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**DOES SOCIAL ISOLATION AFFECT MEDICAL DOCTOR
VISITS? NEW EVIDENCE AMONG EUROPEAN OLDER
ADULTS**

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Does social isolation affect medical doctor visits? new evidence among European older adults

New evidence on elderly social isolation and medical doctor visits

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ABSTRACT

We have used panel data (2004-2015) from the Survey of Health, Ageing and Retirement in Europe (SHARE) to examine the impact of social isolation on general practitioner health care use. Socio-demographic, health and social isolation measures are analysed. Differences by welfare regimes have been also considered. Using two definitions of social isolation (*Alone* and *Help*), we have found that a sizeable proportion of those aged 50 years and older in Europe reported social isolation. Differences by welfare regimes are highlighted. Our findings provide several implications in current debates on the sustainability of welfare states.

Keywords

Europe; aging; social isolation; health care utilization; SHARE; count data models.

JEL classification

I10; I19

Declarations

Authors' contribution

All authors developed the idea and contributed to the concept and design. All authors contributed to the writing of the manuscript and read and approved the final manuscript.

The corresponding author on behalf of the other authors guarantee the accuracy, transparency and honesty of the data and information contained in the study, that no relevant information has been omitted and that all discrepancies between authors have been adequately resolved and described.

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Conflicts of interests

The authors declare that they have no conflicts of interest.

1 Introduction

Population ageing is a matter that concerns all European countries.¹ The main issues are related to the maintenance, and improvements, of the individuals' well-being through different policies without threatening the sustainability of modern Welfare States. The identification of the different factors determining demand for social and health care services is decisive to tackle these challenges. In this study, we are going to focus on health care utilization after age 50.

Since Arrow (1963) and Grossman (1972a, b) different contributions have empirically analysed the relationship between several socio-demographic and health determinants and health care utilization (Morris et al., 2005; Hernández-Quevedo and Jiménez-Rubio, 2009; Devaux, 2015; Terraneo, 2015; Schulz, 2016). Generally, these authors demonstrate the higher the age, the lower the socioeconomic status and the worse health status, the higher the expected health care utilization. Besides, some research advocates that there may also be a direct link, regardless of health status, between social isolation and health care utilization (Barsky, 1981; Ellaway et al., 1999; Mundt and Zakletskaia, 2014; Taube et al., 2015; Gerst-Emerson and Jayawardhana, 2015).

The aim of this paper is to examine the effect of social isolation factors on medical doctor visits over the 2004-2015 period for individuals aged fifty and over in a sample of different European countries from the Survey of Health, Ageing and Retirement in Europe (SHARE). We use a unified framework embedding panel count data techniques. In doing so, we are able to assess the robustness of our results to alternative estimations through allowing for dynamic estimates and possible heterogeneity between countries. Indeed, in addition to the full sample, three Welfare Regimes are considered. Our findings show that both traditional socio-demographic and health determinants, and the “newest” risks factors considered here (and associated with social isolation), are related with health care utilization. However, some differences by Welfare Regimen are observed.²

Several features distinguish the paper from previously published studies. Firstly, this paper exploits the latest available panel data structure. Secondly, on the empirical

¹ According to Eurostat (2018), the proportion of people aged 65 or over (old dependency ratio) rose from 23.5% to 29.9% between 2001 and 2017 for the EU-28 countries.

² Individual countries would be grouped in the Welfare Regimes, following Esping-Andersen (1990) and recent related literature (Srakar and Rupel, 2016). Mediterranean states are therefore considered as a separate regime characterized by the strong supportive role of family networks.

side, our study highlights specific risks associated with factors linked with social isolation which provides basic information when it comes to designing public-health and social policies. Consistent with this, Governments should be actively engaged and place more emphasis on the drivers behind the impacts that population aging has on higher use of health care services and social resources.

The paper is organized as follows. In Section 2, we describe the data sources and methodological issues. Besides, Section 3 presents the empirical results whereas main conclusions and policy implications are shown in Sections 4 and 5.

2 Methods

2.1 Sample selection

We use data from five panel waves of SHARE (Waves 1, 2, 4, 5 and 6). Precisely, the ones in easySHARE release 6.1.0 (Börsch-Supan et al., 2018).³ Data collection ran in the periods 2004-2005, 2006-2007, 2011-2012, 2013 and 2015, respectively. However, the longitudinal approach of the study led us to retain only the 9 countries whose respondents participated in all the considered waves.

Besides, we also explore several patterns between Welfare regimes: (i) Social-democratic (Denmark and Sweden); (ii) Continental (Austria, Belgium, France, Germany and Switzerland); (iii) Mediterranean (Italy and Spain). Therefore, our final sample consists of 31,536 observations distributed as follows by Welfare Regime: 6,843, 16,627 and 8,066 observations, respectively. Table I (Appendix) shows the sample distribution by country and Welfare Regimen.

2.2 Measures

In the empirically literature there are various examples of modelling count measures for health care (Pohlmeier and Ulrich, 1995; Deb and Trivedi, 2002; Kunz and Winkelmann, 2017). This body of studies usually consider as regressors variables related with age, sex, need/morbidity, and other socio-demographic factors such as

³ Wave 3 (SHARELIFE) is not finally considered as medical doctor visits (among other) are not asked in.

marital status, education attainment and labour status. Then, selected measures are justified and validate our model.

Health care utilization: The variable that it is used as dependent variable in our estimates is a count one (*GP*): number of times the respondent has seen or talked to medical doctor during the last 12 months. Fig. I (Appendix) presents its distribution by Welfare Regimen. It could be highlighted that Mediterranean countries have higher contacts with *GP* (8.59) whereas Social-democratic countries have the lesser consultations (4.14). All variables used in estimates are described in Table 1.

[Insert Table 1]

Socio-demographic (using for all dummy variables): gender (1 if female), age (four levels: 50-59 years, 60-69 years, 70-79 years and ≥ 80 years), native (1 if born in the country of interview), educational level (measured according to international classification ISCED-97: low, middle and high education), employment status (retired) or geographic characteristics (value 1 if the person lives in a *Rural* area or not) are considered. *Health:* we consider *MCCs* that is a binary one, it takes value 1 if the person is diagnosed with three or more chronic diseases (Multiple Chronic Conditions) and zero otherwise.^{4,5} *Social isolation measures (behavioural risk factors):* information is covered through two isolation proxies. *Alone* that takes value 1 if respondent is non-married or non with a registered partner, and *Help* which take value 1 if among the activities of the individual during the last year include providing help. Table II in the Appendix presents the prevalence of social isolation measures by SHARE Wave and Welfare Regimen. Percentages for given help are higher in all cases than the ones for *Alone*. Overall, it should be noted that Mediterranean values are always smaller.

As we investigate relationships between social isolation and utilization of GP health services, Fig. II plots the number of GP visits by SHARE wave and social isolation measure. As expected, *Help* proxy would be related with less GP contacts whereas the *alone* one presents the reverse effect. That is, an increase in health care utilization.

⁴ While it may not be surprising that more and more elderly Europeans have a chronic condition, what is striking is the increasing number of people that have multiple chronic conditions.

⁵ Because multicollinearity bias could appear in estimates, other health variables (in spite being available in the survey, such as self-assessed health) are excluded in our final model.

2.2 Method of analysis

Two characteristics of the data led us to select the suitable econometric approach: (i) the dataset is longitudinal and (ii) the selected dependent variable is a count variable (non-negative integer valued count $GP = 0, 1, \dots$). Hence, exploiting the panel structure of the data would allow us to relax the homogeneity assumption and control for unobserved individual heterogeneity, as well as for potential differences between SHARE waves.

The basic count data regression model is the Poisson one. However, it has been proved to be restrictive for modelling health care utilization, and so, more general specifications are preferred. Precisely, in this application we have used negative binomial regression models (Cameron and Trivedi, 1986; Jones et al., 2013).⁶ The specification to be analysed would take the following general form:

$$GP_{it} = \alpha_i + x'_{it}\beta + u_{it}$$

(1)

where x_{it} is a vector of characteristics for individual i at the t th observation, β is a vector of parameters to be estimated and u_{it} is the error term. Individual effects model allows for time series persistence via unobserved heterogeneity (α_i). Consequently, the Poisson or negative binomial model, as appropriate, would have the following form:

$$\mu_{it} \equiv E(GP_{it}|x_{it}, \alpha_i) = \alpha_i \exp(x_{it}\beta); \quad i = 1, \dots, n \quad t = 1, \dots, T \quad (2)$$

Besides, as many doctor visits last period lead to many, dynamic panel count models are considered:

$$GP_{it} = \alpha_i + \rho GP_{i,t-1} + x'_{it}\beta + u_{it} \quad (3)$$

Count specification for dynamic model would be:

$$\mu_{it} \equiv \rho GP_{i,t-1} + \alpha_i \exp(x_{it}\beta) \quad (4)$$

For simplicity, we have considered models where μ_{it} depends on just the first lag of GP_{it} (Cameron and Trivedi, 2013). As a result, the exponential feedback model is:

$$\mu_{it} \equiv \alpha_i \exp(\rho GP_{i,t-1} + x_{it}\beta), \quad (5)$$

In the following section, static and dynamic models are applied.

⁶ Health care utilization data usually contain a large proportion of zeros. Zero inflated models are then required to give more weight on the probability that the count variable equals zero. Nevertheless, due to the nature of our sample (population aged ≥ 50), it is not applicable here.

3 Results

In this section, we present the empirical results for the model described above based on our two social isolation proxies, socio-demographic and health variables. Additionally, given the scope of our study, we first perform some descriptive analysis (Tables III-IV in Appendix).

3.1 Descriptive findings

Main characteristics for the full sample while also considering our two social isolation measures are shown. The sample of participants with full data consisted on 31,536 individuals, 57.32% females and the average age is 68.11 years. Higher GP visits are associated with *Alone* measure and lesser for *Help* one. Similarly, we exploit that information while also accounting for Welfare Regimen differences.

Consequently, these tables are the first approximation to determine both, the main factors associated with medical doctor visits and potential divergences by Welfare Regimen (e.g. Mediterranean participants visit more their GP, they are the eldest and have higher percentages of females). Overall, as expected for all the samples considered, social isolation would increase health care utilization. The same applies the higher the age, the lower education, being retired or individuals with multiple chronic conditions, and somehow for females.

3.2 Panel count data estimates

Firstly, main estimates for our static count panel data models are reported (Tables 2-3); secondly, we provide the dynamic ones (Tables 4-5).⁷ On the one hand, in the first of each we refer to the full sample when controlling for Mediterranean Welfare Regimen that appears as explanatory variable due to the abovementioned descriptive findings. On the other hand, the latest, we present the results distinguishing by Welfare Regimen.

[Insert Table 2]

Table 2 shows the baseline results of our regression models. Regarding socio-demographic factors, *Female* has a positive and strong influence. Then, women tend to

⁷ Further estimates for the number of GP visits (Incidence Rate Ratios) are available upon request.

use medical doctors services more frequently than men do (about 17 percent more times). For age, the 60-69, 70-79 and ≥ 80 years groups have more frequent visits than the 50-59 one. It is corroborated that the higher the age, the higher health care utilization. However, born in the country of interview is not significantly related to the number of GP visits. When considering education, the highest level tends to have significantly less visits; the relationship is stronger in significance compared to middle education. Being the respondent retired would increase GP visits by 6 percent. Rural residents tend to have more visits which can be an indication of better access to medical doctor in small towns, rural areas or villages. As for the multiple chronic conditions, the pattern is clear: the worse the health, the more visits.⁸ Nevertheless, considering social isolation measures, both proxies demonstrate having a strong impact on the number of GP visits: non-partnership was significantly and positively associated with health care utilization (3 percent more times), and providing help is significantly and negatively related with physician visits (6 percent less times). Turning to possible differences in Welfare Regimes, compared to Social-democratic and Continental (reference category), Mediterranean countries tend to have more visits. Different factors could be behind these results, that is why in Table 3 we run the estimates by different samples (by Welfare Regimen).

[Insert Table 3]

Column 1 presents the variables; Column 2 describes the detailed findings for the full sample whereas the following ones do it for each of the Welfare Regimes. Results somehow present changes with the aforementioned ones. Formerly, the main discrepancies are observed for the following factors. Education variables present the reverse effect in Social-democratic countries. Additionally, high education is not significant for Continental ones. Besides, rural location is only significant when considering the full sample of countries. As for our main control variables, the social isolation measures, different patterns (as expected) are provided. Indeed, differences regarding familistic countries are observed, social isolation proxies are not significant for Mediterranean countries.⁹ Furthermore, *Help* would matter for both the Social-democratic and Continental Welfare Regimens, whereas *Alone* would be only

⁸ Around 60% more than the group without the specific health circumstance.

⁹ In Southern Europe, the majority of caring responsibilities rest on the family whereas in Nordic countries this responsiveness is largely supported by the State.

significant for the Social-democratic. Therefore, different interventions and tools should be considered in each Welfare Regimen.

As previously indicated, many doctor visits could lead to more ones. Thus, dynamic panel count models are considered in Tables 4 and 5. These Tables corroborate in some way that foresight when considering the full sample (0.6 percent more times) and both Continental and Mediterranean Welfare Regimes (0.2 percent more times). It is important to be highlighted that previous comments on results for linear estimates are consistent and stable.

[Insert Table 4]

[Insert Table 5]

4 Discussion

Financial pressure and their implications for the financial sustainability of health care systems are often confronted with the demands for health care services for older adults. That is, regardless of their disability and/ or morbidity status, elder population are regular users of GP services. Precisely, we have focused on multiple determinants (both traditional socio-demographic and health ones, while “the newest” risks factors associated with social isolation) related with health care utilization. Besides, geographic heterogeneity is also considered (i.e. Mediterranean countries would use more GP services).

Under two definitions of social isolation using SHARE, we have found that in the European Union these variables are significantly associated with the number of doctor visits. Therefore, we have hypothesized that for many elderly the doctor visits provide “more” than medical treatment. Then, social isolated people would seek for social contact through these physician visits. That is, GPs provides social support. This study supports previous research (Ilinca and Calciolari, 2015; Gerst-Emerson and Jayawardhana, 2015; Taube at al., 2015; Srakar and Rupel, 2016) indicating that social isolation is a significant public health issue, especially among older adults (those aged 50 years and older).

Indeed, our main findings could be grouped as follows: (i) among socio-demographic factors it is obtained than respondent being female, the higher the age and the lesser the educational level would be associated with higher GP visits; (ii) health factors implies than those that reported more health need would use more often health

care services; (iii) in spite the fact different socio-demographic and health variables would matter on medical doctor visits, it should be clear up that elderly Europeans with less social isolation would decrease the expected number of visits per year (Peytremann-Bridevaux et al., 2008; Ladin, 2012; Gerst-Emerson and Jayawardhana, 2015).

Nevertheless, some limitations and extensions should be also considered. For the first one, in spite the fact we are working with micro data we should remember that it is self-reported information. For the latest, when more data would be available, it should be interesting to bear in mind depth differences between and within countries. All in all, despite the above-mentioned limitations, we can postulate that this study provides new and valid information on the understanding of health care utilization by (lonely) elderly people across Europe.

Our finding provide key messages for both policy makers and professionals because in order to enhance efficiency, equity and quality of health care systems, social displacement should be considered (among the well-known traditional determinants) in the development of new public policies. Beyond the large variability observed across countries, this would provide information that could determine the success of the European Welfare States. In spite the fact that our findings point out there are similar patterns in the sample considered, some discrepancies are also determined, different strategies should be then considered though each Welfare Regimen. At this regard, previous studies (Banbury et al, 2017; Landeiro et al., 2017) have pointed out the importance of both group-based interventions and one-to-one interventions (e.g. educational courses on social behaviours, volunteer programs, and/ or providing services like transportation or internet use).

5 Conclusion

In the study above, using SHARE data, we have presented an empirical analysis of determinants of health care utilization for European older adults. Indeed, once health outcomes have been suggested for social isolation and loneliness factors, we focus on the impact of social isolation on a tangible public health and public policy outcome (health care utilization). Hence, different factors have been analysed: socio-demographic, health and social isolation ones. While caution must be used when generalizing results, the accuracy and robustness of our estimates, give us the confidence to express general conclusions.

Overall, our findings are in line with both traditional and recent studies (Ilinca and Calciolari, 2015; Srakar and Rupel, 2016). Then, it has been highlighted that behavioural risk determinants for health care utilization should be considered along with the traditional socio-demographic and health driving factors. Specifically, it is highlighted the pressure on the financial sustainability of health care systems from (unnecessary) demands of elderly people which would increase general practitioner consultations, and so, health care costs. These findings would provide information to allow a better decision-making about public health priorities in European countries. All in all, heterogeneity between areas should be considered in different social and health public policies.

Appendix

[Tables I-IV]

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Table 1 List of variables and description

	Variable	Description	Coding
<i>Dependent variable</i>	<i>GP</i>	Number of times the respondent has seen or talked to medical doctor during the last 12 months	Number of visits
	<i>Female</i>	Gender of respondent	1: female; 0: male
	<i>Age</i>	Age of respondent (four levels in estimates as dummies: 50-59 years, 60-69 years, 70-79 years and ≥ 80 years)	Years; 1: person is in the age interval; 0: otherwise
<i>Socio-demographic factors</i>	<i>Native</i>	Born in the country of interview	1: yes; 0: otherwise
	<i>Loweduc</i>	ISCED-97 coding of education, low education	1: low education; 0: otherwise
	<i>Mideduc</i>	ISCED-97 coding of education, middle education	1: middle education; 0: otherwise
	<i>Higheduc</i>	ISCED-97 coding of education, high education	1: high education; 0: otherwise
	<i>Retired</i>	Current job situation	1: respondent is retired; 0: otherwise
	<i>Rural</i>	Area of location (place of residence)	1: respondent lives in a small town, a rural area or village; 0: otherwise
<i>Health factors</i>	<i>MCCs</i>	Individual is diagnosed with three or more chronic diseases	1: multiple chronic conditions (MCCs); 0: otherwise
<i>Social isolation measures</i>	<i>Alone</i>	Current marital status	1: non-married or non with a registered partner; 0: otherwise
	<i>Help</i>	Respondent has given help during the last 12 months	1: yes; 0: otherwise
<i>Welfare Regime</i>	<i>Social-democratic</i>		1: Denmark and Sweden; 0: otherwise
	<i>Continental</i>	Individual countries are grouped in the Welfare Regimes	1: Austria, Belgium, France, Germany and Switzerland; 0: otherwise
	<i>Mediterranean</i>		1: Italy and Spain; 0: otherwise

Source: Authors' elaboration.

Table 2 Results of panel negative binomial regression (full sample), with outcome variable the number of GP visits

	Full sample		
	β	z	
<i>Socio-demographic factors</i>			
<i>Female</i>	0.169	14.67	***
<i>60-69 years</i>	0.103	6.03	***
<i>70-79 years</i>	0.236	12.14	***
<i>≥ 80 years</i>	0.318	13.63	***
<i>Native</i>	-0.050	-2.20	**
<i>Mideduc</i>	-0.018	-1.35	
<i>Higheduc</i>	-0.032	-2.08	**
<i>Retired</i>	0.057	4.21	***
<i>Rural</i>	0.066	5.88	***
<i>Health factors</i>			
<i>MCCs</i>	0.592	37.33	***
<i>Social isolation measures</i>			
<i>Alone</i>	0.044	3.56	***
<i>Help</i>	-0.067	-5.39	***
<i>Welfare Regime</i>			
<i>Mediterranean</i>	0.199	14.19	***
<i>Constant</i>	0.952	10.40	***
Observations	31,381		

Source: Authors' calculations based on easySHARE release 6.1.0 (Waves 1 to 6: 2004-2015). Population aged ≥ 50 . Welfare Regime: (i) Social-democratic (Denmark and Sweden), (ii) Continental (Austria, Belgium, France, Germany and Switzerland), (iii) Mediterranean (Italy and Spain).

Notes: ***,** and * indicate significance at 1%, 5% and 10%, respectively.

Table 3 Results of panel negative binomial regression by Welfare Regime, with outcome variable the number of GP visits

	Full sample			Social-democratic			Continental			Mediterranean		
	β	z		β	z		β	z		β	z	
Socio-demographic factors												
<i>Female</i>	0.163	14.31	***	0.125	4.81	***	0.149	10.22	***	0.208	9.10	***
<i>60-69 years</i>	0.114	6.72	***	0.027	0.65		0.088	4.02	***	0.191	5.85	***
<i>70-79 years</i>	0.249	12.85	***	0.161	3.09	***	0.218	8.81	***	0.302	8.59	***
<i>≥ 80 years</i>	0.317	13.68	***	0.280	4.72	***	0.351	11.98	***	0.306	7.18	***
<i>Native</i>	-0.018	-0.80		-0.007	-0.12		0.018	0.73		0.063	0.76	
<i>Mideduc</i>	-0.079	-6.14	***	0.208	6.59	***	-0.055	-3.37	***	-0.053	-1.68	*
<i>Higheduc</i>	-0.099	-6.92	***	0.169	5.18	***	-0.019	-1.04		-0.227	-4.70	***
<i>Retired</i>	0.034	2.55	***	0.103	2.73	***	0.055	3.06	***	0.076	3.20	***
<i>Rural</i>	0.063	5.65	***	-0.041	-1.59		-0.020	-1.37		0.009	0.41	
Health factors												
<i>MCCs</i>	0.592	37.64	***	0.550	14.95	***	0.584	28.86	***	0.591	22.03	***
Social isolation measures												
<i>Alone</i>	0.025	2.06	**	0.052	1.84	*	0.020	1.29		0.022	0.88	
<i>Help</i>	-0.088	-7.19	***	-0.057	-2.14	**	-0.029	-1.90	*	-0.037	-1.32	
<i>Constant</i>	0.912	12.10	***	0.833	7.68	***	1.085	13.84	***	0.097	0.97	
Observations	31,381			6,815			16,557			8,009		

Source: Authors' calculations based on easySHARE release 6.1.0 (Waves 1 to 6: 2004-2015). Population aged ≥ 50 . Welfare Regime: (i) Social-democratic (Denmark and Sweden), (ii) Continental (Austria, Belgium, France, Germany and Switzerland), (iii) Mediterranean (Italy and Spain).

Notes: ***,** and * indicate significance at 1%, 5% and 10%, respectively.

Table 4 Results of dynamic panel negative binomial regression (full sample), with outcome variable the number of GP visits

	Full sample		
	β	z	
<i>GP_{t-1}</i>	0.005	7.94	***
<i>Socio-demographic factors</i>			
<i>Female</i>	0.168	14.60	***
<i>60-69 years</i>	0.104	6.09	***
<i>70-79 years</i>	0.239	12.25	***
<i>≥ 80 years</i>	0.325	13.90	***
<i>Native</i>	-0.047	-2.09	**
<i>Mideduc</i>	-0.018	-1.33	
<i>Higheduc</i>	-0.032	-2.07	**
<i>Retired</i>	0.058	4.23	***
<i>Rural</i>	0.064	5.69	***
<i>Health factors</i>			
<i>MCCs</i>	0.591	37.22	***
<i>Social isolation measures</i>			
<i>Alone</i>	0.044	3.56	***
<i>Help</i>	-0.066	-5.30	***
<i>Welfare Regime</i>			
<i>Mediterranean</i>	0.188	13.30	***
<i>Constant</i>	0.921	10.25	***
Observations	31,217		

Source: Authors' calculations based on easySHARE release 6.1.0 (Waves 1 to 6: 2004-2015). Population aged ≥ 50 . Welfare Regime: (i) Social-democratic (Denmark and Sweden), (ii) Continental (Austria, Belgium, France, Germany and Switzerland), (iii) Mediterranean (Italy and Spain).

Notes: ***,** and * indicate significance at 1%, 5% and 10%, respectively.

Table 5 Results of dynamic panel negative binomial regression by Welfare Regime, with outcome variable the number of GP visits

	Full sample			Social-democratic			Continental			Mediterranean		
	β	z		β	z		β	z		β	z	
<i>GP_{t-1}</i>	0.006	10.48	***	0.001	0.34		0.002	2.89	***	0.002	2.67	***
<i>Socio-demographic factors</i>												
<i>Female</i>	0.165	14.37	***	0.126	4.84	***	0.150	10.22	***	0.208	9.07	***
<i>60-69 years</i>	0.113	6.66	***	0.033	0.80		0.088	4.02	***	0.188	5.74	***
<i>70-79 years</i>	0.249	12.83	***	0.163	3.14	***	0.220	8.84	***	0.299	8.47	***
<i>≥ 80 years</i>	0.318	13.69	***	0.284	4.76	***	0.351	11.96	***	0.305	7.12	***
<i>Native</i>	-0.022	-0.97		-0.013	-0.22		0.015	0.60		0.067	0.81	
<i>Mideduc</i>	-0.076	-5.92	***	0.203	6.44	***	-0.054	-3.32	***	-0.054	-1.72	*
<i>Higheduc</i>	-0.096	-6.68	***	0.171	5.22	***	-0.020	-1.10		-0.229	-4.72	***
<i>Retired</i>	0.035	2.60	***	0.105	2.79	***	0.054	3.03	***	0.074	3.11	***
<i>Rural</i>	0.060	5.36	***	-0.041	-1.57		-0.020	-1.37		0.009	0.42	
<i>Health factors</i>												
<i>MCCs</i>	0.593	37.67	***	0.551	14.94	***	0.584	28.86	***	0.593	22.04	***
<i>Social isolation measures</i>												
<i>Alone</i>	0.027	2.16	**	0.053	1.88	*	0.020	1.31		0.022	0.88	
<i>Help</i>	-0.086	-6.99	***	-0.056	-2.09	**	-0.028	-1.87	*	-0.039	-1.38	
<i>Constant</i>	0.893	11.72	***	0.830	7.63	***	1.071	13.64	***	0.077	0.77	
Observations	31,219			6,785			16,482			7,952		

Source: Authors' calculations based on easySHARE release 6.1.0 (Waves 1 to 6: 2004-2015). Population aged ≥ 50. Welfare Regime: (i) Social-democratic (Denmark and Sweden), (ii) Continental (Austria, Belgium, France, Germany and Switzerland), (iii) Mediterranean (Italy and Spain).

Notes: ***,** and * indicate significance at 1%, 5% and 10%, respectively.

Appendix

Table I Distribution of the analytical sample by country and Welfare Regime (all countries (9); sample size (n) = 31,536)

Area	Wave 1	Wave 2	Wave 4	Wave 5	Wave 6	Total
<i>Austria</i>	357	365	368	368	368	1,826
<i>Belgium</i>	1,308	1,330	1,348	1,351	1,354	6,691
<i>Denmark</i>	575	605	615	616	618	3,029
<i>France</i>	671	683	693	695	696	3,438
<i>Germany</i>	537	545	547	548	549	2,726
<i>Italy</i>	911	926	932	932	933	4,634
<i>Spain</i>	674	684	690	692	692	3,432
<i>Sweden</i>	753	763	766	766	766	3,814
<i>Switzerland</i>	377	389	393	393	394	1,946
<i>Social democratic</i>	1,328	1,368	1,381	1,382	1,384	6,843
<i>Continental</i>	3,250	3,312	3,349	3,355	3,361	16,627
<i>Mediterranean</i>	1,585	1,610	1,622	1,624	1,625	8,066
Total	6,163	6,290	6,352	6,361	6,370	31,536

Source: Authors' calculations based on easySHARE release 6.1.0 (Waves 1 to 6: 2004-2015). Population aged ≥ 50 . Welfare Regime: (i) Social democratic (Denmark and Sweden), (ii) Continental (Austria, Belgium, France, Germany and Switzerland), (iii) Mediterranean (Italy and Spain).

Notes: As medical doctor visits (among other) is not asked in Wave 3, final sample in estimates would consist on 31,536 observations.

Table II Prevalence of *Social Isolation* of the analytical sample by SHARE Wave and Welfare Regime (all countries (9); sample size (n) = 31,536)

Wave	Full sample		Social-democratic		Continental		Mediterranean	
	<i>Alone</i>	<i>Help</i>	<i>Alone</i>	<i>Help</i>	<i>Alone</i>	<i>Help</i>	<i>Alone</i>	<i>Help</i>
1	25.815%	38.942%	26.807%	51.431%	29.231%	41.108%	17.981%	24.038%
2	27.091%	38.378%	28.582%	49.488%	30.042%	40.972%	19.752%	23.602%
4	30.699%	21.867%	32.006%	31.282%	33.532%	22.723%	23.736%	12.084%
5	32.794%	21.286%	33.936%	29.667%	35.350%	22.325%	26.539%	12.007%
6	34.490%	27.598%	35.116%	37.500%	36.656%	31.866%	29.477%	10.338%

Source: Authors' calculations based on easySHARE release 6.1.0 (Waves 1 to 6: 2004-2015). Population aged ≥ 50 . Welfare Regime: (i) Social-democratic (Denmark and Sweden), (ii) Continental (Austria, Belgium, France, Germany and Switzerland), (iii) Mediterranean (Italy and Spain).

Notes: As medical doctor visits (among other) is not asked in Wave 3, final sample in estimates would consists on 31,536 observations.

Table III Characteristics of the sample, by Social Isolation measures (all countries (9); sample size (n) = 31,536)

Variable	Full sample		
	<i>Total, (%) or Mean ± SD</i>	<i>Alone, (%),or Mean ± SD</i>	<i>Help,(%)or Mean ± SD</i>
<i>GP (range: 0-98)</i>	6.914±9.181	7.610±9.848	5.960±8.016
<i>Socio-demographic factors</i>			
<i>Female</i>	57.32	71.47	57.25
<i>Age (range: 50.0-105.4)</i>	68.114± 9.168	71.093±10.010	65.207±8.127
<i>Native</i>	93.93	93.90	94.25
<i>Loweduc</i>	46.90	50.69	35.96
<i>Mideduc</i>	29.91	28.56	35.02
<i>Higheduc</i>	22.49	19.82	28.33
<i>Retired</i>	60.70	64.61	56.67
<i>Rural</i>	59.01	52.17	56.53
<i>Health factors</i>			
<i>MCCs</i>	12.14	15.26	9.06

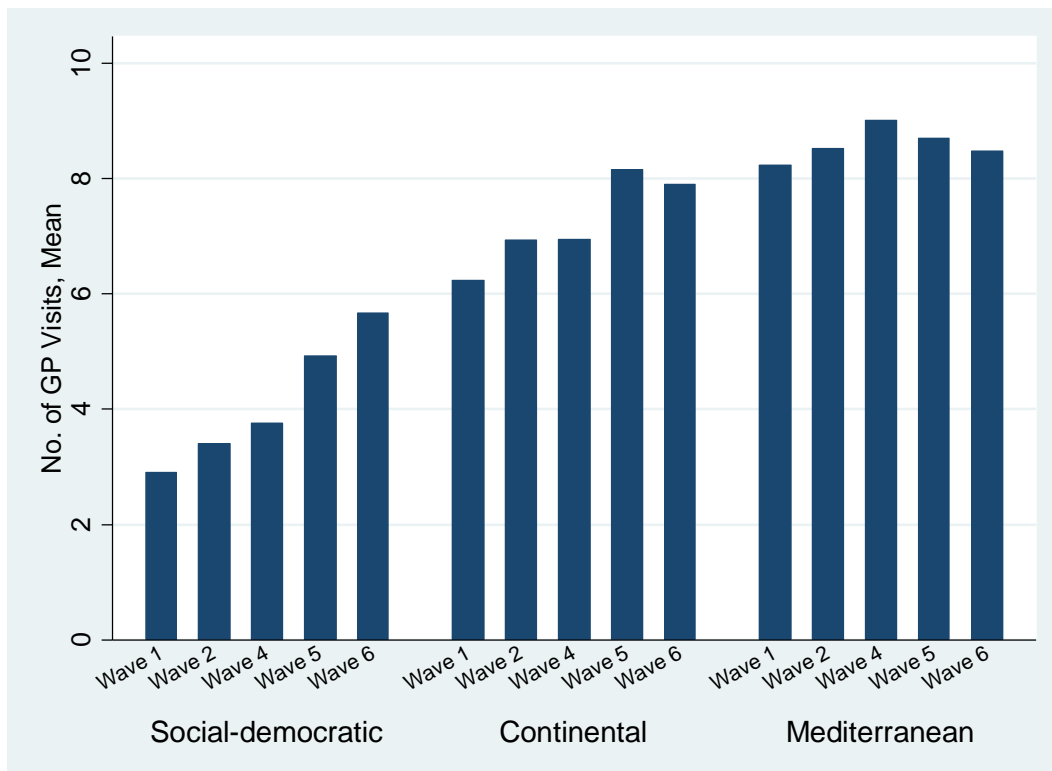
Source: Authors' calculations based on easySHARE release 6.1.0 (Waves 1 to 6: 2004-2015). Population aged ≥ 50. Welfare Regime: (i) Social-democratic (Denmark and Sweden), (ii) Continental (Austria, Belgium, France, Germany and Switzerland), (iii) Mediterranean (Italy and Spain).

Table IV Characteristics of the sample, by Social Isolation measures and Welfare Regime (all countries (9); sample size (n) = 31,536)

Variable	Social-democratic			Continental			Mediterranean		
	Total, (%) or Mean ± SD	Alone, (%),or Mean ± SD	Help,(%)or Mean ± SD	Total, (%) or Mean ± SD	Alone, (%),or Mean ± SD	Help,(%)or Mean ± SD	Total, (%) or Mean ± SD	Alone, (%),or Mean ± SD	Help,(%)or Mean ± SD
<i>GP (range: 0-98)</i>	4.144± 7.076	4.639±7.517	3.702± 6.324	7.243± 8.939	7.989±9.533	6.664±8.046	8.593± 10.627	9.892±12.052	7.800± 9.825
<i>Socio-demographic factors</i>									
<i>Female</i>	56.09	66.09	54.72	57.23	72.57	57.05	58.54	79.39	63.26
<i>Age (range: 50.0-105.4)</i>	67.907±9.304	70.518±10.196	65.314±8.308	67.872±9.219	70.880±9.946	65.209±8.193	68.790± 8.911	72.359±9.881	64.978±7.459
<i>Native</i>	95.16	95.34	96.14	91.25	91.45	92.06	98.40	99.37	99.09
<i>Loweduc</i>	31.32	35.87	27.67	36.60	44.22	31.40	81.34	86.14	71.29
<i>Mideduc</i>	34.75	35.54	36.35	36.13	32.56	37.83	12.98	9.11	21.06
<i>Higheduc</i>	33.26	28.13	35.50	26.32	21.95	29.84	5.45	4.27	7.50
<i>Retired</i>	61.93	68.61	54.24	63.32	68.12	58.95	54.25	49.95	52.58
<i>Rural</i>	42.95	39.27	42.12	64.09	55.41	62.06	62.16	57.38	64.17
<i>Health factors</i>									
<i>MCCs</i>	11.90	15.72	9.41	11.13	13.40	8.74	14.43	20.13	9.62
Sample	6,843			16,627			8,066		

Source: Authors' calculations based on easySHARE release 6.1.0 (Waves 1 to 6: 2004-2015). Population aged ≥ 50. Welfare Regime: (i) Social-democratic (Denmark and Sweden), (ii) Continental (Austria, Belgium, France, Germany and Switzerland), (iii) Mediterranean (Italy and Spain).

Fig. I Number of GP visits by SHARE Wave and Welfare Regime

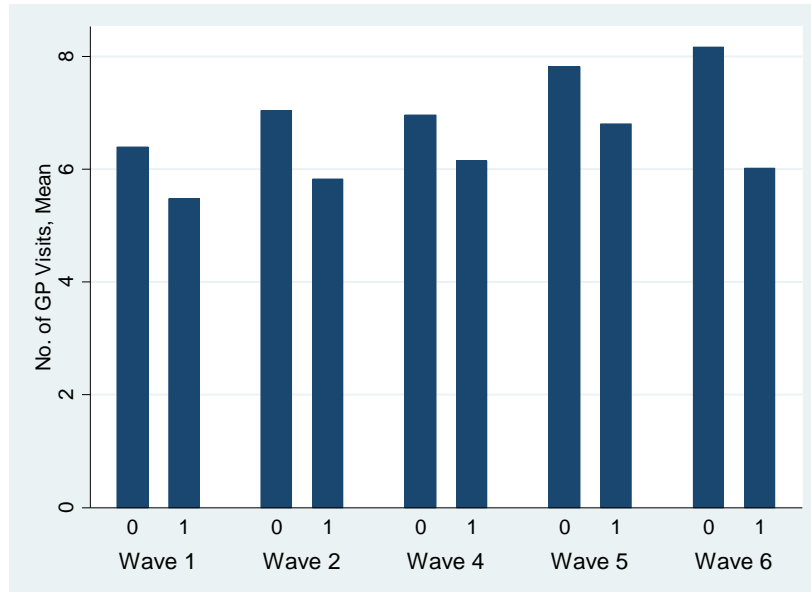


Source: Authors' calculations based on easySHARE release 6.1.0 (Waves 1 to 6: 2004-2015). Population aged ≥ 50 . Welfare Regime: (i) Social-democratic (Denmark and Sweden), (ii) Continental (Austria, Belgium, France, Germany and Switzerland), (iii) Mediterranean (Italy and Spain).

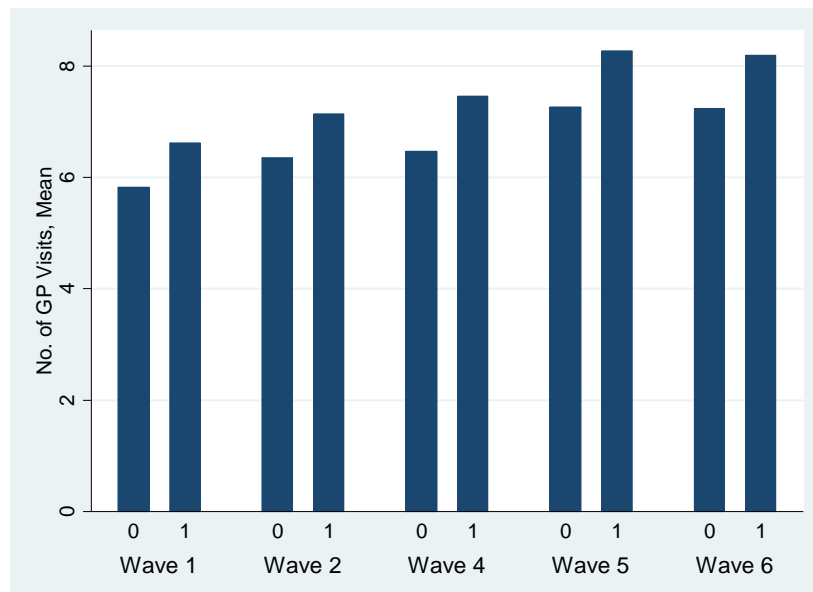
Notes: As medical doctor visits (among other) is not asked in Wave 3, final sample in estimates would consist on 31,536 observations.

Fig. II Number of GP visits by SHARE Wave and Social Isolation measure, full sample

a) *Help*



b) *Alone*



Source: Authors' calculations based on easySHARE release 6.1.0 (Waves 1 to 6: 2004-2015). Population aged ≥ 50 .

Notes: As medical doctor visits (among other) is not asked in Wave 3, final sample in estimates would consist on 31,536 observations.