Papeles de Trabajo

STATISTICAL MODELS OF ECONOMIC EVALUATION IN PUBLIC POLICIES. ANALYSIS OF HEALTH CARE RESOURCE UTILIZATION*

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ÍNDICE

ABSTRACT

This paper tests for the determinants of health care services utilization in Spain. The data used stem from the European Health Interview Survey (EHIS) for Spain (2014). The analysis is carried out using discrete choice and count data models for each of the public health care services analysed (general practitioner –GP-, specialist and emergency visits, and hospitalisations). Health variables and other socioeconomic and demographic characteristics were controlled at individual level. It can be concluded that, our results support those in the literature for which the above mentioned variables are mainly related to social characteristics as age, gender, education level or self-assessed health. We hypothesize that our findings could be relevant for current debates in the literature on health economics. From a policy economic perspective, this contribution could be valuable to policymakers when planning to improve health services management.

Keywords: health care utilization, EHIS, count data models

JEL Classification: I1; I18

1. INTRODUCTION

Since Arrow (1963) and Grossman (1972a, b), several papers have studied the relationship between socioeconomic determinants −such as income, gender, education or labour status− and health care utilization (Clavero-Barranquero and González-Álvarez, 2005; Devaux, 2015). Generally, they demonstrate the lower the socioeconomic level, the higher the expected health care demand.

Recent literature has documented that health care utilization has increased over the last decades in developed economies according to the improvements in health indicators such as life expectancy or infant mortality. In this sense, for health care utilization, OECD Health Statistics (2014) show that doctor's consultations per capita decreased in Spain from 8.1 in 2006 to 7.4 in 2011-2012, whereas for the OECD countries increased from 6.6 to 7.0.

Therefore, our research is closely related to recent theoretical and empirical works focused on demand for health care. As far as we know, these ones are mostly single-country studies, some of them based on general population samples and others on specific subgroups. For example, Kraut *et al.* (2000) examined whether prior use of health services predicts subsequent risk of unemployment, and the acute effects of exposure to unemployment on health care utilization. The authors found for randomly selected residents in Canada that hospitalization would increase after a period of unemployment.

Similar results were obtained by Linn, Sandifer and Stein (1985) for a sample of American veterans, showing an increase in the utilization of health services by unemployed people. However, as said by Åhs and Westerling (2006), results regarding positive association between unemployment and health care consumption are far from conclusive. Van der Heyden *et al*. (2003) found that underachiever individuals in Belgium make more often use of the general practitioner, and are more frequently admitted to hospital, than those with higher education. Though, after controlling for health status and demographic characteristics, people with higher socio-economic status report more often specialist visits. Also, Morris, Sutton and Gravelle (2005) showed for England how low-income individuals and ethnic minorities have lower use of secondary health care, despite having higher use of primary one.

For the latest empirical evidence for Spain we can highlight the one obtained by Calzón *et al*. (2015) whom using data from the Living Conditions Surveys analysed the impact that socioeconomic inequality has had on unmet dental care needs before (2007) and during (2011) the crisis. In addition, García-Gómez *et al.* (2015) investigated the determinants of several long term care services and unmet needs for non-institutionalised disabled population in 2008 using the Spanish Disability and Dependency Survey. As stated by Lostao *et al*. (2001), lower socioeconomic groups exhibit higher rates of medical visits than the upper ones for the same level of need. Yet, it is worth mentioning that the relationship decreased throughout the time span.

Meanwhile, García-Pérez *et al*. (2007) showed that labour status or educational level do not influence when been adjusted by income. Conversely, González-Álvarez and Clavero-Barranquero (2008) and Regidor *et al.* (2008) found inequity in visits to general practitioner favouring low socioeconomic levels, the opposite in specialist visits. Finally, Abásolo, Negrín-Hernández and Pinilla (2014a, b) examined the utilization of health care services and its waiting times. As they showed, there is evidence of inequity in the access to specialist and hospital care services which advantages the highest socioeconomic levels. In the same line, Blazquez-Fernandez (2015) reports that demand-induced supply plays a major role, as health care expenditure is full decentralized since 2002. Also, she demonstrates that economic shocks entail disturbances on labour market which may lead to behavioural changes in individuals.

Our objective is to study whether socioeconomic characteristics can help to explain demand for health care in Spain, and to what extent. We base our results on health care utilization since they thoroughly cover the demand side of health care. In order to do so, we test for the influence of a set of indicators on health attendance for 2014. Nevertheless, several studies (Jones et al, 2013) on health care utilization are conditioned by the available data. In recent years, due to new data, empirical applications have been developed for the demand for health services (Urbanos-Garrido, 2011).

The structure of the study is the following one. Section 2 contains the methodological aspects and Section 3 describes the dataset. The estimation results are presented and discussed in Section 4. Finally, Section 5 summarizes and concludes.

2. METHODOLOGY

The analytical framework of the paper is based on the study of health care utilization in Spain using different econometric techniques. Also, socio-demographic characteristics (like age, gender, education, marital and health status and some economic data) are analysed (Grossman, 1972a and b, 2000; Zweifel, 1981; Pohlmeier and Ulrich, 1995). There are two different approaches in health care utilization: discrete choice models and count data models. On one hand, in discrete choice models, our dependent variable in the statistical model is a dichotomy variable which takes a value of 1 if the individual has a characteristic (access to health care) and 0 otherwise. In this way, a set of factors, such as age, marital status, education, etc., gathered in a vector *x* explain this fact so that:

$$\text{Prob }(Y=1)=F(x,\beta), \qquad (1)$$
$$\text{Prob }(Y=0)=1-F(x,\beta).$$

The set of parameters β reflects the impact of changes in *x* on the probability. In order to estimate this equation, a nonlinear specification of *F*(.) can prevent logical inconsistency and the possibility of predicted probabilities outside the range [0,1].

The most common nonlinear parametric specifications are logit and probit models which have been analysed. So, we will use a latent variable interpretation (Jones, 2000). Let

$$\begin{aligned} y=1 \quad & if\ y_i^*>0 \\ y=0 \quad & if\ y_i^*\le 0 \end{aligned} \qquad (2)$$

where

$$y^*=x'\beta+\varepsilon \, . \qquad (3)$$

If we assume that ε has a standard normal distribution, we obtain the probit model, while assuming a standard logistic distribution, we obtain the logit model. These models are usually estimated by maximum likelihood estimation and the log-likelihood for a sample of independent observations is:

$$\ln L=\sum_{i=1}\left\{y_i \ln F(x_i'\beta)+(1-y_i)\ln\left[1-F(x_i'\beta)\right]\right\} . \qquad (4)$$

On the other hand, there are different approaches to econometric modelling of count measures of health care utilisation (López-Nicolás, 1998 and 2001; Jones, 2000; Bago, 2006). For example, in the case of count data models the Poisson model has been widely used to study count data (Cameron and Trivedi, 1998; Greene, 2003). The model stipulates that each y_i is drawn from a Poisson distribution with parameter λ_i , which is related to the regressors, x_i .

The basic equation of the model is as follows,

$$\Pr(Y_i=y_i)=\frac{e^{-\lambda_i}\lambda_i^{y_i}}{y_i}, \qquad (5)$$

$$y_i=0,1.2,...,\infty \qquad (6)$$

In these sense, the most common formulation for λ_i is

$$\ln\lambda_i=\beta' x_i . \qquad (7)$$

So, it is easily shown that

$$E[y_i / x_i] = Var[y_i / x_i] = \lambda_i = e^{\beta' x_i}, \tag{8}$$

And

$$\frac{\partial E[y_i / x_i]}{\partial x_i} = \lambda_i \beta. \tag{9}$$

In principle, Poisson model is simply a nonlinear regression but it is far easier to estimate the parameters with maximum likelihood techniques and the log-likelihood function is

$$\ln L = \sum_i [-\lambda_i + y_i \beta' x_i - \ln y_i !]. \tag{10}$$

A general Poisson model is the negative binomial model that deals with cases where there are more variation than would be expected. In this case, the probability that a random variable *Y* has a certain value, with the hypothesis that parameter λ follows a gamma (ϕ, υ) is obtained from

$$\Pr(Y_i = y_i) = \int_0^\infty \Pr(Y_i = y_i / \lambda) f(\lambda) d\lambda = \frac{\Gamma(y_i + \upsilon)}{\Gamma(y_i + 1)\Gamma(\upsilon)} \left(\frac{\upsilon}{\upsilon + \phi}\right)^{\upsilon} \left(\frac{\phi}{\upsilon + \phi}\right)^{y} \tag{11}$$

with $E(y_i) = \phi$ and $Var(y_i) = \phi + \alpha\phi^2$, where $\alpha = 1/\upsilon$.

In other way, count data often show a higher incidence of zero counts than would be expected if the data were Poisson distributed. Zero-inflated Poisson regression models are a useful class of models for such data, but parameter estimates may be seriously biased if the non-zero counts are over dispersed in relation to the Poisson distribution.

Finally, there are different specifications of zero-inflated negative binomial models, that fit distributions, like health care utilization, where exists a greater number of reply's with zero (or "zero inflated") (Yin, 2002).

Thus, Poisson regression models are used for modelling count data although we are going to take into account a number of extensions useful for count models. Negative binomial regression can be used for over-dispersed count data. That is when the conditional variance exceeds the conditional mean and it has an extra parameter to model the over-dispersion. Zero-inflated regression model attempts to account for excess zeros and it estimates two equations simultaneously, one for the count model and one for the excess zeros.

3. DATA DESCRIPTION

In 2002, Eurostat launched the European Health Survey System (EHSS) in order to obtain health data by means of official surveys and meet the demand for information on health and health determinants. The European Health Survey (EHIS) is a five-yearly research addressed to all people aged 15 and over who reside in family dwellings throughout the national territory. It includes data of health services and health determinants and it is harmonized and comparable at a European level. The first wave for Spain was published in 2009.

The EHIS 2014 sample (the most recent information) is approximately 23,000 dwellings distributed in 2,500 census tracts. Another point of interest is that this survey provides national results as well as by Autonomous Communities. Also, the information is divided into four modules: health status, health care use, health determinants and socio-economic background variables.

The European Health care Module (ECHM) collects data on the use of health care services and the unmet needs for health care. Information on health care consumption is an essential part of this study in order to assign necessary resources to the population. In fact, we are very interested in these points:

1. General activity limitation: Limitation in activities people usually do because of health problems for at least the past six months.
2. Admission as an inpatient in a hospital in the past 12 months.

3. Number of times admitted as a day patient in a hospital in the past 12 months.
4. Number of times consulted a GP (general practitioner) or family doctor on your own behalf.

In this study we are very interested not only in GP and specialists consults but also average number of visits to the family doctor and specialist in the last 4 weeks, according to sex and age group (Tables 1 and 2). If we compare the results for 2009 and 2014, we can observe that both have decreased except for males between 35 and 54 years old. However, as noted by INE (2014), in 2014, 20.9% of population has visited a GP in the last 4 weeks (this percentage was 28.5% in 2009) and 14.2% of the population has visited a specialist versus 11.2% in 2009. So, more people have consulted a GP or specialist but less number of times. Thus, we consider this point is very important to analyze deeply what has happened.

Table 1

Number of visits to the family doctor or General Practitioner in the last 4 weeks, according to sex and age group: Average and standard deviation. Population aged 16 years old and over that has visited the family doctor or general practitioner in the last 4 weeks

	2009		2014	
	Average	Standard deviation	Average	Standard deviation
Both sexes				
Total	1.42	1.07	1.34	0.91
16 to 24 years old	1.27	0.62	1.21	0.58
25 to 34 years old	1.44	1.15	1.33	0.78
35 to 44 years old	1.39	0.83	1.35	0.93
45 to 54 years old	1.4	0.84	1.37	0.91
55 to 64 years old	1.4	0.91	1.34	0.91
65 to 74 years old	1.41	1.05	1.3	0.97
75 years old and over	1.53	1.52	1.37	0.89
Male				
Total	1.41	1.2	1.32	0.94
16 to 24 years old	1.34	0.7	1.1	0.45
25 to 34 years old	1.38	1.13	1.2	0.54
35 to 44 years old	1.33	0.76	1.34	0.9
45 to 54 years old	1.41	0.86	1.44	1.07
55 to 64 years old	1.4	0.9	1.34	0.93
65 to 74 years old	1.31	0.89	1.25	1.03
75 years old and over	1.63	2.1	1.37	0.93
Female				
Total	1.42	0.97	1.35	0.9
16 to 24 years old	1.22	0.54	1.28	0.64
25 to 34 years old	1.47	1.17	1.41	0.88
35 to 44 years old	1.42	0.88	1.36	0.96
45 to 54 years old	1.39	0.83	1.33	0.77
55 to 64 years old	1.39	0.92	1.34	0.9
65 to 74 years old	1.48	1.15	1.34	0.91
75 years old and over	1.47	0.97	1.37	0.86

Source: Spanish National Statistical Institute.

Table 2

Number of visits to the family doctor or General Practitioner in the last 4 weeks, according to sex and age group: Average and standard deviation. Population aged 16 years old and over that has visited the specialist in the last 4 weeks

	2009		2014	
	Average	Standard deviation	Average	Standard deviation
Both sexes				
Total	1.49	1.45	1.4	1.22
16 to 24 years old	1.42	1.17	1.18	0.55
25 to 34 years old	1.46	1.44	1.37	0.82
35 to 44 years old	1.38	0.91	1.45	1.5
45 to 54 years old	1.5	1.03	1.49	1.53
55 to 64 years old	1.67	2.23	1.39	1.17
65 to 74 years old	1.52	1.53	1.38	0.99
75 years old and over	1.43	1.5	1.35	0.91
Male				
Total	1.51	1.61	1.41	1.48
16 to 24 years old	1.48	0.88	1.25	0.71
25 to 34 years old	1.37	0.94	1.27	0.61
35 to 44 years old	1.38	1.15	1.55	2.23
45 to 54 years old	1.53	1.14	1.59	1.95
55 to 64 years old	1.71	2.65	1.36	1.32
65 to 74 years old	1.47	1.12	1.35	1.06
75 years old and over	1.66	2.14	1.33	0.77
Female				
Total	1.47	1.35	1.39	0.99
16 to 24 years old	1.38	1.32	1.15	0.42
25 to 34 years old	1.49	1.59	1.41	0.9
35 to 44 years old	1.38	0.74	1.39	0.88
45 to 54 years old	1.49	0.96	1.41	1.09
55 to 64 years old	1.65	1.82	1.41	1.04
65 to 74 years old	1.55	1.8	1.42	0.91
75 years old and over	1.29	0.84	1.36	1

Source: Spanish National Statistical Institute.

Indeed, we are going to base our results on the following questions:

a) SEX

- male
- female

b) AGE

Age of the person at the moment of interview

c) What is your legal marital status?

- single, that is, never married
- married (including registered partnership)
- widowed and not remarried
- divorced and not remarried (including legally separated and dissolved registered partnership)?

d) What is the highest education leaving certificate, diploma or education degree you haveobtained?

- no formal education or below (ISCED 1)
- primary education (ISCED 1)
- lower secondary education (ISCED 2)
- upper secondary education (ISCED 3)
- post-secondary but non-tertiary education (ISCED 4)
- first stage of tertiary education (ISCED 5)
- second stage of tertiary education (ISCED 6)

e) How would you define your current labour status?

- working for pay or profit (including unpaid work for a family business or holding, including an apprenticeship or paid traineeship, including currently not at work due to maternity, parental, sick leave or holidays)
- unemployed
- pupil, student, further training, unpaid work experience
- in retirement or early retirement or has given up business
- permanently disabled
- in compulsory military or community service
- fulfilling domestic tasks
- other

f) How is your health in general? Is it…

- very good
- good
- fair
- bad
- very bad
- don't know
- refusal

g) Do you have any longstanding illness or [longstanding] health problem? [By longstanding I mean illnesses or health problems which have lasted, or are expected to last, for 6 months or more].

- Yes
- No
- don't know
- refusal

h) For at least the past 6 months, to what extent have you been limited because of a health problem in activities people usually do? Would you say you have been …

- severely limited
- limited but not severely
- not limited at all
- don't know
- refusal

i) During the past 12 months, that is since (date one year ago), have you been in hospital as an inpatient, that is overnight or longer?

- Yes
- No
- don't know
- refusal

j) How many separate stays in hospital as an inpatient have you had since (date one year ago)? Count all the stays that ended in this period.

- number of stays
- don't know
- refusal

k) Thinking of this/these inpatient stay(s), how many nights in total did you spend in hospital?

- number of nights

- don't know
- refusal

l) During the past 12 months, that is since (date one year ago), have you been admitted to hospital as a day patient, that is admitted to a hospital bed, but not required to remain overnight?

- Yes
- No
- don't know
- refusal

m) How many days have you been admitted as a day patient since (date one year ago)?

- number of days
- don't know
- refusal

n) During the past 12 months, was there any time when you really needed to be hospitalized following recommendation from a doctor, either as an inpatient or a day patient, but did not. When was the last time you consulted a GP (general practitioner) or family doctor on your own behalf?

- Less than 12 months ago
- 12 months ago or longer
- Never
- don't know
- refusal

o) During the past four weeks ending yesterday, that is since (date), how many times did you consult a GP (General Practitioner) or family doctor on your own behalf?

- number of times
- don't know
- refusal

p) When was the last time you consulted a medical or surgical specialist on your own behalf?

- Less than 12 months ago
- 12 months ago or longer
- Never
- don't know
- refusal

q) During the past four weeks ending yesterday, that is since (date), how many times did you consult a specialist on your own behalf?

- number of times
- don't know
- refusal

r) Was there any time during the past 12 months when you really needed to consult a specialist but did not?

- Yes, there was at least one occasion
- No, there was no occasion
- don't know

s) Do you smoke at all nowadays?

- Yes, daily
- Yes, occasionally
- Not at all

t) What tobacco product do you smoke each day?
Manufactured cigarettes

- Yes
- No

Hand-rolled cigarettes

- Yes
- No

Cigars

- Yes
- No

Pipefuls of tobacco

- Yes
- No

Other

- Yes

u) During the past 12 months, how often have you had an alcoholic drink of any kind (that is beer, wine, spirits, liqueurs or other alcoholic beverages)?

- Never
- Monthly or less
- 2 to 4 times a month
- 2 to 3 times a week
- 4 to 6 times a week
- Every day
- refusal

v) How many drinks containing alcohol do you have each day in a typical week when you are drinking?

- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday
- Sunday

w) During the past 12 months, how often did you have 6 or more drinks on one occasion?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily
- refusal

Thus, we are going to base our results on information about demography and socio-economic status (sex, age, education, etc.), health status (self-perceived health, chronic conditions, limitation in daily activities or obesity), health determinants/ health results of lifestyles (smoking and alcohol consumption), and region of residence.

Given the structure of our database, the aim of this paper is to model health care utilization as a function of a range of socio-economic characteristics. In order to it, we have classified them into ten groups of variables: personal characteristics, education level, marital status, income, occupational status, health status, lifestyles, immigrants, and region of residence. Table 3 shows explanatory variables used in estimations and their corresponding definitions.

Table 3

Variables Definitions

Variable Name	Variable Definition
Personal Characteristics	
male	1 if male, 0 otherwise
age	Age in years
Education Level	
secondary_lower	1 if first stage secondary education, 0 otherwise
secondary_upper	1 if second stage secondary education, 0 otherwise
tertiary	1 if university studies or advanced vocational training, 0 otherwise
Marital status	
married	1 if separated, 0 otherwise
widowed	1 if widowed, 0 otherwise
separated_divorced	1 if divorced or divorced, 0 otherwise
Income	
high_income	1 if monthly household income is in the highest range (more than 3280 euros), 0 otherwise
Occupational Status	
unemployed	1 if individual is unemployed, 0 otherwise
Health Status	
Self-Assessed Health (SAH)	1 if individual has very good or good Self-Assessed Health, 0 otherwise
chronic	1 if individual declares chronic illness, 0 otherwise
limited	1 if limited, 0 otherwise
obesity	1 if obess, 0 otherwise
Lifestyles	
smoker	1 if smoke, 0 otherwise
drinker	1 if drinks alcohol daily, 0 otherwise
Immigrant	
spanish	1 if individual is Spanish, 0 otherwise
Region	
North	1 if the region is sited on the North of Spain: Asturias, Cantabria, Galicia and Basque Country.
Mediterranean	1 if the region is sited on the Mediterranean area of Spain: Andalusia, Balearic Islands, Canary Islands, Catalonia, Valencian Community and Murcia.

Source: Authors' elaboration from EHSS.

4. EMPIRICAL RESULTS

This section is devoted to comment on our results in relation to each of the services: general practitioner, specialist, emergency and hospitalizations. Firstly, in order to have a better knowledge of the situation and as a first approximation, we are going to present a description of the data.

Table 4 describes details on the variables used in the estimates where the summary statistics of the series are provided. In any case it is important to highlight the distribution of our four main dependent variables. For this reason, Table 5 presents the frequency of counts and Figures 1-4 plot its respective histograms. As can be appreciated *gp* and *specialist* variables present excess of zeros in their responses. Thus, methods of the estimation procedure would differ between variables, as previously exposed.

Table 4

Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
gp	18157	0.58	2.34	0	20
specialist	12936	0.40	2.10	0	20
emergency	6214	6.55	69.09	1	40
hospitalizations	1949	1.61	5.02	0	20
unemployed	22842	0.13	0.34	0	1
age	22842	52.34	18.78	15	102
male	22842	0.46	0.50	0	1
sah	22842	0.67	0.47	0	1
sns[1]	22842	0.95	0.21	0	1
chronic	22842	0.65	0.48	0	1
limited	22842	0.06	0.24	0	1
obesity	22842	0.51	0.50	0	1
smoker	22842	0.24	0.43	0	1
drinker	22842	0.17	0.37	0	1
secondary_lower	22842	0.20	0.40	0	1
secondary_upper	22842	0.18	0.39	0	1
tertiary	22842	0.26	0.44	0	1
married	22842	0.54	0.50	0	1
widowed	22842	0.13	0.33	0	1
separated_divorced	22842	0.07	0.26	0	1
spanish	22842	0.94	0.23	0	1
high_income	22842	0.07	0.25	0	1
North	22842	0.19	0.39	0	1
Mediterranean	22842	0.42	0.49	0	1

Source: Authors' elaboration.

Table 5

Frequency counts for each dependent variable (*gp*, *specialist*, *emergency*, and h*ospitalizations*)

gp	Freq.	Percent	Cum.
0	10,972	60.43	60.43
1	5,680	31.28	91.71
2	996	5.49	97.2
3	238	1.31	98.51
4	191	1.05	99.56
5	26	0.14	99.7
6	19	0.1	99.81
7	6	0.03	99.84
>7	16	0.17	100

[1] Due to its nature/composition it is not included in the finally estimates.

specialist	Freq.	Percent	Cum.
0	9,631	74.45	74.45
1	2,592	20.04	94.49
2	431	3.33	97.82
3	158	1.22	99.04
4	69	0.53	99.57
5	16	0.12	99.7
6	7	0.05	99.75
7	7	0.05	99.81
> 7	20	0.21	100

Source: Authors' elaboration.

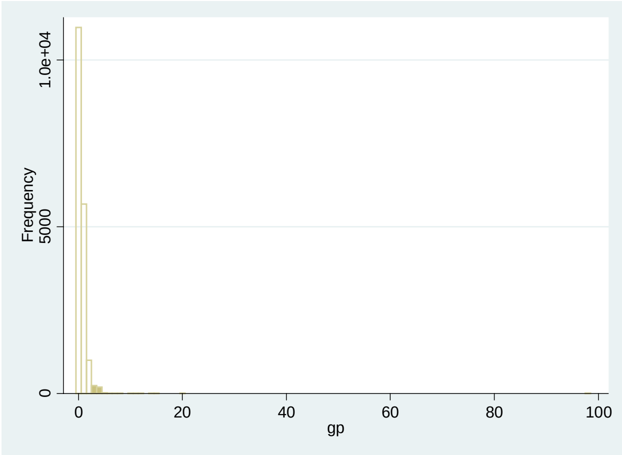
Table 5 (continue)

Frequency counts for each dependent variable (*gp*, *specialist*, *emergency*, and *hospitalizations*)

emergency	Freq.	Percent	Cum.
1	4,145	66.7	66.7
2	1,123	18.07	84.78
3	464	7.47	92.24
4	169	2.72	94.96
5	101	1.63	96.59
6	51	0.82	97.41
7	22	0.35	97.76
>7	109	2.24	100
hospitalizations	**Freq.**	**Percent**	**Cum.**
0	14	0.72	0.72
1	1,535	78.76	79.48
2	259	13.29	92.77
3	69	3.54	96.31
4	31	1.59	97.9
5	10	0.51	98.41
6	12	0.62	99.03
7	4	0.21	99.23
>7	15	0.76	100

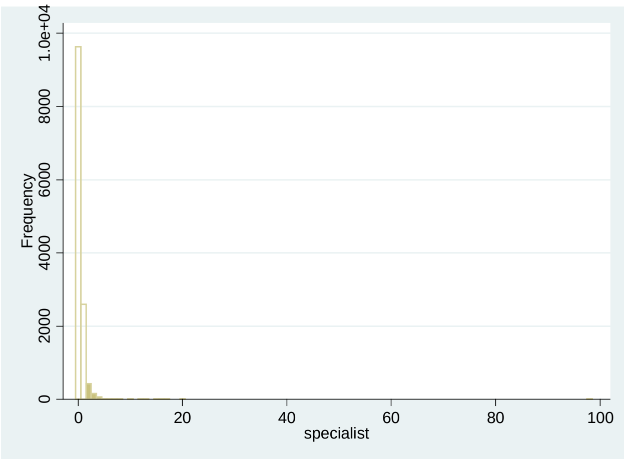
Source: Authors' elaboration.

Figure 1: Histogram *gp*



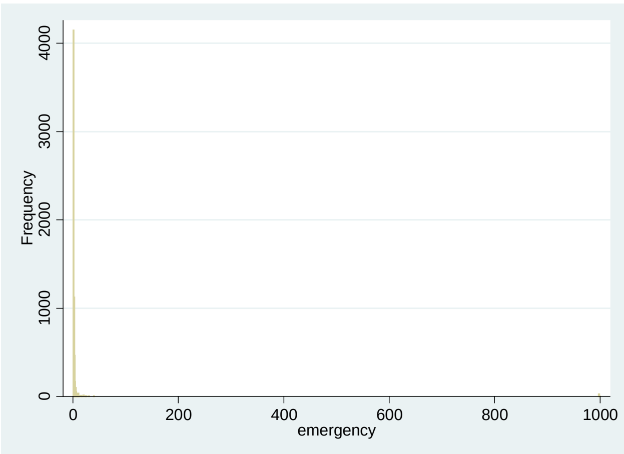
Source: Authors' elaboration.

Figure 2: Histogram *specialist*



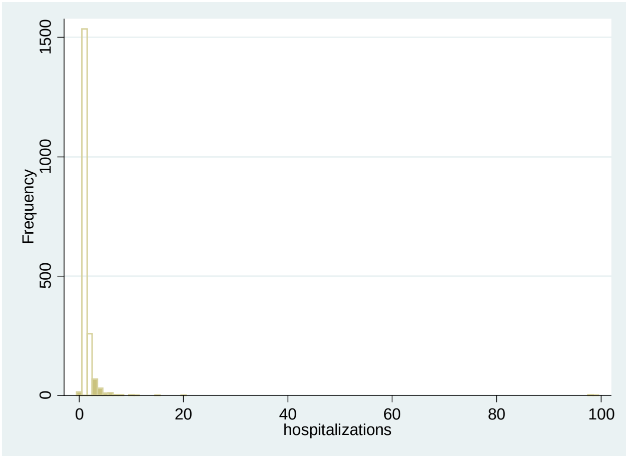
Source: Authors' elaboration.

Figure 3: Histogram *emergency*



Source: Authors' elaboration.

Figure 4: Histogram *hospitalizations*



Source: Authors' elaboration.

As previously highlighted, several methods should be considered when working with count data[2]. Here, we present which we considered the more appropriate for each dependent variable. The Annex contains further estimates of traditional models that corroborate our elections. Nonetheless, the analysis methods considered here are the following ones:

— Ordinal count data models: Poisson and Negative Binomial[3]. The use of one or the other estimator is determined by the Alpha p-value.

— Zero-inflated Poisson and Binomial Regressions.

Tables 6-9 contain the results for each dependent variable. Table A5 summarize these results. We begin with zero-inflated models for *gp* and *specialist* services, respectively. Afterwards, we present ordinal count data models for *emergency* and *hospitalization* variables. The observations for each estimates are: 18148, 12931, 6184 and 1944.

The reason of differentiating the models is due to the organization of health care system (visits of *gp* are of free access for patients, while specialized health care services can only be recommended by another professional of health system, similarly for emergency and hospitalizations).

Similar results are obtained for different specifications of Zero-inflated Poisson regression models and Zero-inflated negative binomial models, while in addition for ordinal ones.

Our estimates show that most of the coefficients are significant and have the expected signs. Generally, we see for all services the better the health status, the less use of health care services. Precisely, a negative effect for SAH is observed. Furthermore, if the person has whatever of the considered illnesses (chronic, limited or obesity problems) when significant. It must be pointed out that *Limited* is significant in all the services whereas chronic is not for hospitalizations. *Obesity* is only significant for specialist services.

Related to age, it can be appreciated, the regular use the higher the age is. Then, in spite the positive effect for primary health care there is a negative effect for emergency services and specialist ones. As for gender, males would do less primary visits and emergency services. Regarding education level whereas higher educational groups make more often use of the specialist services, the reverse effect is observed for emergency ones. Considering lifestyles variables we only found being smoker has a positive effect for emergency.

If we focus on economic variables, being unemployed would have a positive effect on both, primary health care services and emergency ones. We also obtain a negative effect for the highest income group.

[2] The Annex also shows a comparation for *gp* and *specialist* when using discrete choice models.

[3] We use this for emergency and hospitalization visits. Furthermore this initial estimates for general practitioner and specialist are also provided while taking into account people make consultations and not (Annex).

Additionally, the fact the person lives in the North region would be associated with a less probability of using health care services. Regarding Mediterranean regions mixed effects are observed.

Finally, it is also important to note, variables related to nationality and marital status, are not as important as expected.

In summary, the main effects are concentrated on health status. Other socio-demographic aspects have been highlighted. Health determinants or results (lifestyles) seem not to be as important as expected.

Table 6

Zero inflated Poisson-Binomial regresions. Dependent variable: *gp*

gp	POISSON						NEGATIVE BINOMIAL					
	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
unemployed	0.081	0.034	2.420	0.015	0.016	0.147	0.086	0.036	2.390	0.017	0.015	0.157
age	0.004	0.001	5.000	0.000	0.003	0.006	0.005	0.001	4.930	0.000	0.003	0.006
male	-0.092	0.023	-4.000	0.000	-0.137	-0.047	-0.099	0.025	-4.000	0.000	-0.147	-0.050
sah	-0.573	0.024	-23.610	0.000	-0.621	-0.526	-0.570	0.026	-21.970	0.000	-0.621	-0.519
chronic	0.317	0.031	10.240	0.000	0.256	0.377	0.316	0.032	9.740	0.000	0.253	0.380
limited	0.346	0.031	11.120	0.000	0.285	0.407	0.346	0.035	9.960	0.000	0.278	0.415
obesity	0.037	0.022	1.720	0.085	-0.005	0.079	0.037	0.023	1.600	0.109	-0.008	0.083
smoker	-0.047	0.028	-1.720	0.086	-0.101	0.007	-0.043	0.030	-1.450	0.148	-0.101	0.015
drinker	0.010	0.030	0.350	0.729	-0.048	0.068	0.013	0.032	0.400	0.686	-0.050	0.075
secondary_lower	0.060	0.032	1.840	0.066	-0.004	0.123	0.056	0.035	1.600	0.109	-0.012	0.125
secondary_upper	0.046	0.034	1.350	0.178	-0.021	0.112	0.046	0.036	1.250	0.210	-0.026	0.117
tertiary	-0.007	0.032	-0.220	0.823	-0.071	0.056	-0.012	0.035	-0.340	0.733	-0.080	0.056
married	0.030	0.029	1.010	0.310	-0.028	0.087	0.026	0.031	0.840	0.403	-0.035	0.088
widowed	-0.028	0.041	-0.690	0.492	-0.109	0.052	-0.031	0.045	-0.700	0.484	-0.119	0.056
separated_divorced	0.073	0.046	1.590	0.112	-0.017	0.163	0.067	0.049	1.350	0.176	-0.030	0.164
spanish	0.002	0.052	0.040	0.971	-0.099	0.103	0.000	0.055	0.000	1.000	-0.108	0.108
high_income	-0.098	0.043	-2.270	0.023	-0.183	-0.013	-0.091	0.047	-1.950	0.051	-0.182	0.001
North	-0.223	0.029	-7.620	0.000	-0.281	-0.166	-0.221	0.032	-7.010	0.000	-0.283	-0.159
Mediterranean	-0.093	0.023	-4.090	0.000	-0.137	-0.048	-0.090	0.025	-3.660	0.000	-0.138	-0.042
_cons	-0.779	0.078	-10.010	0.000	-0.931	-0.626	-0.807	0.081	-9.920	0.000	-0.966	-0.647

Source: Authors' elaboration.

Table 7

Zero inflated Poisson-Binomial regresions. Dependent variable: *specialist*

	POISSON						NEGATIVE BINOMIAL					
specialist	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
unemployed	-0.022	0.055	-0.400	0.689	-0.129	0.085	-0.033	0.059	-0.550	0.581	-0.148	0.083
age	-0.005	0.001	-3.540	0.000	-0.008	-0.002	-0.005	0.001	-3.040	0.002	-0.007	-0.002
male	-0.025	0.036	-0.700	0.486	-0.096	0.046	-0.036	0.039	-0.910	0.361	-0.113	0.041
sah	-0.631	0.040	-15.740	0.000	-0.710	-0.552	-0.633	0.043	-14.760	0.000	-0.717	-0.549
chronic	0.117	0.048	2.460	0.014	0.024	0.210	0.130	0.050	2.570	0.010	0.031	0.228
limited	0.686	0.047	14.680	0.000	0.594	0.777	0.636	0.054	11.800	0.000	0.531	0.742
obesity	0.078	0.035	2.240	0.025	0.010	0.146	0.091	0.038	2.400	0.017	0.017	0.165
smoker	-0.059	0.042	-1.390	0.166	-0.142	0.024	-0.052	0.046	-1.130	0.257	-0.143	0.038
drinker	-0.021	0.049	-0.420	0.672	-0.116	0.075	-0.006	0.053	-0.110	0.913	-0.109	0.098
secondary_lower	0.187	0.053	3.500	0.000	0.082	0.291	0.193	0.058	3.340	0.001	0.080	0.307
secondary_upper	0.193	0.054	3.600	0.000	0.088	0.298	0.213	0.059	3.640	0.000	0.098	0.328
tertiary	0.317	0.049	6.490	0.000	0.222	0.413	0.338	0.054	6.300	0.000	0.232	0.443
married	0.062	0.045	1.380	0.167	-0.026	0.151	0.082	0.049	1.670	0.095	-0.014	0.178
widowed	0.007	0.069	0.110	0.915	-0.129	0.143	0.017	0.075	0.220	0.825	-0.131	0.164
separated_divorced	0.206	0.069	3.000	0.003	0.071	0.340	0.213	0.075	2.840	0.005	0.066	0.360
spanish	0.178	0.091	1.960	0.050	0.000	0.356	0.153	0.097	1.570	0.116	-0.038	0.343
high_income	-0.209	0.073	-2.880	0.004	-0.352	-0.067	-0.194	0.078	-2.480	0.013	-0.348	-0.041
North	-0.185	0.048	-3.870	0.000	-0.278	-0.091	-0.201	0.051	-3.930	0.000	-0.302	-0.101
Mediterranean	0.035	0.036	0.970	0.330	-0.036	0.106	0.005	0.040	0.130	0.894	-0.072	0.083
_cons	-0.451	0.129	-3.500	0.000	-0.704	-0.199	-1.012	0.138	-7.360	0.000	-1.281	-0.742

Source: Authors' elaboration.

Table 8

Poisson/Negative Binomial model estimation. Dependent variable: *emergency*

emergency	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
unemployed	0.054	0.031	1.730	0.083	-0.007	0.114
age	-0.009	0.001	-9.870	0.000	-0.011	-0.007
male	-0.119	0.024	-5.040	0.000	-0.166	-0.073
sah	-0.364	0.027	-13.690	0.000	-0.416	-0.312
chronic	0.198	0.030	6.510	0.000	0.138	0.258
limited	0.348	0.032	11.020	0.000	0.286	0.409
obesity	-0.032	0.023	-1.430	0.151	-0.076	0.012
smoker	0.093	0.026	3.560	0.000	0.042	0.144
drinker	0.003	0.035	0.100	0.924	-0.065	0.072
secondary_lower	-0.050	0.033	-1.510	0.131	-0.116	0.015
secondary_upper	-0.066	0.035	-1.890	0.059	-0.135	0.003
tertiary	-0.110	0.033	-3.290	0.001	-0.176	-0.045
married	0.023	0.029	0.780	0.437	-0.035	0.080
widowed	0.001	0.047	0.020	0.984	-0.092	0.094
separated_divorced	0.024	0.046	0.530	0.598	-0.065	0.114
spanish	-0.069	0.046	-1.490	0.135	-0.159	0.022
high_income	0.035	0.042	0.820	0.414	-0.048	0.117
North	-0.061	0.032	-1.900	0.057	-0.124	0.002
Mediterranean	0.100	0.024	4.140	0.000	0.052	0.147
_cons	1.070	0.071	15.170	0.000	0.932	1.208
Alpha p-value	0.000					
Obs.	6184					

Source: Authors’ elaboration.

Table 9

Poisson/Negative Binomial model estimation. Dependent variable: *hospitalizations*

hospitalizations	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
unemployed	-0.017	0.069	-0.240	0.808	-0.153	0.119
age	-0.001	0.002	-0.480	0.632	-0.004	0.002
male	0.044	0.043	1.030	0.301	-0.040	0.128
sah	-0.205	0.052	-3.950	0.000	-0.307	-0.104
chronic	0.052	0.066	0.780	0.436	-0.078	0.182
limited	0.288	0.045	6.390	0.000	0.200	0.376
obesity	-0.028	0.040	-0.700	0.484	-0.108	0.051
smoker	0.014	0.054	0.260	0.796	-0.092	0.119
drinker	-0.057	0.058	-0.990	0.323	-0.171	0.056
secondary_lower	0.047	0.063	0.750	0.452	-0.076	0.170
secondary_upper	-0.019	0.065	-0.300	0.765	-0.146	0.107
tertiary	0.018	0.061	0.300	0.764	-0.102	0.138
married	0.031	0.057	0.540	0.589	-0.082	0.144
widowed	0.039	0.078	0.490	0.621	-0.115	0.193
separated_divorced	-0.011	0.086	-0.130	0.899	-0.179	0.158
spanish	-0.062	0.100	-0.610	0.540	-0.259	0.135
high_income	0.022	0.082	0.260	0.793	-0.140	0.183
North	-0.027	0.055	-0.490	0.625	-0.134	0.080
Mediterranean	0.015	0.044	0.340	0.735	-0.071	0.101
_cons	0.318	0.149	2.130	0.034	0.025	0.610
Alpha p-value	1.000					
Obs.	1944					

Source: Authors’ elaboration.

5. CONCLUSIONS

The main objective of this study is to analyse the sociodemographic characteristics determining health care utilization. This topic is principally pertinent given the relationship between demand for health care and health outcomes. Futhermore, there is an extensive empirical literature on the impact of health on per capita income through the channels of growth (Blázquez-Fernández *et al*., 2015). All in all, health care utilization would be an important issue to take into account to establish adequate public health policies. Has demand for health care services increased or not during the last years? Our descriptive analysis shows a decrese. Is this a derived result from the Spanish economic crisis? Our findings must be considered in light of the Spanish NHS characterised by “universal” coverage. As well, effort made to maintain health care services quality played a key role (López-Casasnovas, 2014). Besides, lack-of-time and work-life imbalance may also play a role.

In this study, data from the European Health Interview Survey (EHIS) for Spain (2014) has been used to examine the determinants for health care utilization. The attention has been focused on four main health care services: general practitioner, specialist and emergengy visits, while in addition, hospitalizations. Regarding the empirical strategy, count and other discrete choice data models have been applied.

Preliminary estimates are as expected and it provides support for earlier studies. Our main empirical estimation results sum as follows. We support those findings in the literature for which the above mentioned dependent variables are mainly related to social characteristics as age, gender, education level or self-assessed health. It is importat to point out, the main explanation is concentrated on health status factors. Another importat issue is that our data are based on selfreported information which suggests that our results should be considered with caution (in any case, it is the “unique” available information). We also pointed out that geographic factors do matter as being a region for the North or the Mediterranean seems to be significant.

From a policy economic perspective, we consider that our findings add relevant information to the current debates both in the literature on health economics and real life. This issue, as indicated, is vital in order to improve health services management and to avoid health care inequities. Health policies should help to reduce health inequalities, promoting equal access to health services. Here it is pointed that models of health care utilization can be profitably employed. For all these reasons, we consider this contribution would be valuable to policymakers when planning to improve health services management.

ANNEX

Table A1

Poisson/Negative Binomial model estimation. Dependent variable: *gp considering people make a visit*

gp	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
unemployed	0.014	0.033	0.410	0.684	-0.052	0.079
age	-0.001	0.001	-1.210	0.227	-0.003	0.001
male	0.006	0.023	0.250	0.805	-0.039	0.051
sah	-0.199	0.024	-8.370	0.000	-0.245	-0.152
chronic	0.049	0.030	1.610	0.108	-0.011	0.109
limited	0.199	0.031	6.520	0.000	0.139	0.259
obesity	-0.026	0.022	-1.200	0.232	-0.068	0.016
smoker	-0.007	0.027	-0.250	0.805	-0.060	0.047
drinker	0.002	0.030	0.070	0.942	-0.056	0.060
secondary_lower	0.041	0.032	1.270	0.205	-0.022	0.104
secondary_upper	0.042	0.034	1.250	0.211	-0.024	0.108
tertiary	0.039	0.032	1.220	0.221	-0.024	0.102
married	0.025	0.029	0.870	0.384	-0.032	0.083
widowed	0.008	0.041	0.200	0.842	-0.072	0.088
separated_divorced	0.015	0.046	0.330	0.740	-0.074	0.104
spanish	-0.027	0.051	-0.520	0.606	-0.127	0.074
high_income	-0.037	0.043	-0.860	0.388	-0.122	0.047
North	-0.055	0.029	-1.870	0.061	-0.112	0.003
Mediterranean	-0.029	0.023	-1.280	0.200	-0.073	0.015
_cons	0.404	0.076	5.300	0.000	0.255	0.554
Alpha p-value	1.000					
Obs.	7176					

Source: Authors’ elaboration.

Table A2

Poisson/Negative Binomial model estimation. Dependent variable: *gp*

gp	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
unemployed	0.086	0.036	2.390	0.017	0.015	0.157
age	0.005	0.001	4.930	0.000	0.003	0.006
male	-0.099	0.025	-4.000	0.000	-0.147	-0.050
sah	-0.570	0.026	-21.970	0.000	-0.621	-0.519
chronic	0.316	0.032	9.740	0.000	0.253	0.380
limited	0.346	0.035	9.960	0.000	0.278	0.415
obesity	0.037	0.023	1.600	0.109	-0.008	0.083
smoker	-0.043	0.030	-1.450	0.148	-0.101	0.015
drinker	0.013	0.032	0.400	0.686	-0.050	0.075
secondary_lower	0.056	0.035	1.600	0.109	-0.012	0.125
secondary_upper	0.046	0.036	1.250	0.210	-0.026	0.117
tertiary	-0.012	0.035	-0.340	0.733	-0.080	0.056
married	0.026	0.031	0.840	0.403	-0.035	0.088
widowed	-0.031	0.045	-0.700	0.484	-0.119	0.056
separated_divorced	0.067	0.049	1.350	0.176	-0.030	0.164
spanish	0.000	0.055	0.000	1.000	-0.108	0.108
high_income	-0.091	0.047	-1.950	0.051	-0.182	0.001
North	-0.221	0.032	-7.010	0.000	-0.283	-0.159
Mediterranean	-0.090	0.025	-3.660	0.000	-0.138	-0.042
_cons	-0.807	0.081	-9.920	0.000	-0.966	-0.647
Alpha p-value	0.000					
Obs.	18148					

Source: Authors' elaboration.

Table A3

Poisson/Negative Binomial model estimation. Dependent variable: *specialist considering people make a visit*

specialist	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
unemployed	0.003	0.049	0.060	0.956	-0.093	0.098
age	-0.002	0.001	-1.550	0.122	-0.004	0.001
male	0.010	0.032	0.320	0.749	-0.053	0.074
sah	-0.192	0.036	-5.360	0.000	-0.262	-0.122
chronic	-0.012	0.043	-0.280	0.783	-0.097	0.073
limited	0.366	0.040	9.110	0.000	0.287	0.445
obesity	-0.002	0.031	-0.060	0.955	-0.063	0.059
smoker	-0.010	0.038	-0.250	0.799	-0.084	0.065
drinker	-0.044	0.044	-1.000	0.316	-0.130	0.042
secondary_lower	0.064	0.047	1.360	0.174	-0.028	0.157
secondary_upper	0.048	0.048	1.000	0.315	-0.046	0.142
tertiary	0.105	0.043	2.410	0.016	0.020	0.190
married	0.002	0.041	0.050	0.957	-0.077	0.082
widowed	-0.010	0.062	-0.160	0.870	-0.131	0.111
separated_divorced	0.098	0.061	1.620	0.106	-0.021	0.217
spanish	0.088	0.082	1.070	0.283	-0.072	0.248
high_income	-0.092	0.066	-1.400	0.163	-0.222	0.037
North	-0.051	0.043	-1.180	0.237	-0.135	0.033
Mediterranean	0.042	0.032	1.280	0.199	-0.022	0.105
_cons	0.335	0.114	2.930	0.003	0.111	0.559
Alpha p-value	0.497					
Obs.	3300					

Source: Authors' elaboration.

Table A4

Poisson/Negative Binomial model estimation. Dependent variable: *specialist*

specialist	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
unemployed	-0.033	0.059	-0.550	0.581	-0.148	0.083
age	-0.005	0.001	-3.040	0.002	-0.007	-0.002
male	-0.036	0.039	-0.910	0.361	-0.113	0.041
sah	-0.633	0.043	-14.760	0.000	-0.717	-0.549
chronic	0.130	0.050	2.570	0.010	0.031	0.228
limited	0.636	0.054	11.800	0.000	0.531	0.742
obesity	0.091	0.038	2.400	0.017	0.017	0.165
smoker	-0.052	0.046	-1.130	0.257	-0.143	0.038
drinker	-0.006	0.053	-0.110	0.913	-0.109	0.098
secondary_lower	0.193	0.058	3.340	0.001	0.080	0.307
secondary_upper	0.213	0.059	3.640	0.000	0.098	0.328
tertiary	0.338	0.054	6.300	0.000	0.232	0.443
married	0.082	0.049	1.670	0.095	-0.014	0.178
widowed	0.017	0.075	0.220	0.825	-0.131	0.164
separated_divorced	0.213	0.075	2.840	0.005	0.066	0.360
spanish	0.153	0.097	1.570	0.116	-0.038	0.343
high_income	-0.194	0.078	-2.480	0.013	-0.348	-0.041
North	-0.201	0.051	-3.930	0.000	-0.302	-0.101
Mediterranean	0.005	0.040	0.130	0.894	-0.072	0.083
_cons	-1.012	0.138	-7.360	0.000	-1.281	-0.742
Alpha p-value	0.000					
Obs.	12931					

Source: Authors' elaboration.

Table A5

Summarize empirical results

	GP	SP	EMERGENCY	HOSPITALIZATIONS
unemployed	positive		positive	
age	positive	negative	negative	
male	negative		negative	
sah	negative	negative	negative	negative
chronic	positive	positive	positive	
limited	positive	positive	positive	positive
obesity		positive		
smoker			positive	
drinker				
secondary_lower		positive		
secondary_upper		positive	negative	
tertiary		positive	negative	
married				
widowed				
separated_divorced				
spanish				
high_income		negative		
North	negative	negative	negative	
Mediterranean	negative		positive	
_cons	negative	negative	positive	

Source: Authors' elaboration.

Table A6

Probit model estimates for those who use general practitioner services

	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
unemployed	0.072	0.031	2.350	0.019	0.012	0.132
age	0.006	0.001	7.540	0.000	0.004	0.008
male	-0.113	0.021	-5.270	0.000	-0.155	-0.071
sah	-0.402	0.023	-17.680	0.000	-0.447	-0.358
chronic	0.233	0.025	9.350	0.000	0.184	0.281
limited	0.215	0.038	5.630	0.000	0.140	0.290
obesity	0.064	0.020	3.120	0.002	0.024	0.103
smoker	-0.041	0.025	-1.670	0.096	-0.090	0.007
drinker	0.012	0.028	0.450	0.654	-0.042	0.067
secondary_lower	0.004	0.031	0.120	0.903	-0.056	0.064
secondary_upper	-0.009	0.031	-0.280	0.781	-0.070	0.053
tertiary	-0.063	0.029	-2.130	0.033	-0.120	-0.005
married	-0.008	0.026	-0.310	0.753	-0.060	0.043
widowed	-0.041	0.040	-1.020	0.310	-0.119	0.038
separated_divorced	0.040	0.043	0.940	0.346	-0.044	0.125
spanish	0.024	0.046	0.530	0.595	-0.065	0.114
high_income	-0.060	0.039	-1.520	0.129	-0.137	0.017
North	-0.186	0.027	-6.870	0.000	-0.238	-0.133
Mediterranean	-0.066	0.022	-3.030	0.002	-0.108	-0.023
_cons	-0.465	0.068	-6.890	0.000	-0.597	-0.333
Obs.	18148					

Source: Authors' elaboration.

Table A7

Probit model estimates for those who use specialist services

	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
unemployed	-0.027	0.040	-0.680	0.494	-0.106	0.051
age	-0.002	0.001	-2.210	0.027	-0.004	0.000
male	-0.037	0.027	-1.400	0.160	-0.090	0.015
sah	-0.351	0.029	-12.270	0.000	-0.407	-0.295
chronic	0.110	0.032	3.400	0.001	0.047	0.174
limited	0.248	0.042	5.880	0.000	0.165	0.330
obesity	0.076	0.026	2.960	0.003	0.026	0.126
smoker	-0.039	0.031	-1.240	0.214	-0.100	0.022
drinker	0.029	0.035	0.810	0.415	-0.040	0.097
secondary_lower	0.106	0.039	2.690	0.007	0.029	0.183
secondary_upper	0.133	0.040	3.370	0.001	0.056	0.211
tertiary	0.180	0.036	4.960	0.000	0.109	0.251
married	0.054	0.033	1.650	0.099	-0.010	0.119
widowed	0.018	0.051	0.360	0.721	-0.082	0.118
separated_divorced	0.085	0.052	1.620	0.105	-0.018	0.187
spanish	0.061	0.063	0.970	0.332	-0.063	0.185
high_income	-0.090	0.051	-1.780	0.074	-0.189	0.009
North	-0.115	0.034	-3.400	0.001	-0.181	-0.049
Mediterranean	-0.020	0.027	-0.730	0.467	-0.072	0.033
_cons	-0.629	0.090	-6.980	0.000	-0.806	-0.453
Obs.	12931					

Source: Authors' elaboration.

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SUMMARY. MAIN IMPLICATIONS FOR POLICY MAKING

During this century, research on the impact of public policies on welfare in general, as well as health, in particular, has become core values in developed economies. In this study, we have focus our attention on health care services utilization in Spain. The data used stem from the latest European Health Interview (2014). This topic is principally pertinent given the relationship between demand for health care and health outcomes, vital in order to improve health services management and to avoid health care inequities.

Results point out that the main explanation on health utilization is concentrated on health status factors. All in all, this is something fundamental to put light in these times in which we are living. Consequently, findings add relevant information to the current debates both in the literature on health economics and real life regarding were to allocating resources. At the end, health policies should help to promote equal access to health services. Here it is pointed that models of health care utilization can be profitably employed. Besides, more evaluation of public policies and further research is needed (there is still limited published information) to understand which outcomes are economically relevant.