Does the song remain the same? Health gap by education in Spain over the last 3 decades

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Abstract

Education is one of the most outstanding social determinants of health in the literature. Invariably, individuals in the lowest educational level have reported worse health outcomes respect to their counterparts with high education. However, less is known about possible changes over time in the magnitude of the health gap by education.

The goal of this research is to explore the evolution over time of the magnitude of the health gap between educational categories in Spain, a country which has experienced large social changes in the last four decades. For this purpose, I analyze the Spanish population aged between 30 and 59 for the period 1987-2017.

Preliminary results point to a reduction of the magnitude of the health gap between educational groups from 1987 to 2001, whereas it seems that values remain the same from 2001 to 2017.

Introduction

Education is one of the most outstanding social determinants of health in the literature. The association between health and education has been repeatedly confirmed due to the capacity of the latter to stratify societies in terms of their socioeconomic status (Holmes and Zajacova 2014). Invariably, individuals in the lowest educational level have been consistently found to report worse health outcomes. On the other hand, those with high education have shown an advantaged health profile (Marmot et al. 2008; Cambois et al. 2016). This influence of education on individual's health has been found to be independent from the age group of the analyzed population (from adulthood to elderly), showing also to mediate the longstanding influence of childhood conditions on health (Arpino et al. 2018).

The mechanisms that explain the health gap by education are diverse. As abovementioned, the educational attainment is directly related with the socio-economic status of the individuals. In this way, individuals in high education declare usually to have higher salaries, better working conditions an extended network which could be of help in case of necessity (Kawachi et al. 2010). All these factors have showed to associate with a better health status and lower mortality (Cutler et al. 2008). However, the influence of education on health does not only restrict to a socio-economic explanation but also due to knowledge about how to follow a healthier life-style. For instance, for the Spanish population with a low educational level, Alcañiz et al. (2015) found a higher prevalence of indicators such as tobacco and alcohol consumption and a sedentary lifestyle, which also associate directly with health.

Another outstanding characteristic of the relationship between education and health is that it differs between women and men. The reasons behind this gendered effect are illustrated by the resource substitution theory. This theory proposes that the resulting gap produced by the lowest influence of one or more socio-economic resources can be counterbalanced by a greater influence from other resources (Ross and Mirowsky 2010). Therefore, the importance of education for female health has consequently been reinforced because of the lower female participation in the labor market or the gender wage gap (Ross and Morowsky 2010; Ross et al. 2012). In addition, women have showed to usually have a greater knowledge about healthy life-stiles and to visit practitioners earlier and more often than men (Oksuzyan et al, 2018).

However, less is known about possible changes over time in the health gap by education. In other words, we do not know whether the magnitude of the health advantage of those who have high education respect to those with low educations remains the same across generations. Although the health advantage of high educated subpopulations remains invariable regardless of the analyzed country or the period of reference, social changes over time as educational expansion (progressive increase of the relative number of individuals in high education, mainly for women) could have modified the magnitude of the health gap between low and high educated subpopulations. The educational expansion observed in Western societies implies that access to high education is not yet restricted to only a part of the population. This must have increased the variability of the socio-economic profiles of those with high education. However, there are solid evidences of a persistence of these type of inequalities in Western countries (Marmot 2015) which led to be sceptic about the possibility of a sustained reduction of the health gap by education.

This becomes even more relevant in countries like Spain where it has been observed a rapid social change since the end of the ultra-catholic dictatorship in the middle seventies. During the four decades of dictatorship, social stratification was perpetuated and social elites maintained their privileges thanks to an educational system with a high level of privatization (Gil-Hernández et al. 2017). This was a barrier to the educational expansion which was observed in other European countries at this time. However, Spain showed a rapid increase in the relative number of high educated individuals after the dictatorship. In addition, women outperform men since the nineties and over (Gil-Hernández et al. 2017).

Spain has experienced not only a rapid transformation in terms of its educational population profile but also shows a large improvement in its life expectancy during recent decades. Indeed, this country has turned one of the countries with the highest value for this indicator worldwide. Another factor that turns Spain as an interesting case study is its universal and free public health care during the whole period of analysis. This permits to analyze the relationship between education and health for different Spanish cohorts in the same context in terms of access to health care.

The goal of this research is to explore whether the health gap between the Spanish populations with low and high education remains equal over the last three decades or

has been modified in one or other direction during this period. For this purpose, I analyze the evolution of the gap in the predicted probabilities of declaring to have poor self-perceived health between high educated individuals and the other educational groups. The analyzed data comes from all the available waves of the Spanish Health Survey from 1987 to 2017. All the analyses were restricted to the population in the age range between 30 and 59 in order to consider only individuals in active ages but with time enough for finishing high education. In addition, separated models for women and men will be calculated once the interaction between gender and education was tested.

Methods

The analyzed data comes from all the available waves of the Spanish Health Survey (SHS) and the European Health Survey (EHS) from 1987 to 2017 (1987, 1993, 1995, 1997, 2001, 2003, 2006, 2011, 2014 and 2017). Both surveys SHS and EHS have harmonized samples and questionnaires and are representative for the whole Spanish population, permitting to use them indistinctly and increasing the number of time observations. The samples in each wave are independent each other, which imply that results from each wave are comparable but only permit a cross-sectional analysis. The working sample is composed by individuals aged between 30 and 59.

The analytical strategy consists in running independent multivariate logistic regression models for each year for the association between educational and health status, and controlling for other relevant social determinants of health present in all the waves of the SHS (employment and marital status, nationality, etc.). These models will permit to calculate the probabilities of declaring to have poor health according to educational attainment. The reason behind the fact of calculating the predicted probabilities is because this permits the direct comparison between results from the same probabilistic model with different data (Mood 2010). In this way I can calculate the gap between those with high and low education in terms of probabilities of declaring a poor health status.

Dependent variable:

Self-perceived health (how do you consider your health in the last 12 months). The possible answers to this question were dichotomized into Good Health (Very Good and Good=0) and Poor Health (Fair, Poor and Very Poor=1).

Variable of interest:

Education (question about the educational attainment of the sampled person). Although the possible answers to this question changed over time as a result of the modifications of the Spanish educational programs, it was possible to group them as follows for all the analyzed waves: No studies (all the categories related to not having finished primary education); Primary (completed primary education); Secondary (completed lower or upper secondary education); Tertiary (university education completed).

Control variables:

All the multivariate modes are controlled for employment status (employed; unemployed; domestic tasks; other-basically early retirement-), marital status (single; married; separated or divorced; widow), sex and age.

Results

The preliminary results of this study are divided into two parts: first, I show the main characteristics of the working samples for the years 1987, 2001 and 2017. Second, I present the predicted probabilities of poor health from the logistic models calculated for these three years separately. I selected these three concrete years to illustrate the possible direction of future final results but also to confirm the gender difference in the effect of education on health. This is the reason why the interaction between sex and education is introduced in the models.

Table 1 summarizes the evolution of the Spanish population in the last 3 decades. Overall, Spaniards aged between 30 and 59 years old show a clear educational expansion in the last three decades, standing out the female case. The country also has experienced an increase in the variability of the marital status profile of its population as well as an increase of the female labor force participation. Finally, we can also observe a reduction of the prevalence of poor self-perceived health over time.

<center>**<Table 1 over here>**</center>

The group of figures 1 represent the predicted probabilities of poor health for the interaction between education and gender from the separate models for 1987, 2001 and 2017. All the models are controlled for employment status, marital status and age.

Despite of the clear evolution of the Spanish society in the last three decades depicted by Table 1, the pattern of the probabilities of poor health in terms of gender and health seems to remain stable in general terms (higher female probabilities of poor health and a clear educational gap-the higher the education, the lower the probability of poor health). Looking to the magnitude of the probabilities of poor health, we can observe an increase on the probabilities from 1987 to 2001 for those with low education as well as a slight decrease for those with tertiary education. However, this trend seems to be stagnated from 2001 to 2017. The figures for the years 2001 and 2017 seem to be almost the same.

<p align="center"><Group of Figures 1 over here></p>

Discussion

The goal of this ongoing research is to explore the evolution of the health gap between the Spanish populations with low and high education over time. For this purpose, I focus on the Spanish population aged from 30 to 59 from 1987 to 2017.

Preliminary results for the years 1987, 2001 and 2017 do not confirm the possible hypothesis of a reduction of this gap as a consequence of educational expansion. Conversely, what is observed is some improvement from 1987 to 2001 followed but the stagnation of the probabilities of poor health for each educational level from 2001 to 2017. The reasons that could permit to explain this phenomenon are multiple, from a general perpetuation of health inequalities which are not solved only by a health expansion, to other contextual factors as the recent economic recession which could affect the results from 2017.

The analysis of all the available waves for the SHS and the EHS will permit to get a more detailed picture of the evolution of the health gap by education in Spain. Indeed, the reduction over time of the relative number of individuals in the lowest educational groups together with the increase in the highest educational group would imply a reduction of the general level of health inequalities in the country. In addition, the separated analysis by gender will also permit to explore whether this preliminary results apply to both sexes or the pointed gender differences have drawn different patterns in the evolution of the health gap by education.

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Table 1. Characteristics of the working sample aged 30-59. 1987, 2001 and 2017.

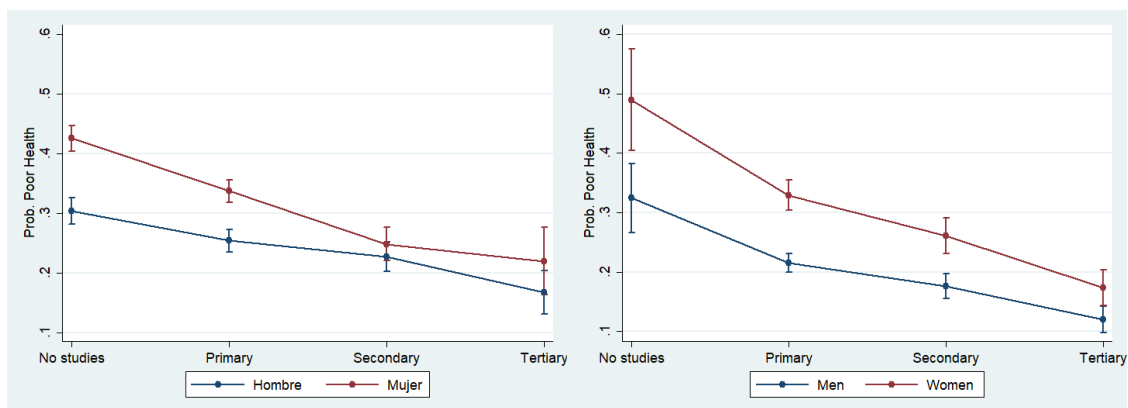|			Women		Men	
			Freq.	**%**	**Freq.**	**%**
1987	**Education**	No studies	2804	40.13%	2032	30.79%
		Primary	2907	41.60%	2589	39.23%
		Secondary	1041	14.90%	1482	22.45%
		Tertiary	236	3.38%	497	7.53%
		Total	**6988**	**100%**	**6600**	**100%**
	Marital status	Single	565	8.09%	889	13.47%
		Married	5957	85.25%	5571	84.41%
		Separated/Divorced	121	1.73%	83	1.26%
		Widow	345	4.94%	57	0.86%
		Total	**6988**	**100%**	**6600**	**100%**
	Employment status	Employed	1736	24.84%	5573	84.44%
		Unemployed	171	2.45%	485	7.35%
		Housework	4928	70.52%	0	0.00%
		Other	153	2.19%	542	8.21%
		Total	**6988**	**100%**	**6600**	**100%**
	Health status	Poor health		36.50%		25.80%
2001	**Education**	No studies	330	6.41%	228	4.59%
		Primary	2854	55.46%	2495	50.28%
		Secondary	1228	23.86%	1377	27.75%
		Tertiary	734	14.26%	862	17.37%
		Total	5146	100%	4962	100%
	Marital status	Single	591	11.48%	1028	20.72%
		Married	4037	78.45%	3661	73.78%
		Separated/Divorced	315	6.12%	226	4.55%
		Widow	203	3.94%	47	0.95%
		Total	**5146**	**100%**	**4962**	**100%**
	Employment status	Employed	2171	42.19%	4231	85.27%
		Unemployed	432	8.39%	314	6.33%
		Housework	2353	45.72%	10	0.20%
		Other	190	3.69%	407	8.20%
		Total	**5146**	**100%**	**4962**	**100%**
	Health status	Poor health		29.70%		19.60%
2017	**Education**	No studies	203	3.35%	211	3.78%

		Primary	542	8.94%	549	9.83%
		Secondary	3646	60.12%	3604	64.51%
		Tertiary	1196	19.72%	1701	30.45%
		Total	**6065**	**100%**	**5587**	**100%**
	Marital status	Single	1292	21.30%	1534	27.46%
		Married	3821	63.00%	3542	63.40%
		Separated/Divorced	399	6.58%	189	3.38%
		Widow	553	9.12%	322	5.76%
		Total	**6065**	**100%**	**5587**	**100%**
	Employment status	Employed	3933	64.85%	4362	78.07%
		Unemployed	1072	17.68%	838	15.00%
		Housework	778	12.83%	7	0.13%
		Other	282	4.65%	380	6.80%
		Total	**6065**	**100%**	**5587**	**100%**
	Health status	Poor health		27.80%		22.00%

Source: Spanish Health Survey 1987, 2001 and 2017.
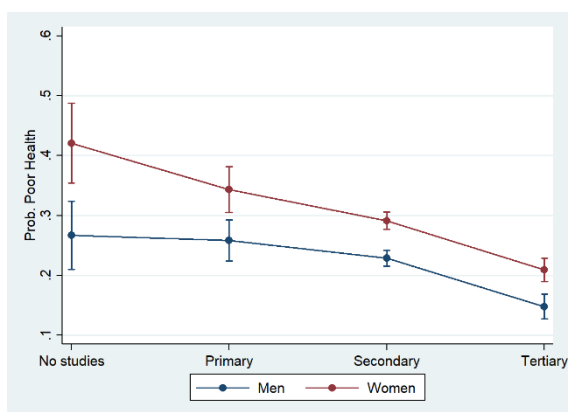
Group of figures 1. Predicted probabilities of poor health for the interaction between education and sex. 1987, 2001 and 2017.

1987   **2001**

2017

Note: Controlled for employment status, marital status and age

Source: Spanish Health Survey 1987, 2001 and 2017