Early Determinants of Work Disability in an International Perspective

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Abstract: Work disability is the (partial) inability to engage in gainful employment due to physical or mental illness, resulting in early retirement and/or uptake of disability insurance benefits. This study juxtaposes health measures of work disability (WD) with the uptake of disability insurance (DI) benefits in the US and Europe. It is based on an internationally harmonized data set assembled from SHARE, ELSA and HRS. Particular attention is given to life-time health using life history data from SHARE and ELSA plus comparable early childhood and life-course data from HRS. The core of the paper relates reported WD status and DI benefit receipt on country-specific DI, pension and labor market policies. We also evaluate the DI systems' efficiency by comparing how well they provide benefits to individuals in need without being misused by individuals who are healthy. We find that while our large set of health measures explains a substantial share of the within-country variation in WD and DI, this is not the case for the variation across countries. Rather, most of the variation between countries is explained by differences in DI policies.

Keywords: Social security and public pensions; work disability; disability insurance; international comparisons (H55, J21, J26)

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This paper uses data from SHARE Waves 1, 2, 3 (SHARELIFE), 4 and 5 (DOIs: 10.6103/SHARE.w1.500, 10.6103/SHARE.w2.500, 10.6103/SHARE.w3.500, 10.6103/SHARE.w4.500, 10.6103/SHARE.w5.500), see Börsch-Supan et al. (2013) for methodological details. The SHARE data collection has been primarily funded by the European Commission through the FP5 (QLK6-CT-2001-00360), FP6 (SHARE-I3: RII-CT-2006-062193, COMPARE: CIT5-CT-2005-028857, SHARELIFE: CIT4-CT-2006-028812) and FP7 (SHARE-PREP: N°211909, SHARE-LEAP: °227822, SHARE M4: N°261982). Additional funding from the German Ministry of Education and Research, the U.S. National Institute on Aging (U01_AG09740-13S2, P01_AG005842, P01_AG08291, P30_AG12815, R21_AG025169, Y1-AG-4553-01, IAG_BSR06-11, OGHA_04-064) and from various national funding sources is gratefully acknowledged (see www.share-project.org).

The ELSA data were made available through the UK Data Archive. ELSA was developed by a team of researchers based at the NatCen Social Research, University College London and the Institute for Fiscal Studies. The data were collected by NatCen Social Research. The funding is provided by the National Institute of Aging in the United States, and a consortium of UK government departments co-ordinated by the Office for National Statistics. The developers and funders of ELSA and the Archive do not bear any responsibility for the analyses or interpretations presented here.

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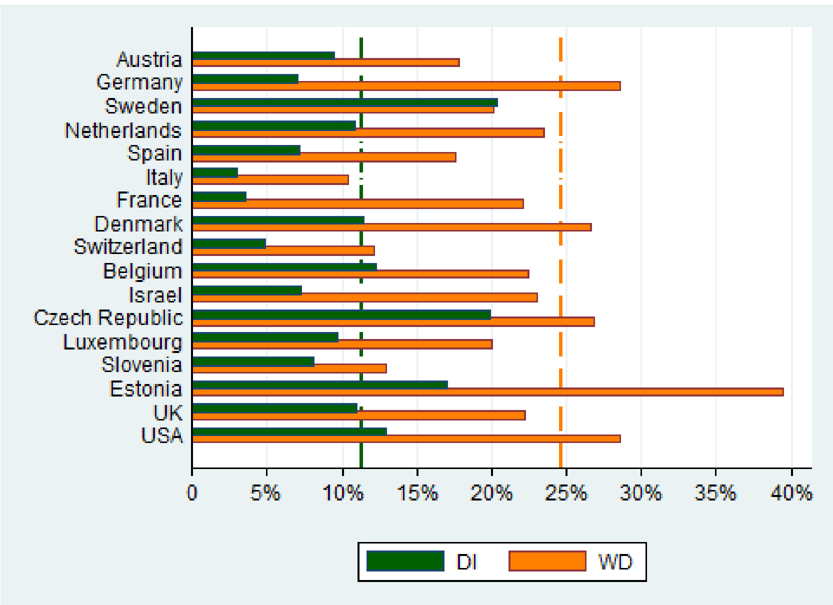
1. Introduction

Work disability is the (partial) inability to engage in gainful employment due to physical or mental illness, resulting in early retirement and/or uptake of disability insurance benefits (Loisel and Anema 2014). Disability insurance (DI) is a substantial part of public social expenditures and an important part of the social safety net of all developed countries (OECD 2003, 2010). The design of work disability insurance systems is a challenging task for policy makers (Havemann and Wolfe 2000; Autor and Duggan 2003, 2006, 2010; de Jong et al. 2011). Like almost all elements of modern social security systems, disability insurance faces a trade-off (Aarts et al. 1996, Diamond and Sheshinski 1995, Banks et al. 2004, Croda and Skinner 2009, Autor et al. 2016). On the one hand, disability insurance is a welcome and necessary part of the social safety net as it prevents income losses for those who lose their ability to work before the normal retirement age. On the other hand, disability insurance may be misused as an early retirement route even if the normal ability to work is not affected at all.

The aim of this study is to shed light on the interrelated roles of health, especially health over the entire life course, and welfare state policies, especially financial incentives of the old-age pension and disability insurance systems, in the decision to take up disability insurance benefits due to work disability. It continues and expands our earlier research on early retirement and disability insurance in Europe (Börsch-Supan and Schnabel 1999, Börsch-Supan et al. 2004, 2007, 2010, 2011, 2012). It makes three new contributions to this string of papers. First, there have been incisive reforms to the DI systems in many of the countries analyzed in our earlier studies, reducing the generosity of DI. This is especially significant for the Netherlands, which used to have the most generous DI system in Europe by far. We show that even after the most striking international differences in DI generosity have been abolished, we still identify a strong reaction of DI uptake to DI regulations. Second, we systematically juxtapose self-reported work disability (WD) with the uptake of DI in order to shed more light on how well DI targets WD. We find systematic international differences in the match quality between WD and DI. Third, we exploit harmonized retrospective data in the US Health and Retirement Study (HRS), the English Longitudinal Study on Ageing (ELSA) and the Survey of Health, Ageing and Retirement in Europe (SHARE) to take life-time health and policy interventions over the life course into account in a systematic way. We find that health problems experienced over the life course even as early as during childhood are important drivers of later life working capacity and the need to rely on DI benefits.

Figure 1 shows the extent of work disability (WD) and disability insurance (DI) receipt in 17 different countries in Europe and the US It is based on internationally comparable measures of WD and DI in SHARE, ELSA and HRS.[1] The data refer to individuals whose age is between 50 years and the age, in which DI benefits are converted to old-age pensions, in most countries at the age of 65 years. In all countries except Sweden the average rate of self-reported WD is higher than the share of persons who receive DI. On average in all countries around 25% self-report that they have a health problem or disability that limits the kind or amount of paid work they can do. The variation between countries is high. The rate ranges from around 11% in Italy to around 40% in Estonia. Compared to that, about 11.5% of these individuals receive DI benefits, again with a substantial variation between countries. The share ranges from around 3-4% in Italy, France and Switzerland up to 20% in Sweden and the Czech Republic. While in almost all countries, there are more individuals reporting WD, there are marked cross-national differences in the relative size of the WD and DI populations. In Sweden, these populations are about equal, while in France, there are about five times as many individuals reporting a WD as receiving DI.

Figure 1: Work disability and disability insurance receipt in Europe and the US

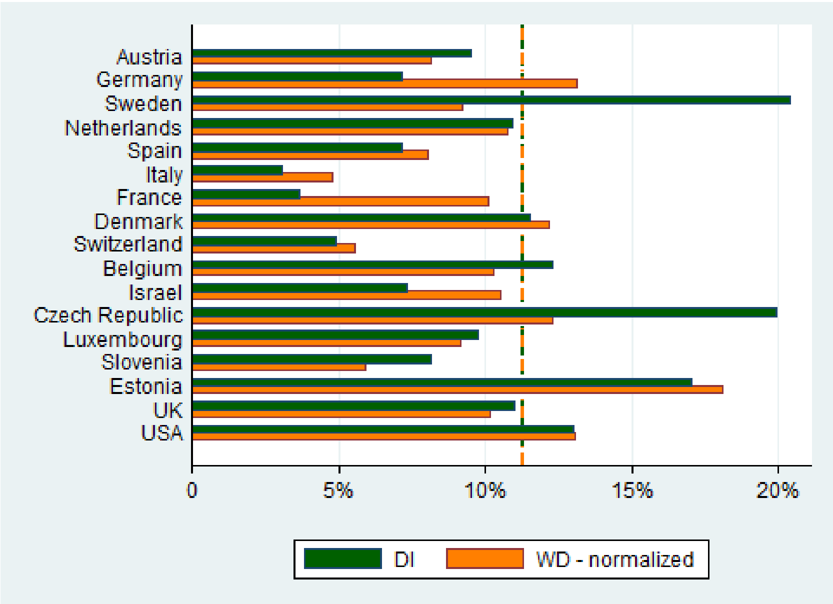


Source: Own calculations based on weighted data from SHARE Wave 5, ELSA Wave 6, HRS Wave 11.

[1] Section 2 and Appendix B describe our dataset harmonization in more detail.

Since self-reported WD and state-regulated DI receipt are two very different concepts, Figure 2 normalizes the two underlying scales to have a common average value. Assuming that self-reported WD has the same scale in each country (a strong assumption, cf. Sen 2002, Kapteyn et al. 2007), the result may be interpreted as relative match quality. After the normalization, in many countries the rates of self-reported work disability and DI benefit receipt match each other more or less. There are a couple of exceptions: Sweden and the Czech Republic appear very generous in granting DI benefits. Here DI benefit rates are much higher than the rates of self-reported disability. The opposite is the case for France and Germany, where the fraction of persons with self-reported disabilities is much higher than those receiving DI benefits. Denmark, the Netherlands, the UK and the US get it about right.

Figure 2: Work disability and disability insurance receipt (normalized)



Source: Own calculations based on weighted data from SHARE Wave 5, ELSA Wave 6, HRS Wave 11.

Table 1 and Figure 3 to 5 take a different look at this match quality by basing the comparison between WD and DI on each individual. If all DI systems would work perfectly we should see a perfect match between work disability and disability receipt. I.e. everyone with a limitation should receive benefits and nobody without a limitation should receive benefits (assuming that there are no reporting errors in WD and DI receipt). In our sample of 30,131 individuals in 13 countries,[2] 83% are correctly matched in the sense that they have a WD and receive DI or have no WD and do not receive DI. 4,429 individuals (14.7 %), however, have a self-

[2] Or sample is described in more detail in Section 2.

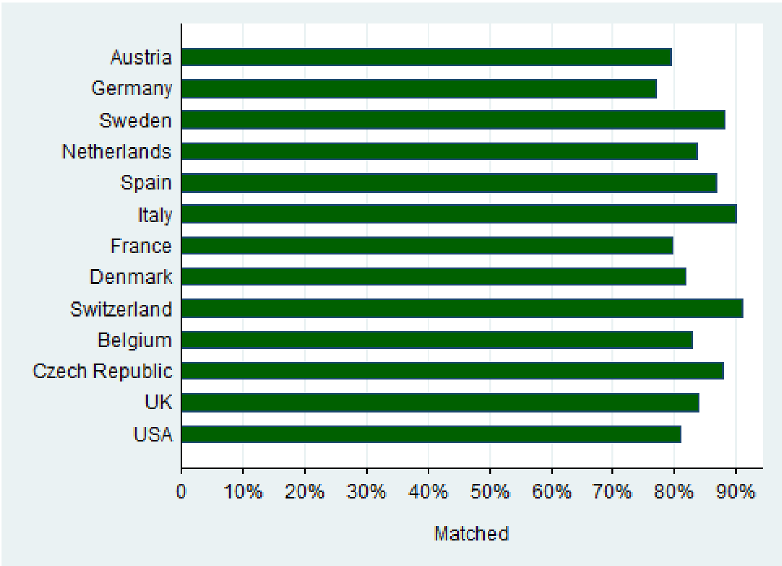
reported WD but receive no DI benefits. In turn, 640 individuals (2.1 %) receive DI but do not report any WD.

Table 1: Work disability and disability insurance receipt

	WD=0	WD=1
DI=0	22.450 74.5% ("Matched")	4.429 14.7% ("WD without DI")
DI=1	640 2.1% ("DI without WD")	2.612 8.7% ("Matched")

If there are a lot of individuals who receive benefits without having limitations then the system is either too generous or prone to abuse. If there are many individuals who receive no benefits despite a limitation then the system is probably not targeting the persons in need very well. Figure 3 shows the frequency of a match which is highest in Switzerland and Italy (around 90%) and lowest in Germany (77%).

Figure 3: Match between work disability and disability insurance receipt

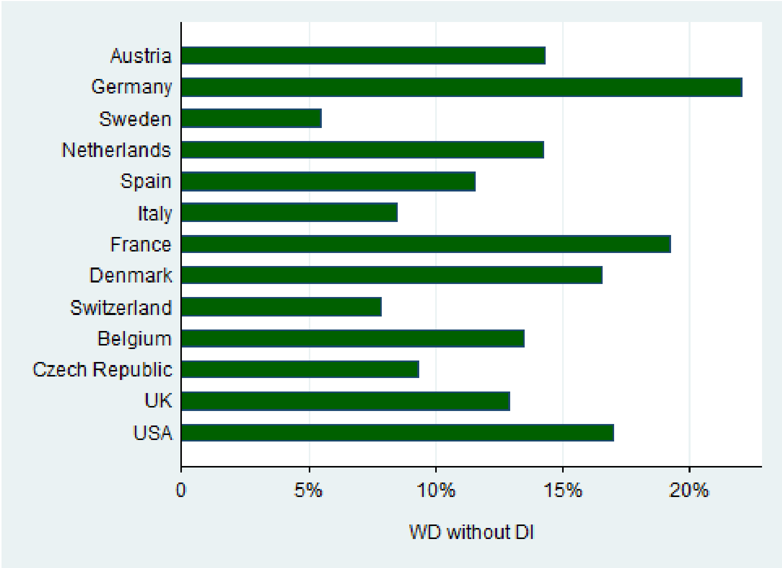


Source: Own calculations based on weighted data from SHARE Wave 5, ELSA Wave 6, HRS Wave 11.

Figure 4 displays the fraction of individuals with work limitations that do not receive DI benefits. Germany, France, the US, and Denmark stand out with a fraction of individuals that report WD and do not receive DI benefits which is above 15% of the population. The rate in Germany is particularly high: Almost 22% of the respondents self-report a disability which prevents them from working full-time while they do not receive DI benefits. In contrast to that in Sweden, Switzerland and Italy this first type of mismatch is lowest. In turn, Sweden and

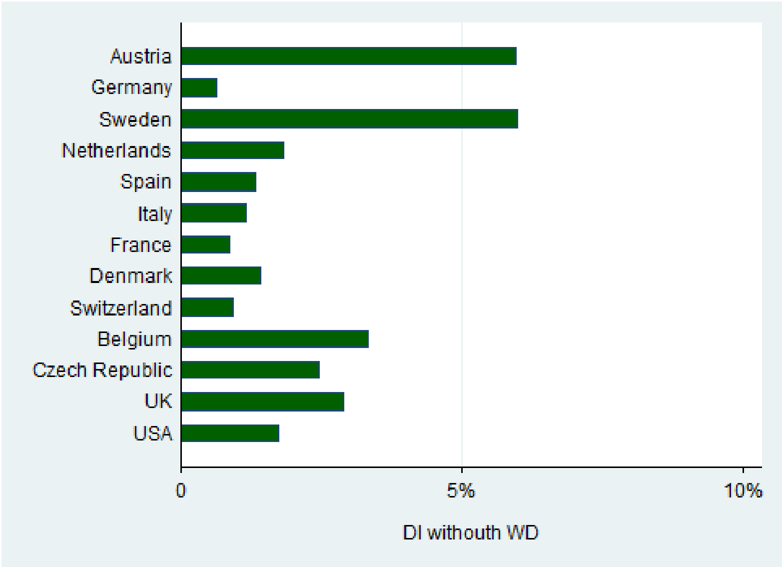
Austria give about 6% of all individuals aged between 50 and 65 DI benefits while these respondents do not claim any limitation in their ability to work (Figure 5).

Figure 4: Restrictive systems: Work disability but no disability insurance receipt



Source: Own calculations based on weighted data from SHARE Wave 5, ELSA Wave 6, HRS Wave 11.

Figure 5: Generous systems: Disability insurance receipt but no work disability



Source: Own calculations based on weighted data from SHARE Wave 5, ELSA Wave 6, HRS Wave 11.

What explains the variation in match quality? Can one country learn from another country to improve match quality? To study this, we try to understand what causes the high variation in the prevalence of WD and which factors can explain why DI is taken up so much more frequently in some countries than in others.

In order to understand the match quality, it is important to measure the "true need" for DI. Usually, this is understood as a measure of physical and mental health. Health, however, is hard to measure and we will be careful in making causal attributions. The subjective measure of WD underlying the figures in this introduction may not reflect "true need". Self-reported WD may be biased towards worse health outcomes since the respondent may feel urged to justify his or her enrolment in DI in spite of a normal health status (Bound 1991; Kerkhofs and Lindeboom 1995, Dwyer et al. 2003). In turn, self-reports may also be positively biased due to accommodation (Hill et al. 2016). Moreover, health is subject to measurement error (Butler et al., 1987) and other endogeneity problems (Dwyer and Mitchell, 1999; Benitez-Silva et al., 2000). We deal with the justification bias by including more objectively measured health indicators which are included in SHARE, ELSA and HRS in addition to the subjective health measures from the surveys. Objective measures include grip strength for upper body strength, EURO-D for depression and the sum of immediate and delayed word recall for memory abilities. We also include (instrumental) activities of daily living (ADL, IADL) which measure functional health and are between subjective and objective measures of health since they are self-reported but on a well-defined scale. In order to deal with reverse causality problems, we exploit information about life health and use time as an identifying instrument. These variables measure health at childhood as well as episodes of ill health during the entire life course. In this way we pick up health problems that occur well before the onset of work disability and DI receipt.

We consider the four drivers which explain the large variation in reported WD and DI uptake: demographics, current health, policies regulating DI and old-age pensions, and life-course factors.

First, while all European countries are aging, the extent of population aging varies considerably. Hence, a first explanation claims that a country with an older population also has a higher prevalence of disability insurance uptake.

A second potential cause for the cross-national variation is that health, measured more objectively than self-reported WD, differs across the countries depicted in Figures 1 and 2. Heterogeneity of health in Europe is very large both across and within countries. According to Eurostat, life expectancy at birth of women in the EU varies between 85.5 years in Spain and

78 years in Bulgaria. The gap in life expectancy is even larger for men: it is 80 years in Sweden but only 68.4 years in Lithuania. There is also a large discrepancy between mortality and morbidity. While Swedish and Italian men have about the same life expectancy (79.9 and 79.8 resp.), Swedish men spend seven more years in good health than their Italian counterparts: the gap in healthy life expectancy is 70.6 versus 63.2 years. Moreover, health varies by income and other socio-economic characteristics. Health is more heterogeneous in the US, Germany and the Mediterranean countries than in Scandinavia (Avendano and Mackenbach, 2009).

Third, welfare-state policies, especially the design of the pension and DI systems, have been shown in the country studies edited by Gruber and Wise (1999, 2004) and Wise (2012, 2015) to create strong incentives on individuals' labor market and retirement behavior.

Fourth and finally, this study emphasizes the role of life-course experiences as determining factors for reported WD and the receipt of DI benefits. As already emphasized, episodes of ill health long before WD is reported or DI is received can more easily be interpreted causally than current health. There is now ample evidence that good health in later life emerges from a person's biological make-up, behavior, lifestyle, environmental and occupational conditions, health care interventions, and a multitude of interactions between these factors across the entire life span. An important insight of recent research is that these interactions manifest their effects starting very early in life and then accumulate in positive and negative feedback cycles over the entire life course (Power and Kuh 2006, Heckman and Conti 2013). To this end, this study has constructed an internationally harmonized data set assembled from SHARE, ELSA and HRS in which particular attention has been given to life-time health using the life history data from SHARE and ELSA plus comparable early childhood and life-course data from HRS.

The paper proceeds as follows. In Section 2 we present the data and the harmonized variables. In Section 3 we describe our empirical methodology. In Section 4 and 5 we present our results. We first focus on explaining the within-country variation in work disability and disability receipt (Section 4). We then use counterfactual simulations to explain the between-country variation (Section 5). Section 6 concludes and points out directions for future research.

2. Data

2.1 SHARE, ELSA and HRS

We use harmonized data from three sister studies on aging: The Survey of Health, Ageing and Retirement in Europe (SHARE), the Health and Retirement Study (HRS) and the English Longitudinal Study of Ageing (ELSA). Harmonization involves extensive data manipulation due to the often subtle differences in variable definitions across the three data sets. These procedures are described briefly in Subsection 2.4 and in more detail in the Technical Appendix B.

SHARE is a pan-European data set designed to analyze the process of population aging using cross-national comparisons within Europe and between Europe, America and Asia (Börsch-Supan et al. 2013). The first wave in 2004 included eleven European countries and more than 22,000 individuals aged 50 and older. In the subsequent waves, which are conducted biennially, more countries joined the project so that SHARE currently includes 20 European countries, covering the area from Sweden to Greece and Portugal to Estonia.

SHARE is modelled closely after the US Health and Retirement Study (see Juster & Suzman 1995), which was the first survey of this kind, and the English Longitudinal Study of Ageing (see Marmot et al. 2003) which followed the lead by HRS. The first wave of HRS was initiated in 1992 and the subsequent waves were conducted in a biennial course. The initial sample included 12,652 individuals living in the United States aged between 51 and 61 years and their spouses or partners. Since this sample ages with the time of the survey, new individuals were sampled as a refreshment sample in later waves in order to represent the younger age group. Until today, 11 waves of HRS data are available.

On the basis of the HRS survey, a longitudinal old age survey was implemented in England in 2002. The baseline sample contains 12,099 persons representing the population aged 50 and older in the United Kingdom (UK). Further refreshment samples were added in subsequent waves. Until now, 6 waves of ELSA data are available.

All datasets are multidisciplinary household panel surveys including detailed information on health, socioeconomic status, work history and social networks. Researchers from HRS and ELSA have been participating in the design process of SHARE at all stages. About two-thirds of the variables in SHARE are identical to variables in ELSA and HRS, and most of the remainder is closely comparable. The harmonization of these variables in HRS, ELSA and SHARE enables us to conduct comparative analyses for different regions in Europe, the UK and the US.

We will use internationally comparable life-course data on health and socio-economic circumstances. The main work was to construct a data base of retrospective life histories collected by SHARE and ELSA, and comparable early childhood and life-course data collected by HRS. Life histories are highly structured computer-assisted interviews which collect retrospective data on the most salient health, family, social, work, accommodation, and economic events from childhood to current age (Belli 1998), including markers for genetic predisposition such as parents' health conditions and life spans. They can be interpreted as a short-cut to a life-long cohort study. While retrospective data have some limitations, the value of information obtained from life histories has nevertheless been proven to be great: validation studies have shown that recall data contain very valuable information even if people do not reproduce events from the past perfectly (Rubin 1996, Jürges 2005). In wave 3, the SHARE panel data has been enriched with detailed accounts of the respondents' life histories (SHARELIFE). By integrating this retrospective view, the living conditions in the preceding decades become accessible, thus granting various insights going back as far as into childhood. The SHARE life histories have been modeled in close cooperation with the ELSA life histories. We enrich the data by variables from SHARELIFE and ELSALIFE, especially on socioeconomic status in childhood, on illnesses during childhood and adulthood and on the employment history of the respondents. HRS does not feature such structured life histories yet but the normal questionnaire covers some retrospective variables describing early childhood conditions and salient events in adult life which permit cross-walking between SHARE, ELSA and HRS.

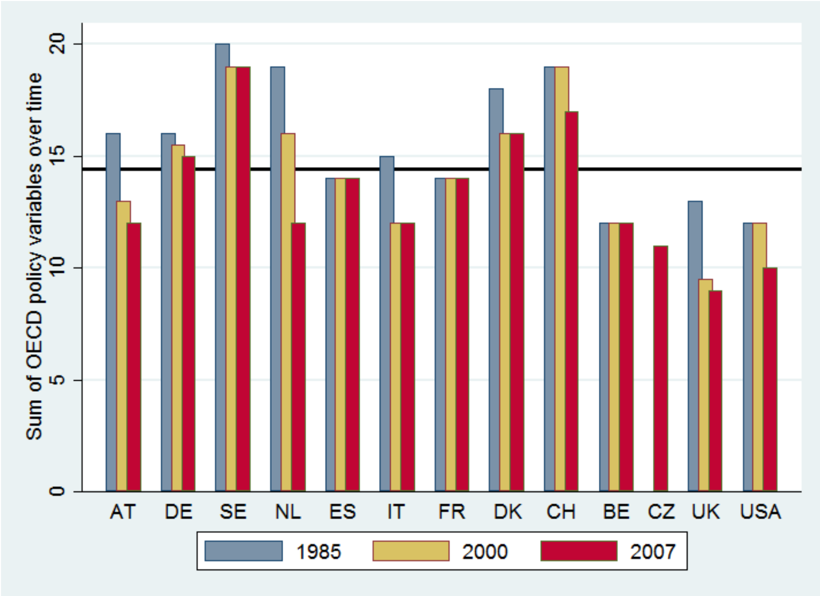
2.2 DI policy and labor market indicators

A cross-national perspective of the data is essential for our analyses because the impact of a policy intervention can only be understood if we observe one policy in contrast to other policies. This is necessary because policy changes over time in one country tend to be confounded with other contemporary changes in that country. The added cross-national variation will support identification. Therefore, we complement the individual level data from the three surveys with some macro-economic indicators. Specifically, we merge data on disability policy indicators provided by the OECD (2003, 2010). These indicators measure the degree of compensation in different DI benefit systems on the basis of the following five characteristics: **Coverage** (ranging from the total population to employees only); **Minimum disability level** (lower bound ranging from 0% to 86%); **Maximum benefit level** (in terms of replacement rate ranging from RR<50% to RR>=75%), **Medical assessment** (ranging from treating doctor only to teams of insurance doctors); **Vocational assessment** (ranging from strict own-occupation assessment to all jobs available). Each indicator is measured according to a predefined scale ranging from zero points (restrictive) to five points (generous). The **sum of the indicators** is used as covariate in the regression analyses to account for country differences in the generosity of DI benefit systems. The indicators are available for three points in time: around 1985, 2003 and 2007 (see Table A. 1). We match the year of first DI benefit receipt of our individuals with these three time periods in order to approximate the policy circumstances of the respective time period as well as possible. Since these policy indicators are not available for Estonia, Israel and Slovenia, we exclude these countries from all analyses.

In Figure 6 we show how the level of generosity of the DI systems changed between 1985 and 2007 by plotting the summarized OECD indicators for the different countries. Overall, the sum of the OECD policy indicators decreases over time in almost all countries, meaning that in general the systems have become less generous reflecting the incisive reforms mentioned in the introduction. The exceptions are Spain, France and Belgium, where the overall level of generosity remains stable over time. Sweden, Denmark and Switzerland reveal high OECD policy scores in all points in time reflecting above-average generosity of their DI systems. In contrast, four countries remain below the average generosity level: Belgium, the UK, the US and the Czech Republic. Some countries started with an above average level of generosity like for example the Netherlands and Austria, but show below average levels of DI benefit generosity today.

In our regression analyses we will include the summary score and alternatively the five sub-scales as explanatory variables.

Figure 6: Generosity of DI systems over time and by countries



Source: Own calculation based on OECD (2003, 2010)

Maestas et al. (2015) show that labor market conditions play a crucial role when evaluating DI uptake. We therefore include two country-level indicators to proxy the labor market environment. First, we use the Job Strain Index created by the OECD by combining information from the European Working Conditions Survey and the Work Orientations modules of the International Social Survey Program.[3] The **Job Strain Index** represents the quality of the working environment and is based on measures for high levels of job demands (time pressure and physical health risk factors) as well as low levels of job resources (work autonomy and learning opportunities; social support at work). The aggregated variable job strain reflects the percentage of workers in jobs with exceeding job demands and a low number of resources at disposal. The indicator is constructed such that a higher score reflects a higher degree of job strain and ranges between 18.80 for Sweden and 53.88 for Spain (see Table A. 2 for details).

Second, in order to take into account the labor market conditions of the respective countries, we include a summary indicator capturing the **adaptability of labor markets** to economic and structural changes (Boeri et al. 2002). This summary indicator combines four different dimensions of the labor market: Employment protection (PR) against uninsurable risks in

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[3] We retrieve the data from OECD.Stat for the year 2005 and the age group 50-64 (OECD 2005).

terms of labor legislation and the provision of unemployment benefits; Vocational training (TR) provided to the labor force in order to acquire skills and to increase employability; Degree of labor market mobility (MO) measured across labor market states and across regions; Size of the labor market (S) measured by the employment rate of a country.

Employment protection and training are dimensions that in some form depend on government regulations, therefore these dimensions are summed up. Mobility and size are considered as reactions to the provision and training and are therefore included in the overall index such that the larger M and S, the larger is the overall adaptability of the labor market. Taking into account these considerations, the adaptability index is created as follows:

$$ADA=S*[(PR+TR)*MO]$$

The ADA index is thus constructed such that a higher score reflects a higher degree of labor market adaptability and ranges from 1.20 for Italy to 11.04 for Denmark (see Table A. 3 for details). Denmark has by far the most flexible labor market reflecting the effects of their very radical labor market reforms which have been used as role models for reforms in other countries. The next flexible labor markets are seen in Germany and Sweden.

2.3 Sample selection

We use the current waves of HRS (Wave 11, collected in 2012/13), ELSA (Wave 6, collected in 2012/13) and SHARE (Wave 5, collected in 2013). For some variables, we merge information from previous waves, e.g. for marital status (see Table B. 3 for details). For the life history variables we add information from SHARE Wave 3 and ELSA Wave 3. Due to the combination of datasets we include thirteen countries in most of our analyses: Austria, Germany, Sweden, the Netherlands, Spain, Italy, France, Denmark, Switzerland, Belgium, the Czech Republic, the UK, and the US.

We restrict our analysis to individuals in an age range in which disability insurance occurs most frequently. Due to the age focus of all three studies age 50 serves as the lower age bound in our analysis. In most countries disability insurance benefits are automatically converted into old-age pension benefits, thus, our upper age bound is the country specific statutory retirement age. For the definition of the statutory retirement ages we gather information on the national pension systems. We create a binary variable indicating whether someone is above or below the national statutory retirement age. While doing so we take into account transitional arrangements of pension reforms and we also differentiate between special arrangements for men and women and different cohorts (see Table A. 4 in the Appendix). We exclude individuals aged above the applicable statutory retirement age so that the sample for the analysis is defined as 50 - age of normal retirement. The upper age bound ranges between 61 years for France and 66 years for the US.

SHARE wave 5 covers 20,428 individuals within this age range. ELSA includes 11,585 and HRS 3,751 individuals. After deleting observations with missing information for the dependent variables or the main health indicators, the remaining sample consists of 30,131 observations. We observe 7,041 individuals (about 23%) who report WD and 3,252 individuals (about 11%) who receive DI benefits.

2.4 Variables

Using data from the sister studies SHARE, HRS and ELSA allows for cross-country comparisons in cultures, living conditions and policy approaches between Europe, the UK and the US if the information is sufficiently harmonized (King et al. 2004). The potential of combining these datasets has not fully been exploited so far. Only few empirical studies are based on a harmonized dataset since it is a time-consuming task to construct the corresponding variables based on different survey questions. Ex-ante harmonization with the questionnaire of HRS is an important prerequisite of ELSA and SHARE and great efforts have been made to deliver truly comparable data. However, country-specific deviations in wording, categories or the nonapplicability of questions and modules are unavoidable. Therefore the comparability of items has to be checked thoroughly one by one. All variables taken from HRS, SHARE and ELSA are harmonized carefully. A detailed description of the harmonization process as well as a list of all variables and how they were combined can be found in the Technical Appendix of this paper (Table B. 1 - Table B. 4).

Dependent variables: For our analysis we use two different dependent variables: self-rated work disability (WD) and the receipt of disability benefits (DI). Both dependent variables used in our analysis are binary. The first dependent variable WD captures the self-assessed work disability based on the question: *"Do you have any health problem or disability that limits the kind or amount of paid work you can do?"* The second dependent variable DI is defined as receiving disability insurance benefits or not. Disability insurance is defined as all branches of publicly financed insurances providing compensation in case of the loss of the ability to perform gainful employment (see Table A. 5 for the country specific details).

In addition to that we use an extensive set of individual level and country level control variables. The following groups of covariates are generated for the analyses:

Demographics: As basic demographics we use gender and the respondents' age at the time of the interview. For ELSA the exact age is given as a variable whereas for SHARE and HRS we calculate the age based on the year of the interview and the year of birth. The current marital status is split into the categories married, divorced, widowed or single. Since information on the marital status is only given if something changed since the last interview, we need to merge information from all previous waves, even going back to Wave 0 for ELSA, which stems from the predecessor study Health Survey for England (HSE). The same applies for the information on the educational level. We built three categories referring to the ISCED[4] coding (low education (0-2), medium education (3-4), high education (5-6)) and match the educational level of the respondents based on their highest educational qualification.

Health: We use the respondent's self-reported health status rated on a categorical five-point scale from excellent (1) to poor (5). Self-reported health is among the most common measures used in public health surveys; it captures various physical, emotional, social aspects of health and wellbeing and has been found to predict mortality (see, e.g. Idler and Benyamini 1997, Jylhä 2009). Additionally, we include the objectively reported health information on the number of limitations with (instrumental) activities of daily living (ADL and IADL). In order to take a person's mental wellbeing into account, we construct the EURO-D depression index based on the number of depressive symptoms in SHARE. In ELSA and HRS, another depression index called CES-D score is used. SHARE contained the information needed for both the EURO-D and the CES-D score in wave 1. Based on this information we build a prediction rule for EURO-D by means of a linear regression and apply this rule to the HRS and ELSA data to obtain the predicted EURO-D scores. We complement these health measures by information from the physical test measuring the maximal grip strength of a

[4] International Standard Classification of Education

person. Grip strength is our most objective measure of health since the task is performed during the interview. It reflects the overall muscle status of the respondent and has been linked to mortality in previous research (see, e.g., Gale et al. 2007). We impute missing values for maxgrip by setting them to zero implying that the missing values originate from situations where persons are not able to perform the grip strength test due to frailty. We add an additional flag variable to control for these imputed values. Further, we include a cognition measure coming from a verbal learning and a verbal recall test.

Life health: We create the sum of all childhood illnesses the respondents had until they were 16 years old, covering infectious diseases, asthma, respiratory diseases, allergies, headaches, epilepsy, psychological problems, diabetes, heart problems, cancer, fractures and ear problems. The variable adulthood diseases is created accordingly and contains the sum of illnesses since the year of 16 including: back pain, arthritis, osteoporosis, angina heat diseases, diabetes, stroke asthma, respiratory problems, headaches, cancer, psychiatric problems, fatigue, allergies, eyesight problems, and infectious diseases.

Employment history: We use different variables from ELSALIFE and SHARELIFE in order to describe the employment history of a respondent. The number of jobs during the work history is constructed by summing up the employment spells (start and end of job). We also consider the situation between different employment spells and count all times of being sick or disabled as the number of working gaps. We further take into account whether the respondent had periods of ill health or disability that lasted for more than a year. Work quality is measured as the subjective assessment of the physical and psychological demands at work.

Childhood circumstances: The socio-economic status during childhood is measured by the number of books and the number of rooms in the accommodation at the age of ten.

Policy variables: As described earlier, we use the sum score of the OECD indicators for our main regression and also check for the relevance of the five single indicators. We further include the ADA index as a measure for the labor market adaptability.

Table B. 1 provides an overview of all the variables used and Table 2 presents the summary statistics.

3. Methodology

Our analysis is divided into two parts: first, an analysis of the within-country variation in WD and DI benefit receipt and second an analysis of the between-country variation of WD and DI benefit receipt.

The objective of the first set of analyses is to understand at the individual level whether a person has work disabilities and receives DI benefits and relate this to the different variable groups, namely demographics, health, life health and other life course variables, the individual job characteristics and macro-indicators of the labor market and DI policy regimes. We do this by pooling the data from all countries and performing probit and linear regression analyses. We are particularly interested in the role of life health and life course variables, since they can give some indications of which life time factors contribute to whether people suffer from limitations on their earnings capacity later in life and have to rely on DI receipt. We assess how much of the total variation in WD and DI benefit recipiency rates at the individual level is explained by the different categories of variables.

Second, we try to explain the cross-national variation in WD and DI receipt. Here we present some descriptive statistics on the share of individuals with work disability and disability receipt by country. The overall objective is to understand whether differences in the demographic structure, health or institutions etc. can explain differences in the level of work disability and DI receipts between countries. To do so, we perform counterfactual simulations which hold some of the explanatory variables constant. We equalize the cross-national differences in demographics, health, life course and policy characteristics stepwise and predict how work disability and DI enrolment rates would look like if the variable groups were identical across countries. If the equalized group of variables were the main cause for the international variation, the simulated outcome should produce roughly identical percentages of work disability and DI benefit recipiency rates in each country.

4. Within-country variation

4.1 Descriptive results

We start our analysis by describing the characteristics of our sample with reference to reporting WD and receiving DI benefits as displayed in Table 2. 23.4% of the respondents report suffering from a disability that limits their working capacity and around 10.8% of the total sample receives DI benefits.5 The correlation between the two variables is high: among those with DI more than 80% report a health problem that limits their work capacity and among those not receiving DI benefits only 16.5% report such limitations. On the other hand, among those with a health problem 37% receive DI benefits, while among those without health problems only 3% receive DI benefits.

Figure 7: WD and DI over age by gender

Source: Own calculations based on weighted data from SHARE Wave 5, ELSA Wave 6, HRS Wave 11.

With respect to socio-demographics we see the following patterns: WD as well as DI benefits receipt increase with age. Women are somewhat more likely to report a work limitation but the benefit receipt is almost equal among men and women. This relationship is also illustrated in Figure 7.

[5] These averages are differing slightly from the numbers reported in the introduction. The reason is that in the introduction we included all 17 countries for which the data is available. Here we only report averages for the 13 countries which we include in the remainder of our analyses.

Table 2: Summary statistics

	categories	share of total sample	WD=0	WD=1	DI=0	DI=1
DI	Not receiving DI	89.21%	83.52%	16,48%		
	Receiving DI	10.79%	19.68%	80.32%		
WD	No health problem	76.63%			97.23%	2.77%
	Health problem	23.37%			62.90%	37.10%
age	50-55	32.35%	79.06%	20.94%	90.57%	9.43%
	56-60	40.02%	76.93%	23.07%	89.00%	11.00%
	61-66	27.64%	73.37%	26.63%	87.91%	12.09%
gender	Male	46.04%	77.74%	22.26%	89.37%	10.63%
	Female	53.96%	75.69%	24.31%	89.07%	10.93%
education	Low education	25.00%	71.00%	29.00%	84.95%	15.05%
	Medium education	43.29%	75.00%	25.00%	88.59%	11.41%
	High education	29.78%	83.74%	16.26%	93.76%	6.24%
marital	Single	9.26%	69.34%	30.66%	81.32%	18.68%
	Married	72.31%	79.69%	20.31%	91.83%	8.17%
	Divorced	13.65%	68.76%	31.24%	83.03%	16.97%
	Widowed	4.78%	66.97%	33.03%	82.44%	17.56%
numberofjobs	0-2	26.38%	72.24%	27.76%	86.60%	13.40%
	3-4	13.52%	77.81%	22.19%	90.45%	9.55%
	5-6	5.50%	74.15%	25.85%	88.29%	11.71%
	>7	2.63%	77.30%	22.70%	88.78%	11.22%
sphus	excellent	12.33%	96.31%	3.69%	97.50%	2.50%
	very good	26.61%	92.87%	7.13%	96.83%	3.17%
	good	36.04%	81.99%	18.01%	92.72%	7.28%
	fair	18.95%	49.82%	50.18%	77.08%	22.92%
	poor	6.07%	17.43%	82.57%	56.01%	43.99%
iadl_cat	0	90.72%	81.02%	18.98%	91.99%	8.01%
	1	6.12%	42.62%	57.38%	68.98%	31.02%
	2	1.59%	17.92%	82.08%	55.21%	44.79%
	>3	1.56%	15.07%	84.93%	41.61%	58.39%
adl_cat	0	91.25%	81.72%	18.28%	92.04%	7.96%
	1	4.59%	32.51%	67.49%	67.34%	32.66%
	2	1.83%	18.87%	81.13%	56.44%	43.56%
	>3	2.32%	9.43%	90.57%	46.86%	53.14%
maxgrip_cat	0-20	4.24%	52.27%	47.73%	75.74%	24.26%
	20-50	45.83%	78.47%	21.53%	90.15%	9.85%
	40-60	27.23%	82.07%	17.93%	91.90%	8.10%
	>60	2.02%	86.56%	13.44%	94.43%	5.57%
eurod_cat	0	22.65%	91.98%	8.02%	96.45%	3.55%
	1-2	44.84%	82.29%	17.71%	92.35%	7.65%
	3-4	19.43%	65.74%	34.26%	84.08%	15.92%
	5-6	9.20%	50.85%	49.15%	75.41%	24.59%
	>7	3.88%	37.35%	62.65%	69.06%	30.94%
recall_cat	0-5	6.52%	62.16%	37.84%	79.25%	20.75%
	6-10	41.52%	73.34%	26.66%	86.91%	13.09%
	11-15	45.00%	80.57%	19.43%	92.02%	7.98%
	16-20	6.96%	84.40%	15.60%	94.04%	5.96%
illnesses_ch_cat	0	14.19%	79.44%	20.56%	92.47%	7.53%
	1-2	77.49%	77.86%	22.14%	89.65%	10.35%
	3-4	7.45%	62.76%	37.24%	81.38%	18.62%
	>5	0.86%	40.00%	60.00%	63.46%	36.54%
illnesses_adult_cat	0	44.78%	88.96%	11.04%	95.19%	4.81%
	1-2	43.92%	73.30%	26.70%	88.37%	11.63%
	3-4	9.43%	44.83%	55.17%	72.03%	27.97%
	>5	1.86%	19.82%	80.18%	51.96%	48.04%

There is a clear education gradient for both variables: Among those with low education more persons report work disability and receive DI (29.0% and 15.0%, respectively) than in the middle (25.0% and 11.4%, respectively) and high education group (16.3% and 6.2%, respectively). The marital status seems to play an important role for the receipt of DI benefits. In the group of married persons only 8.7% receive DI, whereas in the other groups (singles, widowed, divorced) around 17%-19% are enrolled in DI benefits. This can be explained by the fact that in some countries (e.g. Portugal, Denmark and Belgium) disability benefits are means-tested and the income of the partner is taken into consideration. Married individuals are also less likely to report WD compared to single, divorced and widowed persons. Here the reasons could be related to selection effects and healthier lifestyles among married individuals.

As expected, all health variables are strongly related to reporting work disability and receiving DI pensions. The worse the health category is, the more persons are restricted and receive an income replacement. The share of persons with work disability and receiving DI is especially high for low categories of self-reported health measures (sphus, adl, iadl). A bad health status according to objective health measures reveals also a higher share of individuals with WD and more DI recipients (maxgrip, recall). Health over the life course matters as well: Among those who report more than five childhood illnesses 60% report WD and 36.5% receive DI at older ages. Among those with more than five adulthood illnesses 80.2% report WD and 48.1% currently receive DI benefits. Multivariate regressions reported in the following section will give more insights into those patterns.

4.2 Multivariate analysis

Both dependent variables (WD and DI) are binary and we therefore estimate probit specifications. Table 3 presents the results, we report average marginal effects. We include demographic variables and a set of subjective and objective current health indicators, life health, and DI policy indicators. The full models explain 30% and 23% of the total variation for WD and DI receipt, respectively.

Table 3: Determinants of WD and DI

		WD	DI
Demographics	age	0.001	0.000
		(0.001)	(0.001)
	female	-0.027	-0.035
		(0.006)**	(0.004)**
	education_high	-0.014	-0.038
		(0.010)	(0.013)**
	education_medium	0.003	-0.014
		(0.010)	(0.010)
	single	0.023	0.053
		(0.006)**	(0.007)**
	divorced	0.037	0.047
		(0.007)**	(0.005)**
	widowed	0.026	0.039
		(0.015)	(0.012)**
Health	sphus	0.109	0.046
		(0.014)**	(0.010)**
	adl	0.067	0.016
		(0.012)**	(0.003)**
	iadl	0.026	0.021
		(0.009)**	(0.002)**
	maxgrip	-0.001	-0.002
		(0.000)**	(0.000)**
	maxgrip_flag	-0.036	-0.046
		(0.019)	(0.013)**
	eurod	0.014	0.005
		(0.001)**	(0.001)**
	recall	0.000	-0.001
		(0.001)	(0.001)
Life health	illnesses_ch	0.019	0.015
		(0.004)**	(0.003)**
	illnesses_adult	0.043	0.023
		(0.004)**	(0.004)**
Policy	oecd_sum	0.010	0.011
		(0.005)*	(0.005)*
	Pseudo R2	0.30	0.23
	N	30,131	30,131

* $p<0.05$; ** $p<0.01$
Marginal effects of probit specification.
Standard errors in parentheses, clustered standard errors by country.
Based on HRS, ELSA and SHARE including the following countries:
AT, DE, SE, NL, ES, IT, FR, DK, CH, BE, CZ, UK, USA

Reporting a work disability and receiving DI benefits is not related to age in our sample which is restricted to individuals between age 50 and the statutory retirement age. This could be explained by the following off-setting effects: On the one hand, getting older should increase the vulnerability to work disability. On the other hand, getting older increases the probability of becoming eligible for early retirement benefits and therefore the prevalence of DI benefit recipients should decrease. Conditional on other socio-demographic factors and health women are less likely to self-report work disability and also have a lower probability of receiving DI benefits. This is in line with previous findings (OECD 2003) and can be explained by a lower labor market participation of women in general and the fact that many countries have lower eligibility ages for early retirement for women compared to men. Thus, for them alternative routes to early retirement are available. Education does not matter for determining work disability reports, when controlling for health. However, the higher the education level, the smaller is the probability of receiving DI benefits. This can be explained by the different occupational types. If disability benefits are granted also on the basis of the fact that a specific job can still be done, then those in low skilled but physically demanding situations are more likely to be granted benefits. The fact that less married persons receive DI benefits could be related to the fact that in some countries the benefits are means-tested. Interestingly, our regression results show that not being married does not only significantly increase the probability of receiving DI benefits, but also increases the probability of reporting a health problem that leads to work disability. Explanations for this could be related to selection, i.e. healthier persons select into marriage or on the other hand related to a healthier lifestyle and a better mental and emotional status of married persons.

All individual health variables that measure the current health status are strongly significant and have the expected sign: Worse health leads to a higher probability of reporting work disability and at the same time to a higher probability of receiving DI benefits. In more details: Those with worse subjective health are more likely to report disability and also more likely to receive DI pensions. Restrictions in the (instrumental) activities of daily living influence working capacity and benefit receipt. The more objective health measures like grip strength, and the EURO-D depression scale also significantly influence the WD and DI likelihood. This is a particularly interesting result since the subjective health measure as well as the ADL, IADL measures are more likely to be plagued by justification bias (Kerkhofs and Lindeboom 1995). This is much less so the case for grip strength and the depression scale as these measures are not self-reported but measured during the interview. We do not find an effect of recall abilities on WD and DI.

Current or very recent health measures, as broadly as they may be measured, may not appropriately capture the full impact of poor health on employability. Work disability may rather be the result of a long lasting process of becoming sick and finally unable to work. This analytical part of our project will take a life-course approach and exploit the life-course variables in SHARE, ELSA and HRS that account for long-run effects. We include lifetime health indicators that describe childhood and adulthood health status in our regression. The life health variables are highly significant determinants of reported WD and the receipt of DI benefits even after controlling for current health. The higher the number of illnesses during childhood or adulthood, the higher the probability of suffering from WD and receiving a DI pension later in life. Thus, health problems experienced over the life course and even as early as childhood are important drivers of later life working capacity and the need to rely on DI benefits. This is an important result for two reasons. First, from a methodological point of view, health indicators measured as early as childhood are much less likely to be endogenous to labor market outcomes due to the time sequence of events. Thus, the measured effects can more convincingly be interpreted causally. Second, from a policy perspective health interventions that target children when young do not only matter for their health at that point in time but have (positive) long-term impacts for health and labor market participation later in life. In addition, we take other life-course features into account such as childhood socio-economic status, quality of the working place and marital status over the whole life course. The analyses will follow in the next section, since we have to rely on a smaller sample for those analyses.

Finally, we would like to have a look at the institutional indicators.[6] The OECD score describing the generosity of the disability pension system is an important determinant for WD and DI benefit receipt. If the score increases by one point on average the probability of

[6] Clustered standard errors account for the fact that these variables vary across countries only.

receiving a DI pension increases by around 1%.[7] We also ran a regression where we control for the five individual OECD indicators describing the DI pension systems. Results are reported in Table A. 8 in the Appendix. Overall our results for the demographic as well as the health and life health variables remain very similar. The OECD indicators in the regression on benefit receipt are all positive. Meaning the more generous the DI institutions the higher is the likelihood to receive benefits when old. None of the effects are significant. The reason is that the five indicators mostly vary by country and to some small extent over time. Thus, they suffer from high collinearity. Therefore, we refrain from interpreting the individual effects in too much detail.

In a next step we perform a variance decomposition analysis in order to understand the contribution of different variable groups on WD and DI receipt. The decomposition is based on linear regression models presented in Table A. 6. The linear specification gives very similar results as the probit model presented before. Figure 8 (left panel) shows the variance decomposition of the individual variation in self-assessed work disability. The explanatory power of the full model is 31%. Most of the variation in WD (29%) can be explained by current health status. The second most important variable group consists of the life health indicators. They can explain 14% of the total variation, indicating that health problems that occur early in life matter a lot for work disabilities later in life. Demographics (3%) have only small explanatory power for individual level work disability. And the DI policy variables do not seem to matter at all, when analyzing individual WD.

Figure 8 (right panel) shows how much of the variation in DI benefit receipt is explained by each variable group. The full model explains 19% of the variation in the data which is less than in the case of self-assessed work disability. However, the overall pattern is rather similar. By far the most important determinant of DI benefit receipt is individual's health: 15% of the variation is explained by the individual health variables. Health over the life course is also

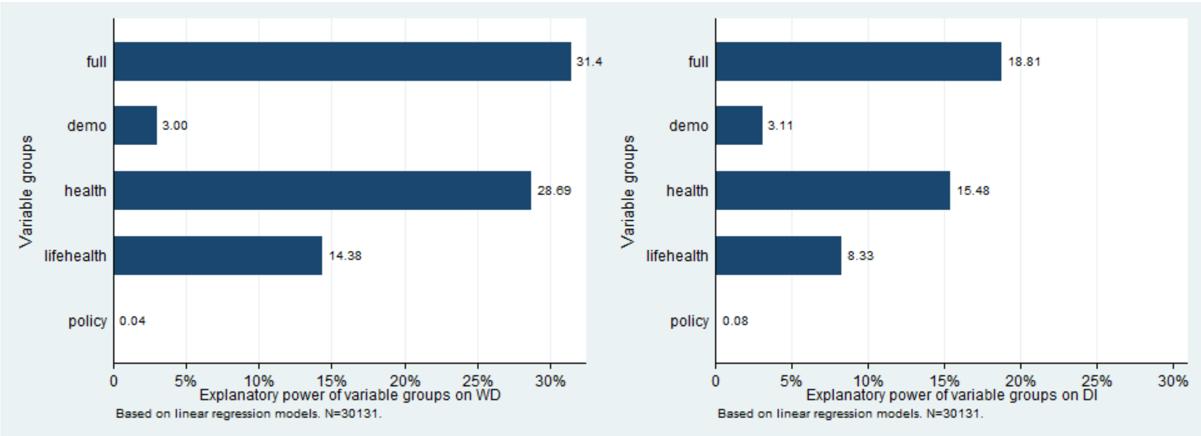
[7] As a robustness check we run a probit regression with country-fixed effects instead of the OECD variables. As expected, the results for the other variable groups remain stable in size and sign. Results are reported in

Table A. 7 in the Appendix.

important. These variables explain 8% of the total variation in benefit receipt. Basic demographics account for only 3% of the variation. The policy indicators explain less than 1% of the individual variation in benefit receipt.

Figure 8: Variance decomposition for the probability of reporting WD and receiving DI benefits

Work disability (WD) *Receipt of disability insurance (DI)*



Source: Own calculations based on weighted data from SHARE Wave 5, ELSA Wave 6, HRS Wave 11.

4.3 The role of labor market conditions

In a next step we would like to understand better how the working environment and the general labor market conditions contribute to the probability of reporting a WD later in life and receive DI benefits. For this purpose we perform several additional regression analyses. Most of the variables used in this section are only available for a subset of countries and individuals so that we have to perform the analysis on smaller samples.

First, we are interested in the effect of general labor market conditions on work disability and DI receipt and therefore include the job strain variable as a macro-economic indicator for the quality of the working environment (see Section 2.2 for detailed description). We find no effect of the job strain indicator on WD but a significant negative effect of job strain on DI benefit receipt (see Table A. 10 in the Appendix). This means that in countries classified as having a high degree of job strain fewer people receive DI benefits. This seems counter intuitive at first glance, since we would expect more individuals to receive DI benefits if the job strain is high. Most likely, however, the causal direction is reverse: in countries with restrictive DI systems people have to work even when they are disabled. This leads to a higher job strain for the age group 50-64. This is an interesting finding. In our future work, we will investigate the long term health consequences of working in an environment with a high job strain and no option to receive DI benefits, using policy changes as instruments to tease out the correct direction of causality.

The ADA index is an indicator for the labor market flexibility (see Section 2.2 for detailed description). The ADA index is not available for the US, Switzerland and the Czech Republic, therefore our sample is reduced to 18,760 observations in this analysis. In Table A. 9 in the Appendix we present probit regressions adding the ADA index as an additional explanatory variable. The ADA index is not significant for DI receipt, indicating that there is no relevant effect of labor market flexibility on DI benefit receipt at the individual level. However, a higher labor market flexibility leads to a significantly higher probability of reporting WD despite controlling for the level of DI system generosity. Looking at the ADA indicator in Table A. 3 in the Appendix reveals that the ADA indicator is particularly high in Denmark with a level of 11.04. The countries with the next highest scores are Sweden and Germany. Those countries have relatively flexible labor markets creating many opportunities for the work force. At the same time, demands on the job are relatively high for those who are in worse health. This appears to lead to higher rates of WD among older workers. This effect does not transfer to DI receipt. This means that these persons continue to work despite their health limitations. More work is necessary to understand the precise interactions and causal chains among labor market environment, DI policies and long term health effects.

Besides the assessment of the work quality on a country level, we also include individual-level indicators for work quality measured as the subjective assessment of the physical and psychological demands at work of the main job in the work history. These variables are not available for all respondents and we perform the regression analysis only for a small subsample of 3,472 respondents. The results are shown in Table 4. Low work quality both in terms of physical and psychological demands has a significantly positive effect on reporting limitations to work, meaning that low work quality in the main job increases the probability of reporting WD. This indicates that, not surprisingly, the working environment has an important effect on whether individuals feel restricted in their capacity to work. If the perceived job strain is high there is a high likelihood to report a work disability. The effect on the uptake of DI benefits is not significant, probably because the individual working environment only plays a minor role in the medical assessment to determine benefit receipt. A more detailed examination of the interaction between job characteristics and the medical and occupational assessment rules will be desirable for future work.

Table 4: Probit specification with individual job characteristics

		WD	DI
Demographics	age	0.001	-0.000
		(0.001)	(0.001)
	female	0.005	-0.014
		(0.021)	(0.006)*
	education_high	-0.022	-0.019
		(0.010)*	(0.009)*
	education_medium	-0.026	-0.016
		(0.009)**	(0.005)**
	single	-0.006	0.017
		(0.023)	(0.005)**
	divorced	0.004	0.002
		(0.012)	(0.007)
	widowed	-0.024	0.012
		(0.022)	(0.015)
Health	sphus	0.069	0.018
		(0.011)**	(0.006)**
	adl	0.063	0.007
		(0.017)**	(0.002)**
	iadl	0.016	0.002
		(0.005)**	(0.004)
	maxgrip	0.000	-0.001
		(0.001)	(0.000)
	maxgrip_flag	0.006	-0.035
		(0.019)	(0.016)*
	eurod	0.009	0.003
		(0.004)*	(0.003)
	recall	0.001	-0.001
		(0.001)	(0.001)
Life health	illnesses_ch	0.018	0.002
		(0.002)**	(0.003)
	illnesses_adult	0.015	0.000
		(0.003)**	(0.002)
Policy	oecd_sum	0.008	0.005
		(0.004)*	(0.002)*
Job quality	job_psycho	0.011	0.000
		(0.003)**	(0.004)
	job_physical	0.018	0.006
		(0.003)**	(0.005)
	Pseudo R2	0.20	0.12
	N	3,472	3,472

* $p<0.05$; ** $p<0.01$
Marginal effects of probit specification.
Standard errors in parentheses, clustered standard errors by country.
Based on HRS, ELSA and SHARE including the following countries:
AT, DE, SE, NL, ES, IT, FR, DK, CH, BE, CZ, UK, USA

4.4 The role of life course circumstances

As mentioned in the introduction, work disability may be the result of a long lasting process and therefore demographics and current health measures might not appropriately capture the effect on work ability. We already showed in our previous analysis that health conditions during childhood and adulthood matter a lot for work limitations and disability benefit receipt later in life. However, we would like to add a layer of complexity and therefore include additional life course variables about early childhood conditions and the work history. These variables are only available for SHARE and ELSA and only for respondents having participated in both wave 3 and wave 5/wave 6 of SHARE and ELSA respectively, which leads to a reduction in our sample size to 4,703 observations. The regression results are shown in Table 5.

More specifically, in addition to the socio-demographics, the health and the life health indicators, we include the number of gaps in the working history in which a person was sick or disabled. The results are positively significant and as expected: The more working gaps due to sickness someone experienced during their career, the higher the probability of reporting work disability and of receiving DI benefits later in life. We further include a binary variable indicating if someone had suffered from an extended period of poor health, which also has a positive and significant effect on both dependent variables. The number of jobs during the working life in general does not have a significant effect on WD. However, individuals with a particularly low number of jobs have a high likelihood of receiving DI benefits probably because they left the labor market early in their career. The socio-economic status during childhood is measured by the number of books and the number of rooms per person in the accommodation. These early childhood circumstances are not related to work disability or DI receipt. However, we already control for childhood health which might be the more important indicator of the situation in which individuals grew up, that is related to the health and working life situation when old.

Table 5: Probit specification with life course variables

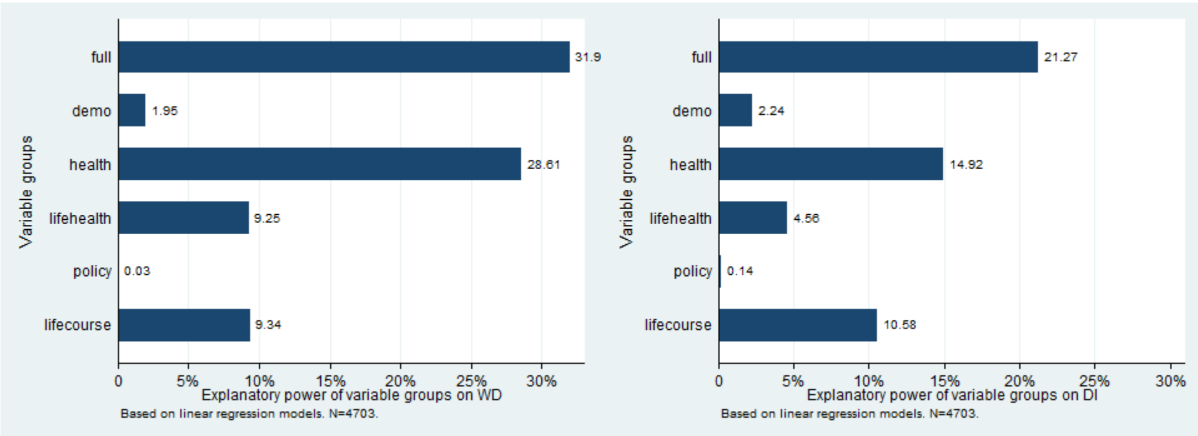
		WD	DI
Demographics	age	0.002	-0.002
		(0.002)	(0.002)
	female	-0.003	-0.046
		(0.017)	(0.015)**
	education_high	-0.017	-0.021
		(0.010)	(0.019)
	education_medium	-0.009	-0.011
		(0.012)	(0.012)
	single	0.017	0.047
		(0.015)	(0.016)**
	divorced	0.018	0.029
		(0.016)	(0.017)
	widowed	-0.058	0.027
		(0.025)*	(0.022)
Health	sphus	0.119	0.047
		(0.009)**	(0.007)**
	adl	0.071	0.013
		(0.011)**	(0.005)**
	iadl	0.045	0.027
		(0.028)	(0.010)*
	maxgrip	-0.001	-0.002
		(0.001)	(0.001)**
	maxgrip_flag	-0.027	-0.038
		(0.026)	(0.021)
	eurod	0.011	0.003
		(0.002)**	(0.003)
	recall	0.001	-0.003
		(0.002)	(0.001)*
Life health	illnesses_ch	0.019	0.002
		(0.003)**	(0.005)
	illnesses_adult	0.028	0.012
		(0.008)**	(0.006)*
Policy	oecd_sum	0.006	0.007
		(0.004)	(0.004)
Life course	working_gaps	0.080	0.066
		(0.026)**	(0.022)**
	poor_health	0.039	0.037
		(0.006)**	(0.004)**
	low_n_jobs	-0.013	-0.036
		(0.012)	(0.012)**
	high_n_jobs	0.014	0.004
		(0.009)	(0.008)
	rooms_ch	-0.001	-0.001
		(0.003)	(0.003)
	books_ch	0.003	0.001
		(0.005)	(0.004)
	Pseudo R2	0.32	0.25
	N	4,703	4,703

* $p<0.05$; ** $p<0.01$
Marginal effects of probit specification.
Standard errors in parentheses, clustered standard errors by country.
Based on ELSA and SHARE including the following countries:
AT, DE, SE, NL, ES, IT, FR, DK, CH, BE, CZ, UK

In Figure 9 we again present the results of the variance decomposition. The full models including the life course indicators explain 32% (21%) of the total variance in case of WD (DI). As before the variables measuring current health are the most important determinants of work disability and DI benefit receipt. In case of WD life health and other life course indicators are about equally important, both sets of variables explain about 9% of the total variance each. In case of DI benefit receipt the life course indicators are even more important than the life health indicators. They account for 11% of the total variance.

Figure 9: Variance decomposition for the probability of reporting WD and receiving DI benefits

Work disability (WD) *Receipt of disability insurance (DI)*



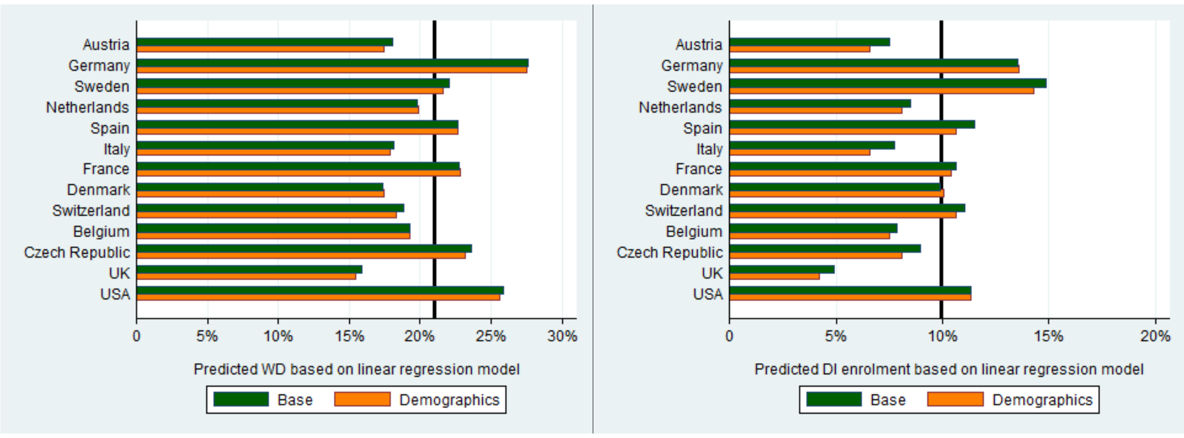
Source: Own calculations based on weighted data from SHARE Wave 5, ELSA Wave 6, HRS Wave 11.

Overall, we find that individual experiences over the life course are important drivers of WD and DI benefit receipt later in life. This means that individual health, working conditions and the institutional environment that influences health and working conditions early in life, matter for health and working capacity later in life. Individuals who were sick during childhood and adulthood, who experience stressful working environments, and who have interrupted working careers due to health problems are very likely to report a reduced working capacity later in life and have to rely on DI benefits.

5. Between-country variation

Why are there so large differences in WD and DI enrolment rates between countries? While health explains a great deal of the within-country variation in early retirement at any point in time, there is hardly any relationship between disability benefit receipt and average population health in a cross-national perspective (Börsch-Supan 2005). Moreover, there is hardly any time series correlation between old-age labor force participation and objective measures of population health such as mortality rates (Börsch-Supan and Jürges 2012). In this section we analyze the between-country variation in WD and DI enrolment rates. Our first step is to normalize self-reported work disability and DI enrolment with respect to demographic differences across countries. Italy, for instance, has an older population than the European average, while Denmark has a younger population. We take out demographic differences by first establishing the influence of age, gender, marital status and education on work disability and DI take up. We then predict which share of our sample would report a WD and take up DI benefits if all countries had the same demographic distribution as the average of all countries. The results for DI and WD are shown in Figure 10, comparing the counterfactual simulation results to the baseline results.

Figure 10: Counterfactual simulation for Demographics



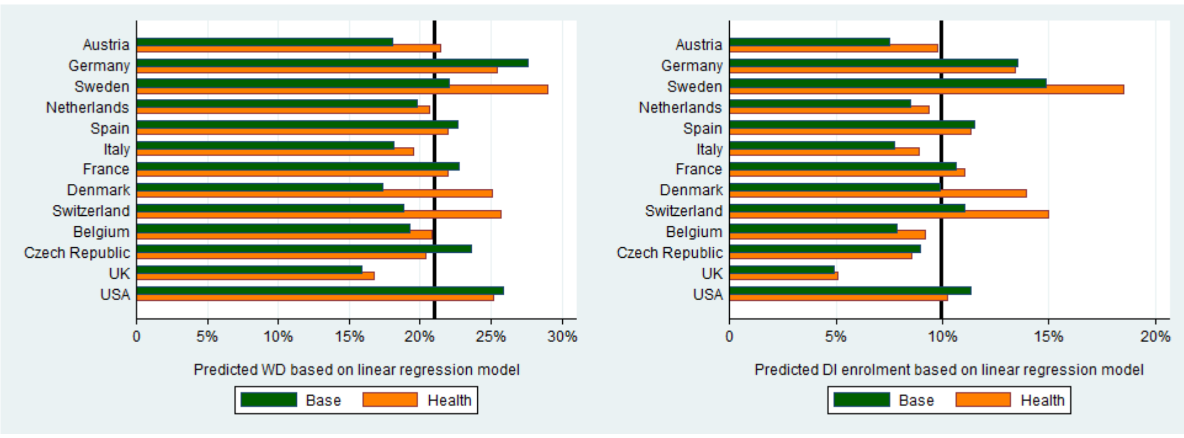
Source: Own calculations based on weighted data from SHARE Wave 5, ELSA Wave 6, HRS Wave 11.

Taking account of demographic differences does not make a substantive difference neither in the DI enrolment rates nor in the self-assessment of WD. Therefore demographic differences across Europe and the US can be ruled out as the main cause of the between-country variation.

Our second step is to account for differences in the health status of the population by first establishing the influence of health on work disability and disability insurance take up, and then predict which share of our sample individuals would report being disabled or would take up disability insurance if the health status measured along the different dimensions would be identical to the average of our countries. The results are shown in Figure 11.

Equalizing all current health measures generates more changes in the variation of WD and DI receipt than equalizing demographics. In countries with a good average population health, such as Sweden, Denmark and Switzerland, both WD rates and DI enrolment rates would be much higher if they had the same average health status. Countries with worse population health like the US reveal lower rates of DI uptake when simulating a relatively better health status. If health would be the main determinant for the variation of DI enrolment rates, the predicted counterfactual rates would be equal around the average DI rate of 9%. As we can see, the counterfactual DI rates do not approach the mean DI rate, meaning that differences in health cannot be the explanation behind the between-country variation of WD and DI benefit receipt.

Figure 11: Counterfactual simulation for Health

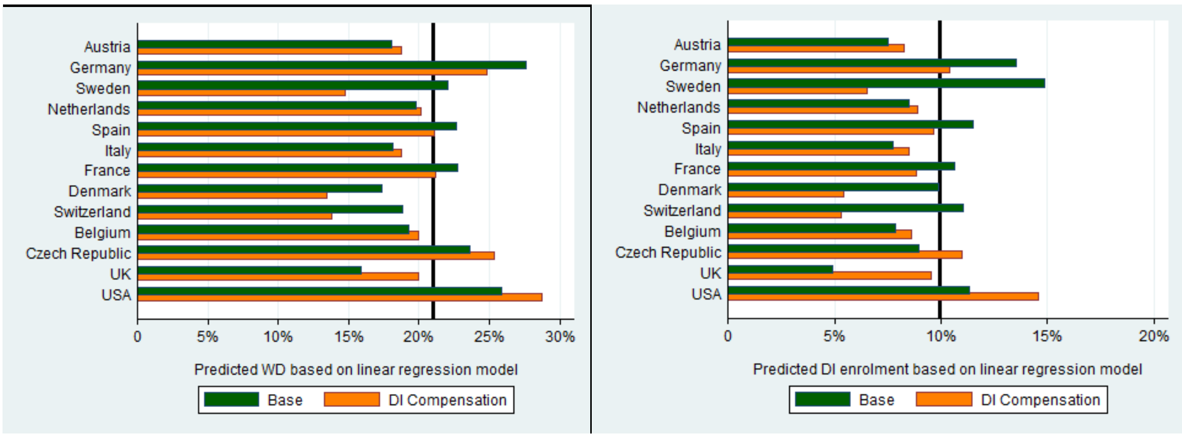


Source: Own calculations based on weighted data from SHARE Wave 5, ELSA Wave 6, HRS Wave 11.

The last counterfactual simulation is based on equalizing DI institutions across countries, i.e. we level the OECD policy summary indicator for all countries and then predict WD and the DI enrolment rates.[8] Thus, the institutional environment in countries like the UK and the US is assumed to become more generous, while countries like Sweden or Denmark become less generous when granting DI benefits. Figure 12 shows the predicted rates if the system characteristics were identical to the average in all countries of our cross-national sample.

[8] We also did the same exercise using the five subscales of the OECD policy indicator and the results are the same.

Figure 12: Counterfactual simulation for OECD Policy indicators



Source: Own calculations based on weighted data from SHARE Wave 5, ELSA Wave 6, HRS Wave 11.

The pattern of DI uptake rates changes strikingly when equalizing the policy variables. In most countries, the counterfactual simulation leads to DI enrolment rates that approach the overall average DI rate. Exceptions are the most generous and at the same time the healthiest countries like Sweden, Switzerland and Denmark, where the simulated DI enrolment rates decrease far below the average DI rate of 9%. The contrary holds for the US which has one of the most restrictive DI regulations and on average an unhealthy population. In this case applying the average degree of generosity would increase the incentives to enroll in DI benefits and the simulated DI uptake rates grow up to 15%. Similar, but less pronounced effects can be found for the variation in self-reported work disability.

6. Conclusions and outlook

The objective of disability insurance (DI) is to provide basic protection for those who suffer from work disabilities (WD). This protection has two dimensions: protection from poverty by income support and protection from deteriorating health by permitting individuals to retire early. This study has evaluated both of the objectives of DI using harmonized data from SHARE, ELSA and HRS.

At the individual level within each of the 13 countries in this study, we found strong and equi-directional effects of current health and socio-demographic circumstances on reporting WD and receiving DI benefits.

Moreover, health experienced early in life matters a great deal for reported WD and DI receipt later in life. The life health variables are statistically highly significant and have large effect sizes. They are the second most important group of variables explaining WD and DI after current health indicators. Thus, health problems experienced over the life course are important drivers of later life working capacity and the need to rely on DI benefits. Even illnesses experienced in childhood have long term consequences. Social expenditures on health of children are therefore well spent since they do not only improve health but also have very long-term benefits for the onset of work disabilities and ultimately the reliance of DI benefit receipt.

Already on an individual level, we find that DI institutions matter for DI receipt. More generous systems increase the likelihood of getting DI pensions holding health and socio-demographic indicators constant. However, on the individual level the variables measuring DI generosity are much less important in explaining reported WD and DI uptake compared to the variables measuring individual health as our variance decompositions show.

The individual job situation matters for reporting a work limitation both at the individual and the macro level. However, there is no effect on the benefit receipt.

At the country level, the picture is dominated by factors describing the generosity of the DI systems while country differences in demographic characteristics such as population aging and health differences contribute very little in explaining the international variation in DI benefit receipt. In our counterfactual simulation exercises, DI enrolment rates approach the average DI rate when the policy variables are equalized. Exceptions are the healthiest and most generous countries such as Sweden, Switzerland and Denmark on the one hand, and the least healthy and most restrictive country, the US, on the other hand.

The large country differences may not be due to DI policies alone. More work is necessary to understand the precise interactions and causal chains among labor market environment, DI policies and long term health effects, as well as the interactions between job characteristics and the medical and occupational assessment rules.

Given the large differences in the generosity and the prevalence of DI, and given the large costs of DI, the obvious next question is then whether the added expenses are well spent.

Does a generous DI system improve individuals' wellbeing and health? Will this permit re-integration into the labor market? Further research is also needed to better understand which countries are successful by providing special employment programs or flexible work schemes following up on DI benefit receipt.

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A. Appendix

Table A. 1: DI system indicators per country

1985	AT	BE	DK	FR	DE	IT	NL	ES	SE	CH	CZ	UK	USA
Benefit_system_coverage	5	3	5	3	2	3	4	1	5	5	n.a.	3	3
Minimum_disability_benefit	5	2	3	2	3	2	5	4	4	3	n.a.	1	1
Disability_benefit_generosity	1	1	4	3	2	3	5	4	5	4	n.a.	1	3
Medical_assessment_rules	3	2	4	2	4	2	1	0	4	5	n.a.	3	4
Vocational_assessment_rules	2	4	2	4	5	5	4	5	2	2	n.a.	5	1
SUM	16	12	18	14	16	15	19	14	20	19	n.a.	13	12

OECD (2003)

2000	AT	BE	DK	FR	DE	IT	NL	ES	SE	CH	CZ	UK	USA
Benefit_system_coverage	2	3	5	3	2	3	4	3	5	5	n.a.	3	3
Minimum_disability_benefit	3	2	3	2	5	2	5	4	5	4	n.a.	1	1
Disability_benefit_generosity	2	1	4	3	2	3	5	4	5	4	n.a.	1	3
Medical_assessment_rules	1	2	3	2	3	1	1	0	3	4	n.a.	3	4
Vocational_assessment_rules	5	4	1	4	3,5	3	1	3	1	2	n.a.	1,5	1
SUM	13	12	16	14	15,5	12	16	14	19	19	n.a.	9,5	12

OECD (2003)

2007	AT	BE	DK	FR	DE	IT	NL	ES	SE	CH	CZ	UK	USA
Benefit_system_coverage	2	3	5	3	3	3	4	3	5	5	1	3	3
Minimum_disability_benefit	3	2	2	2	5	2	4	4	5	4	4	1	0
Disability_benefit_generosity	2	1	3	3	2	3	3	4	5	3	3	1	3
Medical_assessment_rules	1	2	4	2	3	1	1	0	3	3	2	3	4
Vocational_assessment_rules	4	4	2	4	2	3	0	3	1	2	1	1	0
SUM	12	12	16	14	15	12	12	14	19	17	11	9	10

OECD (2010)

Table A. 2: Job Strain Index for age group 50-64 in percentage

	Job Strain	Job Strain					
		High level of job demands	High level of job demands		Low level of job resources	Low level of job resources	
			Time pressure	Physical health risk factors		Work autonomy and learning opportunities	Social support at work
Austria	38,55	26,94	63,23	34,17	40,36	33,15	51,60
Belgium	40,42	22,47	52,66	33,21	44,62	31,35	34,96
Czech Republic	43,80	17,07	53,51	22,56	57,04	26,99	23,61
Denmark	25,03	13,45	51,69	19,58	29,14	38,52	53,42
France	42,66	16,17	28,56	46,04	62,49	24,74	21,07
Germany	53,88	22,18	64,30	29,94	64,05	17,85	25,85
Italy	48,23	12,92	42,89	26,34	79,07	16,63	6,41
Netherlands	20,73	9,66	39,61	18,07	44,91	26,80	42,89
Spain	53,88	22,94	51,15	40,44	63,72	12,27	30,87
Sweden	18,80	16,50	43,35	23,69	23,63	58,78	38,26
Switzerland	30,61	17,27	59,02	20,15	35,56	44,61	42,64
United Kingdom	36,44	17,86	51,31	27,95	44,18	29,38	47,01
United States	28,88	20,43	53,49*	35,57	28,71	33,77	41,81*

Source: OECD (2005) with calculations from European Working Conditions Surveys (EWCSs) and International Social Survey Programme (ISSP).
*not available for age group 50-64, replaced by value for total population

Table A. 3: ADA index per country

	PR INDEX	TR INDEX	MOB INDEX	(PR+TR)*MO	S	ADA INDEX S*[(PR*TR)*MO] SCALED
Austria	5.2	2.0	7.17	51.7	67.9	3.96
Belgium	5.8	2.9	5.35	46.5	61.5	3.22
Denmark	7.6	5.6	9.73	128.0	76.5	11.04
France	5.2	2.7	6.65	52.7	62.4	3.70
Germany	6.8	7.7	6.40	92.4	65.5	6.82
Italy	3.4	0.9	4.56	19.6	54.5	1.20
Netherlands	6.5	3.2	6.92	67.2	74.1	5.62
Spain	3.4	4.2	5.17	39.0	56.6	2.49
Sweden	6.9	9.7	5.27	87.7	72.2	7.14
United Kingdom	3.6	2.7	7.83	49.6	71.6	4.00

Source: Boeri et al. (2002)

Table A. 4: Definition of statutory retirement ages per country

	Women	Men
Austria	60	65
Belgium	60 if year of birth <1936 61 if year of birth >=1936 & <1938 62 if year of birth >=1938 & <1940 63 if year of birth >=1940 & <1942 64 if year of birth >=1942 & <1944 65 if year of birth >=1942 & <1944 65 if year of birth >=1944	65
Czech Republic	57 if year of birth <1941 58 if year of birth >=1941 & <1944 59 if year of birth >=1944 & <1947 60 if year of birth >=1947 & <1950 61 if year of birth >=1950 & <1953 62 if year of birth >=1953 & <1956 63 if year of birth >=1956	60 if year of birth <1941 61 if year of birth >=1941 & <1947 62 if year of birth >=1947 & <1953 63 if year of birth >=1953 & <1959 64 if year of birth >=1959 & <1965 65 if year of birth >=1965 & <1971 66 if year of birth >=1971 & <1977 67 if year of birth >=1977
Denmark	65 67 if year of birth <=1939	65 67 if year of birth <=1939
France	65 if year of birth <=1919 60 if year of birth >=1951	65 if year of birth <=1919 60 if year of birth >=1951
Germany	65 if year of birth<1958	65 if year of birth<1958
Italy	55 if year of birth <1939 56 if year of birth =1939 57 if year of birth =1939 58 if year of birth =1940 59 if year of birth =1940 60 if year of birth >=1941	60 if year of birth <1934 61 if year of birth =1934 62 if year of birth =1934 63 if year of birth =1935 64 if year of birth =1935 65 if year of birth >=1936
Netherlands	65	65
Spain	65	65
Sweden	65	65
Switzerland	62 63 if year of birth >=1956	65
United Kingdom	60 if year of birth<1951 61 if year of birth<1952	65
United States	65 if year of birth <=1937 66 if year of birth >=1937 & <1943 67 if year of birth >=1943	65 if year of birth <=1937 66 if year of birth >=1937 & <1943 67 if year of birth >=1943

Source: Own elaboration

Table A. 5: Definition of Disability Benefits

Austria	Staatliche Invaliditäts- bzw. Berufsunfähigkeitspension, Versehrtenrente oder Krankengeld (aus der Haupt- und Nebenbeschäftigung)
Belgium	Wettelijke/ Aanvullende uitkering bij ziekte of invaliditeit of wettelijke uitkering bij beroepsziekte of arbeidsongeval; Une allocation/pension maladie/invalidité/incapacité légale, Une deuxième assurance maladie/invalidité/incapacité légale
Czech Republic	Státní invalidní důchod, nemocenské dávky
Switzerland	Rente de l"assurance invalidité (AI); Rente der Invalidenversicherung (IV); Rendita invalidità AI
Germany	Erwerbsminderungsrente bzw. Beamtenpension wegen Dienstunfähigkeit, oder Krankengeld
Denmark	Førtidspension, herunder sygedagpenge
Spain	Pensión pública de invalidez/incapacidad o prestación pública por enfermedad, Segunda pensión pública de invalidez/incapacidad o segunda prestación pública por enfermedad; Pensió pública d"invalidesa / incapacitat o prestació pública per malaltia, Segona pensió pública d"invalidesa / incapacitat o segona prestació pública per malaltia
France	Une pension d'invalidité publique (y c. rente d'accident du travail et allocation supplémentaire d'invalidité)
Italy	Indennità pubblica di disabilità; pensione di invalidità, incapacità (incluso assegno di accompagnamento)
Netherlands	WAO, Waz, WIA, of ander invaliditeitspensioen
Sweden	Sjukersättning (förtidspension) eller sjukpenning
England	Incapacity benefits (previously invalidity benefits), Employment and Support Allowance, Severe Disablement Allowance SDA, Statutory sick pay SSP, Attendance Allowance, Disability Living Allowance, Industrial Injuries Disablement benefits
United States	SSDI and SSI disability pension

Table A. 6: Determinants of WD and DI - linear specification

	WD	DI
age	0.001	-0.000
	(0.002)	(0.001)
female	-0.037	-0.042
	(0.007)**	(0.005)**
education_high	-0.015	-0.034
	(0.011)	(0.014)*
education_medium	-0.000	-0.020
	(0.011)	(0.013)
single	0.026	0.061
	(0.007)**	(0.009)**
divorced	0.043	0.055
	(0.008)**	(0.006)**
widowed	0.025	0.043
	(0.017)	(0.016)*
sphus	0.115	0.043
	(0.013)**	(0.011)**
adl	0.085	0.047
	(0.006)**	(0.005)**
iadl	0.036	0.054
	(0.007)**	(0.006)**
maxgrip	-0.002	-0.002
	(0.000)**	(0.000)**
maxgrip_flag	-0.049	-0.056
	(0.021)*	(0.015)**
eurod	0.022	0.008
	(0.002)**	(0.002)**
recall	0.000	-0.001
	(0.001)	(0.001)
illnesses_ch	0.021	0.019
	(0.005)**	(0.003)**
illnesses_adult	0.056	0.034
	(0.004)**	(0.004)**
oecd_sum	0.011	0.013
	(0.005)*	(0.006)*
_cons	-0.374	-0.159
	(0.107)**	(0.114)
Adjusted R2	0.31	0.19
N	30,131	30,131

* $p<0.05$; ** $p<0.01$
Based on linear regression specification.
Standard errors in parentheses, clustered standard errors by country.
Based on HRS, ELSA and SHARE including the following countries:
AT, DE, SE, NL, ES, IT, FR, DK, CH, BE, CZ, UK, USA
Reference categories: Male, low education, married, medium number of jobs, no period of poor health

Table A. 7: Probit specification with country-fixed effects

	WD	DI
age	0.001	-0.000
	(0.002)	(0.001)
female	-0.035	-0.037
	(0.008)**	(0.007)**
education_high	-0.033	-0.040
	(0.009)**	(0.008)**
education_medium	-0.008	-0.011
	(0.009)	(0.004)**
single	0.020	0.051
	(0.005)**	(0.008)**
divorced	0.032	0.040
	(0.005)**	(0.006)**
widowed	0.022	0.038
	(0.015)	(0.010)**
sphus	0.108	0.046
	(0.014)**	(0.008)**
adl	0.065	0.015
	(0.011)**	(0.002)**
iadl	0.025	0.019
	(0.008)**	(0.002)**
maxgrip	-0.002	-0.002
	(0.000)**	(0.000)**
maxgrip_flag	-0.052	-0.059
	(0.009)**	(0.008)**
eurod	0.015	0.005
	(0.002)**	(0.001)**
recall	-0.001	-0.002
	(0.000)**	(0.001)**
illnesses_ch	0.014	0.011
	(0.003)**	(0.001)**
illnesses_adult	0.044	0.024
	(0.005)**	(0.002)**
AT	0.017	0.043
	(0.007)*	(0.002)**
DE	0.063	-0.006
	(0.009)**	(0.004)
SE	0.072	0.140
	(0.004)**	(0.003)**
NL	0.070	0.060
	(0.009)**	(0.002)**
ES	-0.032	-0.015
	(0.013)*	(0.002)**
IT	-0.102	-0.068
	(0.011)**	(0.003)**
FR	0.033	-0.045
	(0.011)**	(0.002)**
DK	0.160	0.089
	(0.004)**	(0.003)**
CH	0.002	0.013

	(0.005)	(0.003)**
BE	0.043	0.060
	(0.007)**	(0.002)**
CZ	0.034	0.084
	(0.016)*	(0.004)**
UK	0.036	0.044
	(0.007)**	(0.003)**
Pseudo R2	0.31	0.26
N	30,131	30,131

* $p<0.05$; ** $p<0.01$
Marginal effects of probit specification.
Standard errors in parentheses, clustered standard errors by country.
Based on HRS, ELSA and SHARE including the following countries:
AT, DE, SE, NL, ES, IT, FR, DK, CH, BE, CZ, UK, USA
Reference category: USA

Table A. 8: Probit specification with five single OECD indicators

	WD	DI
age	0.001	0.001
	(0.002)	(0.001)
female	-0.030	-0.035
	(0.007)**	(0.005)**
education_high	-0.029	-0.044
	(0.007)**	(0.011)**
education_medium	-0.012	-0.022
	(0.009)	(0.006)**
single	0.020	0.052
	(0.006)**	(0.008)**
divorced	0.033	0.045
	(0.007)**	(0.004)**
widowed	0.023	0.036
	(0.015)	(0.012)**
sphus	0.109	0.045
	(0.016)**	(0.010)**
adl	0.066	0.016
	(0.011)**	(0.002)**
iadl	0.025	0.021
	(0.008)**	(0.002)**
maxgrip	-0.002	-0.002
	(0.000)**	(0.000)**
maxgrip_flag	-0.052	-0.052
	(0.011)**	(0.012)**
eurod	0.014	0.005
	(0.001)**	(0.001)**
recall	-0.001	-0.001
	(0.000)*	(0.001)
illnesses_ch	0.016	0.015
	(0.003)**	(0.003)**
illnesses_adult	0.042	0.021
	(0.005)**	(0.005)**
oecd_coverage	0.018	0.001
	(0.016)	(0.015)
oecd_minimum	0.016	0.016
	(0.007)*	(0.014)
oecd_di_generosity	-0.010	0.013
	(0.007)	(0.017)
oecd_medical	0.027	0.025
	(0.013)*	(0.016)
oecd_vocational	0.007	0.013
	(0.010)	(0.013)
Pseudo R2	0.31	0.24
N	30,131	30,131

* p<0.05; ** p<0.01
Marginal effects of probit specification.
Standard errors in parentheses, clustered standard errors by country.
Based on HRS, ELSA and SHARE including the following countries:
AT, DE, SE, NL, ES, IT, FR, DK, CH, BE, CZ, UK, USA

Table A. 9: Probit specification including ADA index

	WD	DI
age	-0.001	0.001
	(0.001)	(0.001)
female	-0.044	-0.042
	(0.011)**	(0.006)**
education_high	-0.036	-0.032
	(0.005)**	(0.009)**
education_medium	-0.015	-0.015
	(0.004)**	(0.010)
single	0.017	0.045
	(0.008)*	(0.009)**
divorced	0.039	0.042
	(0.009)**	(0.006)**
widowed	-0.003	0.019
	(0.013)	(0.009)*
sphus	0.126	0.047
	(0.002)**	(0.008)**
adl	0.052	0.015
	(0.013)**	(0.006)**
iadl	0.018	0.022
	(0.014)	(0.005)**
maxgrip	-0.002	-0.002
	(0.000)**	(0.000)**
maxgrip_flag	-0.034	-0.039
	(0.016)*	(0.010)**
eurod	0.015	0.005
	(0.002)**	(0.002)**
recall	-0.000	0.000
	(0.001)	(0.001)
illnesses_ch	0.015	0.017
	(0.005)**	(0.004)**
illnesses_adult	0.033	0.017
	(0.003)**	(0.004)**
oecd_sum	-0.003	0.008
	(0.002)	(0.007)
ada_index	0.023	0.006
	(0.002)**	(0.004)
Pseudo R2	0.30	0.21
N	18,760	18,760

* p<0.05; ** p<0.01
Marginal effects of probit specification.
Standard errors in parentheses, clustered standard errors by country.
Based on HRS, ELSA and SHARE including the following countries:
AT, DE, SE, NL, ES, IT, FR, DK, CH, BE, CZ, UK, USA

Table A. 10: Probit specification including Job Strain Index

	WD	DI
age	0.001	-0.000
	(0.002)	(0.001)
female	-0.029	-0.038
	(0.006)**	(0.007)**
education_high	-0.019	-0.044
	(0.010)	(0.010)**
education_medium	0.000	-0.018
	(0.009)	(0.006)**
single	0.019	0.047
	(0.005)**	(0.008)**
divorced	0.033	0.042
	(0.006)**	(0.005)**
widowed	0.024	0.036
	(0.014)	(0.011)**
sphus	0.111	0.049
	(0.016)**	(0.011)**
adl	0.067	0.016
	(0.011)**	(0.003)**
iadl	0.024	0.019
	(0.009)**	(0.002)**
maxgrip	-0.002	-0.002
	(0.000)**	(0.000)**
maxgrip_flag	-0.049	-0.064
	(0.014)**	(0.013)**
eurod	0.014	0.005
	(0.001)**	(0.001)**
recall	-0.000	-0.002
	(0.001)	(0.001)*
illnesses_ch	0.017	0.013
	(0.003)**	(0.002)**
illnesses_adult	0.041	0.020
	(0.005)**	(0.003)**
oecd_sum	0.010	0.010
	(0.005)	(0.004)*
job_strain	-0.002	-0.002
	(0.001)	(0.001)**
Pseudo R2	0.30	0.24
N	30,131	30,131

* $p<0.05$; ** $p<0.01$
Marginal effects of probit specification.
Standard errors in parentheses, clustered standard errors by country.
Based on HRS, ELSA and SHARE including the following countries:
AT, DE, SE, NL, ES, IT, FR, DK, CH, BE, CZ, UK, USA

B. Technical Appendix – Harmonization process

Several steps are implemented to harmonize one specific variable. First some characteristics of the required variable are examined in SHARE. We consider the corresponding question to that variable as well as the possible answers and therefore characteristics of the variable - in sense of dichotomy, categorization, values and so forth. Those characteristics are used to compare the corresponding variables included in the HRS and ELSA datasets. After the first step we search for an appropriate variable. For the HRS dataset the RAND file and documentation is reviewed. If we cannot find a variable that can be harmonized, we examine the codebook, which is accessible on the official HRS homepage. If a required variable is not included in the RAND dataset of HRS, but can be found in the codebook, we take the needed data from the core dataset. There is one core dataset for each wave of HRS. The procedure with the ELSA data is similar. We check the existing datasets for each wave and the documentation. After searching for an appropriate variable for harmonization, we compare the variable's characteristics in SHARE, ELSA and HRS. If there are differences, for example in the values, the variables of HRS and ELSA are adjusted to the corresponding variable in SHARE. An easy example would be the coding of the gender variable (male=0 female=1 instead of male=1 female=2). Only if both questioning and the characteristics of the variable are comparable between the studies, it can be harmonized.

As base dataset we perform this procedure for the wave 5 of SHARE, wave 6 of ELSA and Wave 11 of HRS. We further include information from the life history interviews (Wave 3 in SHARE and Wave 3 in ELSA) and adapt available retrospective information from HRS. Some variables also need to be merged from former waves (e.g. years of education is not asked repeatedly or marital status only if it changed between waves). After creating one harmonized dataset for each study in long format, all three datasets are appended so we have a harmonized dataset containing all three studies.

Table B. 1: Overview of variable groups used in regression analyses

Group	Variable	Description	Range	Categories	Available in SHARE	Available in ELSA	Available in HRS
Demographics	age	Age at time of interview	20-89	20-89	yes	yes	yes
	female	Gender	0-1	0. Male 1. Female	yes	yes	yes
	Education_low	Education category	0-1	0. Not in low education category 1. In low education category (ISCED 0-2)	yes	yes	yes
	education_medium	Education category	0-1	0. Not in medium education category 1. In medium education category (ISCED 3-4)	yes	yes	yes
	education_high	Education category	0-1	0. Not in high education category 1. In high education category (ISCED 5-6)	yes	yes	yes
	single	Currently not married, divorced or widowed	0-1	0. Not single 1. Single	yes	yes	yes
	married	Currently married	0-1	0. Not married 1. Married	yes	yes	yes
	divorced	Currently divorced	0-1	0. Not divorced 1. Divorced	yes	yes	yes
	widowed	Currently widowed	0-1	0. Not widowed 1. Widowed	yes	yes	yes
Health	sphus	Self-reported health	1-5	1. Excellent 2. Very good 3. Good 4. Fair 5. Poor	yes	yes	yes
	iadl	IADL: number of limitations with instrumental activities of daily living	0-6	Difficulties with: Using a map, preparing a hot meal, shopping for groceries, making telephone calls, taking medications and managing money	yes	yes	yes
	adl	ADL: number of limitations with activities of daily living	0-6	Difficulties with: Dressing, eating, using the toilet, bathing and showering, getting in and out of bed, walking across a room	yes	yes	yes
	recall	Ten words list learning – sum first and delayed recall	0-10	0-10	Yes	yes	yes
	maxgrip	Maximal Grip Strength (Kg)	0.5 - 90	0.5 – 90	yes	yes	yes
	maxgrip_flag	Flag variable if missing value was imputed	0-1	0. No value was imputed 1. Missing value was replaced by zero	yes	yes	yes
	eurod	Depression scale	0-11	0-11	yes	from cesd	from cesd
	lim_work	Health problem that limits paid work	0-1	0. No 1. Yes	yes	yes	yes

Life health	illnesses_ch	Childhood Illnesses	0-9	0-9	yes	yes	Yes
	illnesses_adult	Adulthood Illnesses	0-9	0-9	yes	yes	yes
Lifecourse others	working_gaps	Working gaps due to sickness	0-2	0-2	yes	yes	no
	poor_health	Number of period of very poor health	0-5	0. None 1. One 2. Two 3. Three 4. More than three 5. Have been ill or with disabilities for all or most of my life	yes	yes	no
	rooms_ch	Number of rooms when ten years old	0-50	0-50	yes	yes	No
	books_ch	Number of books when ten years old	1-5	1. None or very few (0-10 books) 2. Enough to fill one shelf (11-25 books) 3. Enough to fill one bookcase (26-100 books) 4. Enough to fill two bookcases (101-200 books) 5. Enough to fill two or more bookcases (more than 200 books)	yes	yes	No
	job_physical	Physical Demand of Work	0-1	0. No physical demand at work 1. Physical demand at work	yes	yes	Yes
	job_psycho	Psychological Demand of Work	0-1	0. No psychological demand at work 1. Psychological demand at work	yes	yes	yes
	low_n_jobs	Number of jobs over lifetime	0-1	0. Not having had a low number of jobs 1. Having had a low number of jobs (0-2)	yes	yes	yes
	medium_n_jobs	Number of jobs over lifetime	0-1	0. Not having had a medium number of jobs 1. Having had a medium number of jobs (3-4)	yes	yes	yes
	high_n_jobs	Number of jobs over lifetime	0-1	0. Not having had a high number of jobs 1. Having had a high number of jobs (>5)	yes	yes	yes
Policy	oecd_coverage	Benefit system coverage	0-5	0. Employees 1. Labour force 2. Labour force with voluntary self-insurance 3. Labour force plus means-tested non-contr. scheme 4. Some of those out of the labour force (e.g. congenital) 5. Total population (residents)	Not for Estonia, Israel, Slovenia	yes	Yes
	oecd_minimum	Minimum disability benefit	0-5	0. 86-100% 1. 71-85% 2. 56-70% 3. 41-55%	Not for Estonia, Israel, Slovenia	yes	Yes

				4. 26-40% 5. 0-25%			
	oecd_di_generosity	Disability benefit generosity	0-5	0. RR < 50%, minimum not specified 1. RR < 50%, reasonable minimum 2. 75 > RR > = 50%, minimum not specified 3. 75 > RR > = 50%, reasonable minimum 4. RR > = 75%, minimum not specified 5. RR > = 75%, reasonable minimum	Not for Estonia, Israel, Slovenia	yes	Yes
	oecd_medical	Medical assessment rules	0-5	0. Insurance team and two-step procedure 1. Team of experts in the insurance 2. Insurance doctor exclusively 3. Insurance doctor predominantly 4. Treating doctor predominantly 5. Treating doctor exclusively	Not for Estonia, Israel, Slovenia	yes	Yes
	oecd_vocational	Vocational assessment rules	0-5	0. All jobs available taken into account, strictly applied 1. All jobs available taken into account, leniently applied 2. Current labour market conditions are taken into account 3. Own-occupation assessment for partial benefits 4. Reference is made to one's previous earnings 5. Strict own or usual occupation assessment	Not for Estonia, Israel, Slovenia	yes	Yes
	oecd_sum	Sum of five OECD indicators	9-20	9-20	Not for Estonia, Israel, Slovenia	yes	Yes
Macro	job_strain	Share of persons per country in high strain jobs	18,8-53,88	18,8-53,88	Yes	yes	yes
	ada_index	Degree of labor market flexibility per country	1,2-11,04	1,2-11,04	Not for Switzerland and Czech Republic	yes	No

Table B. 2: Detailed list of harmonized variables

Variable	Description	SHARE	ELSA	HRS
Disability benefits				
dis1	disability benefits	X	x	x

dis1_year	first year received disability benefits	X		x
Identifiers (merging…)				
mergeid	Identifier in SHARE	X		
idauniq	Identifier in ELSA		x	
hhidpn	Identifier in HRS			x
study	study identifier	X	x	x
Demographic				
country	Country identifier	X	x	x
yrbirth	Year of birth	X	x	x
age	age (max. 90)	X	x	x
gender	Gender	X	x	x
married	Is respondent married?	X	x	x
ever_married	Has respondent ever been married?	X	x	x
divorced	Is respondent divorced?	X	x	x
ever_divorced	Has respondent ever been divorced?	X	x	x
widowed	Is respondent widowed?	X	x	x
ever_widowed	Has respondent ever been widowed?	X	x	x
Education				
dn041_	years of education	X	x	x
educat	education category	X	x	x
Job				
numberjobs	number of jobs	X	x	x
working_gaps	number of working gaps	X	x	x
ep027_	My job is physically demanding.	X	x	x
ep028_	I am under constant time pressure due to a heavy workload.	X	x	x
ep029_	I have very little freedom to decide how I do my work.	X	x	
ep030_	I have an opportunity to develop new skills.	X	x	x
ep031_	I receive adequate support in difficult situations.	X	x	x
ep032_	I receive the recognition I deserve for my work.	X	x	x
ep033_	Considering all my efforts and achievements, my salary is/earnings are adequate	X	x	x
ep034_	Poor prospects for (main) job advancement	X	x	x
ep035_	Poor (main) job security	X	x	x
lowcontrol_ci	=1 low control (separately calculated for each country)	X	x	x
ERI	Effort-reward imbalance (>1 poor quality of work)	X	x	x
ERIi	=1 poor quality of work	X	x	x
ERIci	=1 poor quality of work (separately calculated for each country)	X	x	x
ep027_main	SHARE main job: My job is physically demanding.	X		
ep028_main	SHARE main job: I am under constant time pressure due to a heavy workload.	X		
ep029_main	SHARE main job: I have very little freedom to decide how I do my work.	X		
ep030_main	SHARE main job: I have an opportunity to develop new skills.	X		
ep031_main	SHARE main job: I receive adequate support in difficult situations.	X		

ep032_main	SHARE main job: I receive the recognition I deserve for my work.	X		
ep033_main	SHARE main job: Considering all my efforts and achievements, my salary is/earnings are adequate	X		
lowcontrol_ci_main	SHARE main job: =1 low control (separately calculated for each country)	X		
ERI_main	SHARE main job: Effort-reward imbalance (>1 poor quality of work)	X		
ERIi_main	SHARE main job: =1 poor quality of work	X		
ERIci_main	SHARE main job: =1 poor quality of work (separately calculated for each country)	X		
Biomarker				
maxgrip	Max. of grip strength measure	X	x	x
General Health				
ph006d1	Doctor told you had: heart attack	X	x	x
ph006d2	Doctor told you had: high blood pressure or hypertension	X	x	x
ph006d3	Doctor told you had: high blood cholesterol	X	x	
ph006d4	Doctor told you had: stroke	X	x	x
ph006d5	Doctor told you had: diabetes or high blood sugar	X	x	x
ph006d6	Doctor told you had: chronic lung disease	X	x	x
ph006d10	Doctor told you had: cancer	X	x	x
ph006d11	Doctor told you had: stomach or duodenal ulcer, peptic ulcer	X		
ph006d12	Doctor told you had: Parkinson disease	X	x	
ph006d13	Doctor told you had: cataracts	X	x	
ph006d14	Doctor told you had: hip fracture or femoral fracture	X	x	
ph006d15	Doctor told you had: other fractures	X		
ph006d16	Doctor told you had: alzheimer's disease, dementia, senility	X	x	x
ph006d18	Doctor told you had: other affective/emotional disorders	X	x	x
ph006d19	Doctor told you had: rheumatoid arthritis	X	x	x
ph006d20	Doctor told you had: osteoarthritis/other rheumatism	X	x	
illnesses_adult_ever	Sum (0-9) ever had illness (Adult)	X	x	x
ph061_	Health problem that limits paid work	X	x	x
sphus	Self-perceived health – us version	X	x	x
hs054_	number periods of ill health	X	x	
Mental Health				
eurod	Depression scale EURO-D - high is depressed	X		
eurod_lin1	Predicted value (linear Regression) for ELSA and HRS	X	x	x
cesd	CES-D Score		x	x
Limitations in activities of daily living				
ph049d1	Difficulties: dressing, including shoes and socks	X	x	x
ph049d2	Difficulties: walking across a room	X	x	x
ph049d3	Difficulties: bathing or showering	X	x	x
ph049d4	Difficulties: eating, cutting up food	X	x	x
ph049d5	Difficulties: getting in or out of bed	X	x	x
ph049d6	Difficulties: using the toilet, incl getting up or down	X	x	x
ph049d7	Difficulties: using a map in a strange place	X	x	x

ph049d8	Difficulties: preparing a hot meal	X	x	x
ph049d9	Difficulties: shopping for groceries	X	x	x
ph049d10	Difficulties: telephone calls	X	x	x
ph049d11	Difficulties: taking medications	X	x	x
ph049d12	Difficulties: doing work around the house or garden	X	x	
ph049d13	Difficulties: managing money	X	x	x
iadl	number of limitations with instrumental activities of daily living	X	x	x
adl	Number of limitations with activities of daily living	X	x	x
Life course history				
backpain_adult	adulthood illness: back pain (16+)	X	x	
arthr_adult	adulthood illness: arthritis... (16+)	X	x	
osteo_adult	adulthood illness: osteoporosis (16+)	X	x	
angina_adult	adulthood illness: angina or heart attack (16+)	X	x	
heart_adult	adulthood illness: other heart disease (16+)	X	x	
diab_adult	adulthood illness: diabetes or high blood sugar (16+)	X	x	
stroke_adult	adulthood illness: stroke (16+)	X	x	
asthma_adult	adulthood illness: asthma (16+)	X	x	
respiratory_adult	adulthood illness: respiratory problems (16+)	X	x	
headaches_adult	adulthood illness: severe headaches or migraines (16+)	X	x	
cancer_adult	adulthood illness: cancer or malignant tumour or leukaemia or lymphoma (16+)	X	x	
psych_adult	adulthood illness: Emotional, nervous, or psychiatric problem, incl. burnout (16+)	X	x	
fatigue_adult	adulthood illness: fatigue, e.g. with ME, MS (16+)	X	x	
eyesight_adult	adulthood illness: eyesight problems (16+)	X	x	
infectious_adult	adulthood illness: Infectious disease (16+)	X	x	
allergies_adult	adulthood illness: allergies (other than asthma) (16+)	X	x	
illnesses_adult_16	sum adulthood illnesses (16+) (0-16)	X	x	
infectious_ch	childhood illness: infectious disease	X	x	x
asthma_ch	childhood illness: asthma	X	x	x
respiratory_ch	childhood illness: respiratory problems	X	x	x
allergies_ch	childhood illness: allergies	X	x	x
ear_ch	childhood illness: ear problems	X		
headaches_ch	childhood illness: headaches or migraines	X	x	x
epilepsy_ch	childhood illness: epilepsy, fits or seizures	X	x	x
psych_ch	childhood illness: emotional, nervous, or psychiatric problem	X	x	x
fractures_ch	childhood illness: fractures	X		
diabetes_ch	childhood illness: diabetes or high blood sugar	X	x	x
heart_ch	childhood illness: heart trouble	X	x	x
cancer_ch	childhood illness: cancer (incl. leukaemia)	X	x	x
illnesses_ch	sum childhood illnesses	X	x	x
cs002	rooms when ten years old	X	x	
cs003	number of people living in household when ten	X	x	

cs008	number of books when ten	X	x	
cs010	relative position to others mathematically when ten	X		
Cognition				
cf003_	Date: day of month	X	x	x
cf004_	Date: month	X	x	x
cf005_	Date: year	X	x	x
cf006_	Date: day of the week	X	x	x
cf008tot	Ten words list learning first trial total	X	x	x
cf016tot	Ten words list learning delayed recall total	X	x	x

Table B. 3: List of variables where information needs to be merged from previous waves

Merged from previous waves				
Variable	Description	SHARE	ELSA	HRS
Demographic				
married	Is respondent married?	X		x
ever_married	Has respondent ever been married?	X	x	x
divorced	Is respondent divorced?	X		x
ever_divorced	Has respondent ever been divorced?	X	x	
widowed	Is respondent widowed?	X		x
ever_widowed	Has respondent ever been widowed?	X	x	x
Education				
dn041_	years of education	X	x	
educat	education category	X	x	
Job				
numberjobs				x
General Health				
ph006d1	Doctor told you had: heart attack		x	x
ph006d2	Doctor told you had: high blood pressure or hypertension		x	x
ph006d3	Doctor told you had: high blood cholesterol			
ph006d4	Doctor told you had: stroke		x	x
ph006d5	Doctor told you had: diabetes or high blood sugar		x	x
ph006d6	Doctor told you had: chronic lung disease		x	x
ph006d10	Doctor told you had: cancer		x	x
ph006d11	Doctor told you had: stomach or duodenal ulcer, peptic ulcer			
ph006d12	Doctor told you had: Parkinson disease			
ph006d13	Doctor told you had: cataracts			
ph006d14	Doctor told you had: hip fracture or femoral fracture			
ph006d15	Doctor told you had: other fractures			
ph006d16	Doctor told you had: alzheimer's disease, dementia, senility			x
ph006d18	Doctor told you had: other affective/emotional disorders		x	x
ph006d19	Doctor told you had: rheumatoid arthritis			x
ph006d20	Doctor told you had: osteoarthritis/other rheumatism			
Childhood Illnesses				
infectious_ch	childhood illness: infectious disease			x
asthma_ch	childhood illness: asthma			x
respiratory_ch	childhood illness: respiratory problems			x
allergies_ch	childhood illness: allergies			x
ear_ch	childhood illness: ear problems			x
headaches_ch	childhood illness: headaches or migraines			x
epilepsy_ch	childhood illness: epilepsy, fits or seizures			x
psych_ch	childhood illness: emotional, nervous, or psychiatric problem			x
fractures_ch	childhood illness: fractures			x

Table B. 4: List of variables including original variable names and data sources

Variable	SHARE Variables	SHARE Data source	ELSA Variables	ELSA Data source	HRS Variables	HRS Data source
Disability benefits						
di_receipt	ep071d4, ep071d5	sharew5_rel1-0-0_ep	iahdnsp, iahdnib, iahdnsd, iahdnaa, iahdndl, iahdnii, iahdn95, iahdnca, iahdnwd, iahdbc	wave_6_elsa_data_v2	r11isdi, r11issi, r11iwcmp	rndhrs_o
di_year	ep213_4, ep213_5	sharew5_rel1-0-0_ep	missing		dis1, radrecy1, radrecy2, radrecy3, radrecy4, radrecy5, radrecy6, radrecy7, radrecy8, radrecy9, radrecy10, radrecy11	rndhrs_o
Identifiers (merging…)						
Respondent identifier	mergeid	general	idauniq	General	hhidpn	general
Demographic						
country	country	general	just UK		just USA	
yrbirth	dn003_	sharew5_rel1-0-0_dn	indobyr	wave_6_elsa_data_v2	rabyear	rndhrs_o
age	dn002_, dn003_, int_month	sharew5_rel1-0-0_dn, sharew5_rel1-0-0_cv_r	indager	wave_6_elsa_data_v2	r11agey_e, rabyear, r11iwendy	rndhrs_o
gender	dn042_	sharew5_rel1-0-0_dn	indsex	wave_6_elsa_data_v2	ragender	rndhrs_o
married	wave 1,2,4,5: dn041_	sharew1_rel2-6-0_dn, sharew2_rel2-6-0_dn, sharew4_rel1-1-1_dn, sharew5_rel1-0-0_dn	dimar	wave_6_elsa_data_v2	r11mstath, r11mnev, r10mstath, r10mnev, r9mstath, r9mnev, r8mstath, r8mnev, r7mstath, r7mnev, r6mstath, r6mnev, r5mstath, r5mnev, r4mstath, r4mnev, r3mstath, r3mnev, r2mstath,	rndhrs_o

					r2mnev, r1mstath, r1mnev	
ever_married	wave 1,2,4,5: dn041_ ; wave3: sl_rp002_, sl_rp002e_	sharew1_rel2-6-0_dn, sharew2_rel2-6-0_dn, sharew3_rel1_rp, sharew4_rel1-1-1_dn, sharew5_rel1-0-0_dn	wave 0: MARITALB, marital; wave 1,3,4,5: dimar; wave 2: DiMar; wave 6: dimar	wave 0: wave_0_common_variables_v2, wave_0_1998_data, wave_0_1999_data, wave_0_2001_data; wave 1: wave_1_core_data_v3; wave 2: wave_2_core_data_v4; wave 3: wave_3_elsa_data_v4´; wave 4: wave_4_elsa_data_v3; wave 5: wave_5_elsa_data_v4; wave 6: wave_6_elsa_data_v2;	r11mstath, r11mnev, r10mstath, r10mnev, r9mstath, r9mnev, r8mstath, r8mnev, r7mstath, r7mnev, r6mstath, r6mnev, r5mstath, r5mnev, r4mstath, r4mnev, r3mstath, r3mnev, r2mstath, r2mnev, r1mstath, r1mnev	rndhrs_o
divorced	wave 1,2,4,5: dn041_	sharew1_rel2-6-0_dn, sharew2_rel2-6-0_dn, sharew4_rel1-1-1_dn, sharew5_rel1-0-0_dn	dimar	wave_6_elsa_data_v2	r11mstath, r11mnev, r10mstath, r10mnev, r9mstath, r9mnev, r8mstath, r8mnev, r7mstath, r7mnev, r6mstath, r6mnev, r5mstath, r5mnev, r4mstath, r4mnev, r3mstath, r3mnev, r2mstath, r2mnev, r1mstath, r1mnev	rndhrs_o
ever_divorced	wave 1, 2, 4, 5: dn041_ ; wave3: sl_rp002e_,	sharew1_rel2-6-0_dn, sharew2_rel2-6-0_dn,	wave 0: MARITALB, marital;	wave 0: wave_0_common_variable	r11mstath, r11mnev, r10mstath, r10mnev,	rndhrs_o

	sl_rp013_1 - sl_rp013_4	sharew3_rel1_rp, sharew4_rel1-1-1_dn, sharew5_rel1-0-0_dn	wave 1,3,4,5: dimar; wave 2: DiMar; wave 6: dimar	s_v2, wave_0_1998_data, wave_0_1999_data, wave_0_2001_data; wave 1: wave_1_core_data_v3; wave 2: wave_2_core_data_v4; wave 3: wave_3_elsa_data_v4´; wave 4: wave_4_elsa_data_v3; wave 5: wave_5_elsa_data_v4; wave 6: wave_6_elsa_data_v2;	r9mstath, r9mnev, r8mstath, r8mnev, r7mstath, r7mnev, r6mstath, r6mnev, r5mstath, r5mnev, r4mstath, r4mnev, r3mstath, r3mnev, r2mstath, r2mnev, r1mstath, r1mnev	
widowed	wave 1, 2, 4, 5: dn041_	sharew1_rel2-6-0_dn, sharew2_rel2-6-0_dn, sharew4_rel1-1-1_dn, sharew5_rel1-0-0_dn	dimar	wave_6_elsa_data_v2	r11mstath, r11mnev, r10mstath, r10mnev, r9mstath, r9mnev, r8mstath, r8mnev, r7mstath, r7mnev, r6mstath, r6mnev, r5mstath, r5mnev, r4mstath, r4mnev, r3mstath, r3mnev, r2mstath, r2mnev, r1mstath, r1mnev	rndhrs_o
ever_widowed	wave 1, 2, 3, 4n041_	sharew1_rel2-6-0_dn, sharew2_rel2-6-0_dn, sharew4_rel1-1-1_dn, sharew5_rel1-0-0_dn	wave 0: MARITALB, marital; wave 1,3,4,5: dimar; wave 2: DiMar; wave 6: dimar	wave 0: wave_0_common_variables_v2, wave_0_1998_data, wave_0_1999_data, wave_0_2001_data; wave 1: wave_1_core_data_v3;	r11mstath, r11mnev, r10mstath, r10mnev, r9mstath, r9mnev, r8mstath, r8mnev, r7mstath,	rndhrs_o

				wave 2: wave_2_core_data_v4; wave 3: wave_3_elsa_data_v4´; wave 4: wave_4_elsa_data_v3; wave 5: wave_5_elsa_data_v4; wave 6: wave_6_elsa_data_v2;	r7mnev, r6mstath, r6mnev, r5mstath, r5mnev, r4mstath, r4mnev, r3mstath, r3mnev, r2mstath, r2mnev, r1mstath, r1mnev	
Education						
dn041_ Collapsed at 14: 14+ because of ELSA	wave 2, 4, 5: dn041_, wave 1: iscedy_r	sharew1_rel2-6-0_gv_isced , sharew2_rel2-6-0_dn, sharew4_rel1-1-1_dn, sharew5_rel1-0-0_dn	wave 0: educend; wave 1,3,4,5: fqend; wave 2: FqEnd; wave 6: fqend;	wave 0: wave_0_common_variables_v2, wave_0_1998_data, wave_0_1999_data, wave_0_2001_data; wave 1: wave_1_core_data_v3; wave 2: wave_2_core_data_v4; wave 3: wave_3_elsa_data_v4; wave 4: wave_4_elsa_data_v3; wave 5: wave_5_elsa_data_v4; wave 6: wave_6_elsa_data_v2;	raedyrs	rndhrs_o
educat	wave 1,2,4,5: isced 1997	sharew1_rel2-6-0_gv_isced, sharew2_rel2-6-0_gv_isced, sharew4_rel1-1-1_gv_isced, sharew5_rel1-0-0_gv_isced	wave 1,2,3,4,5,6,: edqual;	wave 1: wave_1_core_data_v3; wave 2: wave_2_ifs_derived_variables; wave 3: wave_3_elsa_data_v4; wave 4: wave_4_elsa_data_v3; wave 5: wave_5_elsa_data_v4; wave 6: wave_6_ifs_derived_variables;	raedegrm, raeduc	rndhrs_o

Job						
numberjobs	Based on: year started job - sl_re011_1- sl_re011_20 in SHARELIFE (wave 3)	sharew3_rel1_re	wave 1: wpever; wave 2: wpsjoby, wpllsy, wplljy, wplpey, wplpsy, wplpsy2, wplps3, wplpsy4, wplpsy5, wplpey2, wplpey3, wplpey4, wplpey5, wpever; wave 3: rwjstyr, rwjstyr2-rwjstyr9, rwjsty10-rwjsty20, rwevw; wave 4: wpsjoby, wplpey, wplpsy, wplpey2, wplpey3, wplpsy2, wplpsy3, wpever; wave 5: wpsjoby, wplpey, wplpsy, wplpey2, wplpey3, wplpey4, wplpey5, wplpsy2, wplpsy3, wplpsy4, wplpsy5, wpever; wave 6: wpsjoby, wplpsy, wplpsy2- wplpsy5, wpever	wave 1: wave_1_core_data_v3; wave 2: wave_2_core_data_v4; wave 3: wave_3_life_history_data; wave 4: wave_4_elsa_data_v3; wave 5: wave_5_elsa_data_v4; wave 6: wave_6_elsa_data_v2;	r11jnjob, r10jnjob, r9jnjob, r8jnjob, r7jnjob, r6jnjob, r5jnjob, r4jnjob, r3jnjob, r2jnjob, r1jnjob	rndhrs_o
working_gaps	Based on: sl_re033_1- sl_re033_17 SHARELIFE (wave 3)	sharew3_rel1_re	rwst4a- rwst4t, rwst1a- rwst1t, rwst2a- rwst2t, rwst3a- rwst3t, rwst5a- rwst5t, rwst6a- rwst6t, rwst7a- rwst7t, rwst8a- rwst8t, rwst9a- rwst9t, rwst95a- rwst95t, rwsti, rwsti2- rwsti20;	wave_3_life_history_data	Missing	
ep027_	ep027_	sharew5_rel1-0-0_ep	scworkb	wave_6_elsa_data_v2	nlb084b	h12f1a
ep028_	ep028_	sharew5_rel1-0-0_ep	scworkg	wave_6_elsa_data_v2	nlb084b	h12f1a
ep029_	ep029_	sharew5_rel1-0-0_ep	scworkh	wave_6_elsa_data_v2	nlb084h	h12f1a
ep030_	ep030_	sharew5_rel1-0-0_ep	scworki	wave_6_elsa_data_v2	nlb084i	h12f1a
ep031_	ep031_	sharew5_rel1-0-0_ep	scworkj	wave_6_elsa_data_v2	nlb084j	h12f1a
ep032_	ep032_	sharew5_rel1-0-0_ep	scworkc	wave_6_elsa_data_v2	nlb084c	h12f1a
ep033_	ep033_	sharew5_rel1-0-0_ep	scworkd	wave_6_elsa_data_v2	nlb084d	h12f1a
ep034_	ep034_	sharew5_rel1-0-0_ep	scworke	wave_6_elsa_data_v2	nlb084e	h12f1a
ep035_	ep035_	sharew5_rel1-0-0_ep	scworkf	wave_6_elsa_data_v2	nlb084f	h12f1a
lowcontrol_ci	ep029_ , ep030_, country	sharew5_rel1-0-0_ep	scworkh, scworki	wave_6_elsa_data_v2	nlb084h , nlb084i	h12f1a

ERI	ep027_, ep028_, ep031_, ep032_, ep033_, ep034_, ep035_,	sharew5_rel1-0-0_ep	scworkb , scworkg , scworkj, scworkc, scworkd, scworke, scworkf	wave_6_elsa_data_v2	nlb084b, nlb084b, nlb084j, nlb084c, nlb084d, nlb084e, nlb084f	h12f1a
ERIi	ERI	sharew5_rel1-0-0_ep	ERI	wave_6_elsa_data_v2	ERI	h12f1a
ERIci	ERI, country	sharew5_rel1-0-0_ep	ERI	wave_6_elsa_data_v2	ERI	h12f1a
ep027_main	SHARELIFE (wave 3): sl_wq002_	sharew3_rel1_wq	Missing		Missing	
ep028_main	SHARELIFE (wave 3): sl_wq004_	sharew3_rel1_wq	Missing		Missing	
ep029_main	SHARELIFE (wave 3): sl_wq007_	sharew3_rel1_wq	Missing		Missing	
ep030_main	SHARELIFE (wave 3): sl_wq008_	sharew3_rel1_wq	Missing		Missing	
ep031_main	SHARELIFE (wave 3): sl_wq011_	sharew3_rel1_wq	Missing		Missing	
ep032_main	SHARELIFE (wave 3): sl_wq009_	sharew3_rel1_wq	Missing		Missing	
ep033_main	SHARELIFE (wave 3): sl_wq010_	sharew3_rel1_wq	Missing		Missing	
lowcontrol_ci_main	ep029_ main, ep030_main, country	sharew3_rel1_wq	Missing		Missing	
ERI_main	ep031_main, ep032_main, ep033_main, ep034_main, ep035_main, ep027_main, ep028_main	sharew3_rel1_wq	Missing		Missing	
ERIi_main	ERI_main	sharew3_rel1_wq	Missing		Missing	
ERIci_main	ERI_main, country	sharew3_rel1_wq	Missing		Missing	
Biomarker						
maxgrip	maxgrip	sharew5_rel1-0-0_gv_health	mmgsd1, mmgsd2, mmgsdom	wave_6_elsa_nurse_data_v2	ni816, ni852, ni851, ni853	h12f1a
General Health						
ph006d1	ph006d1	sharew5_rel1-0-0_ph	wave 0: illsm1- illsm5 (=16); wave 1,2,3,4,5: hefrac; wave 6: hediami, hedacmi, hedawmi, heagb, henmmi, hedanmi, hediahf, hedashf, hedawmi, hedachf, heagc, hedanhf, hediahm, hedashm, hedawhm, hedachm, hedanhm, hediaar, hedasar, hedawhm, hedacar, hedanar, hedia95, hedasot, hedawot, hedacot, hedanot;	wave 0: wave_0_common_variables_v2, wave_0_1998_data, wave_0_1999_data, wave_0_2001_data; wave 1: wave_1_core_data_v3; wave 2: wave_2_core_data_v4; wave 3: wave_3_elsa_data_v4; wave 4: wave_4_elsa_data_v3; wave 5:	r11hearte, r10hearte, r9hearte, r8hearte, r7hearte, r6hearte, r5hearte, r4hearte, r3hearte, r2hearte, r1hearte	rndhrs_o

				wave_5_elsa_data_v4; wave 6: wave_6_elsa_data_v2;		
ph006d2	ph006d2	sharew5_rel1-0-0_ph	wave 0: illsm1- illsm5 (=17); wave 1,2,3,4,5: hefrac; wave 6: hediabp, hedasbp, hedawbp, hedacbp, hedanbp;	wave 0: wave_0_common_variables_v2, wave_0_1998_data, wave_0_1999_data, wave_0_2001_data; wave 1: wave_1_core_data_v3; wave 2: wave_2_core_data_v4; wave 3: wave_3_elsa_data_v4; wave 4: wave_4_elsa_data_v3; wave 5: wave_5_elsa_data_v4; wave 6: wave_6_elsa_data_v2;	r11hibpe, r10hibpe, r9hibpe, r8hibpe, r7hibpe, r6hibpe, r5hibpe, r4hibpe, r3hibpe, r2hibpe, r1hibpe	rndhrs_o
ph006d3	ph006d3	sharew5_rel1-0-0_ph	wave 6: hediach, hedasch, hedawch, hedacch, hedanch;	wave 6: wave_6_elsa_data_v2;	missing	
ph006d4	ph006d4	sharew5_rel1-0-0_ph	wave 0: illsm1- illsm5 (=15); wave 1,2,3,4,5: hefrac; wav 6: hediast, hedawst, hedacst, heage, henmst, hedanst,	wave 0: wave_0_common_variables_v2, wave_0_1998_data, wave_0_1999_data, wave_0_2001_data; wave 1: wave_1_core_data_v3; wave 2: wave_2_core_data_v4; wave 3: wave_3_elsa_data_v4; wave 4: wave_4_elsa_data_v3; wave 5: wave_5_elsa_data_v4; wave 6: wave_6_elsa_data_v2;	r11stroke, r10stroke, r9stroke, r8stroke, r7stroke, r6stroke, r5stroke, r4stroke, r3stroke, r2stroke, r1stroke	rndhrs_o
ph006d5	ph006d5	sharew5_rel1-0-0_ph	wave 0: illsm1- illsm5 (=2); wave 1,2,3,4,5: hefrac; wave 6: hediadi, hedawdi, hedacdi, hedandi,	wave_0_common_variables_v2, wave_0_1998_data, wave_0_1999_data, wave_0_2001_data; wave 1:	r11diabe, r10diabe, r9diabe, r8diabe, r7diabe,	rndhrs_o

				wave_1_core_data_v3; wave 2: wave_2_core_data_v4; wave 3: wave_3_elsa_data_v4; wave 4: wave_4_elsa_data_v3; wave 5: wave_5_elsa_data_v4; wave 6: wave_6_elsa_data_v2;	r6diabe, r5diabe, r4diabe, r3diabe, r2diabe, r1diabe	
ph006d6	ph006d6	sharew5_rel1-0-0_ph	wave 0: illsm1- illsm5 (=22); wave 1,2,3,4,5: hefrac; wave 6: hediblu, hedblu, hedbwlu, hedbdlu, hedbmlu;	wave_0_common_variables_v2, wave_0_1998_data, wave_0_1999_data, wave_0_2001_data; wave 1: wave_1_core_data_v3; wave 2: wave_2_core_data_v4; wave 3: wave_3_elsa_data_v4; wave 4: wave_4_elsa_data_v3; wave 5: wave_5_elsa_data_v4; wave 6: wave_6_elsa_data_v2;	r11lunge, r10lunge, r9lunge, r8lunge, r7lunge, r6lunge, r5lunge, r4lunge, r3lunge, r2lunge, r1lunge	rndhrs_o
ph006d10	ph006d10	sharew5_rel1-0-0_ph	wave 0: illsm1- illsm5 (=1); wave 1,2,3,4,5: hefrac; wave 6: hedibca, hedbsca, hedbwca, hedbdca, heagg, hedbmca;	wave_0_common_variables_v2, wave_0_1998_data, wave_0_1999_data, wave_0_2001_data; wave 1: wave_1_core_data_v3; wave 2: wave_2_core_data_v4; wave 3: wave_3_elsa_data_v4; wave 4: wave_4_elsa_data_v3; wave 5: wave_5_elsa_data_v4; wave 6: wave_6_elsa_data_v2;	r11cancre, r10cancre, r9cancre, r8cancre, r7cancre, r6cancre, r5cancre, r4cancre, r3cancre, r2cancre, r1cancre	rndhrs_o
ph006d11	ph006d11	sharew5_rel1-0-0_ph	missing		missing	
ph006d12	ph006d12	sharew5_rel1-0-0_ph	wave 6: hedibpd, hedbspd,	wave 6:	missing	

			hedbwpd, hedbdpd, heprk, hedbmpd;	wave_6_elsa_data_v2;		
ph006d13	ph006d13	sharew5_rel1-0-0_ph	wave 6: heoptca, heopsca, heopfca, heopcca, heopnca;	wave 6: wave_6_elsa_data_v2;	missing	
ph006d14	ph006d14	sharew5_rel1-0-0_ph	wave 1,2,3,4,5,6: hefrac;	wave 1: wave_1_core_data_v3; wave 2: wave_2_core_data_v4; wave 3: wave_3_elsa_data_v4; wave 4: wave_4_elsa_data_v3; wave 5: wave_5_elsa_data_v4; wave 6: wave_6_elsa_data_v2;	missing	
ph006d15	ph006d15	sharew5_rel1-0-0_ph	missing		missing	
ph006d16	ph006d16	sharew5_rel1-0-0_ph	wave 6: hedibad, hedbwad, hedbdad, heagi, hedbmad, hedibde, hedbsde, hedbwad¸ hedbdde, heagj, hedbmde;	wave 6: wave_6_elsa_data_v2;	r11alzhe, r10alzhe, r9alzhe, r8alzhe, r7alzhe, r6alzhe, r5alzhe, r4alzhe, r3alzhe, r2alzhe, r1alzhe	rndhrs_o
ph006d18	ph006d18	sharew5_rel1-0-0_ph	wave 0: illsm1- illsm5 (=4); wave 6: hedibps, hedbwps, hedbdps, heagh, hedbmps, hepsyha, hepsyan¸ hepsyde, hepsyem, hepsysc, hepsyps, hepsymo, hepsyma, hepsy95, heyrc;	wave 0: wave_0_common_variables_v2, wave_0_1998_data, wave_0_1999_data, wave_0_2001_data; wave 6: wave_6_elsa_data_v2;	r11psyche, r10psyche, r9psyche, r8psyche, r7psyche, r6psyche, r5psyche, r4psyche, r3psyche, r2psyche, r1psyche	rndhrs_o
ph006d19	ph006d19	sharew5_rel1-0-0_ph	wave 6: hedibar, hedbsar, hedbwar, hedbdar, heagf, hedbmar, heartra;	wave 6: wave_6_elsa_data_v2;	r11arthre, r10arthre, r9arthre, r8arthre, r7arthre, r6arthre,	rndhrs_o

					r5arthre, r4arthre, r3arthre, r2arthre, r1arthre	
ph006d20	ph006d20	sharew5_rel1-0-0_ph	wave 6: heartoa;	wave 6: wave_6_elsa_data_v2;	missing	
illnesses_adult_ever	Sum of ph006d1, ph006d2, ph006d4, ph006d5, ph006d6 , ph006d10, ph006d16, ph006d18, ph006d19	sharew5_rel1-0-0_ph	Sum of ph006d1, ph006d2, ph006d4, ph006d5, ph006d6 , ph006d10, ph006d16, ph006d18, ph006d19	wave 6: wave_6_elsa_data_v2;	Sum of ph006d1, ph006d2, ph006d4, ph006d5, ph006d6 , ph006d10, ph006d16, ph006d18, ph006d19	rndhrs_o
ph061_	ph061_	sharew5_rel1-0-0_ph	helwk	wave_6_elsa_data_v2	r11hlthlm	rndhrs_o
sphus	sphus (ph003)	sharew5_rel1-0-0_gv_health	hehelf	wave_6_elsa_data_v2	r11shlt	rndhrs_o
hs054_	hs054_ SHARELIFE (wave 3)	sharew3_rel1_hs	rhpbb	wave_3_life_history_data		
Mental Health						
eurod	eurod	sharew5_rel1-0-0_gv_health	Missing: see eurod_lin1		Missing: see eurod_lin1	
eurod_lin1	eurod	Prediction rule via linear Regression	Prediction: cesd1, cesd2, cesd3, cesd4, cesd5, cesd6, cesd7, cesd8, age, age2, age3, gender, sphus		Prediction: cesd1, cesd2, cesd3, cesd4, cesd5, cesd6, cesd7, cesd8, age, age2, age3, gender, sphus	
cesd	wave 1: q4_a, q4_b, q4_c, q4_d, q4_e, q4_g, q4_h, q4_j;	sharew1_rel2-6-0_dropoff	psceda, pscedb, pscedc, pscedd, pscede, pscedf, pscedg, pscedh	wave 6: wave_6_elsa_data_v2	r11depres, r11effort, r11sleepr, r11whappy, r11flone, r11enlife, r11fsad, r11going	rndhrs_o
cesd_lin1	Prediction based on wave 1: eurod, age, age2, age3, gender , sphus	Prediction rule via linear Regression	cesd		cesd	
Limitations in activities of daily living						
ph049d1	ph049d1	sharew5_rel1-0-0_ph	headldr	wave_6_elsa_data_v2	r11dress	rndhrs_o
ph049d2	ph049d2	sharew5_rel1-0-0_ph	headlwa	wave_6_elsa_data_v2	r11walkr	rndhrs_o
ph049d3	ph049d3	sharew5_rel1-0-0_ph	headlba	wave_6_elsa_data_v2	r11bath	rndhrs_o
ph049d4	ph049d4	sharew5_rel1-0-0_ph	headlea	wave_6_elsa_data_v2	r11eat	rndhrs_o
ph049d5	ph049d5	sharew5_rel1-0-0_ph	headlbe	wave_6_elsa_data_v2	r11bed	rndhrs_o
ph049d6	ph049d6	sharew5_rel1-0-0_ph	headlwc	wave_6_elsa_data_v2	r11toilt	rndhrs_o
ph049d7	ph049d7	sharew5_rel1-0-0_ph	headlma	wave_6_elsa_data_v2	r11mapa	rndhrs_o
ph049d8	ph049d8	sharew5_rel1-0-0_ph	headlpr	wave_6_elsa_data_v2	r11meals	rndhrs_o
ph049d9	ph049d9	sharew5_rel1-0-0_ph	headlsh	wave_6_elsa_data_v2	r11shop	rndhrs_o

ph049d10	ph049d10	sharew5_rel1-0-0_ph	headlph	wave_6_elsa_data_v2	r11phone	rndhrs_o
ph049d11	ph049d11	sharew5_rel1-0-0_ph	headlme	wave_6_elsa_data_v2	r11meds	rndhrs_o
ph049d12	ph049d12	sharew5_rel1-0-0_ph	headlho	wave_6_elsa_data_v2	missing	
ph049d13	ph049d13	sharew5_rel1-0-0_ph	headlmo	wave_6_elsa_data_v2	r11money	rndhrs_o
iadl	ph049d7, ph049d8, ph049d9, ph049d10, ph049d11, ph049d13	sharew5_rel1-0-0_ph	headlma, headlpr, headlsh, headlph, headlme, headlmo	wave_6_elsa_data_v2	r11mapa, r11meals, r11shop, r11phone, r11meds, r11money	rndhrs_o
adl	ph049d1, ph049d2, ph049d3, ph049d4, ph049d5, ph049d6	sharew5_rel1-0-0_gv_health	headldr, headlwa, headlba, headlea, headlbe, headlwc,	wave_6_elsa_data_v2	r11dress, r11walkr, r11bath, r11eat, r11bed, r11toilt	rndhrs_o
Life course history						
backpain_adult	SHARELIFE (wave 3): hs055d1_1, hs055d1_2, hs055d1_3	sharew3_rel1_hs	rhpbc1	wave_3_life_history_data	Missing	
arthr_adult	SHARELIFE (wave 3): hs055d2_1, hs055d2_2, hs055d2_3	sharew3_rel1_hs	rhpbc2	wave_3_life_history_data	Missing	
osteo_adult	SHARELIFE (wave 3): hs055d3_1, hs055d3_2, hs055d3_3	sharew3_rel1_hs	rhpbc3	wave_3_life_history_data	Missing	
angina_adult	SHARELIFE (wave 3): hs055d4_1, hs055d4_2, hs055d4_3	sharew3_rel1_hs	rhpbc4	wave_3_life_history_data	Missing	
heart_adult	SHARELIFE (wave 3): hs055d5_1, hs055d5_2, hs055d5_3	sharew3_rel1_hs	rhpbc5	wave_3_life_history_data	Missing	
diab_adult	SHARELIFE (wave 3): hs055d6_1, hs055d6_2, hs055d6_3	sharew3_rel1_hs	rhpbc6	wave_3_life_history_data	Missing	
stroke_adult	SHARELIFE (wave 3): hs055d7_1, hs055d7_2, hs055d7_3	sharew3_rel1_hs	rhpbc7	wave_3_life_history_data	Missing	
asthma_adult	SHARELIFE (wave 3): hs055d8_1, hs055d8_2, hs055d8_3	sharew3_rel1_hs	rhpbc8	wave_3_life_history_data	Missing	
respiratory_adult	SHARELIFE (wave 3): hs055d9_1, hs055d9_2, hs055d9_3	sharew3_rel1_hs	rhpbc9	wave_3_life_history_data	Missing	
headaches_adult	SHARELIFE (wave 3): hs055d11_1, hs055d11_2, hs055d11_3	sharew3_rel1_hs	rhpbc10	wave_3_life_history_data	Missing	
cancer_adult	SHARELIFE (wave 3): hs056d1_1, hs056d1_2, hs056d1_3, hs056d2_1, hs056d2_2,	sharew3_rel1_hs	rhpbx1, rhpbx2	wave_3_life_history_data	Missing	

	hs056d2_3,					
psych_adult	SHARELIFE (wave 3): hs056d3_1, hs056d3_2, hs056d3_3,	sharew3_rel1_hs	rhpbx3	wave_3_life_history_data	Missing	
fatigue_adult	SHARELIFE (wave 3): hs056d4_1, hs056d4_2, hs056d4_3,	sharew3_rel1_hs	rhpbx4	wave_3_life_history_data	Missing	
eyesight_adult	SHARELIFE (wave 3): hs056d6_1, hs056d6_2, hs056d6_3,	sharew3_rel1_hs	rhpbx6	wave_3_life_history_data	Missing	
infectious_adult	SHARELIFE (wave 3): hs056d7_1, hs056d7_2, hs056d7_3,	sharew3_rel1_hs	rhpbx7	wave_3_life_history_data	Missing	
allergies_adult	SHARELIFE (wave 3): hs056d8_1, hs056d8_2, hs056d8_3,	sharew3_rel1_hs	rhpbx8	wave_3_life_history_data	Missing	
illnesses_adult_16	Sum of adulthood illnesses16+ listed above	sharew3_rel1_hs	Sum of adulthood illnesses16+ listed above	wave_3_life_history_data	Missing	
infectious_ch	SHARELIFE (wave 3): hs008d1, hs008d2; wave 5: mc012d1, mc012d2	sharew3_rel1_hs, sharew5_rel1-0-0_mc	rhcig1	wave_3_life_history_data	wave 9: lb100, lb101, lb102, lb125m1m, lb125m2m, lb125m3m, lb124; wave 10: mb100, mb101, mb102, mb125m1m, mb125m2m, mb125m3m, mb124; wave 11: nb100, nb101, nb102, nb125m1m, nb125m2m, nb125m3m, nb124;	h08f2a, hd10f5c, h12f1a.dta
asthma_ch	SHARELIFE (wave 3): hs008d3; wave 5: mc012d3	sharew3_rel1_hs, sharew5_rel1-0-0_mc	rhcig3	wave_3_life_history_data	wave 9: lb105; wave 10: mb105; wave 11: nb105;	h08f2a, hd10f5c, h12f1a.dta
respiratory_ch	SHARELIFE (wave 3): hs008d4; wave 5: mc012d4	sharew3_rel1_hs, sharew5_rel1-0-0_mc	rhcig5	wave_3_life_history_data	wave 9: lb107, lb125m1m, lb125m2m, lb125m3m, lb124; wave 10: mb107, mb125m1m, mb125m2m, mb125m3m, mb124; wave 11: nb107, nb125m1m, nb125m2m, nb125m3m, nb124;	h08f2a, hd10f5c, h12f1a.dta
allergies_ch	SHARELIFE (wave 3): hs008d5; wave 5: mc012d5	sharew3_rel1_hs, sharew5_rel1-0-0_mc	rhcig4	wave_3_life_history_data	wave 9: lb109; wave 10: mb109; wave 11: nb109;	h08f2a, hd10f5c, h12f1a.dta

ear_ch	SHARELIFE (wave 3): hs008d8; wave 5: mc012d8	sharew3_rel1_hs, sharew5_rel1-0-0_mc	rhcig6	wave_3_life_history_data	wave 9: lb111; wave 10: mb111; wave 11: nb111;	h08f2a, hd10f5c, h12f1a.dta
headaches_ch	SHARELIFE (wave 3): hs009d1; wave 5: mc013d1	sharew3_rel1_hs, sharew5_rel1-0-0_mc	rhcig7	wave_3_life_history_data	wave 9: lb113; wave 10: mb113; wave 11: nb113;	h08f2a, hd10f5c, h12f1a.dta
epilepsy_ch	SHARELIFE (wave 3): hs009d2; wave 5: mc013d2	sharew3_rel1_hs, sharew5_rel1-0-0_mc	rhcig8	wave_3_life_history_data	wave 9: lb112; wave 10: mb112; wave 11: nb112;	h08f2a, hd10f5c, h12f1a.dta
psych_ch	SHARELIFE (wave 3): hs009d3; wave 5: mc013d3	sharew3_rel1_hs, sharew5_rel1-0-0_mc	rhcig9	wave_3_life_history_data	wave 9: lb116, lb118, lb125m1m, lb125m2m, lb125m3m, lb124; wave 10: mb116, mb118, mb125m1m, mb125m2m, mb125m3m, mb124; wave 11: nb116, nb118, nb125m1m, nb125m2m, nb125m3m, nb124;	h08f2a, hd10f5c, h12f1a.dta
fractures_ch	SHARELIFE (wave 3): hs009d4; wave 5: mc013d4	sharew3_rel1_hs, sharew5_rel1-0-0_mc	rhcig2	wave_3_life_history_data	wave 9: lb125m1m, lb125m2m, lb125m3m, lb124; wave 10: mb125m1m, mb125m2m, mb125m3m, mb124; wave 11: nb125m1m, nb125m2m, nb125m3m, nb124;	h08f2a, hd10f5c, h12f1a.dta
diabetes_ch	SHARELIFE (wave 3): hs009d6; wave 5: mc013d6	sharew3_rel1_hs, sharew5_rel1-0-0_mc	rhcig11	wave_3_life_history_data	wave 9: lb106; wave 10: mb106; wave 11: nb106;	h08f2a, hd10f5c, h12f1a.dta
heart_ch	SHARELIFE (wave 3): hs009d7; wave 5: mc013d7	sharew3_rel1_hs, sharew5_rel1-0-0_mc	rhcig12	wave_3_life_history_data	wave 9: lb110; wave 10: mb110; wave 11: nb110;	h08f2a, hd10f5c, h12f1a.dta
cancer_ch	SHARELIFE (wave 3): hs009d8, hs009d9; wave 5: mc013d8, mc013d9	sharew3_rel1_hs, sharew5_rel1-0-0_mc	rhcig13, rhcig14	wave_3_life_history_data	wave 9: lb125m1m, lb125m2m, lb125m3m, lb124; wave 10: mb125m1m, mb125m2m, mb125m3m, mb124; wave 11: nb125m1m, nb125m2m, nb125m3m, nb124;	h08f2a, hd10f5c, h12f1a.dta
illnesses_ch	Sum of childhood illnesses listed above	sharew3_rel1_hs, sharew5_rel1-0-0_mc	Sum of childhood illnesses listed above	wave_3_life_history_data	Sum of childhood illnesses listed above	h08f2a, hd10f5c, h12f1a.dta
cs002	SHARELIFE (wave 3):	sharew3_rel1_cs,	raroo	wave_3_life_history_data	Missing	

	cs002 & wave 5: mc003_					
cs003	SHARELIFE (wave 3): cs003 & wave 5: mc004_	sharew3_rel1_cs,	rapeo	wave_3_life_history_data	Missing	
cs008	SHARELIFE (wave 3): cs008 & wave 5: mc005_	sharew3_rel1_cs,	rabks	wave_3_life_history_data	Missing	
cs010	SHARELIFE (wave 3): cs010 & wave 5: mc006_	sharew3_rel1_cs,	missing		Missing	
Cognition						
cf003_	cf003_	sharew5_rel1-0-0_cf	cfdatd	wave_6_elsa_data_v2	r11dy	rndhrs_o
cf004_	cf004_	sharew5_rel1-0-0_cf	cfdatm	wave_6_elsa_data_v2	r11mo	rndhrs_o
cf005_	cf005_	sharew5_rel1-0-0_cf	cfdaty	wave_6_elsa_data_v2	r11yr	rndhrs_o
cf006_	cf006_	sharew5_rel1-0-0_cf	cfday	wave_6_elsa_data_v2	r11dw	rndhrs_o
cf008tot	cf008tot	sharew5_rel1-0-0_gv_health	cflisen	wave_6_elsa_data_v2	r11imr	rndhrs_o
cf016tot	cf016tot	sharew5_rel1-0-0_gv_health	cflisd	wave_6_elsa_data_v2	r11dlrc	rndhrs_o