Formal and Informal Volunteering and Health in Mediterranean Europe

By Damiano Fiorillo[*]
Nunzia Nappo[†]

In this paper, we compare the correlation among formal and informal volunteering and self-perceived health across Mediterranean European countries after controlling for socio-economic characteristics, housing features, neighborhood quality, size of municipality, social and cultural participation and regional dummies. We find that informal volunteering has a significant, positive correlation with self-perceived health in France, Spain, Greece and a significant, negative relationship in Italy.

Keywords: *formal and informal volunteering, self-perceived health, Mediterranean European countries.*

Introduction

Volunteering is an activity that people decide to practice spontaneously without any monetary return. One method to classify volunteering is by its formality (Wilson and Musick 1997). *Formal volunteering* is as any donation of time to activities of organizations. *Informal volunteering* (also called *helping behaviour*) is any support provided independently to non-households individuals, for instance advantaging an elderly (Carson 1999, Lee and Brudney 2012).

Largely social science has given more attention to formal volunteering than to informal volunteering. Although these activities share some obvious and non-obvious features, they are not equivalent. The former is more public than the latter, since formal volunteering is pushed by human capital, social capital and cultural capital more than informal volunteering (Wilson and Musick 199, Lee and Brudney 2012). Moreover, recent empirical studies on European Countries reach the conclusion that national dissimilarities in rates of formal and informal volunteering can be attributed to dissimilarities in human, social and cultural factors so as by contextual factors, among which countries' institutions (Plagnol and Huppert 2010).

This paper studies the relationship between formal and informal volunteering and health across some Mediterranean European countries. The contribution of this paper to the literature is double. First, it employs a new and comparable dataset, the 2006 wave EU-SILC micro data, a dataset rich of data on measures of volunteering for a sample of Mediterranean European Countries. Second, concentrating on self-perceived health in Mediterranean

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[*] Assistant Professor, "Parthenope" University, Italy.
[†] Assistant Professor, University "Federico II" of Napoli, Italy.

European Countries, the paper examines cross-countries dissimilarities between volunteering and self-perceived health in Europe, after controlling, among others, for human capital, social capital and cultural factors.

The paper is organized in the following way: section 2 studies channels through which volunteering may affect health. Sections 3 and 4 focus respectively on the dataset and the methodology. Section 5 illustrates the empirical analysis. Section 6 treats the results and section 7 presents conclusions.

Volunteering and Health

A large strand of the socio-medical literature has studied the relation between volunteering and health (Piliavin and Siegel 2007, Casiday et al. 2008, Tang 2009, Kumar et al. 2012). Potential channels through which volunteering benefits health may be related to the determinants of volunteering so as classified by the economic literature (Fiorillo and Nappo 2014b, 2015).

Volunteering may concur to make volunteers feel "good" (Andreoni 1990). According to this approach, volunteering can be considered as an ordinary consumption good (Menchik and Weisbrod 1987, Fiorillo 2011, Bruno and Fiorillo 2012, Nappo 2013) which provide a direct utility to individuals: volunteers draw utility also from volunteering in itself, not only from the goods they collaborate to supply. Therefore, volunteering gives people the chance to be recognized as "good" by society. Thus, volunteering affect positively volunteers' social recognition: volunteers are recompensed with gratitude and admiration and are considered altruist. So, being engaged in such activities may promote feelings of self-worth and self-esteem (Fiorillo and Nappo 2014b, 2015).

Another strand of the literature proposes that individuals volunteer to get work experience, which raises a volunteer's future employability, when he is unemployed, and earning power, when he is employed. In addition, some empirical studies argue that volunteers gain a wage premium (Day and Devlin 1998, Hackl et al. 2007, Bruno and Fiorillo 2015). Still, volunteering can improve workers' career prospects (Wilson 2000). This is likely to occur since volunteers are "team players" who are willing to collaborate with others (Kats and Rosemberg 2005), and therefore, more productive in the work place. Both the possibility of role enhancement and the wage premium linked to volunteering may increase job satisfaction (Fiorillo and Nappo 2014a) which, in turn, causes important positive effects on health (Faragher et al. 2005).

Making friends is a third determinant of volunteering: volunteering is an activity generally performed in groups, it is a way to expand one's personal network, and to ameliorate social skills too (Clotfelter 1985, Schiff 1990, Prouteau and Wolff 2006). There is a relation between this strand of the literature and the social integration theory, according to which multiple social roles provide meaning and purpose in life, encourage social support and relations (Li and Ferraro 2005, Choi and Boham 2007). The integration theory

states that people gain mental, emotional and physical advantages when they think themselves as a helping, accepted part of a community. Without such a feeling of joining, people can experience depression, loneliness and physical illness.

In our analysis, we would aspect a positive relationship among formal and informal volunteering and self-perceived health (Fiorillo and Nappo 2014b, 2015). In any case, since informal volunteering is not implemented through official groups but on individual basis, the others do not recognise informal volunteers' activities as they do for formal volunteering: consequently, the possible channel of "social recognition" might be weakened for informal volunteers. Usually, informal volunteers have fewer occasions to be valued by society than formal volunteers who, often, choose volunteering in well-known organizations, which offer them visibility with its benefits also in terms of health (Fiorillo and Nappo 2014b, 2015). Nevertheless, such reduced channels through which formal volunteering affect positively health might be balanced by the assumption that informal volunteering is likely performed for sole altruistic reasons, which, according to Freud - who supposed altruism as acting for one's own well-being - may influence positively health. Following a strand of the literature (see Batson 1991), altruistic people do not help in order to benefit others, but rather to receive advantages, to avoid distress and anxiety, and to release their sense of obligation.

Data, Descriptive Statistics and Empirical Model

The econometric analysis employs data 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 makes available comparable multidimensional data on income, social exclusion and living conditions in European countries.

The dependent variable is self-perceived health, collected through personal interviews or registers, and assessed through the question: "In general, would you say that your health is very good, good, fair, poor, or very poor?". Responses are coded into a binary variable, which is equal to 1 in cases of good or very good health, 0 otherwise. Largely, the literature considers self-perceived health (*SPH*) as a good proxy for health and, even though its very subjective nature, earlier studies have shown that it is correlated with objective measures of health as for instance mortality (Idler and Benyamini 1997).

We study formal and informal volunteering. The former (*ForVol*) is a dummy variable equal to 1 if the respondent, during the previous twelve months, worked unpaid for charitable organizations, groups or clubs (it includes unpaid work for churches, religious groups and humanitarian organizations and attending meetings connected with these activities), 0 otherwise. The latter (*InfVol*) is a binary variable equal to 1 if the respondent, during the previous twelve months, undertook (private) voluntary activities to help someone, such as cooking for others, taking care of people in hospitals/at

home, taking people for a walk. Informal volunteering does not include any activity that the interviewed undertook for his/her household, in his/her work or within voluntary organizations.

In order to account for other factors that might influence both health status and formal and informal volunteering, we include in the analysis a full set of control variables (Fiorillo and Nappo 2014b, 2015). Table 5, in Appendix A, describes all variables considered in the empirical analysis.

Table 1. *Descriptive Statistics* (mean)

	ES	FR	GR	IT
SPH	0.68	0.69	0.77	0.57
ForVol	0.11	0.01	0.03	0.07
InfVol	0.45	0.17	0.19	0.25
Observations	28055	19236	12606	45975

Table 2. *Correlation among SPH, ForVol and InfVol within European Countries*

	ES		FR	
	SPH	*ForVol*	*SPH*	*ForVol*
ForVol	-0.0048		0.0043	
InfVol	0.0437*	0.0897*	0.0290*	0.0755*
	GR		IT	
	SPH	*ForVol*	*SPH*	*ForVol*
ForVol	0.0323*		0.0323*	
InfVol	0.0414*	0.1848*	-0.0189*	0.1808*

We consider 4 Mediterranean European Countries distinctly: Spain (ES), France (FR), Greece (GR), and Italy (IT).

Table 1 shows the weighted summary statistics for *SPH*, *ForVol* and *InfVol*. On average, respondents rate their health as good and/or very good, except for IT. Formal volunteering is the lowest in FR, where only 1% of respondents supply voluntary activities in charitable organizations, groups or clubs.

Table 2 shows the correlation matrix between the main variables of interest. We observe that the key independent variables are positively correlated each other for all countries, and positively correlated with the dependent variable in all countries, except for IT. This last descriptive evidence is not entirely true in the multivariate analysis.

Following Fiorillo and Nappo (2014b, 2015), self-perceived good health is represented through the following estimation equation:

$$H_{ij}^* = \alpha + \beta FV_{ij} + \theta IV_{ij} + \chi Y_{ij} + Z_{ij}\varphi + \varepsilon_{ij} \qquad (1)$$

where, H_{ij}^* is a "latent" variable, i.e. self-perceived health for individual i in country j; FV_{ij} is formal volunteering provided by individual i in country j; IV_{ij} is informal volunteering performed by individual i in country j; Y_{ij} is

household income of individual i in country j; Z_{ij} is a matrix of control variables that are known to influence self-perceived health and ε is a random-error term. α, β θ, χ, φ are parameters to be estimated.

We do not observe the "latent" variable H_{ij}^{*} in the data. Rather, we observe H_{ij} as a binary choice, which takes value 1 (very good or good perceived health) if H_{ij}^{*} is positive and 0 otherwise. Consequently, the health equation (1) makes it appropriate for estimation as a Univariate Probit Model:

$$\Pr(H_{ij} = 1) = \Phi(\alpha - \beta FV_{ij} - \theta IV_{ij} - \chi Y_{ij} - Z_{ij}\varphi)$$

$$(2)$$

where Φ (-) is the cumulative distribution function of a normal standard.

Empirical Analysis

Tables 3 and 4 show the univariate probit estimates for the 4 Mediterranean European Countries distinctly. Country by country, the first column reports marginal effects and the second column shows the standard errors, which are corrected for heteroskedasticity. Model (1) presents the findings with all the covariates except for social and cultural participation variables that are included in Model (2), where we conduct a robustness analysis.

In all Mediterranean countries informal volunteering matters. In Spain and France, the marginal effect of helping behaviour is statistically significant, respectively, at 1 and 5 percent, rising the probability of declaring self-perceived good health by 2.1 and 2.4 percent (Model 2). In Greece, the positive statistically significant association at 1 percent in Model (1) collapses to 10 percent in Model (2), even so indicating that informal voluntary activities increase the probability of reporting self-perceived good health of Greeks by 1.8 percent. However, in Italy, informal volunteering shows a negative statistically significant (at 1%) correlation with health (Model 2). In IT, undertaking informal voluntary activities decreases the probability of reporting self-perceived good health by 2.3%. In spite of helping behaviour, formal volunteering does not matter in all Mediterranean countries. Indeed, in Greece and Italy in Model (1), we observe a positive association between formal volunteering and health, statistically significant, respectively, at 10 and 1 percent. However, this association disappears in Model (2), when we control for social and cultural variables, meaning that social and cultural participation are relevant factors in driving the self-perceived health of Italians (Fiorillo 2013, Fiorillo and Sabatini 2011, Fiorillo and Sabatini 2015) and Greeks.

Results have to be treated with caution. Although we control for many covariates, the cross-section design of the data does not allow us to treat unobservable individual characteristics (as a panel data does). Moreover, a reverse causality has to be taken into consideration.

Table 3. *Probit Estimates Results: Mediterranean Countries #1*

	ES(1)		ES (2)		FR (1)		FR (2)	
ForVol	-0.003	0.009	-0.008	0.010	0.032	0.026	0.030	0.026
InfVol	0.029***	0.006	0.021***	0.006	0.041***	0.008	0.024***	0.009
Female	-0.029***	0.007	-0.022***	0.006	-0.000	0.007	-0.000	0.007
Married	-0.009	0.009	-0.003	0.009	-0.008	0.011	-0.005	0.011
Separated/divorced	-0.072***	0.015	-0.070***	0.015	-0.043**	0.018	-0.045***	0.018
Widowed	-0.047*	0.026	-0.047*	0.026	-0.042***	0.016	-0.040**	0.016
Age 31- 50	-0.179***	0.013	-0.163***	0.013	-0.162***	0.015	-0.153***	0.016
Age 51- 64	-0.360***	0.015	-0.333***	0.016	-0.285***	0.019	-0.269***	0.020
Age > 65	-0.457***	0.018	-0.425***	0.019	-0.450***	0.023	-0.431***	0.024
Lower secondary edu	0.049***	0.008	0.043***	0.008	0.067***	0.011	0.057***	0.011
Secondary edu	0.079***	0.008	0.070***	0.009	0.074***	0.009	0.065***	0.010
Tertiary edu	0.118***	0.008	0.108***	0.009	0.125***	0.010	0.113***	0.010
Household size	0.005**	0.003	0.007***	0.003	0.006*	0.003	0.007**	0.006
EU birth	0.022	0.030	0.022	0.030	-0.033*	0.019	-0.028	0.019
OTH birth	0.004	0.016	0.012	0.016	-0.044***	0.014	-0.038***	0.014
Household income (ln)	0.016***	0.004	0.014***	0.004	0.046***	0.007	0.042***	0.007
Uneed meet f.m.e.	-0.113***	0.014	-0.107***	0.014	-0.146***	0.021	-0.131***	0.021
Homeowner	0.012***	0.014	0.010	0.010	0.020**	0.008	0.016*	0.009
Employed part time	-0.039***	0.015	-0.041***	0.015	-0.065***	0.014	-0.066***	0.014
Unemployed	-0.067***	0.014	-0.065***	0.014	-0.110***	0.017	-0.110***	0.017
Student	0.076***	0.017	0.067***	0.017	0.018	0.021	0.006	0.021
Retired	-0.158***	0.014	-0.156***	0.014	-0.128***	0.015	-0.130***	0.015
Disabled	-0.612***	0.018	-0.606***	0.019	-0.349***	0.021	-0.334***	0.022
Domestic tasks	-0.093***	0.012	-0.093***	0.012	-0.080***	0.019	-0.078***	0.019
Inactive	-0.159***	0.017	-0.160***	0.017	-0.277***	0.035	-0.264***	0.037
Home warm	0.116***	0.012	0.107***	0.012	0.110***	0.016	0.098***	0.016
Home dark problem	-0.081***	0.008	-0.079***	0.009	-0.064***	0.012	-0.060***	0.012
Noise	-0.044***	0.008	-0.044***	0.008	-0.036***	0.010	-0.040***	0.010
Pollution	-0.043***	0.009	-0.042***	0.009	-0.050***	0.011	-0.051***	0.011
Crime	-0.051***	0.009	-0.050***	0.009	-0.039***	0.010	-0.042***	0.010
Densely populated area	0.012	0.008	0.013	0.008	0.019*	0.011	0.022**	0.011
Intermediate area	0.010	0.009	0.008	0.009	0.012	0.010	0.013	0.010
Political parties/t.u.			-0.027*	0.016			-0.023	0.021
Professional part.			0.002	0.015			-0.032	0.035
Religious part.			-0.007	0.008			0.015	0.026
Recreational part.			0.031***	0.009			0.043***	0.008
Other org. part.			-0.020	0.012			-0.019*	0.011
Meetings with friends			0.051***	0.007			0.030***	0.007
Cinema			0.036***	0.008			0.007	0.008
Live performance			0.015*	0.008			0.039***	0.007
Cultural site			0.017**	0.007			0.015*	0.008
Sport events			0.037***	0.010			0.022	0.010
Regional dummies	Yes		Yes		Yes		Yes	

Pseudo R2	0.232	0.234	0.215	0.215
Observations	26157	25755	18929	18231
Log likelihood	-12495.85	-12216.04	-8982.22	-8547.24

Note: The symbols ***, **, * denote that the marginal effect is statistically different from zero at 1, 5 and 10 percent.

Table 4. *Probit Estimates Results: Mediterranean Countries #2*

	GR (1)		GR(2)		IT (1)		IT (2)	
ForVol	0.037*	0.019	0.020	0.020	0.032***	0.010	0.005	0.011
InfVol	0.025***	0.009	0.018*	0.009	-0.010	0.006	-0.023***	0.006
Female	-0.007	0.009	-0.003	0.009	-0.026***	0.006	-0.021***	0.006
Married	0.008	0.015	0.008	0.015	-0.041***	0.008	-0.038***	0.008
Separated/divorced	-0.051***	0.021	-0.049**	0.021	-0.108***	0.012	-0.104***	0.012
Widowed	-0.123***	0.040	-0.120***	0.040	-0.051**	0.021	-0.057***	0.021
Age 31- 50	-0.117***	0.023	-0.105***	0.022	-0.206***	0.011	-0.185***	0.011
Age 51- 64	-0.306***	0.031	-0.282***	0.031	-0.390***	0.011	-0.369***	0.012
Age > 65	-0.475***	0.032	-0.442***	0.033	-0.542***	0.011	-0.523***	0.011
Lower secondary edu	0.064***	0.010	0.060***	0.010	0.097***	0.008	0.083***	0.008
Secondary edu	0.084***	0.009	0.076***	0.009	0.154***	0.008	0.135***	0.008
Tertiary edu	0.096***	0.010	0.085***	0.010	0.199***	0.009	0.176***	0.010
Household size	0.006*	0.003	0.008**	0.003	0.019***	0.003	0.021***	0.003
EU birth	0.015	0.038	0.032	0.034	0.100***	0.022	0.108***	0.022
OTH birth	-0.047**	0.020	-0.029	0.019	0.098***	0.014	0.107***	0.014
Household income (ln)	0.029***	0.006	0.024***	0.006	0.018***	0.005	0.017***	0.005
Uneed meet f.m.e.	-0.222***	0.021	-0.211***	0.021	-0.229***	0.011	0.224***	0.011
Homeowner	-0.011	0.010	-0.014	0.010	-0.005	0.006	-0.010	0.007
Employed part time	-0.027	0.020	-0.027	0.020	-0.032***	0.012	-0.030**	0.012
Unemployed	-0.067***	0.024	-0.066***	0.024	-0.056***	0.013	-0.028**	0.013
Student	0.036	0.028	0.025	0.028	0.061***	0.016	0.058***	0.016
Retired	-0.174***	0.016	-0.166***	0.016	-0.097***	0.010	-0.084***	0.010
Disabled	-0.768***	0.031	-0.752***	0.036	-0.465***	0.017	-0.467***	0.019
Domestic tasks	-0.111***	0.016	-0.105***	0.016	-0.044***	0.009	-0.028***	0.010
Inactive	-0.187***	0.047	-0.175***	0.047	-0.134***	0.014	-0.109***	0.014
Home warm	0.042***	0.012	0.041***	0.012	0.048***	0.010	0.037***	0.010
Home dark problem	-0.057***	0.010	-0.051***	0.010	-0.111***	0.007	-0.107***	0.007
Noise	-0.045***	0.012	-0.045***	0.011	-0.035***	0.007	-0.036***	0.007
Pollution	-0.031**	0.014	-0.023*	0.013	-0.025***	0.008	-0.026***	0.008
Crime	-0.017	0.016	-0.009	0.016	-0.024***	0.009	-0.019**	0.009
Densely populated area	-0.006	0.010	-0.005	0.010	0.034***	0.007	0.037***	0.007
Intermediate area	0.002	0.014	0.002	0.013	0.025***	0.007	0.022***	0.007
Political parties/t.u.			0.012	0.020			-0.042***	0.014
Professional part.			0.009	0.020			0.043***	0.013
Religious part.			0.018**	0.008			0.000	0.007
Recreational part.			0.010	0.016			0.029***	0.009
Other org. part.			-0.000	0.020			0.014	0.013
Meetings with friends			0.048***	0.010			0.078***	0.006
Cinema			0.012	0.012			0.049***	0.007

Live performance			0.027**	0.011			0.035***	0.007
Cultural site			0.037**	0.013			0.017**	0.008
Sport events			0.023	0.014			0.023***	0.009
Regional dummies	Yes		Yes		Yes		Yes	
Pseudo R2	0.378		0.381		0.264		0.270	
Observations	12088		12008		45497		43808	
Log likelihood	-4192.49		-4114.56		-22880.91		-21748.39	

Note: The symbols ***, **, * denote that the marginal effect is statistically different from zero at 1, 5 and 10 percent.

Despite these limitations, our findings provide the debate on the relationship between volunteering and health with significant insights, encouraging us to develop this course of research.

Summary and Discussion

Volunteering is confirmed to be correlated with health. Our findings are in line with previous research: in particular, with Borgonovi (2008), who employing the US data, finds a positive correlation between volunteer labour and self-reported health, and with Petrou and Kupek (2008) who, using data on England, show a positive correlation between an individual's activities in a wide range of social organisations and self-reported good health. In addition, as concerns the EU countries, results are in accordance with Fiorillo and Nappo (2014b, 2015), who show the beneficial role of both volunteering and community cohesion on health. However, we also remark negative correlations between health and informal volunteering for IT. Hence, relevant cross-countries differences do exist.

In Greece and Italy, results show a statistically positive association between formal voluntary work and health in Model (1). Such results might be explained considering that both Greece and Italy are characterised by a weak welfare regime, so volunteers could perceive their activities as supportive. In addition, in those countries policy makers are orientated to make volunteering a way to empower citizens who should not expect everything done for them by others or by the government. Again, it could be said that where volunteering is perceived as more necessary in terms of social benefits, its impact on health is greater.

As regards informal volunteering, we found a significant, positive correlation with self-rated health in France and in Spain. People informally volunteer especially induced by altruistic motivations, and it may happen that altruistic volunteers gain great benefit from volunteering, which, in turn, have a positive impact on health. Altruists, helping other, feel good, since lessen, or avoid distress and anxiety. However, results are different for Italy, where performing informal volunteering lessens the probability of reporting self-perceived good health. Within the Italian economic scenario, volunteering plays a crucial role in the welfare sector. Results show that Italians are altruistic and care about others without caring about their own health, probably

because they are particularly aware of others' needs of help in a context where public provision of services is quite low.

It is important to note how, as regards formal volunteering, results differ between Model (1) and Model (2): while the former does not include social and cultural participation covariates, the latter does. As said, one of the reasons why people volunteer is making friends and meeting other people. Social relationships affect health. Larger overall involvement with formal (for instance recreational organizations and volunteering groups) and informal (for instance friends and neighbours) social ties affect positively health by several channels: 1) positive health behaviours (Berkman and Breslow 1983), 2) psychosocial mechanisms (for example social support and mental health) and 3) physiological processes (for example, helpful interactions with others benefit immune, endocrine, and cardiovascular systems - Uchino 2004). Results confirm the above statement for volunteering in Models (1) and for some social and cultural participation covariates in Models (2). When the model includes social and cultural participation covariates, some of them are important predictors of self-perceived health, while the effect of volunteering on health lessens or disappears (Greece and Italy). This means that social and cultural participation variables in Models (2) capture the beneficial effect of social relationships on health due to formal volunteering in Models (1). Namely, individuals with poor social life expand their personal network volunteering in formal organizations and through these social relations gain health benefits. While, individuals with a rich social life, including participation in formal volunteering organizations, obtain health benefits from other kinds of social relationships.

Conclusions

In this paper, we compare the correlation among formal and informal volunteering and self-perceived health across some Mediterranean European Countries after controlling for socio-economic characteristics, housing features, neighborhood quality, size of municipality, social and cultural participation and regional dummies. We perform univariate probit models (Fiorillo Nappo 2014b, 2015). Our results expand the existing literature on formal and informal volunteering and health showing that they have a distinct correlation with health perception and that such effects differ across countries. A limit of the paper is that it studies only correlation, without considering causation. Research that can solve the reverse causality problem should be the next step of the study: however, such a problem cannot be solved with data available.

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Appendix

Table 5.*Variable Definitions*

Variable	Description
Dependent variable	
Self-perceived good health	Individual assessment of health. Dummy, 1=good and very good; 0 otherwise
Key independent variables	
Formal Volunteering	Dummy, 1 if the respondent, during the last twelve months, participated in the unpaid work of charitable organizations, groups or clubs. It includes unpaid charitable work for churches, religious groups and humanitarian organizations. Attending meetings connected with these activities is included; 0 otherwise
Informal Volunteering	Dummy, 1 if the respondent, during the last twelve months, undertook (private) voluntary activities to help someone, such as cooking for others; taking care of people in hospitals/at home; taking people for a walk. It excludes any activity that a respondent undertakes for his/her household, in his/her work or within voluntary organizations; 0 otherwise
Demographic and socio-economic characteristics	
Female	Dummy, 1 if female; 0 otherwise. **Reference group: male**
Married	Dummy, 1 if married; 0 otherwise; **Reference group: single status**
Separated/divorced	Dummy, 1 if separated/divorced; 0 otherwise
Widowed	Dummy, 1 if widowed; 0 otherwise
Age 31- 50	Age of the respondent. Dummy, 1 if age between 31 and 50. **Reference group: age 16 - 30**
Age 51- 64	Age of the respondent. Dummy, 1 if age between 51 and 64
Age > 65	Age of the respondent. Dummy, 1 if age above 65
Lower secondary edu	Dummy, 1 if the respondent has attained lower secondary education; 0 otherwise. **Reference group: no education/primary education**
Secondary edu	Dummy, 1 if the respondent has attained secondary education; 0 otherwise
Tertiary edu	Dummy, 1 if the respondent has attained tertiary education; 0 otherwise
Household size	Number of household members
EU birth	Dummy, 1 if the respondent was born in a European Union country; 0 otherwise. **Reference group: country of residence**
OTH birth	Dummy, 1 if the respondent was born in any other country; 0 otherwise
Household income (ln)	Natural log of total disposal household income (HY020)
Unmet need for medical examination	Dummy 1, if there was at least one occasion when the person really needed examination or treatment but did not; 0 otherwise
Homeowner	Dummy, 1 if the respondent owns the house where he /she lives; 0 otherwise
Employed part time	Self-defined current economic status of the respondents; 1 = employed part time; **Reference group: employed full time**
Unemployed	Self-defined current economic status of the respondents; 1 = unemployed; 0 otherwise
Student	Self-defined current economic status of the respondents; 1 = student; 0 otherwise
Retired	Self-defined current economic status of the respondents; 1 = retired; 0 otherwise
Disabled	Self-defined current economic status of the respondents; 1 = permanently disabled; 0 otherwise
Domestic tasks	Self-defined current economic status of the respondents; 1 = domestic tasks; 0 otherwise
Inactive	Self-defined current economic status of the respondents; 1 = other inactive person; 0 otherwise
Housing feature	
Home warm	Dummy, 1 if the respondent is able to pay to keep the home adequately warm; 0 otherwise
Home dark problem	Dummy, 1 if the respondent feels the dwelling is too dark, not enough light; 0 otherwise

Variable	Description
Neighborhood quality	
Noise	Dummy, 1 if the respondent feels noise from neighbors is a problem for the household; 0 otherwise
Pollution	Dummy, 1 if the respondent feels pollution, grime or other environmental problems are a problem for the household, 0 otherwise
Crime	Dummy, 1 if the respondent feels crime, violence or vandalism is a problem for the household; 0 otherwise
Size of municipality	
Densely populated area	Dummy, 1 if the respondent lives in local areas where the total population for the set is at least 50,000 inhabitants. **Reference Group: Thinly-populated area**
Intermediate area	Dummy, 1 if the respondent lives in local areas, not belonging to a densely-populated area, and either with a total population for the set of at least 50,000 inhabitants or adjacent to a densely-populated area.
Other social and cultural participation variables	
Political parties or trade unions	Dummy, 1 if the respondent, during the last twelve months, participated in activities related to political groups, political association, political parties or trade unions. Attending meetings connected with these activities is included; 0 otherwise
Professional participation	Dummy, 1 if the respondent, during the last twelve months, participated in activities related to a professional association. Attending meetings connected with these activities is included; 0 otherwise
Religious participation	Dummy, 1 If the respondent, during the last twelve months, participated in activities related to churches, religious communions or associations. Attending holy masses or similar religious acts or helping during these services is also included; 0 otherwise
Recreational participation	Dummy, 1 if the respondent, during the last twelve months, participated in recreational/leisure activities arranged by a club, association or similar. Attending meetings connected with these activities is included; 0 otherwise
Other organizations paarticipation	Dummy, 1 if the respondent, during the last twelve months, participated in the activities of environmental organizations, civil rights groups, neighbourhood associations, peace groups etc. Attending meetings connected with these activities is included; 0 otherwise
Meetings with friends	Dummy 1, if the respondent gets together with friends every day or several times a week during a usual year; 0 otherwise
Cinema	Dummy. 1 if the respondent goes to the cinema 1-3 times a year; 0 otherwise
Live performance	Dummy. 1 if the respondent goes to any live performance (plays, concerts, operas, ballet and dance performances) 1-3 times a year; 0 otherwise
Cultural site	Dummy. 1 if the respondent visits historical monuments, museum, art galleries or archeological sites 1-3 times a year; 0 otherwise
Sport events	Dummy. 1 if the respondent attends live sport events 1-3 times a year; 0 otherwise