SHARE ERIC
SURVEY OF HEALTH, AGEING AND RETIREMENT IN EUROPE

SHARE WORKING PAPER SERIES

Health shocks and spousal labor supply: An international perspective

Nicholas A. Jolly, Nikolaos Theodoropoulos

Working Paper Series 67-2021

SHARE-ERIC | Amalienstr. 33 | 80799 Munich | Germany | share-eric.eu

MAX PLANCK INSTITUTE FOR SOCIAL LAW AND SOCIAL POLICY
Munich Center for the Economics of Aging

This project has received funding from the European Union under grant agreements VS/2019/0332, VS/2020/0313 and the European Union's Horizon 2020 research and innovation programme under grant agreements No 870628, No 101015924.

SPONSORED BY THE Federal Ministry of Education and Research

Supported by the NIH National Institute on Aging

About the SHARE Working Paper Series

The series is designed to provide a timely discussion of results based on SHARE data within the SHARE family, i.e., members of the SHARE Country Teams, Area Coordination Teams and other SHARE bodies. The papers are not peer reviewed; the authors are solely responsible for the scientific content and the graphical layout of their submissions. The respective Country Team Leaders and Area Coordinators are encouraged to look over the submissions by their team members.

The publisher (SHARE ERIC) checks working papers in this series for formal issues such as proper acknowledgements to the funders of SHARE. The publisher takes no responsibility for the scientific content of the paper.

Acknowledgements

This paper uses data from SHARE Waves 1, 2, 3, 4, 5, 6 and 7. (DOIs: 10.6103/SHARE.w1.710, 10.6103/SHARE.w2.710, 10.6103/SHARE.w3.710, 10.6103/SHARE.w4.710, 10.6103/SHARE.w5.710, 10.6103/SHARE.w6.710, 10.6103/SHARE.w7.711), see Börsch-Supan et al. (2013) for methodological details. The SHARE data collection has been funded by the European Commission through FP5 (QLK6-CT-2001-00360), FP6 (SHARE-I3: RII-CT-2006-062193, COMPARE: CIT5-CT-2005-028857, SHARELIFE: CIT4-CT-2006-028812), FP7 (SHARE-PREP: GA N°211909, SHARE-LEAP: GA N°227822, SHARE M4: GA N°261982, DASISH: GA N°283646) and Horizon 2020 (SHARE-DEV3: GA N°676536, SHARE-COHESION: GA N°870628, SERISS: GA N°654221, SSHOC: GA N°823782) and by DG Employment, Social Affairs & Inclusion. Additional funding from the German Ministry of Education and Research, the Max Planck Society for the Advancement of Science, 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, HHSN271201300071C) and from various national funding sources is gratefully acknowledged (see www.share-project.org).

The authors would like to thank Alexandros Polycarpou for help with the data.

HEALTH SHOCKS AND SPOUSAL LABOR SUPPLY: AN INTERNATIONAL PERSPECTIVE

Nicholas A. Jolly
Department of Economics
College of Business Administration
Marquette University
P.O. Box 1881
Milwaukee, WI 53201-1881
USA
nicholas.jolly@marquette.edu

Nikolaos Theodoropoulos
Department of Economics
University of Cyprus
P.O. Box 20537
CY-1678 Nicosia
Cyprus
n.theodoropoulos@ucy.ac.cy

Abstract: This paper uses data from the Survey of Health, Ageing and Retirement in Europe to analyze the effect of spousal health shocks on own labor market outcomes. Results from the analysis suggest large reductions in labor supply along the extensive margin upon the onset of a spouse's work-limiting disability, suggesting that individuals leave the labor market to either provide care or consume joint leisure. Spousal disabilities further tend to be associated with an increased propensity to work part-time and a reduced probability of full-time employment. Sensitivity analyses show that the provision of care is more important for wives than for husbands of disabled spouses. Spousal health shocks also reduce overall financial well-being of the affected worker's partner. The onset of a spouse's work-limiting health condition reduces own-labor earnings and increases payments from pension income. However, increases in pension income do not completely offset the reduction in labor earnings. Finally, the analysis finds substantial cross-country heterogeneity in the effect spousal health shocks have on the various labor market outcomes examined here, which suggests an important role for country-specific institutions in mitigating the negative effect of health shocks on familial well-being.

JEL Codes: I10; J12; J22
Keywords: health shocks; marriage; labor supply

INTRODUCTION

Researchers and policymakers have long been interested in the economic well-being of individuals suffering from work-limiting health shocks. With advances in the application of panel data techniques, researchers have been able to document the dynamic, long-term impact health shocks have on workers, specifically focusing on earnings, income, and hours worked. For example, the onset of a work-limiting disability is associated with a permanent loss in labor earnings, with evidence suggesting earnings losses of 15%-24% even 10 years after onset occurs (Stephens 2001; Charles 2003; Mok et al. 2008; Meyer and Mok 2019). Further, these earnings losses translate into downward movements in the earnings and income distributions (Nagi and Hadley 1972; Jolly 2013). An area receiving less attention is how the onset of work-limiting disabilities influences the labor market outcomes of the affected individual's spouse. This paper uses longitudinal data from the Survey of Health, Ageing and Retirement in Europe (SHARE) from 2004 to 2017 to study the relationship between labor supply and spousal health shocks.

While understanding the individual experiences of disabled workers is important, it is necessary to explore the impact that work-limiting health shocks have on affected workers' spouses, particularly if programs designed to assist the disabled are to be structured efficiently (Riphahn 1999). Given the financial distress caused by disability, it is reasonable for spouses to adjust their labor supply. Knowing the extent of this adjustment is necessary for understanding if the loss of the disabled worker's earnings is a permanent loss to family income or is offset by increased spousal earnings. Theory, however, does not provide a clear prediction as to the directional relationship between work-limiting health shocks and spousal labor supply.

On the one hand, the onset of a disability should increase spousal labor supply through the added worker effect. A permanent decline in a disabled worker's earnings decreases spousal

non-labor income, which should increase labor supply, assuming leisure is a normal good. The added worker effect may be amplified along four dimensions (Coile 2004; Wu 2003). First, a liquidity-constrained household that cannot borrow to insure against a permanent income shock may experience a larger added worker effect. Second, if the affected worker needs to leave the labor force and loses employer-sponsored health insurance, then the spouse may face added pressure to increase labor supply to qualify for insurance. Third, household expenses may increase due to out of pocket medical expenses thus increasing the need to increase labor supply. Finally, one spouse's home production may substitute for the other spouse's home production. If the disabled individual increases time spent in home production, then this will free up market-based time for the spouse.[1]

On the other hand, it is possible for a work-limiting health shock to reduce spousal labor supply. This is particularly true if the healthy spouse needs to provide in-home care to the disabled individual. Additionally, work-limiting health shocks reduce workers' labor supply (e.g. Charles 2003), which necessarily leads to an increase in time spent at home. If non-market-based time of one spouse complements the other's, then the disability should reduce spousal labor supply. Finally, it is possible that public assistance programs that provide financial aid to those who suffer from work-limiting health shocks crowd out spousal labor supply. Berger and Fleisher (1984) provide evidence of public program crowd out. The authors do not differentiate between the types of public assistance the disabled receive; however, Chen (2012) provides evidence showing spousal labor supply crowd out from Social Security Disability Insurance.

[1] Hardoy and Schøne (2014) examine the effect of husbands' job displacements on their wives' labor supply using Norwegian data. The authors find no evidence of an added worker effect, which suggests some crowding-out effect of social welfare programs. However, Kohara (2010), using Japanese data, finds an increase in wife labor supply at the intensive and extensive margins following a husband's job displacement.

In this paper, we use 2004 to 2017 SHARE data to analyze the relationship between work-limiting health shocks and spousal labor supply. The SHARE data contain survey responses from individuals aged 50 or older and their spouses irrespective of age across 28 European countries and Israel. On average, our results show a negative labor supply response to spousal health shocks at both the extensive and intensive margins. The magnitude of the response is similar across genders. Substantial cross-country heterogeneity exists along all dimensions of labor supply, which highlights the importance of country-specific institutions that aid families affected by health shocks. We further show that the provision of care accounts for approximately 50% of the decrease in labor supply, and this caring effect is much stronger for women of disabled husbands relative to men of disabled wives.

The paper proceeds by discussing the relevant literature in Section II. Section III details the data and empirical methodology. Section IV describes the results, while Section V offers concluding remarks.

LITERATURE REVIEW

The earlier literature on health shocks and spousal labor supply finds conflicting evidence. When focusing on the female labor supply response to a husband's health shock, Coile (2004), Garcia-Gomez et al. (2013), and Meyer and Mok (2019) find no effect, whereas Charles (1999) and Kim, Lee, and Halliday (2018) find a positive effect. Braakmann (2014) finds no effect that spouses adjust their labor supply behavior when the other spouse becomes disabled. Fadlon and Nielsen (forthcoming) find no effect on female labor supply after a severe, non-fatal health shock, and a positive effect after a fatal one. Only Jeon and Pohl (2017) and Shen, Zheng, and Tan (2019) find a negative relationship between a husband's health shock and

his wife's labor supply. Berger and Fleisher (1984) find a positive female labor supply response to a husband's health shock that is mitigated by the availability and generosity of public assistance programs, and Siegel (2006) finds that wives' labor supply responses differ depending on the measure of the husband's health used in the analysis.

The literature also finds that husbands' labor supply responds to their wives' health shock. Again, however, the evidence is inconsistent. Some find that men reduce their labor supply (Charles 1999; Garcia-Gomez et al. 2013; Fadlon and Nielsen forthcoming; Jeon and Pohl 2017; Shen et al. 2019), whereas others find an increase (Coile 2004) or no change (Kim et al. 2018). The only consistency in the literature is that husbands' and wives' respond differently to a spousal health shock. Only two papers find similar movements in labor supply responses across gender. Jeon and Pohl (2017) and Shen et al. (2019) find that men and women reduce their labor supply by relatively similar magnitudes in response to a spousal health shock.

Given the theoretically ambiguous effect of health shocks on spousal labor supply described above, it is unsurprising that the literature finds differing effects. However, differences between studies exist in terms of data used, and these differences help to further explain the inconsistent findings. For example, Berger and Fleisher (1984), Charles (1999), Coile (2004), Siegel (2006), and Meyer and Mok (2019) use data from the United States, whereas Garcia-Gomez et al. (2013) use data from the Netherlands, Fadlon and Nielsen (forthcoming) use Danish data, Jeon and Pohl (2017) use Canadian data, Kim et al. (2018) use data from South Korea, and Shen et al. (2019) use Chinese data. These countries have different social safety nets, which could lead to dissimilar findings across studies.

Even within US-based papers, the data used contain different sub-groups. Charles (1999), Coile (2004), and Siegel (2006) use data from the Health and Retirement Study (HRS),

while Meyer and Mok (2019) use the Panel Study of Income Dynamics and Berger and Fleisher (1984) use the National Longitudinal Surveys. The HRS is a sample of older individuals, whereas Meyer and Mok (2019) limit their sample to male household heads younger than 62.[2] Results may differ for older versus younger spouses. Young individuals facing a health shock have a greater incentive to reinvest in human capital to help adjust due to the longer working life expected when compared to older individuals experiencing a similar health shock (Charles 2003). Therefore, younger spouses may adjust differently relative to their older counterparts.

Differences across studies exist not only in terms of data used, but also in terms of the type of health shock examined. Berger and Fleisher (1984), Charles (1999), and Meyer and Mok (2019) examine self-reported work-limitations, whereas Coile (2004) and Kim et al. (2018) examine acute health events, such as heart attacks, chronic illnesses, such as lung disease, and accidental injuries. Shen et al. (2019) investigate chronic diseases such as cardiovascular diseases, cancer, chronic respiratory diseases and diabetes. Other papers look at acute hospitalizations (Garcia-Gomez et al. 2013), cancer diagnoses (Jeon and Pohl 2017), heart attacks, strokes, and deaths (Fadlon and Nielsen forthcoming). There is no reason that these very different health events should lead to the same type of familial response.

This paper contributes to the literature by using SHARE data in the analysis. The Survey of Health, Ageing and Retirement in Europe is a longitudinal dataset currently containing individuals residing in 28 European countries and Israel. This multinational characteristic of the dataset offers harmonization of survey questions and sample selection criteria across multiple countries. This harmonization allows researchers the ability to perform cross-country comparisons without differences in health outcomes and sample characteristics serving as

[2] Berger and Fleisher (1984) did not report an age range. However, the average age of the women in their sample is 46 years old.

potential confounding factors. Furthermore, instead of conducting single-country case studies, the harmonization in the SHARE data allows for the pooling of nations into one dataset. By pooling countries and including country-specific fixed-effects in the estimated equations, the estimates provided here account for any country-specific institutional features (e.g. social safety nets) that would influence estimates of the labor supply response to spousal health shocks. In our analysis, we estimate the average relationship between spousal health and a wide array of own-labor market outcomes, including labor supply, earnings, and pension income, while accounting for these country specific institutional features. Furthermore, because of the multinational feature of the data, we perform an analysis comparing these relationships across numerous European countries and Israel. According to Börsch-Supan (1992) the importance of international comparisons is crucial as different countries have different institutions and different social safety nets. When studying a single country, it is infeasible to separate preferences from the impact of institutions and policies since there are possibly very few changes of institutions and policies in one country in order to properly identify their impacts (Börsch-Supan 1992). In fact, Angelini et al. (2012) use the first wave of the SHARE data to uncover significant cross-country heterogeneity in self-reported disability status of elderly people in Europe. This heterogeneity in self-reported disability rates is driven by macroeconomic differences across countries and different institutional features associated with the generosity of disability schemes.

To our knowledge, this is the first paper to provide such an analysis. In fact, Riekhoff and Vaalavuo (forthcoming) is the only other study using SHARE data to investigate couples' labor supply decisions after the onset of a husband's work-limiting health shock. The authors find that the probability of both partners working full-time falls after the husband experiences a health shock. However, the propensity for joint retirement increases as does the odds of the

husband retiring and the wife continuing to work either part- or full-time. The changes in probability depend upon whether the spouses have similar levels of schooling.

Our paper differs from Riekhoff and Vaalavuo (forthcoming) along several important dimensions. First, Riekhoff and Vaalavuo (forthcoming) limit their analysis to health shocks experienced by the husband. The authors do not examine female health shocks, which precludes a comparison across genders. Here, we explicitly compare responses to spousal health shocks across genders. Additionally, Riekhoff and Vaalavuo (forthcoming) limit their sample to two waves of SHARE data, which limits the sample to 1,022 couples. The authors note how this small sample restricts their ability to perform a cross-country comparison, and instead only include regional dummy variables in the estimated equations. As discussed below, we use more waves of SHARE, which brings our sample to 38,872 couples. Finally, we examine not only probabilities of working part-time and working full-time, but also weekly hours of work, annual earnings, and annual pension income, which Riekhoff and Vaalavuo (forthcoming) ignore.

DATA AND METHODOLOGY

The data for this analysis come from the Survey of Health, Aging and Retirement in Europe (SHARE), which is a longitudinal dataset designed to understand how health, economic, social, and environmental policies affect individuals who are at least 50 years old and reside in Europe and Israel (see Börsch-Supan 2017 for complete documentation of the SHARE data). The SHARE project began in 2004 by surveying individuals from 11 European countries and Israel. Since 2004, six additional surveys occurred in 2006, 2008, 2011, 2013, 2015, and 2017. In addition, wave 8 has been fielded in 2019/2020. In each new wave, new countries are included. SHARE offers data from 28 European countries and Israel. The list of countries and

their year of inclusion appear in Table 1. For this analysis, the 2008 wave provides no observations to the analytical sample used in the estimation. This wave gathered retrospective information detailing life events, not information on year-specific characteristics such as current labor market status. However, we do use data from the 2008 wave to construct certain variables, such as labor market experience.

The unit of analysis here is an individual in a married, opposite-sex couple with spouse present who does not live in a country that first joined the SHARE project in 2017. Just as in 2008, individuals residing in countries that first joined SHARE in 2017 were only asked about retrospective information on life events, not information on year-specific labor market characteristics. We also exclude couples living in Ireland from the analysis because respondents in that country only participated in the second wave of SHARE, and the number of respondents with useable observations in that country in our final sample is only 262. Therefore, any results that are specific to Ireland would be based on a rather small sample. Since the goal of this paper is to perform a cross-country comparison, we exclude respondents from Ireland for this reason.

We remove observations from the sample if both spouses report working more than 168 hours per week. We also remove individuals with missing information on education, year of marriage, area of residence, and length of marriage. For marital status, geographic distance to children, year of marriage, region of residence, and being born in the country of the interview, we replace missing values in a given wave with the value reported in the previous wave. Finally, we remove individuals if either partner in the couple reports that the marriage occurred when either spouse was younger than 15. After implementing these sample selection criteria, we have a final sample of 92,307 total observations on 38,872 different couples.

The focus of this paper is on health shocks that hinder an individual's ability to work in the same capacity as before the shock, i.e. work-limiting disabilities. We define individuals to have a disability if they state that a doctor diagnosed them with at least one of the following conditions: stroke, chronic lung disease, osteoporosis, cancer, chronic kidney disease, Parkinson's disease, Alzheimer's disease, dementia, senility, and other emotional disorders (e.g. anxiety, nervous or psychiatric problems). The survey asks about the respondent's age at diagnosis. Therefore, the date of onset equals the age of diagnosis subtracted from the current age.

The general form of the estimated equation throughout much of the analysis is

$$y_{it} = \beta_0 + \beta_1 D_{it}^{k\geq 0} + \sum_{j=1}^{19} country_{ij}' \delta_j + x_{it}' \gamma + u_{it} \quad (1).$$

In equation (1), y_{it} is one of several labor market outcomes. In some specifications, y_{it} is a binary variable representing different working categories: employed (y_{it} equals one if employed or self-employed/zero otherwise), working part-time (y_{it} equals one if working part-time/zero otherwise), and working full-time (y_{it} equals one if working full-time/zero otherwise). Part-time work consists of working fewer than 30 hours per week on the respondent's main job, whereas full-time work requires the respondent to work at least 30 hours per week. The 30-hour cut-off is arbitrary. However, there is support for its use (van Bastelaer *et. al.* 1997). When y_{it} is a binary variable, we estimate equation (1) as a probit.

In other specifications, y_{it} equals total hours worked per week on the respondent's main job, the log of earnings, and the log of pension income. Earnings and pension income are measured in Euros, are net of any tax payments, and represent money earned in the previous calendar year. Earnings and pension income are expressed in national currencies in the raw data. We convert them to Euros by multiplying the national currencies with the exchange rate of each

national currency to the Euro. This conversion also converts these nominal measures to real 2015 Euros. When y_{it} equals one of these three measures, we estimate equation (1) using ordinary least squares (OLS). Finally, when the dependent variable is hours worked, we restrict the sample to those who report positive hours of work.

The vector x_{it} contains binary variables representing level of education (omitted category is pre-primary education), a quartic in labor market experience, the number of children younger than 18 years old, binary variables representing the urbanity of the respondent's location (omitted category is living in a large city), binary variables representing geographical distance to closest child (omitted category is closest child lives in the same household or building), and survey wave fixed effects.[3,4] The vector $country_{ij}$ includes 19 binary variables for each country in our sample, with the omitted country being Luxemburg. Descriptive statistics for the variables included in these two vectors as well as on the number of households per country are in Appendix Table A1.

The main independent variable of interest is $D_{it}^{k\geq 0}$. The superscript *k* indexes time relative to the onset of a work-limiting disability, with year zero being the year of onset. Here, $D_{it}^{k\geq 0}$ is a binary variable that equals one in every year after respondent *i's* spouse reports a work-limiting health shock, including the year of onset, and zero otherwise. Estimates of β_1, show the average annual effect that a spouse's health shock has on various labor market outcomes.

Generally, there are some concerns with using self-reported health conditions when trying to identify a causal relationship between health and labor market outcomes (Kalwij and Vermeulen 2008). The first is justification bias. Respondents may use their spouse's ill health

[3] In the US, pre-primary education is equivalent to nursery school/preschool.
[4] Approximately 5.22 percent of the households in our sample do not have any children. In these cases, we code those households without children as having a child that is at least 500 km away or living in a foreign country.

as a justification for their own poor labor market outcomes. This bias would magnify the size of the estimated effect. This concern is mitigated here because of our definition of disability. While respondents report on the conditions from which they suffer, they are reporting that a doctor has actually diagnosed them with a condition. Therefore, the respondent is not stating that she is in poor health; instead, the respondent is stating that a doctor has diagnosed her with a specific physical or emotional condition, which makes these self-reports relatively more objective. Furthermore, the health measure used here does represent actual diagnoses of conditions that may require spousal care or an increase in spousal labor supply to offset any negative labor market effects of the affected individual's health. In fact, Trevisan and Zantomio (2016) use data from SHARE and the English Longitudinal Study of Ageing to examine the impact of acute health shocks on the labor supply of older workers. Their measure of acute health shocks is defined as the first instance of an individual experiencing a heart attack, stroke, or cancer diagnosis. They argue that the first occurrence of any of these three events is unanticipated even if family history or behavioral factors suggest that the respondent may experience the shock. These are unanticipated because no one knows with certainty if or when the shock will eventually occur. Therefore, the authors argue that these are exogenous. This lends some support to our health measure, which includes stroke and cancer diagnoses, being exogenous. Nevertheless, respondents may still use their spouses' health as a justification for poor labor market outcomes.

The second concern is measurement error. These reports on diagnosed conditions may contain measurement error along two dimensions. First, respondents may not comprehend precisely what their doctor is describing and may infer a formal diagnosis from a general discussion of potential medical problems. This would induce noise into the measure of health

used here. Additionally, respondents may have forgotten when the doctor diagnosed them with the condition, which would lead to measurement error with the timing of the health shock. Thus, measurement error would attenuate our estimates to zero. Research shows that justification bias and attenuation bias tend to cancel each other out (Stephens 2001; Blundell et al. forthcoming).

The third concern is omitted variables bias. Kalwij and Vermeulen (2008) note that coefficients associated with self-reported health measures suffer from an omitted variables bias, where the omitted variable is a measure of objective health. The authors argue that self-reported health measures are correlated with objective measures of health, and these other objective measures of health have effects on labor market variables over and above the self-reported measures typically used. In a sensitivity analysis we follow Kalwij and Vermeulen (2008) and Siegel (2006) and construct an index based on the number of restrictions of physical functioning and activities of daily living that the individual faces. We then add this index as an extra control variable alongside our main health measure. According to Kalwij and Vermeulen (2008) such an addition captures the multi-dimensional nature of health.

Another potential issue with the health measure used here is that the SHARE data provide no indication of the condition's severity or chronicity. Therefore, we will miss some potentially interesting heterogeneity in spousal labor supply responses. Additionally, some of the health conditions in our disability definition may be relatively more degenerative than others, specifically Parkinson's disease, Alzheimer's disease, dementia, and senility. Because our sample includes individuals who are relatively older, any estimated labor supply response may be a planned change in labor market behavior as opposed to a change in behavior due to a true health shock. The same can be said for a non-severe, early cancer diagnosis. Furthermore, emotional disorders may not limit work in the same capacity as lung/kidney disease or a stroke.

To deal with these potential issues, in a sensitivity analysis, we re-estimate equation (1) after removing these specific conditions from the definition of work-limiting disability. Additionally, to focus on spousal labor supply responses to health shocks, we re-estimate equation (1) by replacing our work-limiting disability variable with a heart attack binary variable that equals one if the respondent's spouse reports experiencing a heart attack.

A final concern in identifying a causal relationship between labor market outcomes and spousal health is assortative mating along the dimension of health. If health is one dimension along which individuals sort into marriage, then the coefficient associated with $D_{it}^{k\geq 0}$ may capture not only the effect of the spouse's health shock on the respondent's labor supply, but also the effect of own health on labor supply. This concern is low in our sample. The correlation between the spouses' health shocks is only 0.086. However, to address this potential issue, we include a binary variable for own-work-limiting disabilities in a sensitivity analysis.

One of the main benefits of using SHARE data is that it allows for the investigation of cross-country differences in outcomes. Doing so is important since countries may differ based upon social safety nets available for the work-disabled, and these differences may lead to different labor market responses. To examine if there are country-specific differences in responses to spousal health shocks, we modify equation (1) to include an interaction between the disability and country binary variables as follows:

$$y_{it} = \beta_0 + \beta_1 D_{it}^{k\geq 0} + \sum_{j=1}^{19} country'_{ij}\delta_j + \sum_{j=1}^{19} country'_{ij} D_{it}^{k\geq 0}\theta_j + x'_{it}\gamma + u_{it} \quad (2).$$

Now, when estimating equation (2) using OLS, the effect of the health shock on labor market outcomes in country j would be $\beta_1 + \theta_j$, with β_1 being the effect of the shock in Luxemburg (base category). We make similar calculations when estimating equation (2) as a probit model. Since the SHARE dataset is longitudinal, households may appear multiple times in the sample.

Therefore, throughout the entire analysis, we cluster the standard errors at the household level. Finally, we estimate equations (1) and (2) separately for husbands and wives.

RESULTS

Descriptive Statistics

Table 2 presents descriptive statistics of the various dependent variables analyzed here by gender and disability status. For those households where no one experiences a health shock, we use all person-year observations in the calculations. For those households where one of the partners experiences a shock, we only use the observations prior to the health shock to calculate the means and proportions. Focusing on gender, husbands and wives have similar rates of employment. However, husbands tend to work more hours, have higher earnings, are more likely to work full-time, less likely to work part-time and have higher amounts of pension income. Given that men tend to work more hours per week and have a larger propensity to work full-time, the higher level of labor earnings and pension income for men relative to women is unsurprising.

When comparing individuals based on disability status, Table 2 shows that those who belong to households where no one experiences a health shock have slightly higher employment rates, particularly when compared to those households where both partners experience a work-limiting disability. Unsurprisingly, the higher rates of employment translate into higher probabilities of working both part- and full-time for the non-disabled households. However, despite higher employment probabilities, there is little difference in weekly hours of work, earnings, and pension incomes across disability statuses regardless of gender. The slightly elevated employment rates and the similarities in the other labor market outcomes examined here

suggest that those who have and do not have a disability have similar outcomes prior to disability onset.

Labor Supply Outcomes

Results from estimating equation (1) when the dependent variable is a measure of labor supply appear in table 3. Columns (1) through (3) show estimates for the propensity to be employed, work part-time, and work full-time, respectively. The entries in these particular columns represent the average marginal effect of the health shock on each of these probabilities. The estimates in column (4) show the relationship between spousal health shocks and the number of hours worked per week. The results in the first row show the effect of the husband's health shock on his wife's labor supply, and the second row presents estimates of the relationship between the wife's health shock on her husband's labor supply.

For both husbands and wives, a spousal health shock tends to reduce labor supply at both the intensive and extensive margins by roughly the same magnitude. The probability of employment declines by approximately 9.5 percentage points regardless of gender. At the intensive margin, wives reduce their hours worked by 1.4 hours per week. Husbands have a similar response to their wives' health shock and reduce hours worked by 1.2 per week. Additional results show that spousal health shocks alter the structure of work. While the onset of a work-limiting disability reduces the probability of working full-time for husbands and wives, it increases the odds of part-time employment. Since spousal health shocks tend to reduce the probability of participating in the labor market by such a relatively large amount, the increased odds of part-time employment are, on average, most likely due to full-time workers moving to part-time status instead of drawing non-participants into the labor force.

The results in table 3 suggest that individuals reduce their labor supply after their spouse experiences the onset of a work-limiting health condition regardless of gender. These estimates suggest that, for those who are relatively older, the caring/joint leisure effects overpower any added worker effect that may exist. The increased probability of part-time employment does imply a continued need to remain in the labor market, suggesting that an added worker effect may exist. However, on average, the combination of the need to provide care and the desire to consume joint leisure is larger than the need to work in order to afford care.

Compared to the earlier literature, the results presented in table 3 support those of Jeon and Pohl (2017) and Shen et al. (2019). Both papers find that men and women reduce their labor supply after the onset of a spousal work-limiting health shock, and the reductions are similar across genders. Jeon and Pohl (2017) examine employment probabilities, while Shen et al. (2019) investigate weekly hours of work. Focusing on employment probabilities, our results are relatively larger in magnitude than Jeon and Pohl (2017), who find decreases in employment probabilities of approximately 2%. Differences in age across the two samples can account for the larger effect found here. The SHARE data surveys relatively older individuals. As shown in the appendix table, the average age in our analytical sample is 63 for women and 66 for men. The average age in the Jeon and Pohl (2017) sample is 48 for each gender. As discussed above, our results support the caring/joint leisure effects. Those who are relatively older when experiencing a health shock probably require more care relative to their younger counterparts. Similarly, the joint leisure effect should be relatively larger for older couples relative to younger couples due to having fewer remaining years. Both of these characteristics suggest that the declines in employment should be larger for relatively older couples.

In comparison to Shen et al. (2019), the estimates in table 3 are somewhat smaller. Shen et al. (2019) find that men and women reduce weekly hours of work by approximately 3.8 hours. Again, variation in age across the two samples can reconcile the different magnitudes. Shen et al. (2019) focus on workers between 25 and 64 years old. Younger individuals tend to work more relative to their older counterparts. Average weekly hours of work at baseline equal approximately 49 for women and 52 for men in the Shen et al. (2019) study. These are much larger than the average presented in table 2 (approximately 32 hours for women and 39 hours for men). Since younger individuals are already working more hours, it is easier to reduce labor supply at the intensive margin relative to those who are working fewer hours.

One benefit to using SHARE data is that it allows for a cross-country comparison of the relationship between work-limiting health shocks and spousal labor supply. To this end, table 4 contains estimates from equation (2). Each entry in table 4 shows the average marginal effect of the health shock on various measures of spousal labor supply in each of the 20 countries examined here. Panel A examines employment, panel B focuses on weekly hours of work, and panels C and D investigate the propensity to work part- and full-time, respectively.

The results in panel A show a consistent negative relationship between spousal work-limiting disabilities and the probability of being employed. In each of the countries examined here, at least one partner experiences a reduced probability of employment upon the onset of a spouse's work-limiting health shock. The only exception to this is Luxemburg, where neither partner significantly changes his or her employment status after the spouse's disability occurs. There is substantial heterogeneity across countries with respect to how husbands and wives respond to spousal health shocks. In some countries, such as Denmark and Spain, husbands and wives respond similarly. For example, in Denmark, both husbands and wives are 10 percentage

points less likely to be employed upon the onset of a spousal health shock. However, in other countries, such as Belgium and France, there seems to be a gender imbalance across estimates. In France, for example, the probability of employment falls by an insignificant 2.9 percentage points for wives and a significant 17.5 percentage points for husbands.

The results in the remaining panels in table 4 are not as conclusive with respect to the relationship between spousal health shocks and these alternative measures of labor supply. Many countries exhibit statistically insignificant relationships. Furthermore, there is no consistency regarding the sign of the estimates. The relationship between spousal work-limiting disabilities and either weekly hours of work, or the propensities to work part- or full-time, is sometimes negative and sometimes positive depending on the country of interest and gender of the worker. Despite finding a lack of consistent statistical significance and positive or negative relationships between spousal health shocks and these other measures of labor supply, we still observe substantial heterogeneity across countries with respect to how husbands and wives respond to spousal disabilities. In some instances, husbands and wives respond similarly in terms of sign and magnitude, whereas in other instances, the magnitudes differ by relatively large amounts or the signs of the estimates for one gender are different from those of the other.

The results in table 4 are new to the literature. To our knowledge, no study exists that compares labor supply responses to spousal health shocks across countries. The findings presented here are important for two reasons. First, they help explain the differences in findings across studies that focus on just one country. The earlier literature examined the US (Berger and Fleisher 1984; Charles 1999; Coile 2004; Siegel 2006; Meyer and Mok 2019), Germany (Braakmann 2014), Netherlands (Garcia-Gomez et al. 2013), Denmark (Fadlon and Nielsen forthcoming), Canada (Jeon and Pohl 2017), South Korea (Kim et al. 2018), and China (Shen et

al. 2019). However, none of these studies investigate multiple countries using consistent sample selection criteria, measures of labor supply, and health outcomes. Second, the substantial cross-country heterogeneity found here highlights the importance of country-specific institutions in helping individuals adjust to familial health shocks. Even the most consistent finding presented in table 4, the reduced probability of employment, shows a high degree of variation across countries. Therefore, even for these consistent cross-country findings, country-specific institutional features are important to consider.

The literature on public social safety networks supports this notion of large cross-country differences in generosity. For example, Trevisan and Zantomio (2016) examine how countries accommodate acute health shocks for the elderly European population. The authors find significant cross-country heterogeneity in terms of generosity of disability benefit programs, job mobility, and job protection systems. For instance, they argue that compared to the Netherlands, England is characterized by a tight labor market and relatively low rates of disability benefit recipiency and net replacement. Additionally, Garcia-Gomez (2011) notes how countries differ in their definitions of eligibility to receive disability benefits. The author notes how some countries define eligibility based upon a reduction in work capacity, such as Denmark, Italy, and Spain, whereas other countries base eligibility off of earnings reductions, such as Belgium, France, Greece, and Portugal.

Financial Outcomes

Tables 5 and 6 present estimates from equations (1) and (2), respectively, when the dependent variable is either the log of labor earnings or the log of pension income. The results in table 5 suggest that husbands and wives experience significant earnings losses of relatively equal

size after their spouses' health shock. Wives' average annual earnings loss amounts to nine percent after their spouses' disability, whereas the average annual earnings loss for husbands is approximately 10 percent.[5] Given the reductions in labor supply at both the extensive and the intensive margins, these earnings losses are expected. As with employment probabilities, these results are consistent with Jeon and Pohl (2017) who find earnings losses associated with spousal health shocks regardless of gender. Unfortunately, we cannot compare the magnitudes of the estimates since Jeon and Pohl (2017) use the level of earnings as opposed to the natural log.

While earnings tend to fall after a decrease in labor supply, wives and husbands experience an increase in pension income, and, as before, the magnitude of the increase is relatively similar for both genders. This result is intuitive. As shown in Appendix table A1, the sample used here is relatively older. Therefore, a spouse's health shock may induce retirement to either provide care or consume joint leisure time.[6] To investigate this, we re-estimated equation (1) as a probit. In this instance, the dependent variable equals one if the respondent is retired and zero otherwise. We only discuss the results here (the full set of results is available upon request). The onset of a spouse's work-limiting health condition only slightly increases the probability of retirement for men and women by 0.5 percentage points and 0.4 percentage points, respectively. Both estimates are statistically significant at the one-percent level.

The results in table 6 present a cross-country comparison of the relationship between spousal health shocks and financial outcomes. As in table 4, the entries here represent the average marginal effects of the shock in each country. Regardless of the financial outcomes examined here, there appears to be little consistency in the size and sign of the estimates across

[5] When the dependent variable is the natural log of earnings or pension income, the interpretation of the estimates comes from the formula $(e^{\widehat{\beta}} - 1)$.

[6] Siddiqui (1997) finds that elderly employees in West Germany are more likely to retire when faced with a health problem and highlights the criticality of the generosity of pension systems in affecting early retirement.

countries. For example, wives of disabled husbands experience an average annual earnings loss of approximately 34 percent in Austria, whereas wives of the disabled in Belgium experience a statistically insignificant loss of nine percent. These results further confirm the importance of understanding different cross-country institutional programs designed to aid those families that experience significant health shocks.

Sensitivity Analysis

Thus far, our main results suggest somewhat sizable reductions in labor supply following the onset of a spouse's work-limiting health shock. The remainder of this section explores the sensitivity of our results. In table 7, we examine how sensitive our results are to changes in the econometric specification. All estimates come from equation (1).

Assortative mating along the dimension of health could exist. In other words, spouses may experience health shocks together. If so, then the coefficient associated with the spouse's health shock may capture the effect of own health on labor supply if we exclude own health shocks from the model. Panel A in table 7 investigates this by including an own work-limiting disability variable as an additional control. For both, husbands and wives, the inclusion of the own health-shock variable does not significantly change the size or significance of the relationship between spousal disability onset and the labor market outcomes examined here. Unsurprisingly, individuals respond more to their own health shocks than their spouse's.

Individuals may alter labor supply upon the onset of a spousal disability to offset lost income, provide care, or to consume joint leisure. Given the reductions in labor supply documented here, caring and the consumption of joint leisure dominate the added worker effect. To investigate if providing care or the consumption of joint leisure is more influential in

reducing labor supply, we construct a measure of limitations in the ability to perform activities of daily living (ADL) following Siegel (2006). The ADLs investigated here include: ability to walk 100 meters, get up from a chair after sitting for long periods, climb several flights of stairs without resting, climb one flight of stairs without resting, stoop or kneel or crouch, reach or extend the arms above shoulder level, pull or push large objects like a living room chair, lift or carry weights over 10 pounds/5 kilos, pick up a small coin from a table, dress, walk across a room, bath or shower, eat, and get in or out of bed. We then include this index as an additional control variable in equation (1). The results from doing so are in panel B of table 7. Here, the magnitude of the relationship between spousal health shocks and employment and earnings decreases substantially after the inclusion of the ADL index as an additional control variable.[7] The effect of spousal health on employment is reduced by approximately 33 percent after the inclusion of the ADL index, whereas the effect of earnings is reduced by approximately 50 percent (all estimates remain negative and statistically significant).

As discussed above, the results in panel B could suggest that the original specification suffers from omitted variables bias (Kalwij and Vermeulen 2008). To investigate the provision of care further, we create a new variable that equals one if the respondent needed to provide personal care on a regular basis to his/her spouse within the last 12 months and zero otherwise. Here, personal care includes such actions as helping with washing, getting out of bed, or dressing; helping regularly means providing care on a nearly daily basis for at least three of the previous 12 months. We would expect that the onset of a spouse's disability would result in an

[7] The correlation between our health shock variable and the ADL index for husbands is 0.267 and 0.231 for wives. In the wife regressions, the husband ADL index is negative and significant in the employment and annual earnings regressions. It is negative and insignificant in the weekly hours, full-time, and pension income regressions. It is positive and insignificant for the propensity to work part-time. In husband regressions, the female physical index is negative and insignificant in all specifications; however, for the probability of working part-time it is positive and significant. Full results for this variable are available upon request.

increased probability that the other partner provides personal care help. Results from re-estimating equation (1) with this new dependent variable support this notion. Furthermore, the results also uncover a gender difference and suggest that wives are more likely to offer personal care help than husbands. For instance, husband's disability increases the probability that the wife will offer help with personal care by 10.8 percentage points (standard error 0.004), whereas the wife's disability increases the probability that the husband will offer help with personal care by 6.1 percentage points (standard error 0.003). These results suggest that while providing care is important for both genders, it is relatively more important for wives. This suggests that the consumption of joint leisure is relatively more important in explaining the reduced labor supply upon spousal disability for husbands.

As discussed above, our measure of disability includes some conditions that are relatively more degenerative than others, specifically Parkinson's disease, Alzheimer's disease, dementia, and senility. Therefore, the estimated labor supply responses found here may be planned exits from the labor market to consume leisure together during the spouse's remaining years as opposed to a change in behavior due to a true shock. The same can be said for a non-severe, early cancer diagnosis. Also, emotional disorders may not limit work in the same capacity as lung/kidney disease or a stroke. To this end, we re-estimated equation (1) after removing these specific conditions from the definition of work-limiting disability. The results appear in panel C of table 7 and show that this alteration to the work-limiting disability definition does not change the quantitative findings in any meaningful manner.

In a further attempt to focus on a health shock as opposed to the onset of various conditions that may be somewhat anticipated, we replaced the work-limiting binary variable with a binary variable equaling one if the respondent's spouse experienced a heart attack. The results

from this change in the definition of spousal health shock appear in panel D. There is a larger reduction in the probability of employment and larger earnings losses for husbands and wives after their spouse experiences a heart attack. For wives, the magnitude of the estimates falls for weekly hours worked, the propensity to work part- or full-time, and the log of pension income. Husbands experience a larger reduction in hours worked per week. Both, the size of the estimates for part- and full-time work are similar; however, the estimates are less precise.

So far, this subsection has focused on changes to the econometric specification. The remainder of this subsection investigates how sensitive results are to changes in the sample selection criteria used. Results appear in table 8, and all estimates come from equation (1).

Results so far suggest that the need to provide care is an important mechanism behind the negative relationship between labor supply and spousal health shocks. Presumably, having access to low-cost options for care provision, such as adult children, should mitigate the adverse effect of spousal health on labor supply. To investigate this, we re-estimated equation (1) twice, once for those who have a child living within 25 kilometers, and again for those without children or for those with children living farther than 25 kilometers away. These results are in columns (1) and (2) of table 8, respectively. Clearly the estimates from the SHARE data do not support this theory. In many cases, the estimated relationship between spousal health and labor supply are statistically equivalent across the two samples. In other instances, the magnitude of the effect is actually somewhat larger for those who live closer to their children.

In the main sample used throughout the analysis, there is no restriction on when the spouse's disability occurs. In 24.7 percent of all couples in our sample, the husband already has a disability in the first observation. The same number for wives is 20.5 percent. This may dampen the estimated relationship between spouse health and labor supply. To this end, we re-

estimated equation (1) after restricting the sample of treated couples to those who have no disability in the first wave in which they are observed. Results are in column (3) of table 8. When focusing on employment, hours worked per week, and pension income, the results move in the expected direction (the only exception to this is wives' hours worked). However, because of the reduced sample size of the treated group, the estimates lose precision, and only female employment after a husband's health shock is significant. For the propensity to work part- or full-time and earnings, the results move opposite to expectations. The only exception to this is the husband's earnings after the wife's health shock. That estimate does move in the expected direction and is statistically significant. However, small sample sizes preclude drawing any definitive conclusions.

To be a part of the SHARE data, the respondent must be at least 50 years old (the spouse can be of any age). However, throughout the analysis, we have imposed no additional age restrictions on the analytical sample. This may have an effect on the estimates. Those who are older at disability onset may require more care, which would lead to a larger drop in spousal labor supply. Alternatively, those who are younger at onset may require less care. Additionally, those who are younger may need to work for more years due to the longer amount of time remaining in the lifespan. Therefore, younger couples may experience more of an added worker effect than older couples do, which would lead to estimates that are smaller in magnitude relative to those presented in tables 3 and 5. To investigate this, we restricted the sample to those couples where both spouses are no older than 70. Results appear in the final column of table 8. In every case except for pension income, the results support this theory. The estimated relationship between labor supply and spousal health is smaller for couples who are younger, which suggests a larger added worker effect.

Finally, we have tried to account for the severity of the individual's disability by separating our sample based upon values of the disabled spouse's ADL index. Specifically, we re-estimated equation (1) twice for each gender, once where the sample includes those whose spouse's ADL index is less than or equal to the average value of the index for the sample, and again for those whose spouse's ADL index is above the average index in the sample.[8] The results from these regressions are in table 9. If the need to provide care dominates the desire to consume joint leisure time, then the magnitude of the estimates should be larger for those with disabled spouses who have ADL indices above the mean. On the other hand, if the reductions in labor supply are driven by the desire to consume joint leisure, then the magnitude of the estimates should be larger for those with disabled spouses who have indices below the mean. The results for wives generally support the need to provide care. The only exception to this is employment. Wives have larger decreases in the probability of employment if their disabled husbands have an ADL index less than or equal to the mean. For men, however, with the exception of weekly hours of work, the results support the desire to consume joint leisure.

CONCLUSIONS

The purpose of this paper is to analyze the potential effect that spousal health shocks have on various labor market outcomes. Specifically, we use data from six waves of the Survey of Health, Ageing and Retirement in Europe, and examine how the onset of a spouse's work-limiting disability influences labor force participation, hours worked, the propensity to work part- and full-time, labor earnings, and pension income. Results from the analysis suggest a large reduction in labor supply at the extensive margin and a large reduction in earnings and an increase in pension income, upon the onset of a spouse's health shock. Sensitivity analyses

[8] The average value of the husband's disability index is 1.379 and that of wife's is 1.677.

suggest that the provision of care is the main mechanism through which labor supply is reduced for wives, and the consumption of joint leisure drives the results for men.

The main contribution of our study is the use of a broad, international dataset. The SHARE dataset used here contains responses from households within 19 European countries and Israel. This is the first paper to provide separate estimates of the relationship between spousal health and labor supply for a multitude of countries using harmonized sample selection criteria and measures of health. We show substantial cross-country heterogeneity in household responses to the onset of a disability. These results highlight the importance of considering country-specific institutional features and help to reconcile the inconsistent results found in the earlier literature.

REFERENCES

Angelini, Viola, Cavapozzi, Danilo, and Omar Paccagnella. 2012. "Cross-Country Differentials in Work Disability Reporting Among Older Europeans." *Social Indicators Research* 105: 211-226.

Blundell, Richard, Britton, Jack, Costa Dias, Monica, and French, Eric. (forthcoming). The Impact of Health on Labor Supply Near Retirement. *The Journal of Human Resources*.

Börsch-Supan, Axel. (1992). Population Aging, Social Security Design, and Early Retirement. *Journal of Institutional and Theoretical Economics* 148 (4): 533-557.

Börsch-Supan, Axel. (2017). Survey of Health, Ageing and Retirement in Europe (SHARE). In: Encyclopedia of Geropsychology, pp. 2343-2350, (edited by Nancy A. Pachana), Springer, Singapore.

Börsch-Supan, A. (2020). *Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 1*. Release version: 7.1.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w1.710.

Börsch-Supan, A. (2020). *Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 2*. Release version: 7.1.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w2.710.

Börsch-Supan, A. (2020). *Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 3 – SHARELIFE*. Release version: 7.1.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w3.710.

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

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

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

Börsch-Supan, A. (2020). *Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 7*. Release version: 7.1.1. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w7.711

Börsch-Supan, Axel, Brandt, Martina, Hunkler, Christian, Kneip, Thorsten, Korbmacher, Julie, Malter, Frederic, Schaan, Barbara, Stuck, Stephanie, and Zuber, Sabrina. (2013). Data Resource Profile: The Survey of Health, Ageing and Retirement in Europe (SHARE). *International Journal of Epidemiology* 42 (4): 992-1001.

Braakmann, Nils. (2014). The Consequences of Own and Spousal Disability on Labor Market Outcomes and Subjective Well-Being: Evidence from Germany. *Review of the Economics of the Household* 12: 717-736.

Charles, Kerwin Kofi. (1999). Sickness in the Family: Health Shocks and Spousal Labor Supply. Ford School of Public Policy University of Michigan.

-----. 2003. The Longitudinal Structure of Earnings Losses among Work-Limited Disabled Workers. *The Journal of Human Resources* 38 (3): 618-646.

Chen, E. Susan (2012). Spousal Labor Supply Responses to Government Programs: Evidence from the Disability Insurance Program. University of Michigan Retirement Research Center, Working Paper WP 2012-261.

Coile, Courtney C. (2004). Health Shocks and Couples' Labor Supply Decisions. NBER Working Paper # 10810.

Fadlon, Itzik and Torben Heien Nielsen. (forthcoming). Family Labor Supply Responses to Severe Health: Evidence from Danish Administrative Records. *American Economic Journal: Applied Economics*.

Garcia-Gomez, Pilar (2011). Institutions, Health Shocks and Labour Market Outcomes Across Europe. *Journal of Health Economics* 30: 200-213.

Garcia-Gomez, Pilar, Hans van Kippersluis, Owen O'Donnell, and Eddy van Doorslaer. (2013). Long-Term and Spillover Effects of Health Shocks on Employment and Income. *The Journal of Human Resources* 48 (4): 873-909.

Hardoy, Ines and Schøne Pål. (2014). Displacement and Household Adaptation: Insured by the Spouse or the State? *Journal of Population Economics* 27: 683-703.

Jeon, Sung-Hee and R. Vincent Pohl. (2017). Health and Work in the Family: Evidence from Spouses' Cancer Diagnoses. *Journal of Health Economics* 52: 1-18.

Johnson, William G. and James Lambrinos. (1985). Wage Discrimination against Handicapped Men and Women. *The Journal of Human Resources* 20 (2): 264-277.

Jolly, Nicholas A. (2013). The Impact of Work-Limiting Disabilities on Earnings and Income Mobility. *Applied Economics* 45 (36): 5104-5118.

Kalwij, A. and Vermeulen, F. (2008). Health and Labour Force Participation of Older People in Europe: What do Objective Health Indicators Add to the Analysis? *Health Economics* 17: 619-638.

Kim, Kyeongkuk, Sang-Hyop Lee and Timothy J. Halliday. (2018). Health Shocks, the Added Worker Effect, and Labor Supply in Married Couples: Evidence from South Korea. University of Hawaii at Manoa. Working Paper Number 18-12.

Kohara, Miki. (2010). The Response of Japanese Wives' Labor Supply to Husbands' Job Loss. *Journal of Population Economics* 23: 1133-1149.

Meyer, Bruce D. and Wallace K. C. Mok. (2019). Disability, Earnings, Income, and Consumption. *Journal of Public Economics* 171: 51-69.

Mok, W.K.C, Meyer, B.D., Charles, K.K. and Achen, A.C. (2008). A Note on 'The Longitudinal Structure of Earnings Losses Among Work-Limited Disabled Workers'. *The Journal of Human Resources* 43 (3): 721-728.

Nagi, Saad Z. and Linda W. Hadley. (1972). Disability Behavior: Income Change and Motivation to Work. *Industrial and Labor Relations Review* 25 (2): 223-233.

Riekhoff, Aart-Jan and Maria Vaalavuo. (forthcoming). "Health Shocks and Couples' Labor Market Participation: A Turning Point or Stuck in the Trajectory." *Social Science & Medicine*.

Riphahn, Regina. T. (1999). Income and Employment Effects of Health Shocks. A Test case for the German Welfare State. *Journal of Population Economics* 12: 363-389.

Shen, Zheng, Zheng, Xiaodong and Tan, Yiwen. (2019). The Spillover Effects of Spousal Chronic Diseases on Married Couple's Labour Supply: Evidence from China. *International Journal of Environmental Research and Public Health* 16: 4214; doi:10.3390/ijeprh16214214.

Siddiqui, Sikandar (1997). The Pension Incentive to Retire: Empirical Evidence from West Germany. *Journal of Population Economics* 10 (4): 463-486.

Siegel, Michelle J. (2006). Measuring the Effect of Husband's Health on Wife's Labor Supply. *Health Economics* 15: 579-601.

Stephens, M. (2001). The Long-Run Consumption Effects of Earnings Shocks. *The Review of Economics and Statistics* 3 (1): 28-36.

Trevisan, Elisabetta and Zantomio, Francesca. (2016). The Impact of Acute Health Shocks on the Labour Supply of Older Workers. Evidence from Sixteen European Countries. *Labour Economics* 43: 171-185.

van Bastelaer, A., G. Lemaître and P. Marianna. (1997). The Definition of Part-Time Work for the Purpose of International Comparisons. *OECD Labour Market and Social Policy Occasional Papers*, No. 22, OECD Publishing, Paris, https://doi.org/10.1787/132721856632.

Wu, Stephen. (2003). The Effects of Health Events on the Economic Status of Married Couples. *The Journal of Human Resources* 38 (1): 219-230.

TABLES

Table 1: Countries Participating in SHARE and Wave Included

	Survey Wave					
	2004 (wave 1)	2006 (wave 2)	2011 (wave 4)	2013 (wave 5)	2015 (wave 6)	2017 (wave 7)
Austria	X	X	X	X	X	X
Germany	X	X	X	X	X	X
Sweden	X	X	X	X	X	X
Netherlands	X	X	X	X		
Spain	X	X	X	X	X	X
Italy	X	X	X	X	X	X
France	X	X	X	X	X	X
Denmark	X	X	X	X	X	X
Greece	X	X			X	X
Switzerland	X	X	X	X	X	X
Belgium	X	X	X	X	X	X
Israel	X	X		X	X	X
Czech Republic		X	X	X	X	X
Poland		X	X		X	X
Ireland		X				
Luxembourg				X	X	X
Hungary			X			X
Portugal			X		X	X
Slovenia			X	X	X	X
Estonia			X	X	X	X
Croatia					X	X
Lithuania						X
Bulgaria						X
Cyprus						X
Finland						X
Latvia						X
Malta						X
Romania						X
Slovakia						X

Notes. We do not use data from wave 3 (2008) as wave 3 (SHARELIFE) gathered retrospective information detailing life events, not information on year-specific characteristics such as current labor markets status. However, we use data from wave 3 to construct certain variables such as labor market experience. For the same reason, we do not use observations from the eight countries that entered SHARE in 2017 as retrospective information was gathered (SHARELIFE).

Table 2. Descriptive Statistics of Dependent Variables

	(1)	(2)	(3)	(4)
Females	No-one experiences a health shock	Only the husband experiences a health shock	Only the wife experiences a health shock	Both husband and wife experience a health shock
Employment	0.311	0.288	0.295	0.102
	(0.463)	(0.453)	(0.456)	(0.303)
	[66,803]	[78,619]	[77,208]	[3,283]
Weekly hours of work	32.836	32.584	32.700	29.088
	(13.598)	(13.690)	(13.688)	(14.364)
	[19,240]	[21,118]	[21,225]	[352]
Part time	0.091	0.087	0.088	0.046
	(0.287)	(0.282)	(0.283)	(0.210)
	[66,803]	[78,619]	[77,208]	[3,283]
Full time	0.197	0.182	0.187	0.061
	(0.398)	(0.386)	(0.390)	(0.239)
	[66,803]	[78,619]	[77,208]	[3,283]
Log annual earnings	9.948	9.926	9.930	9.556
	(1.795)	(1.811)	(1.797)	(2.001)
	[16,322]	[18,124]	[18,208]	[374]
Log pension income	9.720	9.707	9.719	9.621
	(1.612)	(1.619)	(1.619)	(1.603)
	[23,959]	[29,933]	[29,060]	[1,898]
Males				
Employment	0.326	0.309	0.300	0.074
	(0.469)	(0.462)	(0.458)	(0.261)
	[66,803]	[78,619]	[77,208]	[3,283]
Weekly hours of work	39.439	39.311	39.290	32,541
	(14.294)	(14.384)	(14.445)	(16.088)
	[21,138]	[23,757]	[22,616]	[302]
Part time	0.046	0.045	0.044	0.029
	(0.209)	(0.208)	(0.205)	(0.169)
	[66,803]	[78,619]	[77,208]	[3,283]
Full time	0.271	0.257	0.249	0.063
	(0.444)	(0.437)	(0.432)	(0.243)
	[66,803]	[78,619]	[77,208]	[3,283]
Log annual earnings	10.335	10.322	10.319	10.019
	(1.709)	(1.720)	(1.724)	(1.821)
	[17,973]	[20,413]	[19,464]	[322]
Log pension income	10.013	10.014	10.017	10.020
	(1.513)	(1.512)	(1.515)	(1.500)
	[32,042]	[39,174]	[38,881]	[2,342]

Notes. Entries are means (continuous variables) and proportions (dummy variables). Standard deviations are in parentheses and numbers of observations are in square brackets. Descriptive statistics of the control variables are provided in Table A1 in the Appendix. Log earnings refers to last year's log annual earnings from employment or self-employment net of tax and is expressed in Euros in 2015 prices. Log pension income refers to last year's log of pensions/benefits net of tax and is expressed in Euros in 2015 prices. Column 1 uses all couple-year observations. Column 2 uses observations prior to the husband experiencing a health shock. Column 3 uses observations prior to the wife experiencing a health shock. Column 4 uses observations prior to the husband or the wife experiencing a health shock.

Table 3. Effect of Spousal Health Shock on Labor Supply

	Employment	Part time	Full time	Working hours per week
	(1)	(2)	(3)	(4)
Husband's health shock	-0.095***	0.021*	-0.027*	-1.409***
	(0.006)	(0.011)	(0.015)	(0.369)
Observations	92,307	24,930	24,930	23,125
Wife's health shock	-0.095***	0.009*	-0.025**	-1.224***
	(0.005)	(0.005)	(0.012)	(0.352)
Observations	92,307	25,878	25,878	25,204

Notes. In columns 1, 2 and 3 the estimation method is a probit model and the entries are average marginal effects. In column 4 the estimation method is OLS and is restricted to those who reported a positive number of hours of work. Other controls include six educational qualifications (primary education, low secondary education, upper secondary education, post-secondary (non-tertiary education), first stage of tertiary education, second stage of tertiary education, *omitted category*: pre-primary education), four terms on actual labour market experience (experience, experience squared, experience cubic, experience quartic), number of young children less than 18 (continuous), four dummies on where the household locates (suburbs, large town, small town, rural, *omitted category*: big city), five dummies if the closet child lives (0 to <=5 km, >5 to <=25 km, >25 to <=100 km, >100 to 500 km, >500 km, or in another country, *omitted category*: closest child lives in the same household or building), nineteen country dummies (*omitted category*: Luxemburg), and five wave dummies capturing the year the SHARE wave took place (*omitted category*: year 2004 - wave 1). Standard errors are reported in parentheses and are clustered at the household level. For reasons of brevity we report only estimates for the variables of interest. Estimates for the rest of the controls are available upon request. Levels of significance: *** 1%, **5%, * 10%. Our main right hand side control (husband's health shock, wife's health shock) is a dummy variable taking the value of 1 if the person has experienced one or more of the following work limited disabilities health problems: "stroke or cerebral vascular disease, chronic lung disease (chronic bronchitis or emphysema), osteoporosis, cancer or malignant tumor (including leukemia or lymphoma but excluding minor skin cancers), chronic kidney disease, Parkinson, Alzheimer/ dementia/organic brain syndrome/senility and any other serious memory impairment, or other emotional disorders including anxiety, nervous or psychiatric problems", 0 otherwise.

Table 4. International Comparisons: Employment, Working hours per week, Part time, Full time

Panel A. Employment

	Austria	Belgium	Czech Republic	Croatia	Denmark	Estonia	France	Germany	Greece	Hungary
Husband's health shock	-0.076*	-0.018	-0.091***	-0.092**	-0.109***	-0.184***	-0.029	-0.051**	-0.097**	-0.074*
	(0.039)	(0.028)	(0.032)	(0.045)	(0.032)	(0.026)	(0.034)	(0.023)	(0.044)	(0.042)
Wife's health shock	-0.135***	-0.124***	-0.044	-0.067	-0.100***	-0.119***	-0.175***	-0.070***	-0.118***	-0.120**
	(0.039)	(0.025)	(0.031)	(0.047)	(0.030)	(0.029)	(0.035)	(0.025)	(0.030)	(0.056)
	Israel	Italy	Netherlands	Poland	Portugal	Slovenia	Spain	Sweden	Switzerland	Luxemburg
Husband's health shock	-0.094**	-0.080***	-0.111***	-0.141***	-0.097*	-0.055	-0.081***	-0.136***	-0.126***	-0.001
	(0.039)	(0.030)	(0.032)	(0.055)	(0.050)	(0.042)	(0.031)	(0.032)	(0.044)	(0.063)
Wife's health shock	-0.150***	-0.152***	-0.097***	-0.171***	-0.182***	-0.099**	-0.084***	-0.127***	-0.087*	0.046
	(0.035)	(0.029)	(0.029)	(0.046)	(0.068)	(0.043)	(0.028)	(0.039)	(0.049)	(0.057)

Panel B. Working hours per week

	Austria	Belgium	Czech Republic	Croatia	Denmark	Estonia	France	Germany	Greece	Hungary
Husband's health shock	-1.163	-1.790	-0.364	2.442	-0.611	-3.050**	-0.724	-2.098	0.743	2.144
	(2.543)	(1.263)	(1.445)	(1.934)	(1.182)	(1.272)	(1.966)	(1.315)	(3.450)	(2.542)
Wife's health shock	0.618	-0.222	-2.055	-1.744	-2.347*	0.074	-2.146	-2.168	0.596	-5.107
	(3.204)	(1.366)	(1.484)	(2.830)	(1.335)	(1.147)	(1.617)	(1.406)	(1.693)	(3.290)
	Israel	Italy	Netherlands	Poland	Portugal	Slovenia	Spain	Sweden	Switzerland	Luxemburg
Husband's health shock	0.826	-0.008	-1.369	3.951	-6.756**	-0.456	-3.784***	-4.488***	-3.789	0.252
	(2.374)	(1.382)	(1.827)	(3.890)	(2.912)	(1.610)	(1.377)	(1.599)	(2.897)	(2.470)
Wife's health shock	-2.626	1.099	-1.800	-0.622	3.977	-4.392	0.421	-1.037	-4.839**	0.434
	(2.243)	(1.302)	(1.602)	(2.557)	(5.720)	(2.701)	(1.589)	(2.079)	(2.445)	(1.708)

Panel C. Part time

	Austria	Belgium	Czech Republic	Croatia	Denmark	Estonia	France	Germany	Greece	Hungary
Husband's health shock	-0.019	0.027	-0.020	-0.007	-0.068	0.115***	-0.029	0.037	-0.039	-0.051
	(0.059)	(0.038	(0.078)	(0.139)	(0.046)	(0.040)	(0.057)	(0.031)	(0.088)	(0.125)
Wife's health shock	-0.038	-0.018	0.016	0.074	0.034	-0.005	-0.028	0.038**	-0.067***	0.065
	(0.046)	(0.019)	(0.023)	(0.063)	(0.021)	(0.024)	(0.037)	(0.019)	(0.025)	(0.048)
	Israel	Italy	Netherlands	Poland	Portugal	Slovenia	Spain	Sweden	Switzerland	Luxemburg
Husband's health shock	0.015	-0.009	-0.040	-0.126	0.118*	-0.120	0.108**	0.110**	0.032	0.084
	(0.050)	(0,044)	(0.051)	(0.104)	(0.070)	(0.118)	(0.047)	(0.050)	(0.072)	(0.087)
Wife's health shock	0.047**	-0.038*	0.008	-0.005	-0.026	0.045	0.002	-0.035	-0.006	0.074
	(0.023)	(0.023)	(0.022)	(0.052)	(0.051)	(0.044)	(0.024)	(0.040)	(0.041)	(0.063)

Panel D. Full time

	Austria	Belgium	Czech Republic	Croatia	Denmark	Estonia	France	Germany	Greece	Hungary
Husband's health shock	0.037	-0.052	-0.001	0.004	0.035	-0.127**	0.033	-0.045	-0.043	0.047
	(0.084)	(0.061)	(0.075)	(0.081)	(0.051)	(0.053)	(0.076)	(0.049)	(0.125)	(0.078)
Wife's health shock	0.090	0.001	-0.018	0.054**	-0.115**	-0.027	0.004	-0.092***	0.108*	-0.090
	(0.064)	(0.039)	(0.048)	(0.023)	(0.052)	(0.039)	(0.065)	(0.035)	(0.057)	(0.090)
	Israel	Italy	Netherlands	Poland	Portugal	Slovenia	Spain	Sweden	Switzerland	Luxemburg
Husband's health shock	0.008	-0.012	0.069	0.351**	-0.242**	0.116*	-0.161**	-0.155**	-0.029	-0.113
	(0.071)	(0.061)	(0.076)	(0.144)	(0.107)	(0.065)	(0.070)	(0.077)	(0.098)	(0.139)
Wife's health shock	-0.095*	0.025	-0.032	0.112	0.103	-0.044	-0.007	0.096	-0.013	-0.015
	(0.050)	(0.045)	(0.052)	(0.130)	(0.119)	(0.088)	(0.043)	(0.087)	(0.108)	(0.071)

Notes. Entries are average marginal effects associated with the specific country specified. See the text for a description of the calculation. Standard errors are reported in parentheses and are clustered at the household level. See Notes of Table 3 for information on the other control variables. Levels of significance: *** 1%, **5%, * 10%.

Number of observations in Panel A for the husband's (wife's) health shock is 92,307 (92,307) respectively. Number of observations in Panel B for the husband's (wife's) health shock is 23,125 (25,204) respectively. Number of observations in Panel C for the husband's (wife's) health shock is 24,930 (25,878) respectively. Number of observations in Panel D for the husband's (wife's) health shock is 24,930 (28,878) respectively.

Table 5. Financial Outcomes Associated with Spouse's Health Shock

	Log Annual Earnings	Log Pension Income
	(1)	(2)
Husband's health shock	-0.090***	0.041***
	(0.034)	(0.015)
Observations	20,384	36,932
Wife's health shock	-0.105***	0.025*
	(0.032)	(0.013)
Observations	22,226	48,355

Notes. Entries are OLS coefficients. See Notes of Table 3 for information on the other control variables. For reasons of brevity we report only estimates for the variables of interest. Estimates for the rest of the controls are available upon request. Standard errors are reported in parentheses and are clustered at the household level. Levels of significance: *** 1%, **5%, * 10%.

Table 6. International Comparisons: Financial Outcomes Associated with Spouse's Health Shock

Panel A. Log Annual Earnings

	Austria	Belgium	Czech Republic	Croatia	Denmark	Estonia	France	Germany	Greece	Hungary
Husband's health shock	-0.411*	-0.093	-0.359*	-0.071	-0.071	-0.122	-0.061	0.033	0.087	0.382
	(0.211)	(0.137)	(0.215)	(0.245)	(0.089)	(0.158)	(0.141)	(0.102)	(0.226)	(0.301)
Wife's health shock	-0.030	0.011	-0.243	0.059	-0.182	-0.244	-0.112	0.008	0.083	-0.209
	(0.178)	(0.128)	(0.176)	(0.386)	(0.134)	(0.155)	(0.186)	(0.110)	(0.138)	(0.268)
	Israel	Italy	Netherlands	Poland	Portugal	Slovenia	Spain	Sweden	Switzerland	Luxemburg
Husband's health shock	-0.056	-0.105	-0.162	-0.114	0.753***	0.059	-0.064	-0.263*	-0.355	-0.236
	(0.174)	(0.126)	(0.172)	(0.314)	(0.205)	(0.220)	(0.173)	(0.150)	(0.271)	(0.347)
Wife's health shock	0.030	-0.232*	-0.132	0.095	0.278	-0.165	0.117	-0.170	-0.506**	0.123
	(0.198)	(0.124)	(0.141)	(0.237)	(0.418)	(0.235)	(0.121)	(0.158)	(0.217)	(0.227)

Panel B. Log Pension Income

	Austria	Belgium	Czech Republic	Croatia	Denmark	Estonia	France	Germany	Greece	Hungary
Husband's health shock	0.021	-0.052	-0.046	-0.224*	0.159***	0.172***	-0.128	-0.037	0.081	0.040
	(0.069)	(0.113)	(0.041)	(0.134)	(0.049)	(0.047)	(0.091)	(0.063)	(0.137)	(0.093)
Wife's health shock	-0.032	0.038	0.038	-0.108	0.057	0.196***	0.100	-0.028	-0.153***	0.035
	(0.044)	(0.053)	(0.049)	(0.141)	(0.043)	(0.052)	(0.073)	(0.047)	(0.048)	(0.074)
	Israel	Italy	Netherlands	Poland	Portugal	Slovenia	Spain	Sweden	Switzerland	Luxemburg
Husband's health shock	-0.196***	-0.026	0.194	0.044	-0.095	-0.062	0.050	0.065	0.013	0.154
	(0.065)	(0.049)	(0.209)	(0.061)	(0.168)	(0.086)	(0.081)	(0.058)	(0.070)	(0.233)
Wife's health shock	-0.121*	-0.042	0.122	0.059	-0.046	-0.121	-0.005	0.040	0.029	0.158
	(0.071)	(0.042)	(0.196)	(0.088)	(0.174)	(0.078)	(0.048)	(0.055)	(0.084)	(0.171)

Notes. Entries are average marginal effects associated with the specific country specified. See the text for a description of the calculation. Standard errors are reported in parentheses and are clustered at the household level. See Notes of Table 3 for information on the other control variables. Levels of significance: *** 1%, **5%, * 10%. The number of observations in Panel A for the husband's health shock estimates is 20,384 and for the wife's health shock is 22,226. Number of observations in Panel B for the husband's health shock estimates is 36,932 and for the wife's health shock is 48,355.

Table 7. Sensitivity Analysis I

Panel A	Wives		Husbands	
	Husband's health shock	Wife's health shock	Husband's health shock	Wife's health shock
Employment	-0.086***	-0.125***	-0.175***	-0.084***
	(0.006)	(0.005)	(0.005)	(0.006)
Observations	92,307		92,307	
Working hours per week	-1.297***	-2.049***	-2.340***	-1.147***
	(0.369)	(0.383)	(0.475)	(0.351)
Observations	23,125		25,204	
Part time work	0.019*	0.047***	0.027***	0.008
	(0.001)	(0.013)	(0.008)	(0.006)
Observations	24,930		25,878	
Full time work	-0.024*	-0.059***	-0.056***	-0.024**
	(0.013)	(0.016)	(0.016)	(0.012)
Observations	24,930		25,878	
Log annual earnings	-0.077**	-0.227***	-0.225***	-0.098***
	(0.034)	(0.036)	(0.042)	(0.032)
Observations	20,384		22,226	
Log pension income	0.041***	0.010	0.025*	0.023*
	(0.015)	(0.015)	(0.013)	(0.013)
Observations	36,932		48,355	

Panel B	Wives	Husbands
	Husband's health shock	Wife's health shock
Employment	-0.065***	-0.061***
	(0.006)	(0.006)
Observations	92,307	92,307
Working hours per week	-1.283***	-0.901**
	(0.378)	(0.359)
Observations	23,125	25,204
Part time work	0.019*	0.004
	(0.012)	(0.006)
Observations	24,930	25,878
Full time work	-0.026*	-0.019*
	(0.015)	(0.011)
Observations	24,930	25,878
Log annual earnings	-0.045*	-0.056*
	(0.024)	(0.032)
Observations	20,384	22,226
Log pension income	0.046***	0.033**
	(0.016)	(0.013)
Observations	36,932	48,355

Panel C	Wives	Husbands
	Husband's health shock	Wife's health shock
Employment	-0.082***	-0.098***
	(0.007)	(0.006)
Observations	92,307	92,307
Working hours per week	-1.469***	-1.226***
	(0.430)	(0.428)
Observations	23,125	25,204
Part time work	0.023*	0.002
	(0.013)	(0.007)
Observations	24,930	25,878
Full time work	-0.031*	-0.020
	(0.017)	(0.014)
Observations	24,930	25,878
Log annual earnings	-0.099**	-0.105***
	(0.040)	(0.039)
Observations	20,384	22,226
Log pension income	0.016	0.012
	(0.018)	(0.015)
Observations	36,932	48,355

Continued

Continued

Panel D	Wives	Husbands
	Husband's heart attack shock	Wife's heart attack shock
Employment	-0.110***	-0.137***
	(0.006)	(0.007)
Observations	92,307	92,307
Working hours per week	-0.841**	-2.301***
	(0.418)	(0.672)
Observations	23,125	25,204
Part time work	0.004	0.013
	(0.012)	(0.010)
Observations	24,930	25,878
Full time work	-0.002	-0.026
	(0.017)	(0.019)
Observations	24,930	25,878
Log annual earnings	-0.124***	-0.291***
	(0.037)	(0.057)
Observations	20,384	22,226
Log pension income	0.011	0.001
	(0.016)	(0.017)
Observations	36,932	48,355

Notes. In Panel A we add the own work limiting disability as an extra control alongside all the other controls reported in the Notes of Table 3. In Panel B we add the other spouse's physical health index as an extra control. The physical health index comprises the following measures of physical functioning, activities of daily living and instrumental activities of daily living: ability to walking 100 meters, get up from a chair after sitting for long periods, climb several flights of stairs without resting, climb one flight of stairs without resting, stoop or kneel or crouch, reach or extend the arms above shoulder level, pull or push large objects like a living room chair, lift or carrying weights over 10 pounds/5 kilos, like a heavy bag of groceries, pick up a small coin from a table, dress (including putting on shoes and socks), walk across a room, bath or shower, eating (such as cutting up the food), and get in or out of bed. This index ranges from 0 (=no restriction with any of the above activities) to 14 (= restrictions with all the above activities). In Panel C we subtract from the work limiting disability health problems the following degenerative health problems: cancer or malignant tumor (including leukemia or lymphoma but excluding minor skin cancers), Parkinson, Alzheimer/ dementia/organic brain syndrome/senility or any other serious memory impairment, other affective or emotional disorders including anxiety, nervous or psychiatric problems. In Panel D we replace our work health disability variable with a dummy variable capturing if the respondent has had a heart attack. Entries are average marginal effects. Standard errors are clustered at the household level and are reported in parentheses. Levels of significance: *** 1%, **5%, * 10%. For reasons of brevity we report only estimates for the variables of interest. Estimates for the rest of the controls are available upon request.

Table 8. Sensitivity Analysis II

	Model 1	Model 2	Model 3	Model 4
Employment				
Husband's health shock	-0.104***	-0.096***	-0.141*	-0.073***
	(0.006)	(0.011)	(0.073)	(0.009)
Observations	70,861	21,446	78,643	59,641
Wife's health shock	-0.093***	-0.100***	-0.113	-0.086***
	(0.006)	(0.010)	(0.092)	(0.008)
Observations	70,861	21,446	77,235	59,641
Working hours per week				
Husband's health shock	-1.550***	-1.265*	-1.179	-1.037***
	(0.420)	(0.739)	(7.791)	(0.361)
Observations	18,362	4,763	20,823	21,787
Wife's health shock	-1.257***	-1.088	-4.325	-0.570*
	(0.393)	(0.743)	(4.426)	(0.338)
Observations	20,307	4,897	22,321	23,919
Part time				
Husband's health shock	0.034**	-0.009	0.018	0.016
	(0.013)	(0.018)	(0.012)	(0.011)
Observations	19,385	5,503	22,607	23,920
Wife's health shock	0.007	0.014	0.006	0.003
	(0.006)	(0.010)	(0.006)	(0.005)
Observations	20,489	5,342	23,151	25,306
Full time				
Husband's health shock	-0.046***	0.025	0.138	-0.022
	(0.017)	(0.032)	(0.085)	(0.016)
Observations	19,385	5,545	22,610	23,920
Wife's health shock	-0.026**	-0.024	0.053	-0.014
	(0.012)	(0.030)	(0.062)	(0.011)
Observations	20,489	5,389	23,154	25,306
Log annual earnings				
Husband's health shock	-0.091**	-0.121*	0.149	-0.053*
	(0.038)	(0.073)	(0.457)	(0.030)
Observations	16,027	4,357	18,126	18,844
Wife's health shock	-0.113***	-0.070	-1.082***	-0.069**
	(0.036)	(0.069)	(0.332)	(0.031)
Observations	17,672	4,554	19,471	20,592
Log pension income				
Husband's health shock	0.026	0.088***	0.129	0.083***
	(0.018)	(0.032)	(0.182)	(0.025)
Observations	27,793	8,959	29,944	17,745
Wife's health shock	0.035**	-0.013	0.191	0.027
	(0.015)	(0.028)	(0.152)	(0.021)
Observations	37,353	11,002	38,900	24,567

Notes.

Model 1: The sample is restricted to those who live in the same household with their child/children, or they live 0 to <=5 km away, or they live >5 to <=25 km away.

Model 2: The sample is restricted to those who live >25 to <=100 km away, or they live >100 to <=500 km away, or live >500 km away or in another country.

Model 3: Sample is restricted to those people with no health limiting work disability in the first wave observed.

Model 4: Sample is restricted to households where both husband and wife are 70 or younger.

Entries in rows for employment, part- time and full-time entries are average marginal effects obtained from a probit model. Entries in rows for working hours per week, log annual earnings and log pension income entries are OLS coefficients. Standard errors are clustered at the household level and are reported in parentheses. Levels of significance: *** 1%, **5%, * 10%. For reasons of brevity we report only estimates for the main health shock variable. Estimates for the rest of the controls are available upon request.

Table 9. The Extent of Severity

	Wives		Husbands	
	Below/equal the mean of Husband's physical index	Above the mean of Husband's physical index	Below/equal the mean of Wife's physical index	Above the mean of Wife's physical index
Employment	-0.086***	-0.039***	-0.093***	-0.037***
	(0.008)	(0.006)	(0.008)	(0.006)
Observations	67,117	25,190	59,848	32,459
Working hours per week	-0.969**	-1.881***	-0.703	-1.305**
	(0.431)	(0.640)	(0.447)	(0.539)
Observations	19,515	3,610	19,756	5,448
Part time work	0.009	0.042**	0.007	0.007
	(0.013)	(0.019)	(0.007)	(0.008)
Observations	21,111	3,819	20,524	5,354
Full time work	-0.018	-0.040	-0.026*	-0.016
	(0.018)	(0.025)	(0.015)	(0.018)
Observations	21,111	3,819	20,524	5,354
Log annual earnings	-0.053	-0.045	-0.078*	-0.052
	(0.040)	(0.060)	(0.042)	(0.050)
Observations	16,895	3,489	17,010	5,216
Log pension income	0.016	0.068***	0.042**	0.025
	(0.022)	(0.022)	(0.020)	(0.017)
Observations	24,710	12,222	28,299	20,056

Notes. See Notes of Table 7 for information on how the physical index variable is constructed. The mean of husband's physical index is 1.379 and that of wife's is 1.677. Entries in rows for employment, part and full time work are average marginal effects obtained from a probit regression. Entries in row for working hours, annual earnings and pension income are OLS coefficients. Standard errors are in parentheses and are clustered at the household level. Other controls include those reported in the Notes of Table 3. For reasons of brevity we report only estimates for the main health shock variable. Estimates for the rest of the controls are available upon request. Levels of significance: *** 1%, **5%, * 10%.

Appendix

Table A1: Sample Properties of Variables by Spouse Status

Variable	Wives				Husbands			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
Age	63.565	9.548	22	99	66.684	9.428	29	101
Primary education	0.199	0.400	0	1	0.179	0.384	0	1
Low secondary education	0.193	0.394	0	1	0.171	0.376	0	1
Upper secondary education	0.324	0.468	0	1	0.337	0.473	0	1
Post-secondary (non-tertiary)	0.044	0.205	0	1	0.042	0.201	0	1
Tertiary education	0.189	0.391	0	1	0.219	0.414	0	1
Second stage of tertiary education	0.005	0.067	0	1	0.010	0.099	0	1
Experience	7.619	14.101	0	71	12.581	18.878	0	82
Experience squared/100	2.569	5.491	0	50.4	5.147	8.227	0	67.2
Experience cubic/1000	9.465	23.050	0	357.9	21.712	38.008	0	551.4
Experience quartic/10000	36.753	102.985	0	2541.2	94.174	185.446	0	4521.2
Number of young children	0.059	0.317	0	9	0.059	0.317	0	9
Closest child lives: distance 0 to <=5 km	0.276	0.447	0	1	0.276	0.447	0	1
Closest child lives: distance >5 to <=25 km	0.138	0.345	0	1	0.138	0.345	0	1
Closest child lives: distance >25 to <=100 km	0.076	0.265	0	1	0.076	0.265	0	1
Closest child lives: distance >100 to <=500 km	0.051	0.220	0	1	0.051	0.220	0	1
Closest child lives: distance > 500 or in a foreign country	0.105	0.307	0	1	0.105	0.307	0	1
Household locates in: suburbs	0.110	0.313	0	1	0.110	0.313	0	1
Household locates in: large town	0.160	0.366	0	1	0.160	0.366	0	1
Household locates in: small town	0.253	0.435	0	1	0.253	0.435	0	1
Household locates in: rural area	0.330	0.470	0	1	0.330	0.470	0	1
	0.053	0.225	0	1	0.053	0.225	0	1
Austria	[1,771]				[1,771]			
	0.083	0.276	0	1	0.083	0.276	0	1
Belgium	[2,885]				[2,885]			
	0.070	0.255	0	1	0.070	0.255	0	1
Czech Republic	[2,581]				[2,581]			
	0.019	0.136	0	1	0.019	0.136	0	1
Croatia	[1,035]				[1,035]			
	0.053	0.225	0	1	0.053	0.225	0	1
Denmark	[1,828]				[1,828]			
	0.069	0.254	0	1	0.069	0.254	0	1
Estonia	[2,355]				[2,355]			
	0.068	0.252	0	1	0.068	0.252	0	1
France	[2,470]				[2,470]			
	0.070	0.254	0	1	0.070	0.254	0	1
Germany	[2,810]				[2,810]			
	0.050	0.219	0	1	0.050	0.219	0	1
Greece	[2,214]				[2,214]			
	0.016	0.125	0	1	0.016	0.125	0	1
Hungary	[1,038]				[1,038]			
	0.038	0.191	0	1	0.038	0.191	0	1
Israel	[1,377]				[1,377]			
	0.086	0.280	0	1	0.086	0.280	0	1
Italy	[2,937]				[2,937]			
	0.040	0.196	0	1	0.040	0.196	0	1
Netherlands	[2,019]				[2,019]			
	0.033	0.179	0	1	0.033	0.179	0	1
Poland	[1,922]				[1,922]			

Continued

	Wives				Husbands			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
	0.016	0.124	0	1	0.016	0.124	0	1
Portugal	[807]				[807]			
	0.041	0.199	0	1	0.041	0.199	0	1
Slovenia	[1,744]				[1,744]			
	0.087	0.282	0	1	0.087	0.282	0	1
Spain	[3,122]				[3,122]			
	0.056	0.230	0	1	0.056	0.230	0	1
Sweden	[2,062]				[2,062]			
	0.039	0.194	0	1	0.039	0.194	0	1
Switzerland	[1,321]				[1,321]			
Luxemburg	0.012	0.108	0	1	0.012	0.108	0	1
	[574]				[574]			
wave2 (2006)	0.116	0.320	0	1	0.116	0.320	0	1
wave4 (2011)	0.176	0.381	0	1	0.176	0.381	0	1
wave5 (2013)	0.204	0.403	0	1	0.204	0.403	0	1
wave6 (2015)	0.212	0.409	0	1	0.212	0.409	0	1
wave7 (2017)	0.195	0.396	0	1	0.195	0.396	0	1
Observations		92,307				92,307		

Source: Authors' calculations from SHARE data waves 1, 2, 4, 5, 6, 7. Number of households per country in square brackets.

Total number of couples 38,872.