MASTER IN FINANCE

Master's Final Work
Dissertation

The determinants of demand for individual health insurance in Europe - An empirical analysis based on Survey of Health, Ageing and Retirement in Europe (SHARE)

FILIPA BARAHONA DA FONSECA VALDEZ WILSON

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Abstract

This dissertation investigates the determinants of the individual demand for private health insurance and private health insurance with different coverage (access to specialists, extended choice of doctors, dental care and nursing care at home in case of chronic disease or disability). The five types are analyzed independently.

The determinants of the individual demand for private health insurance are tested empirically using micro data from Survey of Health, Ageing and Retirement in Europe (SHARE), and adopting a Probit model.

The results suggest that living in a country with Beveridge financial health system don't incentive the demand for private health insurance. Education, income and a good self-evaluation of the health status have positive effects on private health insurance. The positive effect found from self-assessed health give the precondition for adverse selection and moral hazard. Being disabled or having a chronic disease putatively influences the individual demand.

Key Words: Health Insurance, Private and Public; Economics of the Elderly; Survey of Health, Ageing and Retirement in Europe (SHARE).

JEL Code: I13, I12, J14

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Abbreviations and Acronyms

CAPI - Computer-Aided Personal Interviews

DECO - Associação de Defesa do Consumidor

EC- European Commission

ECHP - European Community Household Panel

EHIC - European Health Insurance Card

ELSA - English Longitudinal Study of Ageing

EU - European Union

HRS - Health and Retirement Study

ISCED-International Standard Classification of Education

NHS - National Health Service

OECD- Organization for Economic Co-operation and Development

OOP – Out-of-Pocket

PHI – Private Health Insurance

PMI - Private Medical Insurance

SHARE- Survey of Health Ageing and Retirement in Europe

SNS - Serviço Nacional de Saúde

UNESCO- United Nations Educational, Scientific and Cultural Organization

WHO – World Health Organization

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Introduction

Health care systems in the European Union (EU) are mainly financed through taxation or contributions from employers and employees (Mossialos & Thomson, 2004). The sources of financing are voluntary or mandatory sources: voluntary insurance and direct payments are voluntary schemes; and taxes and contributions to social insurance schemes are compulsory sources. Taxes and social insurance are the main sources of financing OECD health system (Barros & Gomes, 2002).

Financial protection through public or private health insurance substantially reduces the amount that people pay directly for medical care, yet in some countries the burden of out-of-pocket spending can still create barriers to health care access and use (OECD, 2013). Take-up of private health insurance is often voluntary, although it may be mandatory by law or compulsory for employees as part of their working conditions. Premiums are generally non-income related, although the purchase of private coverage can be subsidized by government (OECD, 2013).

In recent years, health spending has slowed markedly or fallen in many OECD countries after a period of continuous growth; European countries have also experienced drastic cuts in spending (OECD, 2013). The population covered by private health insurance has increased in some OECD countries in the last decade (OECD, 2013). Figure 1 in appendix 1 shows the evolution of population coverage, in percentage, by private health insurance between 2000 and 2011.

Countries like Portugal, Denmark, Germany, Austria, Belgium and France show a tendency to growth along the years (figure 1). Netherlands and Spain have different results, with the percentage of coverage decreasing between 2005 and 2011.

The fundamental purpose of health insurance is to reduce the risk associated with health care spending (Pauly, Mcguire & Barros, 2012) and the decision of making a health insurance is based, among other factors, on the cost and quality of competing health plan (Kim, Braun, & Williams, 2013). Several individual characteristic are found to be important determinants of demand for health insurance (Paccagnella, Rebba, & Weber, 2013) and the decision to purchase a voluntary private health insurance is

affected by socio-demographic characteristics, health-related characteristics and risk preferences (Kiil, 2012).

The main propose of this dissertation is to analyze the different factors that determine the individual demand for voluntary private health insurance. There are many factors that have impact which aren't completely characterized and studied. The financial health system of the insured country is an example of group of factors which aren't complete characterized.

This research may help to clarify the possible factors in the behavior of the individual concerning the decision to purchase health insurance. It aims to contribute to a better knowledge of the insurance market and its recent evolution and trends. The adopted perspective is focused on demand, however, for the insurer, the supply side of the market, it is essential to have a better understanding of the individual's characteristics associated to the demand for a voluntary health insurance.

The empirical literature has investigated issues related to the purchase or holding additional insurance policy and the effect of additional coverage on the overall consumption of health care. Kiil (2012) presents a paper with the reviews the empirical literature that characterizes individuals with voluntary private health insurance.

Some results of this dissertation are in agreement with Paccagnella, O.,Rebba,V., and Weber, G.(2013) paper. In their work, Paccagnella, Rebba, and Weber (2013) used data from Survey of Health, Ageing and Retirement in Europe (SHARE), wave 1 to analyze the determinants of voluntary private health insurance. Paccagnella, Rebba, and Weber (2013) found that the main determinants of voluntary private health insurance are different in each country, reflecting the underlying different health care system.

The empirical analysis use the data base Survey of Health, Ageing and Retirement in Europe (SHARE), wave 1(2004/2006) and wave 2 (2006/2007). SHARE is a multidisciplinary and cross-national micro base, panel database of micro data on health, socio-economic status and social and family networks from European countries aged 50 or over (SHARE,2006). This micro data set includes information on

several health-relate variables, labor-market conditions, education, sources of income and demographic and behavior variables (SHARE, 2006).

The dissertation is organized as follows. The next section provides a brief presentation of health insurance and a review of literature about health insurance demand. Section 2 describes the database, the sample and the empirical strategy. In section 3 results are presented and discussed. Finally, section 4 concludes and indicates some avenues for future research.

1. Review of Literature

1.1. Determinants of voluntary private health insurance demand:

In the previous section, some concepts associated to health insurance supply were presented. However, supply is only one of the aspects to be considered in the health insurance research. Thomson and Mossialos (2009) argue that the existence of a market for health insurance is dependent on three conditions: (i) it must exist a positive demand; (ii) it must be possible for insurance to be supplied at a price that the individual is able to pay; (iii) and it must be technically possible to supply insurance. The main contribution of the present research is a better knowledge of (i). First, some theoretical approaches related to the insured (real or potential) person behavior and to the process of selection criteria of the insured by the insurance companies is briefly presented (section 1.1.1.) and then, the determinants of health insurance demand are indicated and explained.

1.1.1. Adverse Selection, Moral Hazard and Insurance Selection

Two theoretical tools are frequently used to examine the individual behavior concerning demand for insurance: the adverse selection and the moral hazard. Both are incorporated into the decisions taken by the insurance companies to manage risk (Odeyemi, I. A., & Nixon, J. 2013).

Adverse selection occurs when groups of people choose not to buy health insurance, or they buy insurance coverage that is inappropriate for their risk class (Zhang & Anis, 2009). The adverse selection happens when one party of a transaction has more

relevant information or control of outcome than another party to the transaction, and consequently the party with superior information or control can take advantage of the position (Dorfman, 2008). Adverse selection can be controlled by insurers through the process of selection and classifying applicants for insurance and by policy conditions. Conditions are provisions that qualify or place limitations on the insurer's promise to perform. The preexisting conditions clause is an example (Rejda, 2011). Common policy condition is the insurer doesn't cover treatment for any medical condition that future insured have received treatment for, taken medication for, asked advice on or had symptoms of. In other words, insured will not be covered for any condition that existed in the past few years before the insurance contract. Five years is the usual time period (Association of British Insurers, 2012).

Moral hazard refers to the phenomenon whereby individuals who are insured for their illness risks behave differently than they would behave without the insurance (Zhang & Anis, 2009). Moral hazard describes an attitude of carelessness or indifference to loss created by the purchase of an insurance contract (Dorfman, 2008). For insurers, a solution to combat moral hazard is the cost sharing between patients and insurers (see 1.1.2. section), and even between providers and insurers.

Because the European markets for voluntary health insurance are characterized by asymmetric information between the buyer (i.e. insured person) and the seller (i.e. insurer company), that can cause adverse selection and moral hazard (Bolin, Hedblom, Lindgren, & Lindgren, 2010).

The insurers are not obliged to accept to cover all persons interested on contracting a health insurance. The insurers only select the costumers who they consider as low-risk clients (Silva, 2009). The definition of costumer's risk potential is done by the use of different mechanisms of customer's selection. For example, the potential future insured have to answer questionnaire which is sought some basic information, such as

age, gender, weight, condition of health and some indicators based on clinical history (Antunes & Rueff, 2009).[1]

The individual decision of making a health insurance is based, among others, on the cost and quality of competing health plan (Kim, Braun, & Williams, 2013). Several characteristics are found to be important determinants of insurance demand. Paccagnella, Rebba, and Weber (2013) combining SHARE data (wave 1, 2004) and OECD data conclude that main determinants of voluntary private health insurance are different in each country, reflecting the underlying different health care system.

Bolin, Hedblom, Lindgren, & Lindgren, (2010) also based on SHARE conclude that the insured person tends to be healthier, younger, more educated, and richer than the uninsured as well as having a risk-averse behavior. Kiil (2012), in a recent survey based on 24 articles and 15 working papers identifies that the decision to purchase a voluntary private health insurance can be determined by diverse types of personal attributes grouped into: socio-demographic characteristics, health-related characteristics and risk preferences. Each of the personal attributes with potential impact on health insurance demand are discussed in next sections. The focus here in on demand, however, the same individual characteristic can produce symmetrical effects on demand and supply (e.g. age).

1.1.2. Socio-demographic characteristics:

Socio-demographic characteristics like, the age, the gender, the household conditions and the socioeconomic position have been found to affect the demand of voluntary private health insurance (PHI).

- **Age**

The effect of age on the probability of having voluntary private health insurance is generally found to be positive or positive until a given age and negative or non-significant thereafter. This reflects that health risk increases with age (Kiil, 2012).

[1] One example of that questionnaire applied in Portugal by an insurance company is available ONLINE: http://www.multicare.pt/presentationlayer/ResourcesUser_2009/1/Files/100/Proposta_QIS_IPC_Multicare_FM.pdf

- **Education**

Economists have used a variety of identification strategies to measure the causal effect of education on health behaviors. Grossman (1972) in the seminal model of health capital and demand for health, assumes that education may improve health by enhancing allocate efficiency or productive efficiency, and empirical results show that good health is strongly correlated with education (Grossman & Kaestner, 1997).

More education corresponds to enhanced labor-market opportunities. For example, in many European countries, an individual who has an university degree will put a higher value on health insurance than a comparable individual with less education (Bolin et al., 2010). In England, considering the period 1997-2000, education has a positive association with the probability of having voluntary private health insurance (King & Mossailos, 2005)

In Europe, education systems are deeply rooted in national traditions and are characterized by specific national features. However, because the European countries have also common structure and they follow a common schedule in education (Horner, Dobert, Kopp, & Mitter, 2007), it is expected to find similar results in the present research (section 4) which includes 11 European countries and Israel .

- **Gender**

Women have more longevity and the maternity creates particular health cares. Compared with men, women also have different types of behavior in terms of healthcare demand (Kiil, 2012). Consequently, it's important to consider gender differences in demand for private health insurance and the supply of this type of product may have different rules for males and females (Kiil, 2012). Individual purchased policies are more prevalent among females, while employment-based insurance policies are more prevalent among males (Finn & Harmon, 2006). This last result can be affected by the higher activity rate of male compared with female.

The type of insurance also differs by gender. The women are more likely to purchase complementary voluntary health insurance, and the men are more likely to purchase duplicative health insurance. This is consistent with the fact that women are more risk averse in many aspects of their lives than the men and engage in less risky or

aggressive behavior and men are more willing or more able to pay in order to avoid waiting for treatment within the universal health care system (Kiil, 2012). Differences in behavior are more marked in some societies than others, but across a wide variety of environments and social structures, women avoid risk (Eckel & Grossman, 2002). For example, in more than ten European countries, older women are more financial risk averse than men (Madeira, 2012).

In general, women have significantly lower self-reported health status and lower income than men. Women also have more number of visits to primary care, specialty care, emergency treatment, diagnostic services and annual total charges were all significantly higher for women than for men (Bertakis, Azari, Helms, Callahan, & Robbins, 2000). Although, women use more frequently and intensively the health care systems this is not always accounted for in the premium and consequently there exists some adverse selection in a gender perspective (Bertakis et al., 2000). However, divergent results exist and Jofre-Bonet (2000) demonstrates that gender isn't a significant determinant of individually purchased voluntary private health insurance coverage.

- **Income**

A lower income is a barrier to access to health care and health insurance. Additionally, lower-income earners typically also have worse health status than their counterparts. However, some research points out that even among high-income adult earners, those uninsured still have significantly lower use of recommended health care services than the insured (Wang, Shi, Nie, & Zhu, 2013). Individuals with low income were found to be less likely to have voluntary private health insurance in Ireland, in a research based on the Living in Ireland Survey and the European Community Household Panel (ECHP) (Bolhaar, Lindeboom & van der Klaauw, 2012).

- **Household composition**

The effect of household composition in general may capture determinants of the insurance decision that are related to the taste or availability of other expenditure and consumption smoothing mechanisms than insurance (Finn and Harmon, 2006). In general, the finding of a negative effect of household size on the probability to be insured indicates that there is an income constraint. Studies also found a negative

effect of the number of elderly in the household, as well as, that living with a spouse or partner increases the probability of having voluntary PHI (Harmon & Nolan, 2001).

- **Employment Status and Socioeconomic Position**

Voluntary PHI can be purchased directly by individuals or by employers on behalf of their employees, either at the employers' initiative or in consequence of collective agreements (Mossialos & Thomson, 2002).

Regarding labor status and the probability/frequency of having voluntary PHI, it is generally found that being unemployment has a negative effect (Doiron, Jones & Savages, 2008) as well as being a pensioner (Jofre-Bonet, 2000) or a disability pensioner (Perdersen, 2005). On contrary, being self-employed increase the probability of having voluntary PHI (Jofre-Bonet, 2000). Few studies found a tendency for unskilled workers to be less likely to have a voluntary PHI (Perdersen, 2005).

1.1.3. Health-related characteristics

Literature has different approaches to health-related characteristics. Here are presented two: firstly, the evidence on how self-assessed health status and chronic conditions affect the probability of having voluntary PHI; and after, the findings concerning the use of health care services[2] and the evidence on the role of various health related behaviors (Kiil, 2012).

- **Self-reported measures of health**

Several studies conclude for a positive association between self-assessed health and voluntary PHI (Kiil, 2012). This is noteworthy, given the preconditions for adverse selection. The found association is probably driven by correlated effects of other factors, such as risk preferences and socioeconomic characteristics on self-assessed health (Kiil, 2012).

The *real* health status influences the insurance supply behavior because health risk and medical expenses risk are closely related (Atella, Brunetti, & Maestas, 2011) and the

[2] The use of care services or the demand for them are not the same phenomena that the demand for health insurance, however both have some determinants in common.

health insurance covers risks related to individuals' health care expenditures (OECD, 2004b).

Individuals with poorer self-reported dental health were more likely to purchase voluntary PHI with dental coverage (Godfried, Oosterbeek & Tulder, 2001).

- **Chronic disease and other conditions**

Having a chronic disease is negatively related to the probability of having a voluntary PHI (Ellis and Savage, 2008). That can be explained by the fact that individuals with chronic conditions were more likely to apply for voluntary health insurance coverage than the insurers were likely to accepted them (Shmuelli, 2001). Bolin, Hedblom and Lindgren (2010) conclude that having heart problems, diabetes, and chronic lung disease reduces the probability of having voluntary PHI and having cancer, high blood pressure does not show to have influence on having PHI. Dental health conditions are positively associated with the probability of having voluntary PHI covering dental care (Godfried, Oosterbeek & Tulder, 2001).

The insurer will not refuse a cover because the future insured has a disability or chronic disease. However, insurer might not include cover for treatment that is needed because of his/her disability (Association of British Insurers, 2012).

- **Use of health care services**

A positive association between voluntary PHI and health care use may be argued to be consistent with adverse selection into voluntary PHI as well as moral hazard, while a negative association may be attributable to both adverse selection and supply side restrictions (Kiil, 2012). In fact, several studies show a positive association between voluntary PHI coverage and health care. For example, Individuals who have more frequent dentist visits were more likely to purchase voluntary PHI (Godfried, Oosterbeek & Tulder, 2001). However, other studies find a negative association between voluntary PHI and the predicted probability of using care services, for example, having been hospitalized (Kiil, 2012).

- **Health-related behavior**

Health-related behavior is one of the most important elements in people's health and well-being because the behavioral patterns play a role in the leading causes of death, including chronic diseases. The most common behavioral contributors to mortality or death include the use of alcohol, tobacco and illicit use of drugs (Siepmann, 2008). Buchmueller, Fierbig and Savage (2008) demonstrate that there is a probability of various risky behaviors to reduce the holding of voluntary PHI. Jofre-Bonet (2000) shows that the individuals who are obese, heavy smoking and heavy drinking are less likely to have voluntary PHI.

1.1.4. Risk preferences

Risk preference is a person's "tendency to be attracted or repelled by alternatives that he or she perceives as more risky over alternatives perceived as less risky" (Weber & Milliman, 1997: 128) and risk tolerance can be decomposed into risk attitude and risk perception (Xiao, 2008). Risk preferences perform a crucial role in voluntary PHI demand (Pauly, McGuire & Barros, 2012) and there is empirical evidence of this (Buchmueller, Fierbig & Savage, 2008; Costa-Font & Garcia-Villar, 2009).

2. Database and Empirical Strategy

2.1. SHARE Database

This empirical investigation is based on micro data from the *Survey of Health, Ageing and Retirement in Europe* (SHARE)[3]. SHARE is a European data base about health and ageing, which relies on an international infrastructure acknowledged by the EU (Barangé, Eudier & Sirven, 2008) and collects information on socioeconomic status, health status, and employment status, living conditions, social and family networks.

[3] Detailled information about this database and is avilable online: http://www.share-project.org/

The SHARE database offers particularly rich information on health and health-related behavior of the over 50 years old population of several European countries.[4]

In this work data from the wave 1[5] and wave 2[6] of SHARE is used, and the reference period is 2006/2007 (wave 2 of SHARE). The wave 2 provides data from respondents already interviewed in wave 1 and this panel nature of the data is relevant to the construction of the dependent variable in this research (see 2.2.1. and appendix 3, Appendix 4 Table III and Appendix 5 Table IV).

Software IBM SPSS-V22.0. is used in the initial treatment of the construction of variables. To develop the models estimation Stata® v13.0 is adopted.

2.2. Factors explaining

The selection of variables to include in the analysis is based on the most relevant determinants found on the review of literature previously presented (section 1.2). A summary of these variables is presented in appendix 5, Table IV and appendix 6, Table V.

2.2.1. Dependent variable

One of the dependent variables adopted here is obtained from the answer to the question from respondents who have PHI *(insurance)* and who have PHI with different coverage (TableIV. in Appendix 5). Most of the literature about PHI focuses in this issue, the health insurance in general (e.g. Bolin, Hedblom, Lindgren, & Lindgren, (2010); Paccagnella, Rebba, and Weber (2013)). The present research goes further and also studies particular types of insurance coverage.[7] The *PHI* different coverage studied here are four: (i) PHI with coverage medical care with direct access to specialists

[4] The SHARE follows the design of the US Health and Retirement Study (HRS), and the English Longitudinal Study of Ageing (ELSA) (Bolin et al., 2010).

[5] SHARE data, wave 1, has 20 modules. This present research uses mainly HC (health care) module from the wave 1 (see Table IV, calculation of insurance status variable, *insurance*).

[6] SHARE data, wave 2, has 23 modules. This present research analyzes 7 Modules: DN (Demographics), PH (Physical Health), BR (Behavioral Risks), HC (Health Care), EP (Employment and Pensions), HH (Household Income) and EX (Expectations).

[7] In OECD countries health systems differ in the degree of coverage for different health services and goods. In most countries, the degree of coverage for hospital care and doctor consultations is generally higher than for pharmaceuticals, dental care and eye care (Paris, 2010). In Portugal, although there are several other packages, the majority of PHI covers hospitalization, hospitalization outpatient care, specialist consultations and drug prescript (Deco Proteste, 2014a).

(specialist); (ii) PHI with coverage medical care with an extended choice of doctors *(chdoctor)*; (iii) PHI with coverage dental care *(dental)*; and (iv) PHI with coverage nursing care at home in case of chronic disease or disability *(nurse)*. The process of construction of the dependent variables is explained in Appendix 3, appendix 4 table III an appendix 5 table IV.

2.2.2. Independent variables

Based on the most relevant determinant found on the literature previously presented different specification of a Probit models were tested.

3. Descriptive Statistics

This section presents the characteristics of the total sample by insurance status (the person has or has not a PHI, the binary variable *insurance*), this sample includes 4,989 insured. The descriptive statistics are shown in Appendix 7, table VI. The majority of insured has aged over 60 years old and less 13 years old of education program(appendix 7, Table VI, a.).Mostly of insured had been looking for health care during the last twelve months although, had bad health behavior, and evaluated as bad health status. The majority of respondents that live in country with Beveridge don't have health insurance (67% vs. 33%)(appendix 7, Table VI, d.). In appendix 7, table VII reports the characteristics of the insured with *PHI* with four different coverage**.**

4. The model of demand for private health insurance

4.1. The models

In this section is specified and estimated an econometric model to explore the determinants of the demand for PHI. To achieve this aim several models were tested. Because the dependent variables are binary, the model adopted is the Probit (Wooldrige, 2006). The dependent variables are five. The first is referred to PHI in general (insurance) (Models 1 and 2) and the other four referring to the insurance coverage of particular health care services or options (Models 3 to 6).

The independent variables included in the models are: gender (*fem*), widow (*widow*), age (*age1*), square age (*age2*), years of education (*educ_plus13*), low income per capita

(lowinc30), employed (*employed*), disable (*disable*), homemaker (*homemaker*), health self-report (*healthSelf-report*), chronic diseases (*chronicDiseases*) and Beveridge financial health system (*beveridge*)[8].

4.2. The results from probit model:

4.2.1. The Results from Probit model for dependent variable, *insurance*:

Table I shows the marginal effects after probit obtained from two different probit models. In Model 1 and Model 2 the dependent variable is *insurance*, but the predictors considered are different: in Model 1 the variable female (fem) is included and in Model 2 instead of it is included the multiplicative variable female and widow (fem*widow). Model 1 includes a binary variable corresponding to having an income which belongs to the three lowest deciles of income per capita (*lowin30*), Model 2 doesn't include that variable which increases the number of observations. The explanatory variables are analyzed based on the marginal effects, it means that the values dy/dx. The marginal effects show the effect of a discrete change of the dichotomous variable from 0 to 1, or the effect of an infinitesimal change in the continuous variables (Wooldridge, 2012).

[8] The variables marital status (maritalstatus), unemployed (unemployed), rentier (rentier), health behavior (healthbehavior), health care (healthcare) were also tested but the results show no statistical significance. The variables income per capita (inpcdc) and trust (trust) were excluded because when they are in model the number of observation has a huge decrease.

Table I- Marginal effect after probit (dependent variable: i*nsurance*).

	Model 1		Model 2	
	N=8038		N=11286	
Dependent Variable	insurance		insurance	
Indenpendent variable:	dy/dx	st. dev.	dy/dx	st. dev.
fem	0.001	0.00979		
fem*widow			-0.035**	0.016
age1	0.001	0.00696	0.018***	0.006
age2	2.42e-0.6	0.00005	0.0001***	0.00004
educ_plus13	0.0207*	0.01144	0.033***	0.0096
lowin30	-0.064***	0.00166		
employed	0.031**	0.01232	0.016	0.01
disable	0.083***	0.0286	0.094***	0.026
homemaker	0.011	0.01541	0.026**	0.012
healthself-reported	0.047***	0.01081	0.055***	0.009
chronicdisease	-0.025**	0.01167	-0.012	0.01
beveridge	-0.270***	0.00874	-0.27***	0.007
LR chi2	(11) 850.46		(10) 1225.54	
Prob> chi2	0		0	
Pseudo R2	0.0928		0.0949	
Log likehood	-4159.0207		-5841.7862	
Percent correctly predicted	74.36%		74.17%	

Notes: (***) - Represents high level of significance (p-value< 1%);
(**) - Represents medium level of significance (p-value< 5%);
(*)- Represents low level of significance (p-value< 10%).

The marginal effects are evaluated at the mean values of the variables; for the dichotomous variables, marginal effects are for changes from zero to one

Source: Author's calculation based on the micro data from SHARE, wave 1 and Wave 2

Having high level of education (*educ_plus13*), being disable (*disable*) and good self-reported health (*health self-report*) are positive predictors of insurance in both models (Models 1 and 2 in Table I) and living in a country with Beveridge financial health system decreases the probability of having PHI.

Regarding the years of education (*edc_plus13)* to have more than upper secondary education increases the probability of having a PHI by 2.07% in model 1 and 3.3% in model 2. This result is in line with Bolin, Hedblom, Lindgren and Lindgren (2010) . The results for *disable* is in contradiction with Perdersen (2005) . It's hard to analyze this information because it isn't possible to know if the insured were already disable when

he/she did the contract. Concerning the self-report health status (*healthselfreported*), the results are in agreement to the results of the meta analysis done by Kiil (2012). Living in a country with Beveridge financial health system decreases by 27% in both models the probability of having PHI which converges to the results obtained by Lameire, Joffe and Wiedemann (1999). Barros and Gomes (2001) allege that the PHI offers an additional coverage for certain groups of the population covered by a NHS, however, these results show a substitution between both health care providers.

The negative influence of the low income (*lowin30*) on the demand for PHI is in line with previous literature (Palangkaraya, Yong, Webster & Dawkins, 2009; Bolin, Hedblom, Lindgren & Lindgren, 2010).

Being employed increase by 3.1% the probability of having PHI. However, this result must be taken with care concerning the 'voluntary' nature of the insurance, because, according to OECD (2013), take-up of PHI may be *compulsory* for employees as part of work contract and conditions.

To have a chronic disease (*chronicdisease*) has a negative impact on the demand of PHI (Model 1) which converge to Ellis and Savage (2008) and Atella, Brunetti and Maestas (2011)[9].

Bertakis, Azari, Helms, Callahan and Robbins (2000) argue that women self-reported lower health status and have lower income; consequently both factors contribute to the explanation of a negative relation between being women and having health insurance. The present research does not find any impact of being woman (fem=1) on having insurance. This happen probably because there are effects with symmetrical signs associated to gender and the results is inconclusive and statistically not significant. Jofre-Bonet (2000) also concludes that the gender isn't a significant determinant of individually purchased voluntary PHI. The specification in Models 2

[9] Chronical disease definition according World Health Organization is : "They [chronical disease also known as Noncommunicable diseases (NCDs)] are of long duration and generally slow progression. The four main types […] are cardiovascular diseases (like heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructed pulmonary disease and asthma) and diabetes". Source: http://www.who.int/topics/noncommunicable_diseases/en/

considering the interaction between being widow and being female (*fem x widow*) presents significant results: being female and widow decreases by 3.5% the probability of having a PHI. This result may be explained by some kind of health care benefit received after and in consequence the husband death.

4.2.2. The Results from Probit model for dependent variables *specialist, chdoctor, dental and nurse:*

The results for the four models analyzing particular aspects of the insurance (specialist doctor, choice of doctor, dental care and nurse coverage) converge in several points (Table II, Model 3 to Model 6): The probability of having private helath insurance with specialist, chdocotor, dental and specialist decrease with age and the good self-assessment of health (*healthSelf-reported*). These last results diverge from the result obtained for the demand for insurance in general (Table I, Models 1 and 2).

Table II- Marginal Effect after probit model (dependent variables *specialist*, *chdoctor*, *dental* and *nurse*):

	Model 3		Model 4		Model 5		Model 6	
	N=7897		N=7850		N=7886		N=7823	
Dependent Variable	*specialist*		*chdoctor*		*dental*		*nurse*	
Indenpendent variable:	dy/dx	st. dev.	dy/dx	st. dev.	dy/dx	st. dev.	dy/dx	st. dev.
fem	0.0045	0.0096	0.0019	0.009	0.006	0.009	0.007	0.008
fem*widow								
age1	-0.015**	0.007	-0.011*	0.006	-0.025***	0.007	-0.015***	0.006
age2	0.0001**	0.0001	0.0001*	0.0001	0.0001***	0.0001	0.0001***	0.00004
educ_plus13	-0.013	0.0113	-0.016	0.01	0.006	0.011	-0.004	0.0096
lowin30								
employed	-0.011	0.0114	-0.0114	0.01	-0.027**	0.01	-0.0006	0.0097
disable	-0.045*	0.023	-0.04**	0.02	-0.007	0.024	0.015	0.02
homemaker	-0.024*	0.0128	-0.02**	0.012	-0.029**	0.012	-0.01	0.011
healthself-reported	-0.068***	0.0112	-0.07***	0.011	-0.037***	0.01	-0.041***	0.095
chronicdisease	0.003	0.0118	0.006	0.011	0.001	0.011	-0.011	0.098
beveridge	-0.076***	0.009	-0.049***	0.09	-0.131***	0.009	0.071***	0.008
LR chi2	(10)	119.95	(10)	102.19	(10)	268.23	(10)	120.46
Prob> chi2	0.0000		0.0000		0.0000		0.0000	
Pseudo R2	0.0142		0.0137		0.0342		0.0183	
Log likehood	-4175.2263		-3686.9824		-3782.4904		-3237.1553	
Percent correctly predicted	77.24%		81.68%		80.27%		85.07%	

Notes: (***) - Represents high level of significance (p-value< 1%);
(**) - Represents medium level of significance (p-value< 5%);
(*)- Represents low level of significance (p-value< 10%).

The marginal effects are evaluated at the mean values of the variables; for the dichotomous variables, marginal effects are for changes from zero to one.
Source: Author's calculation based on the micro data from SHARE, wave 1 and wave 2

Living in a country with Beveridge financing health system (*beveridge*) decreases by 7.6%, 4.9% and 13.1% respectively the probability of having PHI with a specialist (*spcialist*), choosing the doctor (*chdocto)* and dental coverage (*dental*). While Beveridge financial health system (*beveridge*) increases by 7.1% the probability of having a PHI that covers nursing care at home in case of chronic disease or disability (*nurse*). This result can be explained by the non-coverage of this service by the NHS in the countries under study.[10]

The probability of having PHI decreases by 2.7% with coverage dental care if he/she is employed. This can be explained because in some countries PHI is compulsory for

[10] In Portugal (not included in the sample), and according to *Associação de Defesa do Consumidor* (DECO, 2014a), in a comparative study of the health insurance products available in the Portuguese insurance market, concludes that the costs and expenses in private nursing home care aren't usually covered by the *Serviço Nacional de Saúde* (SNS), the Portuguese NHS.

employees (OECD 2013) and dental expenses aren't in the *general* health insurance or are provided by the NHS.

5. Conclusion and Future Research Avenues

The main conclusions of this research are:

First, individuals living in countries with Beveridge financial health system (*beveridge*) show a lower demand for PHI in general. The same happens concerning the insurance with specific coverage as: PHI with coverage medical care with direct access to specialists *(specialist)*, PHI with coverage medical care with an extended choice of doctors *(chdoctor)* and PHI with coverage dental care *(dental).* Similar results are obtained by previous studies (e.g. Paccagnella,Rebba and Weber, G. (2013)).
Second, there is a positive effect of good self-evaluated health status and the demand of health insurance in general, this gives the precondition for adverse selection and moral hazard. This result converges with Kill's (2012) conclusion.

Third, individuals with low income are less likely to have voluntary PHI (Model 1). Besides that the income variable doesn't reveal significant association with demand for particular health care services (Model 3, 4, 5 and 6). Several authors conclude similarly results (e.g. Wang, Shi, Nie, and Zhu (2013)).

Fourth, there is a positive association between the demand of general health insurance (insurance) and "be employed"(employee). This result converges with Mossialos and Thomson (2004) assumptions.

Fifth, in all models tested (six are presented here) the variable associated to gender (*female*) show no statistical significance and this coverage with the literature (e.g. Jofre-Bonet *(*2000)). However, the addition of an interaction term in the model combining the gender with being widow (*female x widow*) produced statistically significant results. According to Jonet-Bonet (2000) gender doesn't have a significant influence on the individual demand of PHI coverage.

Sixth, there is positive effect of being disable on insurance demand. This is apparently unexpected because insurance companies may refuse to insure disable persons

(Association of British Insurers, 2012). However, in this dissertation it isn't possible to know if the insured was disable *when* he/she did the health insurance.

The data base used, the SHARE, imposes some limitations to the analysis. Referring two of them. First, because all the respondents are over 50 years old, and is unknown the date when the insurance started, the results for variable age must be considered carefully. Second, the risk aversion may have positive effects influences on the individual demand (Costa-Font & Garcia-Villar, 2009) but in the present dissertation this factor wasn't analyze due to the absence of specific information in the data base.

During the research process, several avenues for future research were identified. The ones below are those that seemed to have some potential:

- European public health insurance includes health coverage mainly financed through taxation or through contributions to social insurance schemes (Mossialos & Thomson, 2004) and in order to reduce the cost many governments in different countries didn't invest in health (OECD,2013). How that influences the demand for PHI? What is the expected trend in EU countries? Future research based on SHARE (the wave 5 will be published in 2015) and including the comparative analysis of health systems across EU will give further results about this issue.

- European residents who are covered by a social security scheme in their country of residence are entitled to a European Health Insurance Card (EHIC)[11]. How does this EHIC influence the demand for PHI in EU and in each country?

- The insurer companies are not obliged to accept the coverage of all persons interested in doing a health insurance contract. The insurers only select the customers who they consider low-risk customers. However in nowadays there are many chronic diseases and the longevity is increasing, how will insurers adapt to this situation? A manifest change towards a much older population structure in

[11] http://ec.europa.eu/social/main.jsp?catId=559

several EU Member States is evident (Eurotat 2014)[12]. How will that influence the demand and the supply of the health insurance in EU?

- Health insurance covers diverse health care expenses (e.g. hospitalization, outpatient, prostheses, childbirth, drugs and dental) what are the changes in the covererage in result the current crises? Is the demand for health insurance also affected by the crises?

- Health systems in OECD countries differ in the degree of coverage for different health services and goods. In most countries, the degree of coverage for hospital care and doctor consultations is generally higher than for pharmaceuticals, dental care and eye care (Paris, 2010). That difference in the degree of coverage for different health services and goods may have interesting implications on the individual demand of PHI. So it's maybe necessary to study the different of coverage of health system in each OECD country.

[12] http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Population_structure_and_ageing

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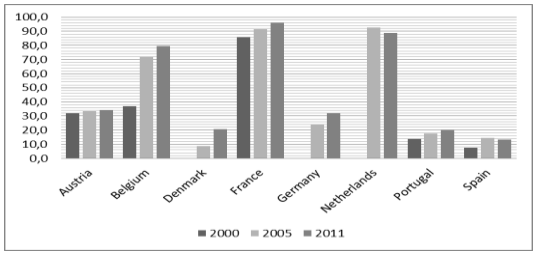
Appendix 1
Evolution in private health insurance coverage

Figure I.- Evolution in private health insurance coverage, 2000 to 2011(%)



Source: Author's construction based on OECD Health Statistics 2013, http://dx.doi.org/10.1787/health-data-en. Insurance coverage is measured as % of total population.

Appendix 2
Health Insurance: Concept and Characteristics

1. Health Systems and Health Insurance Models

The health system in OECD countries can be classified according to the type of financing sources into two groups: the Beveridge's model and the Bismarck's model. The **Beveridge's model,** in which the core financing sources are taxes, is characterized by a centrally organized National Health Service (NHS) where the services are mainly provided by public health providers (Lameire, Joffe, & Wiedemann, 1999). The countries using this model are the United Kingdom, Italy, Spain, Sweden, Denmark, Norway, Finland and Portugal (Comissão para a Sustentabilidade do Financiamento do Serviço Nacional de Saúde,2007Barros & Gomes, 2002). The **Bismarck's model**, in which the major source is the social insurance schemes, results in a mix of private and public providers, and allows more flexible spending on healthcare (Lameire, Joffe, & Wiedemann, 1999). The countries using this model are Austria, Belgium, France, Germany, Netherlands and Switzerland (Comissão para a Sustentabilidade do Financiamento do Serviço Nacional de Saúde,2007.Barros & Gomes, 2002).

Public health insurance includes health coverage mainly financed through taxation or through contributions to social insurance schemes, it dominates in many countries, but direct payments by households still have significant weight in health care financing source (OCED, 2004b). Social insurance programs are financed entirely or in large part

by mandatory contributions from employers, employees, or both, and not primarily by the revenues of government (Drofman, 2008).

Private health insurance (PHI) refers to insurance schemes that are financed through private health premiums, which are often voluntary (OECD, 2004a). but sometimes private health insurance is mandatory (OECD, 2004b). Private health insurance offers an additional coverage, voluntary for certain groups of the population covered by a NHS; or it offers a compulsory insurance scheme (Barros & Gomes, 2002). Private health insurance cover a defined set of health services financed mainly through private non-income related payments (called *premiums*) to an insuring entity or to a mutual pool (OECD, 2004b). In the European Union (EU) countries PHI can operate together with publicly-financed (statutory) health insurance, but there is a large difference in the role played by PHI within the health systems and in the dimension and working of markets for PHI (Thomson & Mossialos, 2009)

Primary private health insurance represents the only available access to basic health cover because individuals do not have public health insurance. This could be because there is no public health insurance, individuals are not eligible to be covered under public health insurance, or because they are entitled to public coverage but have chosen to opt out of such coverage (OECD, 2004b):

In some countries, additional health coverage can be purchased through private insurance to cover any cost-sharing left after basic coverage (**complementary insurance**), add additional services (**supplementary insurance**) or provide faster access or larger choice to providers (**duplicate insurance**) (OECD , 2013). In EU country members there are different private medical insurance (PMI) systems whit three voluntary PMI schemes categories: additional, complementary or supplementary PMI; substitute PMI; and duplicate PMI (CEA, 2011)[13] . Below, these three insurance schemes are presented briefly.

Complementary cover is a private insurance that complements publicly insured services or services within principal or substitute health insurance (Paccagnella, Rebba,

[13] This mandatory category only exists in Netherlands (CEA, 2011).

& Weber, 2013). It intends to pay only a proportion of qualifying care costs, by covering all or part of the residual costs not otherwise reimbursed (OECD, 2004a).

Supplementary cover is a private health insurance that provides cover for additional health services not covered by the public scheme (Paccagnella, Rebba, & Weber, 2013). Supplementary voluntary health insurance is developed to increase consumer choice and access to additional health services. In general, this type of voluntary health insurance guarantees a wider consumer choice of providers, faster access to treatment and superior accommodation and amenities in hospital (Mossialos & Thomson, 2004).

Duplicate voluntary private health insurance provides cover for health services already included under public health insurance (Paccagnella, Rebba, & Weber, 2013). It offers access to the same medical services as the public scheme, but it also offers access to private health facilities that are not accessible through public insurance. It also offers the possibility to choose the doctor, the hospital, or other health provider. Duplicate voluntary private health insurance does not exempt individuals from contributing to public health insurance (OECD, 2004a).

2. Insurance Companies and Insurance Costs

The part agreeing to pay for the losses is the **insurer** and the part whose loss causes the insurer to make claim payment is the **insured**, policy holder or owner (Dorfman, 2008). Health insurance guarantee is usually set forth in a contract between both parties that spells the terms and conditions for payment or reimbursement of health services (OECD, 2004b). Because accurate prediction of losses is crucial to insurance companies success, to determine expected losses, insurance actuaries apply mathematical principles (e.g. law of large numbers) to study the characteristics of the ensured population distribution, the average expected losses for a random sample of exposure units and other aspects (Redja, 2011).

From the insured patient perspective, there are three common types of cost sharing: the premium cost sharing, the deductibles, and the copayments. These types of cost are defined as: the **premium cost sharing** is the amount that the insured is required to contribute to part of the insurance premium cost; the **deductible** is the amount that

the insured is required to pay before any covered medical expenses are compensated by the insurance plan; and the **copayment** is the amount that the insured has to pay out-of pocket for his/her medical care after paying the deductible amount (Zhang & Anis, 2009).

The **Out-of-pocket payments** (OOP) of health expenditures are expenditures borne directly by a patient where neither public nor private insurance cover the full cost of the health good or service. They include cost-sharing and other expenditure paid directly by private households/individuals, and also include estimations of informal payments to health care providers in some countries (OECD, 2013).

Appendix 3
Construction of the Dependent Variables

In the wave 2 was questioned if the respondent has changed his/her health insurance coverage during the period between wave 1 and wave 2. Based on the match the information on wave 1 (respondents have private insurance in general or one of the 4 specifics coverage) and wave 2 (Who didn't change his/her coverage) it was possible to create the dependent variables with information for 2006. All dependents variables are dummy variables (appendix 5 Table IV and appendix 6 table V).

Only four types of insurance coverage are studied here because wave 1 and wave 2 have different terminologies and only these four variables are considered to be identical in both waves. The comparison between wave 1 and wave 2 is presented in Appendix 4 (Table III, Categories Harmonization: Health care coverage by health insurance).

In the wave 1 was questioned if the respondent has health insurance in general and if the respondent has the specific coverage (several categories of coverage of health care services). Based on that, it was created a dummy variable with information if respondent has or has not in 2004 the PHI. On wave 2 the questions about health insurance did not differentiate the PHI from social insurance. The next waves (wave 3 and wave 4) present the similar problem.

Appendix 4
Categories Harmonization: Health care coverage by health insurance

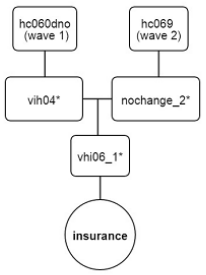
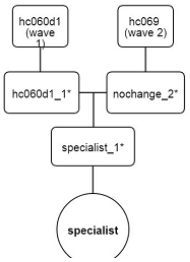
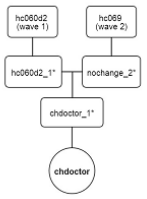
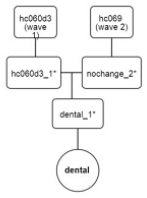
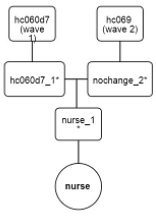
Table III - Categories harmonization between tow SHARE wave (Wave 1 2004 and wave 2 2006/2007): Health care coverage by health insurance

Wave 1 HC060: Contract voluntary, supplementary health Insurance. Do you have any voluntary, supplementary or private health insurance for at least one of the following types of care in order to complement the coverage offered by the National Health System?	**Wave 2** HC068: Current health insurance coverage. Who finally pays for?	**Harmonization**
Medical care with direct access to specialists	Medical visits to specialists, when not prescribed by a general practitioner.	A
Medical care with an extended choice of doctors	Medical visits to any doctor of your choice	A
Dental care.	Dental care.	A
(Extended) Nursing care at home in case of chronic disease or disability.	Nursing care at home in case of chronic disease or disability.	A
A larger choice of drugs and/or full drugs expenses (no participation).	Prescribed drugs.	B
An extended choice of hospitals and clinics for hospital care.	Hospitalisations in private hospitals.	B
Full coverage of costs for doctor visits (no participation).	Medical visits to a general practitioner.	B
(Extended) Home help for activities of daily living (household, etc.).	Stays in a nursing home	B
Full coverage of costs for hospital care (no participation).	Hospitalisations in public hospitals	C
(Extended) Long term care in a nursing home.		C
	Medical visits to specialists, when not prescribed by a general practitioner	C

Legend: A- Well-matched; B- partial matched and C- No matched.

Source: Author's considerations based on the micro data of SHARE, first and second wave

Appendix 5
Variables description and construction
Table IV- Variables description and construction

Variable	Variable name	Variable Desriptions	SHARE original questions (wave 1 and 2)	Variable construction diagram
Who have private health insurance?	*(insurance)*	= 1 if the respondent has private health insurance, 0 otherwise;	*"Please look at card 20.Do you have any voluntary, supplementary or private health insurance for at least one of the following types of care in order to complement the coverage offered by the National Health System? If yes, please say what is covered.* *(...)* *96. No voluntary health insurance at all;" (HC060)*[1]-This is the only question in which respondent were selected if he/she didn't selected this card. *"Taking all your social and health insurances into account, has anything changed, for better or for worse, in your coverage for health problems since [{month year previous interview}]?* *1. No change;(...);"(HC069)*[2]	
Who have private health insurance that coverage medical care with direct access to specialists?	*(specialist)*	= 1 if the respondent has private health insurance that coverage medical care with direct access to specialists, 0 otherwise;	"Please look at card 20.Do you have any voluntary, supplementary or private health insurance for at least one of the following types of care in order to complement the coverage offered by the National Health System? If yes, please say what is covered. 1. Medical care with direct access to specialists; (...) " (HC060)[1] "Taking all your social and health insurances into account, has anything changed, for better or for worse, in your coverage for health problems since [{month year previous interview}]? 1. No change;(...)"(HC069)[2]	
Who have private health insurance that coverage medical care with an extended choice of doctors?	**Variable name** (chDoctor)	= 1 if the respondent has private health insurance that coverage medical care with an extended choice of doctors, 0 otherwise;	"Please look at card 20.Do you have any voluntary, supplementary or private health insurance for at least one of the following types of care in order to complement the coverage offered by the National Health System? If yes, please say what is covered. (...) 2. Medical care with an extended choice of doctors;(...)" (HC060)[1] "Taking all your social and health insurances into account, has anything changed, for better or for worse, in your coverage for health problems since [{month year previous interview}]? 1. No change(...);"(HC069)[2]	
Who have private health insurance that coverage dental care?	(dental)	= 1 if the respondent has private health insurance that coverage dental care, 0 otherwise;	"Please look at card 20.Do you have any voluntary, supplementary or private health insurance for at least one of the following types of care in order to complement the coverage offered by the National Health System? If yes, please say what is covered. (...) 3. Dental care (...)" (HC060)[1] "Taking all your social and health insurances into account, has anything changed, for better or for worse, in your coverage for health problems since [{month year previous interview}]? 1. No change(...);"(HC069)[2]	
Who have private health insurance that coverage nursing care at home in case chronic disease or disability?	(nurse)	= 1 if the respondent has private health insurance coverage nursing care at home in case chronic disease or disability, 0 otherwise;	"Please look at card 20.Do you have any voluntary, supplementary or private health insurance for at least one of the following types of care in order to complement the coverage offered by the National Health System? If yes, please say what is covered. (...)7. (Extended) Nursing care at home in case of chronic disease or disability;(...)" (HC060)[1] "Taking all your social and health insurances into account, has anything changed, for better or for worse, in your coverage for health problems since [{month year previous interview}]? 1. No change;(...);"(HC069)[2]	

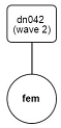
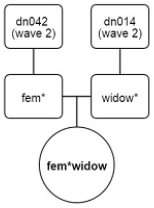
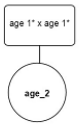
1-Correspondent question in SHARE 2004 Questionnaire version 10 (wave 1)

2- Correspondent question in SHARE w2 Questionnaire version 2.7 (wave 2);

* - Auxiliary variables created by the author

Source: Author's construction based on SHARE methodological documents and references.

Table IV - Variables description and construction (cont.)

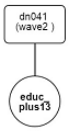
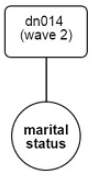
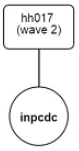
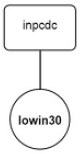
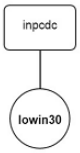
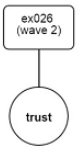
Variable		Variable Desriptions	SHARE original questions (wave 1 and2)	Variable construction diagram
	Variable name			
Gender	*(fem)*	=1 If the respondent is a woman, 0 if is a man;	"1. Male 2. Female" (dn042)[2]	
Widow	*(fem*widow)*	=1 if the respondent is a widow, 0 otherwise The variable Widow (fem*widow) is a gender variable based on an interaction term between female and widowed variables. That interaction tests the null hypothesis that the gender differential doesn't depend on widow status and that the widow differential doesn't depend on gender. As a dichotomous variable, setting female =0 and widow= 0 this eliminates female, widow, and female*widow and corresponds to the group of men either married or living together with partner, separated or divorced and single.	"1. Male 2. Female" (dn042)[2] "What is your marital status? 6. widowed" (dn014)[2]	
Age	*(age1)*	Respondent's age;	"In which month and year you was born?" (dn003)[2]	
Square Age	*(age2)*	Repondent's square age;	"In which month and year you was born?" (dn003)[2]	

2- Correspondent question in SHARE w2 Questionnaire version 2.7 (wave 2)

* - Auxiliary variables created by the author

Source: Author's construction based on SHARE methodological documents and reference

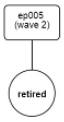
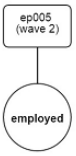
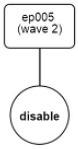
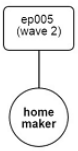
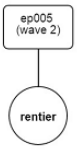
Table IV - Variables description and construction (cont.)

Variable		Variable Desriptions	SHARE original questions (wave 1 and2)	Variable construction diagram
	Variable name			
Education	*(educ_plus13)*	=1 if respondent has at least 13 years of education, 0 otherwise. Concerning the variable Education (educ_plus13), this dummy variable was adopted ISCED-11 classification for education. ISCED level 3 or Upper Secondary Education program usually end in 13 years (UNESCO, 2012).	"How many years have you been in full time education?"(dn041)[2]	
Marital status	*(maritalstatus)*	=1 If the respondent is Married or living together with partner; =2 if the respondent is separated or divorced; = 3 if the respondent never married; =4 if the respondent is widowed.	"Please look at card 4.What is your marital status? 1. Married and living together with spouse;2. Registered partnership;3. Married, living separated from spouse; 4. Never married; 5. Divorce;6. Widowed" (dn014)[2]	
Income per capita	*(inpcdc)*	Monthly income per capita by deciles, where 1 (0 to195), 2 (196 to 333), 3 (334 to 500), 4(501 to 650), 5(651 to 846), 6 (847 to 1085), 7 (1085 to 1455), 8(1456 to 2013), 9(2014 to 4250) and 10(4250 to highest).	"To summarize, how much was the overall income, after tax, that your entire household had in an average month in previous year?"(hh017)[2]	
Income per capita lower than 500€	*(lowin30)*	=1 if the respondent's income per capita is lower than3 ;0 otherwise	"To summarize, how much was the overall income, after tax, that your entire household had in an average month in previous year?"(hh017)[2]	
Income per capita lower than 500€	*(lowin30)*	=1 if the respondent's income per capita is lower than3 ;0 otherwise	"To summarize, how much was the overall income, after tax, that your entire household had in an average month in previous year?"(hh017)[2]	
Trust	*(trust)*	= 1 if the respondent trust in other people; 0 otherwise.	"Generally speaking, would you say that most peoplecan be trusted or that you can't be too careful in dealing with people?"(ex026)[2]	

2- Correspondent question in SHARE w2 Questionnaire version 2.7 (wave 2)
* - Auxiliary variables created by the author

Source: Author's construction based on SHARE methodological documents and references.

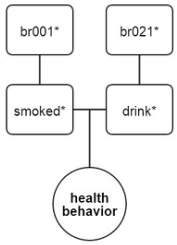
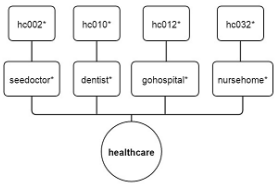
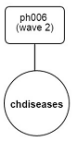
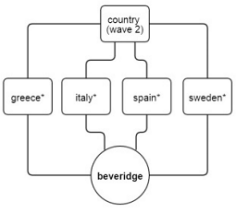
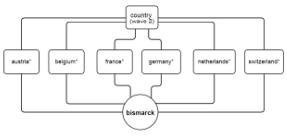
Table IV - Variables description and construction (cont.)

Variable		Variable Description	SHARE original questions (wave 2)	Variable construction diagram
	Variable name			
Retired	*(retired)*	=1 If the respondent is retired, 0 otherwise;	"Please look at card 20. In general, which of the following best describes your current employment situation? (1.) Retired(...)" (ep005)[2]	
employed	*(employed)*	=1 If the respondent i s employed or self-employed, 0 otherwise;	"Please look at card 20. In general, which of the following best describes your current employment situation? (...)(2.)Employed or self-employed (including working for family business) (...)" (ep005)[2]	
Unemployed	*(unemployed)*	=1 If the respondent is unemployed, 0 otherwise;	"Please look at card 20. In general, which of the following best describes your current employment situation? (...) (3.) Unemployed and looking for work(...)" (ep005)[2]	
Disable	*(disable)*	=1 If the respondent is disabled or permanently sick, 0 otherwise;	"Please look at card 20. In general, which of the following best describes your current employment situation? (...) (4.) Permanently sick or disabled ;(...)" (ep005)[2]	
Homemaker	*(homemaker)*	=1 If the respondent is a homemaker, 0 otherwise;	"Please look at card 20. In general, which of the following best describes your current employment situation? (...) (5.) Homemaker;(...)"(ep005)[2]	
Rentier	*(rentier)*	=1 if the respondent is rentier, living off own property, student or doing voluntary work; 0 otherwise	"Please look at card 20. In general, which of the following best describes your current employment situation? (...) (97.) Rentier, Living off own property, Student, Doing voluntary work"(ep005)[2]	

2- Correspondent question in SHARE w2 Questionnaire version 2.7 (wave 2)

Source: Author's construction based on SHARE methodological documents and references

Table IV - Variables description and construction (cont.)

Variable	Variable name	Variable Desriptions	SHARE original questions (wave 1 and2)	Variable construction diagram
Health Behavior	*(healthbehavior)*	=1 if the respondent behavior is good; 0 otherwise	"The following questions are about smoking and drinking alcoholic beverages. Have you ever smoked cigarettes, cigars, cigarillos or a pipe daily for a period of at least one year? 1. Yes 5. No"(dn001)[2] "Have you ever drunk alcoholic beverages? 1. Yes ; 5. No"(dn021)[2]	
Health care	*(healthcare)*	=1 if the respondent has looking for health care during the last twelve months before the questionnaire; 0 otherwise.	"(...)During the last twelve months, about how many times in total have you seen or talked to a medical doctor about your health?(...)"(hc002)[2] "During the last twelve months, have you seen a dentist or a dental hygienist? 1. Yes 5. No"(hc010)[2] "During the last twelve months, have you been in a hospital overnight? Please consider stays in medical, surgical, psychiatric or in any other specialized wards. 1. Yes 5. No"(dn012)[2] "During the last twelve months, did you receive in your own home any of the kinds of care mentioned on this card? | | 1. Professional or paid nursing or personal care"(dn032)[2]	
Health Self-Report	*(healthSelf_Reported)*	=1 if the respondent rates his/her health as good, 0 otherwise;	*"Would you say your health in general is excellent, very good, good, fair, or poor?" (ph003)*[2]	
Chronic Diseases	*(chDiseases)*	=1 if the respondent has any chronic diseases, 0 otherwise;	*Has a doctor ever told you that you had/Do you currently have any of the conditions on this card?(...)* 96. None(...)(ph006)[2]	
Beveridge	*beveridge*	=1 if the financial health system of respondent's country is Beverigde, 0 otherwise; . The European countries grouped according to the Beveridge (beveridge) financial system are Greece, Italy, Spain and Sweden. The countries were grouped based	*country*	
Bismarck	*bismarck*	=1 if the financial health system of respondent's country is Bismarck, 0 otherwise. The European countries in the sample with Bismarck (bismark) financial system are Austria, Belgium, France, German, Netherland and Switzerland	*country*	

2- Correspondent question in SHARE w2 Questionnaire version 2.7 (wave 2)
* - Auxiliary variables created by the author
Source: Author's construction based on SHARE methodological documents and references.

Appendix 6
Variables description and construction

Table V- Variables description

Dependent Variable		Description
Who have private health insurance?	*(insurance)*	= 1 if the respondent has private health insurance, 0 otherwise;
Who have private health insurance that coverage medical care with direct access to specialists?	*(specialist)*	= 1 if the respondent has private health insurance that coverage medical care with direct access to specialists, 0 otherwise;
Who have private health insurance that coverage medical care with an extended choice of doctors?	*(chDoctor)*	= 1 if the respondent has private health insurance that coverage medical care with an extended choice of doctors, 0 otherwise;
Who have private health insurance that coverage dental care?	*(dental)*	= 1 if the respondent has private health insurance that coverage dental care, 0 otherwise;
Who have private health insurance that coverage nursing care at home in case chronic disease or disability?	*(nurse)*	= 1 if the respondent has private health insurance coverage nursing care at home in case chronic disease or disability, 0 otherwise;
Independent Variable		**Description**
Gender	*(fem)*	=1 If the respondent is a woman, 0 if is a man;
Widow	*(widow)*	=1 if the respondent is a widow, 0 otherwise
Age	*(age1)*	Respondent's age; Author's limitation to respondent ages between 50 and 89 years.
Square age	*(age2)*	Respondent's square age;
Education	*(educ_plus13)*	=1 if respondent has at least 13 years of education, 0 otherwise
Marital status	*(maritalstatus)*	=1 If the respondent is Married or living together with partner; =2 if the respondent is separated or divorced; = 3 if the respondent never married; =4 if the respondent is widowed.
Income per capita	*(inpcic)*	Monthly income per capita by deciles, where 1 (0 to195), 2 (196 to 333), 3 (334 to 500), 4(501 to 650), 5(651 to 846), 6 (847 to 1085), 7 (1085 to 1455), 8(1456 to 2013), 9(2014 to 4250) and 10(4250 to highest).
Income per capita lower than 500€	*(lowin30)*	=1 if the respondent's income per capita is lower than €500;0 otherwise
Trust	*(trust)*	=1 if the respondent trust in the others; 0 otherwise.
Retired	*(retired)*	=1 If the respondent is retired, 0 otherwise;
Employed	*(employed)*	=1 If the respondent i s employed or self-employed, 0 otherwise;
Unemployed	*(unemployed)*	=1 If the respondent is unemployed, 0 otherwise;
Disable	*(disable)*	=1 If the respondent is disabled or permanently sick, 0 otherwise;
Homemaker	*(homemaker)*	=1 If the respondent is a homemaker, 0 otherwise;
Rentier	*(rentier)*	=1 if the respondent is rentier, living off own property, student or doing voluntary work; 0 otherwise
Health Behavior	*(healthbehavior)*	=1 if the respondent behavior is good; 0 otherwise
Health care	*healthcare*	=1 if the respondent has looking for health care during the last twelve months before the questionnaire; 0 otherwise.
Health Self-Report	*(healthSelf_Reported)*	=1 if the respondent rates his/her health as good, 0 otherwise;
Chronic Diseases	*(chronicDiseases)*	=1 if the respondent has any chronic diseases, 0 otherwise;
Beveridge	*(beveridge)*	=1 if the financial health system of respondent's country is Beverigde, 0 otherwise;
Bismarck	*(bismarck)*	=1 if the financial health system of respondent's country is Bismarck, 0 otherwise.
Other	*(other)*	=1 if the financial health system of respondent's country isn't Beveridge or Bismarck.;0 itherwise.

Source: Author's considerations based on the micro data of SHARE, first and second wave

- The variable Widow (fem*widow) is a gender variable based on an interaction term between female and widowed variables. That Interaction tests the null hypothesis that the gender differential doesn't depend on widow status and that the widow differential doesn't depend on gender. As a dichotomous variable, setting female =0 and widow= 0 this eliminates female, widow, and female*widow and corresponds to the group of men either married or living together with partner, separated or divorced and single.

- Concerning the variable Education (educ_plus13), this dummy variable was adopted ISCED-11 classification for education. ISCED level 3 or Upper Secondary Education program usually end in 13 years (UNESCO, 2012).

- Regarding the financial health system, the European countries in the sample with Bismarck (bismark) financial system are Austria, Belgium, France, German, Netherland and Switzerland. The European countries grouped according to the Beveridge (beveridge) financial system are Greece, Italy, Spain and Sweden. The countries were grouped based on European Health Care Reform. Analysis of current strategies. WHO Regional Publications, European Series, N.º 72.

Appendix 7
Insured sample characteristics

Table VI: Sample characteristics of respondent by insurance status

a. Insured characteristics by insurance status (%):

	Gender (*fem*)		Age (years) (*age1*)				Education (year) (*educ_plus13*)	
	Male (0)	Female (1)	50-59	60-69	70-79	= 80	<13 (*0*)	=13 (1)
insurance	45.52%	54.48%	29.81%	34.28%	23.45%	12.47%	72.10%	27.90%
Not Insured	44.87%	55.13%	33.87%	32.96%	22.23%	10.94%	76.33%	23.67%

	Marital Status (*maritalstatus*)				Trust (trust)	
	Married or living together with partner	Separated or divorced	Never married	Widowed	No Trust (0)	Trust (1)
Insurance	72.86%	9.67%	3.68%	13.80%	28.35%	71.65%
Not Insured	71.92%	8.23%	4.08%	15.77%	27.80%	72.20%

Note:
See Table I – Variable description
insurance: *Female*: N=4989; *Age* (years): N= 4814; *Education* (years): N=4904; *Marital status*: N=2203; *Trust*: N=4046.
Not Insured: *Female*: N=13785; *Age* (years): N= 15664; *Education* (years): N=13510; *Marital status*: N=7451; *Trust*: N=14632

b. The overall income per capita in euros, after tax, that the entire household had in an average moth in previous years (%):

	1	2	3	4	5	6	7	8	9	10
Insurance	4.06%	6.41%	12.78%	9.18%	11.40%	11.63%	11.31%	10.75%	12.78%	9.69%
Not Insured	7.95%	9.36%	11.92%	8.62%	10.32%	10.13%	10.73%	10.04%	10.17%	10.76%

Note:
insurance: N= 2167; Not Insured: N=8298
Monthly income per capita by deciles, where 1 (0 to195), 2 (196 to 333), 3 (334 to 500), 4(501 to 650), 5(651 to 846), 6 (847 to 1085), 7 (1085 to 1455), 8(1456 to 2013), 9(2014 to 4250) and 10(4250 to highest)

c. Occupational Status (%):

	Retired *(retired)*	Employed *(employed)*	Unemployed *(unemployed)*	Disable *(disable)*	Homemaker *(homemaker)*	Rentier *(rentier)*
insurance	46.02%	29.78%	2.68%	3.98%	16.14%	1.40%
Not Insured	50.30%	28.18%	2.49%	4.04%	13.88%	1.12%

Note: insurance: N= 4087 ;Not Insured: N=14793

d. Physical health status and health system (%):

	Health care[1] *(healthcare)*	Health behavior *(healthbehavior)*		Health self-reported *(healthself_reported)*		Chronic disease *(chronicdiseases)*	Financing health systems		
	Yes	Good	Bad	Good	Bad	Yes	Beveridge *(beveridge)*	Bismark *(bismarck)*	Other *(other)*
insurance	94.68%	42.78%	57.22%	70.31%	29.69%	73.46%	32.59%	50.23%	17.18%
Not Insured	93.88%	39.63%	60.37%	64%	36%	75.01%	53.84%	41.81%	4.35%

Not Insured: *Health care*: N=12357; *Health behavior*: N= 2069; *Health self-reported*: N=15091; *Chronic disease*: N=12357; Financing health systems: N=12537.
insurance: *Health care*: N=4552; *Health behavior*: N= 353; *Health self-reported*: N=4167; *Chronic disease*: N=4552; Financing health systems: N=4989.

Source: Author's considerations based on the micro data of SHARE, first and second wave

Table VII: Sample characteristics of insured (specialist=1; chdoctor=1; dental=1; nurse=1)

a. Insured characteristics by insurance status (%):

	Gender *(fem)*		Age (years) *(age1)*				Education (year) *(educ_plus13)*	
	Male	Female	50-59	60-69	70-79	= 80	<13	=13
specialist	43.98%	56,02%	28,62%	32,84%	25,94%	12,60%	77,34%	22,66%
chdoctor	44.01%	55,99%	28,08%	33,03%	25,71%	13,18%	77,34%	22,66%
dental	43.88%	56,12%	29,54%	31,13%	25,87%	13,46%	75,18%	24,83%
nurse	42.94%	57,06%	28,43%	32,13%	25,72%	13,72%	76,66%	23,33%

	Marital Status *(maritalstatus)*				Trust (trust)	
	Married or living together with partner	Separated or divorced	Never married	Widowed	No Trust (0)	Trust (1)
specialist	71,53%	6,44%	5,43%	16,60%	33.26%	66.74%
chdoctor	71.31%	6.49%	5.08%	17.12%	32.21%	67.79%
dental	70%	5.66%	7.89%	16.45%	33.31%	66.69%
nurse	68,1%	6,78%	6,78%	18,35%	33.42%	66.58%

Note:
specialist: *Female*: N=1935; *Age* (years): N= 1897; *Education* (years): N=1898; *Marital status*: N=994; *Trust*: N=1798.
chdoctor: *Female*: N=1545; *Age* (years): N= 8091; *Education* (years): N=1517; *Marital status*: N=847; *Trust*: N=1441.
dental: *Female*: N=1666; *Age* (years): N=1635; *Education* (years): N=1639; *Marital status*: N=760; *Trust*: N=1563.
nurse: *Female*: N=1239; *Age* (years): N=1217; *Education* (years): N=1217; *Marital status*: N=605; *Trust*: N=1158.

b. The overall income per capita in euros, after tax, that the entire household had in an average moth in previous years (%):

	1	2	3	4	5	6	7	8	9	10
specialist	5,14%	9,88%	10,99%	6,96%	9,07%	10,89%	11,69%	9,88%	11,69%	13,81%
chdoctor	5,45%	9,6%	10,51%	6,87%	9,21%	10,77%	11,93%	9,73%	11,93%	14,01%
dental	4,48%	8,42%	11,3%	7,61%	9,34%	11,3%	12,46%	9,46%	11,65-5	13,61%
nurse	4,62%	8,42%	11,39%	8,09%	9,41%	11,88%	12,05%	9,24%	9,9%	15,02%

Note:

specialist: N= 992; chdoctor: N= 771. dental: N= 867; nurse: N= 606

Monthly income per capita by deciles, where 1 (0 to195), 2 (196 to 333), 3 (334 to 500), 4(501 to 650), 5(651 to 846), 6 (847 to 1085), 7 (1085 to 1455), 8(1456 to 2013), 9(2014 to 4250) and 10(4250 to highest).

c. Occupational Status(%)

	Retired *(retired)*	Employed *(employed)*	Unemployed *(unemployed)*	Disable *(disable)*	Homemaker *(homemaker)*	Rentier *(rentier)*
specialist	50,11%	27,73%	2,89%	3,32%	15,77%	1,16%
chdoctor	50,83%	27,32%	2,61%	3,42%	15,6%	1,32%
dental	50,87%	26,77%	3,22%	3,79%	15,13%	1,35%
nurse	48,92%	28,31%	2,65%	4,39%	15,57%	0,98%

Note:

Specialist: N= 1868.chdoctor:N= 1493.dental: N=1610 nurse: N= 1220.

d. Physical health status and health system (%):

	Health care[1] *(healthcare)*	Health behavior *(healthbehavior)*		Health self-reported *(healthself_reported)*		Chronic disease *(chronicdiseases)*	Financing health systems		
	Yes	Good	Bad	Good	Bad	Yes	Beveridge *(beveridge)*	Bismark *(bismarck)*	Other *(other)*
insurance	94.68%	42.78%	57.22%	70.31%	29.69%	73.46%	32.59%	50.23%	17.18%
Not Insured	93.88%	39.63%	60.37%	64%	36%	75.01%	53.84%	41.81%	4.35%
specialist	94.94%	50.18%	49.82%	41.31%	58.69%	75.74%	42.89%	53.28%	3.83%
chdoctor	94.60%	47.45%	52.16%	57%	43%	76.1%	44.21%	50.74%	5.05%
dental	95.40%	43.87%	56.13%	60.80%	39.20%	74.95%	34.09%	65.07%	0.84%
nurse	94.93%	46.03%	53.97%	58.71%	41.29%	76.81%	39.31%	56.34%	4.35%

specialist: *Health care*: N=1896; *Health behavior*: N= 283; *Health self-reported*: N=1905; *Chronic disease*: N=1904; Financing health systems: N=1935.
chdoctor: *Health care*: N=1519; *Health behavior*: N= 232; *Health self-reported*: N=1528; *Chronic disease*: N=1527; Financing health systems: N=1545.
dental: *Health care*: N=1630; *Health behavior*: N= 212; *Health self-reported*: N=1649; *Chronic disease*: N=1666; Financing health systems: N=1666.
nurse: *Health care*: N=1224; *Health behavior*: N= 212; *Health self-reported*: N=1228; *Chronic disease*: N=1229; Financing health systems: N=1239.

Source: Author's considerations based on the micro data of SHARE, first and second wave