Does working life expectancy reflect health status?

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Abstract

The aim of the article is to analyze the relationship between working life expectancy (WLE) and health status at age 50 in Europe. We do so by analyzing past and present developments of WLE, healthy life expectancy (HLE) and three selected measures that capture physical, cognitive and mental health status for at least ten EU countries.

All measures are calculated using the Sullivan Method. The data for labor force participation – needed for the prevalence of being economically active for calculating WLE – come from Eurostat and are based on the EU Labor Force Survey (EU LFS). Estimates for HLE come directly from Eurostat. Prevalence rates for three selected measures of health status are based on the Survey of Health, Ageing and Retirement in Europe (SHARE): Physical health status is measured by hand-grip strength, cognitive health status is based on results of an episodic memory test, and mental health status is calculated using the risk of depression scale EURO-D.

Our preliminary results indicate that working life expectancy and mental life expectancy, in particular, are highly correlated for both men and women, whereas the relationship between working life expectancy and healthy life expectancy is rather weak. Moreover, investigating the relationship between national factors and the diverse life expectancies shows that social benefits are significantly associated with the four life expectancy measures.

Introduction

People in Europe are living longer than ever before. A highly discussed consequence is that without changes in the timing of when people leave the labor force, these additional years will be added to the period that is spent economically inactive towards the end of people's life. The great majority of people in Europe draw some kind of public pension that is financed through pay-as-you-go pension systems once they retire. Therefore, there have been severe concerns that an aging population will lead to substantial financial burdens if people do not work until higher ages.

Many countries have passed legislation to gradually increase official retirement ages and measures to promote higher economic activity among the population 50+. In many countries, these measures have started to show effect and labor force participation rates of this age group have been increasing. Thus older adults remain on average longer in the labor force due to higher retirement ages, but are they still fit to work?

For instance, adequate muscle power is required for optimum productivity (Shephard, 2000) and decreased muscle strength is a predictor of physical limitations (Magee, 2002). Hand-grip strength is a good indicator of muscle strength. However hand-grip strength is shown to peak at about 30-40 and decrease at higher ages. Next to muscle power affective disorders (e.g. depression) appear to play a major role in productivity due to shorter working life, absenteeism and on-the-job performance. Interestingly, bad mental health has been estimated to be the leading cause of sickness absence and incapacity in most high-income countries (Harvey, 2009). Moreover, studies have found that cognitive ability levels predict individual productivity better than any other observable individual characteristics and that they are increasingly relevant for labor market performance (Schmidt, 2004, Spitz, 2006). Normal age-related cognitive decline is usually characterized by having difficulty recalling facts (Ritchie & Tuokko, 2010), but may additionally affect processing speed (Salthouse, 2010). Affective disorder and the normal aging processes in muscle strength and cognition may negatively affect work productivity particularly of the oldest workers.

Against this background, the question suggests itself to what degree healthy life expectancy, affective disorder and the normal aging processes in muscle strength and cognition correlate with working life expectancy. The analyses of these correlations for selected European countries across time and by gender are the focus of this paper in addition to investigating the association of national factors with specific life expectancies.

Method and data

Statistical Analysis

The main two approaches that have been used for estimations of the number of years a person is expected to be economically, cognitively, physically, and mentally active are the Sullivan method (through prevalence rates) and multi-state models (through transition probabilities) (Hytti & Valaste, 2009; Sullivan, 1971). All indicators estimate the remaining years to live in a certain condition. One big advantage of the Sullivan method is that it allows comparisons between measures, age-groups, men and women, as well as comparisons over time and across countries (Hytti & Nio, 2004; Hytti & Valaste, 2009).

The labor force participation rate represents the share of the economically active population in each age-group, as defined by the International Labour Office (ILO), and covers the employed as well as the unemployed.

Individual health capacities influencing working ability are represented by good physical functioning (i.e. good hand-grip strength), good cognitive functioning (i.e. good episodic memory) and good affective functioning (i.e. absence of clinical depression). Hand-grip strength is an established indicator for morbidity and mortality. Therefore we distinguish those with good physical functioning as grip-strength being above the threshold suggested in recent literature (Bohannon, Peolsson, Massy-Westropp, Desrosiers, & Bear-Lehman, 2006; Massy-Westropp, Gill, Taylor, Bohannon, & Hill, 2011).

Episodic memory is very closely linked with working memory, therefore we employ a word recall test, whereat a recall of at least 5 words out of 10 is indicating good episodic memory (Skirbekk, Loichinger, & Weber, 2012). In SHARE mental health is measured on the EURO-D scale, which is based on the presence or absence of twelve depression symptoms. Clinically significant depression is defined by a EURO-D score greater than 3 (Dewey & Prince, 2005).

Data Sources

We use data from two sources: (1) Eurostat's database and (2) the Survey of Health, Ageing and Retirement in Europe (SHARE).

Labor force participation (LFP) rates by age and sex were obtained from Eurostat and are based on the European Labor Force Survey (EU LFS) (European Commission, 2015). Period life tables for five

years of age (ages 0-85+) and by sex and country were also provided by Eurostat (European Commission, 2015).

We calculated prevalence rates of good physical, cognitive and mental functioning (i.e. hand grip strength, episodic memory, depressive symptoms) of older adults with SHARE data. Data on healthy life expectancy (HLE) were obtained through the Eurostat database. From 2004 onwards, HLE (called healthy life years by Eurostat) has been calculated using the self-perceived activity limitations question in the EU-SILC survey.

Data availability defines which countries will be included in the final analysis. The data from SHARE are the bottleneck with only 11 European countries that have been included in the first wave in 2004.

National factors such as social benefits are compiled from different sources such as Eurostat, OECD, and the World Bank.

Preliminary findings

First, in order to address the question how the observed increases in life-expectancy (LE) have been distributed between economically active and inactive years as well as good health and bad health, HLE and WLE at age 50 are set in relation to LE at age 50. This comparison of life expectancy, healthy life expectancy, and working life expectancy at age 50 in 2009 shows quite some diversity across countries (Figure 1). Overall, women have fewer remaining active years than men, but more remaining years to live and almost the same amount of remaining healthy years as their male counterparts.

Life expectancy differs from healthy life expectancy on average by 10.3 years for men and 14.6 years for women. Life expectancy and working life expectancy differ between 12 and 22 years among men and between 20 and 30 years among women, whereas the difference between working and healthy life expectancy ranges between 0.5 and 12 years for men and 3 and 17 years for women. This means that while in some countries people do not have many healthy years remaining after they leave the labor force, in others more than 10 healthy years can be expected. Hence, the correlation between both measures is rather weak (Table 1, last row).

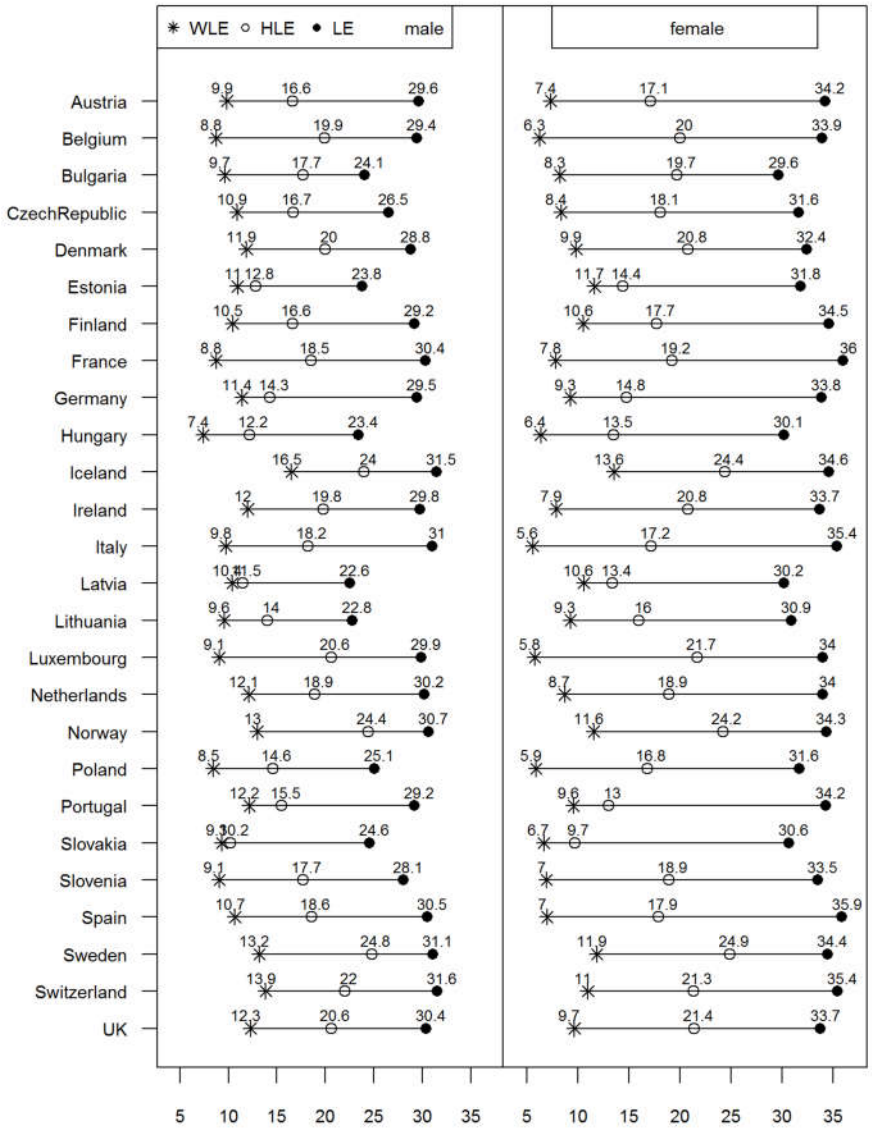

Figure 1: Life expectancy (LE), healthy life expectancy (HLE), and working life expectancy (WLE) at age 50 for selected countries in 2009, by sex (source: LE: Human Mortality Database. HLE: Eurostat database. WLE: own calculations; Loichinger and Weber, 2015).

Investigating in a next step different dimensions of health – physically active life expectancy (PLE), cognitively active life expectancy (CLE), and mentally active life expectancy (MLE) – our results show that the correlation of the three measures with WLE varies for both men and women (Table 1).

There are gaps of varying magnitude between WLE and health specific life expectancies. For instance, 50 year old women in Denmark can expect 6.3 more active years, whereas they will have 16.5 years on average with good cognitive capacities, 8.5 years on average in good physical health and even 15.7 years on average in good mental health. Their Spanish counterparts however show 4.4 remaining active years and only 3.5 remaining years in good physical health (Table 2).

The remaining years spent in various health states after withdrawal from the labor force can be estimated by calculating the difference between WLE and the respective indicator. For example, Spanish men aged 50 years have 3 more years in good physical health during their inactive time, while their Danish counterparts have even 7.8 more years in good physical health during their inactive time (Table 3).

Our complete analysis will cover more countries and we will look at developments over time.

Table 1: Correlation coefficients between WLE and cognitively (CLE), physically (PLE), and mentally active life expectancy (MLE) as well as healthy life expectancy (HLE) of 50 year olds by sex pooling all available countries and years, starting in 2004.

Correlation between…	women	men
CLE and WLE	0.71	0.54
PLE and WLE	0.57	0.53
MLE and WLE	0.69	0.77
HLE and WLE	0.36	0.46

Table 2: Specific life expectancies of 50 year old women in Denmark, Germany, and Spain in 2011

country	WLE	CLE	PLE	MLE
Denmark	6.3	16.5	8.5	15.7
Germany	6.0	16.3	8.3	13.6
Spain	4.4	10.0	3.5	11.5

Table 3: Specific life expectancies of 50 year old men in Denmark, Germany, and Spain in 2011

country	WLE	CLE	PLE	MLE
Denmark	7.7	14.3	15.5	16.7
Germany	7.6	14.6	14.5	15.2
Spain	6.5	9.9	9.5	15.3

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