Our paper documents the existence of a correlation between mental health and retirement. As for the retirement decision we cannot conclude that mental health plays a role on its own, but it is certainly one major component of the effect of he overall "health status" that partly determines the exit from the labour force. We find a significant association between retirement and mental health when controlling for other characteristics, including age, in a static regression framework.
- Looking at the dynamic dimension or at retrospective questions on the time elapsed since retirement reveals that the impact of retirement on depression symptoms is captured typically after a few years after the event.
- The main finding is that retirement may induce – together with other determinants- the onset of depression symptoms, even if with a delay. This result provides one more reason for policy makers to make it possible for individuals to work longer, in a favourable working environment.

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6.7 Quality of Work and Well-being – The European Dimension

Johannes Siegrist, Morten Wahrendorf

Compared to the other main regions of the world, the region of Europe is often perceived as a socio-economically rather homogeneous association of countries. This view is supported by the development of a unifying social and economic policy among member states of the European Community which is currently composed by the large majority of all European states. However, at this stage, considerable variations in economic, social and health-related conditions still exist across Europe. For instance, a North-South gradient of economic growth and welfare state development has been observed for many years, with Nordic and Western European countries ranging at the top and Mediterranean countries ranging at the bottom. More recently, with the political and economic transformation of former communist countries a second gradient of wealth and health became obvious, an East-West gradient with substantially poorer living conditions in Central and Eastern compared to Western European countries. This gradient in wealth is reflected in a gradient of health, documenting a gap in mean life expectancy of about ten years between the least developed Eastern and the most developed Western countries (Marmot and Wilkinson, 2006). Differences in labour market participation, wages and working conditions contribute to the explanation of this gradient, but comparative studies monitoring these latter conditions in detail with standardized measures are still scarce (Parent-Thirion et al., 2007).

In this chapter we set out to compare one aspect of the socio-economic development of European countries, quality of work and employment. Given their exposure time over years or even decades, people's working conditions exert a strong influence on their quality of life, their health and well-being. An adverse physical and psychosocial work environment was shown to increase the risk of morbidity, early retirement and premature (Marmot and Wilkinson, 2006). Importantly, this impact is not restricted to less privileged labour market groups confined to precarious work, but extends to skilled and higher educated segments of employment as well. With the major shift of employment from the agricultural and industrial sector to the service and administrative sector the quality of work has undergone substantial change. Today, fewer jobs are defined by physical demands and more by mental and emotional demands. Computer-based information processing is becoming a part of a growing number of job profiles, and employment in the service sector continues to rise. As a result, psychological and social stressors are becoming more prevalent, and their contribution to health and well-being is likely to parallel or even outweigh the contribution of more traditional occupational stressors.

To measure an adverse psychosocial work environment theoretical models are needed that delineate particular stressful job characteristics at a level of generalization that allows for their use in a wide range of different occupations. Several such concepts were developed (Antoniou and Cooper, 2005), but two models received special attention in occupational research in recent past, the demand-control model (Karasek et al., 1998) and the effort-reward imbalance model (Siegrist et al., 2004). The former model identifies stressful work by job task profiles characterised by high demand in combination with low control (decision latitude), whereas the latter model claims that an imbalance between high efforts spent and low rewards received in turn (money, esteem, career opportunities, job security) adversely affects health.

Here, we answer the following questions:

- What is the prevalence of low quality of work, in terms of these two models, in the European countries under study in SHARE? Can we observe a North-South and East-West gradient in quality of work?
- To what extent does quality of work vary according to socio-economic position, age, gender, and employment sector?
- Does low quality of work assessed at first measurement predict well-being at second measurement, two years later?

Variations in Quality of Work Between Countries

Quality of work was assessed by a short battery of items derived from (a) the Job Content Questionnaire measuring the demand-control model (Karasek et al., 1998) and (b) from the effort-reward imbalance model questionnaire (Siegrist et al., 2004). With regard to the first model, the measurement was restricted to the control dimension as this dimension proofed to be of particularly high predictive power in a number of studies (Karasek et al., 1998; Pikhart et al., 2004). Low control at work was measured by the sum score of two Likert-scale items ranging from 2 to 8, with higher scores indicating lower control at work. Scores in the upper tertile were defined as representing poor quality of work in terms of low control for each country separately. To measure effort-reward imbalance, we first analysed its core dimension, reward (5 items ranging from 5 to 20), and additionally composed a ratio of the two scales 'effort' (2 items) and 'reward' (5 items; the ratio being adjusted for unequal number of items). This ratio is assumed to mirror the crucial hypothesis of this model, i.e. the imbalance between high 'cost' and low 'gain', with higher ratios indicating poorer quality of work. For cross-country analyses, tertiles of the ratio were calculated for each country separately. Participants scoring in the upper tertiles of this ratio of imbalance were considered experiencing poor quality of work.

As demographic and socioeconomic factors we included age and gender, as well as income and education. Income information was based on the total annual household income that we categorised into country specific tertiles (high, medium, low). Education was measured according to the International Standard Classification of Educational Degrees (ISCED-97) that we categorised into 'low education' (pre-primary, primary or lower secondary education), 'medium education' (secondary or post-secondary education), and 'high education' (first and second stage of tertiary education). Additionally, information on employment sector was included.

We introduced two indicators of well-being. First, 'depressive symptoms' were measured using the EURO-D scale of depression with an established cut-point indicating the presence of clinically relevant depressive (Dewey and Prince, 2005). Second, 'decreased self-rated health' was measured by a single question: "Compared with your health when we talked with you in [{month and year previous interview}], would you say that your health is better now, about the same, or worse?" 'Decreased self-rated health' was present if people reported worse health.

The analyses are based on release 2.0.1 data of Wave 1 and preliminary data of the second wave (release 0) of the SHARE study. The sample is restricted to people who were still in regular employment or self-employed at the time of the interview (Wave 1: N=9142; Wave 2: N=9,135). The analyses of effects on prospective well-being are limited to the longitudinal data from employed people answering all questions at both waves (N=5403).
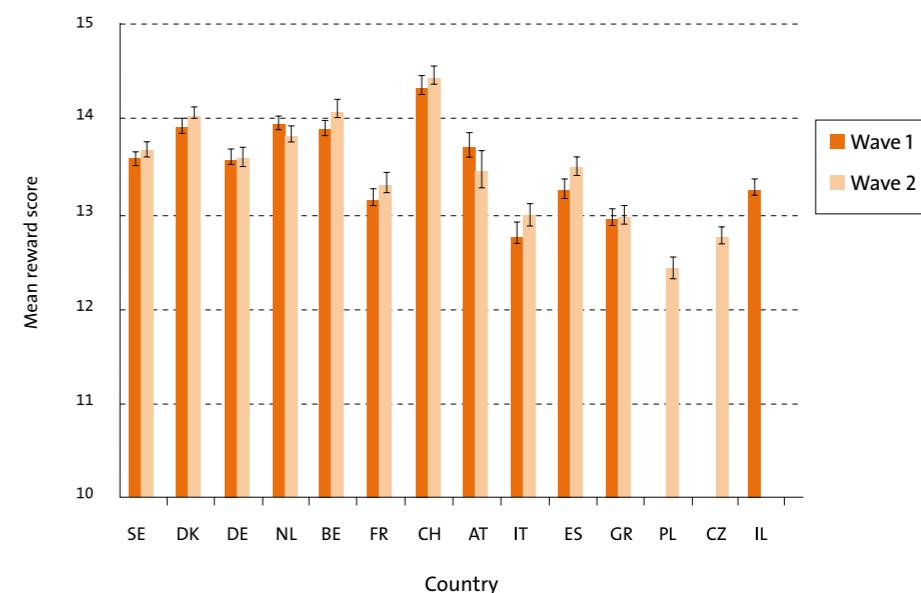
Figure 1 Quality of work across SHARE countries (mean scores of reward at work (range 5-20) and standard error) in Wave 1 and Wave 2
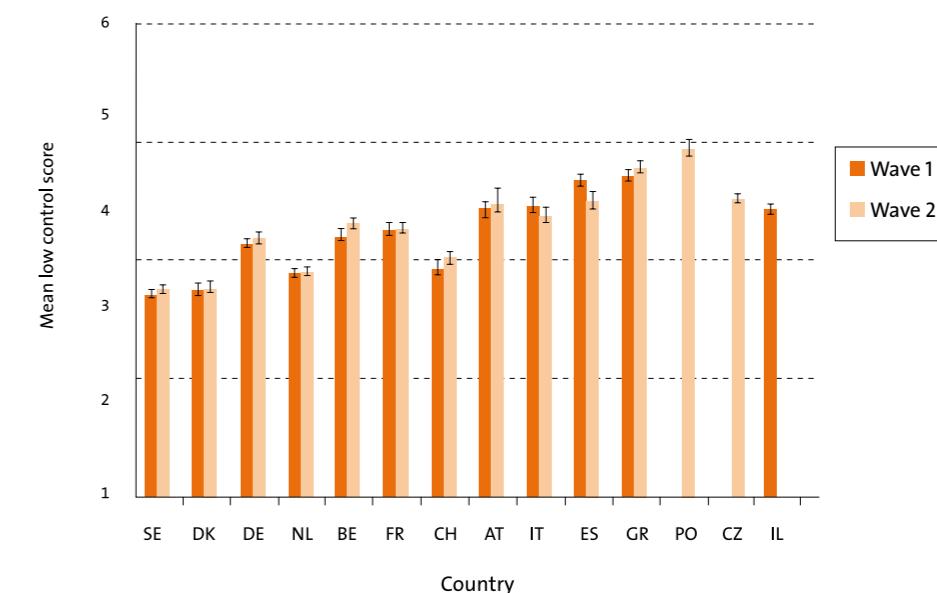
Figure 2 Quality of work across SHARE countries (mean scores of low control at work (range 2-8) and standard error) in Wave 1 and Wave 2

As can be seen from Figures 1 and 2, quality of work varies according to the country under study. For both models, we observe an overall lower quality of work in Southern and Eastern European countries, compared to Northern and Western European countries. Concerning reward at work, differences are largest between Switzerland (top) and Poland (bottom). Poland also ranks lowest with regard to control at work where scores in Sweden are at the top. A second finding that is obvious from Figures 1 and 2 concerns the relative stability of measures of quality of work over the two measurement waves. Although some minor improvements or deteriorations are visible from single countries the scores, taken together, do not really differ.

Variations in Quality of Work Within Countries

The second question of interest is whether quality of work varies within the countries under study according to main population characteristics, such as age, gender, socio-economic position and employment sector. To answer this question we conducted both bivariate and multivariate analyses with 'effort-reward ratio' (upper tertile) and 'low control' (upper tertile) as criteria. In a majority of countries the percentage of participants with a high effort-reward ratio is higher among men then among women, with exceptions in Denmark and Sweden. Conversely, low control at work is more often reported in women in almost all countries. Yet, in either case, these differences are relatively small (results not shown).

With regard to age findings are less consistent. In general, younger age groups exhibit poorer quality of work compared to the group 60 plus. Yet, to some extent this might reflect a healthy worker effect. Additionally, in countries with a high employment participation rate beyond age 60, this decline of poor quality of work is less visible (results not shown). We also explored variations in quality of work according to employment sector. Interestingly, scores were relatively highest among self-employed people and relatively lowest among civil servants. As the percentage of self-employed was quite high in some Southern European countries, this effect may in part explain the poorer quality of work observed in these countries (results not shown).

The most robust and significant differences in quality of work were observed with respect to socio-economic position. Given the consistency of these trends across all countries we grouped countries into four categories (Northern, Western, Southern, Eastern) and calculated the scores of the two work models according to two different measures of socio-economic position, education and income (tertiles). Figures 3 and 4 display the results indicating a gradient in quality of work according to education and income. The gradient is steepest in Southern European countries. Overall findings indicate that within the ageing European workforce there are large differences in quality of work according to socio-economic position. If low quality of work affects health and well-being, this finding has direct implications for socially graded risks of early retirement and disability pension. Yet, whether quality of work contributes to the prediction of reduced well-being in our data set remains to be seen (see below).
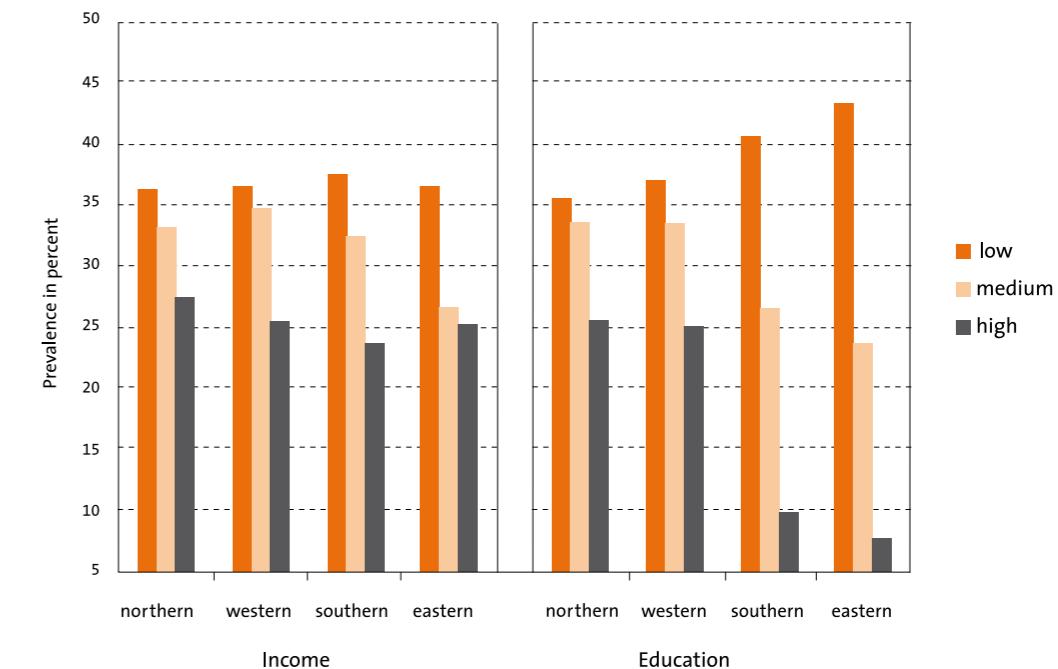
Figure 3 Prevalence of low quality of work (effort-reward ratio upper tertile) according to income and education, by region
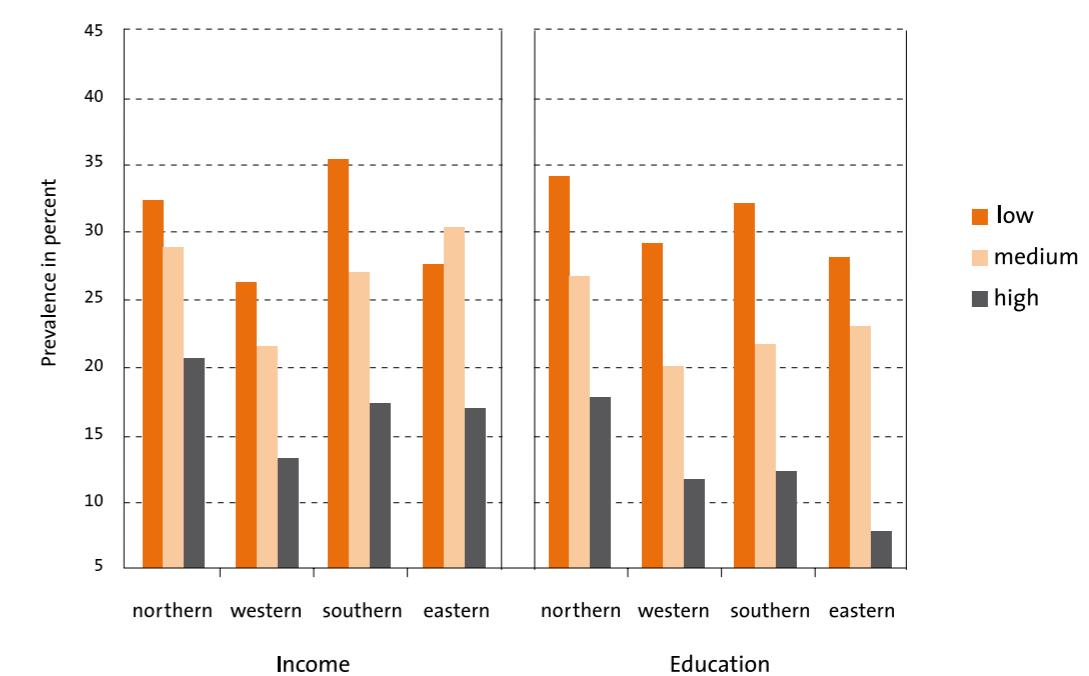
Figure 4 Prevalence of low quality of work (low control upper tertile) according to income and education, by region

Quality of Work and Well-being: First Prospective Results

Results derived from a prospective epidemiological study design have higher scientific credibility than those derived from cross-sectional investigations. This is due to the fact that both the exposure of interest (in our case quality of work) and the health condition under study (in our case depressive symptoms and self-rated health) are measured at study onset (Wave 1), whereas health is measured again at Wave 2, and is subsequently related to the

exposure. If a consistent 'dose'-'effect' relationship between quality of work and well-being is observed, after appropriate adjustments in multivariate statistical models, there is some indication that this association can be interpreted in terms of a causal relation. Here, we present findings from bivariate analyses, but discuss additional results derived from multivariate analyses.
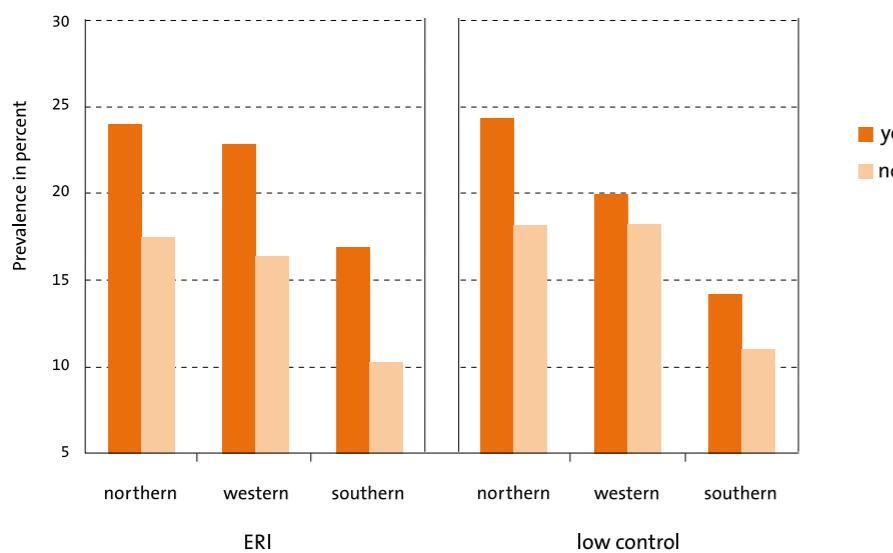
Figure 5 Prevalence of depressive symptoms in Wave 2 (EURO-D) according to low quality of work in Wave 1 (effort-reward ratio or low control upper tertile)
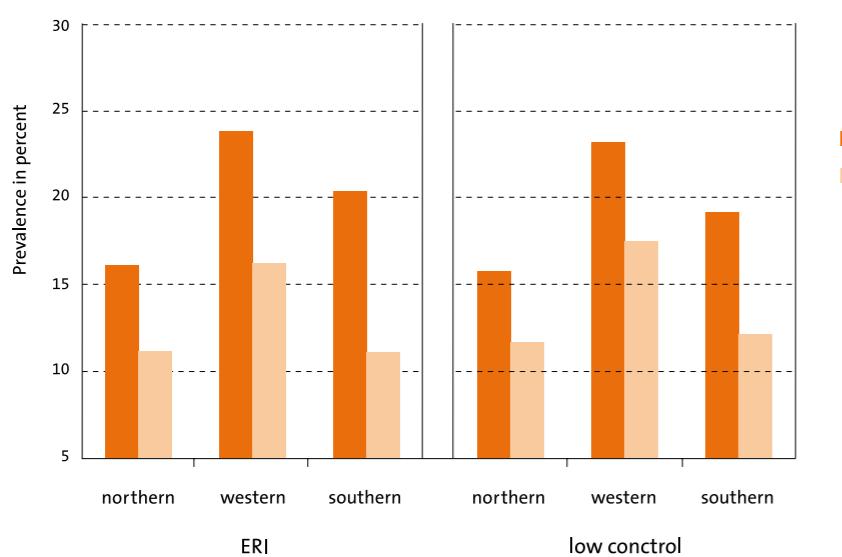
Figure 6 Prevalence of decreased self-rated health in Wave 2 according to low quality of work in Wave 1 (effort-reward ratio or low control upper tertile)

Again, given a high consistency of results across the countries under study, we present the results according to groups of countries. As data from Eastern Europe are restricted to one measurement point they are excluded from this analysis. Figure 5 demonstrates the prevalence of depressive symptoms (Wave 2) according to whether participants experience poor quality of work or not at Wave 1. Despite variations in the prevalence of

depressive symptoms – with a higher percentage in Western compared to Northern and Southern countries – clear-cut differences are obvious for effort-reward imbalance and for low control at work. The same holds true for the second measure of well-being, 'decreased self-rated health'. Results of Figure 6 indicate a higher proportion of participants with decreased self-rated health among those experiencing high effort and low reward at work and among those with low control at work, compared to the remaining participants.

These findings were further analysed in multivariate logistic regression models. A remarkable outcome of these latter analyses indicates that the robust association of socioeconomic position with well-being (not shown in this chapter) is considerably diminished if measures of quality of work are introduced into the model. This observation may indicate that poor quality of work accounts for some of the effect of low socio-economic position on reduced well-being. In the final model, odds ratios of depressive symptoms and decreased self-rated health remain elevated for poor quality of work, and in particular for effort-reward imbalance.

The results of these analyses are supported by those evolving from a number of prospective and cross-sectional investigations testing associations of the two models of a health-adverse psychosocial work environment with depressive symptoms and poor self-rated health (Dragano et al., 2008; Kivimaki et al., 2007; Stansfeld and Candy, 2006). These studies were conducted in all regions of Europe and beyond, including employed men and women of different age groups and a variety of occupational categories, thus adding to the validity of the trends reported here. It is likely that continued exposure to effortful work that is not reciprocated by appropriate rewards as well as exposure to job tasks with little freedom and decision latitude in the long run undermine the well-being and health of working people by eliciting recurrent stressful experience and by reducing positive emotions and motivations in daily working life.

Conclusions

'Modern' work is more often characterized by mental, emotional and psychosocial demands and threats than by physical demands. These changes in quality of work are taken into account by models of a health-adverse psychosocial work environment, such as the demand-control and the effort-reward imbalance model.

- We found significant differences in mean quality of work between different regions of Europe, indicating a North-South and an East-West European gradient, with relatively lowest quality of work in Eastern and Southern Europe.
- We observed variations in quality of work according to age, gender, employment sector and socio-economic position within each country. These variations became most obvious if stratified according to education and income, the two indicators of socio-economic position. In all European regions under study, low socio-economic position was associated with low quality of work.
- Low quality of work of older participants in the workforce predicts a higher prevalence of depressive symptoms and a higher proportion of subjects reporting decreased self-perceived health two years later. This holds true for either measure of poor quality of work, effort-reward imbalance and low control.

What are the policy implications of these findings?

- First, it is obvious that considerable efforts are needed from responsible bodies in order to achieve a more homogeneous level of quality of work across European regions. Within the EU member states, respective frameworks and regulations have been developed and in part implemented. It is hoped that economic growth and social policy developments in post-communist countries and in the Mediterranean region contribute to this aim in the forthcoming years.
- Second, as we observe a social gradient of quality of work within all countries, including the most advanced ones, special attention should be directed towards target populations characterized by low level of qualification and low income. Educational efforts and initiatives of continued training are needed to increase the proportion of skilled and trained workforce.
- In addition, wage policies should take account of less privileged groups of older workers within the labour market to offer them appropriate earnings.

Within single branches and companies, structural measures of organisational and personnel development that are informed by the theoretical models mentioned could provide a starting point of improving health and well-being of employees. Such interventions were already shown to improve health and to reduce the economic burden of poor quality of work. It is hoped that an implementation of such measures may ultimately result in a more healthy older workforce and, thus, in marked reductions of early retirement from regular work across Europe.

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6.8 Caring for Parents and Employment of European Middle-Aged Women

Laura Crespo, Pedro Mira

The prevalence of age-related health problems in European countries is high. Mackenbach et al. (2005) show that around 40 percent of respondents of the first wave of SHARE in ten European countries reported to have some degree of activity limitation due to health problems and almost 50 percent reported to have some long-term health problems. Furthermore, many of them reported some limitations with ADLs (around 10 percent) or with IADLs (around 17 percent). Therefore, the demand for care by the elderly in Europe is high and is likely to increase because of the ongoing population ageing.

One of the most important sources of care to the disabled elderly is the help received from family members, which are traditionally daughters in their middle-age (Attias-Donfut et al., 2005). However, the current demographic and economic trends have raised important concerns about the difficulties these women face to combine care-giving responsibilities with other time uses. On the one hand, the increase in life expectancy implies that the probability that an adult child will face a decision on the provision of informal care to an elderly parent is also increasing. On the other hand, given the continuous increase in the female labour force participation taking up informal care may imply important economic costs in terms of reduced employment. These opportunity costs are relevant in the debate about the role of governments in the provision of care to the elderly and in the implementation of programs to support informal caregivers.

The goal of this note is to study the relationship between parental ill-health, intensive informal care-giving and employment of mid-life European women and to estimate the causal effect of changes in the health status of elderly parents on employment of their daughters, mediated through the provision of intensive informal care. We use longitudinal data from Wave 1 (release 2.0.1) and Wave 2 (release 0) of SHARE for those countries that participated in both waves. These data are of special interest for this analysis for several reasons. First, SHARE provides very detailed information on informal care-giving activities and employment status of all respondents, as well as information on their natural parents' health status. Second, the cross-national dimension of the data allows us to compare our results across countries that strongly differ in terms of their long-term care systems and this comparison is informative in the afore-mentioned policy debate. For instance, cross-country variation in the availability of alternative sources of care-giving should be reflected in variation in the prevalence of informal care as well as in variation in the employment effects of the provision of informal care. And third, the longitudinal dimension of the data allows us to better control for common factors confounding the relationship between informal care and employment in observational data. The correlation between these two variables in cross-sectional data may be driven by their joint dependence on unobservable variables such as labour market opportunities or the fact that preferences over informal care and labour market status can be correlated. For instance, women who value their careers more may be both less likely to provide intensive care, and more likely to work when they provide care. We exploit changes in the health status of parents between the 2004 and 2006 waves, as a source of variation in the care-giving and labour supply choices in 2006 which is independent of those common confounding factors. In modern econometric parlance, we use adverse shocks to the health of parents as an instrumental variable to identify a local average treatment effect (LATE), which is the causal effect of informal care on labour force participation for a particular group of women.

Sample and Main Variables of Interest

In this analysis we focus on the group of women aged between 50 and 60 years old, interviewed in both waves and with at least one living parent in good health at the time of the interview in 2004. As Attias-Donfut et al. (2005) note, between the age of 50 and 65 individuals are involved in personal care mainly with their elderly parents. Therefore, women in this range of age are more likely to be at risk of dealing with the burden associated with combining paid employment and the provision of help to their elderly parents. However, we restrict the sample to those aged 60 at most to minimize the influence of retirement decisions.

The resulting sample has 1565 women but samples sizes are too small at the country level. Therefore, we group countries according to the availability and generosity of public formal care services and long-term care benefits, a source of variation which is very relevant to the behaviour under study. The results provided by the European Commission and the Council (2003) show that there is a clear North-South gradient with respect to these criteria, with the northern countries having extremely generous and universal long-term care systems and the southern countries covering only basic needs of the poorest elderly. Based on this we group the SHARE longitudinal countries into the following pools: the northern countries (NC) including Denmark, Sweden and The Netherlands; the central countries (CC), including Austria, Belgium, France, Germany and Switzerland; and the southern countries (SC) including Greece, Italy and Spain.

Regarding labour supply decisions, we focus on the participation decision in 2006 which we measure by an indicator variable, Labour Force Participant (LP). This variable is equal to 1 if the woman reports a positive number of weekly hours of work and 0 otherwise. In Wave 2, information about hours worked is asked only to those women who report either being employed or self-employed at the moment of the interview or having been working continuously between both waves.

Parental care-giving activities are identified from the information reported by each respondent about the provision of help provided to elderly parents living inside or outside the household in the last twelve months. With respect to this, respondents that reported to have provided care to someone living outside the household also report information about the frequency or intensity of this care (i.e., almost daily, almost every week, almost every month, less often). For those that reported to have provided care to an elderly parent living in the same household, we assume that they did it on a daily basis since this question refers to daily or almost daily help. We will focus our analysis on those care-giving activities that are more likely to represent a competing demand on daughters' time. Therefore, we construct an indicator variable, Intensive Caregiver (IC), that is equal to one if the woman reports to have taken care of at least one living parent on a daily or weekly basis in the last twelve months and 0 otherwise.

Finally, SHARE respondents rate their living parents' health status according to a categorical variable. However, different versions of this item are applied in Wave 1 and Wave 2. Whereas in Wave 1 the EU (European) version (Very Good, Good, Fair, Poor, and Very Poor) is used, in Wave 2 the U.S. (United States) version (Excellent, Very Good, Good, Fair, and Poor) is applied. Based on results shown in Jürges et al. (2007), a simple and quite accurate way of mapping one scale into the other is to collapse the two top categories of the U.S. version as category "Very Good", and the two bottom categories of the EU version as category "Poor". This results in a four-point comparable scale (Very Good, Good, Fair, Poor).

Our measure of the existence of negative shocks to the health status of parents between the two waves is defined by a binary variable, Negative Health Shock (ΔPH). This indicator equals 1 if either of the following conditions holds. First, at least one parent went from a very good, good, or fair health status to a poor health status and the other parent – if alive – did not improve his/her health status from poor to one of the other categories. Second, if one the parents died between both interviews and the surviving one has poor health in Wave 2.

Table 1 shows averages of these binary variables at the country group level:

	NC (DK,SE,NL)		CC (AT,BE,FR,DE,CH)		SC (GR,IT,ES)	
ΔPH=1 (*)	9.49		9.51		7.40	
	ΔPH=1	ΔPH=0	ΔPH=1	ΔPH=0	ΔPH=1	ΔPH=0
Labour Participant=1 (**)	60.87	71.58	56.96	58.16	11.76	37.95
Intensive Caregiver=1 (**)	30.43	21.98	35.44	23.95	38.24	17.69
Sample sizes	46	373	79	643	34	390
(total)	419		722		424	

Table 1 Prevalence of parental health shocks, employment and intensive care-giving (%)

Note: (*) Adverse parental health shock between 2004 and 2006. (**) In 2006.

The first row measures the prevalence of negative shocks in parents' health status between the two waves. Overall, almost 9 percent of women had a parent that experienced a negative health shock as defined above. The following two rows show the percentages of labour force participants and informal caregivers in Wave 2 for women whose parents experienced a negative shock (ΔPH=1) and for women whose parents did not experience such shock (ΔPH=0). These simple cross-tabulations show that in all countries women whose parents experienced an adverse health shock participate less on average than women who did not experience the shock. This difference is particularly remarkable for southern countries where only 11.8 percent of women that had a negative parental health shock participate in the labour market, compared to 38.0 percent for women with no such shock. In addition to this, the results confirm a clear North-Central-South gradient in the female labour force participation running from the highest percentages of labour force participants in northern countries to the lowest percentages in the southern countries, regardless of whether parents experienced a health shock or not.

With respect to the provision of intensive informal care, we see that there is not a large variation across these three groups of countries in the prevalence of this type of service. In particular, even though northern middle-aged women participate much more in the labour market, they are not less likely to provide intensive care to an elderly parent. In addition to this, the table clearly shows that there exists a positive relationship between the occurrence of a negative change in parental health status and providing intensive care in Wave 2 for all countries, especially for the South.

Empirical Strategy and Results

We now go from the correlations in Table 1 to very simple estimates of parameters which have a causal interpretation. Under plausible assumptions, these estimates provide quantitative answers to the following questions: Does a negative change in the health of parents lead to increased intense informal care by mature women, and does this in turn cause a reduction in employment? Are these responses different across countries? With this aim we compute a simple instrumental variable (IV) or Wald estimator, which is the ratio of the following two differences in means. In the numerator we obtain the difference in the proportions of labour force participants in 2006 for women with and without a shock to the health of their parents. Likewise, in the denominator we have the difference in the proportions providing care in 2006 for these two groups. Therefore, both numerator and denominator correspond respectively to the difference in the proportions of labour force participants and intensive caregivers for women with $\Delta PH=1$ and women with $\Delta PH=0$ which are shown in Table 1.

	NC	CC	SC
Numerator (Difference in LP)	–0.1071 (0.0758)	–0.0120 (0.0591)	–0.2618*** (0.0606)
Denominator (Difference in IC)	0.0845 (0.0713)	0.1149** (0.0565)	–0.2054** (0.0857)
Wald Estimate	–1.2676 (1.4242)	–0.1046 (0.5118)	–1.2746* (0.7053)
Sample Size	419	722	424

Table 2 Wald Estimates

Note: Standard errors robust to heteroskedasticity in parentheses. (*) Significant at 10%. (**) Significant at 5%. (***) Significant at 1%. Similar results are obtained when controlling for age and education.

In order to interpret our estimates we follow the framework in Imbens and Angrist (2004), which we describe in the Appendix. We make the following two assumptions about the causal mechanisms linking the variables LP, IC and ΔPH. First, we argue that a negative parental health shock influences the employment choices of women only through its effect on the decision to provide (or not) intense informal care. Second, we assume that any woman who would provide care in the absence of negative parental health shock would also provide care if a negative shock happened, which seems highly plausible. In the language of econometrics, the first assumption states that ΔPH is a valid instrument for IC and the second assumption states that it is a monotone instrument.

Imbens and Angrist (2004) show if these assumptions are valid the Wald estimate can be interpreted as a local average treatment effect (LATE) specific to the instrument. More specifically, the LATE parameter is the average effect of intensive care on the probability of employment for the so-called compliers. These are the women whose care-giving decision is changed by the value of the health instrument. In particular, they would not provide intensive care in the absence of a negative shock to the health of their parents, but they choose to provide care when there is such a shock. Note that women who are driven to provide intensive care because their parents suffer an adverse health shock are precisely the group of women that is at risk of paying an opportunity cost in the form of reduced

employment. Compliers are the group that would be targeted by any new policy aimed at reducing the opportunity costs of informal care, and therefore the number of compliers is clearly interesting from a policy perspective. Under our assumptions about the health instrument the denominator of the Wald estimator is an estimate of the proportion of compliers.

The second row in Table 2 reports the denominator of the estimator. This estimate of the proportion of compliers is positive in all three groups of countries, ranging between 21% in southern countries and 8% in northern countries. The point estimate is significantly different from zero in southern and central countries at the 5 percent level. We thus find a North-South gradient in the proportion of compliers which mirrors the negative North-South gradient in the development of public long-term care systems. One may interpret these differences in the number of compliers as evidence that the greater the availability of formal care services, the less prominent the role of parental ill health in the intensive care-giving choices of middle-aged women. However, it should be noted that the gradient in the proportion of compliers may also arise from other sources such as differences in the labour market attachment or preferences of the average woman.

The first row of the table shows the numerator, which is the difference in the labour force participation rates of women with and without an adverse parental health shock. This difference is negative for all three groups of countries but it is significant only for southern countries. In particular, for this group, women whose parents experienced a substantial deterioration between 2005 and 2006 years are 26 percent less likely to be at work in 2006. Moreover, this difference is significant at the 1 percent level.

The Wald estimate, which results from dividing the first two rows of Table 2, attributes any effect of a negative parental health shock on the employment rate of women to its effect on the provision of intensive informal care. The average effect of intensive care-giving on labour force participation for these women whose care-giving decision would be affected by negative parental health shocks is significant, negative and very large in southern countries. Note that the true LATE parameter is bounded between -1 and 1 and estimates outside this range are an artifact of small samples. The Wald estimates for central and northern countries are also negative but standard errors are large. Therefore, it is only in southern countries that we find statistically significant evidence (at the 10 percent level) of an important trade-off between care-giving and employment. We can think of at least two reasons why this local average treatment effect is not significant for northern and continental countries. First, the higher accessibility to part-time jobs or more flexible working schedules in northern and central European countries may facilitate the compatibility of these two activities. Second, given the higher availability of public formal care services in northern countries, it may be that only women who can more easily combine both activities will take up care-giving activities in the event of parental ill-health, which could lead to a smaller or non-significant effect.

Main Conclusions

- Middle-aged European women who reported a deterioration of the health of their elderly parents between 2004 and 2006 were less likely to be working and more likely to be providing intensive informal care in 2006. These correlations grow in size and significance from North to South. This North-South gradient mirrors the negative North-South gradient in the development of long-term formal care systems.

- The number of mid-life women whose care-giving and employment behavior is potentially affected by parental ill-health seems quite large in southern European countries. Our first estimates, obtained under plausible assumptions about counterfactual scenarios, imply that in 2006 around 20% of women would provide intensive care if and only if an adverse shock to the health of their parents occurred in the previous two years. In that event, most of these women would choose not to work because of the burden of care-giving. Further research is needed to check the robustness of these results, to exploit other measures of labour supply, health and care available in the SHARE data and to provide a framework to interpret cross-country differences in the correlations between these variables.

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7 Socio-Economic Status

Editor: Guglielmo Weber

7.1 Income and Income Changes

Danilo Cavapozzi, Omar Paccagnella, Guglielmo Weber

Income is a key measure in several economic, social and health research areas. It represents an important measure of access to the economic resources, particularly when the interest is on poverty or inequality. It is to be stressed that the other key measure of access to economic resources - fungible wealth - is increasingly important in old age, but this is the topic of section 7.3.

The availability of longitudinal surveys is of fundamental importance to empirically assess how income reacts to age and other time-varying factors, most notably retirement. The second wave of SHARE thus helps shed light on how the socioeconomic characteristics of the elderly in Europe have evolved over time and evaluate the effects on income produced by such dynamics.

The first important issue to investigate concerns the level and the adequacy of the income resources available to households and individuals. We stress in this chapter that an important role is played by household-level income sources, such as some welfare state benefits, imputed rent from owner-occupied housing and home-production of food.

A second issue we investigate is how individual incomes are affected by retirement. We exploit the longitudinal nature of SHARE to investigate whether leaving the labour market entails a drop in income, and whether income changes are of similar magnitude among the retired as among the employed.

What income is in the 2006 wave of SHARE?

As in the 2004 wave, the SHARE 2006 questionnaire collects income information at the individual level (questions addressed to all respondents about earnings, pensions and regular transfers) and at the household level (questions asked only to one respondent in each household about interest and dividends, rents, housing benefits received as well as an estimate of all income of non-eligible individuals who live in the household). Total household income is the sum of the individual incomes for all respondents plus household level income items. Finally, it is noteworthy that, unlike the 2004 wave, the 2006 wave of SHARE collects income amounts after taxes.

The raw income data require some adjustments before they can be used. First, imputations are needed for missing income items. Secondly, a correction must be made for differences in purchasing power across countries. To this end, we use OECD PPP exchange rates (that apply also within the Euro area) to turn nominal incomes into real incomes. When 2004 and 2006 data are compared, the PPP-adjustments take into account also country variations in inflation for these years (Germany is used as the benchmark).

The issue of imputation is particularly relevant for income. In fact, household income is the sum of a very large number of items: for most of these, we have an exact record provided by the respondent, but for some others such amount is not available. However, when respondents refused or were not able to provide an exact answer to a question on a particular income or asset component, they were routinely asked unfolding brackets questions (was this income higher/lower than a certain threshold?). These answers place the income in a certain range, but an exact value needs to be imputed. Imputations in release 1 of Wave 2 were made using a conditional hot-deck procedure: missing income items were randomly replaced with income records from households from the same country and either in the same income range (where available) or with a family respondent with

the same sex and age (where such range was not available). A more refined imputation method will be used in release 2, see section 8.7.

In Figure 1 we compare country median household income according to three, possible definitions: the household income variable discussed above, its sum with imputed rent from owner-occupied housing (see Paccagnella and Weber, 2005, for details), and finally the widest possible definition that also includes self-production of food (a newly added piece of information).
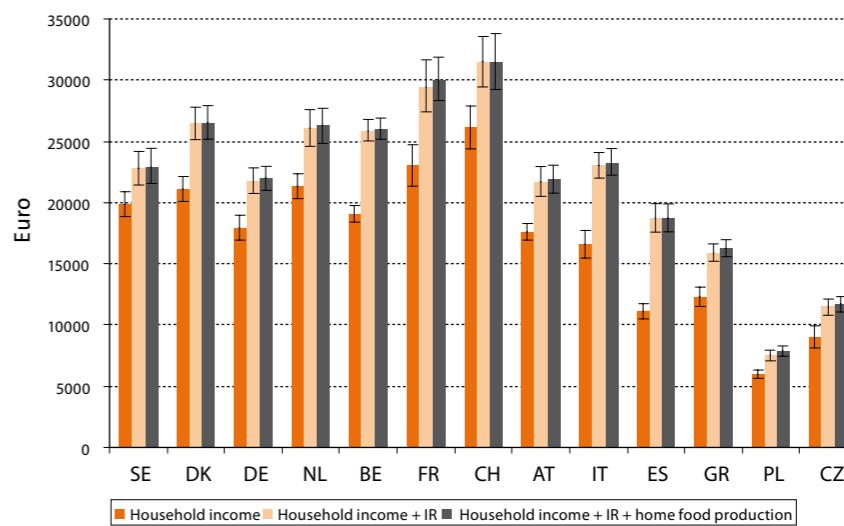
Figure 1 Total household income – all 2006 wave respondents (in €)

The first definition is standard, and can be compared to what is available in other data sources (most notably SILC). However, it fails to consider the role played by housing wealth in supporting living standards. Comparing the first and second bars for each country, we see that imputed rent plays a major role, particularly in Southern European countries. A potentially important role is played by other components that are often neglected in surveys, such as home production of food, that is now recorded in SHARE. Even though this item is important in Southern European countries and Poland, we see from the third bar that it has a relatively small impact on the median.

As expected, cross-country differences are much smaller within 2004 wave countries (that did not include newly accessed Eastern European countries) than within 2006 wave countries: median incomes in Poland and Czech Republic are much smaller than in any other country. As described in Krüger (2007), this pattern is overall confirmed even when we look at the disposable income per-capita for the overall population of European Union households.

The first step in our analysis of how retirement affects income details the relationship between income and occupational status in the cross section.

In Figure 2 we focus on couples, and report median household income (excluding imputed rent and home-production) for three groups: two-earner households ("Both members are workers"), one-earner households ("Only one member is a worker") and zero-earner households ("Both members are out of work"). We restrict the sample to individuals who either currently work or did some paid work some time in the past – couples where one individual never worked are not considered.

This picture suggests that workers are better off than the retired – the median income of single-earned couples is sometimes higher, sometimes lower, than the median income of zero – earner households, possibly reflecting the more or less wide-spread presence of a pension for the retired individuals.
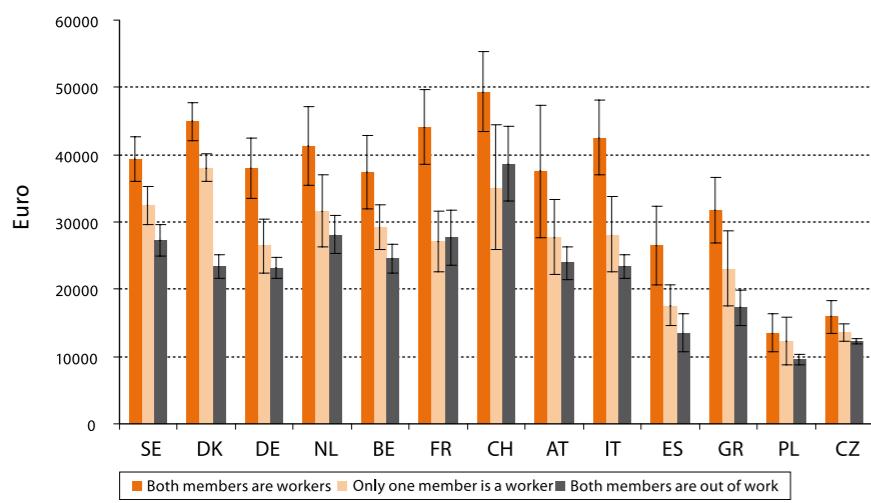
Figure 2 Median household income of couples by occupational status

A sharper picture on the effect of retirement on income can be obtained if we focus on individual incomes. We display in Figure 3 median individual incomes for 2006 wave respondents by employment status: the currently employed ("workers"), the newly retired ("left work less than 5 years ago") and the long-term retirees ("left work 5+ years ago"). We consider only respondents aged 70 years or less in order to reduce the importance of age/cohort effects.

There is a common pattern in all countries: workers have the highest individual incomes, while individuals out of work for a short time (less than 5 years) have higher incomes than individuals out of work for a longer time. The magnitude of the differences is also interesting: in Sweden, Denmark and Greece there is a major difference in income for individuals who recently left their job, followed by Spain, Germany and Italy, while in the other countries the differences are not so large. These differences could be due to replacement rates, but could also be due to age or cohort effects (the employed are on average 5.5 years younger than the recent retirees, and therefore entered the labour market at a later stage).
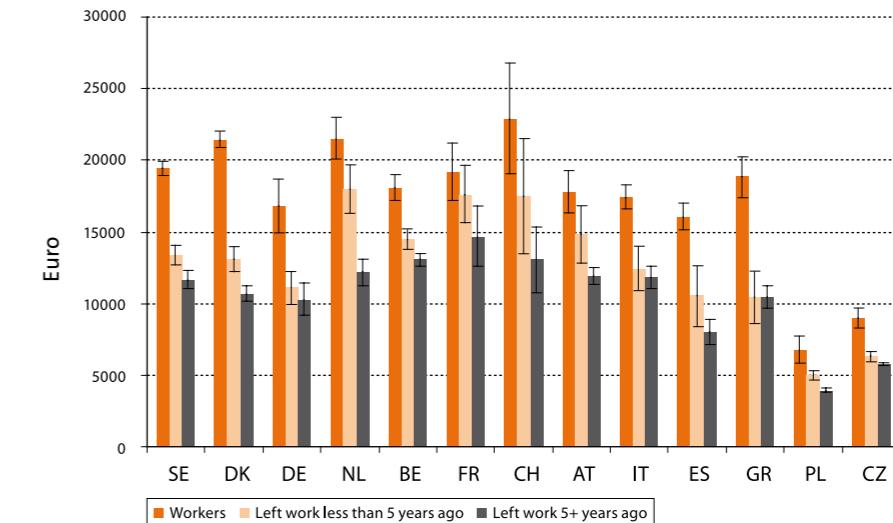
Figure 3 2006 wave median individual incomes by occupational status (in €)

Changes in Income Between the Two Waves

Before comparing 2004 wave and 2006 wave incomes, we should stress that 2004 wave income components are before taxes, whereas the same 2006 wave items are reported after taxes. For this reason, 2004 wave incomes were transformed from gross to net according to a procedure described in Paccagnella and Weber (2005) and based on OECD data about average tax and social security contribution rates by country as well as household composition.

In the rest of this chapter, we analyse individual net incomes in the 2004 and 2006 waves according to possible combinations of the occupational status in the two periods.

In Figure 4 we compare for all 2004 wave countries the median individual incomes in both waves for respondents who worked in both waves, for those who were retired in both waves and for those who worked in 2004 wave but were retired in 2006 wave. It is worth keeping in mind that workers have the highest individual incomes in every wave.

Figure 4 Median household income in the two waves by occupational status

However, while the median income for respondents who do not change their status did not change much between waves, the median income of respondents who retired between the two waves is much lower in 2006 wave compared to 2004 wave. It is also interesting to note that the income level of the newly retired (retired between the two waves) is higher than the income level of the long-term retirees (even if, as underlined in the previous section, some cohort effects can be present in these results). This picture does not change much after disentangling by macro-region.

The comparison of median incomes across waves is likely to be affected by the business cycle (time effects) and by any change in income definition across waves (most likely related to the gross-to-net transformation of 2004 wave income data mentioned before).

We overcome these potential problems by comparing median between-waves variations in log-income among the groups described above. Because of the relatively small number of individuals who retire we display the results for three major groups of countries: Nordic (Sweden and Denmark), Central European (France, Belgium, the Netherlands, Germany, Switzerland and Austria) and Southern (Italy, Spain and Greece).

The results are summarized in Figure 5. The general finding is that, except for Southern countries, individuals who exit from work have a sizeable reduction of their incomes – accounting for PPP's – greater than individuals who work in both waves. The largest drop is found for Central European countries: this is imprecisely estimated for the group of countries overall, but large and significant drops of 20% or more are estimated for the Netherlands and Belgium, The second largest, and significant, drop is estimated for Nordic countries, while a small and insignificant drop is estimated for Southern European countries. If the income age profiles in all these countries were flat for workers and for the retirees, these changes could be interpreted as replacement rates.

We should stress that these results are affected by the fact that in almost all countries the proportion of respondents who change their status (from worker in 2004 wave to retired in 2006 wave) is very low. Overall, this percentage is lower than 15%, but in some countries, such as in Greece, this proportion is even lower than 7%. As new waves of SHARE data become available, the precision of the estimates should dramatically improve.
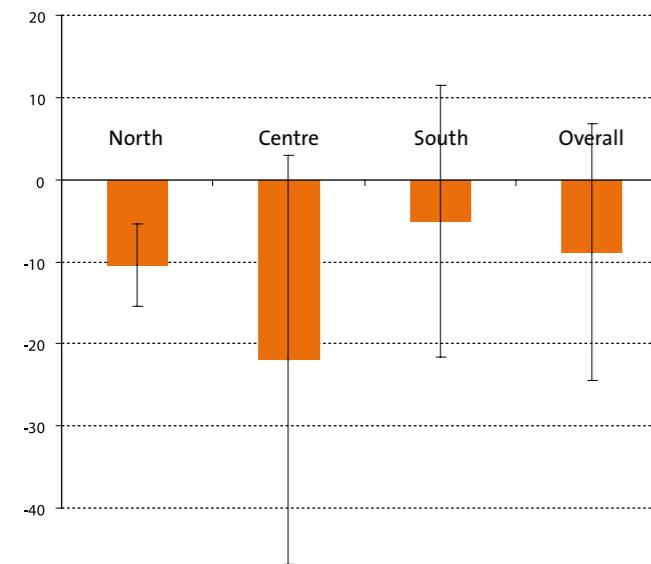
Given that the time length between the SHARE interviews varies a lot (ranging from 11 to 40 months), it is preferable to compute annual variations, rather than simple between-wave differences. We find that in Central European countries the median individual income change for the retired is higher than for workers (2.45% with a standard error of .82). The relative income performance for the two groups is reversed in Nordic countries (but insignificantly different from zero) and in Southern countries (-6.17%, with a standard error of .72).

Conclusions

We have provided evidence on how income varies across countries and across occupational status. We have shown that

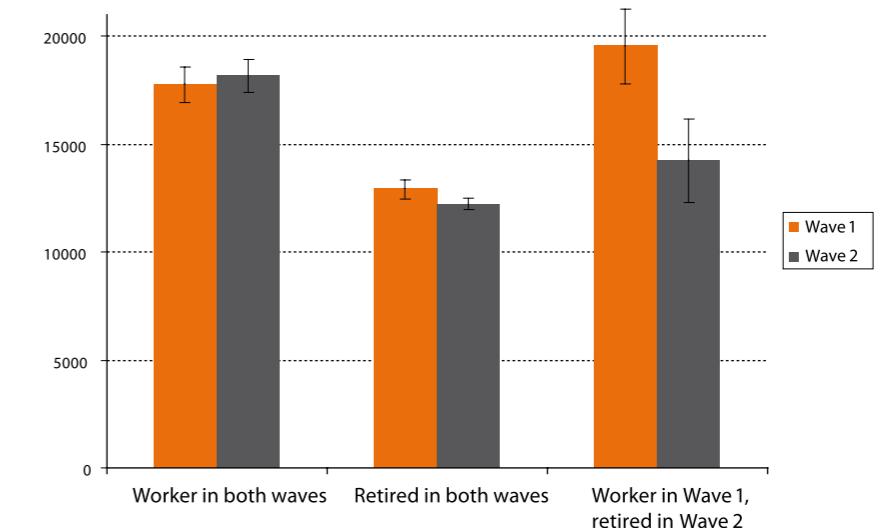- there are important differences across European countries in terms of household income of the over fifties – with the Eastern European countries (particularly Poland) displaying the lowest median incomes, followed by Southern European countries.
- retirement also has different effects on income across groups of countries: in Central European countries retirement is associated with sizeable income drops, but is followed by positive income dynamics compared to those who remain employed. In Southern European countries the reverse is true: there are very small income drops at retirement, but pension incomes fall behind wages over time.

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Figure 5 Differences in median changes in individual incomes – newly retired versus workers

7.2 Poverty and Persistent Poverty: Adding dynamics to familiar findings

Antigone Lyberaki, Platon Tinios

Poverty is most commonly defined in advanced countries as the situation in which an individual is unable to participate fully in what is socially accepted as the life of the community. If everything that matters could be obtained in markets, then the idea of 'participating fully' could be approximated as possessing a minimum level of income. Though this assumption obviously does not hold, financial poverty even if it does not exhaust all categories of exclusion clearly would play a key role – as a sufficient if not necessary condition of exclusion. A 'pragmatic approach' has evolved whereby financial poverty is conventionally linked to the shape of the lower end of the income distribution: thus a poverty line is drawn with reference to the income of the median individual (the person at the middle of the income distribution). Lines of 50% median and 60% median are in common use, while the latter has received most attention at the EU level, as the central 'risk of poverty line'.

Be that as it may, poverty as a concept has proved a powerful mobilising force in formulating and implementing social policy. By introducing a dichotomous measure to a complex picture it can bring into stark focus issues that may have evaded notice if a more rigorous and continuous approach had been followed. The use of poverty in policy discussions has accorded it much weight as a bridge between the worlds of policy and those of research.

Analysing poverty in SHARE data as a distinct exercise thus carries added weight as it can link SHARE to the many discussions on social exclusion that are underway both in the EU and in the national contexts. It is important to know what the poverty picture in SHARE is, how it has evolved in time and how it compares with other data that are frequently used to examine poverty. This process of 'translation' – mapping points of contact and noting infelicities - is important in order to derive the maximum value added from a new and, in many respects, richer source, such as SHARE.

This paper marks the arrival of the second wave in SHARE by asking a number of questions linked to the dynamic analysis of poverty: First, has poverty increased between the first and second wave of SHARE? Second, what is the extent of 'persistent poverty' in SHARE and where is it concentrated? Third, who are the persistent poor? Fourth, can we find indications that persistent poverty has explanatory power?

Has Old Age Poverty Increased?

The first step in the analysis is to see how SHARE compares with the 'stylised facts' of poverty. To do this we must note that the analysis of low income in a survey like SHARE comes at the end of the data processing phase and is particularly vulnerable to extreme values at the bottom end.

The analysis for Wave 1 uses the weighted data for the entire sample of the over 50s in SHARE release 2. Given that the income concept relevant for poverty is net income, the net income correction reported in the FRB chapter on household income for Wave 1 was employed. (Paccagnella and Weber, 2005). Given the centrality of the income of the median individual, problems in modelling taxation in the middle of the income distribution may well bias the poverty line upwards – more so in the Northern countries. Total household income was attributed in equal part to all household members. Wave 2 data employed weighted release 0 data. Given that Wave 2 income is net by construction, no adjustment was made to Wave 2 incomes. The initial definition of income used is cash in-

come, excluding imputed housing income of owner-occupiers. Poverty lines are computed on the basis of the median individual of the SHARE sample of over 50s, for each wave. Figure 1 reports the results.
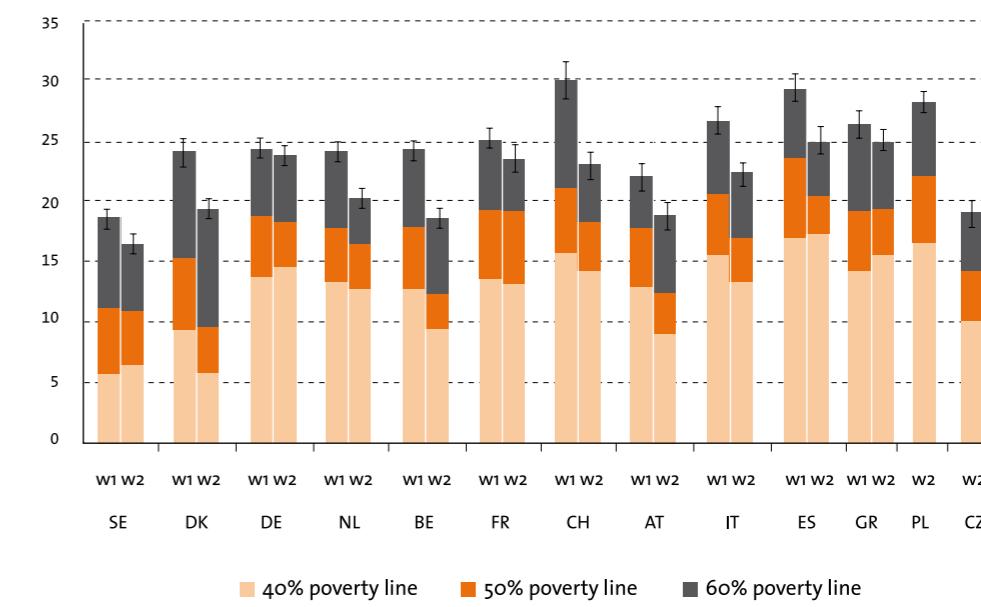
Figure 1 Poverty rates in Wave 1 and Wave 2

Note: Based on SHARE median net equivalent income.

Figure 1 shows a clear fall in measured risk of poverty rates. Big falls are noted in Switzerland (7 percentage points), Belgium (5.6 points), Denmark (4.7 points), Spain (4.4 points) and Italy (4.3 points). The transition from gross to net income as the basic income concept is unlikely to account for this result alone, as those at the bottom of the income distribution will pay little tax. Those familiar with the picture of social exclusion from European data sources such as ECHP and lately, SILC (CEC, 2006; 2007) may be surprised by the picture emerging in Figure 1. 'Risk of poverty' rates are much higher, while the difference does not depend on the definition of the poverty line. There is also a smaller dispersion of poverty rates; the country rankings may also be unfamiliar. Though these comments should be borne in mind as a cautionary note against over-interpretation of the poverty results, the remainder of the paper shows that SHARE can lead to important new insights in poverty analysis.

What is the relationship of measured 'objective' poverty rates (based on income) with the subjective experience of poverty, as gauged by the respondents' own assessment? Figure 2 contrasts the percentage of poor and non-poor who say that they 'have difficulty in making ends meet' whether 'with great' or 'with some difficulty'. Even if one were to concede that objective poverty rates measure poverty with some noise, and allowing for national 'styles' in response, Figure 2 is clear that the poor (classified by income) experience financial hardship to a greater extent than those classified as non-poor. Nevertheless, it is noteworthy that objective and subjective poverty track each other more in the South and East than elsewhere.
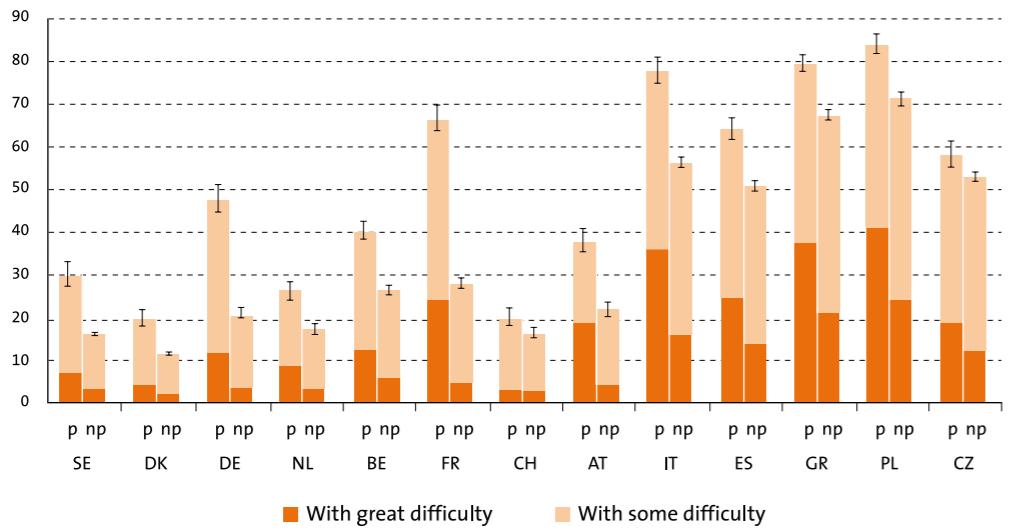
Figure 2 Being able to make ends meet by 'objective' poverty status, Wave 2

Note: Poverty line set at 60% of median equivalent income. p = poor; np = non poor.

One of the findings of Wave 1 was that cohabitation of the generations, either in the same household or in the same building was strongly correlated with poverty status in Southern Europe (and in Austria and Germany), lending weight to the suspicion that the mechanism at work was family solidarity supplementing social protection systems (Lyberaki and Tinios, 2005). Figure 3 confirms this relationship for Wave 2 data, impressively so in the case of the new countries of Eastern Europe.
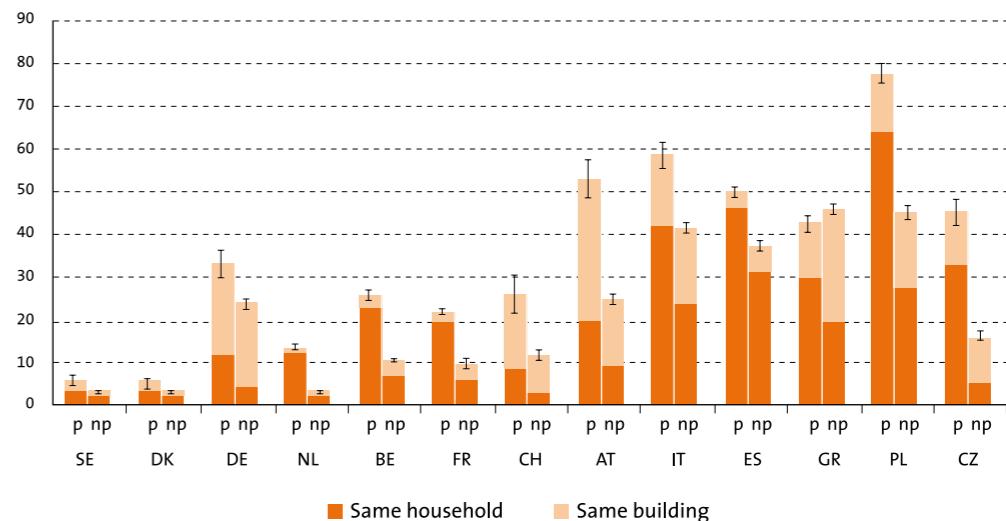
Figure 3 Family proximity and poverty for people over 65: (%) living in the same household and in the same building with the nearest living child, by poverty status

Note: p= 'poor'; np= 'non-poor'. Based on SHARE median net equivalent income

Persistent Poverty in SHARE

Once the population of the two SHARE waves has been classified according to poverty status, it is important to turn to the dynamic nature of poverty. To what extent is poverty persistent – i.e. are the same people classified as poor in both waves. An alternative explanation of tracking the poverty status of a given households may be based on an errors-in-variables justification: income is measured with an error. Using two different estimates of income (based on a slightly different definition) would improve the poverty status classification. Given the rather short time between waves 1 and 2, the latter interpretation gains weight. Figure 4 examines the longitudinal sample and looks at four categories of people: those poor in both waves, those in one or the other wave and those in neither wave.
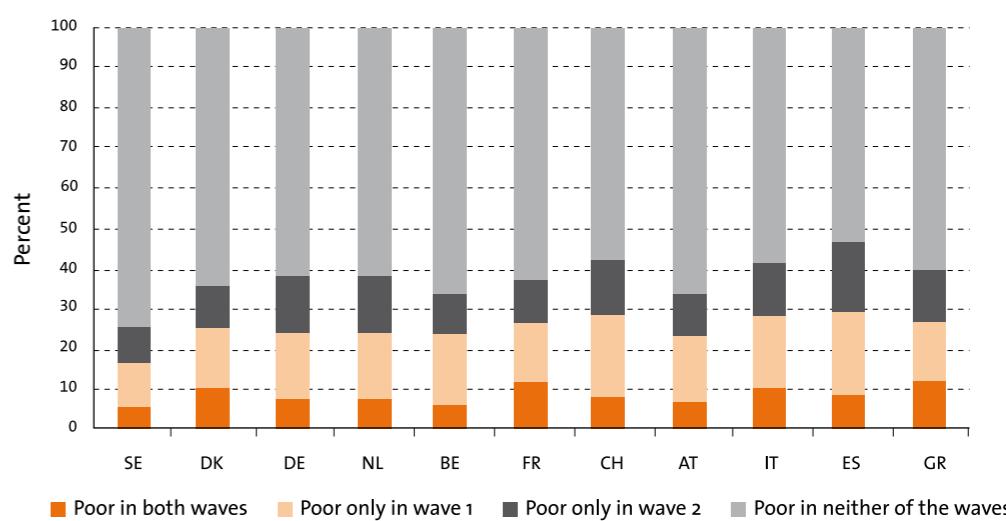
Figure 4 Longitudinal assessment in poverty status, total population

Note: Based on SHARE 60% median net equivalent income.

There are a number of points to make: First, there is considerable turnover in the group of the poor, even in the SHARE age groups where income variation is thought to be relatively smaller; between 25% (SE) and 46% (CH) have had some experience of poverty.

The risk of poverty is thus more widespread than may first be thought. Second, the range of values of persistent poverty as well as the ranking of countries are closer to the SILC risk of poverty rates. Third, the extent to which poverty is persistent by age varies. Figure 5 notes the percentage of the poor in Wave 1 who are also poor in Wave 2 according to whether the Wave 1 age was larger or smaller than 65. The choice of 65 is significant as that is the point at which most workers have passed into retirement. Thus, the comparison between the two groups would be affected by both the effect of social protection systems and differences in income variability once people have retired. If one assumes that income variability is lower amongst pensioners, then one would expect poverty to be more persistent among the old, as in DK, GR, and AT. The finding of the reverse effect in DE, NL, ES and CH might imply that the errors-in-variables explanation of persistent poverty may be more appropriate.

How is persistent poverty related to changes in important variables? Figure 6 examines the relationship between persistent poverty, poverty and changes in health status. The percentage of respondents replying that their health is 'worse' in Wave 2 is plotted against poverty status for different groups of countries and age. In Figure 6 we can discern a strong relationship between persistent poverty and health deterioration. This relationship is differentiated along two other dimensions:

- Poverty and age. The poverty-health deterioration relationship is much stronger for younger age groups (where the differences are significant for all countries than for the over-75s.
- The relationship is far stronger in the Nordic countries, weaker though still strong in the Continental countries and weaker in the South.
- The group who have experienced some poverty fall in the middle in all cases, though closer to the never-poor group.
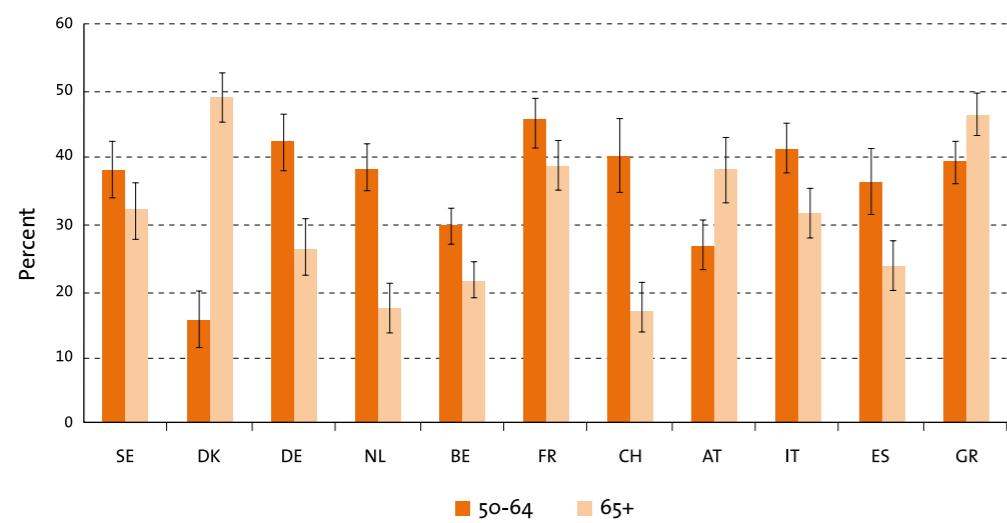
Figure 5 Percentage of the persistent poor, by Wave 1 age group.

Note: Based on SHARE 60% median net equivalent income.
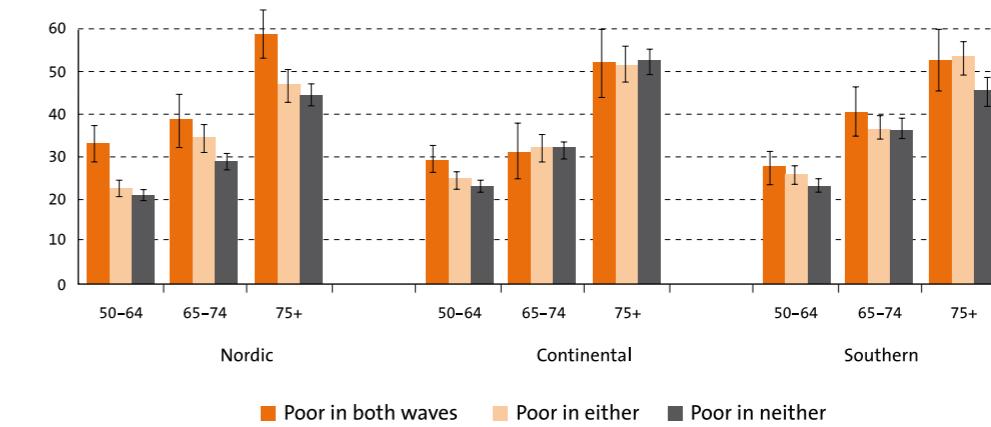
Figure 6 Persistent poverty and deterioration of health, by group of countries.

Note: Age groups defined according to Wave 1. Poverty status defined according to SHARE 60% median net equivalent income.

The longitudinal information present in SHARE allows a more thorough investigation of the characteristics of the persistent poor. To approach this question technical issues such as the selection bias of being included in the longitudinal sample have to be dealt with; reporting the full results of that analysis is beyond the scope of this short note. Be that as it may, the conclusion emerges that persistent poverty (controlling for other effects and for selection bias), increases with age and household size and decreases with education. However, even for individuals with the same characteristics, the relative risk of poverty differs widely between countries, possibly implying an important residual effect for the social protection systems.

Conclusions

The analysis of the previous section gave a flavour of the kind of insights that SHARE can bring:

- SHARE data conclude, for Wave 1 as well as for Wave 2 that financial poverty may be more serious than is thought. The investigation of non-financial dimensions thus acquires greater significance.
- Living close to one's children, in the same household or the same building, remains a very important mechanism of social solidarity with an important poverty alleviation role, not only in the South but also in Germany.
- Persistent poverty appears to be linked closely to deterioration in health status.

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7.3 Real and Financial Assets in SHARE Wave 2

Dimitris Christelis, Tullio Jappelli, Mario Padula

The second wave of SHARE allows researchers to assess how households' financial situation and the assets and liabilities holdings have changed between 2004 and 2006, and also provides information about changes in ownership patterns of the different assets that make up household wealth. These comparisons are made easier by the fact that the assets modules in Wave 1 and 2 share the same structure (for details on the asset section in Wave 1 of SHARE see Christelis, Jappelli and Padula, 2005, 2006). This chapter reports basic facts on wealth amounts, wealth composition, and financial asset ownership and their dynamics between Waves 1 and 2 of SHARE.

Financial wealth, real estate, and other assets and their evolution over time are key indicators of the well-being and quality of life of the elderly. Because of the demographic trends, the saving behaviour of the elderly and their portfolio holdings are central to the policy debate. While income and consumption are important determinants of current well-being, assets are a key indicator of future, sustainable consumption. SHARE allows the study of the composition of wealth around and after retirement, the distribution of wealth between real and financial assets, and the extent to which the wealth of the elderly is annuitized through pensions, social security, and health insurance.

There are a number of further reasons for considering wealth and its evolution over time as a key indicator of well-being in old age. Most people save for retirement, and reach retirement age with considerable amount of assets. These assets provide income for the elderly in the form of rents from real estate, interests on government and other bonds, dividends from stocks. The same assets can be spent during the retirement period and converted into a flow of consumption. Conversely, if people don't save enough for retirement, they will not have enough resources to finance later consumption, a problem that has come to be known as adequacy of saving at retirement. Furthermore, wealth can provide a buffer to protect the elderly against health and other risks, which is very important at times when the length of life is increasing together with the cost of health care.

A related issue is the appropriate asset mix during retirement between low-risk saving vehicles, insurance policies, and risky financial assets. People do not rely solely on financial assets in order to provide for their old age but also on real assets, with housing being the most important among them. With respect to portfolio choice, the elderly face higher mortality and morbidity risks compared to the young, which should make the portfolio of the elderly different from that of the rest of the population. How large this difference is and how it varies across Europe depends on the public coverage of health care and the working and generosity of public pension systems. On these and related issues, SHARE provides fresh evidence in comparative fashion, both across countries as well as over time.

Asset Amounts

As in the first wave, SHARE respondents are asked about ownership and amounts of assets grouped in the following categories: main residence, other real estate, bank accounts, bonds, stocks, individual retirement accounts, contractual savings for housing, whole and term life insurance, own business and vehicles. In addition, they are asked about any mortgage on the main residence and any debts other than the mortgage. All the aforementioned asset and liabilities (with the exception of term life insurance) are

included in the definition of total wealth, from which various aggregates are constructed, such as real assets and financial assets net of financial liabilities.

Figure 1 displays median net worth (defined as the sum of net financial and real assets) by country in both waves (the Czech Republic and Poland are present only in the second wave). All values are expressed in euro and are adjusted for differences in the price level across countries. As in Wave 1, the countries ranking the highest median net worth are Belgium, Switzerland and France, while the lowest net worth is observed in the two new SHARE participant countries from Eastern Europe. In some of those countries homeownership is widespread ranging from 80% in Belgium to just below 70% in France. This confirms that real assets account for a sizable share of net worth, as in Wave 1 of SHARE. The comparison with Wave 1 indicates the sizeable increases in net worth in Sweden, Denmark, the Netherlands, Belgium, Italy and Spain, ranging from 18,000 (Netherlands) to 37,000 euro (Italy).
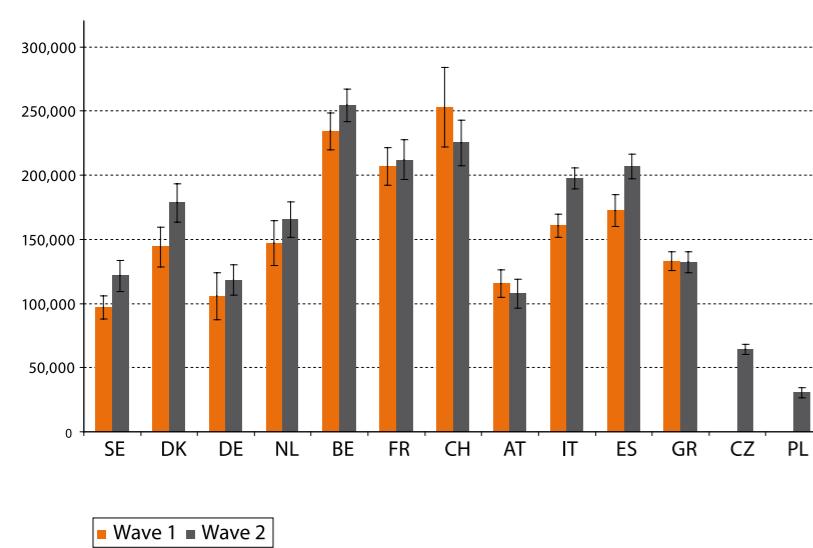
Figure 1 *Median Net Worth by Country*

The change in the unconditional median value of the primary residence is shown in Figure 2, and it is clear that home values have increased from Wave 1 to Wave 2 for the aforementioned six countries. The most likely candidate for this increase is home values appreciation between 2002 and 2006, rather then changes in the number of homeowners which exhibit relatively minor fluctuations over the period, as shown by Kohli et al. (2008) or Angelini and Laferrère (2008).

Figure 3 reports average annual increases in home prices between 2002 and 2006: prices have increased very substantially in Spain (roughly by 16 percent per year), and considerably in Denmark, Belgium and France (between 10 and 12 percent). Sweden, Italy and Greece show slightly lower but still high annual rates of increase of 8 percent. The only country where there has been a home price decrease is Germany, while Switzerland and Austria experience only a weak appreciation of home values during the period considered.
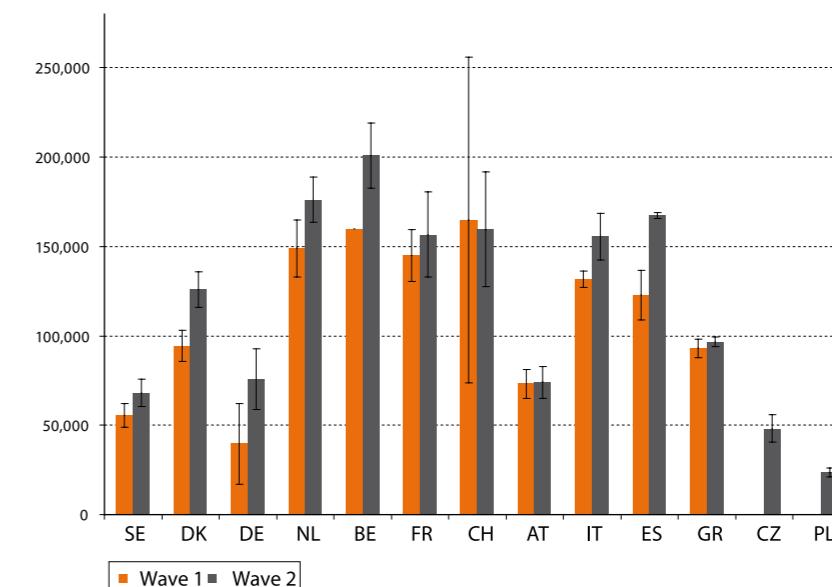
Figure 2 *Median Home Value*
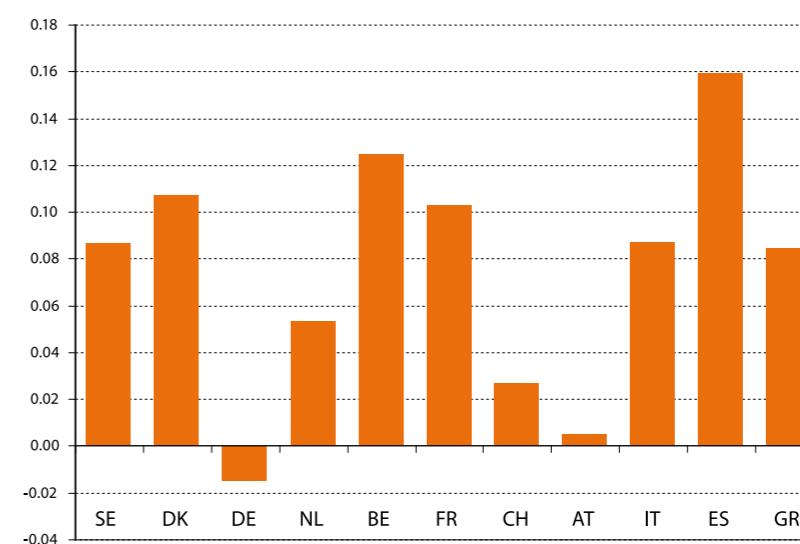
Figure 3 *Average Annual Growth of House Prices, 2002 – 2006*
Note: *Based on OECD and Hypostat.Data*

Thus, between the two waves there has been a significant home value appreciation in most of the countries of the SHARE sample. In the survey, this increase is reflected in the substantial increase in net worth, particularly in the countries that exhibited the largest house price increases (such as Spain and Denmark). On the other hand, median net financial assets show substantial increases only in Sweden (11,000 euro), Denmark (22,000 euro) and Belgium (7,000 euro).

Asset Ownership

We now turn to asset ownership, focusing on financial assets and referring the interested reader to Kohli et al. (2008) and Angelini and Laferrère (2008) for an analysis of homeownership patterns and their changes across the two waves. The percentage of households holding bank accounts is quite high in Northern and Central European countries, and lower in Southern Europe (although it has increased for Italy with respect to Wave 1). It is also notable that less than 3 out of 10 Polish households report having a bank account, while the corresponding percentage for the Czech Republic is roughly 65 percent. In SHARE, respondents report the reasons why the household does not have a bank account, if they report not to the have one. The distribution of the answers is reported in Figure 4, which shows that 60 percent of households point at "lack of financial assets" as the main reason for not having a bank account. "Not needing a bank account" or "dislike of dealing with banks" are reasons for roughly 10 percent of the sample with no bank account, while 5 percent of these households recalls having a bank account after all.

The two Eastern European countries add interesting features to the overall picture. The Czech Republic has a higher-than-average prevalence of individual retirement accounts and contractual savings for housing (roughly 30 and 35 percent, respectively), while life insurance policies are more commonly owned in Poland (35 percent) than in the rest of Europe. Financial liabilities are also widespread in both countries, with Poland being again above the European average (approximately 20 percent of Polish households have debts)
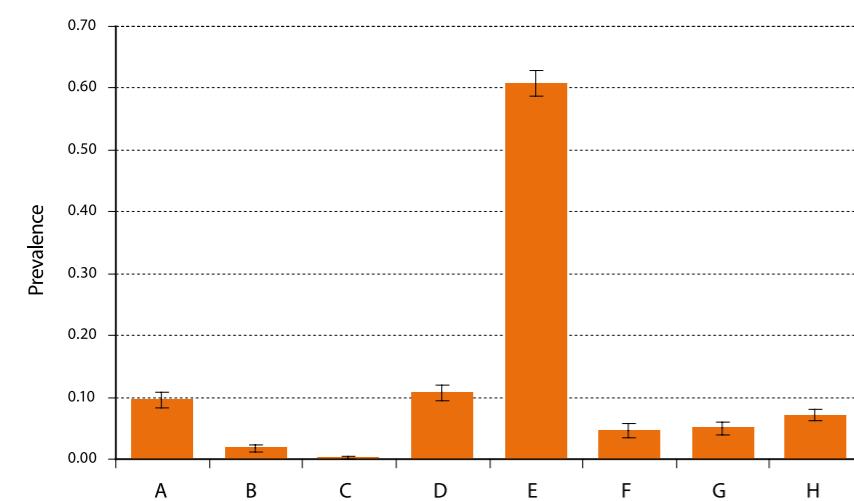
Figure 4 Reasons for Not Having a Bank Account

A = Does not like dealing with banks

B = Minimum balance/service charges are too high

C = No bank has convenient hours or location

D = Do not need/want a bank account

E = Do not have enough money

F = Savings are managed by children or other relatives (in or outside the household)

G = Actually we do have an account

H = Some other reason

Asset Ownership Transitions

One advantage of having multiple waves of the same survey is the possibility to compare changes in ownership patterns of assets for households that appear in the survey more than once.

Figure 5 refers to bank accounts and shows that in Southern Europe there is a sizable proportion of households with transitions. In addition, for almost every country we observe transitions into ownership, which could be due to financial market developments or increased willingness of households to report their ownership of financial assets. We also observe changes in bond ownership, especially in Sweden, Denmark, Germany, Belgium, Switzerland and Italy, the countries with the highest bond ownership in Wave 1 (for brevity, transitions for bank accounts and bonds are not reported in detail).

Figure 5 shows that there are substantial ownership transitions for direct stockholding, mainly for Northern and Central European countries, where financial markets are in general more developed than in Southern Europe. This is likely to be associated with greater familiarity with stocks in these countries, facilitating transactions in and out from the stock market. In Northern and Central Europe we also observe more frequent movements in and out of ownership of individual retirement accounts and life insurance policies, confirming the patterns found for stocks.

Figure 5 Transitions in Direct Stock Ownership

Notes: N_N denotes no ownership in either wave, while N_Y denotes no ownership in the first wave and ownership in the second wave. The remaining two cases are defined analogously.

As for financial liabilities, Figure 6 shows that in all countries there is a substantial fraction of households that pays back debts or incurs new ones, with the former being more common than the latter. While paying back debts is perhaps to be expected to occur as people age, incurring new debts means that even in middle and older ages households need to borrow to purchase durable goods or to buffer adverse shocks like job loss or health problems.

Figure 6 Transitions in Incurring Debts

Notes: N_N denotes no ownership in either wave, while N_Y denotes no ownership in the first wave and ownership in the second wave. The remaining two cases are defined analogously.

Summary

- Even though the two waves of SHARE are not that far apart in time, we observe substantial changes in household balance sheets, both in ownership and in amounts, between 2002 and 2006.
- Most of the changes in assets amounts are due to the house price boom, while most changes in financial asset ownership occur in Northern and Central Europe, a reflection of the more developed state of financial markets therein.
- The newly added countries in Wave 2, the Czech Republic and Poland, exhibit average or higher than average ownership of some financial assets, but relatively low household wealth in comparison to other European countries.

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7.4 Consumption

Viola Angelini, Agar Brugiavini, Guglielmo Weber

In this section we ask the following questions: Is there a drop in consumption immediately after retirement in the SHARE countries? Do recently retired households experience financial hardship?

The presence of a drop in expenditure around retirement is well documented for the UK (Banks, Blundell and Tanner, 1998) and for the US (Bernheim, Skinner and Weinberg, 2001) and is known as the retirement consumption puzzle (or retirement savings puzzle), as it apparently contradicts Modigliani's life cycle model key prediction that consumers form intertemporal plans aimed at smoothing their standard of living over their life-cycle (Browning and Lusardi, 1996).

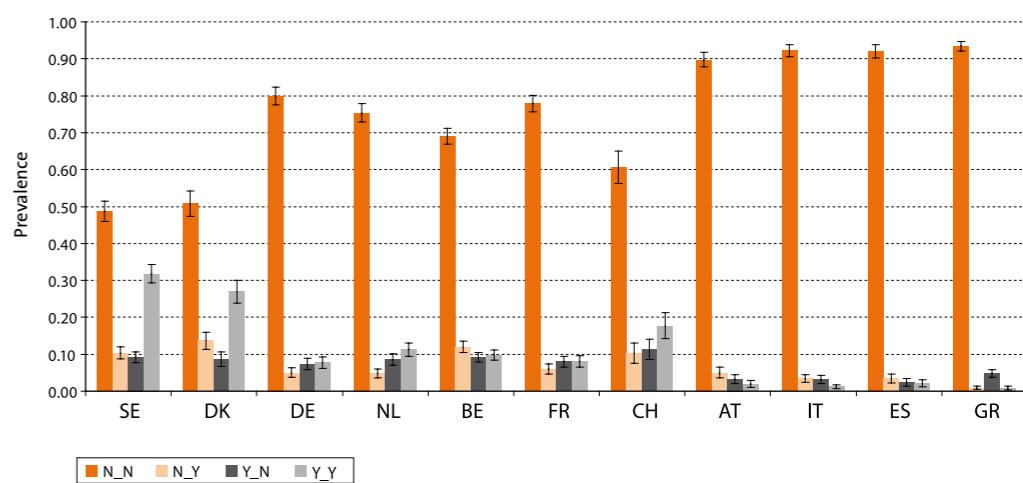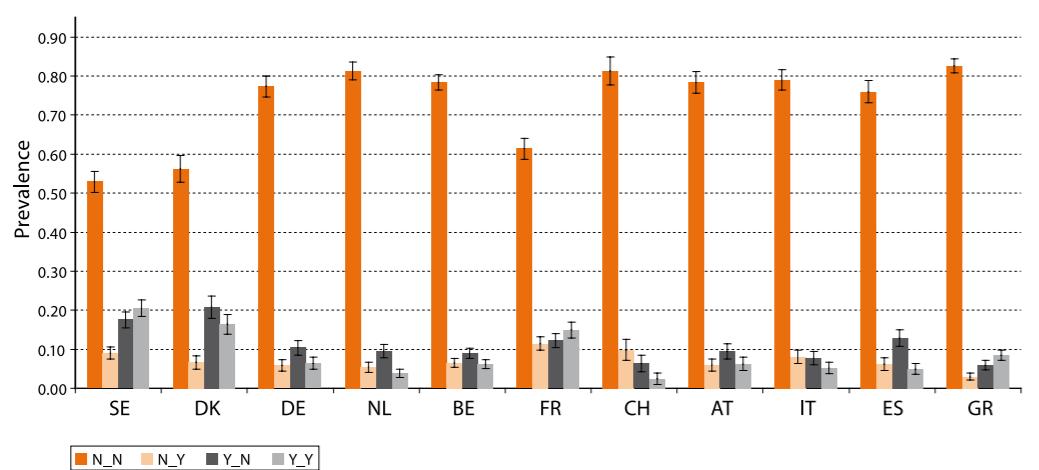Recent papers stress that the drop in expenditure at retirement does not necessarily imply a drop in utility. For instance, work-related expenditure (transport to and from work, canteen meals and business clothing) is no longer needed. Also, home production of services (laundry, gardening, house-cleaning, cooking) may become advantageous, and the extra leisure time may allow consumers to shop more efficiently. This last channel has been stressed by Aguiar and Hurst, (2005) and (2008), in their careful analysis of food consumption around retirement.

Other possible reasons for this drop are myopic or perhaps time-inconsistent behaviour or unexpectedly low pensions or liquidity problems. For policy purposes, it is crucially important to ascertain whether the drop is associated with financial hardship: if the drop is the result of a change in preferences, for instance, it should not be a matter of concern for the policy maker.

In SHARE we have food consumption recall data (food at home and food outside), but also financial hardship questions ("difficulties with making ends meet" and "changes in financial situation") that may relate closely to the more general concept of standard of living. In this chapter we compare how food consumption has changed over time for those who have retired between waves, and compare it to consumption changes for those who have stayed in employment and those who have stayed in retirement. We split the sample in three broad geographical areas: Nordic countries, Central European countries, and Mediterranean countries. We find significant, negative effects only for this last group.

We also use the 2006 wave, where a question is asked about changes in financial situation, to assess whether retirement is associated with an increase in financial hardship. Finally, we show how employment/retirement correlates with the question on difficulties with making ends meet that is asked to all 2006 respondents, and therefore covers the two new SHARE East-European countries, Poland and the Czech Republic.

Food Consumption Evidence

Table 1 presents the evidence on the way food at home and total food changed across waves for those households where at least one member left employment ("Outempl" – 864 observations in all) and those where none changed employment status, and at least one was in employment in both waves ("Inempl" - 2,265 observations). All values are PPP-adjusted and we do not consider households whose consumption has been imputed. North denotes Denmark and Sweden, South denotes Spain, Italy and Greece, and Central includes all remaining Wave 1 countries (France, Belgium, Netherlands, Switzerland, Germany and Austria). We consider the one-year equivalent of the percentage change in consumption be-

tween the two waves because there are significant differences in the time distance between interviews both within and across countries (from a minimum of 11 months to a maximum of 40).

	FOOD-IN	TOTAL FOOD	N
North	0.0005	0.0036	813
	(0.0015)	(0.0185)	
Central	0.0025	0.0133	1,448
	(0.0077)	(0.0176)	
South	−0.0162	−0.0641*	738
	(0.0162)	(0.0337)	
TOTAL	−0.0003	−0.0022	2,999
	(0.00238)	(0.0137)	

Table 1 Difference in the percentage changes in food (medians) between the newly retired and the employed

We report results for the difference in the annual change in consumption between the two groups of households (newly retired and employed). For food at home, the newly retired do not experience larger drops than the control group. The evidence for total food is instead that there is a significant difference (6.4 percent) in the drop in Southern European countries. This annual drop corresponds to a 15.1 percent drop between the two waves for this part of Europe.

A similar picture emerges when we compare the newly retired to those who were retired in both periods ("Outout" - 6,654 observations). However, the control group is in this case much older on average, and this may make the comparison less clear cut (the average age is 61 for the "outempl" sample, 57 for the "inempl" sample and 69 for the "outout" sample).

Table 2 reports the annual change in the fraction of food consumed at home over total food for those households where at least one member left employment ("outempl") and whose consumption of food outside the house was non-zero in the first wave. Newly retired households seem to substitute food-out for food-in. Indeed the fraction of food consumed at home over total food increases in all three geographical areas. However, a formal statistical test shows that the increase is significantly different from that of the employed only in Central Europe (see Lührmann, 2007, for Germany).

	FOOD-IN OVER TOTAL FOOD	N
North	0.0111	146
Central	0.0095	323
South	0.0331	103
TOTAL	0.0135	572

Table 2 Annual change in the fraction of food-consumed at home over total food for the newly retired

The lack of precision of some of the estimates is due to the relatively small number of households who are observed to transit from employment into retirement. When we analyse the effect of retirement on consumption we want to track the same households over time, especially before and after retirement. When further waves of SHARE become available, we will be able to obtain more precise and robust findings.

Evidence from Changes in Financial Situation

The question was asked – with respect to the last interview, has your financial situation (greatly/somewhat) improved, remained the same or (greatly/somewhat) deteriorated?

We show the answers by country for the same three groups as in the previous section.
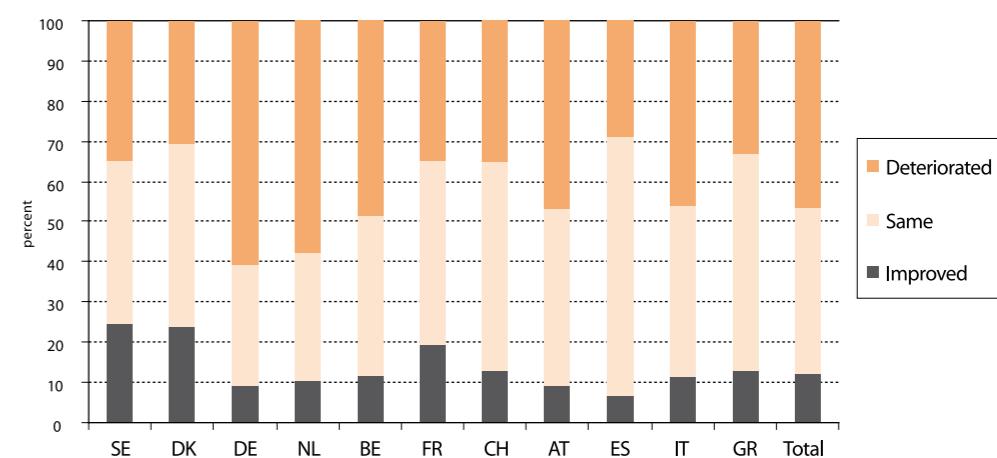
Figure 1 Changes in Financial Situation for the Newly Retired

We see from Figure 1 that the largest proportions of reported deterioration are in Germany and the Netherlands (almost 60%), followed by Belgium, Austria and Italy (around 50%). As a way to control for country-specific reporting styles and macro effects, we can compare with the other two groups.
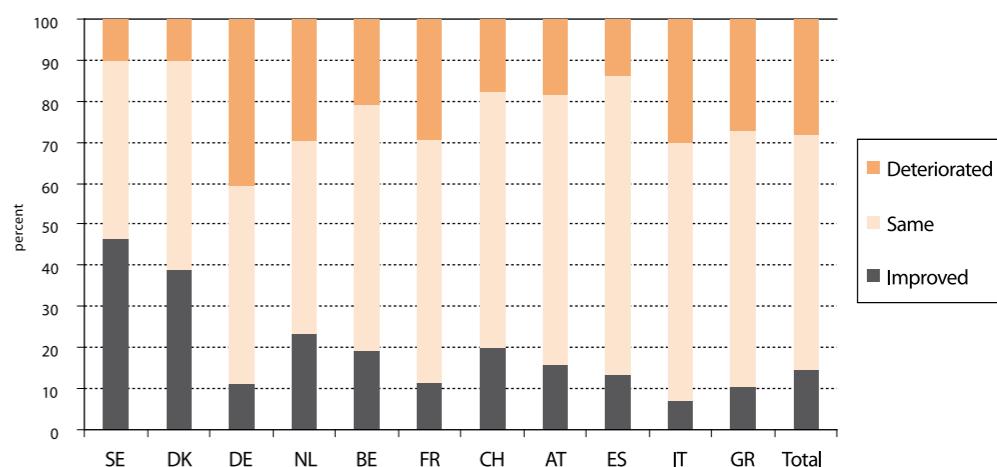
Figure 2 Changes in Financial Situation for those in Employment
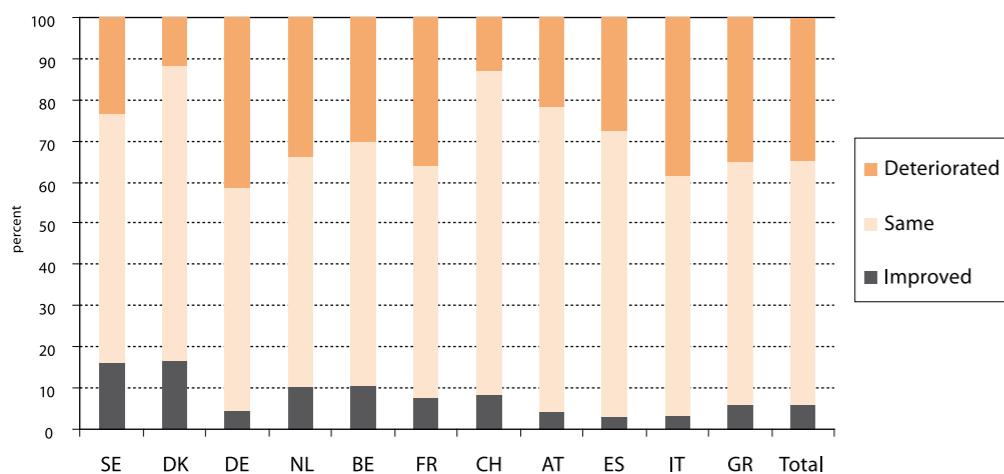
Figure 3 Changes in Financial Situation for the Retired
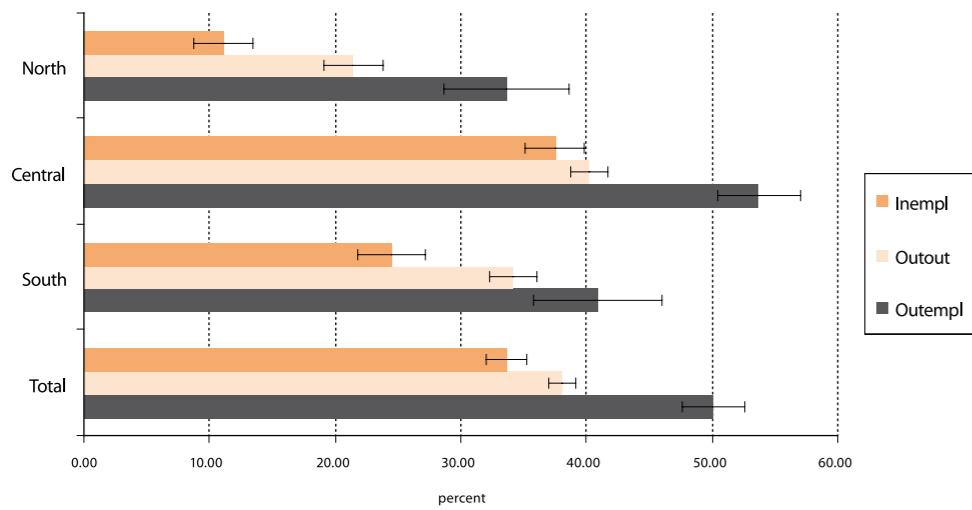
Figure 4 Households whose Financial Situation has Deteriorated (in percent)

Notes: Inempl = Employed in both waves; Outout = Not Employed in both waves, Outempl = Recently retired in Wave 2

We then focus on the proportion of households who report that their situation has somewhat or greatly deteriorated with respect to the last interview and we group countries in three geographical areas: North, Centre and South.

A formal statistical test shows that both the group of newly retired and the group of households who were retired in both periods do significantly worse than those in continued employment (note: and the group of newly retired does worse than the group of households who were retired in both period everywhere but the South).

How Well Do the Retired Fare?

It is quite clear that retirement is associated with greater difficulties overall, but more so in Southern European countries. A formal test confirms this result. There are no major differences according to the number of years individuals have been retired.

A final question we address here is how employment/retirement affects one's ability to make ends meet. To this end, we use Wave 2 data, and show the proportions of households who find it difficult to make ends meet, comparing households where all members are in employment (EE) with households where all members are out of employment (RR).
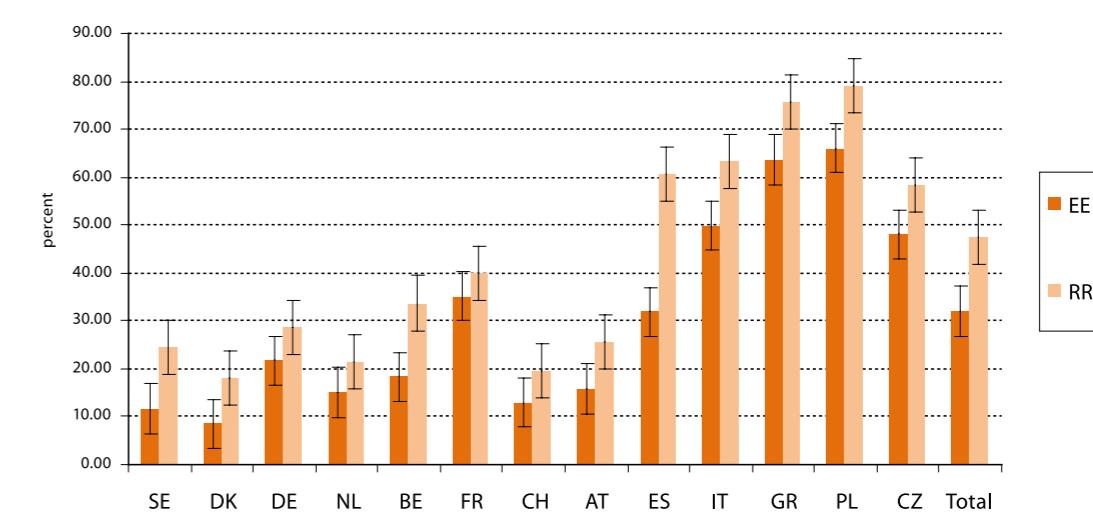
Figure 5 Households which find it Difficult to Make Ends Meet, by Employment Status (in Percent)

Note: EE = all Household Members in Employment, RR = all Household Members out of Employment

Conclusion

- If we look at food consumption and compare the drop in consumption of newly retired and employed households, there is a significant difference only in Southern Europe.
- If we focus on changes in the financial situation, newly retired households do significantly worse than those in continued employment also in Northern and Central Europe.
- In general, retirement seems to be associated with much higher self-reported financial hardship.

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7.5 Inequality, Life-Course Transitions, and Income Position

Steven Gorlé, Karel van den Bosch

Living standards of the elderly vary greatly, both between and within countries. This chapter will focus on evidence concerning inequality in income, consumption and assets in the SHARE countries. We will also use the opportunities of the panel to investigate in an exploratory way the impact of life-course transitions, such as retirement, widowhood and children that leave the parental home, on the income position of the elderly.

It may be noted that the analysis reported in this paper could only have been done using the SHARE data, as it is the only internationally comparable survey which collects data on all three dimensions just mentioned: income, consumption and assets, while also following persons over time. By contrast, for example the Survey of Income and Living Conditions (SILC), the current source of official reports on income, poverty and social exclusion, does not include consumption and wealth variables.

Definitions and Methods

Income is defined as total annual equivalent net household income. As the same disposable income represents a higher living standard for a single person than for a couple, we divide household income by the modified OECD equivalence scale. This equivalence scale has weights 1.0 for the first adult, 0.5 for all other adults, and 0.3 for children. The fact that these weights are much lower than one implies substantial economies of scale in the conversion of income into a household's material standard of living. The working assumption is that all household members share equally in its standard of living. Note that consumption is defined as monthly equivalent household food consumption (at home and outside home) following Perelman et al. (2005). The modified OECD equivalence scale, which was developed for income and total consumption, may be less appropriate for food consumption; we use it nevertheless for lack of a generally accepted alternative. The asset variable is defined as equivalized household net worth. Missing values in all variables are imputed, so that we have valid values for all households in the SHARE sample. Extreme values are deleted from the net household income and consumption variables, following two rough-and-ready rules: 1) values below €100 (PPP-adjusted) are deleted; 2) values in excess of ten times the country median are deleted. While such values can be realistic in some circumstances, they would have an unduly large influence on the results. No extreme values were excluded from the wealth variable. All results are weighted by the household calibrated weights (whole sample), in order to make sure that they are representative for the populations of persons aged 50 and over.

We use two summary measures of inequality. Probably the most common measure of income inequality is the Gini coefficient, which is based on the Lorenz-curve. The Gini coefficient can vary between 0 (complete equality) and 1 (extreme concentration: one household has all). Following Gottschalk & Smeeding (2006) we also use percentile ratios to measure income and consumption inequality, in particular the P90/P10 ratio, i.e. the ratio of the 90th and the 10th percentile (P90/P10 for short). The 90th percentile is the income or consumption level below which we find 90 percent of the population, conversely the 10th percentile is the level below which we find 10 percent of the population. The P90/P10 measure gives in an intuitive way the distance between the top and bottom of the distribution of income or consumption. In addition we present the 90th percentile and the 10th percentile as a percent of the median. The P90/Median and P10/Median measures provide

an indication where social distances are largest. Are persons or households at the bottom of the income distribution far removed from the average person in the middle? What is the distance between persons at the top and those in the middle? These percentile ratios turned out to be less useful for characterizing the distribution of wealth, mainly because households at the bottom of this distribution have zero or negative wealth.

Inequality

The received view on income inequality in the 'old' countries of the European Community (EU15) is that it is lowest in the Northern countries, followed by the Central countries, and highest in the South of Europe. The results on income inequality presented in Figure 1 generally bear this out: income inequality is relatively low in Sweden and Denmark, and high in Spain and Greece, with Central Continental European countries somewhere in between. However, there are some important exceptions to this north-south gradient. Austria is the country with the lowest income inequality; Italy finds itself among the Continental countries. These results are broadly in agreement with those found for Wave 1 (Bonsang et al., 2005).

The percentile ratios provide useful clarifications and qualifications. In countries with the lowest level of income inequality – Austria, Sweden and Denmark – persons at the 10th percentile enjoy a living standard that is about half of that of the median person. Differences are also relatively small at the other end of the income distribution: persons at the 90th percentile enjoy a living standard that is less than twice that of the median person. By contrast, the P90/Median ratio is always higher than two in the other countries, rising to a high 2.68 in Greece. Interestingly, the lowest values for the P10/Median ratio are found in Germany and Switzerland, lower even than in the high-inequality countries Greece and Spain. In the former countries, the living standard of persons in the bottom ten percent of the income distribution is less than one-third of that of the median person.

The Eastern European countries Poland and the Czech Republic joined SHARE in the second wave, and it is interesting to compare them to the countries of the 'old' EU (and Switzerland). Their positions are strikingly different. Income inequality among the 50+ population in the Czech Republic is only slightly higher than in the Nordic countries, and lower than in almost all Continental countries. By contrast, Poland is characterized by very high income inequality, higher than in any other SHARE country. In particular, the P10/Median ratio is quite low, indicating that persons at the bottom of the income distribution in Poland have a standard of living that is very low relative to the median (which is of course itself low, compared to living standards in the EU15). One reason for this may be that many older persons in Poland worked in the agricultural sector. We have not considered here home production of food in either income or consumption, for the sake of comparability across waves, but note that the information is available in Wave 2 and this item may be important for Poland and Southern European countries.

The most obvious reason for the differences in income inequality reported here is the variety of pensions systems in European countries, varying from social-democratic in the Nordic countries, to Bismarckian ones in most central continental countries, while in the Southern countries pension systems are often called familistic, and depend strongly on the former profession. However, within any type one finds important differences in such crucial characteristics as minimum pensions, the degree of solidarity and so on. Moreover, the distribution of income among persons aged 50 and over also depends on a host of other factors: the extent and nature of second-pillar pensions, the employment rate (small even

among persons aged 50 to 60 in some countries, significant even among the 65+ in others) and household formation (in the Southern and Eastern countries, many older people live together in one household with their adult children; this is rare in most Northern and Central European countries), to name a few of the most important.

The first thing to note about the results on food consumption inequality in Figures 1 and 2 is that it is much more limited than income inequality in all SHARE countries. The second thing is that the cross-country pattern is somewhat different from that found for income inequality. Again inequality is low in the Nordic countries, but for food consumption inequality they are followed by Greece and Spain. Germany also seems to have limited inequalities in food consumption. By contrast, Belgium and France move up in the ranking of countries if we look at this dimension of inequality.
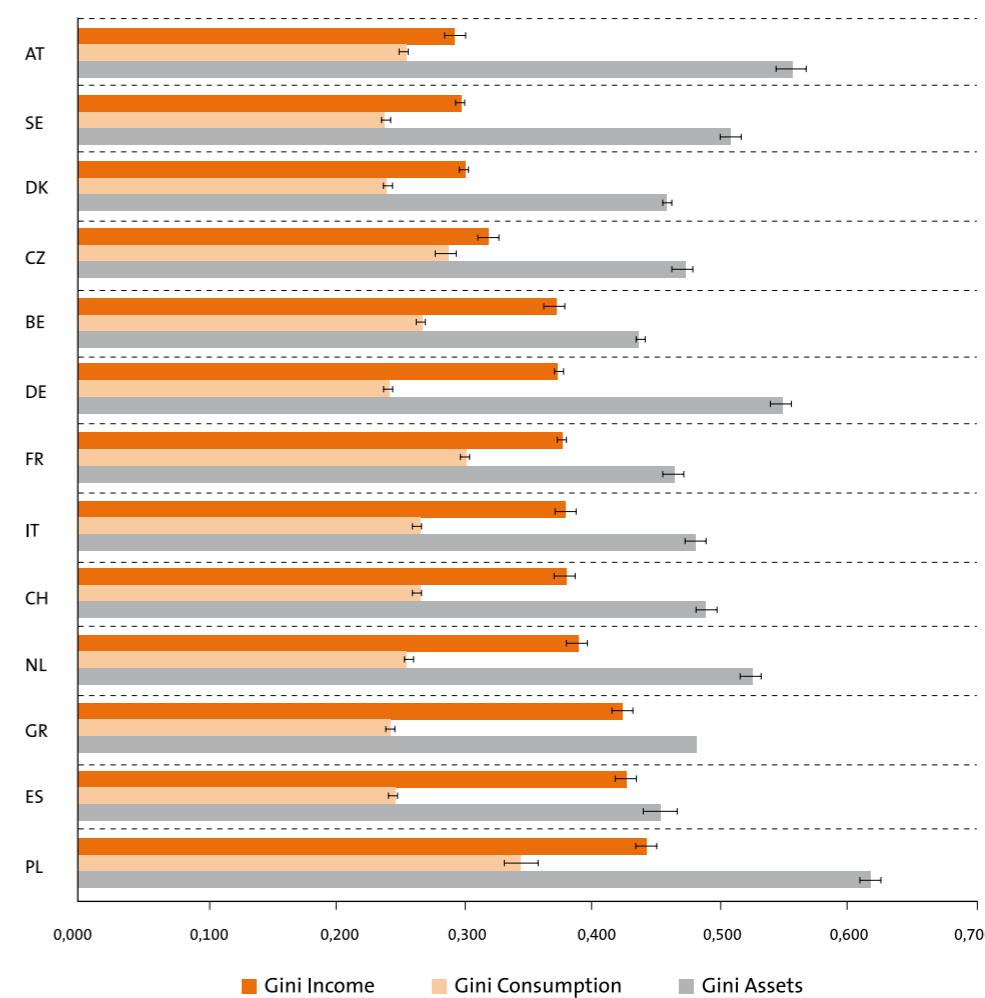

Figure 1 Gini coefficients for inequality in household equivalent income, equivalent food consumption and equivalent assets. Countries are ordered by the Gini for household income, from low to high

	Income	Consumption
AT	1,81	1,78
SE	1,92	1,67
DK	1,90	1,74
CZ	1,91	1,61
BE	2,17	1,80
DE	2,19	1,67
FR	2,32	1,80
IT	2,27	1,85
CH	2,33	1,77
NL	2,34	1,75
GR	2,68	1,73
ES	2,62	1,75
PL	2,28	2,96
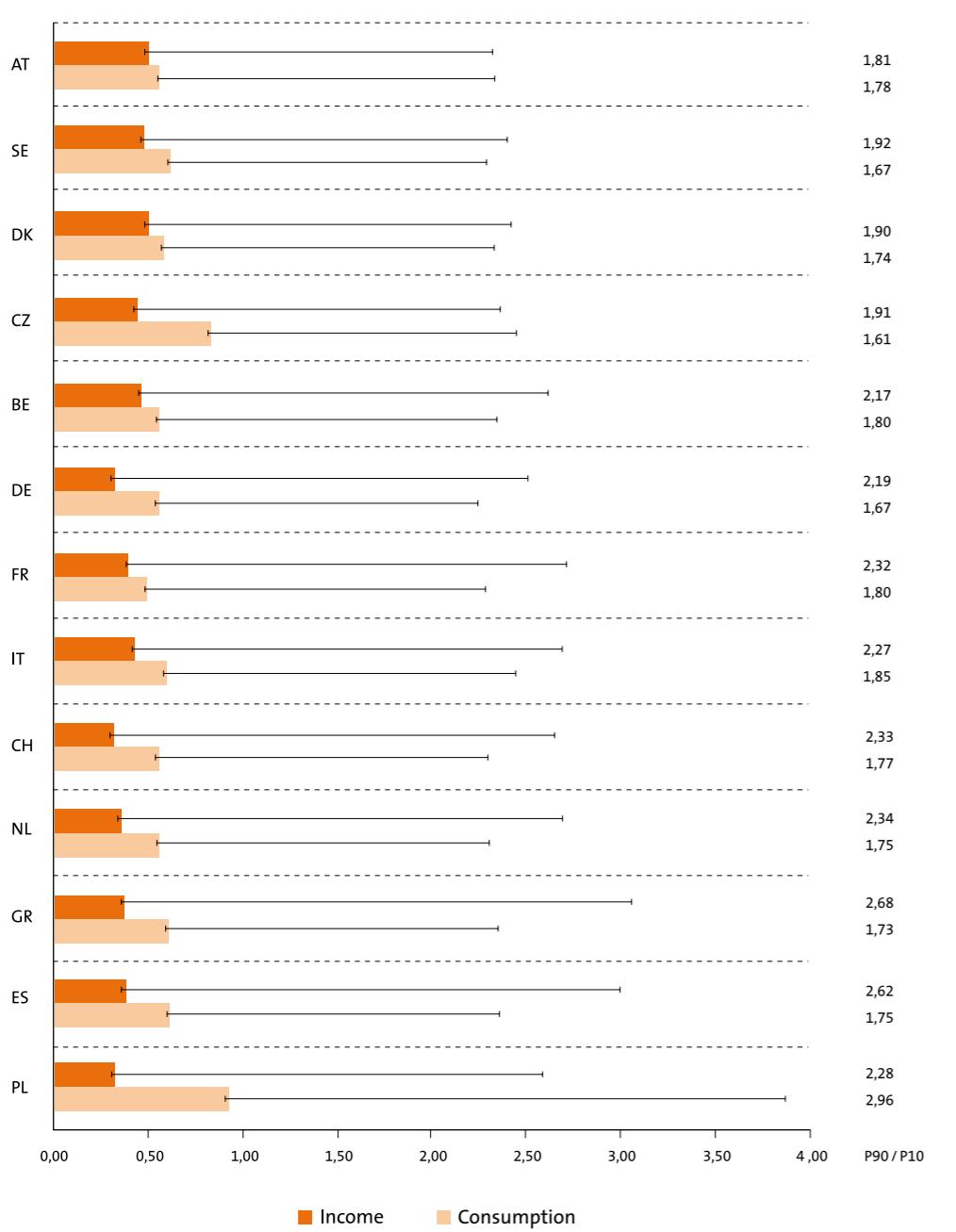
Figure 2 Percentile ratios for household equivalent income and equivalent food consumption. Bars represent P10/Median; Lines represent P90/Median. Countries are ordered as in Figure 1

For the Czech Republic, the Gini and the P90/P10 ratio tell a quite different story: the Gini is high, while the P90/P10 ratio is the lowest of all countries. This indicates that the great majority of persons aged 50 and over in the Czech Republic enjoy levels of food consumption that are very far apart from each other, while small minorities are far below or above the average. As was the case for income inequality, Poland has the highest level of food consumption inequality. A striking finding for both the Czech Republic and Poland is that the 10th percentile is quite close to the median, resulting in values for P10/Median measure that are close to one. Apparently, households in lower half of the distribution

somehow manage to keep their level of food consumption near to the average level, perhaps by reducing other kinds of consumption. This is an indication that those households approach a kind of subsistence minimum in food consumption.

As expected, the Gini coefficients measuring inequalities in household wealth in Figure 1 are much larger than those for household income and consumption. Also, it is evident that inequality of household wealth shows cross-country patterns that are quite different from those of income and consumption inequality. Countries with strong wealth inequality include Poland, Austria, Germany, The Netherlands and Sweden. On the other hand, for each of those countries one can find a neighbouring country where wealth inequality is much lower: the Czech Republic, Switzerland, Belgium and Denmark. It is also noteworthy that Spain and Greece, which have high levels of income inequality, are not characterized by extensive inequalities in wealth. As the home is for most older persons overwhelmingly the main component of their wealth, differences in the rate of owner-occupied housing is probably one reason for these patters, among many other factors.

Transitions and Income Position

Inequality, implying large differences in the standard of living between persons living in the same society, is often regarded as detrimental to social cohesion and inclusion. Another aspect of social inclusion is income security: the degree to which one is protected from the risk of large income drops. Income security is also an important determinant of people's sense of well-being; this is particularly true for older people, who have fewer options on the labor market, and are more dependent on the welfare state. The issue of income security addresses directly one of the two important goals of the welfare state: the guarantee of the acquired standard of living (the other being minimum income protection), in particular at the occurrence of certain social risks, such as sickness, invalidity, retirement, widowhood, unemployment. The analysis of income security requires of course panel data, which the second wave of SHARE provides.

In this section we look at three common transitions, which occur quite commonly in all countries, and which can easily have a large effect on the income and standard of living of individuals and families. These are retirement, widowhood and children leaving the parent's home. Given that the income measures in Wave 1 and Wave 2 are not directly comparable, we look at relative income positions, in particular the quintile distribution, which can be assumed to be robust regarding these changes in measurement, and also regarding the more general problems of measurement error and outliers. Our approach is conservative: shifts in quintile position reflect major changes in a person's position in the income distribution. The assumption is that errors and changes in measurement will not affect these big movements. However, a consequence of this approach is that we will not capture all income changes. As above, income is defined as equivalent net household income. For each of the three transitions, we compare the quintile position before and after. In addition we present the transition tables. The quintile position is always determined within each country separately, and for each transition with respect to a relevant subgroup. For retirement this is population aged between 50 and 70, for widowhood the population aged 65 or over, while for the transition where children leave their parent's home this is the whole population of persons aged 50 or over.

Figure 3, panel A shows the results as regards retirement. In operational terms, persons are making this transition if they have defined themselves as 'employed' in wave one and as 'retired' in wave two. Perhaps rather surprisingly, on aggregate the income position

of these persons changes hardly, if anything, after retirement. However, as the transition Table 1 indicates, this aggregate stability hides a great deal of individual movement. A lot of persons move up or down the income distribution due to (or at least, coincidental with) retirement, often moving two or more quintiles. While one would have expected persons to experience a drop in income, and therefore a decline in income position, after retirement, it is rather surprising to find that for so many retirees the income position improves. Within the scope of this short contribution, it is impossible to go into the reasons for this unexpected finding.
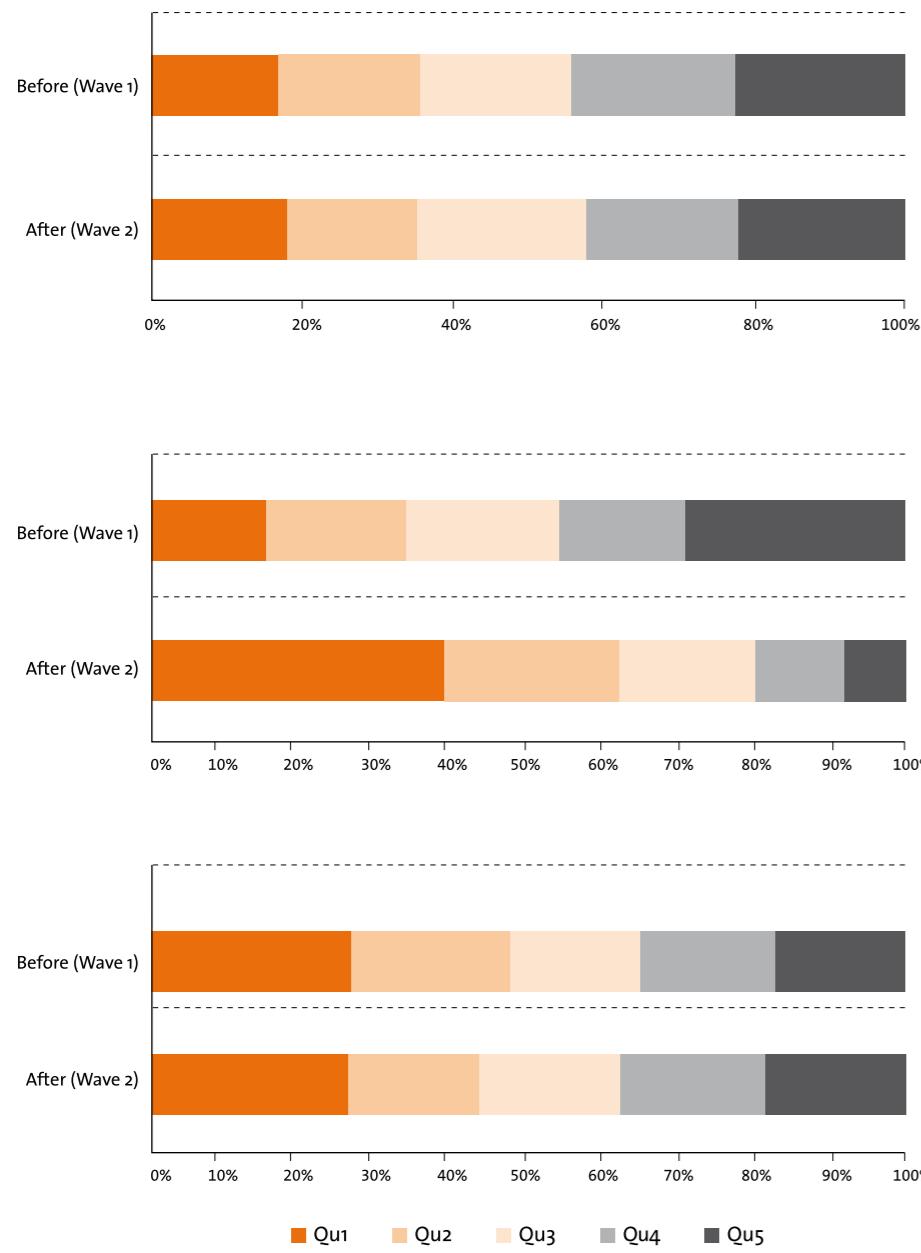
Figure 3 Income quintile position before and after making three common transitions

Figure 3, panel B shows the results regarding the transition from being married into widowhood. It is clear that widowhood for many persons implies a drastic fall in income and the living standard. Remember that the income measure used is equivalent income, where income is adjusted for the smaller household size. This implies that even a fairly large drop in disposable income does not necessarily lead to a decline in the equivalent income position. Nevertheless, after the transition into widowhood the proportion in the bottom quintile more than doubles, while the proportion in the top quintile is reduced by more than two-thirds. The transition matrix in Table 1 shows that a large number of persons suffer large drops in income; within the group previously in the top quintile, no less than 29 percent fall to the bottom quintile. On the other hand, the transition matrix also shows that the income position of a number of people improves after widowhood; this happens mainly for persons who were in the bottom quintile before widowhood. Such an improvement can occur when there is no fall in disposable income, or where the fall is compensated by a larger drop in equivalent household size.

A. Retirement

		Income quintile Wave 2					Total
		1	2	3	4	5	
Income quintile Wave 1	1	40	14	19	15	12	100
	2	17	30	22	18	14	100
	3	15	17	34	20	14	100
	4	10	17	22	26	25	100
	5	13	9	16	22	40	100

B. Widowhood

		Income quintile Wave 2					Total
		1	2	3	4	5	
Income quintile Wave 1	1	48	22	15	4	11	100
	2	47	35	10	6	2	100
	3	38	22	22	11	7	100
	4	44	11	18	20	7	100
	5	29	23	21	14	13	100

C. Children leaving home

		Income quintile Wave 2					Total
		1	2	3	4	5	
Income quintile Wave 1	1	51	20	9	14	5	100
	2	25	28	25	13	9	100
	3	14	15	31	27	13	100
	4	20	9	18	24	29	100
	5	10	9	16	22	43	100

Table 1 Income quintile transition tables for persons making one of three common transitions

It goes without saying that the majority of persons making the transition into widowhood are women. The results presented here have therefore clear implications for inequalities by gender in the standard of living of older people. Moreover, the income consequences of widowhood are mediated by gender differences on the labor market, which, depending on the pension system, can have a larger or smaller effect on the pensions (widowed) women are entitled to.

The third transition we look at is where all children leave their parent's home. The effect this has on the living standard of the parents can go both ways, depending on the income the child(ren) brought into their parent's household. (Another important factor is the degree to which incomes and consumption are shared between parents and adult children, but on this we have no information.) If the child had no or little income, his or her departure will enhance equivalent income of the parents, as there are fewer 'mouths to feed'. Perhaps for the reasons just noted, Figure 3, panel C shows that on average the income position of the former does not change much after the children have left. There is a slight net improvement among the middle groups (second to fourth quintile). It is noteworthy that the proportion in the bottom quintile remains clearly in excess of 20 percent, indicating that these households are in a worse income position, compared to households where there were no children present anyway. The transition matrix in Table 1 shows that households move both up and down the income distribution after children have left the home. In most cases, the shifts remain limited to a change of at most one quintile, which compared to the impact of widowhood, is not very not large.

Conclusions

This chapter has focused on inequality in income, consumption and assets among persons aged 50 and over in the SHARE countries, and has also looked at the impact of some life-course transitions on the income position of the elderly. As was found earlier, income inequality follows a rough north-south gradient, being relatively low in Sweden and Denmark, and high in Spain and Greece, with the Central Continental European countries somewhere in between. Important exceptions are Austria, which is the country with the lowest income inequality, and Italy, which in terms of income inequality finds itself among the Continental countries. The positions of Poland and the Czech Republic, which joined SHARE in the second wave, are strikingly different. Income inequality among the 50+ population in the Czech Republic is only slightly higher than in the Nordic countries, and lower than in almost all Continental countries. By contrast, Poland is characterized by very high income inequality, higher than in any other SHARE country.

Food consumption inequality is much more limited than income inequality in all SHARE countries. Also, the cross-country pattern is somewhat different from that found for income inequality. Again inequality is low in the Nordic countries, but for food consumption inequality they are followed by Greece and Spain. As was the case for income, the Czech Republic has limited inequalities in food consumption, while Poland has again the highest level of inequality. Inequalities in household wealth are much larger than those in household income and consumption. Also, inequality of household wealth shows cross-country patterns that are quite different from those of income and consumption inequality.

We have looked look at the effect of three common transitions, viz. retirement (employment to retirement), widowhood and children leaving the parent's home, on the income position (measured by income quintile) of older persons. Perhaps surprisingly, retirement coincides with large changes in income position, but downward and upward movements

occur in about equal proportions, cancelling each other out, when aggregating across all SHARE countries. The same is true, but less surprisingly, for the income position of the parents when children leave their home. By contrast, widowhood has large and mostly negative effects on the income position of persons who go through this transition. A substantial proportion of widows (and widowers) move from the top to the bottom of the distribution.

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7.6 Expectations and Attitudes

Joachim Winter

Households' beliefs about future events play a central role in forward-looking models of decision-making. Examples of probability beliefs that may affect individual decisions related to aging abound. They include beliefs about mortality risks, beliefs about the future value of retirement portfolios of stocks, bonds, and – most importantly for PAYG systems – social security benefits, and beliefs about receiving or leaving bequests. Obtaining reliable measures of households' beliefs with respect to future events has been at the centre of much research in survey design and analysis over the past decades (see Manski, 2004, for an overview of the literature). There is now a broad consensus that data about households' beliefs should be obtained using probability formats (rather than using discrete response alternatives and verbal descriptors such as "very likely", "likely", and "somewhat unlikely"). In the United States, the Health and Retirement Study (HRS) has pioneered asking questions about subjective probability beliefs on a wide variety of topics, including general events (e.g., economic depression, stock market prices, weather); events with personal information (e.g., survival to a given age, entry into a nursing home), events with personal control (e.g., retirement, bequests). SHARE has endorsed this view: most expectations questions are about the probability individuals subjectively assign to relevant events. Such questions were included in both the 2004 and 2006 questionnaires (wave 1 and 2, respectively).

Elicitation of probabilistic expectations has several a priori desirable features. Perhaps the most basic attraction is that probability provides a well-defined numerical scale for responses and this makes it easier to compare responses across individuals. A second attraction is that an empirical assessment of the internal consistency and external accuracy of respondents' expectations is possible, since in principle one can compare subjectively reported probability with objective calculations of the relevant events (e.g. survival probabilities conditional on age). A third consideration is the usefulness of elicited expectations in predicting prospective outcomes. Several studies show that responses to probabilistic questions have predictive power for life-cycle decisions and in other domains relevant for older populations. For example, responses to a question about subjective mortality risk are generally predictive for subsequent mortality experience (Hurd and McGarry, 2002) and more predictive for savings behaviour than objective life table hazard rates (Hurd, McFadden, and Gan, 1998).

SHARE elicits respondents' expectations on a variety of topics which have been selected for their policy relevance for this particular segment of the population. They are: the future of the pension system, expectations about future living standards, expectations about individual survival, and expectations about bequests and transfers. Though the set of subjective probability questions asked is smaller than in recent HRS waves, they cover the main topics of concern for the elderly. The first part of the expectations section contains questions on expected bequests, retirement, survival, pension benefits, and standard of living. These questions remained largely unchanged between the first and second waves of SHARE, but the question on retirement expectations is new. The second part of the expectations section changed from 2004 to 2006. The questions on how respondents would do with an unexpected gift were dropped. Instead, SHARE Wave 2 contains three new questions on the respondent's attitudes: how much respondents trust in other people, on general political preference on a left-right scale, and on religious activity.

The expectations questions in SHARE Wave 1 have been analyzed by Guiso, Tiseno, and Winter (2005) and Hurd, Rohwedder, and Winter (2008). They found that response behaviour was comparable to that observed in other major surveys such as the Health and Retirement Study. In this chapter, we analyze whether subjective probabilities reported in SHARE Wave 1 have predictive power for outcomes that occurred between Wave 1 and Wave 2, focusing on subjective probabilities of survival and the subjective probability of an improvement in the standard of living. We also analyze one of the attitudes questions, namely that on the respondent's religious activity.

Subjective Survival Probabilities

For many purposes, it is useful to obtain individuals' subjective assessment of their mortality risk. In order to construct a complete probability distribution of the uncertain event "time of death", a sequence of probabilistic questions with different time horizons would be required. Due to space restrictions, waves 1 and 2 of SHARE contain only one such question, worded as follows: "What are the chances that you will live to be age T or more?" The target age, T, was chosen conditional on the respondent's age. For respondents younger than 65, the target age is 75, for older respondents, the target age is set in five-year bands such that the distance from current to target age is between 10 and 15 years.

The most basic test that allows one to asses the predictive power of subjective survival probabilities is to compare average survival probabilities between those respondents who survived from Wave 1 to Wave 2 and those who deceased. Average survival probabilities are much smaller (mean=40.0, s.e.=1.26) for those who did not survive than for those who survived (mean=62.8, s.e.=0.20). The difference between these two averages is statistically significant at any conventional level.

This analysis can be refined by looking at how subjective probabilities of survival reported in Wave 1 vary with other covariates. Figure 1 does this by stratifying respondents by self-rated health status (SRHS), also reported in Wave 1, that is, at the same time as the subjective survival probabilities have been reported. We make two observations. First, as one moves from excellent to poor SRHS, subjective survival probabilities decline on average. Second, for each level of self-rated health status, average survival probabilities are smaller for those who deceased between waves 1 and 2 than for those who survived. In other words, subjective survival probabilities appear to be related to actual survival even after the effect of (self-rated) health has been controlled for. This finding is confirmed by a logit regression which has as its dependent variable whether a respondents survived from Wave 1 to Wave 2 (results not reported).
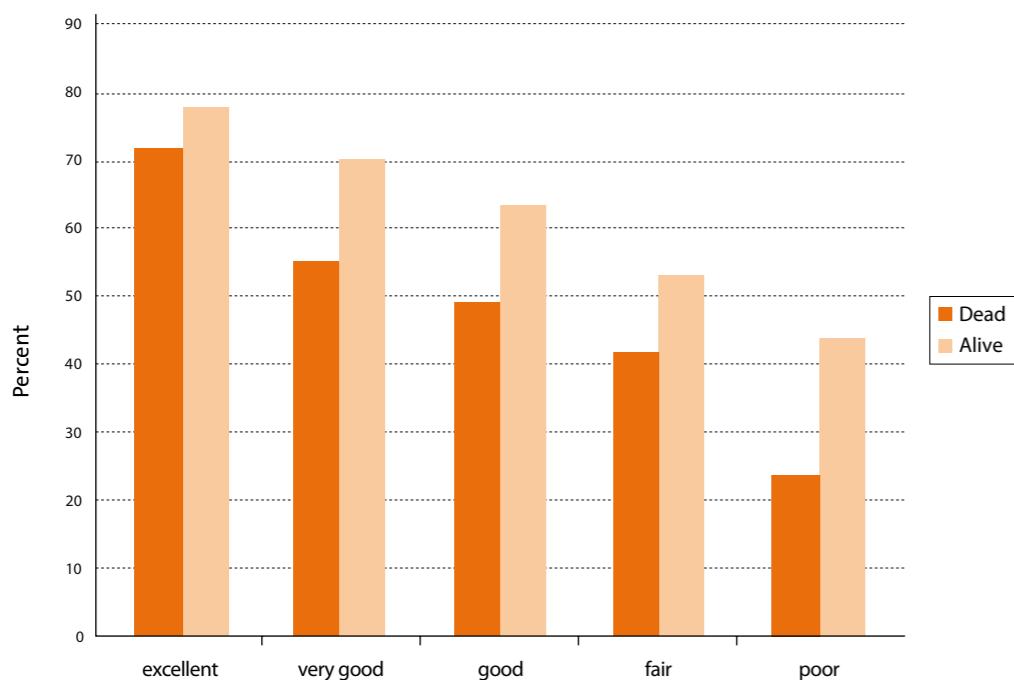
In summary, subjective survival probabilities reported by respondents in the first wave of SHARE predict actual survival. This result confirms findings from the existing literature on data from other surveys such as the HRS. For the economic analysis of many questions, being able to predict individual mortality is important, so this finding is very good news. It will be interesting to see whether subjective survival probabilities also predict health outcomes other than mortality and economic decisions that are related to future health and survival, such as saving, demand for certain insurance plans, and planning of bequests and inter vivos transfers. This is left to future research.

Expectations with Respect to One's Standard of Living

Another question that allows us to assess the predictive power of subjective probability questions is more directly related to economic outcome. In Waves 1 and 2, respondents were asked for the probability "that five years from now your standard of living will be better than today." We compare responses to this question as given in Wave 1 with responses to a retrospective question on how the respondent's financial situation had changed between waves that was asked in Wave 2. The latter question could be answered on a symmetric five-point scale ranging from "greatly deteriorated" to "greatly improved". This question is narrowly focused on the respondent's financial situation while the expectations question concerns the overall standard of living, but we believe that the two concepts are still close enough so that they can be used to test predictive ability.

Figure 2 shows the means of the subjective probability question stratified by the response to the retrospective question on changes in the financial situation. There is a clear pattern: respondents who report that their financial situation improved greatly or at least somewhat between waves also gave higher probabilities that their standard of living would

improve. The average response for those who said that their financial situation has improved was 41.9%, for those how said that it greatly deteriorated, 20.4%. The difference in the medians is even more striking: 50% and 10% for these two groups, respectively.

Religious Activity
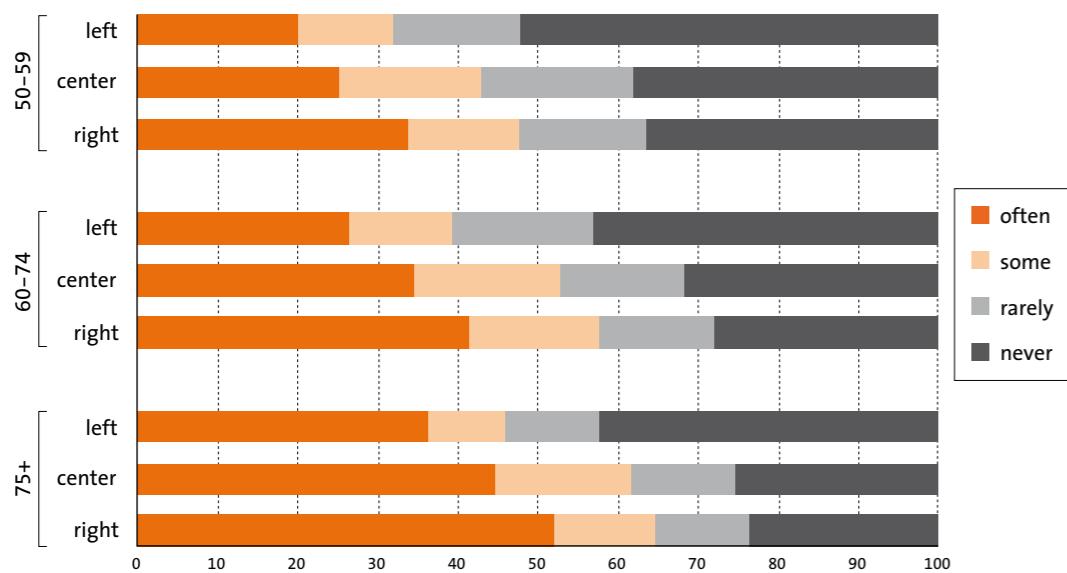
Finally, we look at the responses to the question on religious activity. Earlier research in other fields had shown that a simple and easy-to-answer question – How often do you pray? – provides reliable measures of a person's religious attitudes. In SHARE, this question was asked with a six-point response scale ranging from "more than once per day" to "never". The question was not asked in France for legal reasons.

There is substantial cross-country variation in the responses to this question in SHARE, as can be seen from Figure 3. (For clarity, the responses have been collapsed into four categories in this and the next figure.) The countries with the strongest reported religious activity are Poland, Greece, and Italy, where more than half of the respondents pray at least once per day. In contrast, in Sweden, the Czech Republic, and Denmark, majorities say that they never pray. Additional analyses show that there is also a strong age gradient, with older respondents reporting that they pray more often (even in the SHARE population which is of course already older than the population at large).

Figure 3 Religious activity by country

The displayed response categories for the question on frequency of prayer are defined as follows: "often" comprises the responses "more than once a day" and "once daily"; "some" comprises "a couple of times a week" and "once a week"; "rarely" is "less than once a week"; and "never" is just this. The question was not asked in France.

Note: This figure shows the distribution of the responses to the question, "Thinking about the present, how often do you pray?" (horizontal axis) by country.

Figure 4 Religious activity by political orientation and age

The displayed response categories for the question on frequency of prayer are defined as follows: "often" comprises the responses "more than once a day" and "once daily"; "some" comprises "a couple of times a week" and "once a week"; "rarely" is "less than once a week"; and "never" is just this.

Note: This figure shows the distribution of the responses to the question, "Thinking about the present, how often do you pray?" (horizontal axis), stratified by self-assessed political orientation (constructed from responses on an eleven-point scale) and by age group.

Finally, we compare the answers to the question on religious activity with those to another question that was asked as part of the expectations and attitudes section of SHARE Wave 2. Respondents were asked to report their political orientation on an eleven-point scale ranging from left to right. An interesting pattern that deserves more study emerges from Figure 4: The more often respondents pray, the further right they place themselves on a political scale. The figure also reflects that younger respondents tend to pray less often than older respondents, and the association between religious activity and political orientation holds within each of three broad age groups as well.

Summary

The analysis of the responses to two of the subjective probability questions contained in SHARE confirmed that they contain useful information about respondents' expectations:

- Subjective survival probabilities vary with a known risk factor (self-rated health) and predict actual outcomes (mortality between waves).
- Responses to the question on expected changes in the standard of living in Wave 1 predict responses to a retrospective question on a household's financial situation in Wave 2.

These findings imply that subjective probabilities are useful for subsequent economic analysis, in particular for intertemporal decisions in which an individual's expectations about future events are crucial. Future research will study the responses to other subjective expectations questions on economically quantities such as bequests; a particular focus will be to incorporate such variables in more structural models of intertemporal decisions. Interesting patterns also emerged from the analysis of a question on religious activity; this is a variable that will be explored much deeper in future analysis. Another attitude question which we did not have the space to analyze in this chapter was concerned with how much individuals trust others. Responses to these attitude questions will be important for the analysis of many economic behaviors since they promise to capture some portion of individual heterogeneity that so far has been left unmodeled.

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8 Development

Editor: Hendrik Juerges

Development

This chapter provides a brief overview of various methodological aspects of the second wave of the Survey of Health, Ageing and Retirement in Europe. It includes an overview of both the substantive and technical issues involved in turning the cross-sectional instrument used in the first wave of SHARE into a longitudinal survey instrument. We briefly describe the sample design and weighting strategy in the participating countries, our train-the-trainer program that aimed at implementing common practices in each country, and the field work and survey management. The chapter further presents basic information about unit and item non-response rates. Finally, we include in this chapter a methodological note on anchoring vignettes, which SHARE collected in the course of the EU financed COMPARE project.

8.1 The Development Process: Going Longitudinal and Including New Countries

Axel Börsch-Supan, Hendrik Jürges

Ageing is a dynamic process that can only be observed longitudinally. The environment in which people age also changes over time, e.g. by way of pension and health care reforms. Without adding the time dimension, the SHARE data would have remained incomplete because the process of ageing cannot be observed, reactions to the ongoing changes in the institutional environment cannot be traced, and related behavioural hypotheses cannot be tested. Collecting a second wave of data and linking these data with the first wave was a first crucial step to understand the changes over time. Of course, further waves are necessary to follow the ageing process as it unfolds over the coming years.

A second and important new piece in the development process was the inclusion of four new countries: in addition to the original 11 SHARE countries, the Czech Republic, Poland, Ireland and Israel were included in the second wave.

The SHARE Wave 2 development process iterated in several stages between questionnaire design and data collection. In the first stage, starting in January 2006, several thematic working groups produced English-language draft questionnaires, departing from the original cross-sectional SHARE questionnaire. Adjustments to the survey instrument had to be made to account for the fact that most individuals to be interviewed had already participated in the first wave. For instance, questions had to be rephrased to cover the incidence of chronic disease rather than the prevalence, or to monitor changes in labour market states, e.g. transitions into retirement. Moreover, pre-loads of already collected information was integrated in the survey instrument to ease respondent burden. At the same time, the original SHARE questionnaire was thoroughly evaluated in the light of the first wave experiences and if necessary carefully revised. Further, some limited country specific adaptations had to be considered to make the questionnaire suitable for data collection in the new SHARE countries.

Pilot data collections with quota samples of 50 respondents in each of the new SHARE countries were scheduled very early in the process (February 2006) in order to synchronise the following joint development process. Building on the existing SHARE technology, e.g. the language management utility (LMU), translated survey instruments for the new countries could be finalized in time for this crucial development step. The main objective was to test the translated version of the SHARE 2004 questions in the two accession countries.

Specifically, we checked for linguistic incompatibilities, translation errors in particular regarding technical terms (e.g., pension schemes, health care services, asset categories, etc.) and the internal consistency of the survey instrument.

The second stage of the development process was an all-country pre-test in May/June 2006. At this stage, the newly designed longitudinal questionnaire was tested for the first time in all SHARE countries. About 100 longitudinal respondents per country were recruited from the participants of the Wave 1 pre-test. The main objective was to test the survey instrument in its entirety in the 11 SHARE Wave 1 countries. Hence, the focus was on testing the internal consistency of the updated survey instrument (especially the skip patterns which tend to be particularly error prone) under realistic conditions. This step was essential to create a state-of-the art survey instrument, including additional applications such as an electronic sample management system (SMS), which was reliable for large-scale application. The pre-test results were thoroughly analysed to maximise the validity of the questions as well as the reliability of the procedures. The results suggested some final improvements to questions and assisted in the design of the final source questionnaire.

The fieldwork period for the main Wave 2 data collection was from October 2006 to November 2007. In this time, we applied the longitudinal questionnaire to all participants in SHARE Wave 1 who were still alive and agreed to be re-interviewed. Additional samples were drawn in the Wave 1 countries to make up for sample size reductions due to panel mortality. These samples were given baseline questionnaires – identical to those that were administered in the new SHARE countries. Overall, we conducted interviews with some 30,000 respondents in 15 countries, of which about 20,000 were re-interviews.

The articles in this book are based on an early release of the SHARE Wave 2 data, created in December 2007 ("Release 0"). While we have done a host of crosschecks, extensive consistency and plausibility checks of all data with subsequent imputation of missing data are still to be done. All results in this book are therefore preliminary. In late 2008, a more complete and cleaned data set ("Release 1") will be accessible to the entire research community. This release is eagerly awaited by many researchers, because it will allow them for the first time to conduct longitudinal analyses in ageing research with cross-national data. A final release of the complete and integrated data set – containing about 60,000 individual observations and an extensive set of generated and imputed variables ("Release 2") – is planned for the first half of 2009.

A third wave collecting retrospective data is currently in the design stage and will be fielded in 2008/09. A fourth wave of data collection – using an enhanced version of the Wave 2 longitudinal instrument – is planned in 2010/11. Future waves are intended to follow biannually.

8.2 Survey Instruments in SHARE Wave 2

Maarten Brouwer, Marcel Das, Maurice Martens

In the SHARE project several software tools were developed for data collection, data transfer and data dissemination. The concept of the logic behind the tools used in the first wave was further developed in the second wave. CentERdata, a survey research institute affiliated with Tilburg University (The Netherlands), provided the technical infrastructure for both waves.

The basic idea behind the Computer Assisted Personal Interviewing (CAPI) instrument was to have exactly the same underlying structure of meta-data and routing. This structure was directly implemented in Blaise, a software package developed by Statistics Netherlands. The country specific questionnaires were conducted in local languages. The generic question texts, interviewer instructions, answer categories, fill texts, and other instrument texts (e.g. error messages) were replaced by their language specific equivalents. Because of the longitudinal character the CAPI instrument was set up in such a way that preloading of previously collected information was possible. The instrument can also be used for new respondents (refreshment sample and new spouses). Both the baseline and longitudinal questionnaire were integrated into one CAPI instrument.

The country specific translations were entered in the Language Management Utility (LMU). The LMU was already developed and used in SHARE Wave 1, but extended to meet new requirements. These requirements included improved user-friendliness and better version control. Seven development cycles, each with a published version of the CAPI instrument, were run through. In total 17 distinct CAPI instruments were released for a total of 14 countries.

In the second wave new countries joined SHARE: Ireland, the Czech Republic, and Poland after Israel had joined one year earlier. Due to the generic set up of the instrument adding new countries was rather straightforward: new countries were added to the LMU, translations were entered, and new country specific CAPI instruments (as well as automatically generated paper versions) were created. New countries could be added because the CAPI instrument has a baseline version (for fresh respondents) included. The specific character sets, though, needed additional efforts, and in case of a specific grammar (like for the Czech Republic and Poland) new fills had to be added. The inclusion of the Arab, Hebrew, and Russian languages in Israel was a particularly large effort and a technical challenge.

To manage the fieldwork in each country, survey agencies usually make use of a Case Management System (CMS). A CMS contains a list of all households in the gross sample and stores information like contact notes and appointments with respondents. When the CMS supports features like merging questionnaire data and contact information for generating progress reports, a more general name is applicable: Sample Management System (SMS). In Wave 1, the general idea was to give the participating agencies the freedom to use their own SMS. The only restriction was that it should be able to communicate with the centrally provided CAPI instrument. This restriction turned out to be problematic for several agencies, so it was then decided to make use of a centrally provided CMS, used in combination with a Combine and Distribute Tool (CDT) to transfer the data to a central location. In that way, not only the CAPI instrument was similar in each country, but also the CMS. Progress reports for monitoring the fieldwork were now based upon the same underlying management system. In the second wave, the CDT and a tool for generating a

report were combined with a new CMS. The combined functions of this new tool turned the SMS into a fully functional system, available in a SMS Server (agency) and SMS Client (interviewers laptop) variant.

The remainder of this chapter is organised as follows. Section 2 describes some specific changes in the CAPI instrument in more detail. The functionality and in particular the changes in the LMU from Wave 1 to Wave 2 are described in Section 3. Section 4 discusses the new SMS, followed by some concluding remarks and suggestions for future developments in Section 5.

CAPI Instrument

As mentioned above Blaise was used as interviewing system tool in SHARE. For detailed information on Blaise we refer to the website of Statistics Netherlands (www.cbs.nl/en-GB). The basics of the SHARE CAPI instrument and questionnaire as used in Wave 1 are described in Das et al. (2005). This section briefly discusses the specific changes made in the CAPI instrument towards the main survey of Wave 2.

Every sample member who was listed as eligible in the first wave was selected to be interviewed again in the second wave. For those individuals some available data from Wave 1 were preloaded, mainly for routing purposes. The only information that was shown in the question texts was month and year of the last interview. Preload data included whether the natural parents still lived, the number of brothers and sisters the respondent reported in Wave 1, some physical conditions, a few job market characteristics, and whether the respondent was still smoking at the time the Wave 1 interview was conducted. For new spouses, respondents from the refreshment sample, and respondents in the new countries this information was not yet available. Because the number of preload variables was rather limited and the routing for the longitudinal sample did not deviate that much from the routing for new respondents, it was decided to create one instrument that could be used for both the existing and new panel members.

In Wave 1 there were only a few ways to bypass the generic blueprint of the questionnaire. In a few (exceptional) cases the generic routing tested for a condition based on a country specific identifier. This turned out to be very inefficient, in particular when new countries were added. Some questions were removed, and a few remaining country specific questions were incorporated but without a country specific routing. Countries for which these questions were irrelevant, translated the questions with a translation such as "Does not apply in country X – please type CTRL-R (Refusal)".

Funded by the U.S. National Institute on Aging, two new modules for physical measurements were added to the CAPI instrument: the peak flow test and the chair stand test. Some modules such as the EP and AS module were substantially restructured. The so-called pre-Euro currency option was removed from the instrument for almost all questions. Only a question about a received gift or inheritance worth more than 5000 still had the pre-Euro currency option. For all other amount questions the respondent had to report in the local currency (so Euro only in Euro-countries) in Wave 2.

As in the first wave the SHARE CAPI instrument used in Wave 2 consisted of two separate components: the cover screen and the main instrument. The cover screen is used to provide a complete household listing and to determine and select individuals in the household who are eligible for participation in the main questionnaire. In Wave 2 a third component was added: the exit interview. This end-of-life interview is conducted when a SHARE panel member died. The interview is held with a proxy; in most cases a partner or

close relative. The aim of the exit interview is to bring closure to the information collected in the SHARE study. One can link the answers given by the deceased respondent in a previous wave to those given in their exit interview, to find out how live may have changed in the period preceding their death.

Language Management Utility

An online Language Management Utility (LMU) was used to keep track of all the language specific texts. This tool enabled CentERdata to conduct short-cycle development runs for producing the country specific instruments, i.e. opening the LMU to translators for entering the translations, creating the country specific CAPI instruments using the generic blueprint of the questionnaire and the translations, conducting tests and performing the same actions multiple times in a very short period of time. Using the LMU database, a paper version of the language specific questionnaire could also be created easily.

The LMU web interface was extended with new features to help translators keep track of their work and thus the user friendliness was improved. CentERdata introduced a "flag system" which identified the changed or questions added and enabled the translators to indicate the progress of their work. New or changed questions (compared to a previous version, starting with the final version of Wave 1) were indicated with a red flag. The translator could replace this flag by a yellow (adapted, but not finished; may need advice) or green one (translation finished). A webpage with pie charts showing the fractions red, yellow, and green per country, made it easy for the central management team to monitor the progress of the translation process for all countries. The set up is such that new states (colors) with a different meaning can be added easily. All flags can be included in the (country specific) paper versions as well. Comments were added to adapted questions to further explain the changes made. Minor textual changes were visualized by a different font color in the generic version. Besides these new functionalities, a lot of new validations and input checks were added to the LMU, so errors caused by incorrect use were limited to a minimum. The underlying database was upgraded to use UTF-8 to encode text-fields in Unicode.

The LMU also helped in the difficult part of the translation process where dynamic texts were involved, the so-called fills. These fills would get their value from answers given earlier. A simple example is a fill for 'he'/'she' depending on the gender. In the LMU, each question had its own fills, using question-specific fill names. The fill architecture created flexibility towards the countries by making it possible to create country specific fills. Fills were optional; a translator did not need to use the available fills. Countries with complicated grammar could ask for additional fills, even during the translation process. A new fill did not affect other questions nor did they bother other countries in their translation. Poland made use of this possibility. For their language not only 'you' is gender specific (and thus required a fill) but also the verb that follows 'you'. For Poland more than 300 fills were added. In Wave 2 the fill architecture was also adapted to allow for fills in fills (e.g. a fill for the current year in a fill text).

SMS Client and SMS Server

To manage the interviewers' subsample and start the appropriate CAPI instrument, CentERdata developed the Case Management System in Wave 1. Additional tools for data transfer and monitoring of the fieldwork were developed as well. In the second wave the CMS and separate tools were improved and integrated into a Sample Management System

(SMS), with one part installed on the interviewers' laptops (SMS Client) and one part on the agency's server (SMS Server). Figure 1 shows the SMS/CAPI action flows.

The SMS Client registered all contact notes, appointments with respondents, and some basic information on the households and individuals. The client's main screen outlined the sample information regarding id number, name, telephone number, status (complete/incomplete), the number of contact attempts so far, whether the respondent was reluctant to be interviewed, and whether an appointment was made, with date and time of the appointment. Stable addresses could be entered by the interviewer too. These are addresses of persons that might be helpful in next waves in case the interviewer is not successful in contacting the household or respondent. Interviewers were supposed to ask the respondents for such stable addresses.
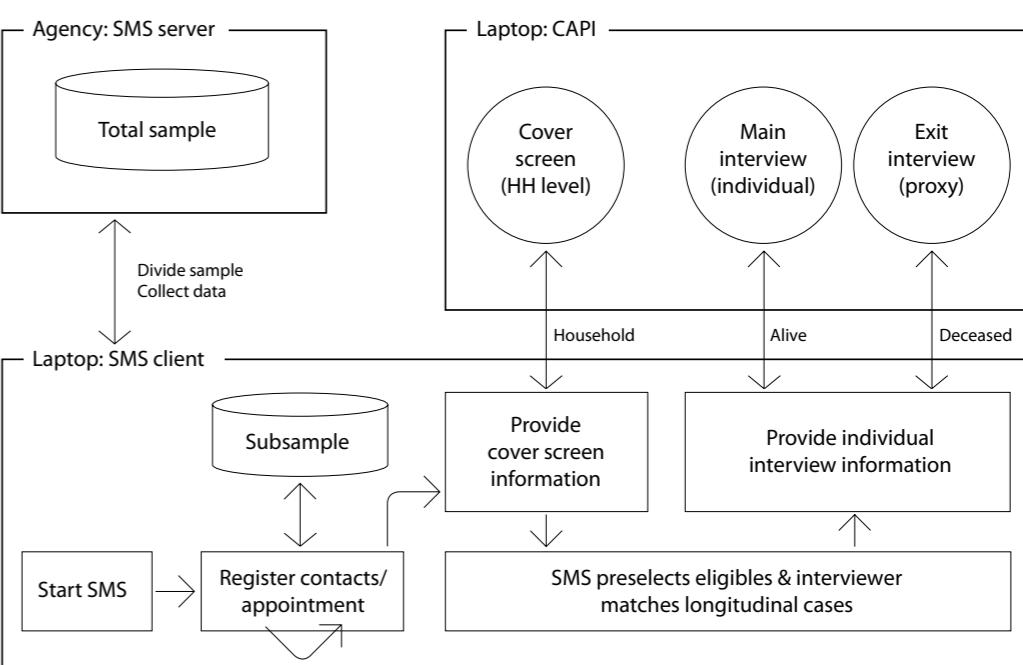
Figure 1 *The SMS/CAPI action flows*

In the second wave two types of households were included in the SMS listing: baseline (refresher) and longitudinal. The SMS main screen indicates the type of household. For baseline households the main interview was conducted with the primary respondent (age-eligible) plus his/her spouse/partner (independent of age). In some countries age-eligible individuals have been randomly selected from local or national registers. In that case, the sampled respondent was the primary respondent in his or her household. In countries with no register of age-eligible individuals, a sample of households, dwellings or telephone numbers was used. For those countries, the SMS Client was equipped with a simple pre-screening process (Screening mode) to first screen potential respondents for eligibility.

The cover screen for a longitudinal household contained additional questions on who moved in, moved out, or died since Wave 1. Persons who moved out and deceased persons were indicated on the SMS main screen, since additional efforts were needed for these cases (finding new addresses or proxies for the exit interviews). There was also some preloading of information for the longitudinal households, but due to legal restrictions the

respondent was not confronted with this information. The interviewer could check in the SMS Client who was listed as eligible in last wave (name, gender, and year of birth), who participated in last wave, and who gave consent to be re-interviewed.

Due to legal restrictions the interviewer could not ask for a confirmation of names that were mentioned last wave. Instead, a cover screen appeared and the interviewer had to match respondents from the first wave to the second wave based on limited preload variables (first name and year of birth), combined with new answers provided in the cover screen of the second wave, see Figure 2. In case a perfect match was found, a suggestion was made by pre-selecting a name. The final choice was made by the interviewer.

Figure 2 Linking respondents from the first wave to second wave respondents

In the second wave, all previously available tools (combining datasets, setting up electronic communication with CentERdata, generating reports) were combined in a fully functional SMS Server. The first main function of the SMS server was dividing the sample into subsamples and distribute these over the different laptops. The second main function was to collect all the survey results, combine them and transfer the data to CentERdata. The server offered a lot of flexibility towards the agencies. They were to some extent free in using the communication options in order to send/retrieve sample information from laptop to central server at the agency, they could easily manipulate the SMS client databases by altering SQL-statements, and they were equipped with the possibility to more actively control the actions from the interviewers (e.g. setting final contact codes).

Concluding Remarks

SHARE – being a research project with genuine innovations that advance cross-national comparability and electronic survey technology – has proven to be a project in dynamic development. New requirements came up in the process at unexpected times necessitat-

ing a flexible software development approach. At the same time, an important goal in the second wave was to further improve software stability to ensure a solid base for data collection. Being flexible as well as stable was a real challenge in the project so far. We think that the quality of the data show that the development process has achieved a successful compromise between the two counteracting requirements.

References

Das, M., C. Vis, and B. Weerman. 2005. Developing the Survey Instruments for SHARE. In *The Survey of Health, Ageing and Retirement in Europe. Methodology,* eds. A. Börsch-Supan, and H. Jürges. Mannheim: Mannheim Research Institute for the Economics of Aging (MEA).

8.3 Training for SHARE Wave 2

Kirsten H. Alcser, Grant D. Benson, Heidi M. Guyer

SHARE – using funding from the U.S. National Institute on Aging – contracted with the Survey Research Center (SRC) at the University of Michigan to provide training to survey agency trainers in a centralized location. The SHARE Train-The-Trainer (TTT) training model has been established with the explicit goal of standardizing interviewer training, study procedures, and data collection as much as feasible across participating survey agencies in me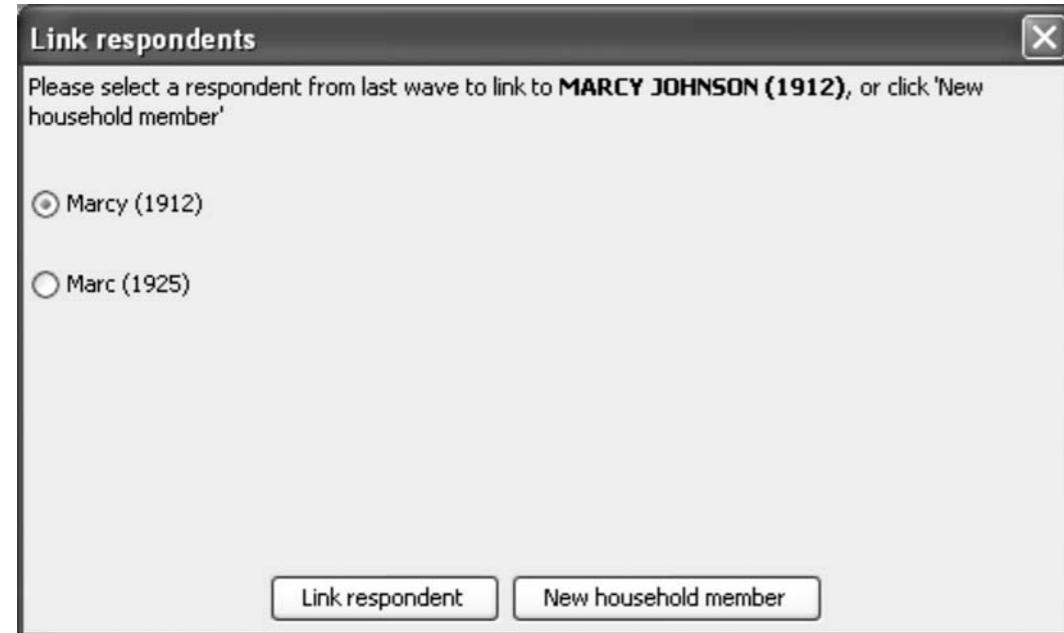mber countries in an effort to increase quality and comparability of the data that is collected for the entire SHARE project. (Please see Alcser et al. (2005) for a detailed description of the implementation of the TTT at Wave 1.)

SHARE Two-Phased Training Approach

With the plan to expand the SHARE either to additional countries or with sample supplements within participating countries in future years, there will be a need to provide training for agencies or interviewers collecting panel data and for agencies or interviewers collecting baseline data in each new round of data collection. This is important not only because the survey instruments differ, but also because training costs and requirements can be tailored based on previous experience. Thus, already in 2006 training was provided for the SHARE member countries collecting panel data as well as for new countries joining SHARE and collecting baseline data. This chapter describes the challenges and solutions to carrying out the two-phased SHARE TTT.

The Trainees

In 2006, the SRC trainers provided training for eleven countries that would be conducting the second wave of data collection as well as for three new countries joining the SHARE project and scheduled to conduct baseline data collection. As was the case in the earlier wave of data collection, each country sent 2-3 trainers from the participating survey agency to the training prior to each data collection effort. Similarly, the Country Team Leader (CTL) and his or her Operator participated as much as possible. Training was scripted and conducted in English, and the translation of all training materials was carried out by each survey agency in consultation with the CTL or Operator and other professionals (e.g. translators) as needed, prior to local interviewer training.

TTT Development

TTT training was tailored to the needs of each group of countries (i.e. those collecting panel data and those collecting baseline data).

The three new countries received baseline training in January 2006 prior to conducting the Pilot data collection in their respective countries. The Pilot baseline training lasted a total of 19.5 hours spread across three days and was very similar to the training conducted for all eleven countries at Wave 1. The baseline pilot study training included general interviewing techniques and field procedures, case sample management, Computer Assisted Interviewing (CAI) with walk through of each section of the SHARE baseline instrument, baseline physical measurements, response rate and bias, and techniques for gaining respondent cooperation.

Pretest training was conducted together for panel and baseline data collection in April 2006. The focus for both groups was on changes made to the baseline instrument used in the previous wave of data collection as well as in the baseline data collection for the new countries in the current wave of data collection. The major changes were made to the panel instrument which in several modules phrased questions in terms of "since the last time we spoke with you", obtaining measures of change. Similarly, the case sample management system was reviewed, highlighting several changes made to accommodate the panel data collection. Training also covered the use of proxy interviews and rules for selecting a proxy reporter, administration of the Drop-Off questionnaire, as well as review of physical measurements and the requirement that all interviewers be carefully observed and documented to do these measurements. Interviewer checklists and project certification documents were covered. The panel study countries also received training in techniques for tracking movers, contacting respondents in nursing homes and conducting the end-of-life interview. Finally, TTT participants were provided with a phase-specific model training agenda and an Interviewer Project Manual for use in country level pretest training.

Both participants and trainers found that combining the training for two different data collection efforts was suboptimal. As a result, this approach was abandoned in future SHARE training.

Fine-tuning the Two-Phased Training Model for the Future

Training for main data collection took place in September 2006. Consecutive training for panel and baseline data collection was carried out across a total of 5 days – 2.5 days (total of 18 hours) each – with a two-hour overlap to share lunch and presentation by the Project Coordinator. Countries collecting panel data were trained first. As was the case for SHARE Wave 1 main data collection training, the TTT model assumed progression of training of the same trainees across one or more data collection points. Thus, each main data collection training focused on changes since the pretest data collection as well as on how to put together a full training at the country level which should be approximately 18 hours long, not counting agency specific administrative procedures and basic training offered for newly hired interviewers. At the end of the training session, the TTT participants were provided with an updated Interviewer Project Manual and a model agenda for use in country level training for main data collection.

Content of Training

A prototype of training for study specific baseline data collection overall was presented earlier (ibid). However, it has become apparent that it did not allow for sufficient hands-on practice. Thus, even for baseline training of experienced interviewers, SHARE now requires 3 days of training or a total of approximately 18 hours, not including breaks.

A prototype of study specific training for panel data collection and baseline data collection, endorsed by SHARE, now covers a total 18 hours usefully distributed across 3 or more days. Table 1 below lists each topic that was to be covered in country level training of interviewers in 2006, a brief note about the topic, and estimated time devoted to the topic. Depending on the topic, more time has been assigned to baseline training, since this is interviewers' first contact with the project. Variations of this model may be anticipated in future waves of data collection, depending on whether new protocols are added, e.g. bio-measures.

Summary

The SHARE 2006 data collection encompassed two phases – the panel or longitudinal data collection with sample initially interviewed in 2004-2005 and new baseline data collection for new countries joining SHARE.

Initially a combined training for all countries, regardless of phase, was attempted. However, based on trainer observation and trainee feedback SHARE decided to provide separate training for each. This decision reinforced the general belief that the most successful training is one that makes training relevant to the trainees, i.e. is tailored directly to what the trainees need, thereby using their time more optimally.

Based on experience during the first wave of data collection, SHARE acknowledged the need to require more extensive training of interviewers in 2006 and for future waves, including more practice and hands-on opportunities during the sessions. With a survey of the current level of complexity, SHARE requires three days of study-specific training (approximately 18 hours total). Adjustments will be made as warranted in training requirements for future waves of data collection if additional specialized study protocols are added, such as bio-measures, for example.

References

Alcser, K.H., and G. Benson. 2005. The SHARE Train-the-Trainer Program. In *The Survey of Health, Ageing and Retirement in Europe. Methodology*, eds. A. Börsch-Supan and H. Jürges, Ch. 6. Mannheim: Mannheim Research Institute for the Economics of Aging (MEA).

Topic	Purpose	Panel: Time (minutes)	Baseline: Time (minutes)
Introductions, Welcome, and Logistics	Setting the stage for this intense training	15	30
SHARE Project and Questionnaire Overview	Explain the goals of the project; Importance of baseline and longitudinal sample	45	45
Sample Overview	Understanding how the sample was selected, sample eligibility, and response rate requirements	30	60
GIT Requirements	Covering minimal GIT requirements, including when and how to contact sample, probes, feedback, etc.	60	60
Overview of the Sample Management System	How to operate the SHARE electronic sample management system, assigning result codes, entering call notes. Introduce non-contact mock scenarios and test results	60	90
Longitudinal Sample Management System	Splitters, deceased, new eligible respondents, additional result codes	30	na
Proxy Interviews	Explain how to identify proxy respondents; Interview proxy respondents	30	45
Nursing Homes	Contacting respondents in nursing homes; Working with gatekeepers / potential proxy respondents	30	na
Overview of the Blaise Program	Blaise component must be explained, including different types of questions, question text, data entry, interviewer instructions, etc.	45	45
SHARE Questionnaire Walk-Through	Description of SHARE modules. Scripted review of the questionnaire, including spawning of additional line. Should address main questions and issues that arise with different sections	330	240
	Longitudinal: Description of longitudinal differences. Explanation of preloads. Must address different questions arising from re-interviews		
End-of-Life Interviews	Must cover both concept of the EOL interview, approaching respondents, and administration of the interview (CAPI/CATI)	30	na
Drop Off	Describe drop-off; Describe procedure for identifying and labeling drop-off appropriately; Explain procedure for administering drop-off. Record these in SMS	45	45
Physical Measurements; "Certification"	Have each interviewer demonstrate the ability to conduct physical measures. Must eventually include all four physical measures	30	60
Response Rates and Contact Efforts	The importance of response rates and reiteration of required contact effort per line. (Longitudinal: review only)	45	90
	Longitudinal: Panel care and effort requirements; Tracking effort		

Topic	Purpose	Panel: Time (minutes)	Baseline: Time (minutes)
Gaining Respondent Cooperation	Review eight concerns that interviewers are likely to encounter. Practice quick answers to several concerns. Note that longitudinal sample is more likely to encounter different types of resistance	90	90
Practicing House-hold Introductions	Interviewers should team up in groups of 10 or so and each take a turn introducing the study	optional	60
Pair-wise Question-naire Walk-though	This is an opportunity for interviewers to go through the questionnaire with a fellow interviewer. Use an abbreviated script; Switch at half-point mark and complete the interview	90	130
Pair-wise Exit Interview	Practice administering the exit interview	45	na
Administrative Wrap-Up	Answer open questions	30	30

Table 1 *SHARE Training Requirements for Panel and Baseline Data Collection – Model Agenda*

Note: Total Time Training for the Panel Model: 1080 minutes (18 hours, 0 minutes); Total Time Training for the Baseline Model: 1120 minutes (18 hours, 40 minutes)

8.4 Attrition

Mathis Schröder

One of the main aspects of a longitudinal study is the stability of the panel, i.e. the continuing participation of respondents which allows observing changes within persons over time. All panels experience a decline in initial respondents due to moves out of the country, death, or refusals to be interviewed again. While moves and deaths are beyond the influence of interviewers, survey agencies or researchers, a refusal to be interviewed a second time may be viewed differently. In this regard a detailed analysis of a respondent's propensity to remain in a survey like SHARE is of importance, since, on the one hand, the present data can be corrected for the attrition by constructing weights accordingly and, on the other hand, detailed strategies to cope with likely refusals in the future can be developed.

Lepkowski and Couper (2002) identify three areas that could affect the continuing participation in a panel study: the survey design, household (or individual) characteristics and the interaction between the household and the interviewer. Survey design factors include length of the interview in the first wave, topic of the survey, incentives, number of interviewer contacts, and follow-up procedures. Respondent characteristics encompass demographics like age, gender, employment status and health as well as household location and composition. Some studies have shown, for example, that married respondents in households located in rural areas are more likely to remain in a panel (Fitzgerald et al., 1998). How interviewers and respondents get along is also likely to be important, especially in a face-to-face interview like SHARE. Interviewer experience, education, age and gender are all factors that could influence the response behaviour as well (see Grouves and Couper, 1998). As the space is limited here, we will only focus on a few selected correlations and cross-tabulations.

This article will first present the attrition rates across countries. These rates vary considerably across countries, and thus the attrition analysis in the following is conducted separated by countries. The effects of survey design, demographics and respondent-interviewer interaction will each be addressed in turn.

Attrition Rates

The attrition rate is based on SHARE respondents with a completed interview in 2004-2005. This reduces the sample to eleven countries: Austria, Belgium, Denmark, France, Germany, Greece, Italy, the Netherlands, Spain, Sweden, and Switzerland. In Wave 1 (release 2.0.1), 28,296 respondents contributed an interview in these countries. In the preliminary release of Wave 2[1], 68.23% (19,309) of these participants remain in the panel. However, following Rendtel (2002), some adjustments need to be made to this number to account for those individuals that could not participate in Wave 2 from the outset: First, 757 (2.7%) of all Wave 1 respondents deceased between Wave 1 and 2. Another 480 (1.7%) individuals moved out of the respective country or did not leave any contact information behind and thus could not be contacted at all. Finally, strict data protection rules

[1]Since the identification of people's whereabouts is particularly important for this paper, the data is based on the most recent data developments available to the author, and thus observations may slightly differ from other articles in this book.

apply in Italy: individuals had to be asked in the first wave whether their address could be kept for a contact trial in the second wave. In case they declined, they could not be contacted at all, unless there was another individual in the same household who had agreed to participate. 274 Italian respondents belonged to households that completely withdrew their address. Overall 1508 cases are dropped in these three steps (the categories overlap and so the numbers do not add up).

Figure 1 shows the participation rates for each country. After removing the above mentioned 1508 observations, the file now consists of 26,788 individuals from the first wave, leading to an attrition rate of 27.93%. The lowest attrition rate exists in Greece with 13%, the highest is in Germany with 41%. Due to the special data protection law mentioned above, Italy's attrition rate is decreased by 9 percent.
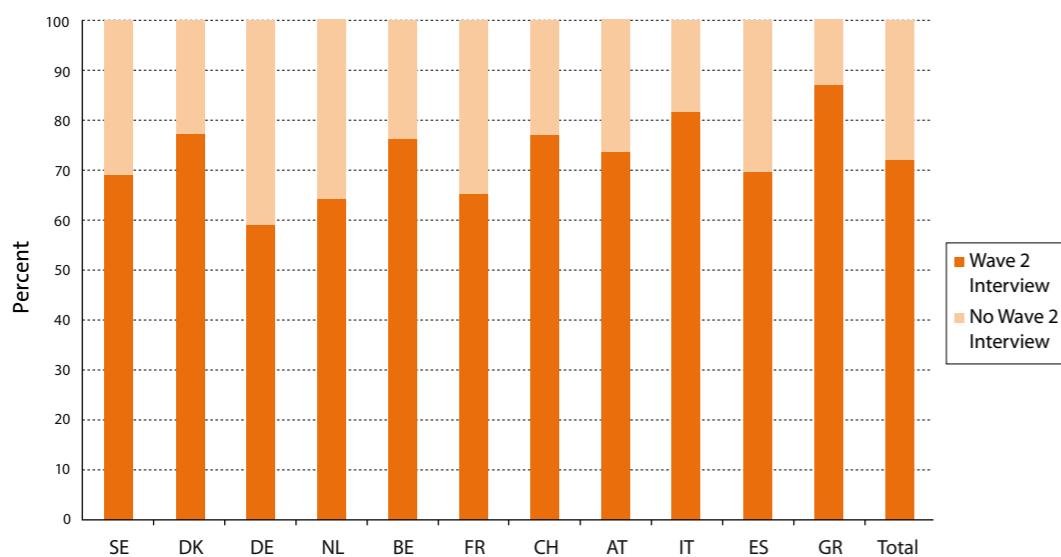
Figure 1 Attrition rates for Wave 1 respondents

We now take a look at the specific reasons that are related to declining the participation in Wave 2 of SHARE. Note that all of the following is based on the adjusted file, i.e. under condition that an interviewer-household contact was established in the second wave.

Determinants of Attrition

Survey Design

One of the major concerns of survey agencies and interviewers after the first wave has been the length of the interview. Figure 2 shows how the interview length from Wave 1 is related to survey participation in Wave 2. To take into account the large differences in interview length across countries (see Jürges, 2005), we consider country specific quartiles of Wave 1 interview length.

It becomes clear from Figure 2 that large differences in attrition exist between the shortest interviews and the rest, that is, respondents with a short interview in Wave 1 are less likely to be interviewed in the second wave. This result – significant overall and in five of the eleven countries – is similar to what Hill and Willis (2001) find in the U.S. Health and

Retirement Study. At the other end, there are mixed findings: an interview duration in the highest quartile is associated with a significantly higher attrition rate compared to the third quartile in Greece and the Netherlands, whereas the relationship is reverse in Switzerland and Spain.
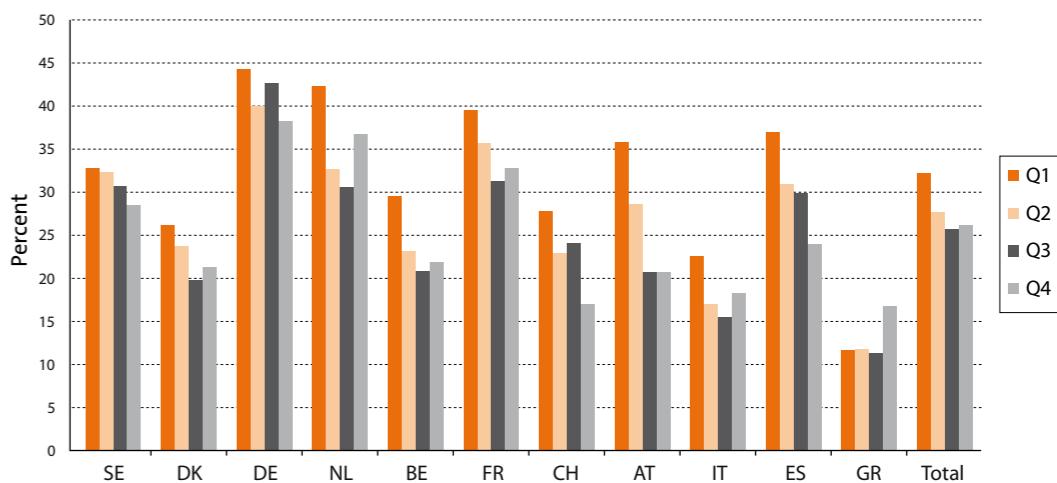
Figure 2 Attrition Rates by Quartiles of Interview Duration

Respondent Characteristics

There is a multitude of characteristics that could be considered in this section, but we will now take a look at only a few important ones: gender, age, employment status, health status, and type of house. There is no consistent pattern across the countries regarding gender and attrition and neither is this relationship significant in any country. This also holds when taking all individuals together: being male or female does not have a significant influence with survey participation in Wave 2, at least not in this bivariate setting.

Figure 3 Attrition Rates by Age Quartiles

Figure 3 shows the attrition rates by age quartiles, where age is calculated from the point of contact for the second wave interview. The lowest age quartile covers respondents up to 58 years of age, the second age quartile includes age 65, and the third is up to 74. In almost all countries we can see a U-shaped pattern: in the youngest group, the attrition is the highest, in the second or third quartile it is the lowest. In all countries, the probability to not participate increases from the third quartile to the oldest group (remember that deceased people are already taken out of the calculations here).

There is virtually no relationship between the employment status at Wave 1 and the attrition behaviour. Only in Greece (lower participation) and in Switzerland (higher participation) we find a significant effect of working in Wave 1 on response in Wave 2. The pattern is somewhat clearer for health. Here only Italy and Spain have a counterintuitive effect: those reporting fair or poor health in Wave 1 are more likely to be interviewed in Wave 2, although this difference is not significant. All other countries have the opposite relationship, and an overall significant effect of good or better health and a higher propensity to participate in Wave 2 is present. Finally, we find for all countries that individuals living in free standing homes are more likely to have an interview in Wave 2. This effect is likely to be correlated with wealth and income, which have been shown to positively influence response behaviour (e.g. Hill and Willis, 2001).

Interviewer-Respondent Interaction

The question of how interviewers influence the response behaviour is of interest to survey agencies and researchers alike. It has been shown that having the same interviewer for both Wave 1 and Wave 2 interviews increases the response rate in the second wave by about six percent (see for example, Hill and Willis, 2001). This information about the interviewer identity has not yet been provided by the survey agencies in SHARE. Still, other interviewer characteristics might have an influence. We concentrate here on the interviewer's gender, education and "evaluation" of response behaviour, all from the first wave.

Over all countries, interviews of Wave 1 were mainly conducted by female interviewers, with a ratio of about 2:1, but this varies across countries: Sweden, for example, has only very few interviews conducted by male interviewers, whereas in Switzerland, the majority are done by male interviewers. Overall, there is a significantly positive effect of about 1.2% on participation in Wave 2 if the interviewer in Wave 1 was female. However, this varies across countries: in Sweden, Denmark, Germany, Belgium and Austria, the effect is actually negative (significant in Denmark), whereas in the remaining countries it is positive (significant in France, Switzerland, Spain and Greece).

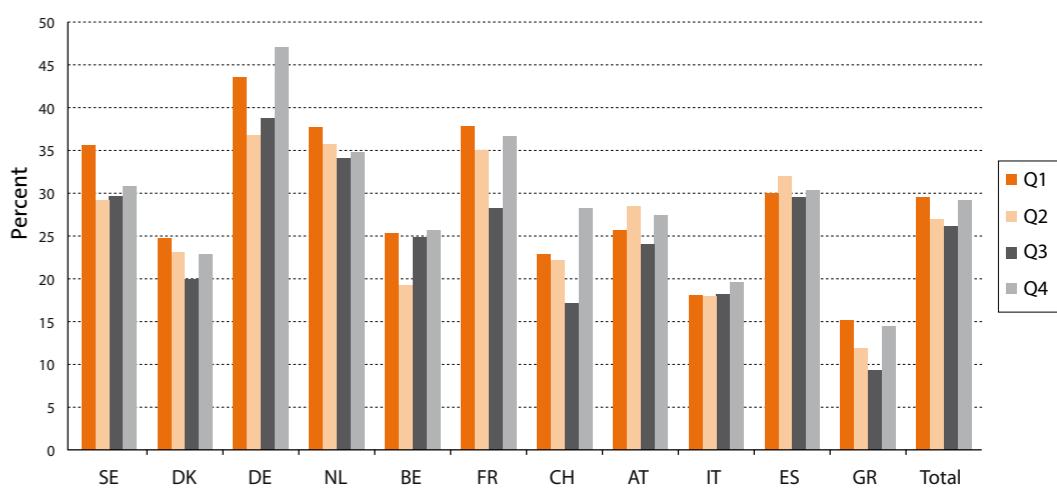Educational differences between interviewer and respondent might influence the attrition behaviour as well. Figure 4 shows for each country the effects of interviewers being more educated, having the same education, or being less educated than the respondent (considering three education categories low, middle, high).

Figure 4 shows an interesting pattern: for all countries except the three Mediterranean and Austria, attrition rates are lower when the respondent is more educated than the interviewer compared to when they have the same education or when the respondent is less educated than the Wave 1 interviewer. For Austria, Italy, Spain and Greece, this relationship is just the reverse.
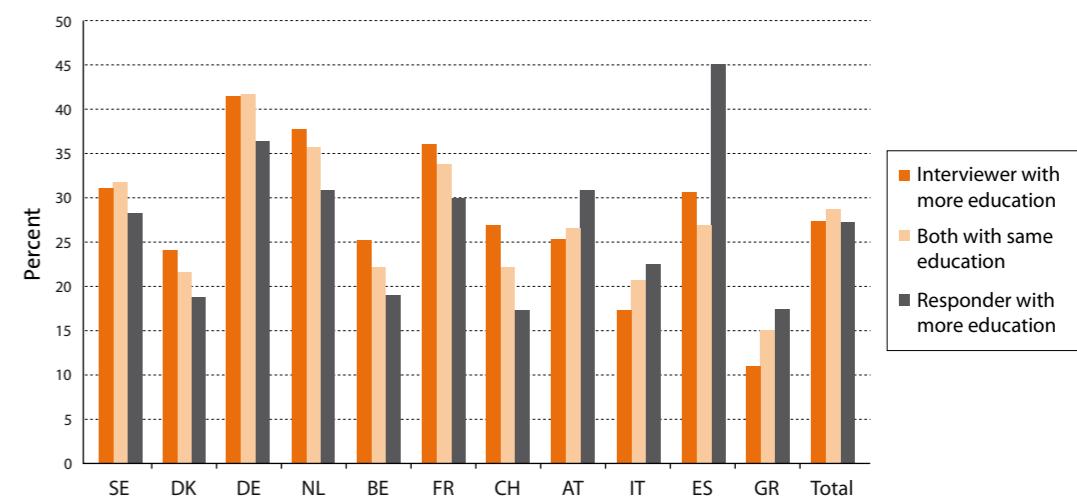
Figure 4 Attrition Rates by Educational Differences

Finally, we take a look at the evaluation of the interviewer after the Wave 1 interview to see if there is a relationship with respect to the participation in Wave 2. Specifically, we are interested if the willingness to answer (as perceived by the interviewer) is predictive of the participation in Wave 2. Figure 5 shows a clear relationship here: In all countries except Greece, we find that a Wave 1 willingness to answer that was perceived as "very good" by the interviewer is associated with significantly higher participation rates in Wave 2. The overall difference is almost 10 percentage points. This finding related to Wave 1 respondent behaviour is also present when looking at the respondents refusing to answer financial questions. In all countries we find a positive relationship with attrition, which is significant when looking at all countries together.

Figure 5 Attrition Rates by Willingness to Answer in Wave 1

Conclusions

This article provided a brief overview of how survey continuation in Wave 2 in SHARE is related to various variables in Wave 1 such as survey design, respondent demographics and interviewer-respondent interactions and how these differ across the participating countries. Contrary to the general notion that long survey time in Wave 1 negatively influences participation in Wave 2 we do not find such a relationship. There are no clear cut results for the demographic variables, but it seems likely that considering a more elaborate model with multiple influencing variables, this will change. As for the interactions of interviewers and respondents, we find several interesting results, which sometimes vary considerably over the countries. It seems reassuring that the interviewers' perception of the willingness to answer transfers directly into the participation in the next wave, as this can help when addressing potentially reluctant respondents in the future.

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8.5 Sampling Design and Weighting Strategies in the Second wave of SHARE

Giuseppe De Luca, Claudio Rossetti

Sample surveys are usually affected by two types of errors: sampling and nonsampling errors. Sampling errors derive from the choice of studying a probability sample instead of the whole population. Nonsampling errors encompass all other sources of errors like coverage errors of the sampling frame and nonresponse errors. In this chapter, we provide a description of sampling design procedures and nonresponse weighting strategies adopted in the second wave of SHARE to deal with both types of errors.

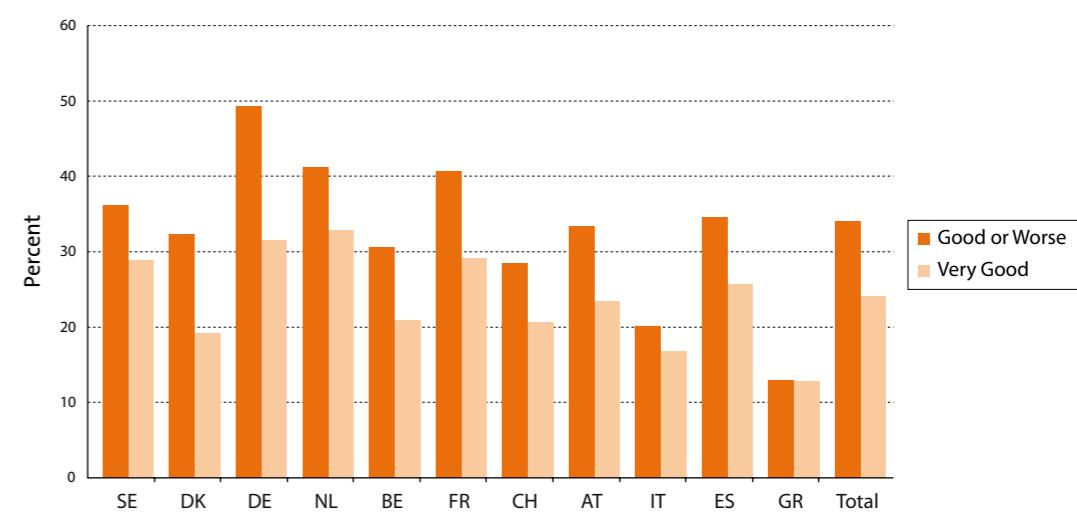First, we will define the target population of the second wave. Then we discuss sampling design procedures and computation of sampling design weights, with focus on the main sampling design differences between the first and the second wave. Detailed information on the sampling design adopted in each SHARE country will be provided in a separate technical report. We continue by focusing on the problem of unit nonresponse in the second wave and describing the computation of calibrated cross-sectional weights. The last section focuses on the problem of sample attrition between the first and the second wave and describes computation of calibrated longitudinal weights.

Target Population

The target population of the second wave of SHARE can be defined in terms of both individuals and households. The target population of individuals consists of all people born in 1956 or earlier, speaking the official language of the country, not living abroad or in an institution such as a prison during the entire fieldwork period, plus their spouses/partners independent of age. The target population of households is implicitly defined as all households with at least one member in the target population of individuals.

Sampling Design Weights

The second wave of the SHARE was carried out in fifteen European countries. Of these, eleven countries (Austria, Belgium, Denmark, France, Germany, Greece, Italy, Netherlands, Spain, Sweden and Switzerland) also participated in the first wave conducted in 2004, while four countries (Czech Republic, Ireland, Israel, Poland) only participated in the second wave conducted in 2006. (Israel 2005)

As already pointed out by Klevmarken et al. (2005), institutional conditions and regulations regarding sampling are so different across countries involved in this project that using a common sampling frame and sampling design for all countries was infeasible. In most of them, suitable sampling frames for the target population investigated by SHARE either did not exist, or could not be used. Thus, national sampling frames were selected depending on what was already available in each country. All national samples were drawn through probability sampling, but sampling procedures are not standardized across countries. In particular, they vary from simple random sampling to rather complicated multi-stage designs. The most common sampling design is two-stage sampling, with geographical areas (usually municipalities) as primary sampling units, and households or individuals as secondary sampling units. Simple random sampling was used in Denmark, Poland, and Sweden, whereas three-stage sampling was used in Austria, Czech Republic, Greece and Italy (In Austria, Czech Republic and Greece the third stage consists of screening of telephone numbers to assess age-eligibility of sampled units). The main sampling design differences with respect to the first wave occurred in Belgium and Denmark. In Belgium, the sampling

design changed from three-stage sampling of telephone numbers in Wave 1 to two-stage sampling of households in Wave 2. In Denmark, the sampling design changed from simple random sampling of households in Wave 1 to simple random sampling of individuals in Wave 2.

For most countries which participated in both waves of the panel, the sample for the second wave consists of two parts, a longitudinal sample and a refreshment sample. The former includes the subset of individuals and households already interviewed in the first wave, while the latter includes a new sample drawn to compensate for the loss of observations due to sample attrition. The only countries with no refreshment sample are Austria and the Dutch part of Belgium. Oversampling of individuals born in 1955 or 1956 was carried out in the refreshment sample. The aim of oversampling is to maintain an adequate representation of these cohorts because the longitudinal sample includes only individuals born in 1954 or earlier. In addition to the main sample, a sample with anchoring vignette questions in the drop-off questionnaire was drawn in most countries (the so called vignette sample). The only countries where no vignette samples were drawn, neither in Wave 1 nor in Wave 2, are Austria and Switzerland.

After taking into account the peculiar features of the sampling design adopted in each country, the probability of being selected in the sample of the second wave was generally computed as the joint probability of being selected in four sub-samples: main longitudinal, main refreshment, vignette longitudinal and vignette refreshment. (Since the first wave, the data also include a supplementary sample that was drawn in Sweden to increase the low number of achieved interview. This sample can be usually considered as a part of the main longitudinal sample). Sampling design weights were then computed as the inverse of the selection probability for the main sample alone, the vignette sample alone, and the two samples combined. Notice that, these weights only account for sampling errors by compensating for unequal selection probabilities of individuals and households. Furthermore, by the design of SHARE, the probability of including any eligible household member is the same as the probability of including the household. Thus, the selection probability and the design weight is the same for the household as for any eligible household member. A list of the sampling design weights included in the release 0 of the SHARE data is provided in the first panel of Table 1.

Variable	Description
wgtADH	Design weight, household & individual, overall sample
wgtMDH	Design weight, household & individual, main sample
wgtVDH	Design weight, household & individual, vignette sample
wgtACH	Calibrated cross-sectional household weight, overall sample
wgtMCH	Calibrated cross-sectional household weight, main sample
wgtVCH	Calibrated cross-sectional household weight, vignette sample
wgtACI	Calibrated cross-sectional individual weight, overall sample
wgtMCI	Calibrated cross-sectional individual weight, main sample
wgtVCI	Calibrated cross-sectional individual weight, vignette sample
lwgtACH	Calibrated longitudinal household weight, overall sample
lwgtMCH	Calibrated longitudinal household weight, main sample
lwgtVCH	Calibrated longitudinal household weight, vignette sample
lwgtACI	Calibrated longitudinal individual weight, overall sample
lwgtMCI	Calibrated longitudinal individual weight, main sample
lwgtVCI	Calibrated longitudinal individual weight, vignette sample

Table 1 Weighting variables in the second wave of SHARE

Calibrated Cross-Sectional Weights

As discussed in the previous section, sampling design weights allow obtaining unbiased estimators of the population parameters under the ideal situation of complete response. Unfortunately, survey data are usually affected by problems of nonresponse. Hence, estimators constructed on the basis of sampling design weights may lead to biased estimators of the population parameters of interest.

In this section, we focus on problems of unit nonresponse in the second wave of SHARE and describe the construction of calibrated cross-sectional weights. Under certain conditions, these weights may help reduce the potential selectivity bias generated by this source of nonsampling error. (Notice that, the set of calibrated weights provided in the public release of the SHARE database are designed to compensate for problems of unit nonresponse in the CAPI interview by ignoring for problems of unit nonresponse in the drop-off questionnaire). As for the first wave, nonresponse corrected weights in Wave 2 were constructed through the calibration procedure provided by Deville and Särndal (1992). This is a statistical reweighting procedure that assigns weights to sample respondents in order to match known population totals obtained from external sources. As discussed at length in the survey literature, effectiveness of this reweighting procedure relies crucially on the assumption that the missing data mechanism underlying unit nonresponse is missing at random (MAR). This means that, after conditioning on a set of variables, there is no relation between the probability of unit nonresponse and other key survey variables excluded from the conditioning set. In principle, the MAR assumption could be relaxed by considering alternative approaches where the process for the outcome of interest and the nonresponse process are estimated jointly. An empirical application of this approach can be found in De Luca and Peracchi (2007). In practice, however, the specification of this type of sample selection models tends to be specific to the analysis of interest. Furthermore, they usually require some background information on both responding and nonresponding units

which is not available for all SHARE countries. Depending on the purpose of the analysis, users should decide if the set of calibrated weights provided by SHARE is enough for unit nonresponse compensation.

Consider a finite population $U=\{1,\ldots,k,\ldots,N\}$ from which a probability sample $S \subseteq U$ is drawn according to a given sampling design. Let w_k be the original sampling design weight of the kth unit, and assume that only a sub-sample of respondents $R \subseteq S$ agree to participate to the survey. Following Deville and Särndal (1992), the calibrated weight w_k^* can be obtained by minimizing the chi-square distance function

$$\sum_{k \in R} \left(w_k^* - w_k \right)^2 / w_k$$

subject to a set of J calibration equations

$$t_x = \sum_{k \in R} w_k^* x_k$$

where $x_k=(x_{k1},\ldots,x_{kJ})$ and $t_k=(t_1,\ldots,t_J)$ are J-vectors of calibration variables and known population totals respectively. Note that the use of the chi-square distance function is a convenient choice because it guarantees the existence of a closed form solution. (Alternative distance functions which require iterative solution methods have been investigated by Deville and Särndal (1992).) The solution of the minimization problem gives calibrated weights of the following form

$$w_k^* = w_k \left[1 + \left(t_x - \sum_{k \in R} w_k x_k \right)' \left(\sum_{k \in R} w_k x_k x_k' \right)^{-1} x_k \right]$$

Thus, given the chosen distance measure, calibrated weights are as close as possible to the original sampling design weights, while also respecting a set of constraints which reflect the size of the target population across one or more dimensions. Notice that, even if calibrated weights are primarily designed to obtain unbiased estimates of population totals, population means can be easily estimated after rescaling the sum of the weights to one.

Calibrated cross-sectional weights of Wave 2 were separately computed by country using at least 8 calibration margins to control for the size of the target population across gender and age groups (50-59, 60-69, 70-79 and 80+). For most of the SHARE countries, information about the calibration margins comes from sources other than the sampling frame, such as national population census. (As pointed out by Klevmarken et al. (2005), this may be worrisome because census data may not exactly cover the same target population investigated by SHARE.) For those countries involved in oversampling of individuals born between 1955 and 1956, we have calibrated against 10 population totals by splitting the age class 50-59 into the age classes 50-52 and 53-59. Additional calibration margins were only used in France, Italy and Denmark. In France, we added one calibration margin to control for home ownership, while in Italy and Denmark we added 14 and 15 calibration margins respectively to control for the size of the target population across geographical areas.

Overall, the release 0 of the data includes six types of calibrated cross-sectional weights which are listed in the second panel of Table 1. We can distinguish between cross-sectional weights at the individual and the household level, and cross-sectional weights for three variants of the SHARE sample (main, vignette and overall sample). For the individual level weights, each 50+ respondent receives a calibrated weight which depends on the household design weight and the respondent's calibration variables. For the household level weights, each interviewed household member receives a common calibrated weight which depends on the household design weight and the calibration variables of all 50+ household respondents. These weights are therefore designed for inference on the target population of individuals and households respectively. For each type of weight, we also provide a flag variable which is equal to 1 when the corresponding calibrated weight is missing. In particular, weights at the individual level are missing for respondents younger than 50 and respondents with missing information on either gender or year of birth. Weights at the household level are instead missing whenever sampling design weights can not be computed because of incomplete sampling frame information.

Calibrated Longitudinal Weights

In addition to calibrated cross-sectional weights, SHARE also provides calibrated weights for the longitudinal part of sample. These weights aim of compensating for potential selectivity effects generated by sample attrition between the first and the second wave.

In this preliminary release of the data, calibrated longitudinal weights were constructed by using the same procedure adopted for calibrated cross-sectional weights. There are only two major differences. First, they are only defined for the subset of respondents who agree to participate to both waves of the panel. Second, we have calibrated against 8 population totals to match the size of the target population of Wave 1 by gender and age class (50-59, 60-69, 70-79 and 80+). As for cross-sectional weights, calibrated longitudinal weights were computed at the individual and the household level, and for three variants of the sample (main longitudinal, vignette longitudinal, and overall longitudinal sample). This leads to six types of calibrated longitudinal weights which are listed in the third panel of Table 1. Validity of these weights relies again on the assumption that the missing data mechanism underlying sample attrition is MAR.

A more refined version of longitudinal weights is planned to be provided in the final release of the Wave 2 data. The aim of this revision is twofold. First, we will account for mortality in the target population of Wave 1 by using estimates of mortality rates obtained from life tables. Unlike other sources of attrition, mortality is indeed a phenomenon that affects both the sample and the population. For this reason, the most appropriate population for longitudinal weights should be the target population of Wave 1 that survives across waves. Second, the construction of calibrated longitudinal weights will be based on a larger set of conditioning variables by using the additional information collected in the Wave 1 interview. In principle, this may help reduce the selectivity bias generated by sample attrition and improve the plausibility of the MAR assumption. In practice, however, one cannot ignore the undesirable increase in the variability of the weights arising from a larger conditioning set. To avoid unnecessary delay in the release of the data, these issues will be addressed in future research.

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8.6 Fieldwork and Survey Management in SHARE

Barbara Schaan

SHARE is designed to be a genuine cross-national survey. In order to ensure high quality data and a strict cross-national comparability, certain design tools have been applied of which the common interview mode, questionnaire design, effort devoted to the translation of the questionnaire, and finally the standardisation of the fieldwork procedures across countries (including a common electronic sample management system) were the most important ones.

This chapter describes the main fieldwork procedures and survey design characteristics adopted by SHARE, which have been designed and implemented in close cooperation between the Mannheim Research Institute for the Economics of Ageing (MEA) and CentERdata at the University of Tilburg, with help of the Survey Research Center (SRC) at the University of Michigan in Ann Arbor. Professional survey agencies have been selected in all participating countries in order to achieve high data quality. Agencies were subject to a common set of requirements designed by the SHARE co-ordinating team in order to minimise the occurrence of nonsampling errors, and to minimize attrition rates. Examples of the common protocols are the use of advance and follow-up letters, brochures which informed the respondents about the results from Wave 1, and the set-up of general rules for the management of the fieldwork. Basic fieldwork procedures were then administrated by the survey agencies according to their own established protocols.

The Fieldwork Period

During its second wave, SHARE was conducted in thirteen European countries. Austria, Belgium, Denmark, France, Germany, Greece, Italy, the Netherlands, Spain, Sweden and Switzerland already participated in the first wave of SHARE, whereas two new countries, the Czech Republic and Poland, debuted to SHARE. In between the waves 1 and 2 Israel joined the SHARE survey with its first wave, and data are currently being collected in Ireland.

In several countries, the sample consisted of two parts: the "core sample" and the "vignette sample". In the vignette samples, a section with anchoring vignettes replaced a part of the self-completion questionnaire. A vignette sample was added in eleven countries (Belgium, Czech Republic, Denmark, France, Germany, Greece, Italy, the Netherlands, Poland, Spain, and Sweden).

The main fieldwork period of SHARE lasted about twelve months, from October 2006 until September 2007. In some countries the fieldwork period of the second wave was prolonged to November 2007, as the specific sample requirements of SHARE – to follow respondents who moved house, to interview people living in old-age institutions, and to conduct end-of-life interviews – requested more time-consuming (administrative) efforts by survey agencies and their interviewers than originally expected.

For all countries participating for the second time (except for Austria) a refresher sample was drawn. The refresher sample served to boost the overall sample size. In almost all countries with a refresher sample, the newly drawn sample consisted of households belonging to the core as well as of households belonging to the vignette sample. The only exceptions were France and Switzerland where the refresher sample was a core sample only.

Country	Fieldwork duration
Austria	October 2006 – August 2007
Belgium (French-speaking part)	November 2006 – October 2007
Belgium (Flemish-speaking part)	December 2006 – June 2006
Switzerland	November 2006 – September 2007
Czech Republic	October 2006 – May 2007
Germany	October 2006 – July 2007
Denmark	November 2006 – October 2007
Spain	November 2006 – November 2007
France	October 2006 – February 2007
Greece	December 2006 – August 2007
Italy	October 2006 – September 2007
The Netherlands	January 2007 – September 2007
Poland	October 2006 – July 2007
Sweden	September 2006 – November 2007

Table 1 SHARE Wave 2 fieldwork periods

Advance, Follow-up and Thank-you Letters, and Panel Care

SHARE mailed an advance letter to each household in the gross sample before any other contact attempt was made. Informing all respondents of upcoming calls or visits by an interviewer, communicating the nature of, and the motivation for, the study, explaining the importance of participating, and addressing the respondent's potential concerns about data confidentiality were the main purposes of that advance letter.

Together with the advance letter the respondents received a coloured brochure that explained the aims and objectives of SHARE, stressed the importance of participation of each selected household and provided the respondents with interesting results from the first wave of SHARE. This first results brochure was designed centrally and translated into local languages afterwards.

After the initial contact with the household, respondents who showed a general reluctance to participate received a follow-up letter, which was mainly designed to reiterate the importance of cooperating with the survey request and the adherence to the data protection laws.

After the interview, a thank-you letter was mailed out to each respondent in order to increase the propensity to participate in future waves of the survey. In some countries, season greetings cards were sent. The advance letter as well as the season greetings cards was sent out together with a form which respondents who moved since then end of Wave 1 fieldwork could use in order to provide the survey agency with their new contact details.

In cases where the survey agency detected the death of a respondent from Wave 1 the family of the deceased respondent received a condolence letter from the survey agency.

In order to reach respondents who moved into old-age institutions a special letter has been designed to inform old-age home staff about the purpose of the study and the respondents' participation during the first wave.

Incentive Schemes

Three types of incentive schemes were adopted in SHARE. In most of the SHARE countries, incentives for respondents were distributed in order to gain their cooperation. Because of different cultures and experiences of the survey agencies, different types of incentives were used in each country.

Country	Fieldwork duration
Austria	10 € for the first and 10 € for a second interview in the same household (in the later stage of the fieldwork this was raised to 30 € for the first and 20 € for the second interview)
Belgium (French-speaking part)	Each respondent received a small gift (a 5 € voucher or a lottery ticket) after completion of the interview.
Belgium (Flemish-speaking part)	The respondents received a calculator as a present.
Switzerland	Each household received with the announcement letter for Wave 2 a check of SFr. 50.
Czech Republic	Respondents received vitamin supplements (multivitamins for seniors) mainly, the other gifts were CD's or pencil's set
Germany	For each respondent an incentive to the amount of 5 € was available. This incentive should be used variably, i.e. the interviewers were either allowed to pay cash or to bring along a small gift for the respondent (flowers, coffee, candies etc.). Additionally 20 € were offered to respondents who disagreed in 2004 to further participate in the panel.
Denmark	No respondent incentives were given.
Spain	Each respondent was given a lottery tickets or other gifts after the interview.
France	A light folding reusable shopping bag was given to respondents as a token of appreciation of their cooperation.
Greece	A digital thermometer was used as incentive.
Italy	A 15 € petrol voucher was given to the first respondent in the family, a 10 € petrol voucher was given to each other interviewed family member
The Netherlands	The incentive was a gift voucher of 15 €.
Poland	The incentive was a gift voucher of 15 €. Vouchers that could be used for payment in shops were used as incentives.
Sweden	A lottery ticket was used as incentive

Table 2 Respondent incentives used in each country

In order to increase interviewers' motivation most countries also implemented incentives scheme for interviewers. In households with more than one eligible person, interviewers received more money for the first respondent. Such a payment system accounts for the higher effort, which is normally needed to make the first interview. In other countries, special premiums were also paid on the basis of the interviewer level response rate. Each survey agency fixed its own threshold response rate. Once the target response rate was reached, interviewers received higher payments for additional interviews.

Finally, the contract with the survey agencies contained incentives for the survey agency to reach the target response rate. Interviews in excess of the target response rates were paid better, while not reaching the target response rate precipitated a contractual penalty.

Other Fieldwork Requirements

In order to increase the response rates a set of additional fieldwork requirements was designed. First, the minimum number of contact attempts was set to eight; all of them had to be in person. In person and telephone contact attempts were required to be done at varying times of the day and days of the week. Such fieldwork rules were mainly designed to obtain high contact rates. Second, for all respondents who showed reluctance to participate to the survey, participation-enhancing strategies were required to be attempted. Refusal conversion strategies were additional follow-up letters, switching to more experienced interviewers and switching to other contact modes. Third, survey agencies were required to make sure that an appropriate number of interviewers were available in a sufficient regional spread. Furthermore, interviewers working for SHARE were required to have extensive face-to-face experience. Survey agencies were asked to employ the same interviewers as in Wave 1 if possible, as these interviewers were not only familiar with the survey and its instrument, but were also known to the respondents, which increases respondents' trust and willingness to participate again.

Interview Mode

The mode of the data collection is one of the main survey design characteristics which may affect the quality of the collected data. Among other things, interview mode may impact survey participation, item nonresponse and reporting errors. As in Wave 1, the interview mode adopted in SHARE was Computer Assisted Personal Interview (CAPI), supplemented by a self-administered paper and pencil questionnaire ("drop off"). The CAPI interview, which is known to be one of the most effective interview modes, represents the largest part of the SHARE interview.

The self-administrated questionnaire was handed to each eligible respondent only after the CAPI interview was completed. It was interviewee's choice whether to return the questionnaire to the interviewer right away, or send it back to the survey agency by mail using a pre-stamped envelope.

All refresher respondents in the core sample received the same version of the questionnaire. Core sample members, who already participated in the first wave of SHARE were not supposed to fill out a drop-off questionnaire. Respondents in the vignette sample received one of two different versions of the vignette questionnaire, which were randomised by interviewer.

Proxy Interviews

Under particular circumstances, a sample respondent is allowed to be assisted by a proxy respondent to complete the interview. Typically, a proxy respondent is a person who is knowledgeable about the sample respondent's situation regarding the area covered in the questionnaire, such as a spouse, an adult child, or any other family member. When physical or mental health problems affected the propensity to participate to the survey or the reliability of the data collected during the interview, proxy interviews were allowed in SHARE. Conditions under which proxy interviewing was allowed were: hearing loss, speaking problems, Alzheimer's disease and difficulty in concentrating for the interview time period needed for SHARE.

SHARE allowed two types of proxy reporting. The interview is referred to as a "partly proxy" interview if a respondent was merely helped by a proxy. The interview is referred to as a "fully proxy" interview if the proxy answers the entire questionnaire in lieu of the respondent. Proxy interviews skipped six modules of the CAPI interview: Cognitive Function, Mental Health, Grip Strength, Walking Speed, Activities and Expectations since the information required in these modules is based on personal abilities, cognitive and physical measures, or personal judgment. For all other modules of the questionnaire, interviewers recorded at the end of each module whether it was completed by a respondent only, partly by proxy or fully by proxy.

End-of-Life Interviews

For deceased Wave 1 respondents, SHARE has designed an end-of-life or exit interview, which covers health, social and economic well-being in the last year of life, and which is answered by a proxy respondent, mainly next of kin. In case the respondent died only very recently, interviewers were instructed to postpone the exit interview until at least three months after the initial respondent's death.

Especially in cases where a respondent formerly living alone died, it was a difficult task for interviewers to identify a knowledgeable person who could provide information on the deceased respondent. Exit interviews could also be conducted via telephone. This was a suitable solution as the case did not have to be transferred to another interviewer if the most knowledgeable person lives in far distance from the deceased respondent.

Sample Management

In order to facilitate the management and the coordination of the fieldwork procedures all survey agencies were required to use an electronic sample management system (SMS). The SMS is an electronic tool which automatically stores and links different sources of information that are useful for the organisation of the fieldwork and which allows to better document the fieldwork processes. France was the only country in which the survey agency used their own electronic system. The SHARE SMS started with a list of households to be approached by each interviewer, together with the contact details of the households (like address and/or telephone number). The SHARE SMS interacted with the main SHARE CAPI instrument and determined automatically those household members that were interview-eligible, and whether or not eligible household members had already been interviewed. The screening of the respondents' eligibility was greatly facilitated as well as the management of appointments and interrupted interviews. Interviewers recorded the history of all contact attempts made to a household. These call records data allowed the interviewers to tailor how to approach each household. The SMS also enforced appropriate calling and follow-up strategies to maximise response rates. Call records data were also used to manage refusal conversion strategies, especially when addresses were transferred from one interviewer to another.

Fieldwork Monitoring

The information delivered by the SMS, specifically on the mode, the date, the time and the result code of each contact attempt, allowed the SHARE co-ordinating team to conduct an effective fieldwork monitoring during the entire fieldwork period. In a bi-weekly mode, survey agencies sent their updated CAPI and SMS data electronically to CentER-data, where the data were processed and made available to the country team leaders and the SHARE co-ordinating team. These data were used to produce reports which depicted the discrepancies between actual and projected status of the fieldwork, using some key indicators such as the number of households already contacted, the number of interviewers

actively working on SHARE, the number of achieved interviews, and response rates. Identifying possible problems in the field and their possible reasons early in the process was the main purpose of collecting this information. The coordinating team and the country team leaders then discussed strategies to cope with these problems. Country team leaders then contacted the survey agencies, so that remedies to problems could be implemented without unnecessary delay.

8.7 Item Non-Response in SHARE Wave 2

Dimitris Christelis

As in every household survey, in SHARE we can observe item non-response for a number of variables. The patterns of non-response can be indicative of the quality of the interviewer's training and performance, of the survey instrument and of the reasons why interviewees choose not to respond.

It is reasonable to expect that there are going to be different patterns of non-response for economic and non-economic variables, since the former contain information about the household finances that is deemed to be sensitive by many respondents, thus leading to increased non-response. Furthermore, even if respondents intend to give a complete answer, they might experience genuine difficulties in valuing assets like the house for which the last transaction might have taken place many years in the past or assets whose market value depends on economic factors like the interest rate in a complicated fashion (e.g. bonds, life insurance). Finally, interviewees might have difficulties remembering values due to cognitive limitations, especially at older ages.

In the discussion to follow we include as non-response not only instances of refusal and/or inability to answer, but also, in the case of economic variables, complete answers that result in very implausible values of the item. To the extent that these implausible responses are due to interviewer errors, the prevalence of non-response is overestimated. In addition, we do not include the cases of partners of interviewees who refuse to be interviewed outright, since they represent unit non-response (even if they are eventually included in the publicly released data with imputations).

Prevalence of Item Non-Response

Since we cannot give a comprehensive account of item non-response in such a limited space we will choose three non-economic variables and two economic ones. The three non-economic variables are: i) feeling limited in daily activities (question PH005_); ii) current employment status (question EP005_); iii) expectation about the weather tomorrow (question EX001_). These three variables come from the beginning, the middle and the end of the questionnaire respectively, and thus the differences in the prevalence of missing values should also reflect the effect of the duration of the interview. The two economic variables are the values of the main home and of bank accounts, which are the two principle assets that most households hold.

In Figure 1 one can see the prevalence of missing values for feeling limited in daily activities, and it is clear that item non-response is not a serious issue for this variable since it is below 0.7 percentage points (pp) for all countries in Wave 1, with the exception of France where it is equal to 2.4. Furthermore, there is some evidence that non-response is even smaller in Wave 2, especially for France. The two new countries in Wave 1, the Czech Republic and Poland show patterns of non-response similar to those observed for the other countries in Wave 1. In Figure 2 we show the prevalence of non-response for current employment status, and we observe that it is slightly higher than that for question PH005, although still quite low in Wave 1 with an average of roughly 0.5 pp, with the exception of France where it is equal to 3.3 pp.

the part of respondents (some of which have dropped out of the interview by the time this question is asked) but also due to genuine ignorance as to the weather conditions on the next day. When we move to the two economic variables, item non-response becomes much more pervasive.
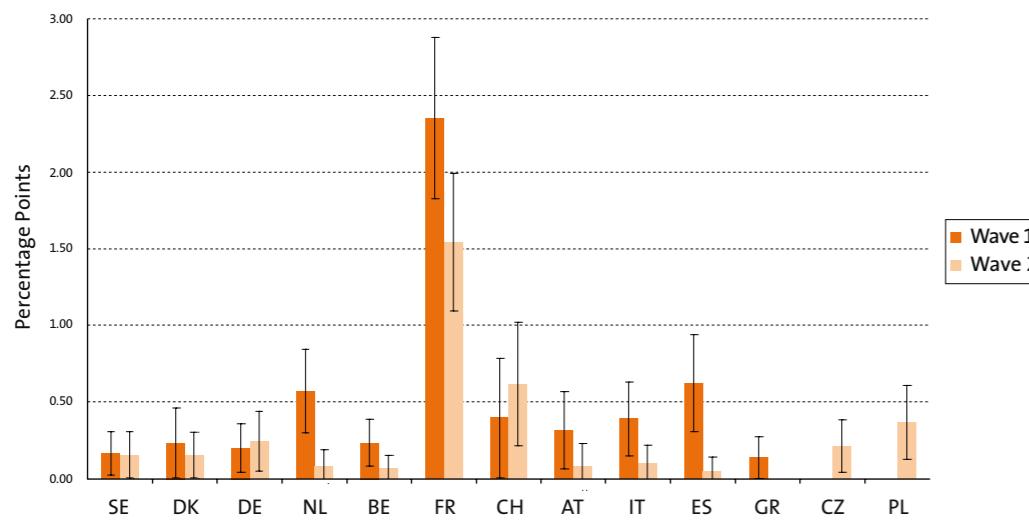
Figure 1 Prevalence of Missing Values – Limited Activities
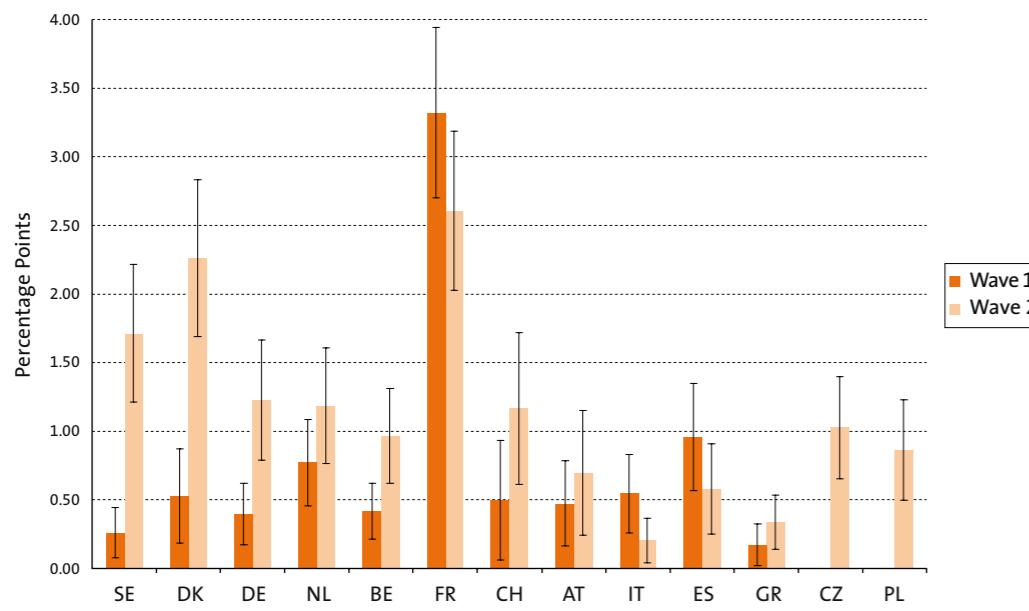
Figure 2 Prevalence of Missing Values – Current Employment Status
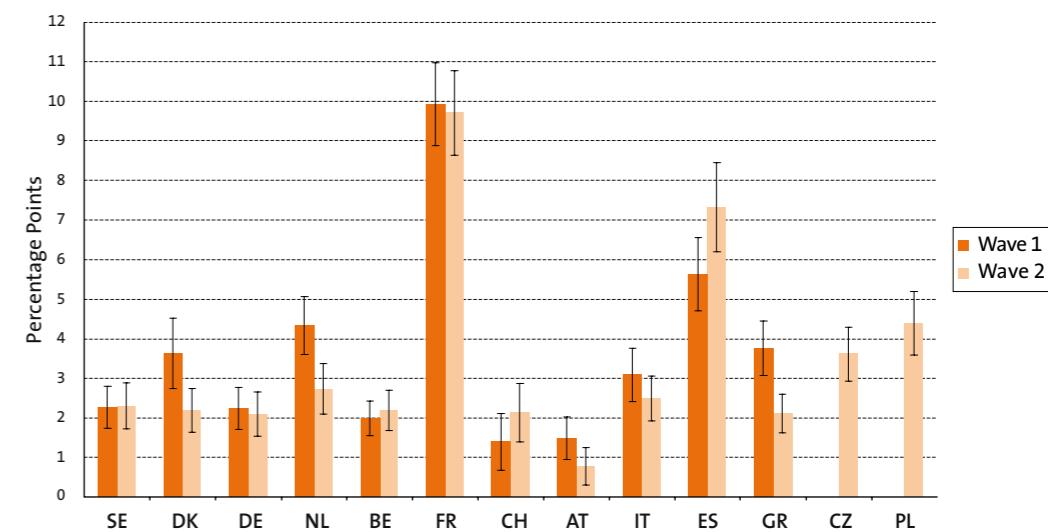
Figure 3 Prevalence of Missing Values – Expectations about Weather

In Figure 4 we show the pattern of non-response for the question on the value of the main home, and we observe that in Wave 1 missing values range from around 6.5 pp for Sweden, Denmark and the Netherlands to 25 pp for Spain, for an overall mean of approximately 15 pp.
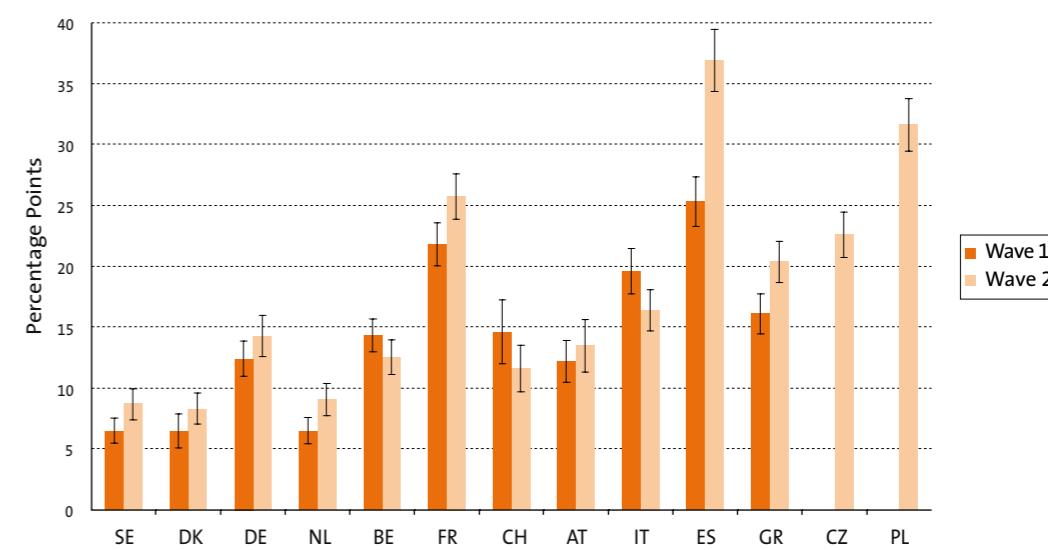
Figure 4 Prevalence of Missing Values – Home Value

In Wave 2 there is a slight deterioration in response rates for this question, with the average of all countries except France now rising to roughly 1 pp, while France exhibits and amelioration in non-response of 0.7 pp. Finally, in Figure 3 we show non-response in the question about weather expectations, weather expectations which was used as a calibration device for all other expectation questions. The Figure shows clearly that non-response is higher for this question, with an average of 3 pp in both waves, again with the exception of France which is an outlier exhibiting non-response of about 10 pp. Poland and the Czech Republic show non-response that is slightly higher than average, close to 4 pp. The increase in non-response for this question could be due to interview fatigue on

In Wave 2 we observe a slightly higher non-response for most countries, for an over-all average of 19 pp. The Czech Republic and Poland exhibit higher than average non-response for housing of 23 and 32 pp respectively. Non-response for bank accounts is shown in Figure 5, and we observe that it is roughly constant in both waves for an overall average of approximately 31 pp, ranging from 23 pp for Italy to 44 pp for Belgium.
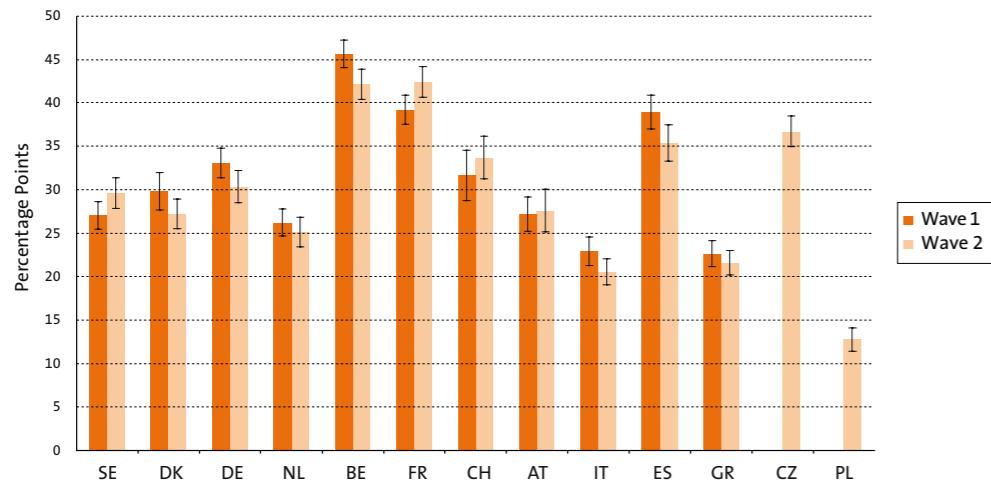
Figure 5 Prevalence of Missing Values –Value of Bank Accounts

In the case of economic variables, non response is mitigated by the possibility that the respondent gives an answer that lies within a range of values, through the use of a sequence of unfolding brackets (for more details see Brugiavini et al., 2005). There are three possible outcomes for the bracket process: i) the respondent goes through the whole process, in which case the answer lies within a relatively narrow range; ii) she starts but does not complete the process, in which case the answer lies in a wider range; iii) she does not enter the process at all, either because of refusal/inability to answer or because she gives a complete answer that is highly implausible. In Figure 6 we show the distribution of outcomes of the bracket sequence for the main home, and we observe that in both waves 43% of respondents who do not give complete answers belong to the first case, 5% to the second case and 52% to the third case.
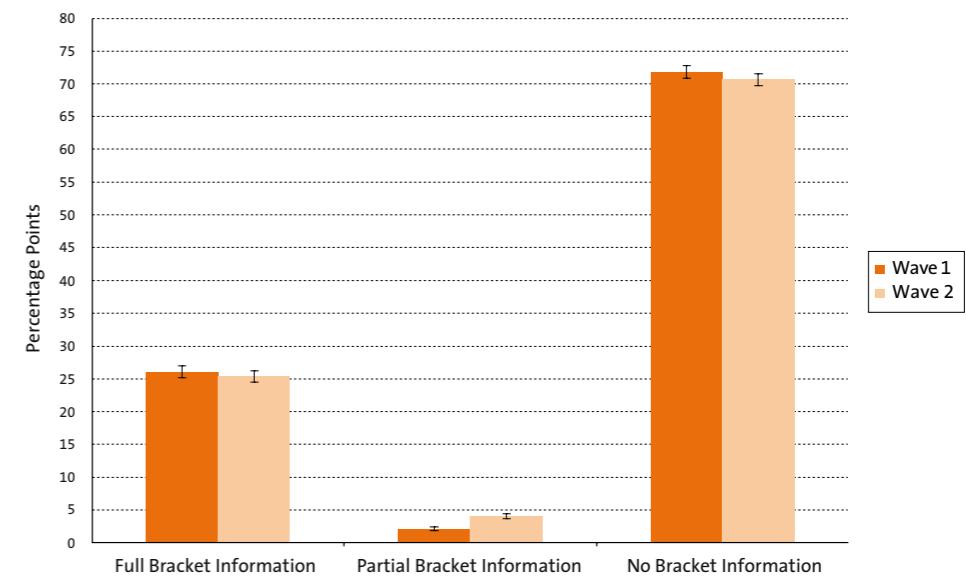
Figure 6 Distribution of Bracket Responses –Value of Bank Accounts

The corresponding percentages for the case of bank accounts are shown in Figure 7, and in that case the proportion of those who do not provide bracket information is much larger (71%), while those who provide full and partial bracket information form 26% and 3% of the sample of non-respondents respectively. Therefore, in Wave 2 the brackets continue to provide useful information that helps to mitigate the problem of item non-response (although their usefulness varies by variable), and this happens more or less at the same rate as in Wave 1.

Figure 7 Distribution of Bracket Responses – Home Value

Imputation Methodology

The problem of missing values necessitates the construction of an imputation procedure for the reasons detailed in, e.g., Rubin and Little (2002). The imputation procedure followed for Releases 2.0 and 2.1 of SHARE Wave 1 differ from the procedure described in Kalwij and van Soest (2005), and since we plan to use the same procedure for release 2 of Wave 2 we are now briefly going to describe it.

We implement an imputation procedure for a system of variables Y, along the lines of the procedure proposed by Lepkowski et al. (2001) and van Buuren et al. (2006). The distribution of missing values Y_{mis} given the observed values Y_{obs} and the parameters θ of the joint distribution function of Y is given by

$$P(Y_{mis}|Y_{obs}) = \int P(Y_{mis}|Y_{obs}, \theta)P(\theta|Y_{obs})d\theta \qquad A.1$$

One would like to impute missing values by drawing from the above distribution, but, with the exception of a few specialized cases, it is impossible to evaluate it directly. Thus we need to approximate this distribution by using Markov chain Monte Carlo methods, specifically Gibbs sampling with data augmentation (see e.g. Little and Rubin, 2002). This method is done iteratively and for each iteration the following two steps are performed:

In each iteration t+1 we draw from the predictive distribution of the missing values given the observed ones and the parameters estimated in iteration t, i.e. we draw from

$$Y_{mis}^{(t+1)} \sim P\left(Y_{mis}|Y_{obs,}\theta^{(t)}\right) \qquad A.2$$

The draw is performed by assuming an appropriate predictive model for each variable Yj given the remaining variables Y-j in the system, with the ones preceding Yj in the sequence of variables being evaluated at iteration t+1 while the ones following Yj in the sequence are evaluated at iteration t. That is we draw from the following conditional distribution
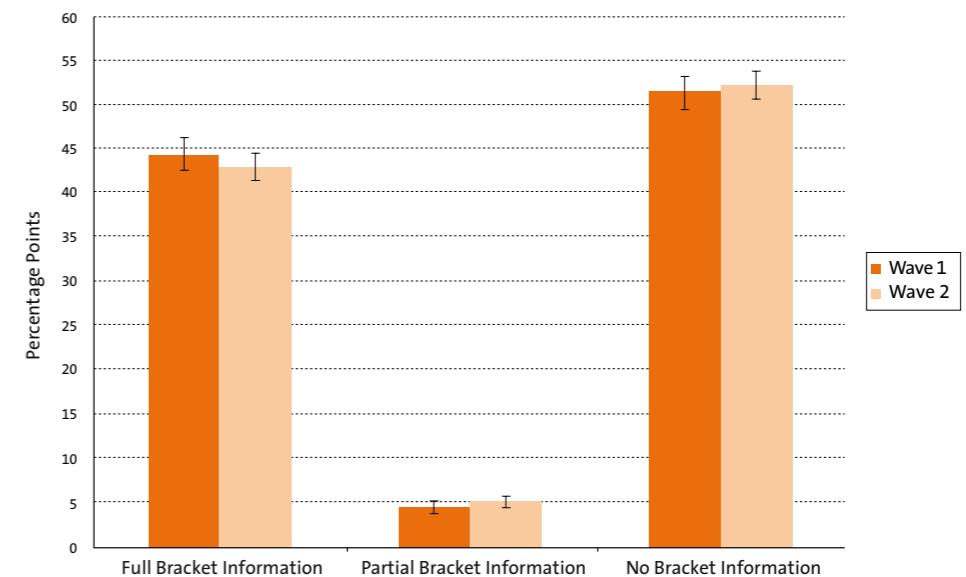
$$Y_j^{(t+1)} \sim F\left(Y_j^{(t+1)}|Y_1^{(t+1)},...,Y_{j-1}^{(t+1)}, Y_{j+1}^{(t)}, Y_j^{(t)},\theta^{(t)}\right) \qquad A.3$$

where J is the total number of variables.

Having drawn the missing values for iteration t+1 we estimate appropriate linear or nonlinear models at iteration t+1 and then draw the parameters θ from their posterior distribution, i.e. we draw from

$$\theta^{(t+1)} \sim P(\theta|Y_{obs,}Y_{mis}^{(t+1)}) \qquad A.4$$

Thus the imputation procedure generates a Markov chain of $Y^{(t)}, \theta^{(t)}, Y^{(t+1)}, \theta^{(t+1)},...$ that converges under mild conditions to the joint distribution of $P(Y_{mis}, \theta | Y_{obs})$ and each draw from this joint distribution represents also a draw from the conditional distribution (A.1).

As Lepkowski et al. (2001) point out using the linear prediction (A.3) to simulate draws from (A.2) makes it difficult to evaluate whether the draws are consistent with the underlying joint distribution of the variables, but they suggest that the approximation works reasonably well.

The general framework just described has to be adapted to fit the particular features of a large-scale complex survey like SHARE. Some of the most important modifications are the following:

We divide the vector Y into economic variables Z and demographic characteristics X. Z contains roughly 60 variables that are related to income, assets, health expenses, consumption and financial transfers. X contains 15 variables including education, self-reported health, number of children and grandchildren, number of rooms in the house etc.

For the demographic variables X we do hotdeck imputation by age and gender for singles since for them there are relatively few missing values. For couples on the other hand, since we have a non-trivial number of missing values, we run ordered probits or OLS regressions depending on the nature of the variable (e.g. for the 5-level self-reported health variable we use an ordered probit). In both cases demographic variables are then used as covariates for the regressions of economic variables, but in the case of couples economic variables are also used as covariates for the estimation procedure of demographic variables.

For the economic variables Z we first have to determine whether the respondent owns the item in question, and if so, in which range the value of the item lies. The latter information can be taken from the bracket questions that respondents are directed to when they don't answer directly the question on the amount. Having determined ownership and admissible range of values, an OLS regression is run (i.e. specification A.3) among owners. The estimated parameters of this regression are redrawn from their posterior distribution (A.4) and then are used to generate predicted values of the Z variables. We then add to these predicted values random draws from the assumed normal distribution of the error term using the estimated error variance. The draws are performed in such a way as to observe the boundaries of the bracket range the observation falls in.

We use a multiple imputation methodology to generate the missing values, i.e. we generate five different values for each missing one as advocated by Rubin and Little (2002), and thus we run five independent imputation chains that generate five different datasets.

Having drawn the missing values at the end of each iteration one has to decide whether to continue iterating or whether the data can be thought to have approximately converged to the underlying joint distribution. To determine convergence we use the convergence criterion of Gelman-Rubin (1992) that compares the between-implicates variance with the within-implicates one and when the former is sufficiently small compared to the latter convergence is deemed to have occurred.

The second wave of SHARE provides opportunities to use information that helps the imputation in Wave 1 and vice versa. The first case takes place when, e.g. a person has the education information missing in Wave 1 but not missing in Wave 2. The latter case can occur when we know that a person receives a public pension in Wave 1, and thus we can reasonably assume that the same will hold in Wave 2. Amounts in economic variables in Wave 1 can also help in conditioning the imputation of amounts in Wave 2. Our plan is to thus link the imputation in the two waves, since performing it independently could result in excessively large transitions of participation and amounts for the same individuals across waves.

Summary

As observed in Wave 1, item non-response seems to be not a major issue for non-economic variables, like those referring to demographics, physical and mental health, qualitative employment variables, expectations or activities. On the other hand item-non response is more of a problem for economic variables, and its prevalence seems to be roughly constant across waves. While the differences across countries in item-non response are relatively small for non-economic variables, they are substantial for economic ones. In order to impute missing values in for release 2 of Wave 2, we plan to use an iterative multivariate procedure that takes into account the cross-linking of the information across the two SHARE waves.

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8.8 Enhancing International Comparability Using Anchoring Vignettes

Arthur van Soest

In a diverse continent like Europe, much can be learned from cross-national research using surveys among households and individuals. Often, however, such comparisons suffer from differences across countries and socio-economic groups in the way people answer survey questions, particularly self-evaluations of, e.g., health or quality of work. This problem can be solved using anchoring vignettes: short descriptions of, e.g., the health or job characteristics of hypothetical persons. Respondents are asked to evaluate the hypothetical persons on the same scale on which they assess their own health or job. Respondents are thus providing an anchor, which fixes their own health assessment to a predetermined health status or job characteristic. These anchors can then be used to make subjective assessments comparable across countries and socio-economic groups. Such anchors can be used in a broad range of domains, such as health; work disability; quality of life, employment and health care; or satisfaction with political institutions, and can in principle be applied to many cross-national surveys with self-assessed questions, including SHARE.

This section briefly describes the methodology of anchoring vignettes and its application the SHARE data through the seperate EU project COMPARE, and additional funding through the U.S. National Institute on Aging with the goal of constructing improved indicators of health, well-being, job satisfaction, etc., helping Europe to create opportunities for more accurate and richer analyses of the consequences of ageing and the effects of socio-economic and health care policies at the national and European level (see www.compare-project.org). The vignette questionnaires were fielded in eleven countries: Belgium, Czech Republic, Denmark, France, Germany, Greece, Italy, Netherlands, Poland, Spain, and Sweden.

Why Anchoring Vignettes?

Comparison of such subjective measurements across countries (or socio-economic groups in one country) raises the issue whether people in different countries (or socio-economic groups) use the same benchmarks or scales on which they evaluate themselves. The literature shows that this is not the case – Different groups of people use systematically different norms for assigning a label like "good" or "very good" to their own self-assessment. In psychometrics this is called differential item functioning (DIF; Holland and Wainer, 1993). DIF substantially impedes the usage of cross-national data to make valid international comparisons in crucial areas such as health care and policy analysis. Additional information is needed to distinguish the effects of language and cultural and social norms from genuine health differences that may result from, for example, the effects of public health care policy. Analogous examples can be provided for other subjective measurements such as well-being or satisfaction with the social and political environment (King et al., 2004).

In anchoring vignettes, respondents are asked to assess the described features of the health, quality of health care, quality of employment, etc., on the same scale as used for the evaluations of their own health, quality of health care, etc. If different respondents evaluate the same hypothetical person (or situation) differently, this is evidence of response scale differences (DIF). The response scale differences can be expressed more precisely using econometric models, making it possible to create indicators of health, quality of work, health care, or life, etc., that are better comparable across countries or socio-economic

groups than the indicators that are currently available, since response scale differences are corrected for.

The following example illustrates a vignette for the domain of mobility:

Margaret feels chest pain and gets breathless after walking distances of up to 200 metres, but is able to do so without assistance. Bending and lifting objects such as groceries also causes chest pain.

Overall in the last 30 days, how much of a problem did Margaret have with moving around? None, Mild, Moderate, Severe, or Extreme?

The crucial point is that these vignette descriptions are the same in all countries, so that the vignette persons represent the same health conditions. Hence, any differences in responses must be due to DIF. Vignette evaluations then identify the differences between the scales in the two countries. Using the scales in one of the two countries as the benchmark, evaluations in the other country can be adjusted by evaluating them on the benchmark scale. The corrected evaluations can then be compared to those in the benchmark country – they are now on the same scale.

The existing applications suggest the vignettes work quite well in a number of different domains in the sense that the vignette corrections go in the direction that is intuitively expected. For example, King et al. (2004) have applied the vignette methodology to political efficacy. They find that without correction the Chinese seem to have more political influence than the Mexicans. The conclusion reverses if the correction is applied. More applications to health are given in Salomon et al. (2004) and Bago d'Uva et al. (2008). Kapteyn et al. (2007) have used anchoring vignettes to analyse cross country differences in self-reported work disability. They find large differences between self-assessed rates of work disability between the U.S. and the Netherlands, with much higher rates in the Netherlands, particularly for respondents of older working age. Objective measures of health do not provide any evidence that U.S. citizens are healthier than Dutch citizens – on the contrary, they suggest that the Dutch are healthier. Correcting for DIF, Kapteyn et al. find that the difference between the U.S. and the Netherlands is less than half of the uncorrected difference. Kristensen and Johansson (2008) find clear evidence of DIF in self-assessed job satisfaction.

Vignettes in SHARE

The chosen domains for which vignettes are fielded in SHARE are the following:

- Several domains of health (mobility, pain, sleep, breathing, emotional health, cognition);
- The extent to which health limits the amount or kind of work people can do;
- The quality and responsiveness of health care;
- Quality of employment; satisfaction with work;
- Satisfaction with income; poverty and social exclusion;
- Well-being and quality of life;
- Political efficacy and satisfaction with the national political system.

Vignettes for physical and mental health were already collected in the form of a pretest added on to SHARE Wave 1 in 2004, for eight countries. This also applies to work disability – SHARE 2004 included vignettes on work-limiting health problems in the domains of pain, depression, and cardio-vascular disease. The same work limitation vignette questions have also been administered to a sub-sample of the U.S. Health and Retirement Study (HRS) 2004 and are included in the English Longitudinal Study on Ageing (ELSA).

The quality of health care services is compared by subjective questions in the spirit of Schoen et al. (2004) and the World Health Survey vignettes on several aspects of health care quality, such as waiting time for a test or an operation, willingness to refer patients to (other) experts, cooperation of the insurance company, and communication with medical professionals (see http://gking.harvard.edu/vign/eg/). An example in the domain "choice of providers" is:

Jim had stomach problems for several years. He has visited his doctor many times. His requests for a referral to a particularly well-known stomach specialist have been turned down because his doctor was sure that he was capable of treating the illness and assured Jim of this.

Now, overall, how would you rate Jim's experience of being able to choose to see the health care provider he went to? Very good, Good, Moderate, Bad, or Very bad?

A major policy challenge consists in increasing the number of regularly employed people at older age by influencing the determinants of early retirement. Poor quality of work and employment is an important determinant of premature departure from working life. This is why we include self-assessments and several vignettes on job satisfaction. Since more than half of the respondents in SHARE do not do any paid work, job satisfaction self-assessments and vignettes are replaced by self-assessments and vignettes on daily activities more in general for the older part of the sample.

A rather general but subjective measure of economic well-being and poverty is obtained by the question:

How satisfied are you with your household's income? Very satisfied, Satisfied, Neither satisfied nor dissatisfied, Dissatisfied, or Very dissatisfied?

This question may suffer from DIF across socio-economic groups and across countries. To correct for this, we developed vignettes on income satisfaction. An example:

Jim is married and has two children; the total after tax household income of his family is € 1,700 per month.

How satisfied do you think Jim is with the total income of his household? Very satisfied, Satisfied, Neither satisfied nor dissatisfied, Dissatisfied, or Very dissatisfied?

Another dimension of social exclusion is lack of social contacts with family, friends, neighbours, etc. We therefore also included a self-assessment and some vignette questions on satisfaction with social contacts. An example:

Mary has been married for many years. Lately she has spent little time with her

husband and they have been quarrelling more. They seem to prefer spending time with others rather than with each other. Both of them have many friends.

    How satisfied do you think Mary is with her social contacts (family, friends, etc.)? Very satisfied, Satisfied, Neither satisfied nor dissatisfied, Dissatisfied, or Very dissatisfied?

The vignettes for overall quality of life give more complete descriptions of people's lives, including the various domains given above. They are used to correct for DIF in the self-assessment question: How satisfied are you with your life in general?

Political efficacy refers to the "feeling that individual political action does have, or can have, an impact upon the political process, that is, that it is worthwhile to perform one's civic duties" (Campbell et al., 1954). The vignettes in King et al. (2004) to correct for DIF in political efficacy self-assessments were placed in the context of a developing country. We adjusted them to the European context. An example:

    John is bothered by the air pollution caused by a local firm. It is not dangerous but sometimes leads to a bad smell. The mayor has looked into the problem, but concluded that industrial development is the most important policy right now instead of clean air.

    How much say does John have in getting the municipality to address issues that interest him? Unlimited say, A lot of say, Some say, Little say, or No say at all?

Questionnaire Design

The vignette questionnaire comes in the form of a drop off. It is a paper and pencil questionnaire that is given to the respondent by the interviewer at the end of the CAPI interview. Since job satisfaction and work disability are more relevant for respondents younger than 65 while respondents of 65 and older tend to make more use of health care and have other daily activities, we used two different versions for the younger than 65 and 65 and older. The table below shows how many self-assessments and vignettes are included in each version. The questionnaires can be found on the Compare web-site (www.compare-project.org).

Country	Self-assessments		Vignettes	
	< 65	65 +	< 65	65 +
Health (in six domains)	6	6	6	6
Work disability (3 domains)	1	–	3	–
Income satisfaction	1	1	2	2
Satisfaction with social contacts	1	1	2	2
Job satisfaction	1	–	2	–
Satisfaction with daily activities	–	1	–	2
Satisfaction with life in general	1	1	2	2
Health care responsiveness (3 domains)	3	3	3	6
Political efficacy	1	1	2	2
Total	**15**	**14**	**22**	**22**

Table 1 Number of self-assessments and vignettes in the COMPARE survey for respondents younger than 65 and respondents ages 65 and over

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