Equity in the Use of Health Care Services by Immigrants in the Spanish National Health Care System

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ABSTRACT

The increasing proportion of immigrants in the Spanish society is creating pressures for the National Health Care System to accommodate the needs of this population group while keeping their costs under control. The Spanish health care system establishes that all people, regardless of their nationality, should be entitled to use health care services with the same conditions as Spanish citizens provided that they are registered in the local population census. Empirical evidence about differences in health status or utilisation between immigrant and Spanish-born population is however insufficient. This study uses the 2003 Spanish National Health Survey to explore whether non-Spaniards, for the same level of need, use health care services at the same rate as national citizens. The findings suggest that the nationality of an individual is an important predictor of health care utilisation, independent of other factors. These results may indicate horizontal inequity in the utilisation of health care with respect to nationality.

Keywords: Horizontal Equity; Health Care Utilisation; Immigrant Population; Spanish National Health System.

Equidad en el acceso a los servicios sanitarios de los inmigrantes en el Sistema Nacional de Salud español

RESUMEN

La creciente proporción de inmigrantes en la sociedad española supone el importante reto para el Sistema Nacional de Salud de satisfacer las necesidades de este grupo de población manteniendo su presupuesto bajo control. El sistema sanitario español establece que todos los individuos, independientemente de su nacionalidad, deberían tener acceso a los servicios sanitarios con las mismas condiciones que los ciudadanos españoles, siempre que estén registrados en el padrón municipal. La evidencia empírica sobre las diferencias en el nivel de salud o la utilización sanitaria entre la población inmigrante y autóctona es sin embargo insuficiente. Este estudio utiliza la Encuesta Nacional de Salud del año 2003 para investigar si, para el mismo nivel de necesidad sanitaria, los individuos no autóctonos utilizan los servicios sanitarios al mismo nivel que los españoles. Los resultados sugieren que la nacionalidad es un importante factor determinante de la utilización sanitaria, independientemente de otros factores. Estos resultados pueden indicar la existencia de inequidad horizontal en la utilización de servicios sanitarios con respecto a la nacionalidad de un individuo.

Palabras clave: Equidad horizontal; utilización sanitaria; población inmigrante; Sistema Nacional de Salud español.

Clasificación JEL: I11, J15.

1. INTRODUCTION

Immigration is a phenomenon of increasing importance in Spain. Considering the 1998-2006-time span, the proportion of foreigners registered in the census as a proportion of the total population has increased from 1.6% to 9.3%. Immigrants tend to concentrate in Balears, Comunidad de Valencia and Murcia. Galicia and Asturias are the *Autonomous Communities* (ACs) where immigrants represent the lowest proportion of the population. By nationality, Latin Americans are the most numerous, followed by citizens from the European Union and Africa[1].

The Spanish Health Care System establishes that all people, regardless of their nationality, should be entitled to use health care services with the same conditions as Spanish citizens. The only requisite for immigrants, whether legally accredited or not, to be able to access health care services in the same way as Spaniards is to be registered in the local population census (Law 4/2000 of 11th of January about rights and liberties of foreigners in Spain). Immigrants who are not registered in the population census are only covered by emergency services. Children and pregnant women have full coverage irrespective of their legal and administrative situation (World Health Organization 2006).

In spite of the considerable available evidence on equity in health care utilisation for the Spanish population (Abásolo & Manning 2001; Urbanos 2001; Clavero & González 2005a; Garcia & López 2007), the unequal treatment for equal need to different nationality groups has received little attention. On the one hand, immigration in Spain is a recent phenomenon (Arango Vila-Belda 2004), and despite the higher rate of immigration in recent years, immigrants still account for a low proportion of the population. This contrasts with the situation in other European countries, particularly the United Kingdom, with a longer tradition as an immigrant-recipient country. Consequently, some research has already been conducted on this issue in the British National Health System (Gravelle, Morris, & Sutton 2006; Smaje & Le Grand 1995). On the other hand, in the Spanish context an additional obstacle is the lack of micro data related to this population group (Rivera 2007). For this reason, the limited research on the use of health care services by immigrants is referred to specific health care areas or regions within the Spanish National Health System.

Using data from hospital admissions at Hospital del Mar in Barcelona, Cots *et al*. (2002) find that immigrants have different needs than the Spanish population given their different age structure and their higher fertility rate. The analysis also shows that low income immigrants tend to access health care services primarily through the emergency department. In a more recent study, Cots *et al*. (2007) analysed hospital emergency visits at Hospital del Mar in Barcelona by immigrant and Spaniard population. They find that immigrants tend to use hospital emergency

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[1] Data accessed on 28 December 2007 from the Spanish National Statistics Institute, INE ("*Foreign population by nationality, autonomous communities and provinces, age and sex*"). Available online at http://www.ine.es/en/inebmenu/mnu_cifraspob_en.htm

services as a substitute for other health care resources. García Gómez (2007) uses the 2006 Catalan Health Survey to explore the differences in the access of health care services between immigrants and Spanish population. The results of this study suggest that immigrants have a lower probability of visiting a specialist doctor and a higher probability of visiting hospital emergency services than Spanish-born individuals, other factors equal. Since the differences in utilisation are reduced with the immigrants' number of years of residence in Catalonia, the study concludes that the different utilisation patterns between native and immigrant population might be due to a limited knowledge of the functioning of the Spanish health care system by immigrants.

The 2003 Spanish National Health Survey (SNHS) has incorporated a variable describing the country of nationality of respondents that was not available in previous waves of the SNHS. This information provides us with the opportunity of exploring the differences in the utilisation of health services by immigrants and native population for the entire Spanish National Health System.

2. MATERIAL AND METHODS

2.1. Defining equity in the use of health care services

The analysis of equity in the use of health care is based on the concept of "horizontal equity" (Wagstaff & Van Doorslaer, 2000). Assuming a linear model, horizontal equity can be tested by regressing medical care use (y_i) on income, a vector of k medical need indicator variables (x_k), and a set of p non-need variables (z_p) using the equation:

$$y_i = \alpha + \beta * \ln(inc_i) + \sum_k \gamma_k x_{k,i} + \sum_p \delta_p z_{p,i} + \varepsilon_i \qquad (1)$$

Need variables are those that ought to affect the use of health care, whereas non-need variables are those that ought not to affect current health care use. In spite of the substantial debate on the meaning of need and the value judgements involved in distinguishing between need and non-need variables (Gravelle, Morris, & Sutton, 2006), we follow the standard approach in the empirical literature and use morbidity variables (proxied by health status and health limitations) as need indicators, and variables such as income, education, AC of residence (as a proxy for availability of care), tenure of private insurance, and ethnicity, as non-need indicators. The variables used in the estimations are similar to those employed by national and international studies on the determinants of health care utilisation (see e.g. García & López, 2007; Van Doorslaer, Masseria, *et al*. 2004). There is horizontal inequity if, holding need variables constant, use varies with non-need variables, that is, if coefficients associated to non-need variables are statistically significant (β or $\delta_p \neq 0$). In this paper we focus in particular on the coefficients of the variables associated to the nationality of the respondent.

Because health care use variables are discrete and non-normally distributed, linear (OLS) estimation methods are in general not appropriate for the regression specified in equation (1), and non-linear methods are required in order to obtain efficient estimations and appropriate predictions (Wooldridge, 2006). The general functional form G of a non-linear model can be written as:

$$y_i = G\left(\alpha + \beta * \ln(inc_i) + \sum_k \gamma_k x_{k,i} + \sum_p \delta_p z_{p,i}\right) + \varepsilon_i \qquad (2)$$

The test for horizontal inequity uses the estimated coefficients on the explanatory variables from the non linear model in exactly the same way as in a linear model.

We estimated probit regression models for each utilisation variable (Clavero & González, 2005b; Jones, 2000) and used individual weights (provided by the SNHS) in all computations in order to make the results representative of the Spanish population. Throughout, given their special status, Ceuta and Melilla have been excluded from the analysis, and instead restricted attention to the seventeen Spanish ACs.

2.2. Data and variables

The data is taken from the adult survey of the 2003 SNHS that contains information from about 21,150 individuals aged 16 years or older living in Spain. The health status and health care use data contained in the adult survey is supplemented with socio-economic information from the household survey. Previous waves of the SNHS include 1987, 1993, 1995, 1997 and 2001. We restrict the analysis to the 2003 SNHS wave because it is the only one in which respondents are classified according to their nationality.

Measurement of the utilisation of the general practitioner (GP) and medical specialist services is based on the question: "During the last two weeks, about how many times have you visited: (a) a family doctor or general practitioner and (b) a medical specialist?". Hospital utilisation is measured on the basis of the question: "How many times in the past 12 months have you (a) been a patient overnight in a hospital and (b) visited hospital emergency services?.

Income is measured as a categorical variable with 8 possible response categories that provides an estimate of the aggregate monthly income, after taxes and deductions, of all household members from all sources. We have assigned to all the individuals within each category the mean income of the interval and have used the modified OECD equivalence scale to take into account differences in the size and composition of the families[2] (Casado Marín, 2006).

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[2] The modified OECD scale assigns a weight of 1.0 to the first adult household member, 0.5 to the second adult household member and 0.3 to children as follows:
Equivalent income = ((income)/(1+0,5*(householdsize – 1 – number of children) + 0,3*children))

The variables used to proxy need in our analysis are: age, sex, self-assessed health, health limitations and health difficulties. Age is captured by the following five dummy variables: 16-34, 35-44, 45-64, 65-74, and over 75 years. We allow for interaction between age and sex. 16-34 year old male individuals are the reference category. The measurement of health as a proxy for health care need is based on two questions in the SNHS. The first refers to the self-perceived health status of an individual: "In general, would you say your health is: very good, good, fair, poor, very poor?". Based on these five categories, we have constructed four dummy variables, keeping very good health as the reference category. The second health-related question is: "Are you experiencing any difficulties to do your day life activities?" (no, yes: moderate, yes: severe, yes: absolute). We create three dummy variables for the different levels of difficulty and use no difficulty as the reference category.

The other (non-need) variables used in the analysis are: AC of residence, tenure of private insurance, economic status, education and nationality of respondents. We have included a dummy variable for each AC, except for the base category: Comunidad de Madrid. Tenure of private insurance is defined as a dummy variable taking the value one if the individual has private coverage for health care services. For education, we use four levels: no studies, primary and secondary (first cycle) studies, secondary (second cycle) and postsecondary studies, and university studies (reference category). Economic status is measured by six dummy variables derived from different variables that describe the activity status of the respondents: employed (base category), unemployed, retired, student, housework and other. Nationality is captured by the following dummy variables: Spain (reference category), European Union, other European country, Canada or USA, Latin America, Asia, Africa, and Oceania. Table 1 shows the mean of the nationality categories included in the 2003 SNHS. After Spaniards, nationals from Central and South America are the most numerous, followed by European Union citizens, Africans and Europeans (from non European Union countries). Asian, Australasian, and North American are the less representative nationalities in the survey. Given the low proportion of foreign nationalities in the sample, in addition to nationality dummies we have also used in the estimations a variable representing all non Spaniard nationalities. We have therefore estimated two separate models for health care use, one for each definition of immigrant.

TABLE 1
Nationality categories included in the 2003 SNHS.

Nationality	Percentage (%)
Latin America	1.3
European Union	0.6
Africa	0.4
Europe	0.3
Asia	0.1
Oceania	0.01
North America	0.01
Non Spaniard	**3**
Spaniard	**97**
All	*100*

Source: *Own calculations from Spanish National Health Survey 2003 data.*

3. RESULTS

3.1. Descriptive statistics

Details on the sample means statistics of the health care use variables are provided in Table 2. Sample means of the main variables included in the regression models are presented in Table 5 in the Appendix. According to the sample descriptives, compared to Spanish citizens non Spaniard individuals report better levels of health and higher levels of education. Also, there are relatively more non Spaniards employed, in the working age, and in the middle income categories. The socio economic characteristics of immigrants, and in particular their similar distribution by income level to the Spanish population, suggest that the non Spaniard sample might be capturing to a great extent immigration of wealthy individuals for non economic reasons such as retiring rather than the more recent immigration of individuals that move to Spain in search for work.

According to Table 2, there are differences in the use of health care services between Spanish nationals and non-nationals. Non-Spaniards report fewer visits to a GP, a specialist doctor, and hospital emergency services, and more visits to a hospital than Spaniards do. The next section explores whether these differences persist after controlling for all those factors that are known to affect health care use.

TABLE 2
Summary statistics of health care use variables.

Nationality	Obs.	Visits GP		Specialist visits		Hospital visits		Hospital emergency visits	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Non Spaniard	424	0.17	0.42	0.05	0.3	0.15	0.37	0.40	0.83
Spaniard	15,437	0.29	0.64	0.11	0.56	0.13	0.56	0.46	1.1
All	*15,851*	*0.28*	*0.63*	*0.11*	*0.56*	*0.13*	*0.55*	*0.45*	*1.1*

3.2. Regression results

The estimated coefficients of the probit models for the two immigrant categories employed in the estimations are presented in Table 3. Regression results for the remaining control variables used in the econometric estimations are presented in Tables 6, and 7 in the Appendix. The regression results show that need is the most important determinant of health care use. Overall, the estimated coefficients on the need variables have the expected sign. For instance, relative to being in very good health, being in very bad health increases the probability of using every type of health service considered in this study. In general, the coefficients for the variable self-assessed health also show the expected gradient. Also, an interesting result indicates that 16-34 years old females have a higher probability of contacting a GP, a specialist doctor, and being hospitalized than their male counterparts, possibly indicating the use of maternity related services by healthy women. However, other non-need factors were also found to be important determinants of health care utilisation, including the nationality of an individual. For example, the tenure of a private insurance increases as expected the probability of paying a visit to the specialist doctor and of being hospitalised. The impact of the nationality of an individual on health care use across nationalities and types of health care is described in more detail below.

GP visits

According to the results Asian individuals report a higher probability of a GP visit than a Spaniard. In particular, Asian citizens have a probability 0.25 greater of contacting a GP than a Spaniard individual with the same socio economic and health characteristics.

TABLE 3
Regression results: coefficients for the two immigration categories.

Nationality	GP visits		Specialist visits		Hospitalisations		Hospital emergency visits	
Non Spaniard	−0.01		−0.30**		0.39***		0.08	
	(−0.1)		(−2.4)		(3.7)		(0.9)	
Latin America		−0.06		−0.39**		0.38***		0.22*
		(−0.4)		(−2.1)		(2.6)		(1.9)
European Union		0.08		−0.69***		0.31		−0.24
		(0.4)		(−3.1)		(1.3)		(−1.3)
Africa		−0.20		0.28		0.64**		0.08
		(−0.7)		(1.0)		(2.3)		(0.3)
Europe		−0.19		−0.31		−0.04		−0.29
		(−0.7)		(−0.9)		(−0.1)		(−1.2)
Asia		0.72**		−0.45		0.60		0.20
		(2.0)		(−1.0)		(1.4)		(0.5)
Pseudo R^2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Log-L	−7,626	−7,621	−3,774	−3,771	−4,606	−4,602	−8,727	−8,721

[a] *The asterisks indicate significance at the 1% level (***) 5% level (**) and 10% level (*).*

[b] *z-statistics between brackets.*

Specialist visits

In general, non Spaniards have a lower probability of visiting a specialist physician than Spanish individuals. By nationality, the analysis reveals that Latin Americans and citizens from the European Union have a lower probability of contacting a specialist. For European Union citizens for example the probability of a visit is 0.05 lower than for a Spanish individual with the same level of need.

Inpatient stays

For non-national individuals the results reveal a higher probability to spend a night in a hospital as compared to a Spanish citizen. Among non Spaniards, the probability of being hospitalised relative to a Spaniard individual is larger for Latin Americans and Africans. For Latin Americans for example the probability of an inpatient stay is 0.1 greater than for a Spaniard, holding all other factors equal.

TABLE 4
Regression results: coefficients for non-Spaniards[3].

Nationality	Admissions through the emergency department
Non Spaniard	0.41*
	(1.8)
Pseudo R^2	0.1
Log-L	−1,072

[a] *The asterisks indicate significance at the 1% level (***) 5% level (**) and 10% level (*).*
[b] *z-statistics between brackets.*

Since the 2003 SNHS contains information on the mechanism of access to inpatient services (ordinary admission versus admission through hospital emergency services), we have further explored whether immigrants are more likely to access the hospital through the emergency department. The results shown in Table 4 suggest that immigrants are more likely to be admitted to hospital through hospital emergency services than Spaniards with the same socioeconomic and health characteristics.

Hospital emergency services

According to the results presented in Table 3 there is some evidence that non Spaniards have a higher probability of using hospital emergency services. In particular, the results show that Latin Americans have higher probabilities of an emergency visit as compared to Spaniards. These results corroborate the previous findings suggesting that emergency services are an important mechanism of access to hospital services by immigrants, and are in line with previous research for Catalonia (Cots, Castells, Garcia, Riu, Felipe, & Vall, 2007; García Gómez, 2007).

4. DISCUSSION

In this paper we have sought to address whether there are different patterns of health care utilisation by different nationality groups in the Spanish National Health System. For this purpose, we have used the 2003 Spanish National Health Survey, as it is the first wave of this dataset which classifies respondents according to their nationality.

The analysis of the differences in the health care utilisation patterns by nationality groups is based on the concept of horizontal equity. There is horizontal ineq-

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[3] Due to the reduced number of observations for hospital admissions through the emergency department (N = 1,687), we have only employed an aggregate variable for all non Spaniard individuals in the estimations. Regression results for all variables used in the estimations are presented in Table 8 in the Appendix.

uity when use varies with non-need characteristics, so that individuals with the same levels of the need variables consume different amounts of health care according to factors that ought not to affect use. Attention is drawn to whether, after having controlled for need variables (proxied by morbidity variables), utilisation of a GP, a specialist doctor, inpatient and hospital emergency services vary according to the nationality of the respondents. Other non-need variables included in the study are: income, education, Autonomous Community of residence, tenure of private health insurance and economic status. Utilisation of health care services is analysed using probit regression models.

According to the results there is no horizontal equity in the delivery of health care services in the Spanish National Health System. Although need is the most important predictor of use, other non-need factors were found to be statistically significant in predicting individual utilisation of health services, including the nationality of the respondent.

The results of this study reveal that immigrants are more likely to be treated in a hospital than Spaniards are, and they are more likely to be admitted to a hospital through the emergency department. For specialist visits the findings indicate that foreigners are less likely to contact a specialist doctor than national citizens. Since under utilisation of specialist care services does not appear to be caused by a reluctance to seek an initial contact with the GP, these results may be taken to imply the existence of inequity in the access to specialist care with respect to nationality. Regarding emergency visits, the findings suggest that immigrants have a higher probability of contacting hospital emergency services as compared to Spaniards. As suggested by previous research for Catalonia, this result may reflect a limited understanding of the functioning of the Spanish health care system by immigrants, and a potential substitution of specialised care by hospital emergency services.

Overall, our findings indicate that immigrants in Spain have different health care use patterns than Spanish population and face substantial barriers of entry to health care services. Health policies should therefore focus on improving immigrants' knowledge of the system by reducing legal, cultural and administrative barriers to access health services. Some caution is however required when interpreting the results of this study given the low proportion (3%) of non-Spanish nationals in the 2003 Spanish health survey. Moreover, 2003 data does not fully capture the boom of immigration for economic reasons that has taken place in Spain more recently. In spite of these limitations, this research contributes to the existing literature by providing evidence on the utilisation of health care services by the immigrant population in Spain based on recent nation-wide data. Testing the robustness of the results using forthcoming waves of the SNHS offers wide scope for future research in this area. In addition, an interesting methodological avenue for future studies is to quantify the extent to which the observed differences in utilisation between immigrants and Spaniards are due to inherent individual characteristics or to their nationality or ethnic group using the Oaxaca-Ransom approach (see e.g. Clavero & González 2007).

APPENDIX

TABLE 5
Sample means of key variables.

Variable	All	Non Spaniard	Spaniard
Income			
< 360 euros	0.02	0.01	0.02
361-600 euros	0.11	0.07	0.12
601-900 euros	0.18	0.23	0.18
901-1200 euros	0.21	0.23	0.21
1201-1800 euros	0.25	0.25	0.25
1801-3600 euros	0.19	0.18	0.19
3601-6000 euros	0.03	0.02	0.03
> 6000 euros	0.01	0.01	0.01
Self-reported health			
Very good	0.11	0.15	0.10
Good	0.56	0.63	0.55
Fair	0.24	0.18	0.24
Bad	0.07	0.03	0.07
Very bad	0.02	0.01	0.02
Health difficulties			
None	0.92	0.97	0.91
Moderate	0.05	0.01	0.05
Severe	0.02	0.01	0.02
Absolute	0.01	0	0.01
Age and sex			
16 to 34 years old male	0.17	0.27	0.17
35 to 44 years old male	0.10	0.11	0.10
45 to 64 years old male	0.13	0.07	0.13
65 to 74 years old male	0.05	0.01	0.05
> 75 years old male	0.04	0.01	0.04
16 to 34 years old female	0.17	0.29	0.16
35 to 44 years old female	0.10	0.14	0.10
45 to 64 years old female	0.13	0.08	0.13
65 to 74 years old female	0.07	0.02	0.07
> 75 years old female	0.05	0.01	0.05
Education			
None	0.14	0.11	0.14
Primary and secondary (cycle 1)	0.49	0.31	0.49
Secondary (cycle 2) and postsecondary	0.23	0.36	0.22
University	0.14	0.22	0.14
Activity status			
Employed	0.45	0.60	0.45
Retired	0.2	0.05	0.20
Unemployed	0.08	0.12	0.08
Student	0.09	0.07	0.09
Housework	0.17	0.16	0.17
Other	0.01	0.004	0.01
Health insurance			
Compulsory health insurance	0.99	0.98	0.99
Private insurance	0.13	0.10	0.13

TABLE 6
Regression results: GP visits and specialist visits.

	GP visits		Specialist visits	
Income (ln)	−0.01	−0.01	0.16***	0.16***
Self-reported health				
Good	0.32***	0.32***	0.11	0.11
Fair	0.77***	0.78***	0.54***	0.54***
Bad	0.93***	0.94***	0.85***	0.84***
Very bad	0.79***	0.80***	1.05***	1.05***
Health difficulties				
Moderate	0.14**	0.13**	0.07	0.07
Severe	0.11	0.11	0.09	0.09
Absolute	−0.07	−0.07	−0.23	−0.23
Age and sex				
35 to 44 years old male	0.09	0.09	0.02	0.02
45 to 64 years old male	0.15**	0.15**	0.15*	0.16*
65 to 74 years old male	0.36***	0.36***	−0.04	−0.04
over 75 years old male	0.45***	0.45***	0.10	0.11
16 to 34 years old female	0.25***	0.25***	0.18**	0.19**
35 to 44 years old female	0.25***	0.25***	0.17*	0.18**
45 to 64 years old female	0.39***	0.39***	0.13	0.14
65 to 74 years old female	0.52***	0.52***	−0.08	−0.08
over 75 years old female	0.50***	0.50***	−0.33***	−0.32**
Education				
None	0.19***	0.19***	−0.18**	−0.19***
Primary and secondary (cycle 1)	0.13**	0.13**	−0.10	−0.10
Secondary (cycle 2) and postsecondary	0.08	0.08	0.01	0.01

TABLE 6 (Continuation)
Regression results: GP visits and specialist visits.

	GP visits		Specialist visits	
Activity status				
Retired	0.24***	0.24***	0.28***	0.28***
Unemployed	0.11*	0.11*	0.12	0.12
Student	−0.01	−0.02	−0.02	−0.02
Housework	0.13**	0.13**	0.19***	0.19***
Other	0.16	0.15	−0.10	−0.10
Autonomous Community				
Andalucía	0.07	0.07	−0.17*	−0.16*
Aragón	0.18**	0.18**	0.00	0.00
Asturias	0.14*	0.14*	0.05	0.06
Balears	0.03	0.03	0.05	0.05
Canarias	0.13	0.12	0.16	0.17
Cantabria	−0.41***	−0.41***	−0.18	−0.17
Castilla y León	0.01	0.01	−0.10	−0.10
Castilla la Mancha	0.35***	0.35***	−0.20*	−0.20*
Cataluña	−0.22***	−0.22***	0.15	0.15
Comunidad Valen- ciana	0.19**	0.19**	0.13	0.13
Extremadura	0.04	0.04	−0.13	−0.12
Galicia	0.15*	0.14*	0.03	0.03
Murcia	0.13	0.13	−0.11	−0.11
Navarra	0.05	0.06	0.00	0.00
País Vasco	−0.07	−0.07	0.05	0.05
La Rioja	0.12	0.12	−0.06	−0.06
Private health insurance	−0.06	−0.06	0.29***	0.29***
Nationality				
Non Spaniard	−0.01		−0.29**	
Latin America		−0.06		−0.39**
European Union		0.08		−0.70***
Africa		−0.20		0.28
Europe		−0.19		−0.31
Asia		0.72**		−0.45
Pseudo R^2	0.1	0.1	0.1	0,1
Log-L	−7,626	−7,621	−3,774	−3,771
N	15,851	15,849	15,851	15,849

Note: The asterisks indicate significance at the 1% level (***) 5% level (**) and 10% level (*)

TABLE 7
Regression results: Hospitalisations and hospital emergency visits.

	Hospitalisations		Hospital emergency visits	
Income (ln)	0.12***	0.12***	0.08**	0.08**
Self-reported health				
Good	0.03	0.04	0.21***	0.21***
Fair	0.50***	0.50***	0.76***	0.76***
Bad	0.97***	0.97***	1.25***	1.25***
Very bad	1.22***	1.22***	1.37***	1.37***
Health difficulties				
Moderate	0.21***	0.21***	0.24***	0.24***
Severe	0.22**	0.22**	0.19**	0.18**
Absolute	−0.08	−0.08	−0.09	−0.09
Age and sex				
35 to 44 years old male				
45 to 64 years old male				
65 to 74 years old male				
over 75 years old male				
16 to 34 years old female	−0.04	−0.04	−0.21***	−0.21***
35 to 44 years old female	0.10	0.10	−0.35***	−0.35***
45 to 64 years old female	−0.002	0.002	−0.37***	−0.36***
65 to 74 years old female	0.11	0.11	−0.26***	−0.26***
over 75 years old female	0.27***	0.27***	0.01	0.01
	0.06	0.06	−0.28***	−0.28***
	−0.25***	−0.24***	−0.42***	−0.42***
	−0.21**	−0.20**	−0.29***	−0.29***
	0.06	0.06	−0.25***	−0.24***
Education				
None	0.06	0.05	0.12*	0.11*
Primary and secondary (cycle 1)	0.11*	0.11*	0.19***	0.19***
Secondary (cycle 2) and postsecondary	0.01	0.01	0.15***	0.15***
Activity status				
Retired	0.19***	0.20***	−0.08	−0.08
Unemployed	0.05	0.05	−0.02	−0.02
Student	−0.47***	−0.47***	0.01	0.01
Housework	0.23***	0.23***	−0.08	−0.08
Other	0.12	0.12	−0.34**	−0.34**

TABLE 7 (Continuation)
Regression results: Hospitalisations and hospital emergency visits.

	Hospitalisations		Hospital emergency visits	
Autonomous Community				
Andalucía	−0.19**	−0.19**	0.07	0.07
Aragón	−0.12	−0.12	0.02	0.02
Asturias	−0.05	−0.06	0.02	0.02
Balears	0.05	0.05	0.21**	0.21**
Canarias	−0.08	−0.08	−0.14*	−0.14*
Cantabria	−0.04	−0.05	−0.01	−0.01
Castilla y León	−0.13*	−0.13*	−0.08	−0.08
Castilla la Mancha	−0.09	−0.09	0.11	0.12
Cataluña	−0.01	−0.01	0.10	0.10
Comunidad Valenciana	0.03	0.03	0.17**	0.17**
Extremadura	−0.07	−0.07	0.10	0.10
Galicia	−0.16*	−0.16*	0.13*	0.13*
Murcia	−0.16	−0.16	0.20**	0.19**
Navarra	−0.05	−0.06	−0.03	−0.03
País Vasco	−0.10	−0.11	−0.08	−0.08
La Rioja	−0.24	−0.24	−0.37**	−0.37**
Private health insurance	0.15***	0.15***	0.00	0.00
Nationality				
Non Spaniard	0.39***		0.08	
Latin America		0.39***		0.22*
European Union		0.30		−0.24
Africa		0.65**		0.08
Europe		−0.04		−0.29
Asia		0.60		0.20
Pseudo R^2	0.1	0.1	0.1	0.1
Log-L	-4,606	−4,602	−8,727	−8,721
N	15,851	15,849	15,851	15,849

Note: The asterisks indicate significance at the 1% level (***) 5% level (**) and 10% level (*).

TABLE 8
Regression results: Admissions through the hospital emergency department.

	Hospitalisations through the emergency department
Income (ln)	−0.06
Self-reported Elath	
Good	0.17
Fair	0.26
Bad	0.45**
Very bad	0.34
Health dificultéis	
Moderate	0.10
Severe	0.29
Absolute	0.84***
Age and sex	
35 to 44 years old male	0.11
45 to 64 years old male	−0.15
65 to 74 years old male	0.57**
over 75 years old male	0.79***
16 to 34 years old female	0.17
35 to 44 years old female	−0.08
45 to 64 years old female	−0.27
65 to 74 years old female	0.33
over 75 years old female	0.76***
Education	
None	−0.11
Primary and secondary (cycle 1)	0.06
Secondary (cycle 2) and postsecondary	0.10
Activity status	
Retired	−0.20
Unemployed	0.10
Student	0.30
Housework	−0.29**
Other	−0.22

TABLE 8 (Continuation)
Regression results: Admissions through the hospital emergency department.

	Hospitalisations through the emergency department
Autonomous Community	
Andalucía	0.23
Aragón	0.17
Asturias	0.23
Balears	0.34
Canarias	0.13
Cantabria	0.74***
Castilla y León	0.24
Castilla la Mancha	0.20
Cataluña	−0.01
Comunidad Valenciana	0.18
Extremadura	0.36
Galicia	0.16
Murcia	0.60**
Navarra	−0.20
País Vasco	0.10
La Rioja	−0.22
Private health insurance	−0.14
Non Spaniard	0.41*
Pseudo R^2	0.1
Log-L	−1,072
N	1,687

Note: The asterisks indicate significance at the 1% level (***) 5% level (**) and 10% level (*).

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