

HEDG

HEALTH, ECONOMETRICS AND DATA GROUP

WP 18/29

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October 2018

<http://www.york.ac.uk/economics/postgrad/herc/hedg/wps/>

Reasons for unmet needs for health care: the role of social capital and social support in some Western EU countries

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Abstract

This paper focuses on the demand side factors that determine access to health care and analyses the issues of unmet needs for health care and the reasons thereof in western EU countries. A probit model is estimated from a sample of the whole population, accounting for the possibility of individual selection in unmet needs for health care (UN) (selection equation). Expanded probit models (including the inverse Mills ratio) are then used on the reasons for unmet needs (RUN) with social capital and social support as determinants and using the European Union Statistics on Income and Living Conditions (EU-SILC) dataset carried out in 2006. In RUN equations, the findings show that females, large households, people with low income and financial constraints, the unemployed and those in poor health have a higher probability of declaring unmet needs due to economic costs. Additionally, people in tertiary education, those with high income and the employed have a higher probability of not visiting a doctor when needed due to time availability. Furthermore, the frequency of contact with friends and the ability to ask for help are correlated with a lower probability of unmet needs due to economic costs, while the frequency of contact with relatives is related with a lower probability of unmet needs due to time availability and distance. However, the ability to ask for help is also correlated with a higher probability of not having medical care due to time availability and the wait-and-see-approach.

Keywords. Unmet needs for healthcare, reasons for unmet needs, social capital, social support, EU Western countries, EU-SILC data, Heckman selection model

JEL classification: C35, I12, I18, Z1

1. Introduction

Access to health care – whether or not individuals who need care are admitted to the health care system - is a fundamental determinant of health (Aday and Andersen 1975). Access to health care and universal coverage characterise many health care systems in Europe (McKee et al. 2013; Toth 2016). Nevertheless, more than 1.5 million Europeans declared unmet needs for health care at the beginning of the economic crises in Europe (Reeves et al. 2015). The concept of unmet needs, defined as individuals' subjective assessments that they have not received the care that they need (Allin et al. 2010), represents a measure used to monitor accessibility to health care (Herr et al. 2013; Fjaer et al. 2017). The use of subjective unmet needs for health care allows us both to account for those perceived medical needs that do not turn into demand and to investigate the subjective barriers that individuals with health needs meet in accessing medical care (Cavalieri 2013). The literature explains unmet needs for health care with both the features of the health care system and the characteristics of the individuals seeking care. The former considers such factors as availability of service, waiting times before receiving care, referral patterns and the booking system. The latter judges patients' socio-economic status, lifestyle, health status, social capital and social support (Allin and Masseria 2009; Bryant et al. 2009; Herr et al. 2013).

This study focuses on the patient-side factors that determine access to health care and analyses the issues of unmet needs (UN) and the reasons for unmet needs for health care (RUN) with a focus on social capital and social support for 14 EU countries, using the European Union Statistics on Income and Living Conditions (EU-SILC) dataset from 2006. While in health economics and the public health literature there are extensive studies that maintain the importance of the role of social capital and support in improving health status (see Kumar et al. 2012; Fiorillo and Sabatini 2015), with respect to health care access scant attention has been paid to social capital and social support as predictors (Deroose and Varda 2009). Indeed, social capital and social support can play a role in ensuring access to health care services and facilities through economic, material and psychological support.

This paper has two main objectives: first, to study the determinants of UN with a particular focus on social capital and social support; second, to analyse whether social capital and social support are predictors of RUN. In pursuing its aims, the paper uses probit models to account for the possibility of individual selection in unmet needs for health care by using a Heckman selection model. To the best of our knowledge this is the first empirical study that addresses the role of social capital and social support as predictors of RUN in EU countries.

The remainder of the paper is structured as follows. "Related literature and hypotheses" reviews the related literature focusing on social support and social capital and provides our empirical hypotheses. "Data" and "Methodology" describe data and the descriptive statistics, and set up the empirical models used in the analysis. The estimation results are presented in "Results" and summarised in the "Summary", followed by a brief conclusion.

2. Related literature and hypotheses

In the health economics and public health literature the positive association between health, social support and social capital, such as social trust, social relations and membership in various kinds of associations, is one of the most robust findings. According to Song (2011), social support represents various forms of aid which individuals receive or perceive from their network members such as emotional support (e.g. care), instrumental support (e.g. goods and services) and informational support (e.g. knowledge and skills). Following Putnam (1993), social capital is usually referred to as "features of social organisation such as trust, norms and networks that can improve the efficiency of society by facilitating coordinated actions" (Putnam 1993, 167). Social capital can be both an individual and collective attribute and presents a cognitive and a structural component (Uphoff 1999; Kawachi et al. 2004). On the one hand, while community social capital concerns the aggregate level of trust, interactions and networks in the community, individual social capital indicates the social capital of a particular individual. On the other, cognitive social capital derives from individuals' perceptions resulting in norms, values and beliefs while structural social capital concerns individuals' behaviour and mainly takes the form of networks.

The literature has proposed several mechanisms for the potential positive relationship between social support, social capital and individual health: (1) Social capital and social support may provide information regarding the appropriate doctor and treatment fostering matching procedure, as a result of more intense social relations. (2) Social capital and social support can play a role in ensuring access to health care services and facilities through financial assistance, transportation services and help in dealing with doctors. (3) Social capital and social support may provide moral and effective support which mitigates the psychological distress related to sickness (buffering effect).

In the health care access literature, measured also through unmet needs, much research has focused on individual characteristics such as socio-demographics and health status. Studies have reported lower health care access for women, younger people, those with secondary and tertiary education, those on low income, the unemployed and those with poor health status

(Ahs and Westerling 2006; Allin et al. 2010; Chaupain-Guillot and Guillot 2015; Litaker and Ezra Love 2005; Lee et al. 2015).

However, there has recently been increasing interest in the role of social factors, such as social capital and social support, above and beyond individual factors (Derose and Varda 2009). Derose and Varda (2009) present the first systematic review of the literature on the relationship between social support and social capital and access to health care. Focusing on structural and cognitive social capital at individual level, Lindstrom et al. (2006), for Sweden, and Wan and Lin (2003), for Kazakhstan, find that individual structural and cognitive social capital (membership of organisations and general trust) is positively correlated, respectively, with access to regular medical and health services. Moving on an aggregate level, Greenberg and Rosenheck (2003) and Hendryx et al. (2002), for the US, show that indexes of aggregate structural and cognitive social capital (membership of organisations and general trust) are related, respectively, positively and negatively with the regularity of health care and access problems. Moreover, Perry et al. (2008) for the US find a negative relationship between social support and barriers to health care. Finally, Bryant et al. (2009) for Canada show a negative relationship between individual structural social capital (membership of organisations) and unmet healthcare needs while the association between social support and unmet needs is not statistically significant.

The present paper tries to fill two gaps existing in previous investigations. The first concerns the research conducted on European countries: there are few studies which have analysed the link between social capital, social support and unmet needs for health care in European countries. The second lacuna concerns the reasons for unmet needs. The literature considers three categories, including accessibility (related to cost and proximity), availability (related to timely provision of health service) and acceptability (related to personal attitudes and circumstances) (Pappa et al. 2013). While some studies examine the correlates of these categories (Chen and Hou 2002; Cavalieri 2013; Fjaer et al. 2017), they do not regard social capital and social support as determinants.

Our hypothesis is that networks of social relations are places in which to share economic, material and psychological support to cope with healthcare issues. Indeed, economic support may cover the out-of pocket costs of health care, material support may resolve issues concerning lack of time as well as transport, while psychological support may overcome the “wait-and-see” attitude in making medical appointments and seeking treatment. Hence our prediction is that social capital and social support variables are associated with a lower

probability of unmet needs for health care due to economic costs, time availability, proximity and personal attitudes.

3. Data and descriptive statistics

The data come from the Income and Living Conditions Survey carried out by the European Union's Statistics on Income and Living Conditions (EU-SILC) in 2006. The EU-SILC database provides comparable cross-section and longitudinal information on income, poverty, social exclusion and living conditions in European countries. The 2006 wave of EU-SILC contains cross-sectional data on income, education, health, demographic characteristics, housing features, neighbourhood quality, size of municipality, and social and cultural participation. Information on social and cultural participation regards respondents aged 16 and above. No panel dimension is available.

We carry out the empirical investigation on 14 Member States of the EU: Austria (AT), Belgium (BE), Germany (DE), Denmark (DK), Spain (ES), Finland (FI), France (FR), Greece (GR), Ireland (IR), Italy (IT), the Netherlands (NL), Portugal (PT), Sweden (SE) and the United Kingdom (UK). These EU countries shared universal (or near universal) health coverage (UHC) in 2006 (OECD 2013). UHC is in place where (i) there is legislation explicitly stating that the entire population is covered by a defined health plan and (ii) that population has access to at least skilled attendance at birth and 90% of them have insurance coverage (Stuckler et al. 2010; McKee et al. 2013).

Unmet needs

Access to health care is addressed through a question on subjective unmet needs for health care. The phrasing is as follows: "Was there any time during the last twelve months when, in your opinion, you needed a medical examination or treatment for a health problem but you did not receive it?". Individuals who respond positively – "Yes, there was at least one occasion when I really needed examination or treatment but did not receive it" – are then asked to give the main reason why they failed to access health care. Eight possible answers are provided: (1) "Could not afford to (too expensive)", (2) "Waiting list"; (3) "Could not take time because of work, care for children or for others"; (4) "Too far to travel/no means of transport"; (5) "Fear of doctors/hospitals/examination/treatment"; (6) "Wanted to wait and see if the problem got better on its own"; (7) "Didn't know any good doctor or specialist"; (8) "Other reasons".

Our first dependent variable is *Unmet needs*, coded 1 if the individual reported that, at least once in the past 12 months, he/she needed a medical examination or treatment but did not consult a doctor, whatever the reason. Furthermore, because our hypothesis is that social capital and social support provide economic, material and psychological support able to cope with healthcare issues, we restrict the analysis to the reasons for unmet needs related to cost, proximity, personal attitudes and circumstances. Hence, we build the following variables:

Expensive coded 1 if the reason for unmet needs is “Could not afford to (too expensive)”.

No time equal to 1 if the reason for unmet needs is “Could not take time because of work, care for children or for others”.

Distance coded 1 is the reason for unmet needs is “Too far to travel/no means of transport”.

Wait and see equal to 1 if the reason for unmet needs is “Wanted to wait and see if the problem got better on its own”.

Social capital and social support

Social capital and social support are measured through the module on social participation in which an individual is asked to report the frequency of getting/being in contact with relative and friends, ability to ask for help, participation in formal voluntary activities and participation in activities of other formal organisations.

Four (structural) social capital variables are built: *Relatives*, *Friends*, *Volunteering* and *Group*. *Relatives* and *Friends* are dummy variables that are equal to 1 if the respondent had contact, respectively, with relatives and friends every day during a usual year. *Volunteering* is a dummy variable that is equal to 1 if the respondent worked unpaid for charitable organisations, groups or clubs during the previous twelve months. *Group* is a dummy variable that is equal to 1 if the respondent, during the last twelve months, participated in an activity of at least one of the following organisations: political parties or trade unions, professional, religious, recreational and other organisations.

Social support is evaluated by considering the individual's ability to ask for help whether or not the individual needed it. *Ability to ask* is a dummy variable equal to 1 if the respondent had the ability to ask for help from any relative, friend or neighbour (those who do not live in the same household as the respondent should be considered).

Control variables

In order to account for factors that may simultaneously influence health care access and social capital and support, we include in the analysis a full set of control variables: demographic characteristics as well as socioeconomic features.

We account for gender (*female*), marital status (*married*), age (*age 30-39*, *age 40-49*, *age 50-59*, *age 60-69*, *age 70-79*, *age 80*), the number of individuals living in the household (*household size*) and the respondent's country of birth (*EU birth*). Based on the International Standard Classification of Education (ISCED), three indicators are built to represent the level of education attained (*low secondary*, *secondary* and *tertiary*), while four variables account for economic features: the natural logarithm of annual net household income (*household income(ln)*), tenure status (*homeowner*), arrears on utility bills (*utility arrears*) and incapacity to face unexpected financial expenses (*unexpected expenses*). We further control for self-defined current economic status (*employed*, *unemployed*, *inactive*) and for health status: self-perceived good health (*SPGH*), self-perceived bad health (*SPBH*), chronic (long-standing) illness or condition (*CC*) and limitations in activities of daily living (*limits ADLs*). We also control for categories of the size of municipality (*densely populated area*, *intermediate area*) and for country-fixed effects to account for the high heterogeneity in health care access existing in EU countries.

Sample selection variables

Individuals' recognition of their needs for services and their decisions to seek medical care form the first step in the process of accessing services. The probability of using care services depends on the balance between individuals' perceptions of their needs and their attitudes, beliefs and previous experiences with health services. Access to health services implies that individuals accept their need for services and acknowledge socially generated resources that they are willing to utilise. Such processes of access are subject to social and cultural influences as well as environmental constraints (Gulliford et al. 2002). Hence, in order to identify the exclusion variables that may account for the possibility that an individual selection himself in unmet needs for health care answers (selection equation), we use two variables of subjective perception of the quality of the surrounding environment where an individual lives - *noise* and *crime* – and a variable that considers general practitioners (per 1000 population), *Gps*. These variables are supposed to discourage health care access and are uncorrelated with the reasons for unmet health care needs.

Descriptive statistics

The international sample includes about 260000 respondents. After removing unselected respondents and missing variables (about 5% of the sample) on the key dependent and independent variables, the final data set is a cross-section sample of about 205000 observations of which about 12000 concern unmet needs for health care.

Table 1 presents the summary weighted statistics of the unmet needs, social capital and social support variables while Table 2 reports the weighted correlation matrix. In the whole sample 7 percent of individuals aged 16 and over indicated that, at least once in the last twelve months, they needed a medical examination or treatment but did not receive it. In terms of the key independent variables, respectively 83 percent of individuals have the ability to ask for help (from any relative, friend or neighbour), 57 and 63 percent of individuals meet relatives and friends every day during a usual year, and 43 percent participate in an activity of at least one organisation. Finally, 8 percent of the sample supply volunteering in formal organisations. Note that the dependent variable and the key independent variables are negatively correlated (Table 2).

Among respondents who experienced unmet needs, one-third reported that they did not access care because it was *Expensive*. The other reasons quoted are *Wait and see* (21%), *No time* (12.9%). The least mentioned is *Distance* (Table 3). The weighted correlation matrix between reasons for unmet needs and social capital and social support is shown in Table 4. Table 5 presents weighted descriptive statistics of control and sample selection variables.

4. Methodology

To study the relationship between social capital, social support and reasons for unmet needs we need to reflect on the self-selection of an individual in the health care services. An individual may choose to stay out of the health care services because of perceived problems regarding the quality of the surrounding environment where he/she lives. Thus we use a selection model which takes into account the possibility of selection of an individual into health care services (selection into the sample). The model consists of two probit equations: an unmet needs (UN) equation and a reasons for unmet needs (RUN) equation (Maddala 1983; Cameron and Trivedi 2005; Green 2012).

Table 1. Weighted descriptive statistics of unmet needs, social capital and social support

	Mean	Std. dev.	Min	Max
Unmet needs	0.071	0.257	0	1
Relatives	0.571	0.494	0	1
Friends	0.634	0.482	0	1
Volunteering	0.083	0.275	0	1
Group	0.435	0.496	0	1
Ability to ask	0.843	0.363	0	1
Observations	205832			

Source: EU-SILC UDB 2006 – version 1 of March 2008 (Author's calculations)

Table 2. Weighted correlation between unmet needs, social capital and social support

	Relatives	Friends	Volunteering	Group	Ability to ask
Unmet needs	-0.036**	-0.045**	-0.008**	-0.021**	-0.009**

Note: ** Significant at 5% level

Source: EU-SILC UDB 2006 – version 1 of March 2008 (Author's calculations)

Table 3. Weighted descriptive statistics of reasons for unmet needs

	Mean	Std. dev.	Min	Max
Expensive	0.326	0.469	0	1
No time	0.129	0.336	0	1
Distance	0.013	0.113	0	1
Wait and see	0.208	0.406	0	1
Observations	11783			

Source: EU-SILC UDB 2006 – version 1 of March 2008 (Author's calculations)

Table 4. Weighted correlation between reasons for unmet needs, social capital and social support

	Relatives	Friends	Volunteering	Group	Ability to ask
Expensive	-0.007	-0.064**	-0.065**	-0.094**	-0.038**
No time	-0.013	-0.062	0.027**	0.024**	0.082**
Distance	-0.014	0.006	0.007	0.009	0.010
Wait and see	-0.011	0.018	0.006	0.031**	0.129**

Note: ** Significant at 5% level

Source: EU-SILC UDB 2006 – version 1 of March 2008 (Author's calculations)

Suppose that z_i is a dichotomous latent variable associated with the decision to access health care services. This can be expressed as

$$z_i = Z_{1i}\beta_1 + \alpha SC_i + \theta SS_i + \varepsilon_{1i} \quad (1)$$

Table 5. Weighted descriptive statistics of control and sample selection variables

	Mean	Std. dev.	Min	Max
Female	0.527	0.499	0	1
Married	0.541	0.498	0	1
Age 30-39	0.178	0.382	0	1
Age 40-49	0.187	0.390	0	1
Age 50-59	0.154	0.361	0	1
Age 60-69	0.136	0.343	0	1
Age 70-79	0.103	0.305	0	1
Age 80	0.051	0.220	0	1
Household size	2.765	1.327	1	16
EU birth	0.013	0.113	0	1
Lower secondary education	0.226	0.418	0	1
Secondary education	0.393	0.488	0	1
Tertiary education	0.231	0.422	0	1
Household income (ln)	10.130	0.719	1.098	14.664
Homeowner	0.666	0.472	0	1
Utility arrears	0.063	0.243	0	1
Unexpected expenses	0.307	0.461	0	1
Employed	0.518	0.500	0	1
Unemployed	0.053	0.224	0	1
Inactive	0.205	0.404	0	1
SPGH	0.652	0.476	0	1
SPBH	0.100	0.298	0	1
CC	0.316	0.465	0	1
Limits ADLs	0.254	0.435	0	1
Densely populated area	0.499	0.500	0	1
Intermediate area	0.283	0.450	0	1
Noise	0.250	0.433	0	1
Crime	0.170	0.375	0	1
GPs ^a	0.972	0.365	0.3	2.1
AT	0.025	0.158	0	1
BE	0.032	0.175	0	1
DK	0.010	0.100	0	1
ES	0.136	0.343	0	1
FI	0.008	0.091	0	1
FR	0.052	0.222	0	1
GR	0.034	0.182	0	1
IR	0.008	0.088	0	1
IT	0.188	0.390	0	1
NL	0.027	0.162	0	1
PT	0.033	0.179	0	1
SE	0.016	0.127	0	1
UK	0.167	0.373	0	1
Observations	205832			

Source: EU-SILC UDB 2006 – version 1 of March 2008 (Author's calculations)

a. OECD (2007) (Author's calculations)

where Z_{1i} is a vector containing individual characteristics that influence the decision to enter health care services, SC_i, SS_i are individual social capital and social support variables, β_1 , α and λ are vectors of parameters to be estimated and ε_{1i} is a random error term. UN_i is unobservable but relates to the observable binary variable UN_i , which takes the value of 1 if the individual chooses to stay out of the health care services and 0 otherwise.

The reason for unmet needs equation can be written as

$$RUN_i^* = Z_{2i}\beta_2 + \delta SC_i + \phi SS_i + \varepsilon_{2i} \quad (2)$$

where RUN_i^* is the dichotomous latent variable indicating the reason for unmet needs for health care, SC_i, SS_i are individual social capital and social support variables, Z_{2i} is a matrix of all control variables, β_2 , δ , ϕ , are parameters to be estimated and ε is a random error term.

Equation (2) is the equation of primary interest. However, RUN_i is observed only when $UN_i = 1$. Hence, fitting (2) to the observed data raises the question of selection bias. The proposed solution involves two steps:

Step 1. Estimate the probit model (1) by likelihood techniques;

Step 2. Fit the expanded probit model

$$P(RUN_i = 1) = \Phi(Z_{2i}\beta_2 + \delta SC_i + \phi SS_i + \varphi\lambda_i) \quad (3)$$

to the data on individuals i with $UN_i = 1$. This time $\lambda_i = \phi(Z_{1i}\beta_1) / \Phi(Z_{1i}\beta_1)$ is the inverse Mills ratio for the unmet needs equation where $\phi(.)$ is the normal probability distribution and $\Phi(.)$ is the normal cumulative distribution.

5. Results

In this section we present estimations of the empirical models described in Section 4. We start by estimating the unmet needs equation (1) and we compute the inverse Mills ratio. The estimates are shown in Table 6. Then we fit the expanded probit model (3) for *Expensive*, *No time*, *Distance* and *Wait and see*. For all estimates, we compute the robust standard errors.

5.1. Unmet needs for health care

Table 6. Results for unmet needs equation

	dy/dx	Robust Std. Err.
Noise	0.013***	0.001
Crime	0.010***	0.001
GPs	-0.101***	0.004
Relatives	-0.002**	0.001
Friends	-0.006***	0.001
Volunteering	0.005***	0.001
Group	0.006***	0.001
Ability to ask	-0.010***	0.002
Female	0.001	0.001
Married	-0.001	0.001
Age 30-39	0.012***	0.002
Age 40-49	0.010***	0.002
Age 50-59	0.000	0.002
Age 60-69	-0.006***	0.002
Age 70-79	-0.011***	0.002
Age 80	-0.016***	0.002
Household size	0.000	0.000
EU birth	0.001	0.003
Lower secondary education	-0.005***	0.001
Secondary education	-0.005***	0.001
Tertiary education	-0.003**	0.001
Household income (ln)	-0.006***	0.001
Homeowner	-0.002**	0.001
Utility arrears	0.045***	0.002
Unexpected expenses	0.024***	0.001
Employed	0.015***	0.002
Unemployed	0.013***	0.003
Inactive	0.003**	0.002
SPGH	-0.026***	0.001
SPBH	0.003**	0.001
CC	0.003***	0.001
Limits ADLs	0.025***	0.002
Densely populated area	0.002**	0.001
Intermediate area	0.001	0.001
AT	-0.010***	0.002
BE		
DK	-0.038***	0.001
ES	-0.023***	0.001
FI	-0.039***	0.001
FR	0.063***	0.008
GR	-0.041***	0.001
IR	-0.039***	0.001
IT	-0.025***	0.001
NL	-0.042***	0.001
PT	0.047***	0.006
SE	-0.009***	0.002
UK	-0.038***	0.001
Observations	190486	
Pseudo R ²	0.121	
Log likelihood	-36141.52	

Note: *, **, *** Significant at 10, 5 and 1 percent level, respectively.

Source: EU-SILC UDB 2006 – version 1 of March 2008 (Author's calculations)

Looking first at demographic and socioeconomic characteristics, gender and marital status are not statistically significant. The same findings are found for household size and country of origin.

The probability of reporting unmet needs is negatively and significantly correlated with age. The youngest age groups remain at the highest risk of unmet needs. By contrast, older people are more likely to see a doctor when they feel they need to.

The probability of not visiting a doctor when needed is weaker among individuals with higher education than individuals with lower education. Moreover, individuals with tertiary education have a higher likelihood of declaring unmet needs than individuals with secondary education. Following the literature a possible explanation is that individuals with tertiary education have greater time constraints which may lead them to postpone medical visits and treatment (Chaupain-Guillot and Guillot 2015).

The likelihood of forgoing medical examination or treatment is correlated with the economic situation of the household. Individuals living in higher-income households with home ownership are less likely to report unmet medical treatment. Individuals who have arrears on utility bills and are unable to cope with unexpected financial expenses present, respectively, a 4.5 and 2.4 percent higher probability of declaring unmet needs for health care. Hence, the poor household economic situation is a burden in healthcare access. Furthermore, the likelihood of declaring unmet healthcare needs is also positively correlated with occupational status: employed, unemployed and inactive. While for those employed a feasible explanation of unmet needs may be that they have “time constraints”, for the unemployed unmet needs may be due to the economic burden (Lee et al. 2015). Finally, the probability of declaring unmet needs has a strong positive relationship with poor perceived health. Individuals perceiving to be in poor or very poor health are more likely to declare unmet medical needs (the opposite holds for individuals who perceive good and very good health). Having a chronic condition is also positively correlated with the probability of experiencing an unmet medical need, as is the fact of being hampered in daily activities because of health problems. These results may reveal the fact that less healthy people have multiple or recurrent care needs but they might decide to forgo or delay some examinations or treatment due to the economic burden involved.

These findings on demographic and socioeconomic characteristics are overall consistent with previous studies mentioned in Section 2 (Ahs and Westerling 2006; Allin et al. 2010; Chaupain-Guillot and Guillot 2015; Litaker and Ezra Love 2005; Lee et al. 2015).

Looking at social capital and social support, we find that all variables are statistically significant but with mixed sign. On the one hand, individuals with a higher frequency of visiting relatives and friends, and those with a higher ability to ask for help have a lower probability of reporting unmet needs. On the other, individuals who offer voluntary work and participate in at least one formal organisation are more likely to forgo medical examination or treatment. The former findings may find an explanation in the observation that networks of social relations (friends and family) are a place to share economic, material and psychological support to help cope with healthcare issues. By contrast, volunteering and participation in formal organisations may operate as temporal, economic and psychological constraints in health care access. We test these potential explanations in section 5.1

With regard to sample selection variables, we show that all variables are statistically significant with different sign. The quality of the surrounding environment where the individuals live, measured by *noise* and *crime*, enter in the unmet needs equation with positive sign. In other words, the lower the perceived environmental quality where an individual lives, the greater is the likelihood of not visiting a doctor when needed. Instead, the number of general practitioners (per 1000 inhabitants) presents a negative sign, indicating that as the number of *GPs* rises, the probability of declaring unmet needs decreases.

Finally, looking at the country-fixed effect, taking Germany as a reference category, we show that France and Portugal have a higher probability of unmet needs, respectively, with 6.3 and 4.7 percent, while the Netherlands and Greece a lower likelihood (4.2 and 4.1 percent).

5.1. Reasons for unmet needs

Regarding demographic and socioeconomic characteristics, "female" is found positively associated with *Expensive* and negatively related to *Wait and see*. This shows that women are more likely to experience unmet needs due to cost but they are less willing to wait and see when they need to visit a doctor. Marital status is negatively correlated with *Distance*, indicating that a spouse is a material support when needed. Age is shown negatively associated with the likelihood of declaring unmet needs due to cost (70 years and over) and time availability (50 years and over). These results seem to indicate that older people have a better economic status and more time availability than younger individuals.

Table 7. Results regarding reasons for unmet needs	Expensive		No time		Distance		Wait and see	
	dy/dx	Robust	dy/dx	Robust	dy/dx	Robust	dy/dx	Robust
		Std. Err.		Std. Err.		Std. Err.		Std. Err.
Mills ratio	0.039	0.059	-0.049	0.037	-0.000	0.010	0.157***	0.048
Relatives	0.017*	0.009	-0.012**	0.006	-0.004***	0.002	-0.007	0.007
Friends	-0.021**	0.010	-0.013**	0.006	0.001	0.002	0.004	0.008
Volunteering	0.012	0.018	-0.013	0.009	-0.000	0.003	0.010	0.013
Group	-0.015	0.010	-0.000	0.006	0.002	0.002	0.010	0.008
Ability to ask	-0.102***	0.017	0.028***	0.009	0.004*	0.002	0.028**	0.012
Female	0.034***	0.009	0.007	0.006	0.001	0.001	-0.021***	0.007
Married	-0.010	0.011	0.007	0.007	-0.005***	0.002	-0.002	0.009
Age 30-39	0.019	0.019	0.003	0.011	0.005	0.004	-0.010	0.014
Age 40-49	0.008	0.018	-0.007	0.010	0.003	0.003	0.006	0.014
Age 50-59	0.021	0.019	-0.039***	0.009	0.002	0.003	-0.004	0.014
Age 60-69	0.001	0.022	-0.049***	0.011	-0.000	0.036	-0.009	0.017
Age 70-79	-0.070***	0.022	-0.059***	0.012	0.003	0.005	0.003	0.022
Age 80	-0.130***	0.020	-0.039*	0.019	0.018**	0.012	0.021	0.031
Household size	0.015***	0.004	-0.000	0.003	-0.002***	0.001	-0.001	0.003
EU birth	0.083**	0.042	0.006	0.023	0.011*	0.009	-0.044*	0.024
Lower secondary education	-0.020	0.014	-0.005	0.010	-0.002	0.002	-0.005	0.012
Secondary education	-0.020	0.014	0.008	0.010	-0.003	0.002	-0.013	0.012
Tertiary education	-0.051***	0.016	0.027**	0.012	-0.005**	0.002	-0.017	0.013
Household income (ln)	-0.070***	0.009	0.021***	0.006	0.003*	0.001	-0.001	0.007
Homeowner	-0.030***	0.011	0.006	0.007	-0.000	0.002	0.008	0.009
Utility arrears	0.128***	0.027	-0.031**	0.013	0.000	0.004	0.005	0.021
Unexpected expenses	0.193***	0.017	-0.042***	0.011	0.001	0.003	-0.015	0.014
Employed	-0.050**	0.020	0.128***	0.015	-0.007**	0.004	0.002	0.017
Unemployed	0.042*	0.026	0.039*	0.023	-0.006**	0.002	-0.022	0.019
Inactive	-0.034**	0.016	0.056***	0.018	-0.001	0.002	-0.002	0.015
SPGH	-0.011	0.019	0.010	0.012	-0.000	0.003	-0.020	0.015
SPBH	0.058***	0.015	-0.024**	0.010	0.003	0.002	-0.074***	0.010
CC	0.020*	0.012	-0.011	0.007	-0.000	0.002	-0.018*	0.009
Limits ADLs	0.019	0.018	-0.013	0.011	0.001	0.003	0.032**	0.015
Densely populated area	0.018	0.012	0.013*	0.008	-0.012***	0.002	-0.041***	0.009
Intermediate area	0.033***	0.012	0.003	0.008	-0.006***	0.001	-0.030***	0.009
AT	-0.162***	0.021	0.218***	0.064	0.005	0.014	-0.088***	0.022
BE	0.065	0.104	0.048	0.084	0.038	0.061	-0.147***	0.008
DK	-0.077	0.062	0.581***	0.100	0.003	0.017	-0.154***	0.004
ES	-0.272***	0.007	0.227***	0.021	0.006	0.005	-0.008	0.014
FI	-0.058	0.038	-0.092***	0.010	-0.007	0.002	-0.163***	0.004
FR	-0.076***	0.023	0.124***	0.033	0.023**	0.015	-0.093***	0.014
GR	0.150***	0.029	0.071***	0.023	0.015**	0.009	-0.155***	0.006
IR	-0.026	0.041	-0.027	0.031	0.004	0.010	-0.150***	0.006
IT	-0.012***	0.017	0.073***	0.015	-0.002	0.003	-0.164***	0.009
NL	-0.196***	0.013	0.108**	0.062	-0.001	0.008	-0.159***	0.004
PT	0.128***	0.041	0.043	0.032	0.006	0.009	-0.169***	0.005
SE	-0.198***	0.011	0.057***	0.021	-0.002	0.003	0.030	0.022
UK	-0.250***	0.006	-0.070***	0.011	-0.003	0.004	-0.149***	0.007
Observations	10646		10646		10646		10646	
Pseudo R ²	0.291		0.177		0.130		0.139	
Log likelihood	-4626.28		-3675.44		-700.71		-4555.63	

Note: *, **, *** Significant at 10, 5 and 1 percent level, respectively.

Source: EU-SILC UDB 2006 – version 1 of March 2008 (Author's calculations)

Household size is found to be positively associated to *Expensive* and negatively correlated with *Distance*. These findings seem to indicate that living in a large family generates two opposite effects: it increases the household costs of health care and it decreases the distance-related costs for accessing health care. Being born in EU countries is found to have a positive correlation with *Expensive* and *Distance* while a negative relationship with *Wait and see*. Thus individuals born in EU countries are more likely to declare unmet needs due to cost and proximity but a smaller probability due to personal attitudes.

Tertiary education and household income are both found negatively correlated with *Expensive* and positively associated to *No time*. Hence, people with more individual and household economic resources are less likely to experience unmet needs due to economic constraints. However, more time spent on procuring economic resources means less time available for visiting a doctor when needed. These explanations also seem to support results on the employed, which are negatively related to *Expensive* and positively to *No time*. Furthermore, tertiary education and home ownership are found negatively related, respectively, to *Distance* and *Expensive*. Financial constraints, i.e. utility arrears and unexpected expenses, are found positively correlated with the probability of unmet needs due to costs and negatively related to the likelihood of not visiting a doctor when needed due to the lack of time available. Being unemployed is shown to be positively correlated with a higher likelihood of declaring unmet needs due to cost and lack of time and with a smaller probability of unmet needs due to proximity. "Inactive" is found to be associated with *Distance* and *No time*, respectively, with negative and positive sign.

In terms of health status, self-perceived poor health and chronic conditions are associated with a higher probability of having unmet needs due to economic cost. Self-perceived poor health is also related to a lower probability of declaring unmet needs due to lack of time and personal attributes. The last result is also found for chronic conditions. Finally, limitations in ADLs is shown to be associated with a higher likelihood of needs being unmet due to a wait-and-see approach.

The findings indicating that females, younger individuals, those with tertiary education, low income, financial constraints, the unemployed and those with poor health status are more likely to declare unmet needs due to cost (accessibility) are in line with previous studies (Cavalieri 2013; Fjaer et al. 2017).

Moving on to social capital and social support, the frequency of visiting friends and ability to ask for help are negatively correlated with the likelihood of declaring unmet needs due to economic cost, respectively, at 2.1 and 10.2 percent. Instead, the frequency of visiting

relatives is positively associated with the probability of stating unmet needs due to economic cost at 1.7 percent. These results seem to indicate that friendship and ability to ask are important features in sharing economic support to cope with healthcare costs. Instead, visiting relatives seems to raise economic constraints to visiting a doctor when needed.

The frequency of visiting relatives is correlated with a lower probability of having unmet needs due to time availability and distance while ability to ask is found correlated with a 2.8 percent higher likelihood of not visiting a doctor due to time constraints. The former findings indicate that relatives are a source of shared material support in the event of healthcare issues. The latter results show that asking for help is a time-consuming activity which has the effect of postponing medical care.

Furthermore, ability to ask is found correlated with a 2.8 percent higher probability of declaring unmet needs due to a wait-and-see approach. This result appears to show that asking for help has another downside: individuals who do so can be persuaded to postpone a medical examination or treatment while waiting and seeing what happens.

Volunteering and participation in a formal group are never statistically significant in RUN equations. Thus *Volunteering* and *Group* are not correlated with unmet needs due to cost, time availability, proximity and a wait-and-see approach. As doing unpaid work and participating in a formal group is found significantly correlated with a greater likelihood of declaring (overall) unmet needs, we have to conclude that other personal attitudes and motivations are driving the results in the UN equation.

The inverse Mills ratio marginal effect is only statistically significant in the *Wait and see* equation and it is positive, meaning that there is an underestimation of the probability of declaring unmet needs due to personal attitudes if we do not account for the possibility that an individual selection himself in unmet needs for health care.

Looking at country-fixed effects, taking Germany as a reference category, Spain and the UK have, respectively, a 27.2 and 25.0 % lower probability of unmet needs due to economic cost. Denmark and Spain show a higher probability of declaring unmet needs due to time constraints (respectively 58.1 and 22.7 %) while the UK exhibits less probability (0.70 %). Portugal and Italy present a lower likelihood of unmet needs due to the wait-and-see approach (16.9 and 16.4 %, respectively).

6. Summary

The aims of the present analysis were to identify the role of social capital and social support in overall unmet needs for health care and determine the main causes for unmet needs, considering the demand side. Our analysis identified a positive role for the frequency of contact with relatives and friends and for the ability to ask for help but not for volunteering and participation in a formal group. In the UN equation, the frequency of contact with relatives and friends and the ability to ask for help are correlated with a lower probability of not visiting a doctor when needed. In RUN equations, the frequency of contact with friends and the ability to ask for help are related with a lower probability of unmet needs due to economic cost, while the frequency of contact with relatives is related with a lower probability of unmet needs due to time availability and distance. However, the ability to ask for help is also correlated with a higher probability of not having medical care due to time availability and a wait-and-see approach. Nevertheless, the overall marginal effects of *Ability to ask* is to reduce the probability of unmet healthcare needs. These findings seem to support the hypothesis according to which the network of social relations (family, friends and ability to ask) is a place to share economic and material support for coping with healthcare issues. However, the results also seem to indicate that asking for help is a time-consuming activity as well as a psychological activity which results in postponing medical treatment.

The results regarding demographic and socioeconomic characteristics confirm for western EU countries the findings of previous studies: young individuals, those with tertiary education, economic and financial constraints, the unemployed and those in poor health present a higher likelihood of reporting difficulties in meeting their health care needs.

For women, people living in large households, those with economic and financial constraints, the unemployed and those in poor health, the higher probability of declaring difficulties in meeting their health care needs is due to the burden of cost. Additionally, for people with tertiary education, in a high-income bracket and those employed, the greater probability of not visiting a doctor when needed is due to time constraints.

The objective of facilitating access to better and safer health care for European Union citizens is part of the EU Health Programme which is the main instrument used by the European Commission to implement EU health. In spite of the European Commission's efforts, the findings of this paper showed, first of all, that health inequalities among EU citizens are still high and, secondly, that it is important to consider economic and social factors that contribute substantially to the difficulties EU citizens encounter in accessing health care. Hence, EU health policies should also look at the demand side of health care

access, implementing measures designed to support individuals participating fully in employment and social life.

A limitation of the paper is reverse causality. Individuals who do not visit a doctor when needed might be forced to use their network of social relations against their will. Because the paper uses cross-sectional data it cannot rule out the possibility of reverse causality in driving the findings. Hence it cannot prove causality.

7. Conclusion

Even though access to health care and universal coverage characterise many health care systems in EU countries, economic costs and time availability appear to be barriers for European citizens in accessing health care. The network of social relationships (family and friends) of which the individual is part, combined with an ability to ask when necessary, plays a role in sharing economic and material support with a view to coping with healthcare barriers.

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