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Education inequalities in health among older Europeans: the role of active aging

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Abstract

Social differentials in health prevalence exist in all European countries, but their scale varies markedly. To improve understanding of this variation, the article focuses on each end of the social gradient. First, we want to assess to what extent inequalities exists among older Europeans aged 50 years and older in terms of health outcomes. Second, we explore the heterogeneities in these inequalities by country. Third, we study whether the observed inequalities among older Europeans can be at least in part explained by different patterns of active aging, and in particular, by different levels of participation in activities that have been showed to be beneficial for older people wellbeing. Previous studies have shown, from one hand, positive effects of active aging activities on health and, from the other hand, different patterns of active aging by education level. Therefore, we expect that part of the health inequalities across education groups can be explained by active aging activities. The analysis uses longitudinal data from the 2004-2012 Survey of Health, Ageing and Retirement in Europe (SHARE) of adults 50 years and older in 19 high-income countries.

Introduction

In a context of intense promotion of healthy aging worldwide, reducing and preventing the health inequalities is a priority. It might be of crucial importance especially in mid- and old-adult ages when disability starts to be highly prevalent and raises major social support and loss of financial resources. Europeans live longer than ever and spend decades in retirement, but a significant part of their life expectancy is lived with diseases and disability (Solé-Auró and Alcañiz 2015). It is also well known that the socioeconomic status (SES) of the Europeans produces inequalities within and between groups. Moreover, the literature has shown substantial variation in the size of social inequalities in health across countries (Mackenbach et al., 2008). Low-social groups are *disadvantaged* regarding health outcomes compared to the rest of the population, and the high-social groups are *advantaged*; however the extent of these health or disability advantage and disadvantage varies highly across countries (Cambois et al., working paper). Therefore, reducing social differentials in health within and across countries has become a priority for public policies (Jagger et al., 2013; Lagiewka, 2012; Mackenbach, Karanikolos, and McKee, 2013). Indeed, social inequalities in health problems result from a complex interaction between individual characteristics, patterns of active aging, and state specific context regarding health, life-style and public policies. Previous studies have emphasised that participation in social activities is beneficial for older people mental' health (Engelhardt et al., 2010) and physical wellbeing (Pynnönen et al. 2012) and participation in society has become a key pillar in the active ageing discourse (WHO, 2002; Zaidi et al., 2013). The prevalence and patterns (types of activities and frequency of involvement) of engagement in social activities vary markedly across European countries (Arpino and Bordone, 2015a; Hank, 2011; Hank and Stuck, 2008). Educational inequalities have been documented with respect to both the levels and

pattern of engagement in social activities (Arpino and Bordone, 2015b). Therefore, we might think of social participation as a possible mediator of the effect of education on health. More specifically, if higher educated people are those more actively engaged in social activities we can expect that at least part of the educational inequalities in health can be explained by social activities. This would have important policy consequences.

In this study we examine to what extent inequalities exists among older Europeans aged 50 years and older in terms of health. We also explore the heterogeneities by educational gradient in these health inequalities by country. And finally, we study whether the observed inequalities in the high-, middle-, and low-educated groups among older Europeans can be explained by different aspects of active aging (i.e. by different levels of participation in activities that have been showed to be beneficial for older people wellbeing).

Data

This study uses individual-level data from the Survey of Health, Ageing and Retirement in Europe (SHARE), a multidisciplinary longitudinal survey, representative of the non-institutionalised population aged 50 and over (Börsch-Supan et al. 2005; Börsch-Supan and Jürges 2005). All persons aged at least 50 in the selected households were interviewed. The partners of eligible persons living in the same household were also surveyed, even if they were younger than 50.

Our work is based on a cross-sectional analyses on the first interview for each respondent from the first, second, and fourth wave of SHARE (2004, 2006, 2010) for the following 19 countries: Austria, Belgium, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Netherlands, Poland, Portugal,

Slovenia, Spain, Sweden, and Switzerland1. The third wave (2008) of SHARE, called SHARELIFE, contains only retrospective information on the respondents, thus this data was not included in our analysis. We plan to include also data from the fifth wave (2012) that have been recently released.

We restricted our sample to women and men aged 50-85. The upper age limit presents very low prevalence of engagement in social activities after the age of 85 in our sample. Missing values in each of the variables used in the statistical analyses were other criteria for the exclusion of cases. The final sample was composed of 57,389 persons (32,421 women and 24,968 men). Table 1 shows the sample sizes by country and their distribution by education group.

Dependent variables

We considered three measures of health as dependent variable. Our first dependent variable is self-reported health ranging from 1 to 5 (1="Excellent", 2="Very good"; 3="Good"; 4="Fair"; 5="Poor"), where higher values indicate worse subjective health. Number of depression symptoms measured using the EURO-D scale and ranging from 0 to 12, higher values indicating more depression symptoms is our second dependent variables. Finally, our third dependent variable measures health related to activity limitations with a single question measured by the Global Activity Limitation Indicator ("GALI"), a binary variable taking value 1 for respondents that declared to be "Severely limited" or "Limited, but not severely" because of health in activities people usually do and not limited when equals to 0.

[1] More specifically, we used data from the first wave (2004) and the refresher samples from the following waves for those countries that took part in the data collection in 2004 (i.e., Austria, Belgium, Denmark, France, Germany, Greece, Israel, Italy, Netherlands, Spain, Sweden, and Switzerland). We used the second wave (2006) and the refresher sample from the fourth wave (2010) for the countries that joined SHARE in 2006 (i.e., Czech Republic, Ireland, and Poland). We used the fourth wave for countries that joined SHARE in 2010 (i.e., Estonia, Hungary, Portugal, and Slovenia).

Explanatory variables

To assess whether educational inequalities in health outcomes among older Europeans exists we considered three educational groups based on the level of education achieved using the International Standard Classification of Education[2]: "low" (corresponding to ISCED 0-1, no or primary education; reference), "middle" (ISCED 2, lower secondary education), "high" (ISCED 3-4, higher secondary education; and ISCED 5-6, tertiary education).

Another set of key independent variables that relate to active aging are participation in social activities. The SHARE questionnaire include the question: "Have you done any of these activities in the last four weeks?" Respondents could tick several activities from a list including: voluntary or charity work; educational or training course; a sport, social or other kind of club; taking part in a religious organisation (church, synagogue, mosque etc.); taking part in a political or community-related organisation. Respondents were also asked about the frequency of participation in the activities they mentioned ("almost daily"; "almost every week"; "less often"). For each of the five activities we created a binary variable taking value 1 for respondents that participated in that activity "almost daily" or "almost weekly" and 0 otherwise. We also considered participation ignoring frequency and results were similar to those reported here.

Control variables

We control for socio-demographic characteristics and living arrangements in all the analysis. Socio-demographic controls for age groups (six dummy variables: "50-55" (reference), "56-60", "61-65", "66-70", "71-75", "76-80", and "80-85"); partnership

[2] http://www.uis.unesco.org/education/pages/international-standard-classification-of-education.aspx

status ("no partner" = 1 if not living with a partner, = 0 otherwise); number of children; activity status ("employed", "retired" (reference), and "other", i.e., unemployed, homemaker, etc.; type of living area ("rural" = 1 for respondents living in rural areas, = 0 otherwise)[3].

Results

Descriptive statistics

Table 1 presents the sample descriptive characteristics on the dependent variables we used in the multivariate analyses by country and education gradient. From this table, a considerable heterogeneity emerges in the level of health across countries and levels of education.

The average value of self-reported health varies from 2.4 in Denmark to 3.8 in Poland (overall average equal to 3.1). Similarly, the average number of depressive symptoms varies from 1.7 (Denmark) to 3.6 (Poland). Also the prevalence of older people affected by GALI varies considerably: from 25.1% in Greece to 58.4% in Poland. Table 1 shows also evidence of large health inequalities by education levels. In the pooled sample of all countries, self-reported health varies, on average, from 2.7 for high-educated seniors to 3.3 for low-educated group. People with middle level of education occupy an intermediate position with an average of 3 points. Older people with high education also tend to have less depression symptoms than those with lower levels of education. The average number of depression symptoms increases from 1.9 for the high-educated group to 2.2 and 2.8 for the middle- and low- education, respectively. Finally, the prevalence of GALI is also negatively associated with the level of

[3] We used the question on the type of area where the building is located and we coded as "rural" respondents in the category "rural area or village", while all other categories ("big city", "suburbs or outskirts of a big city", "large town", and "small town") were included in the reference group.

education: there is a difference of more than 15 percentage points between the high (32.7%) and low (49.9%) education groups.

The pattern of health inequalities that we find in the pooled sample without disaggregating by country also replicates in each of the 19 countries under study. Usually, the group with a middle level of education is placed in between the levels of health of the other two groups. In many countries, and overall, this group is more similar to the high-educated than to the low-educated one. The most striking differences in terms of health appear to be between the two extreme educational groups.

Multivariate results

Tables 2, 3 and 4 show the estimates of different sets of regression models that differ for the dependent variable: self-reported health, depression and GALI, respectively. In each table, the first model only includes education, country dummy variables and all the control variables listed above. Models 2 to 6 include active aging activities one at the time. Model 7 includes all the variables. All models were run separately for women and men. Country dummies and all the control variables are included in all models but not showed for sake of space. The outcomes variable in table 2 and 3 were treated as continuous and a simple linear regression model with robust standard errors was used. A logistic regression was instead used for the GALI variable in table 4 and odds ratios are reported.

Model 1 in Table 2 shows that, consistently with the descriptive evidence in Table 1, education is negatively associated with the self-reported health measure: higher education correspond to lower values of the scale (better self-reported health). Both older people with medium and high levels of education have significantly lower levels of self-reported health (better health). This is true for both genders, but inequalities

seem to be stronger for women. Models 2 to 7 show that older people actively engaged in the considered social activities have better self-reported health. The coefficients of all activity variables are statistically significant even when included simultaneously in the model (last column, model 7) with the exception of political activities that loose significance (for men it is significant at the 10% level). Comparing the coefficients of the education variables across the 7 models we can see that they tend to get smaller when adjusting for active aging activities. However, the differences do not seem to be large. Therefore, education inequalities in self-reported health can be partly explained by different levels of active engagement of older people but only to a limited extent.

A similar pattern of results emerge for the other two outcome variables. Please, notice that table 4 reports odds ratios and so values smaller than 1 indicate a negative association with GALI. Table 3 and 4 confirm that the higher is the education level the better tend to be the health. Also for depressive symptoms and GALI, participation in social activities is associated with lower better health. However, in these cases only participation in sport clubs has a highly significant effect on health when all activities are considered together. This can be due to multicollinearity and will be subject of further investigation. It is confirmed also for these two outcomes that active aging activities explain modestly the education inequalities.

Conclusions

From these primarily self-report data, one can conclude that for all our health outcomes active aging activities partly explain the educational inequalities in health. We reaffirm that health inequalities seem to be stronger for women than men.

Comparable surveys across a number of countries allow us to make generalizations that cannot be made with isolated surveys in individual countries or

studies that address only one aspect of health. However, some limitations in the present analysis could affect our findings. Longitudinal data indicating onset and survival by gender would be needed to clarify the process leading to the gender differences. Therefore, we plan to exploit the longitudinal dimension of SHARE. Because we do not consider the nursing home population, our results do not reflect the entire population. The nursing home population in Europe would contain persons with relatively high risk of mortality and morbidity. Nursing home residence is generally relatively low in these countries at ages below 80. In SHARE, the nursing home population in Europe indicates relatively low nursing home usage, for instance, in the Netherlands (2% of those aged 65–80) and Denmark (1% of persons aged 60–79). Usage appears somewhat higher for France (6% for those aged 65–80). In the entire population aged 65 and older, nursing home usage is low in Italy (2%) and higher in Spain (5.8 %) (Huber et al. 2009). We believe that because the percentages in nursing homes are relatively similar across Europe, differential use of nursing homes is unlikely to influence the differences that we observe. Moreover, for the time being, we did not include alternative activities such as grandchild care in our analysis, but we plan to do it in future examinations. Moreover, to exploit and better understand the country differences, we will include in our models country-dummy variables interacted with education attainment.

We conclude for the moment that the patterns of active aging benefit more the higher educated people, as they are more actively engaged in social activities. Overall, our results could have important policy consequences.

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Tables

Table 1 – Sample sizes and summary statistics on the three health measures by education level and country

Countries	Sample size				Self-perceived health				Depressive symptoms				GALI			
	All	% Low	% Mid	% High	All	Low	Mid	High	All	Low	Mid	High	All	Low	Mid	High
Austria	4,095	26.2	48.9	24.9	2.9	3.2	2.8	2.6	2.0	2.5	1.8	1.7	45.6	56.4	43.9	37.5
Germany	3,150	16.5	56.7	26.7	3.1	3.5	3.1	2.9	1.8	2.5	1.8	1.5	46.9	63.3	46.0	38.6
Sweden	3,144	49.6	27.2	23.2	2.5	2.7	2.5	2.2	1.9	1.9	2.0	1.7	41.2	45.7	39.3	33.7
Netherlands	3,393	52.3	24.1	23.6	2.8	3.0	2.6	2.6	1.8	2.0	1.7	1.5	42.9	47.1	37.5	38.8
Spain	3,319	82.3	9.0	8.8	3.3	3.4	2.9	2.9	2.9	3.1	2.0	1.9	38.9	43.0	20.2	19.2
Italy	3,834	72.5	21.2	6.3	3.2	3.3	2.9	2.7	2.7	2.9	2.1	2.1	37.6	42.4	25.6	23.2
France	5,025	47.0	33.1	20.0	3.1	3.3	3.0	2.6	2.8	3.0	2.6	2.4	37.5	46.0	33.5	24.0
Denmark	2,638	20.2	41.4	38.3	2.4	2.9	2.5	2.2	1.7	2.1	1.7	1.6	35.4	47.0	36.9	27.7
Greece	2,794	58.7	26.5	14.8	2.8	3.1	2.5	2.3	2.0	2.3	1.7	1.3	25.1	33.3	13.8	12.4
Switzerland	2,763	25.1	60.0	15.0	2.6	2.8	2.5	2.2	1.8	2.2	1.7	1.7	29.7	40.3	25.9	27.3
Belgium	4,859	46.1	26.1	27.9	2.8	3.1	2.7	2.6	2.4	2.6	2.3	2.2	38.1	45.1	33.4	30.8
Israel	2,089	33.9	41.3	24.8	2.9	3.3	2.8	2.6	2.8	3.5	2.5	2.1	36.7	49.3	31.1	28.7
Check Rep	5,108	49.0	39.3	11.7	3.3	3.6	3.2	2.9	2.2	2.6	1.8	1.7	57.0	65.4	49.7	46.1
Poland	1,985	46.8	44.9	8.4	3.8	4.0	3.6	3.5	3.6	4.2	3.1	3.0	58.4	71.0	47.5	47.0
Ireland	819	38.1	18.4	43.5	2.5	2.7	2.4	2.3	1.8	2.0	1.5	1.7	26.5	31.7	23.2	23.3
Hungary	1,617	32.2	51.8	16.0	3.7	4.1	3.6	3.1	3.2	4.2	2.8	2.2	56.3	74.3	52.0	34.0
Portugal	1,148	62.8	7.1	30.1	3.6	3.8	3.1	3.4	3.4	3.7	2.6	2.9	47.1	54.1	35.4	35.4
Slovenia	1,833	33.2	50.1	16.8	3.3	3.7	3.3	2.8	2.5	3.2	2.2	1.8	45.0	58.6	40.7	30.9
Estonia	3,776	29.6	48.1	22.3	3.8	4.2	3.8	3.5	3.2	3.8	3.1	2.7	56.7	67.5	54.6	47.0
Total	57,389	44.1	35.8	20.1	3.1	3.3	3.0	2.7	2.4	2.8	2.2	1.9	42.7	49.9	39.3	32.7

Table 2 – Estimates of a linear regression model predicting *self-perceived health* by gender, standard errors in parentheses.

Covariates				**Women**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Education: middle (Ref. low)	-0.249***	-0.244***	-0.245***	-0.231***	-0.249***	-0.248***	-0.225***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
high	-0.454***	-0.443***	-0.439***	-0.412***	-0.452***	-0.451***	-0.395***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Volunteering		-0.148***					-0.088***
		(0.021)					(0.021)
Education			-0.218***				-0.153***
			(0.028)				(0.028)
Sport or other club				-0.316***			-0.299***
				(0.015)			(0.015)
Religious organisation					-0.082***		-0.052**
					(0.019)		(0.019)
Political organisation						-0.171***	-0.090
						(0.052)	(0.052)
N	32421	32421	32421	32421	32421	32421	32421
				Men			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Education: middle (Ref. low)	-0.189***	-0.183***	-0.186***	-0.178***	-0.190***	-0.187***	-0.173***
	(0.016)	(0.016)	(0.016)	(0.015)	(0.015)	(0.016)	(0.015)
high	-0.348***	-0.336***	-0.340***	-0.324***	-0.346***	-0.343***	-0.308***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Volunteering		-0.171***					-0.093***
		(0.023)					(0.024)
Education			-0.199***				-0.149***
			(0.039)				(0.039)
Sport or other club				-0.280***			-0.264***
				(0.017)			(0.017)
Religious organisation					-0.128***		-0.099***
					(0.026)		(0.026)
Political organisation						-0.151***	-0.078*
						(0.038)	(0.039)
N	24968	24968	24968	24968	24968	24968	24968

Note: * p < 0.05; ** p < 0.01; *** p < 0.001. Each model includes all the control variables and country fixed effects. Complete results are available upon request.

Table 3 – Estimates of a linear regression model predicting the *number of depression symptoms* by gender, standard errors in parentheses.

Covariates	Women						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Education: middle (Ref. low)	-0.506***	-0.498***	-0.501***	-0.480***	-0.506***	-0.504***	-0.472***
	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)
high	-0.621***	-0.604***	-0.604***	-0.563***	-0.618***	-0.614***	-0.539***
	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)
Volunteering		-0.228***					-0.136**
		(0.050)					(0.051)
Education			-0.259***				-0.164*
			(0.068)				(0.068)
Sport or other club				-0.443***			-0.418***
				(0.037)			(0.037)
Religious organisation					-0.128**		-0.085
					(0.046)		(0.047)
Political organisation						-0.402**	-0.286*
						(0.124)	(0.124)
N	32421	32421	32421	32421	32421	32421	32421
	Men						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Education: middle (Ref. low)	-0.242***	-0.237***	-0.240***	-0.229***	-0.243***	-0.239***	-0.225***
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)
high	-0.317***	-0.307***	-0.311***	-0.288***	-0.315***	-0.309***	-0.273***
	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)
Volunteering		-0.142**					-0.043
		(0.045)					(0.046)
Education			-0.168*				-0.110
			(0.076)				(0.076)
Sport or other club				-0.337***			-0.324***
				(0.032)			(0.033)
Religious organisation					-0.135**		-0.111*
					(0.050)		(0.050)
Political organisation						-0.244**	-0.175*
						(0.075)	(0.075)
N	24968	24968	24968	24968	24968	24968	24968

Note: * p < 0.05; ** p < 0.01; *** p < 0.001. Each model includes all the control variables and country fixed effects. Complete results are available upon request.

Table 4 – Estimates (odds ratios) of a logistic regression model predicting the probability of reporting *limitations with activities of daily living* by gender, standard errors in parentheses.

Covariates	Women						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Education: middle (Ref. low)	0.692***	0.695***	0.696***	0.706***	0.692***	0.693***	0.710***
	(0.020)	(0.020)	(0.020)	(0.021)	(0.020)	(0.020)	(0.021)
high	0.593***	0.599***	0.603***	0.620***	0.593***	0.595***	0.632***
	(0.022)	(0.022)	(0.022)	(0.023)	(0.022)	(0.022)	(0.024)
Volunteering		0.861**					0.921
		(0.041)					(0.045)
Education			0.752***				0.810**
			(0.051)				(0.055)
Sport or other club				0.698***			0.713***
				(0.025)			(0.026)
Religious organisation					0.935		0.964
					(0.041)		(0.043)
Political organisation						0.786	0.858
						(0.097)	(0.107)
N	32421	32421	32421	32421	32421	32421	32421
	Men						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Education: middle (Ref. low)	0.747***	0.751***	0.750***	0.757***	0.746***	0.750***	0.762***
	(0.026)	(0.026)	(0.026)	(0.027)	(0.026)	(0.026)	(0.027)
high	0.673***	0.682***	0.681***	0.693***	0.675***	0.681***	0.709***
	(0.027)	(0.027)	(0.027)	(0.028)	(0.027)	(0.027)	(0.029)
Volunteering		0.844**					0.935
		(0.045)					(0.052)
Education			0.731**				0.779*
			(0.071)				(0.075)
Sport or other club				0.710***			0.725***
				(0.028)			(0.029)
Religious organisation					0.904		0.934
					(0.053)		(0.055)
Political organisation						0.706***	0.765**
						(0.067)	(0.073)
N	24968	24968	24968	24968	24968	24968	24968

Note: * p < 0.05; ** p < 0.01; *** p < 0.001. Each model includes all the control variables and country fixed effects. Complete results are available upon request.