

Trends of socioeconomic inequalities and socioeconomic inequalities in self-perceived health in Spain

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(Evolución de las desigualdades socioeconómicas y desigualdades socioeconómicas en la percepción de la salud en España)

Abstract

Objective: To study the trends of socioeconomic inequalities and socioeconomic inequalities in self-perceived health in Spain between 1987 and 2001.

Methods: We estimated the distribution of educational level and *per capita* provincial income, and the differences in less-than-good self-perceived health by educational level and *per capita* provincial income in each period.

Results: The percentage of the population that had completed secondary or higher education was larger and inequality in *per capita* provincial income was smaller in 2001 than in 1987. In general, the differences in less-than-good self-perceived health by educational level and provincial income were larger in 2001 than in 1987, in both absolute and relative terms. However, when the effect of residual correlation within provinces was taken into account, the differences by *per capita* provincial income were smaller in 2001 than in 1987.

Conclusions: The redistribution of socioeconomic resources achieves greater social justice, but probably does not lead to reduced health inequalities in all cases.

Key words: Health inequalities. Education. Per capital income. Self-perceived health.

Resumen

Objetivo: Estudiar la evolución de las desigualdades socioeconómicas y las desigualdades socioeconómicas en la percepción subjetiva de la salud en España entre 1987 y 2001.

Métodos: Se han estimado la distribución del nivel de estudios y de la renta *per cápita* provincial, así como las diferencias en la percepción de la salud según el nivel de estudios y según la renta *per cápita* provincial en cada período.

Resultados: El porcentaje de población que había completado estudios de segundo grado o superiores fue mayor, y la desigualdad en la renta *per cápita* provincial fue menor en el año 2001 que en 1987. En líneas generales, las diferencias en la percepción negativa de la salud como según el nivel de estudios y la renta *per cápita* provincial fueron mayores en 2001 que en 1987, en términos relativos y absolutos. En cambio, cuando se tuvo en cuenta el efecto de la correlación residual dentro de las provincias en el resultado, las diferencias según la renta *per cápita* provincial fueron menores en 2001 que en 1987.

Conclusión: La redistribución de los recursos socioeconómicos básicos consigue una mayor justicia social, pero probablemente no siempre consigan reducir las desigualdades en salud.

Palabras clave: Desigualdades en salud. Estudios. Renta *per cápita*. Autopercepción de la salud.

Introduction

Recommendations in proposals aiming to decrease socioeconomic inequalities in health usually focus on the socioeconomic determinants of health¹⁻⁵. It is assumed that improved health in socioeconomically disadvantaged individuals or areas

would be achieved by social and economic interventions that would improve their material situation.

However, the evaluation of such interventions is rare. For example, in 1997 the Ministry of Health of England and Wales asked a group of experts to recommend the most appropriate interventions to reduce health inequalities among different social groups³—a task that fits within a framework of social and public health policies based on experimental tests, in line with the principles of the evidence-based medicine movement⁶. However, after several months of work, the group made explicit the lack of empirical evidence about the effectiveness of this type of interventions⁷.

Some authors have warned about the lack of a basis for recommending randomised controlled studies for certain interventions, such as implementing a fiscal policy of income redistribution or establishing an economic policy to reduce unemployment^{8,9}. In their opinion, studies

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or “natural experiments” that observe what happens in a population before and after the introduction of an intervention can provide reasonable evidence about its impact in reducing socioeconomic inequalities in health, even when this is not their primary aim.

This is the strategy followed in the present study, in which we estimate inequalities in self-perceived health in Spain by individual educational level and by *per capita* income in the province of residence in the mid 1980s and around the year 2000, a period of 15 years characterised by important social and economic investments.

Methods

Data sources

This cross-sectional study in 2 periods used information provided by the 1987 and 2001 national health surveys carried out by the Ministry of Health and Consumer Affairs, which had a 10% and 15% non-response rate, respectively. The sampling framework was the resident population of Spain, except for Ceuta and Melilla which were not included in the 1987 sample. Sampling was multistage, stratified by clusters, with proportional random selection of municipalities and census sections, and selection of individuals by age and sex quotas. Each individual in the sample was assigned a weighting coefficient which was used in the estimates. The study was restricted to the population aged between 20 and 74. Individuals older than that were not included because institutionalised individuals were excluded from the health survey samples, and the probability of being institutionalised is relatively high among individuals older than 74. Younger individuals were excluded because they had not completed their education yet.

Health measures and socioeconomic indicators

Perceived health was classified as good –for individuals stating that their health was “good” or “very good” in response to the question about how they perceived their health status– and less-than-good –for those answering “fair”, “poor” or “very poor”. Individuals interviewed in the health surveys were asked about the highest level of education attained; from these replies, educational level was grouped into 5 categories: no education –unable to read or write or some primary education; first level– primary level completed (under the old educational system), 5 years of general basic education; second level, 1st cycle –elementary baccalaureate, eight of general basic education, vocational training, level I; second level, 2nd cycle– upper level baccalaureate, vocational training, level II; and third le-

vel –3-year university degrees, 5- or 6-year university degrees. Information on *per capita* provincial income was obtained from Eurostat estimates for 1987 and 2000 (the most recent data available when the study was carried out). After assigning each province’s *per capita* income, the provinces were grouped into quartiles. Quartile 1 included those with the lowest income level and quartile 4 those with the highest income level. Each person interviewed was then assigned to a *per capita* income quartile according to his or her province of residence.

Statistical analysis

The age-adjusted percentage of the population with less-than-good perceived health was estimated for each year by educational level and *per capita* income. The age distribution of the 2001 sample was used as the standard population. The magnitude of health inequalities in each period was then estimated by measuring the association between each socioeconomic variable and perceived health status. To avoid bias in interpreting the results when comparing extreme categories, the association was also calculated with each socioeconomic variable grouped into 2 categories. The age-adjusted measures of association were calculated based on the absolute and relative differences –ratios. In all cases the association was estimated by binomial regression. The possible residual correlation within provinces was taken into account by estimating the odds ratio using multilevel logit models which included a random effect of the intersection of origin for each province; individual educational level was included as a confounding factor. The program used for this purpose (the SAS macro procedure GLIMMIX) only models the logit function in the multilevel analysis of random coefficients when the outcome variable is binary; therefore the results of this analysis are shown as odds ratios rather than as prevalence ratios. All analyses were made separately for men and women.

Results

The number of individuals analysed in 1987 and 2001 was 24,771 and 14,271, respectively. The percentage of the population aged 20 to 74 with no education fell from 33.2% in 1987 to 11.1% in 2001, while the percentage of the population with second level-2nd cycle or higher education rose from 19.6% to 34.4%. Between the first and second period *per capita* income increased in all provinces, while inequality in income distribution decreased: the ratio between maximum and minimum *per capita* provincial income dropped from 2.90

Table 1. Percentage of population with less-than-good perceived health, and absolute and relative differences in percentages by educational level

	Men			Women		
	1987	2001	Increase	1987	2001	Increase
Percentage ^a (sample size)						
No education	33.9 (3,249)	37.6 (782)	3.7	41.8 (4,981)	51.1 (1,217)	9.3
First level	26.3 (4,087)	30.4 (2,011)	4.1	32.7 (4,400)	35.9 (2,418)	3.2
Second level, 1st cycle	23.0 (1,802)	23.3 (2,542)	0.3	28.5 (1,383)	28.8 (2,743)	0.3
Second level, 2nd cycle	21.3 (1,000)	17.5 (1,920)	-3.8	22.4 (946)	26.3 (1,604)	3.9
Third level	17.6 (1,698)	12.8 (1,365)	-4.8	21.9 (1,225)	21.0 (1,274)	-0.9
Absolute differences ^a						
Difference in percentages (95% CI)						
No education versus third level	9.5 (6.3-13.2)	17.2 (12.1-23.2)	-	13.7 (9.8-18.2)	18.8 (13.4-25.1)	-
Low versus high education ^b	4.3 (2.7-6.1)	6.7 (4.8-9.1)	-	9.6 (7.1-12.3)	8.5 (6.2-10.9)	-
Relative differences ^a						
Ratio of percentages (95% IC)						
No education versus third level	1.87 (1.65-2.11)	2.86 (2.41-3.39)	-	1.92 (1.68-2.18)	2.53 (2.19-2.92)	-
Low versus high education ^b	1.51 (1.31-1.73)	2.60 (2.15-3.16)	-	1.55 (1.41-1.71)	1.43 (1.32-1.56)	-

CI = Confidence interval.

^aAdjusted for age.^bNo education, first level and second level, 1st cycle (low education) versus second level, 2nd cycle and third level (high education).

to 2.27, and the coefficient of variation decreased from 0.24 to 0.21.

A smaller percentage of individuals perceived their health status as less than good in 2001 than in 1987: 22.6% versus 26.5% in men and 32.1% versus 35.1% in women, respectively. In both periods, the percentage of subjects reporting their health status as less than good was higher in those who had no education than in those who had third level education (table 1). In men, the absolute and relative differences were higher in 2001 than in 1987. In women, the absolute and relative differences comparing the extreme groups were higher in 2001 than in 1987. In contrast, when educational level was grouped into 2 categories, these differences were smaller in the second period than in the first.

The lowest *per capita* income quartile had the highest percentage of individuals who stated that their health was less than good, except for men in the first period (table 2). The absolute and relative differences based on the percentages difference and on the percentages ratio were higher in 2001 than in 1987. In contrast, when the effect of residual correlation within provinces was taken into account in the results, the relative differences estimated by odds ratios were smaller in 2001 than in 1987.

Discussion

Few studies have shown the simultaneous evolution of both socioeconomic and health inequalities. One ex-

ception to this may be a study in Holland, which found an increase in perceived health inequalities by educational level, in both absolute and relative terms, in the last 2 decades of the 20th century, together with increased educational level in the population¹⁰. Increased relative inequalities in perceived health¹¹ and in mortality¹² by educational level have also been observed in the developed countries in the last decades of the 20th century, despite the population's higher educational level.

In general, these findings are due to a decrease of negative perception of health or of mortality in the total population, but the magnitude of the reduction is greater in subjects with a high educational level¹¹⁻¹³. Something similar was observed in the present study. The differences by educational level in the percentage of men who considered that their health status was less than good were larger in 2001 than in 1987. This was because this percentage increased among men with a low educational level and decreased among men with a high educational level. In women, the trend for the extreme categories of educational level was the same as in men, and the differences in the percentages when comparing these categories were greater in 2001 than in 1987.

The increase in health inequalities may be due to the fact that low educational level at the beginning of the 21st century reflects probably poorer socioeconomic conditions than in 1987, which would have prevented these individuals from taking advantage of the opportunities offered for vocational training and education in the last 2 decades of the 20th century. In addition, individuals with a high educational level have a greater

Table 2. Percentage of population with less-than-good perceived health, and absolute and relative differences in percentages by *per capita* income quartile of providence of residence

	Men			Women		
	1987	2001	Increase	1987	2001	Increase
Percentage ^a (sample size)						
Quartile 1 (lowest income)	28.4 (2,650)	24.2 (2,197)	-4.2	36.5 (2,905)	36.1 (2,408)	-0.4
Quartile 2	29.9 (2,223)	25.8 (1,707)	-4.1	38.3 (2,469)	31.7 (1,785)	-6.6
Quartile 3	25.4 (3,709)	22.3 (1,384)	-3.1	32.6 (4,019)	29.2 (1,430)	-3.4
Quartile 4 (highest income)	25.4 (3,253)	20.3 (3,360)	-5.1	34.3 (3,543)	30.7 (3,605)	-3.6
Absolute differences ^a						
Difference in percentages (95% CI)						
Quartile 1 <i>versus</i> quartile 4	3.6 (1.4-6.0)	4.7 (2.5-7.1)	-	3.5 (1.4-5.8)	6.3 (3.9-8.8)	-
Quartiles 1+2 <i>versus</i> quartiles 3+4	4.4 (2.8-6.0)	5.1 (3.3-7.1)	-	4.7 (3.1-6.3)	4.9 (2.5-6.3)	-
Relative differences ^a						
Ratio of percentages (95% CI)						
Quartile 1 <i>versus</i> quartile 4	1.14 (1.06-1.23)	1.22 (1.12-1.34)	-	1.10 (1.04-1.16)	1.19 (1.12-1.27)	-
Quartiles 1+2 <i>versus</i> quartiles 3+4	1.17 (1.11-1.23)	1.24 (1.15-1.32)	-	1.13 (1.09-1.18)	1.13 (1.08-1.19)	-
Odds ratio adjusted for education (95% CI) ^b						
Quartile 1 <i>versus</i> quartile 4	1.38 (1.14-1.67)	1.11 (0.84-1.47)	-	1.36 (1.09-1.71)	1.37 (1.06-.76)	-
Quartiles 1+2 <i>versus</i> quartiles 3+4	1.37 (1.19-1.57)	1.25 (1.02-1.54)	-	1.36 (1.15-1.60)	1.29 (1.07-.56)	-

CI = Confidence interval.

^aAdjusted for age.

^bThe possible within-province correlation in the result was taken into account by estimating multilevel logit models which included the random effect of the intersection of origin for each province.

capacity to acquire a series of economic and social resources –power, prestige, wealth and material wellbeing, social relationships, etc.– which allow them to protect themselves from disease, avoid acquiring risks, and minimize the negative consequences of risks to health¹⁴. The exception to our findings was in women with second level, 2nd cycle education, among whom the percentage with less-than-good perceived health was higher in 2001 than in 1987. Monitoring health status by educational level may help to determine the reasons for this result in the future.

During the last 2 decades of the 20th century, regional *per capita* income in Spain moved closer to the European Union mean, and regional income inequality decreased¹⁵. In spite of this, the percentage of individuals who perceived their health status as less than good in 2001 was higher in provinces with lower *per capita* income. The differences in this percentage by *per capita* income increased in 2001 with respect to 1987, although in most cases this increase was due to educational level, since the estimates that took within-province residual correlation into account decreased in 2001 with respect to 1987, except in women in the comparison of the extreme quartiles. This is because, between the first and second period, the percentage of the population with second level, 2nd cycle and higher education grew in larger proportion in the wealthy provinces than in the poor ones.

When interpreting these results, we did not consider whether the 1987 and 2001 estimates differed from the point of view of statistical significance. Except for the estimates by educational level in men, and the percentage ratio among women with no education and women with third level education, in all other cases the confidence intervals for the 1987 and 2001 estimates overlapped. Nevertheless, the consistency of the findings supports the importance of the trend in the magnitude of the estimates. On the other hand, because this was a cross-sectional study in 2 periods, the increased relation between individual socioeconomic characteristics and health could have been caused by subjects with poorer health moving down in the social hierarchy over time. However, this is not the case in the present study, because the socioeconomic characteristic used is educational level, and this remains stable throughout life. The cross-sectional design is also unlikely to be responsible for the reduced inequalities in perceived health by *per capita* income, since there is no evidence that individuals with poor health emigrate to wealthier provinces, or that those with better health emigrate to poorer provinces.

Summing up, our results show that during a period of important social and economic development in Spain, the effect of educational level on perceived health increased, whereas the effect of *per capita* income of the providence of residence decreased. These findings suggest that the redistribution of basic socio-

economic resources may achieve greater social justice, but it probably does not always achieve a reduction in health inequalities, despite the improved socioeconomic and health status of those who are in a more disadvantaged situation.

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Comment. Redistribution of socioeconomic resources without a reduction of health inequalities? Some surprises on the road to Utopia

(Comentario. ¿Redistribución de los recursos socioeconómicos sin reducción de las desigualdades en salud? Algunas sorpresas en el viaje a Utopía)

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Socioeconomic inequalities in health have been found in all countries with available data¹, and logically find their origins in the unequal distribution of socioeconomic resources, such as education, occupation and income. If a totally egalitarian society would be feasible, in which everybody would have the same level of income, there would of course be no health inequalities by income level. Similarly, if everybody would have the same level of education, there would be no health inequalities by level of education.

While this is logically incontrovertible, the actual road to Utopia is paved with surprises. Smaller inequalities in socioeconomic resources are not always accompanied by smaller health inequalities. In England and Wales between 1920 and 1970, decreasing income inequalities between occupational classes were accompanied by larger mortality inequalities².

In Western Europe, societies with smaller income inequalities, like the Nordic countries, do not have smaller health inequalities than societies with larger income inequalities, such as Spain and Italy³.

At first sight, Regidor et al's paper⁴ seems to be another addition to this paradoxical literature. The authors succinctly phrase their provocative, but potentially important, conclusion as follows: «The redistribution of socioeconomic resources achieves greater social justice, but probably does not lead to reduced health inequalities in all cases».

This conclusion is based on an analysis in which they looked at inequalities in self-perceived health in Spain at two points in time, 1987 and 2001. They measured health inequalities by calculating relative and absolute differences in self-perceived health by level of education, and by level of income (estimated on the basis of the average per capita income of the province of residence).

Despite the short time-period, there apparently has been an enormous upward shift in the distribution of education in the Spanish population, and a notable reduction in the inequality of per capita provincial income. While the latter has been accompanied by a reduction in inequalities in self-perceived health between higher and lower incomes (only after controlling for education, and not statistically significantly so, table 2), there was no such reduction in inequalities of self-perceived health by level of education. On the contrary, health inequalities by level of education clearly increased over time (table 1).

Do these findings indeed support the authors' conclusion? Actually, the situation is not as dramatic as they suggest. He-