



## The effect of the economic crisis on health in Spain according to educational level and employment status: Does the duration of the crisis also matter?

El efecto de la crisis económica sobre la salud en España según el nivel educativo y la relación con la actividad: ¿importa también la duración de la crisis?

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**ABSTRACT** The objective of this study is to explore the possible impact of the economic crisis on the health of the Spanish-born population not of retirement age (between 30 and 59 years). Specifically, using data from the *European Union Statistics on Income and Living Conditions* (EU-SILC) for the years 2006, 2010 and 2014, we analyze differences in self-perceived health by socioeconomic profile and position occupied in the household. According to our results, the health of men and women show similar levels of association with certain factors (such as education) and different levels with others (women's health is more sensitive to household income level while men's is more sensitive to employment status). Finally, while substantial improvements in self-perceived health were observed during the first period in almost all socioeconomic groups, during the second period there was almost no change, and for the most disadvantaged men (inactive in the labor market and with low educational levels), health worsened.

**KEY WORDS** Economic recession; Impacts on health; Work; Education; Spain.

**RESUMEN** El objetivo del trabajo es explorar el posible efecto que la crisis económica ha tenido sobre la salud de la población nacida en España en edad adulta previa a la jubilación (entre 30 y 59 años). Específicamente, a partir de los datos de la *European Union Statistics on Income and Living Conditions* (EU-SILC) para los años 2006, 2010 y 2014 analizamos diferencias en la salud autopercebida según su perfil socioeconómico y la posición que ocupan en el hogar. Nuestros resultados muestran que la salud de los hombres y las mujeres tienen niveles de asociación similares con ciertos factores (por ejemplo, nivel educativo) y diferenciados con otros (la salud de la mujer es ligeramente más sensible al nivel de los ingresos del hogar, mientras la salud de los hombres a su propio estado de empleo). Finalmente, mientras que en el primer periodo se observan mejoras sustanciales en la salud autopercebida en casi todos los grupos socioeconómicos, en el segundo periodo no hay casi ningún cambio e incluso, para algunos hombres con un perfil más desfavorecido (inactivos con educación baja), la salud empeoró.

**PALABRAS CLAVES** Recesión económica; Impactos en la Salud; Trabajo; Educación; España.

## INTRODUCTION

The short and long term consequences of the economic crisis that Spain has been undergoing since 2008 have raised concerns about the health of the Spanish population. Despite the numerous scientific studies carried out internationally over the course of a century regarding the effect of economic cycles on health, the relationship between adverse economic contexts and health is still not well understood.<sup>(1)</sup> This lack of knowledge is primarily due to the fact that the impact of an economic crisis on population health depends on many factors defining the period itself, such as the crisis intensity and duration, the populations most affected, the economic and social policies which determine the nature of the crisis' evolution (both those preexisting and those that form part of the austerity policies put in place to confront the crisis), the dominant sociocultural values, the level of formal and informal welfare, and the demographic changes in the labor market.<sup>(2)</sup>

In response to the economic context, politicians may try to limit public expenditure through cuts that affect the health budget, among others.<sup>(3)</sup> For example, in the European countries most affected by the crisis such as Spain, Greece and Portugal, disproportionate cuts have been made in the line items directed at covering public health, accompanied by an increased health spending burden on the part of patients (called "cost-shifting"), even though health systems generally require more resources in periods of economic crisis.<sup>(2,4)</sup> In fact, evidence exists that highlights the importance of countercyclical public spending, especially in social sectors,<sup>(3)</sup> as a consequence of the increasing need of services in the most vulnerable groups, like the unemployed, immigrants and, in general, anyone without a regular income.<sup>(5)</sup> In this way, if an economic crisis compromises public health, the health of individuals that require medical care could be affected, given that they can no longer receive the same services they once did. Nevertheless, a clear relationship has not yet been established between economic crises

and population health, and in fact many of the results obtained are counter-intuitive. For example, in different contexts in the short term – and depending on age, sex and outcome – few adverse effects have been seen in overall health during periods of economic crisis in countries with high income levels; in fact, mortality has been seen to decline with the slowing of the economy and then increase in the subsequent economic recuperation.<sup>(1,6,7,8,9,10,11,12)</sup> Although results show to be dependent on the indicators used to measure economic change<sup>(13)</sup> or the methodology applied – if for example a time lapse in the covariates is included<sup>(14)</sup> – one possible explanation of such findings is that economic crisis improves certain health-related behaviors such as the increase in hours of sleep or free time, which can be used for health activities (such as physical activity), the reduction in consumption of less healthy foods or alcohol (given the limited household budget), or less time at the wheel (resulting in fewer highway deaths).<sup>(1)</sup>

Other works clearly show a worsening in population health profiles during periods of economic crisis, although this is at a fairly disaggregated population level and is in relation to certain types of behaviors, diseases or disabilities, for example the deterioration of mental health<sup>(15)</sup> that can have consequences in the increase in suicide deaths,<sup>(16)</sup> alcohol and drug consumption, and HIV contagion incidence.<sup>(5)</sup> With respect to the present crisis period in Spain, evidence exists of a decline in the health of subpopulations with disadvantaged social profiles. The situation has produced an increase in health inequalities in the area of mental health, in addition to signs of possible incipient effects in the increase in infectious pathologies and changes in healthy lifestyles like the consumption of toxic substances and diminished use of contraceptives.<sup>(17)</sup>

### Economic changes in Spain during the crisis

One of the defining characteristics of a period of economic crisis is the reduction in the rate of growth of economic production,

which can even reach negative values. In Spain it is well known that between 2008 and 2013 there was a reduction of 7.6% in the gross domestic product (GDP) accompanied by an growing unemployment rate (from 11% to 26% of the active population).<sup>(18)</sup> One of the detonating factors of the recession period was the bursting of the housing market bubble, although the destruction of jobs was not limited to the construction sector but also affected the industrial and service sectors. In the context of a high proportion of workers with temporary contracts of short duration, large companies could rapidly reduce their personnel at a relatively low cost.<sup>(19)</sup> Nevertheless, according to Jaumotte,<sup>(20)</sup> Spain stands out for the strength of the collective bargaining that served to limit the levels of salary flexibility, assure good compensation for employees with stable contracts, and fix the duration and quantity of unemployment services. Therefore, workers who were in the last stages of their working life that had stable contracts and seniority left the labor market in good economic conditions.

Nevertheless, sociodemographic profiles exist that present greater or lesser vulnerability to the effects of the economic crisis. In this way, the crisis has redefined the boundaries of groups in situations of vulnerability, with the appearance of the “newly vulnerable”: a group made up of people who were employed and are far from retirement age, who after losing their jobs accumulate risk factors, starting with those economic-based.<sup>(21)</sup> As a consequence, the vulnerability profile begins to be defined by other factors beyond those which were important prior to the crisis, like health problems, family destructuring and substance consumption.<sup>(22)</sup>

Other consequences of the present economic crisis are found in the ways families have forcibly adapted to new circumstances (such as the loss of employment of the primary breadwinner of the family). This adaptation process has implications in both the economic arena (for example, the rate of economically active women has increased in spite of the crisis) and in the family structure (people who were previously independent or who are newly divorced find themselves obligated to return to

their parents' homes). After eight years of unemployment rates above 20% in Spain, the role of the family has been key to surviving the situation. In this sense, the family – understood as the kinship relationships among people who live in the same home – define the context in which the distribution of resources of different types (economic as well as others such as knowledge and time) takes place.<sup>(23,24)</sup> In the case of Spain, the importance of the family is even more pronounced given that the welfare state articulates its activities based on the support and services that the family offers its members.<sup>(25)</sup> Indeed, the typology of Spain's welfare state has been defined as “familialist.”<sup>(26)</sup> Given that the characteristics of the home have been uncovered as a key factor in understanding the effects of the crisis, we have taken into account information related to this sphere in our analysis (the individual's position in the household structure and the economic capacity of the home).

The objective of this work is to explore the possible effect that the economic crisis has had on the self-perceived health of individuals of adult, non-retirement age (between 30 and 59 years), and in particular, to examine differences according to educational level and relation to the labor market. We will consider a gender perspective given the unequal roles men and women usually take on within the home and in the workplace.

Although previous studies have shown that people with a high level of education or job type tend to have better levels of health, our hypothesis here is that the differentials increase as a consequence of the crisis. If this were so, it would be possible to understand why at the population level the effects of the crisis on health are not visible, given that one part of the population (the most vulnerable in socioeconomic terms) would be affected, but not another.

## DATA AND METHODS

The sources utilized are the Spanish samples of the EU-Survey on Income and Living

Conditions (EU-SILC) for the years 2006, 2010 and 2014 (before and during the economic crisis in the short and medium term). We used secondary, anonymous data and totally independent samples. With respect to this last characteristic, the EU-SIC is a panel survey in which selected people are interviewed over a maximum of four consecutive years. This is to guarantee the complete renewal of the sample among each of the years. The sampling unit of the survey is the private home; homes are selected probabilistically and are representative at the national level. Within each home all people over the age of 16 are interviewed. A more detailed description of the survey methodology can be found in Eurostat.<sup>(27)</sup>

Our dependent variable is the health of the individual measured through self-perception. This type of health relates to the holistic definition proposed by the World Health Organization (WHO), and is sensitive to the health differences within populations that are relatively homogenous in relation to their desired health.<sup>(28)</sup> This information is obtained through the question: "How is your health in general?" For the purpose of this work, the possible answers were grouped into: *good health* ("very good" or "good") and *not good health* ("fair," "bad," or "very bad").

Given our primary interest in how the crisis has affected the health of the population most exposed to the labor situation, we reduced the sample to include people between 30 and 59 years of age who did not declare themselves unable to work, so as to avoid possible selection bias. A large percentage of younger adults are still in school and also have a very low probability of not having good health, while the age limit is fixed at 59 and not 64 to avoid including individuals outside of the labor market for diverse reasons that are difficult to identify in the data. For example, for the 2006-2014 period, the effective retirement age was 62 in men and 63 in women,<sup>(29)</sup> that is, under 65. This is due to pre-retirement not just for economic reasons in the company, but for reasons related to worker health. Had these people been younger, they likely would have been given sick leave or a disability pension

instead of early retirement. Additionally, belonging or not belonging to an economically active group defines the mechanisms by which the crisis has affected individuals as well as the resources they have to face the crisis (for example, job loss with the only opportunity for compensation being unemployment insurance for a fixed period of time).

In addition to age and employment status, the samples were also selected by country of birth (Spain) and household position. The reason for working only with the population born in Spain is to avoid possible bias in the health and socioeconomic profile of the foreign population. With respect to household position, all those who do not form part of the household's family nucleus were excluded (2% of the sample). Based on earlier works,<sup>(30)</sup> the household position is defined for each individual according not only to the household structure (single person, multi-person) but also their place in the family nucleus or nuclei (part of a couple, co-parent, son or daughter, single parent, outside of the family nucleus). We utilize family arrangements instead of family typologies because we propose focusing on the individual and his or her role in the home; we understand that while the household structure is the same for all members, each person holds a type of place within that common context. It is precisely this role that determines the level of responsibility and/or burden to which each member of the household is exposed, taking into account that the relationships within the home are articulated in a constant daily exchange of economic resources, emotional support, care, information, and similar aspects.<sup>(31)</sup>

We will first proceed to describe the sample, so as to then show the bivariate analysis carried out between the dependent variable and the covariates of interest. Lastly, the results of multivariate logistic regression analysis will be presented, in order to obtain the effect of each covariate (prevalence odds ratio). In Model 1, we test differences among three categories in relation to employment status: employed, unemployed and inactive.

Model 2 controls for educational level to see if the relationship between employment status and health is modified. Educational level is associated with the acquisition of knowledge regarding healthy attitudes and behaviors, as well as the ability to optimize the use of health services.<sup>(32,33)</sup> In addition, education level unequivocally presents a strong association with health inequalities and mortality that affects, above all, the less educated subpopulation.<sup>(34)</sup> Similarly, having a higher level of education can play a protective role in wellbeing (both physical and psychological) during a personal crisis such as unemployment.<sup>(35)</sup> Model 3 includes information regarding the home to control for the combined purchasing power of the family unit. Household income can alleviate the effects of unemployment or economic inactivity<sup>(36)</sup> when living with someone else or receiving income not based in employment. In addition, we have taken into account the household arrangement given that, as explained previously, living in a family can bring about health benefits beyond those related to economic reasons. In Model 4 the variable resulting from crossing employment status, education and year is shown to see if the crisis has had different effects according to educational level and employment status. We know that over the eight years of the study health has improved overall, but there may be unequal trends.

Given our interest in capturing the possible effects derived from gender inequalities, all the analyses were carried out independently for men and women. In this way, it is possible to observe any existing differences in relation to the intensity and direction of the associations among the different factors included in the analysis and the self-perceived health of men and women in a social context in which gender norms continue to be unfavorable to women. In other words, instead of comparing the prevalence of not having good health between men and women, we are interested in seeing if the factors associated with this poor health are different according to gender.

## Characteristics of the sample

In the original samples the age range of 30 to 59 years consisted of 14,494 people in 2006, 15,952 in 2010 and 13,7111 in 2014. Following the previously described selection criteria for the sample of interest to this work, 12% were excluded in 2006, 17% in 2010 and 16% in 2014 (the larger percentage in these last years is due to the greater number of people born outside of Spain in the Spanish samples of the EU-SILC).

Throughout the 8-year period between 2006 and 2014, the profile of the Spanish population showed changes related to employment status. The proportion of people with employment, as can be expected, lowered substantially among men, among whom the percentage of unemployment tripled over the period, reaching 21.5%. Although women showed similar percentages of unemployment, the percentage employed grew during the crisis (from 56.2% to 59.6%) while economic inactivity lowered drastically (from 34.5% to 18.2%) (Table 1). These results are consistent with those of the Encuesta de Población Activa (EPA)<sup>(37)</sup> and reflect a growing trend of female participation in the workplace that began in 1980 as part of the process of women's liberation.

With respect to education, as a consequence of the educational expansion initiated in the 1960s from which women benefitted more than men, an increase in the percentage of people with higher studies can be observed. This increase was greater among women, overcoming the percentage seen in men by 5 percentage points in 2014. Regarding the combined capacity of the home to make ends meet, as expected the situation is worse in 2014 than in 2006: 35.2% of men and 35.8% of women expressed great difficulty in making ends meet, almost 10% more than in 2006. It should be highlighted that a large part of the decline took place between 2010 and 2014, years both within the crisis period.

Differences by sex can also be highlighted in the last variable examined (household position), especially in those categories that imply not living with a partner (living alone, with a

parent or parents and in a single-parent family). In the case of men, higher percentages as compared to women are observed in the case of living alone or living with parents when over the age of 30, while for women higher percentages are seen in single parent families, a situation which is almost marginal among men. With respect to the change between 2006 and 2014, the percentage of single person homes increased as well as that of single-parent homes (almost 10% of all women). The percentage of those living with children decreased and that of those living without children increased during the study period.

## RESULTS

### Descriptive results

In 2006, almost a fourth of the male population from 30 to 59 years declared not having good health; this proportion changed to one in six in 2014. Among women the percentages were 26.0% and 20.7%, respectively (Table 2). This is observed even though the 2014 sample is somewhat older than that of 2006 (in terms of greater relative weight of older ages among all the age groups of interest in this work). It should be highlighted,

Table 1. Percentage of Spanish men and women aged 30 to 59 years, according to variables and categories. Spain, 2006, 2010 and 2014.

Variables	Men			Women		
	2006 (n=6,153)	2010 (n=6,385)	2014 (n=5,546)	2006 (n=6,621)	2010 (n=6,849)	2014 (n=5,916)
<b>Age</b>						
30-39	33.2	32.1	28.3	33.8	31.2	26.8
40-49	37.4	35.8	35.8	37.2	37.1	36.3
50-59	29.4	32.1	35.9	29.0	31.7	36.9
<b>Employment status</b>						
Employed	89.0	82.7	75.7	56.2	62.1	59.6
Unemployed	6.1	14.2	21.5	9.3	14.9	22.1
Inactive	4.9	3.1	2.8	34.5	23.0	18.2
<b>Educational level</b>						
Mandatory education	50.3	46.4	44.5	51.7	44.2	41.1
Baccalaureate (FP2)	22.1	22.2	22.2	20.8	21.2	20.1
University (FP3)	27.6	31.4	33.3	27.5	34.5	38.8
<b>Economic capacity of the household to make ends meet</b>						
(Great) difficulty	25.3	27.1	35.2	26.5	27.4	35.8
Some difficulty	30.7	27.5	28.3	31.0	27.7	27.8
Fair ease	28.8	27.5	25.0	28.4	27.7	24.8
Great ease	15.2	17.9	11.5	14.1	17.2	11.6
<b>Household position</b>						
Single person	4.5	6.6	7.2	3.8	5.5	5.4
Living with parent(s)	13.8	14.6	15.3	8.5	8.0	7.9
Living with partner, no children	13.3	13.8	15.2	12.7	15.4	15.0
Living with partner and children	67.3	63.8	60.4	67.2	62.1	61.2
Single parent, as parent	1.1	1.2	1.8	7.8	9.0	10.4

Source: Own elaboration based on the Spanish sample of the European Union Statistics on Income and Living Conditions (EU-SILC), 2006, 2010 and 2014. Clean and unweighted sample (N). FP2 = *Formación profesional de grado medio* [Intermediate level professional training in Spanish educational system]. FP3 = *Formación profesional de grado superior* [Higher level professional training in Spanish educational system].

however, that among women there was no improvement between 2010 and 2014, while among men the proportion with good health increased more from 2006 to 2010 than from 2010 to 2014. Given these results, the question arises as to what variables might be behind this stagnation.

For each of the years in the study, the well-known pattern of differences in percentage of those declaring not good health according to sex, age, education, employment status, economic capacity of the household and household position can be observed. However, what is interesting to us, and where we place our attention, is the evolution of the percentages of the self-perception of not having good health in each of the categories of these variables over time. In this way, we observe three possible patterns in the combined evolution of these categories, differentiated according to the trend from 2010 to 2014, given that from 2006 to 2010 a reduction in the percentage without good health is observed in all groups. The first trend is in the subpopulations in which self-perceived health worsened in the second period, as is the case of unemployed women or women with only basic studies, people of both sexes with higher studies, men who live in a home that easily makes ends meet (although at 10.2% of the sample, it is the lowest percentage after 30-39 years of age), women who live in a single person home or live with their parent(s), and men who are single parents. The second trend is observed among those subpopulations that maintained stable self-perceived health percentages (with differences of less than 1%) between 2010 and 2014, as is the case of the 30-39 year old age group for both sexes, women of 40-49 years, employed women, women who live in homes that make ends meet with some difficulty or live with a partner and children or are single parents. Lastly, we find the subpopulations in which there continues to be a decline in the percentage of not good health, although with a smaller magnitude than that observed in the previous period.

It should be highlighted that the differences among the best and worst categories

of the variables decreased between 2006 and 2014 (and especially between 2010 and 2014), with the only exception being in employed and inactive women (which increased 1%), women with basic education and university education (an increase of 3%) and women whose households easily make ends meet and those that cannot (no change). Indeed, according to employment status, health differences are greatest: in 2014, only 12.7% of employed males and 15.5% of employed females did not have good health, as compared to 43.8% and 28.5% of inactive men and women respectively. Additionally, there was no improvement in the last four years among those not working. This difference between inactive men and women is due to the fact that many inactive women are not in the situation because of having lost their jobs, but rather because they dedicate their time to domestic tasks. In the case of unemployed men, it is interesting to note that their health improved greatly between 2006 and 2010, perhaps because the crisis initially implied an increase in the number of men in this situation and a diversification of the profile of such men as compared to earlier years, including people that before the crisis did not belong to a vulnerable group. Between 2010 and 2014, however, this effect disappeared, possibly as a result of the erosion of health throughout long lasting unemployment.

## Results of multivariate models

In order to see whether the differences mentioned previously are influenced by other related factors, we calculated the sequence of models represented in Table 3 and Table 4. First, we tested the effect of employment status, controlling for age and year. The results reinforce that not being employed negatively affects health, more so in men than in women, with the difference by sex more pronounced in the case of economic inactivity. This difference is likely due to the different profile of economically inactive people according to sex; while a large

Table 2. Percentage of people with the self-perception of “not having good health” in Spanish men and women 30 to 59 years of age, according to variables and categories. Spain, 2006, 2010 and 2014.

Variables	Men			Women		
	2006	2010	2014	2006	2010	2014
<b>Self-perception of “not having good health”</b>	23.1	17.3	16.0	26.0	20.7	20.7
<b>Age</b>						
30-39	14.3	9.7	8.8	15.2	11.3	10.8
40-49	21.3	16.6	15.2	25.5	18.8	18.0
50-59	35.2	25.8	22.6	39.3	32.1	30.6
<b>Employment status</b>						
Employed	20.1	14.8	12.7	21.1	15.4	15.5
Unemployed	38.3	25.2	24.3	29.6	26.3	28.4
Inactive	57.9	47.5	43.8	33.1	31.2	28.5
<b>Educational level</b>						
Mandatory education	28.1	23.5	21.4	33.3	30.0	31.4
Baccalaureate (FP2)	20.8	15.4	13.4	21.4	17.7	16.8
University (FP3)	15.8	9.6	10.5	15.9	10.5	11.5
<b>Economic capacity of the household to make ends meet</b>						
(Great) difficulty	31.9	25.7	22.8	35.7	31.8	30.4
Some difficulty	24.2	17.6	13.9	28.1	20.8	20.0
Fair ease	16.6	14.3	11.6	19.6	14.5	12.2
Great ease	18.4	9.1	10.2	16.4	12.7	11.0
<b>Household position</b>						
Single person	27.7	20.4	18.1	30.7	23.1	27.7
Living with parent(s)	18.8	16.2	15.1	21.0	13.2	19.1
Living with partner, no children	23.3	18.7	17.5	26.6	26.7	25.4
Living with partner and children	23.5	16.9	15.4	24.9	19.0	18.2
Single parent, as parent	30.9	22.8	23.8	37.9	27.0	26.7

Source: Own elaboration based on the Spanish sample of the European Union Statistics on Income and Living Conditions (EU-SILC), 2006, 2010 and 2014. FP2 = *Formación profesional de grado medio* [Intermediate level professional training in Spanish educational system]. FP3 = *Formación profesional de grado superior* [Higher level professional training in Spanish educational system].

number of women may be inactive because they dedicate their time to household work, the male profile is characterized by greater diversity (pre-retirees, men temporarily unable to work, etc.). The effect of employment status is minimally reduced when educational level is also taken into account (Model 2). In relation to education, men and women with basic education have approximately twice the odds of not having good health as compared to their counterparts with higher studies. This difference is slightly reduced when the

capacity of the home to make ends meet and the household position are taken into account (Model 3). That is, not only characteristics of an individual nature, like having a high education level or employment, influence health; those with whom one lives and the combined purchasing power of the home also have an impact. In the end, the combined income is what makes it possible to obtain the resources necessary to live (food, shelter and clothing) and, in effect, those who live in homes with low and very low incomes



Table 3. Odds ratio of the self-perception of “not having good health” in Spanish men from 30 to 59 years of age, according to variables and categories. Spain, 2006, 2010 and 2014.

Variables	Model 1			Model 2			Model 3			Model 4		
	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value
<b>Constant</b>	0.14		0.000	0.10		0.000	0.08		0.000	0.09		0.000
<b>Age</b>												
30-39*	1.0			1.0			1.0			1.0		
40-49	1.8	1.6-2.0	0.000	1.7	1.6-1.9	0.000	1.8	1.6-2.1	0.000	1.8	1.6-2.0	0.000
50-59	3.0	2.7-3.3	0.000	2.8	2.5-3.1	0.000	3.0	2.7-3.4	0.000	3.0	2.7-3.4	0.000
<b>Year</b>												
2006*	1.0			1.0			1.0					
2010	0.6	0.6-0.7	0.000	0.7	0.6-0.7	0.000	0.7	0.6-0.7	0.000	-	-	-
2014	0.5	0.5-0.6	0.000	0.6	0.5-0.6	0.000	0.5	0.5-0.6	0.000	-	-	-
<b>Employment status</b>												
Employed*	1.0			1.0			1.0					
Unemployed	2.3	2.0-2.5	0.000	2.0	1.8-2.2	0.000	1.6	1.4-1.8	0.000	-	-	-
Inactive	4.2	3.5-4.9	0.000	4.0	3.4-4.7	0.000	3.8	3.2-4.5	0.000	-	-	-
<b>Educational level</b>												
High (University / FP3)*	-	-	-	1.0			1.0			-	-	-
Medium (Baccalaureate / FP2)	-	-	-	1.4	1.2-1.5	0.000	1.3	1.5-1.8	0.000	-	-	-
Low (Mandatory education)	-	-	-	2.0	1.8-2.2	0.000	1.6	1.1-1.4	0.000	-	-	-
<b>2006</b>												
Employed and high EL*	-	-	-	-	-	-	-	-	-	1.0		
Employed and medium EL	-	-	-	-	-	-	-	-	-	1.3	1.0-1.5	0.027
Employed and low EL	-	-	-	-	-	-	-	-	-	1.4	1.2-1.6	0.000
Unemployed and high EL	-	-	-	-	-	-	-	-	-	1.7	0.9-3.3	0.095
Unemployed and medium EL	-	-	-	-	-	-	-	-	-	1.2	0.6-2.3	0.590
Unemployed and low EL	-	-	-	-	-	-	-	-	-	3.0	2.3-4.1	0.000
Inactive and high EL	-	-	-	-	-	-	-	-	-	2.2	1.2-3.9	0.008
Inactive and medium EL	-	-	-	-	-	-	-	-	-	3.1	1.8-5.5	0.000
Inactive and low EL	-	-	-	-	-	-	-	-	-	6.4	4.5-9.0	0.000
<b>2010</b>												
Employed and high EL	-	-	-	-	-	-	-	-	-	0.5	0.4-0.7	0.000
Employed and medium EL	-	-	-	-	-	-	-	-	-	0.8	0.7-1.0	0.054
Employed and low EL	-	-	-	-	-	-	-	-	-	1.0	0.9-1.3	0.618
Unemployed and high EL	-	-	-	-	-	-	-	-	-	0.9	0.5-1.4	0.570
Unemployed and medium EL	-	-	-	-	-	-	-	-	-	0.9	0.6-1.4	0.620
Unemployed and low EL	-	-	-	-	-	-	-	-	-	1.6	1.3-2.0	0.000
Inactive and high EL	-	-	-	-	-	-	-	-	-	1.3	0.6-2.8	0.427
Inactive and medium EL	-	-	-	-	-	-	-	-	-	3.7	1.8-7.5	0.000
Inactive and low EL	-	-	-	-	-	-	-	-	-	4.4	3.0-6.6	0.000
<b>2014</b>												
Employed and high EL	-	-	-	-	-	-	-	-	-	0.5	0.4-0.7	0.000
Employed and medium EL	-	-	-	-	-	-	-	-	-	0.5	0.4-0.7	0.000
Employed and low EL	-	-	-	-	-	-	-	-	-	0.7	0.6-0.9	0.004
Unemployed and high EL	-	-	-	-	-	-	-	-	-	0.9	0.6-1.3	0.570
Unemployed and medium EL	-	-	-	-	-	-	-	-	-	0.9	0.6-1.3	0.498
Unemployed and low EL	-	-	-	-	-	-	-	-	-	1.2	1.0-1.5	0.128
Inactive and high EL	-	-	-	-	-	-	-	-	-	0.8	0.3-1.9	0.589
Inactive and medium EL	-	-	-	-	-	-	-	-	-	1.2	0.5-2.7	0.703
Inactive and low EL	-	-	-	-	-	-	-	-	-	5.7	3.5-9.3	0.000
<b>Economic capacity of the household to make ends meet</b>												
Great ease*	-	-	-	-	-	-	1.0			1.0		
Fair ease	-	-	-	-	-	-	1.2	1.0-1.3	0.055	1.1	1.0-1.3	0.067
Some difficulty	-	-	-	-	-	-	1.5	1.3-1.7	0.000	1.5	1.9-2.5	0.000
(Great) difficulty	-	-	-	-	-	-	2.2	1.9-2.5	0.000	2.2	1.3-1.7	0.000
<b>Household position</b>												
Living with partner and children*	-	-	-	-	-	-	1.0			1.0		
Single person	-	-	-	-	-	-	1.1	0.9-1.4	0.158	1.1	0.9-1.4	0.166
Living with parent(s)	-	-	-	-	-	-	0.9	0.8-1.1	0.279	0.9	0.8-1.1	0.255
Living with partner, no children	-	-	-	-	-	-	0.8	0.7-0.9	0.002	0.8	0.7-0.9	0.002
Single parent, as parent	-	-	-	-	-	-	1.1	0.8-1.5	0.584	1.1	0.8-1.5	0.552

Source: Own elaboration based on Spanish sample of the European Union Statistics on Income and Living Conditions (EU-SILC), 2006, 2010 and 2014. \*Reference value. OR = odds ratio. 95% CI = 95% confidence interval. EL = educational level. FP2 = *Formación profesional de grado medio* [intermediate level professional training in Spanish educational system], FP3 = *Formación profesional de grado superior* [higher level professional training in Spanish educational system]. R<sup>2</sup> de Nagelkerke: Model 1 = 0.10; Model 2 = 0.11; Model 3 = 0.13; Model 4 = 0.13.

Table 4. Odds ratio of the self-perception of “not having good health” in Spanish women from 30 to 59 years of age, according to variables and categories. Spain, 2006, 2010 and 2014.

Variables	Model 1			Model 2			Model 3			Model 4		
	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value
<b>Constant</b>	0.14		0.000	0.10		0.000	0.09		0.000	0.10		0.000
<b>Age</b>												
30-39*	1.0			1.0			1.0			1.0		
40-49	1.8	1.7-2.0	0.000	1.6	1.5-1.8	0.000	1.8	1.6-2.0	0.000	1.8	1.6-2.0	0.000
50-59	3.4	3.1-3.8	0.000	2.9	2.6-3.2	0.000	3.1	2.8-3.5	0.000	3.2	2.9-3.5	0.000
<b>Year</b>												
2006*	1.0			1.0			1.0					
2010	0.7	0.7-0.8	0.000	0.8	0.7-0.8	0.000	0.7	0.7-0.8	0.000	-	-	-
2014	0.7	0.6-0.7	0.000	0.7	0.7-0.8	0.000	0.6	0.6-0.7	0.000	-	-	-
<b>Employment status</b>												
Employed*	1.0			1.0			1.0					
Unemployed	2.0	1.8-2.2	0.000	1.7	1.5-1.8	0.000	1.4	1.3-1.5	0.000	-	-	-
Inactive	1.7	1.6-1.9	0.000	1.4	1.3-1.5	0.000	1.4	1.3-1.5	0.000	-	-	-
<b>Educational level</b>												
High (University / FP3)*	-	-	-	1.0			1.0			-	-	-
Medium (Baccalaureate / FP2)	-	-	-	1.4	1.2-1.5	0.000	1.2	1.1-1.4	0.000	-	-	-
Low (Mandatory education)	-	-	-	2.3	2.1-2.5	0.000	1.8	1.6-2.0	0.000	-	-	-
<b>2006</b>												
Employed and high EL*	-	-	-	-	-	-	-	-	-	1.0		
Employed and medium EL	-	-	-	-	-	-	-	-	-	1.2	1.0-1.5	0.103
Employed and low EL	-	-	-	-	-	-	-	-	-	1.5	1.2-1.8	0.000
Unemployed and high EL	-	-	-	-	-	-	-	-	-	1.4	0.9-2.2	0.182
Unemployed and medium EL	-	-	-	-	-	-	-	-	-	1.5	1.0-2.3	0.057
Unemployed and low EL	-	-	-	-	-	-	-	-	-	1.9	1.4-2.5	0.000
Inactive and high EL	-	-	-	-	-	-	-	-	-	1.3	0.9-1.9	0.121
Inactive and medium EL	-	-	-	-	-	-	-	-	-	1.4	1.1-1.9	0.019
Inactive and low EL	-	-	-	-	-	-	-	-	-	2.1	1.7-2.5	0.000
<b>2010</b>												
Employed and high EL	-	-	-	-	-	-	-	-	-	0.6	0.5-0.7	0.000
Employed and medium EL	-	-	-	-	-	-	-	-	-	0.8	0.6-1.0	0.041
Employed and low EL	-	-	-	-	-	-	-	-	-	1.1	0.9-1.4	0.235
Unemployed and high EL	-	-	-	-	-	-	-	-	-	0.9	0.6-1.3	0.517
Unemployed and medium EL	-	-	-	-	-	-	-	-	-	1.1	0.7-1.5	0.730
Unemployed and low EL	-	-	-	-	-	-	-	-	-	1.5	1.2-1.9	0.000
Inactive and high EL	-	-	-	-	-	-	-	-	-	0.7	0.5-1.2	0.198
Inactive and medium EL	-	-	-	-	-	-	-	-	-	1.1	0.8-1.6	0.456
Inactive and low EL	-	-	-	-	-	-	-	-	-	1.8	1.5-2.2	0.000
<b>2014</b>												
Employed and high EL	-	-	-	-	-	-	-	-	-	0.5	0.4-0.7	0.000
Employed and medium EL	-	-	-	-	-	-	-	-	-	0.6	0.5-0.8	0.000
Employed and low EL	-	-	-	-	-	-	-	-	-	1.0	0.8-1.3	0.669
Unemployed and high EL	-	-	-	-	-	-	-	-	-	0.9	0.6-1.2	0.430
Unemployed and medium EL	-	-	-	-	-	-	-	-	-	0.9	0.6-1.3	0.499
Unemployed and low EL	-	-	-	-	-	-	-	-	-	1.5	1.2-1.9	0.000
Inactive and high EL	-	-	-	-	-	-	-	-	-	0.7	0.4-1.1	0.105
Inactive and medium EL	-	-	-	-	-	-	-	-	-	0.8	0.5-1.1	0.177
Inactive and low EL	-	-	-	-	-	-	-	-	-	1.5	1.2-1.8	0.000
<b>Economic capacity of the household to make ends meet</b>												
Great ease*	-	-	-	-	-	-	1.0			1.0		
Fair ease	-	-	-	-	-	-	1.1	1.0-1.3	0.107	1.1	1.0-1.3	0.095
Some difficulty	-	-	-	-	-	-	1.7	1.5-1.9	0.000	1.7	1.5-2.0	0.000
(Great) difficulty	-	-	-	-	-	-	2.5	2.2-2.9	0.000	2.5	2.2-2.9	0.000
<b>Household position</b>												
Living with partner and children*	-	-	-	-	-	-	1.0			1.0		
Single person	-	-	-	-	-	-	1.1	0.9-1.3	0.214	1.1	0.9-1.3	0.215
Living with parent(s)	-	-	-	-	-	-	0.9	0.8-1.1	0.393	0.9	0.8-1.1	0.411
Living with partner, no children	-	-	-	-	-	-	0.7	0.6-0.8	0.000	0.7	0.6-0.8	0.002
Single parent, as parent	-	-	-	-	-	-	1.0	0.9-1.2	0.655	1.0	0.9-1.2	0.573

Source: Own elaboration based on Spanish sample of the European Union Statistics on Income and Living Conditions (EU-SILC), 2006, 2010 and 2014. \*Reference value. OR = odds ratio. 95% CI = 95% confidence interval. EL = educational level. FP2 = *Formación profesional de grado medio* [Intermediate level professional training in Spanish educational system]. FP3 = *Formación profesional de grado superior* [Higher level professional training in Spanish educational system]. R<sup>2</sup> de Nagelkerke: Model 1 = 0.09; Model 2 = 0.12; Model 3 = 0.15; Model 4 = 0.15.

have, respectively, an odds of not having good health 1.5 and 2.2 times greater among men and 1.7 and 2.5 times greater among women. This result also suggests that women with economic difficulties in the home are slightly more vulnerable with respect to their health than men.

In terms of the position of the person within the household, this variable has little effect upon the relationship between employment status and self-perceived health, with the exception of the lowest category of both variables. That is, a part of the poorer health in people that are economically inactive or that have received up to basic mandatory education is explained by their household position. In terms of the relationship between household position and health (net effect), all the categories are have similar odds, except those living as couple without children, who have the best health (odds ratio of 0.8 in men and 0.7 in women). It appears that the difference observed at the bivariate level among persons who live alone or as a single parent are explained by their adverse socioeconomic conditions. For both women and men, the variable of household position is the least significant of those included in the models (with its inclusion in Model 3, Nagelkerke's  $R^2$  improves 0.002 and 0.007 respectively).

Finally, to see how the crisis has affected the association among health, employment status and education, we constructed a model with interactions between educational level and relationship to the labor market (Model 4). The results can be viewed more clearly in Figure 1. As can be observed, the best health situation is observed among people with employment, whose odds ratio of declaring not good health also lowered substantially, especially between 2006 and 2010. Among the categories of labor market relationship, the most educated also have lower odds of declaring not good health. Among the unemployed, as was seen previously in the bivariate analysis, in 2010 self-perceived health appears to have improved with respect to 2006, although this tendency leveled out between 2010 and 2014, with the exception

of those least educated. In the case of those who are economically inactive, although the small number of people in this category makes comparison among the years more difficult, it can be observed that the only group that shows an improving trend, although not statistically significant, is that with high levels of education. At the other extreme we can see how those economically inactive with low education levels appear to maintain the odds of not having good health during the study period. With regard to women, although there is less variation between those unemployed and those inactive, those with lower education levels show a greater odds of not having good health than those with university education in all categories of employment status, with differences remaining stable over time.

## DISCUSSION

In the present work we seek to identify the possible effect that the present economic crisis, one of the most acute in recent times, has had on the general state of health of the adult population in Spain of working age (30 to 59 years). With this purpose as our base, we analyzed the association between self-perceived health and the socioeconomic characteristics of the population before the onset of the economic crisis, in the year 2006, and during the crisis at two times, 2010 and 2014, in men and women independently. Although previous studies have demonstrated that people with a socioeconomic profile characterized by high educational level and stable employment tend to have better levels of health than the rest of the population, our hypothesis here is that these differences increase as a consequence of the crisis given that this group is not affected, while the negative effects have been augmented in those with profiles associated with greater vulnerability. In addition, keeping in mind that the economic level of each person is defined not only by their individual characteristics but also in conjunction with their household, we have

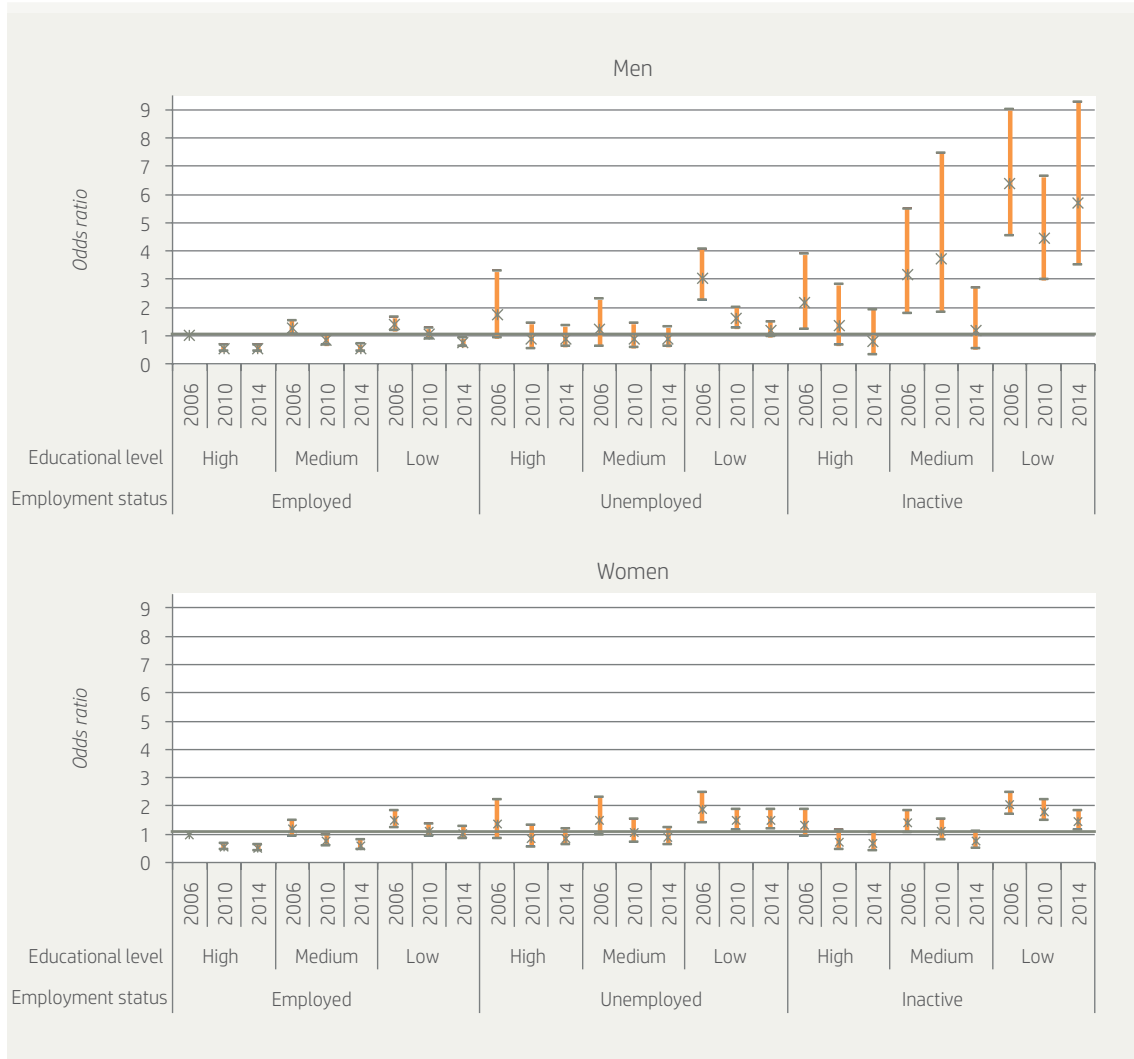


Figure 1. Odds ratio of the self-perception of “not having good health” in Spanish men and women aged 30 to 59 years, according to employment status and educational level, controlled for age, economic capacity of the home to make ends meet and the person’s position in the household (Model 4). Spain, 2006, 2010 and 2014.

Source: Own elaboration based on the Spanish sample of the European Union Statistics on Income and Living Conditions (EU-SILC), 2006, 2010 and 2014.

introduced into our models variables such as position in the household and the household’s economic capacity to make ends meet. The literature on this subject leaves no room for doubt that those who live with a partner have greater availability of resources – both tangible (economic and similar) and intangible (larger social network, for example) – and optimize their use, which allows for a greater capacity to overcome possible adverse situations related to the economic context in

comparison with those who live in family structures that are less frequent such as single parents, the paradigmatic family type exposed to the worst conditions.<sup>(30)</sup>

The results of the descriptive analysis show how the socioeconomic profile of the adult Spanish population has clearly changed between 2006 and 2010, but less between 2010 and 2014. Although for men and for women in the period studied, the educational profile shows an increase in the percentage

in the higher two categories (Baccalaureate and university studies), the relationship to the labor market shows clear deterioration. Among men, these changes are clearly located in the increased percentage of those surveyed who report being unemployed, while among women part of those who were inactive have become active, although this passage from inactive to active has given rise to a larger increase in the relative weight of unemployed women.

The results of the multivariate models confirm the difficulty of isolating the effects of the crisis on health. Indeed, in the short term our results corroborate what has been found in earlier works regarding the lack of influence of the adverse economic situation on population health in Spain.<sup>(6)</sup> Nevertheless, what appears clear is that although the health of Spanish adults has not worsened, the trend towards improvement has reduced or even disappeared when the more advanced crisis period is analyzed (between 2010 and 2014). This fact appears to be due to two factors. The first is the increase in the relative weight of the population with a less favorable profile and the association of that profile with health. As has been commented (Table 1), the socioeconomic profile of the Spanish population shows a deterioration that has caused an increased number of men and women to be unemployed. The perception regarding economic capacity of the household to make ends meet also shows how the relative weight of those who report difficulties has increased with respect to 2006. Additionally, we observe that those with profiles that *a priori* were considered outside the range of danger have become more sensitive to the economic context. The deterioration in the socioeconomic profile of the last years has led to an increase in the relative weight of the subpopulation with characteristics highlighted in the literature as implying greater vulnerability, such as being unemployed. The profile of unemployed men in particular has gone from being very selective and concrete in terms of health or family destructuring<sup>(22)</sup> to being much more diverse and including, for example, different education levels, which

leads us to a different scenario with respect to those preceding. For example, it is known that individuals with higher educational levels are not healthier only because they have a better socioeconomic level but also because they have greater knowledge about how to carry out healthier lifestyles (for example, diet, physical activity and so on); this is likely the reason why the women with only basic mandatory education experienced hardly any improvement over the period. Even so, the long duration of the crisis begins to take its toll: amongst both people who work and those who are unemployed there was hardly any improvement in health between 2010 and 2014. Nevertheless, medium and high educational levels have served to mitigate the adverse effects of the crisis on health. We can therefore see greater permeability in the lines between different levels of vulnerability according to socioeconomic profiles, which emerges as a key for distinguishing among subpopulations those who are susceptible to having their health affected by the socioeconomic context and those least affected.

Another key factor for understanding the health of the Spanish adult population is the subjective capacity of homes to make ends meet. In this way, the general economic level shows a clear association with individual health, most clearly among women. In previous works women showed to have greater sensitivity to the characteristics and situation of the household, while the health of men is most sensitive to individual characteristics.<sup>(30,38)</sup> This idea is corroborated by the household position, a variable associated much more to women's health variability than that of men, although for the latter results were also significant. Again, living with a partner and children shows to be the situation with least probability of being associated with a poor or regular state of health.

In summary, the complexity of identifying at present the possible effect of the economic crisis on the health of the population is great. This recession period has not only modified the socioeconomic status of a large part of the Spanish population, but also drawn new lines between vulnerable and non-vulnerable

subpopulations. In this way, the knowledge held previously regarding the connection among different social determinants and health during a period of crisis might not be totally valid, or at least should be reviewed. Such a review should take into account not only that changes in the sociodemographic profiles before and after the crisis have not been the same for men as for women, especially with regard to labor market relationship (less economically active men and at the same time less economically inactive women), but also the possible effects caused by the duration of

the crisis are different. Finally, it is important to consider that health in both sexes can show similar levels of association with certain socio-economic factors (such as educational level, as was seen in our study) as well as differences in others (for example, the health of women is slightly more sensitive to the household income level while that of men is more sensitive to their employment status, especially at the lowest educational level). Future studies in this area should consider such combinations of socioeconomic characteristics from a temporal perspective.

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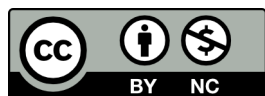
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