LIFE EXPECTANCY AND HEALTHY LIFE EXPECTANCY IN EUROPEAN COUNTRIES

Kornélia Cséfalvaiová – Petra Dotlačilová – Jana Langhamrová

Abstract

In advanced populations recently there has been a gradual extension of the life expectancy. This is why we are asking ourselves how much will the life expectancy continue to grow? The aim of this paper will be to call attention to the improvement in mortality and the lengthening of the life expectancy. It is important to realise, however, that the improving mortality may sooner or later cause the discussed problem of the ageing of the population.

Scientists state that the human body can live up to 120 years. Naturally this assumes that will be found a cure for the diseases that are the most frequent causes of death. If a cure could be found for these diseases, then people could be living to the age of 120 years by 2070. More and more often people are asking what proportion of the extra years would one live through in health and what proportion in illness? In this context the indicator of the healthy life expectancy is used.

In this paper we compare the development of healthy and life expectancy in selected European countries and for selected ages. We also give the differences in values of selected indicators for selected ages.

Key words: life expectancy, healthy life expectancy, Sullivan method

JEL Code: J10, J19

Introduction

Nowadays,not only expertsfrequently ask questions inthe context of increasinglife expectancy about how many years today's children can expect to live, what is thelimitof human lifeand will people spend the rest of their lives in good health? Thispaper focuses on theincrease in life expectancydue tothe improvingmortality andthe growingnumber of people inolder age

groups.This phenomenonis related to theaging of thepopulationat the top ofthe age pyramid - theabsoluteaging.

Scientists believethat thehuman bodycan liveabout 120years.According to predictions, we could achieve this age by 2070 in case an effective treatmentof malignantneoplasm was found,that is oneof the most commoncauses of death.It iscertainlycurrentto ask the questionwhetherthese extra obtained yearsof lifearespentin good healthorin disease.In this context,the termof healthy life expectancy is used. The healthy life years indicator measures the number of remaining years that a person of a certain age is still supposed to live without disability.

1 Indicators of incidence, prevalence, disability and absence of disability

In the past, life expectancy at birth and its extensions was considered as an indicator of the improving health status of the population. However, when life expectancy exceeded 70 years, many people were asking whether extending life expectancy does not mean just adding years of life in disease (Rychtaříková, 2006).

The firsttheory iscompressionof morbiditywhenreducingmortalityis connected also with theimprovement of health(seeFries, 2002). Theory of compressionof morbidityassumes thatdiseaseswill besqueezed into ashort period of timebefore death.Therefore,people willlive longerand the elderlywillhavefewer healthproblems.Another ideawasthe theory of expansion ofmorbidity,which statesthat theextra yearsaremostlyspentin poor health(see Gruenberg, 1977, Cameras, 1980 or Olshanskyet. al.). Thirddirection is thetheoryof dynamic equilibrium,which statesthatthe proportion ofmorbidity does not change inaddedyears of life. In other words, life expectancyincreasesproportionallywith morbidity. People willlive longerand the ratiobetween the yearsof life in goodandpoor healthremains the same.

Rychtaříková (2006) indicates that after thedeclineof infectiousdiseases, chronic diseases has become an inseparable and unpleasantpart of many people´s lives.It is long-term diseases, which do not have to restrict theperson and hisautonomyand mayeven not to bethe causeof death,butmeans worse health status.Therefore,besides the typicalindicators of mortality,mortality tables, morbidity,prevalenceandincidence rates, also othercharacteristicsare studying, such asdisability.

Disabilityis an indicatorof healthrestrictions.It isan indicator of disease importance and quality of life. According to the WorldHealth Organization, definition of healthin this context is changingandhealthis a state of complete physical, mental and social well-being and not

merely the absence of disease or infirmity. Number of yearslivedwithoutdisabilityorwith disabilityis considered to bea suitable indicator ofthe health statusof the population.Disabilityabsence indicator DFLE(Disability-free Life Expectancy) is calculated from life tablesand combinations ofprevalenceof good health. It indicatestheaverage number of remaininglife expectancyin good healthand is calculatedmostly forages0and65,separatelyfor menandwomen. This indicatorcan be calculatedusing modified Sullivan's method for calculation of healthy life expectancy:

$$DFLE_x = \frac{\sum_{i=x}^{\omega-1} {}_nL_i * prev_i{}^0}{l_x}, \qquad (1)$$

where$l_x$is number ofpeople left alive at age x, $nL_x$is number ofyears lived by population betweenexactagesx andx+nand$prev_x$notes prevalence ofhealth status atage x.

HLYresultsshould be taken withcaution.The mainproblemisthe comparability ofthe input data.The question is also, howhealthstatus data are investigated, whetherthey are from registersorfrom surveys. We ask whether definitions of health are the sameand about thecontent of questionsincluding health inrelation to theprevalenceandincidence.In Europe between years1994-2001 the ECHPsurvey(European Community Household Panel) was performed. This investigation waslaterreplaced by the Europe-widesurveySILC(Statistics onIncomeandLivingConditions).

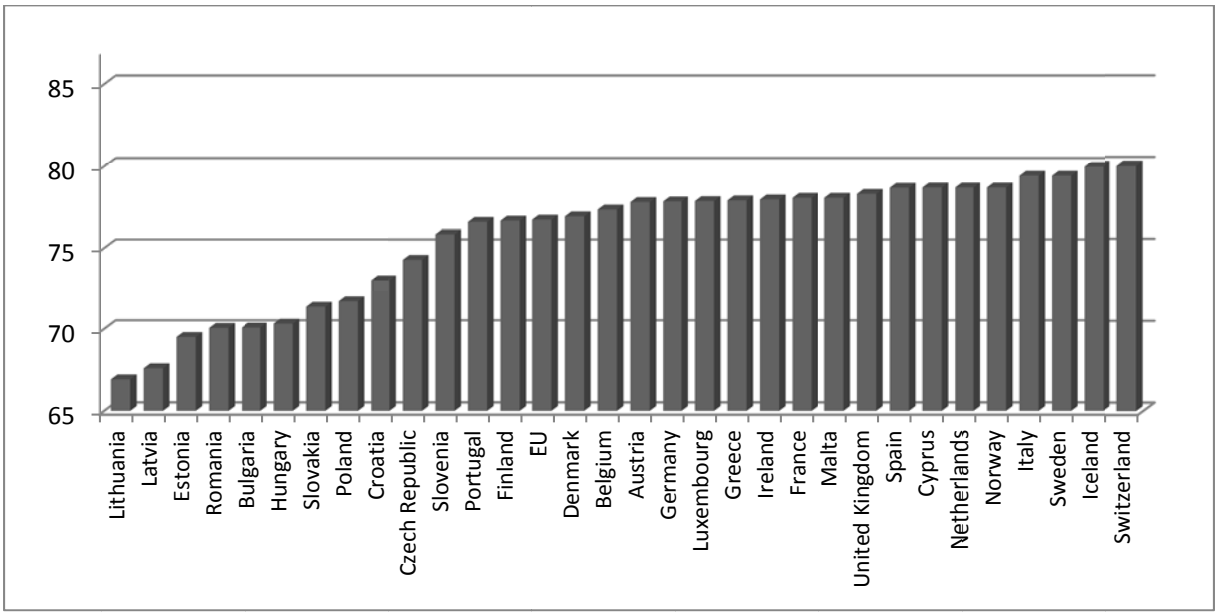
2 Life expectancy and healthy life expectancy in the years 1997-2011

The following sectioncompares the valuesof life expectancyand healthy life expectancyandtheirdifferencesat age 0and 65yearsin Europeancountries on the basisof data publishedby Eurostat in1997-2011.

Figure 1shows that thehighestlife expectancyof men is in Switzerland (80). The lowest valuesare achievedin Latvia (66.94). In theCzechRepublic, life expectancyat birth is 74.28 years.

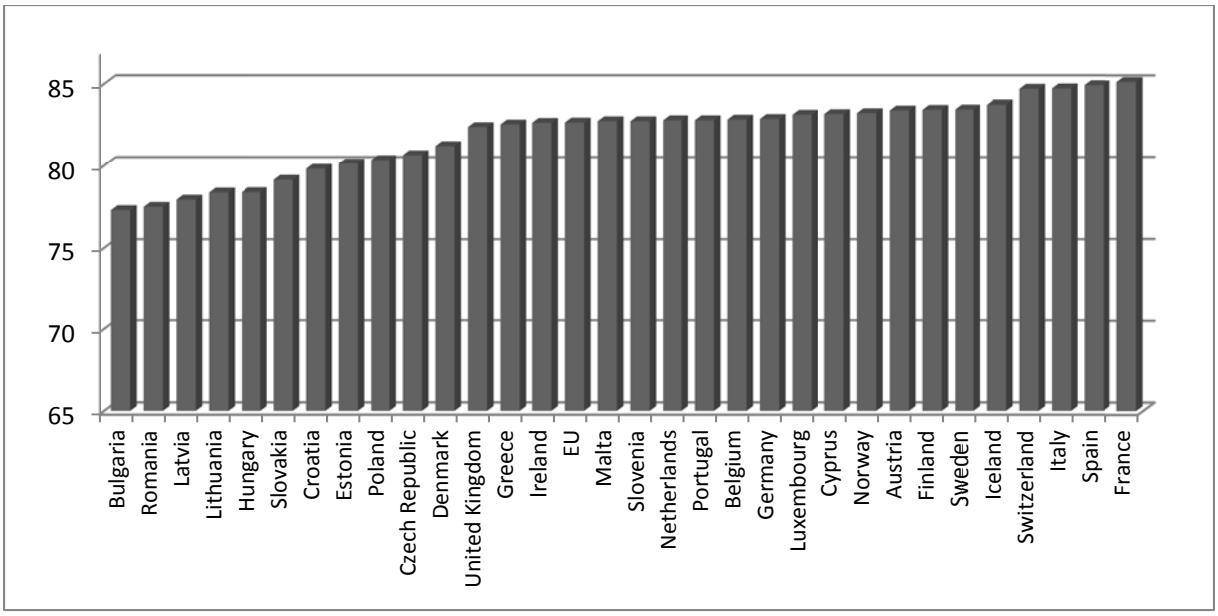
Figure 2shows the valuesof life expectancyof womenat birthin selected Europeancountries.From the obtained values it is clear thatthe highestvaluesof life expectancyat birth(85.12) are reached in France, followed bySpain(84.92). The lowest values are achievedin Bulgaria (77.26). In theCzechRepublic,value of life expectancy at birth is80.64 years.

Figure 1: Life expectancy at birth in European countries - males



Source: Eurostat

Figure 2: Life expectancy at birth in selected European countries - females



Source: Eurostat

Table1 shows values of the averagehealthylife expectancy and averagelife expectancyat birthfor men in European countries.The average wascalculated from thevalues for theperiod 2007-2011.The highestaveragehealthylife expectancyat birthis for Island(70.16 years). The highest averagelife expectancy is achieved in Switzerland (80 years).The value ofhealthy life expectancy at birth for Czech menis 61.62years on average. Among thementioned countrieslowest values reaches Latvia with 52.56years of the healthy life expectancyat birthfor men in thelastfiveyears.

Table 1: Life expectancy (LE) and healthy life expectancy (HLE) at birth for men (average values 2007-2011)

	Lithuania	Latvia	Estonia	Romania	Bulgaria	Hungary	Slovakia	Poland	Croatia	Czech Republic	Slovenia
LE	66.94	67.62	69.50	70.06	70.08	70.32	71.36	71.70	73.02	74.28	75.84
HLE	56.10	52.56	53.20	59.12	63.28	55.94	52.92	58.40	58.55	61.62	57.24
	Portugal	**Finland**	**EU**	**Denmark**	**Belgium**	**Austria**	**Germany**	**Luxembourg**	**Greece**	**Ireland**	**France**
LE	76.58	76.66	76.72	76.92	77.34	77.80	77.84	77.86	77.90	77.96	78.06
HLE	59.18	57.96	61.56	63.44	63.60	59.16	57.64	64.48	66.14	64.38	62.56
	Malta	**United Kingdom**	**Spain**	**Cyprus**	**Netherlands**	**Norway**	**Italy**	**Sweden**	**Iceland**	**Switzerland**	
LE	78.06	78.30	78.68	78.70	78.70	78.70	79.42	79.42	79.98	80.00	
HLE	69.60	64.96	64.04	64.02	63.10	69.00	64.14	70.12	70.16	65.68	

Source: Eurostat, own calculations

In Table 2 is life expectancy and healthy life expectancy at birth for females. The country with the highest healthy life expectancy at birth is Malta (71.34 years). The average healthy life expectancy at birth for women in the Czech Republic is 63.5 years and life expectancy is 80.6 years. The last place took Slovakia, where the healthy life expectancy of women represents 53.1 years.

Tab. 2: Life expectancy (LE) and healthy life expectancy (HLE) at birth for women (average values 2007-2011)

	Bulgaria	Romania	Latvia	Lithuania	Hungary	Slovakia	Croatia	Estonia	Poland	Czech Republic	Denmark
LE	77.26	77.46	77.90	78.34	78.36	79.12	79.80	80.12	80.34	80.64	81.20
HLE	67.70	60.34	55.66	60.76	58.40	53.14	61.20	57.54	62.52	63.50	61.92
	United Kingdom	**Greece**	**Ireland**	**EU**	**Malta**	**Slovenia**	**Netherlands**	**Portugal**	**Belgium**	**Germany**	**Luxembourg**
LE	82.38	82.54	82.64	82.66	82.74	82.74	82.80	82.80	82.84	82.88	83.14
HLE	65.84	66.98	65.92	62.34	71.34	58.60	60.70	57.42	63.58	58.36	65.68
	Cyprus	**Norway**	**Austria**	**Finland**	**Sweden**	**Iceland**	**Switzerland**	**Italy**	**Spain**	**France**	
LE	83.18	83.24	83.40	83.44	83.46	83.74	84.70	84.72	84.92	85.12	
HLE	63.90	68.50	60.62	58.52	69.34	69.16	63.90	63.46	63.74	63.90	

Source: Eurostat, own calculations

Except forage0 it isinteresting to followthe valuesof life expectancyandhealthylife expectancyalsoat age 65.When comparing thevaluesof life expectancyat age 65 (see Table 3) we find out thatthe highestvalueisachievedin Switzerlandand in lowest one in Latvia. The Czech Republic is in this comparisonon the 10th place.The highest value ofhealthylife expectancyisachievedin Iceland and the lowest value inSlovakia.

When comparing thevalues oflife expectancy at age 65 (see Table 4)we find out thatthe highestvalue is achievedin Franceand the lowest value inBulgaria. When comparing thehealthylife expectancy, we conclude that the highestvalueis achievedin Norwayand the lowestinSlovakia.

In Tables 5 and 6 there are differences in healthy life expectancies and life expectancies of women and men in European countries in 2011. From Table 1 it is clear that women have higher life expectancy at birth than men. Unlike differences in life expectancies at birth, where life expectancies at birth for women are always higher than for men, healthy

life expectancies at birth do not show a clear tendency. These irregularities can be caused by certain subjective impression of the respondent - man and woman, or by a certain character, mentality of the country.

Tab. 3: Life expectancy (LE) and healthy life expectancy (HLE) for men at the age 65 (average values 2007-2011)

	Latvia	Lithuania	Bulgaria	Estonia	Hungary	Slovakia	Romania	Croatia	Poland	Czech Republic	Slovenia
LE	13.18	13.44	13.62	13.92	14.00	14.00	14.04	14.48	14.94	15.34	16.48
HLE	4.92	5.92	9.24	4.80	5.60	3.48	6.78	6.85	6.94	8.12	8.08
	Denmark	**Portugal**	**Luxembourg**	**Malta**	**EU**	**Finland**	**Ireland**	**Belgium**	**Netherlands**	**Germany**	**Austria**
LE	16.84	17.20	17.30	17.30	17.36	17.40	17.44	17.50	17.58	17.70	17.78
HLE	12.12	7.06	10.50	11.24	8.56	8.26	10.24	10.26	10.10	6.84	8.00
	Norway	**Cyprus**	**Greece**	**United Kingdom**	**Sweden**	**Spain**	**Italy**	**Iceland**	**France**	**Switzerland**	
LE	17.84	17.98	18.06	18.06	18.18	18.32	18.38	18.52	18.76	18.94	
HLE	13.86	9.40	8.94	10.80	13.54	9.76	8.40	13.92	9.06	12.10	

Source: Eurostat, own calculations

Table 4: Life expectancy (LE) and healthy life expectancy (HLE) for women at the age 65 (average values 2007-2011)

	Bulgaria	Romania	Slovakia	Latvia	Croatia	Hungary	Lithuania	Czech Republic	Estonia	Poland	Denmark
LE	16.88	17.20	17.94	18.04	18.06	18.12	18.40	18.86	19.20	19.32	19.60
HLE	10.50	6.50	3.10	5.16	6.70	5.98	6.44	8.52	5.00	7.66	12.92
	Greece	**Cyprus**	**Ireland**	**Malta**	**Slovenia**	**Portugal**	**United Kingdom**	**Germany**	**EU**	**Netherlands**	**Sweden**
LE	20.08	20.44	20.60	20.60	20.66	20.68	20.68	20.86	20.88	20.92	21.08
HLE	8.20	7.52	10.72	11.52	8.68	5.70	11.72	7.10	8.68	10.34	14.66
	Norway	**Iceland**	**Belgium**	**Luxembourg**	**Austria**	**Finland**	**Italy**	**Switzerland**	**Spain**	**France**	
LE	21.10	21.12	21.16	21.18	21.28	21.44	22.18	22.36	22.40	23.28	
HLE	14.72	14.44	10.20	11.60	7.96	8.88	7.78	12.48	9.06	9.84	

Source: Eurostat, own calculations

From Table5it is clearthat life expectancyof womenat age65 years is higherthanfor menin allcountries. Difference in life expectancies for this agegroupin mentionedcountries rangesfrom4.38years in the Czech Republic to the smallestdifference 3.1 years inBelgium.Differencesinhealthy life expectancies at age 65arethe highestin Sweden, wheremenspend in a good health about6.66yearsmorethanwomen.

Tables 5 and 6 show that the proportion of life spent with health limitations is higher for women than for men in both age groups. Again, it is important to realize that the value of healthy life expectancy is affected by the subjective opinion of the respondent.

We can expect that with more years of life years spent in good health will decrease, and therefore we would not be surprised by the fact that for 65 years old people is the proportion of future life spent with health limitations approximately 74.16 - 88.24 % for men (see Figure 3) and almost 67.16 - 83.08 % for women (see Figure 4). It is possible to ask what has influenced this result, whether it is really the better health status of inhabitants of these countries or their positive viewing of personal health?

Tab. 5: The differences among values of life expectancyat birth (LE) for women and men and the differences among values healthy life expectancy at birth (HLE) for women and for men in European countries in 2011 (in years)

differences	Bulgaria	Romania	Latvia	Lithuania	Hungary	Slovakia	Croatia	Estonia	Poland	Czech Republic	Denmark
LE	10.32	9.84	8.4	8.28	8.28	8.8	8.44	8.42	7.32	6.36	5.36
HLE	11.6	7.78	2.46	1.64	-4.88	-2.8	8.28	-0.86	3.97	1.88	4.68
differences	United Kingdom	Greece	Ireland	EU	Malta	Slovenia	Netherlands	Portugal	Belgium	Germany	Luxembourg
LE	5.80	5.88	5.92	5.74	5.4	4.94	4.96	4.94	4.94	4.92	5.08
HLE	6.66	9.02	4.36	-1.1	7.74	-0.56	3.06	-7.06	-2.56	-6.02	3.12
differences	Cyprus	Norway	Austria	Finland	Sweden	Iceland	Switzerland	Italy	Spain	France	
LE	5.12	4.94	4.72	4.74	4.76	5.04	5.28	5.3	4.94	5.12	
HLE	-5.70	3.54	-3.42	-5.5	6.24	0.16	-0.24	-6.66	-6.42	-1.775	

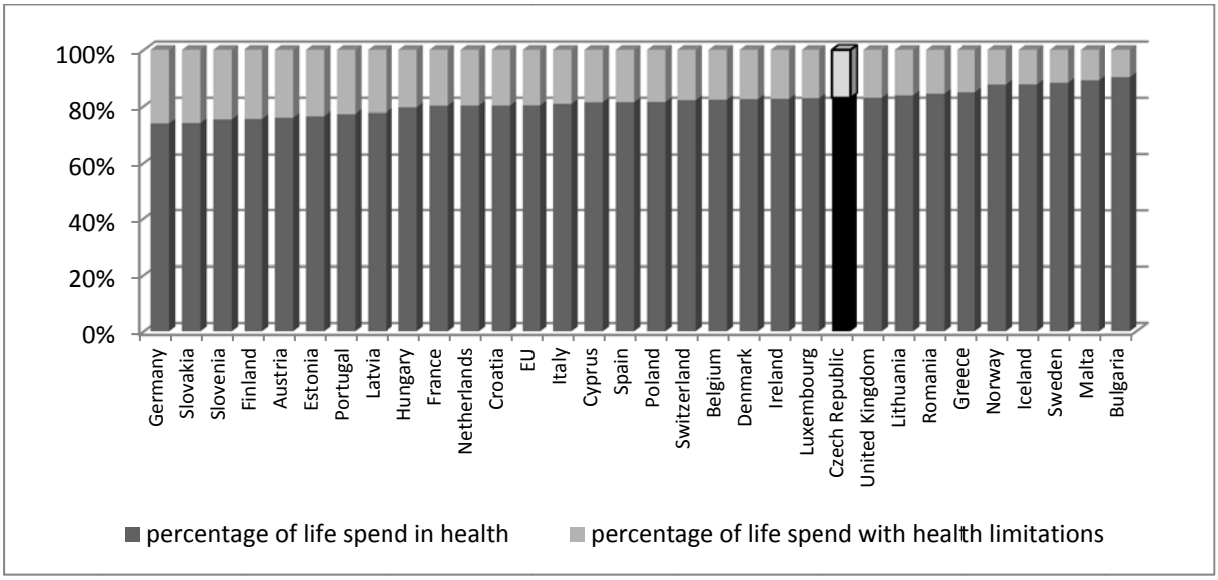
Source: Eurostat, own calculations

Table 6: Difference in life expectancy at age 65 for (LE) women and men and difference in healthy life expectancy at age 65 (HLE) for women and men in selected European countries in 2011 (in years)

differences	Bulgaria	Romania	Slovakia	Latvia	Croatia	Hungary	Lithuania	Czech Republic	Estonia	Poland	Denmark
LE	3.70	3.76	4.32	4.12	4.06	4.12	4.36	4.38	4.26	3.98	3.12
HLE	5.58	0.58	-6.14	0.36	1.10	2.50	-0.34	1.67	-1.94	-0.46	4.84
differences	Greece	Cyprus	Ireland	Malta	Slovenia	Portugal	United Kingdom	Germany	EU	Netherlands	Sweden
LE	3.24	3.24	3.30	3.3	3.3	3.28	3.24	3.36	3.30	3.22	3.30
HLE	-3.92	0.46	0.22	0.28	0.12	-2.56	1.48	-3.16	-1.42	3.5	6.66
differences	Norway	Iceland	Belgium	Luxembourg	Austria	Finland	Italy	Switzerland	Spain	France	
LE	3.26	3.14	3.10	3.12	3.1	3.12	3.80	3.84	3.64	4.34	
HLE	0.86	5.04	1.26	0.80	-5.58	-0.88	-0.62	-1.45	0,00	-2.26	

Source: Eurostat, own calculations

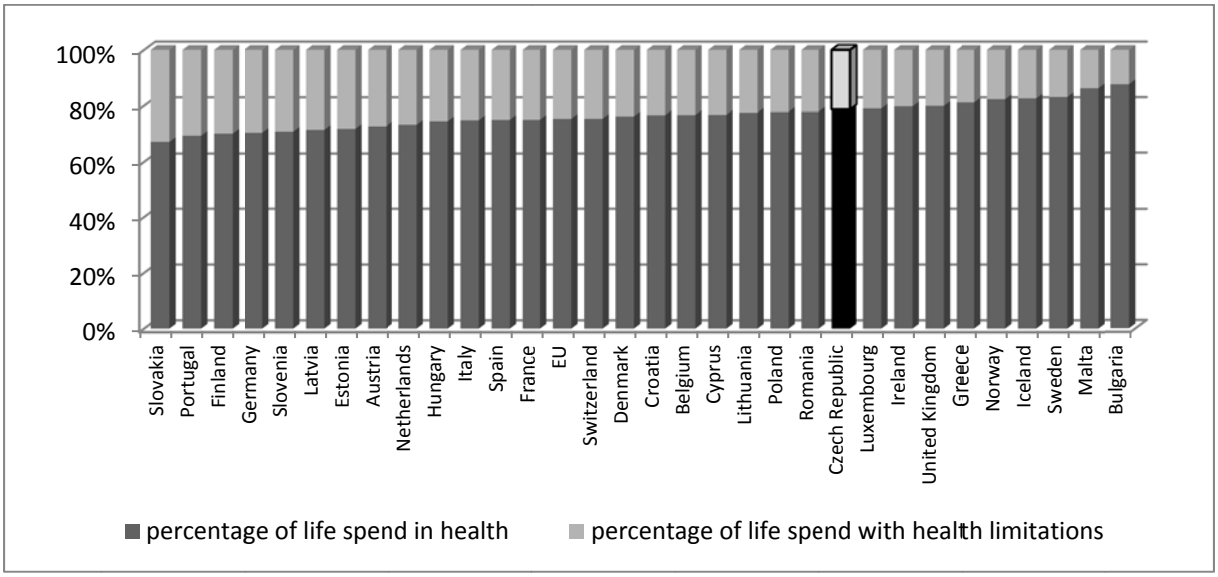
Figure 3: Percentage of life spent with health limitations for men aged 0 in European countries in 2011



Source: Eurostat, own calculations

From Figure3 it isapparent that menin theCzechRepublic reach the 10thhighestproportionof life spent in good health. At the same place has taken place also the United Kingdom. On thefirst placeis Bulgaria.

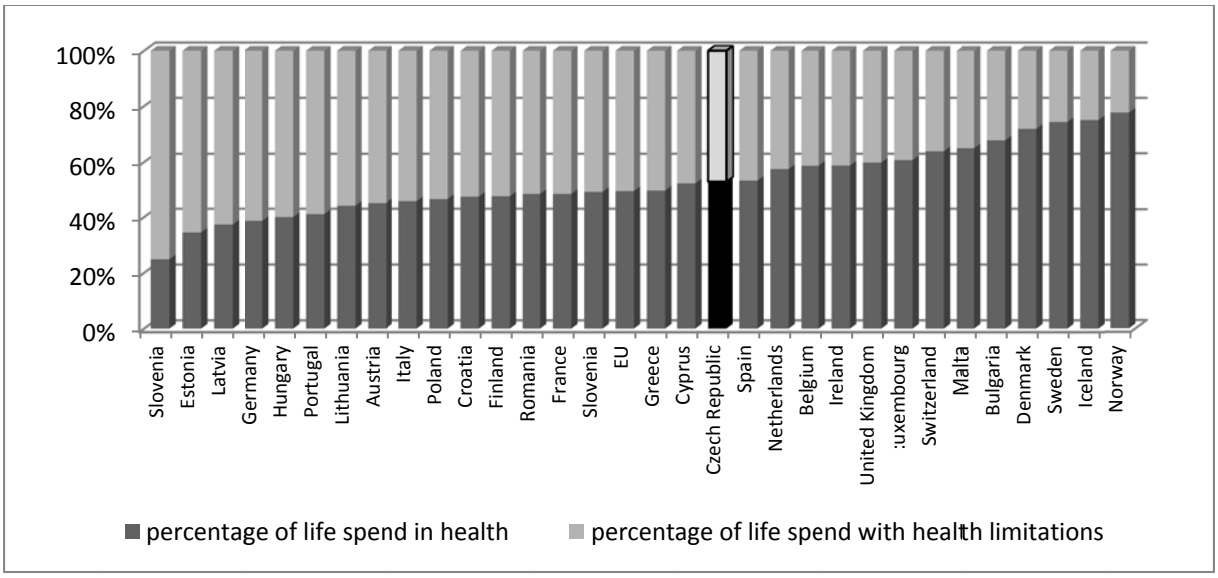
Figure 4: Percentage of life spent with health limitations for women aged 0 in European countries in 2011



Source: Eurostat, own calculations

Figure4 shows thepercentage of life spent in health and diseaseforwomen in Europeancountries. The obtainedresults showthat Czech Republic is on the 10th place. The proportionof life spent in health for women in theCzechRepublicreached 79.92 %.

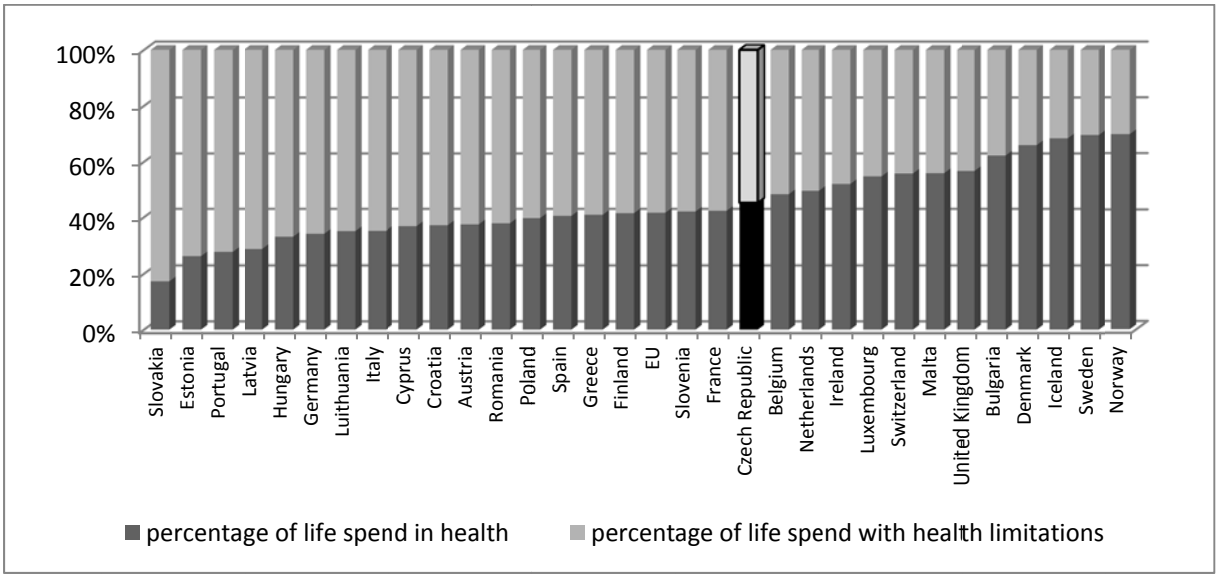
Figure 5: Proportion of life spent with health limitations for men and women aged 65 in selected European countries in 2011



Source: Eurostat, own calculations

Figure5 shows thepercentage of life spent in health and diseaseformen aged 65 in Europeancountries. The Czech Republic is in this comparison on the 14th place. The proportionof life spent in health for men aged 65 in theCzechRepublicreached 52.93 %.

Figure 6: Proportion of life spent with health limitations for men and women aged 65 in European countries in 2011



Source: Eurostat, own calculations

From the obtained results it isobvious, that the Czech Republic is in this comparisonon the13th placewith proportion of life spent in health and diseasefor women aged 65,the proportionof life spent in health is 45.17 %. It achievesbetter rank for women then for men.

Based onthe results obtainedfor65 years old men andwomenin theCzechRepublic we canconclude, that also men aged 65spendthe restof their lifein good healthratherthan in disease (for womenthe opposite is true).

Conclusion

Recently, there is more and morediscussionabout thepopulationagingand about the consequences ofincreasing life expectancyat birth.We are interested inwhether extra yearsof lifeaddedto the life expectancy are spent in health or in disease. Healthy life expectancymeasures the number of remaining years that a person of a certain age is still supposed to live without disability.Unlikelife expectancy, healthy life expectancyimplies acertainqualitative factor.Therefore,when interpreting, it is necessary to take into consideration thedifferent perceptionof healthnot onlybysocio-cultural customs of the country. Recently,in developedcountries,chronicdiseases thatare notthe primary cause ofdeath are increasing.It is causedby the fact thatpeople who live longer, are more likelyto haveone of the mentioned illnesses. Therefore, besides the indicator of life expectancywe are adding also the indicator of healthy life expectancy.It can be saidthat womenin generallivelongerthanmen. However, extra yearsspent by women arespentwith healthlimitations.

Acknowledgement

This article has beensupported by the grantIGAVSE24/2013"Mortality and agingof the Czech population."

References

Arltová,M.,Langharmová, Jitka, Langhamrová, Jana. Development of life expectancy in the Czech Republic in years 1920-2010 with an outlook to 2050. *Prague Economic Papers*, Vol. 22, No. 1, pp. 125–143. ISSN 1210-0455. 2013.
Langhamrová, Jitka, Miskolczi, Martina, Langhamrová, Jana. Life Expectancy Trends in CR and EU. Prague 22.09.2011 – 23.09.2011. In: International Days of Statistics and Economics at VŠE, Prague. Prague : VŠE, 2011, p. 298–306. ISBN 978-80-86175-77-5.
Demografickýinformační portal. Available from WWW: <http://www.demografie.info.cz >
Eurostat. Available from WWW: <http://ec.europa.eu/eurostat>
Fries, J. F.: Reducing disability in older age. JAMA, 2002. p. 3164-3166.
Gruenberg, E. M.: The failures of Access. Milbank Memorial Fund Quarterly / Health Society, 1977. p. 3-24.
Kamer, M.: The rising pandemic of mental disorders and associated chronic diseases and disabilities. ActaPsychiatricaScandinavica 62, 1980. p. 282-297.
Kučera, M.: Budou se Evropanédožívatvěkusta let. Praha: Panorama, 1990. 419-455 p.
Olshansky, S. J., Rudberg, M. A., Carnes. B. A., Cassel. C. K., Brody. J.: Trading off Langer for worsening health: the expansion of morbidity hypotesis. Journal of Aging and Health. 3. 2. p. 194-216.
Rabušic. L.: Kdejsou meze délkylidskéhoživota? Demografie, 1993. roč. 35. č. 3. p.153-161.
Rychtaříková, J.: Zdravádélkaživota v současnéčeské populace, Demografie, 2006. roč. 48. č. 3. p. 166-178.

Contact

Kornélia Cséfalvaiová

University of economics in Prague

Winston Churchill Sq. 4, 130 00 Prague 3

xcsek00@vse.cz

Petra Dotlačilová

University of economics in Prague

Winston Churchill Sq. 4, 130 00 Prague 3

Petra.Dotlacilova@vse.cz

Jana Langhamrová

University of economics in Prague

Winston Churchill Sq. 4, 130 00 Prague 3

xlanj18@vse.cz