

# **Life-course health and labour market exit in 13 European countries: Results from SHARELIFE**

Mauricio Avendano<sup>1,2</sup>, Johan P. Mackenbach<sup>1</sup>

## **Affiliations:**

<sup>1</sup>Department of Public Health, Erasmus MC, PO Box 2040, 3000 CA Rotterdam, The Netherlands

<sup>2</sup>Harvard Center for Population and Development studies, 9 Bow Street, Cambridge, Massachusetts 02138, USA

## **Address for correspondence:**

Mauricio Avendano, PhD

Department of Public Health, Erasmus MC (AE-building)

PO Box 2040, 3000 CA Rotterdam

The Netherlands

# **Life-course health and labour market exit in 13 European countries: Results from SHARELIFE**

## **Abstract**

Health is strongly associated with labor force participation, but the institutional mechanisms that explain this association remain unknown. This paper examines the impact of life-course illness on labor market exit based on reconstructed life histories of adult health and employment. We use newly collected data from the Retrospective Survey of Health, Ageing and Retirement in Europe (SHARELIFE), linked to data on institutions for the period 1960-2009 in 13 countries. We find that periods of illness at any point during the life-course are associated with earlier exit from the labor market, but this association differs across countries with different institutions. While the level of investment in public health does not explain cross-country variations, higher investments in curative health care are associated with weaker effects of long-term illness on work duration. We find that higher unemployment benefits may work as incentive towards earlier exit from the labor market due to illness.

## Introduction

Despite dramatic increases in life expectancy during the second half of the 20<sup>th</sup> century, the proportion of lifetime individuals spend in the labour force has decreased in most European countries during the last decade. Although the official retirement age in most of Europe ranges between 60 and 65 for women and 62 and 65 for men, the age at which Europeans actually withdraw from the labour market varies markedly across countries, and is generally well below the official age (Romans, 2007). Among women, the median retirement age ranges from 55 in Poland and Slovenia, to 63 in Sweden; among men, it ranges from 57 in Poland, to 65 in Estonia and Cyprus (Romans, 2007). The determinants of these variations are not well understood due to the complexity of retirement decisions and pathways to retirement. Understanding the determinants of these variations is essential for the development of policies that can increase labour force participation in Europe.

Particularly at old age, health is a major determinant of transitions in and out of employment (Haan & Myck, 2009). The mechanisms through which illness may lead to labour market exit can be conceptualized in two ways: First, illness may lead to impairments that limit the ability to work; second, illness may lead to eligibility to public disability benefit programmes, which enable individuals to earn non-wage income while out of the labour market. Consistent with these two mechanisms, two types of policies may influence the rate of exit from the labour market as a result of illness. First, health promotion and prevention policies have the potential to produce healthy workers that remain longer in the labour force. Second, higher generosity of public disability benefit programmes might be an incentive for disability insurance uptake, leading to higher exit rates attributable to illness (Börsch-Supan, 2006, 2008). Policies on these domains differ dramatically across countries and may influence the link between illness and labour force participation. Cross-national comparisons provide a unique opportunity to identify policies that can ameliorate the impact of health on labour force participation in Europe.

Previous studies have focused primarily on the short-term impact of mid- and old-life health on retirement (Bound, Schoenbaum, Stinebrickner, & Waidmann, 1998; Disney, Emmerson, & Wakefield, 2006; Dwyer & Mitchell, 1999; Haan & Myck, 2009; Romans, 2007; Tanner, 1998), but less is known about how health since the early years of productive age influences the

likelihood of leaving the labour force later in life. In this paper, we examine the impact of periods of long-term illness over the life-course on labour force participation in a sample of 13 European countries participating in SHARELIFE. Three hypotheses underlie our analysis: First, we hypothesize that periods of illness over the life cycle have a long-standing impact on the ability to work and the likelihood of leaving the labour market at older ages. Second, we expect larger government investments in public health to reduce the impact of illness on the ability to work, thus leading to gains in economic productivity. Finally, we hypothesize that more generous disability insurance and unemployment benefit programmes lead to a stronger association between health and labour market exit, as these may work as financial incentive towards earlier health-related exit from the labour market.

## Methods

Our analysis is based on men who participated in the SHARELIFE survey, and who were also interviewed in the first wave of SHARE. Due to the complexities of labour market histories in older cohorts of women, our analysis focuses on men only. Data from SHARELIFE was linked to basic demographic and labour force participation data from the first wave (2004/2005) of SHARE, except for the Czech Republic and Poland, where the first wave took place in 2006/2007.

Based on the life History Event Calendar approach we reconstructed life histories of *adult health* using the questions asking participants about the number of *periods of ill health or disability* experienced during adulthood that lasted more than a year. Individuals were asked the starting and ending year of each period of illness, as well as the specific medical condition that accounted for each period.

*For work participation*, individuals were asked about their entire labour market history, including transitions in and out of employment over the life-course. Participants reported the date on which they entered the labour market, at which point follow-up started. Based on the approach of previous studies (Disney et al., 2006), labour market exit was defined as the *last observed exit from economic activity* (if observed), thus assuming inactivity as an absorbing state.

We exploit the event history structure of the data to assess long-term effects of health on labour force participation in *failure-time or duration models* (Box-Steffensmeier & Jones, 2004). We reconstructed the date at which individuals entered the labour market and observed individuals thereafter. During the observation period, individuals were at risk of experiencing a transition from employment to non-employment. Individuals that did not experience a transition out of employment were *censored*, because although the outcome event may be experienced, employment status after the last point of observation was unobserved.

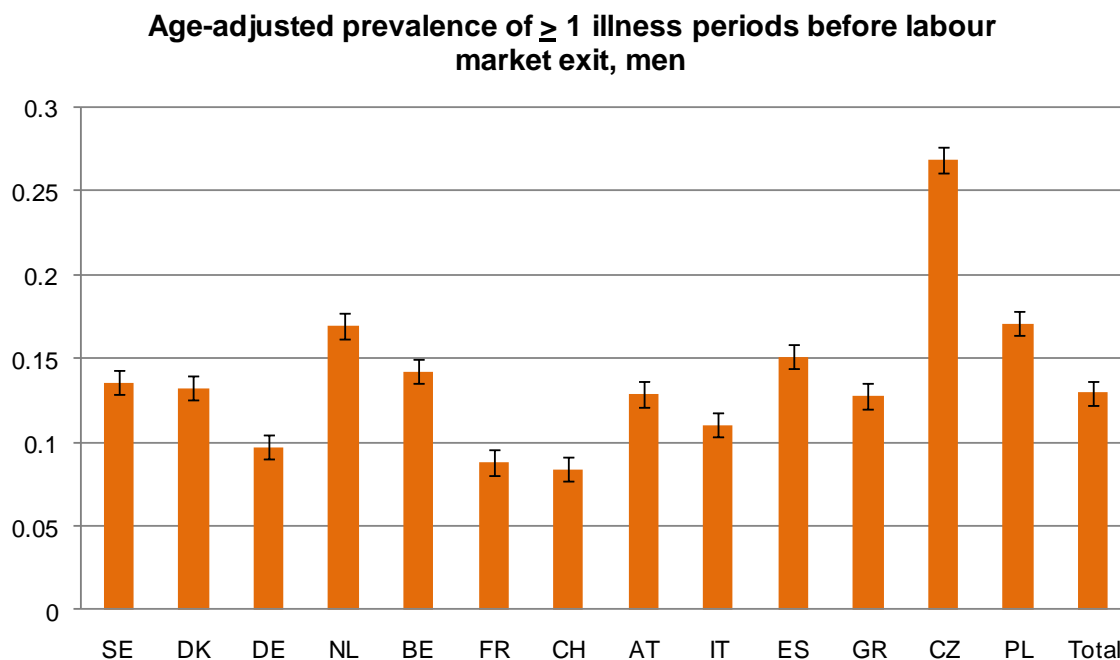
The Cox Proportional hazard model was used to model survival time in the labour market as a function of illness status, controlling for age of entry into the labour market, education, age of illness and country. We are interested in the effect of experiencing at least one period of illness during adulthood on ‘survival’ in the labour force. Illness status and age of illness were treated as time-varying covariates. Individuals could change the value of illness status from “no illness” to “illness”. Similarly, individuals and periods without illness were assigned the mean age of illness, which changed to the observed age of first illness for those who reported having had an illness period.

Analysis was restricted to individuals who at some point in their lives entered the labour market, because those who did not enter employment were not at risk of experiencing a transition out of the labour force. Thus, individuals who reported that they had never done any paid work were excluded. The final sample size included 8,132 male participants. Individuals who started to work immediately after completing school were assigned the date in which they finished high school as the date of entry into the study. Individuals that reported a gap of non-employment after high-school were assigned the date of their first job as the date of entry into the study. Participants who started to work before completing their full-time education did not report the exact age and were assigned the median age of entrance into the labour market of other participants (18 years). Individuals who were still employed at the time of interview were right-censored at interview date.

## Results

### Illness over the life-course

Figure 1 shows the age-adjusted prevalence of reporting one or more periods of illness that lasted at least one year during the years of productive life for the 13 European countries in SHARELIFE. Overall, 13% of participants reported having experienced an episode of illness, but there were large variations across countries. Switzerland (8%) and France (9%) experienced the lowest prevalence of illness, while the highest prevalence was observed in Poland (17%) and the Czech Republic (27%).

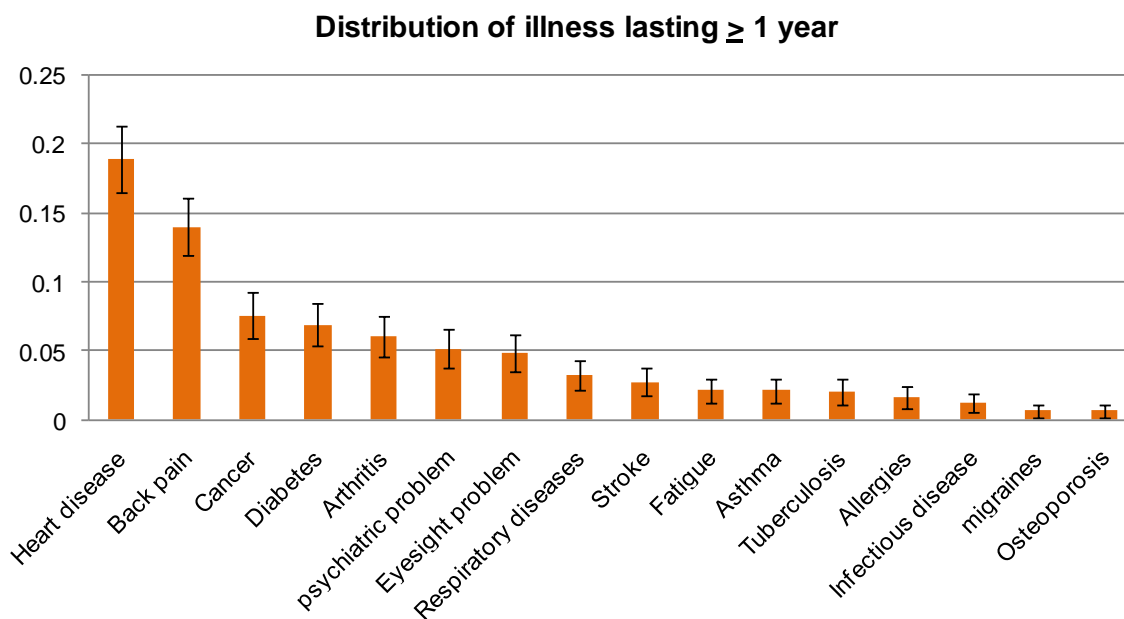


*Figure 1. Prevalence of reporting 1 or more periods of illness before labour market exit in men at ages 50 years and older*

The nature of these periods of illness is summarized for the entire sample of males in Figure 2. Percentages add to more than a hundred because individuals could report more than one condition as responsible for each period of illness. Heart disease, including angina, heart attack and other heart diseases, accounted for the largest share of periods of illness lasting at least one

year (19%). The second major cause of periods of illness was back pain (14%), followed by cancer (7%), diabetes (6%), arthritis (6%), psychiatric conditions (5%), and eyesight problems (5%). Other listed conditions accounted each for less than 4% of periods of long-term illness. In total, 30% of illness periods were attributable to conditions that were not included in the list.

The distribution of conditions was overall very similar across all countries. However, there were some important regional differences. In the Nordic countries as well as in Western Europe, around 20% of all cases of illness was attributable to back pain, compared to only 7% in Southern Europe and 10% in Eastern European countries. While heart disease and angina accounted for 8% of illness periods in the Nordic countries and 14% in Western European countries, this figure was 23% for Southern Europe and 24% for Eastern European countries. Cancer had a larger share of all illness in Nordic (9%) and Western (10%) European countries than in Southern (5%) and Eastern (6%) European countries. About 20% of all periods of illness in Northern Europe was attributable to other conditions not included in the list, compared to around 30-33% in Western, Southern or Eastern European countries.



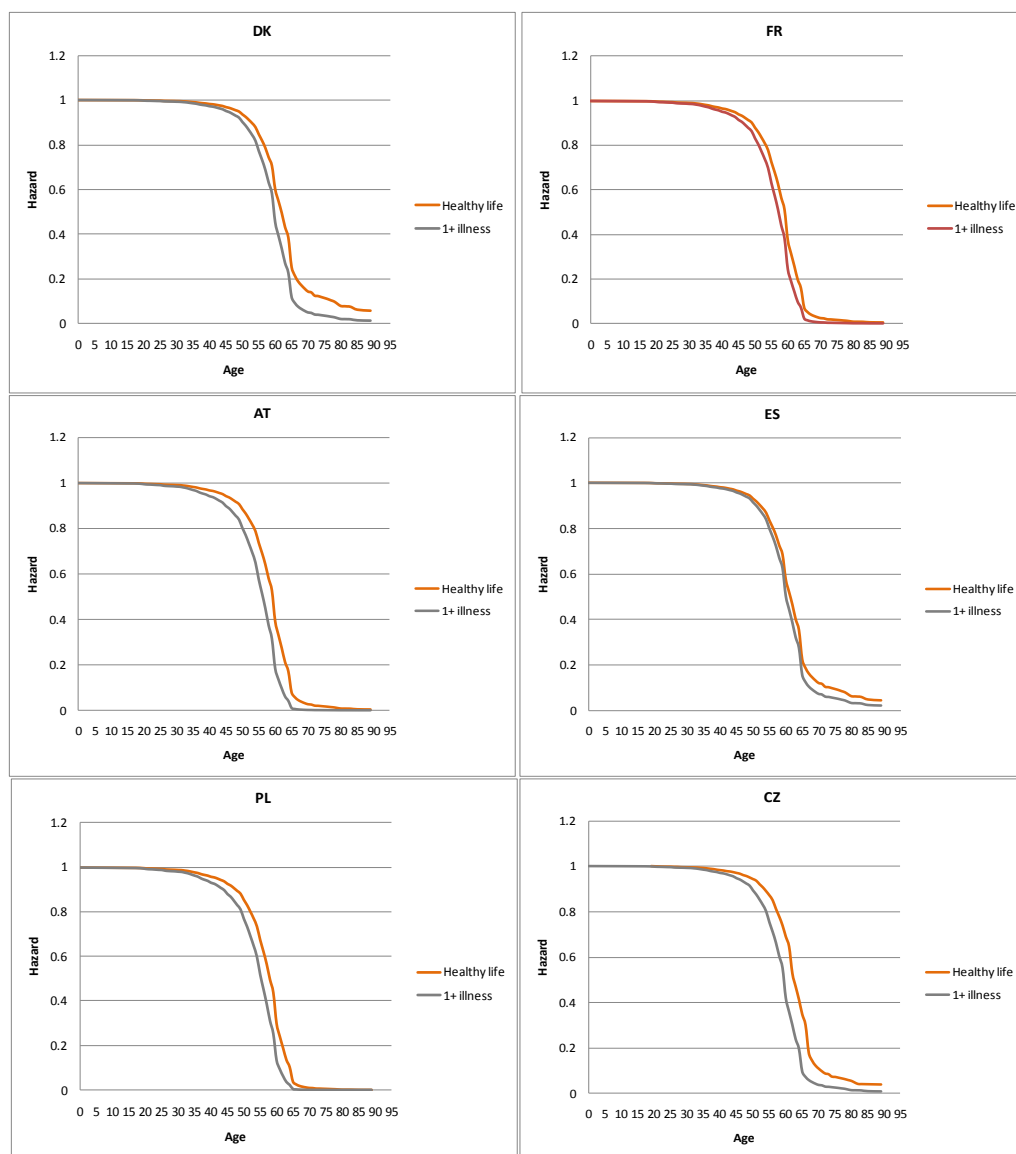
*Figure 2. Medical conditions that account for the first period of illness in men aged 50 years or older who experienced at least one illness period*

## **The impact of illness on labour market exit**

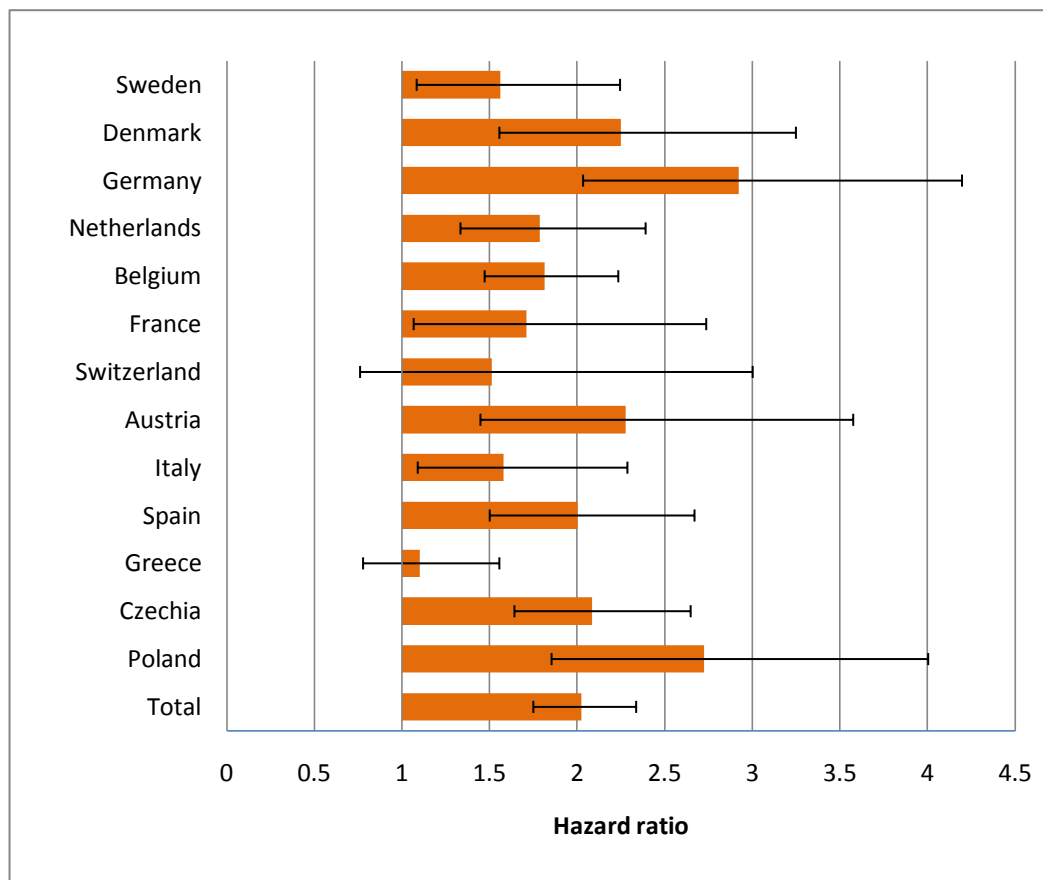
For a selected set of countries, Figure 3 shows survival curves that summarize the length of time individuals survive in the labour market before exiting (or censoring), according to whether they experienced at least a period of illness earlier in their life. Participants who never experienced a period of illness ('healthy life') had generally higher rates of labour force participation and lower exiting rates at all ages than individuals who at some point in their life experienced a period of illness. Although in some countries the lines approached each other, in most countries differences were substantial. For example, in Austria, at age 55, 74% of men who had never experienced a major illness were still in the labour market, as opposed to only 57% of those who had experienced a period of long-term illness. By age 60, 40% of those in good health were still in the labour market, as opposed to only 18% of those who had had a period of illness. In France, 72% of healthy men were still in the labour force at age 55, compared to 63% of those who had experienced a period of illness. At age 60, 37% of healthy men were in the labour market, compared to only 24% of those who had experienced a period of illness. In Italy, as well as in Greece and Spain, there was little difference in the employment trajectories of those with and without a previous history of long-term illness. However, survival curves ignore the time-varying nature of illness, underestimating potential differences in survival.

Figure 4 shows the hazard ratio of labour market exit according to whether individuals had experienced at least one period of illness lasting a year or more over their life course, incorporating illness as a time-varying covariate. Effects appear now to be much more consistent across countries. In the total sample, a period of long-term illness is significantly associated with twice higher risk of exiting the labour market over the years of productive life. There were, however, important variations across countries. Long-term illness increased the risk of future labour market exit by almost three times in Germany and Poland, and by around twice in Austria, Denmark, the Czech Republic and Spain. Strong effects were also observed in Belgium, the Netherlands, France, Italy and Sweden, where illness increased the risk of labour market exit by 60-80%. Effects were not significant in Switzerland possibly due to the small sample size, while in Greece, there was no evidence of an association.





*Figure 3. Survival in the labour market according to illness status in a Cox Proportional Hazard model for men at ages 50 years and older*



*Figure 4. Hazard ratio of last labour market exit according to illness status in a time-varying Cox Proportional Hazard model for men at ages 50 years and older*

## **The role of public health and labour policies**

Differences among countries in the impact of illness on labour market exit may be explained by a variety of both health care and labour policies. In this section, we explore to what extent expenditures in relevant policies are correlated with life-course health and the magnitude of the association between illness and labour market exit.

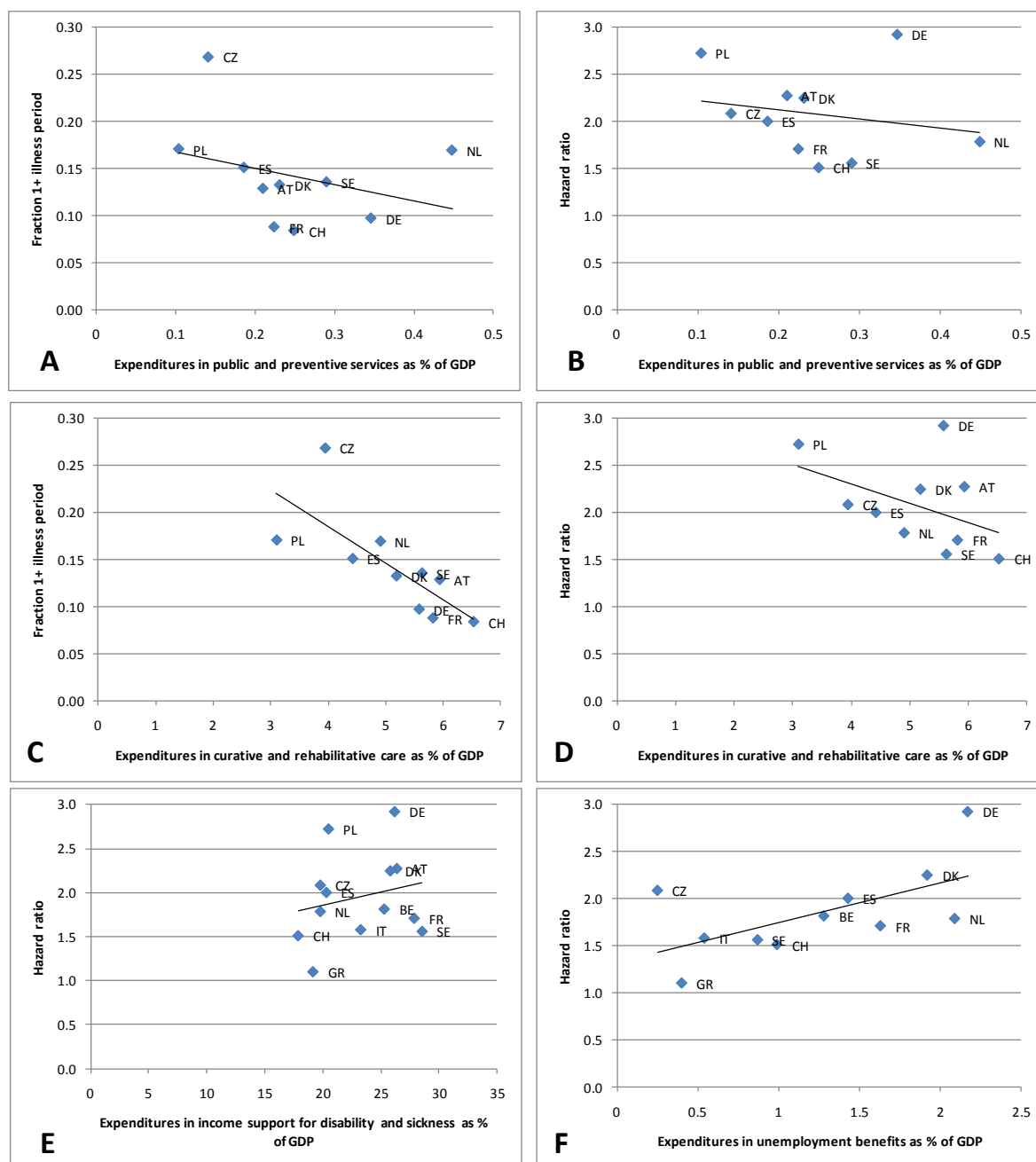


Figure 5. Welfare state interventions and hazard ratio of the impact of illness on last labour market exit in men at ages 50 years and older

Panels A to D in Figure 5 summarize the association of expenditures in public health and curative care as percentage of GDP with the prevalence of long-term illness and the hazard ratio that summarizes the association between illness and labour market exit. Panels A and B show that expenditures in public health were not correlated with the prevalence of long-term illness or the association between illness and labour market exit. In contrast, Panels C and D show that

higher expenses in curative care were associated with lower prevalence of long-term illness ( $r=-.74$ ,  $p=.015$ ), and hazard ratios on the impact of illness on labour market exit ( $r=-.44$ ,  $p=.19$ ), although only the former was significant.

Panels E and F show that while there was no significant correlation for expenditures in disability and sickness ( $r=.22$ ,  $p=.47$ ), higher expenditure in unemployment benefit programmes was associated with a stronger association between illness and the risk of labour market exit ( $r=.60$ ,  $p=.053$ ). In supplementary analyses, we explored this further by examining correlations with unemployment benefit duration and average net replacement rates for the year 2004 from the OECD employment outlook. There was a non-significant positive correlation between unemployment benefit duration and the impact of illness on labour market exit ( $r=.329$ ,  $p=.324$ ). In contrast, although the correlation was not significant, higher average net replacement rates over 60 months of unemployment seemed to be correlated with a stronger association between illness and labour market exit ( $r=.46$ ,  $p=.11$ ).

## **Conclusions**

Three hypotheses guided our analysis. First, we hypothesized that periods of illness over the life cycle have a long-standing impact on the ability to work and the likelihood of leaving the labour market at older ages. In support of this hypothesis, we found that in most European countries, long-term illness is associated with earlier exit from the labour market. We hypothesized that higher public health investments might ameliorate this association. Our results are inconclusive but generally do not suggest a strong correlation of the level of public health investments with the prevalence of long-term illness or the magnitude of the association between illness and labour force participation. Investments in curative health care do seem to be strongly associated with the prevalence of long-term illness and the impact of illness on labour market exit, although correlations were not significant for the latter. Our third hypothesis referred to the role of labour market programmes. We found that larger investments in unemployment benefit programmes are associated with a larger impact of illness on labour force participation. Although correlations with average replacement rates and unemployment duration policies did not reach statistical significance, overall findings suggest that higher unemployment benefits may potentially work as incentive towards earlier exit from the labour market due to illness.

It is important to consider a number of limitations in our study. First, our analysis examines associations, and ignores the fact that illness might be endogenous to labour force participation. Lower labour force participation may lead to poorer self-reports of health, or both health and labour force participation may be the result of unobserved characteristics such as parental investments or family background. Therefore, although our results are consistent the hypothesis that poor health leads to shorter working lives, they are also consistent with other hypotheses involving reverse causality or unobserved heterogeneity. Second, our study is based on a life-history event approach, and may therefore suffer from mortality selection, as individuals who did not survive to become part of the survey are unobserved. If poor health increases the risk of exiting employment, we would expect mortality selection to downwardly bias estimates, as those in poor health would be more likely to be unobserved. Third, information on periods of illness and employment histories might be susceptible to recall bias. Finally, our assessment of the impact of welfare state policies is only a first approximation that ignores that time-varying nature of employment and public health policies. Future analyses should focus on linking national data on policies over time to the particular timing of events of illness and job loss experienced by participants.

Despite these limitations, our study raises important questions regarding the impact of poor health on work and the potential mechanisms behind this association. Findings are consistent with previous studies showing that adverse shocks to individual health predict individual retirement (Disney et al., 2006; Haan & Myck, 2009). Our results extend these findings by suggesting that periods of illness impact duration in the labour market, even if these events occurred at a relatively early point in the life-course. Previous evidence suggests that ill health is a major reason for retirement among men in several European countries (Bound et al., 1998; Tanner, 1998). It has been suggested that this association may be explained by the ‘justification hypothesis’, i.e., self-reports of health are misreported as individuals use health as justification for leaving the labour force (Bound, 1991). This phenomenon is unlikely to explain our results, because periods of illness assessed in our study referred often to health shocks that occurred many years before retirement decisions took place. In addition, our measure is not based on an overall self-assessment of health, but on self-reports of specific periods of illness accounted by specific medical conditions.

Several plausible mechanisms may explain the association between illnesses and labour market exit. Poor health may directly prevent productive activity thus leading to early retirement. Periods of long-term illness may be indicators for general poor health, so that individuals who experience a period of illness earlier in life may be prone to experience late-life problems that ultimately lead to early retirement. Poor health may also lead to a change in preferences and the 'price' of leisure time, as the need for non-work time to care for health increases. Our results are consistent with these two potential mechanisms linking health and earlier exit from the labour market. On the other hand, poor health may also lead to higher consumption of health care, potentially forcing individuals to delay retirement to meet their consumption needs. This second explanation is not consistent with the finding that ill health leads to earlier exit from the labour market. This may be due to the fact that European countries enjoy close to universal health care coverage, potentially diminishing the need to increase work to meet health care consumption needs. Overall, our results are consistent with the view that poorer health leads to earlier exit from the labour market because of its effects on preferences and productivity (Dwyer & Mitchell, 1999).

Our results suggest that the association between poor health and labour market exit is complex and varies substantially across countries with different welfare state policies. We find that higher investments in unemployment benefit programmes are associated with stronger associations between ill health and retirement. This suggests that while health as such plays an important role, individuals also respond to incentives to retirement, and may use unemployment benefit programmes as a potential pathway to leave the labour market as a result of illness.

In conclusion, our study suggests that periods of illness during the life-course are associated with an increased risk of leaving the labour force, but the magnitude of this association varies across countries. Our results suggest a new area of exploration to disentangle how historical reforms to labour market programmes have influenced the role of illness in early retirement, and how this varies across European countries with different welfare state policies and institutions.

## References

- Börsch-Supan, A. (2006). Work Disability and Health. In A. Börsch-Supan (Ed.), *Health, Ageing and Retirement in Europe: First Results from the Survey of Health, Ageing and Retirement in Europe* pp. 253-258). Mannheim: Mannheim Research Institute for the Economics of Aging (MEA).
- Börsch-Supan, A. (2008). Changes in Health Status and Work Disability. In A. Börsch-Supan (Ed.), *First Results from the Survey of Health, Ageing and Retirement in Europe (2004-2007)* pp. 230-238). Mannheim: Mannheim Research Institute for the Economics of Aging (MEA).
- Bound, J. (1991). Self-reported versus objective measures of health in retirement models. *J Hum. Resour.*, 26, 106-138.
- Bound, J., Schoenbaum, M., Stinebrickner, T. R., & Waidmann, T. (1998). The dynamic effects of health on the labor force transitions of older workers. *NBER working paper w6777*, National Bureau of Economic Research, Cambridge, Mass.
- Box-Steffensmeier, J., & Jones, B. (2004). *Event History Modeling: A guide for Social Scientists*. Cambridge: Cambridge University Press.
- Disney, R., Emmerson, C., & Wakefield, M. (2006). Ill health and retirement in Britain: A panel data-based analysis. *Journal of Health Economics*, 25(2006), 621–649.
- Dwyer, D., & Mitchell, O. (1999). Health problems as determinants of retirement: Are self-rated measures endogenous? *Journal of Health Economics*, 18, 173-193.
- Haan, P., & Myck, M. (2009). Dynamics of health and labor market risks. *J Health Econ*, 28(6), 1116-1125.
- Romans, F. (2007). *The transition of women and men from work to retirement*. Brussels: European Communities.
- Tanner, S. (1998). The dynamics of male retirement behaviour. *Fiscal Studies*, 19(May), 175-196.