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Preprint

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Abstract

In this paper, we compare the correlation among formal and informal volunteering and self-perceived health across 13 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 formal volunteering has a significantly positive association with self-perceived health in Finland and the Netherlands, significant negative relationship in Belgium, but none in the other countries. By contrast, informal volunteering has a significantly positive correlation with self-perceived health in France, the Netherlands, Spain, Greece and Portugal, and a significantly negative relationship in Italy. Our results point out that although formal and informal volunteering are correlated one with another they represents different aspects of volunteering whose correlations with self-perceived health depend, among others, on social and cultural characteristics of each country.

JEL codes: I10, D64, P5**,** Z1

Keywords: self-perceived health, formal and informal volunteering, European Countries

1. Introduction

Volunteering is an activity which people undertake of their free will without asking for monetary compensation in return. One way to categorize this activity is by its formality (Wilson and Musick 1997). *Formal volunteering* is defined as any unpaid contribution of time to activities of organizations. *Informal volunteering* (also called *helping beavhiour*) is any assistance given directly to non-households individuals, for instance helping a neighbour (Carson 1999; Lee and Brudney 2012). Table 1 reports for some European Countries the percentage of population involved in formal volunteering (giving time) and informal volunteering (helping a stranger) according to the World Giving Index (WGI) 2013 report[1]. The table illustrates two facts: i) helping others outside a formal organization is important as formal volunteering; ii) there are cross-country differences in volunteering.

In spite of (i), in sociology, political science and economics, formal volunteering has received more attention than informal volunteering. Although these activities share some observed and unobserved characteristics, they are not the same. Formal volunteering is more public than helping behaviour, since driven by human capital, social capital and cultural capital more than informal volunteering (Wilson and Musick 1997; Lee and Brudney 2012). As regards (ii), recent empirical investigations on European countries conclude that national differences in rates of formal and informal volunteering can be explained by differences in human, social and cultural factors as well as contextual factors, such as country's institutions (Plagnol and Huppert 2010).

Given the importance of helping behaviour and the cross-country differences in volunteering, ignoring voluntary work that occurs outside organizations means a misunderstanding about volunteering and its socio-economic effects. This is particularly true in public health researches, where few studies have addressed the relationship among formal and informal volunteering and health outcomes (Li and Ferraro 2005). In this field of research, a large strand of the socio-medical literature investigates on the relationship between formal volunteering and health, suggesting that volunteers are more likely to enjoy good physical and

[1] Following List and Price (2012), we use The Charities Aid Foundation (CAF) as source to compare volunteering between countries. CAF hosts the World Giving Index that ranks 153 countries based on charitable behavior of their citizenry. The index is compiled using data from Gallup trough the WorldView World Poll (worldview.gallup.com). The WorldView World Poll is a survey carried out in 153 countries on representative samples of about 1000 people per country aged more than 15 years and over, living in urban years. The index is based on three survey questions: 1) have you donated money to a charity in the past month? (giving money); 2) have you volunteered your time to an organization in the past month? (giving time); 3) have you helped a stranger or someone you didn't know who needed help in the past month? (helping a stranger). In particular, the World Giving Index is the average of the three measures. Each measure is the percentage of people answering yes to each question.

Table 1. Some European countries in WGI 2013.

Country	Giving time (%)	Helping a stranger (%)
Austria	28	56
Belgium	25	39
Denmark	20	53
Finland	27	55
France	25	35
Germany	27	56
Greece	4	30
Italy	25	56
Netherlands	37	57
Norway	35	53
Portugal	16	45
Spain	17	50
Sweden	13	51
United Kingdom	29	65

mental health (Moen et al. 1992; Musick et al. 1999; Post 2005), have lower rates of mortality than non-volunteers (Musick and Wilson 2008; Konrath et al. 2011) and declare better self-reported health (Carlson 2004). Recently, economic studies also started studying the impact of formal volunteering on health. Borgonovi (2008), focusing on the US data, finds a positive correlation between volunteer labor and self-reported health. In addition, Petrou and Kupek (2008), using data on England, show a positive correlation between individual's activities in a wide range of social organizations and self-reported good health.

This paper studies the relationship among formal and informal volunteering and health across European countries. In so doing, the contribution of this paper to the literature is threefold. First, it uses a new and comparable dataset, the 2006 wave EU-SILC micro data, with plenty of information on measures of volunteering for a sample of European countries. Second, it examines jointly the impact of formal and informal volunteering on self-perceived health. In the paper, formal volunteering is measured by voluntary activities undertaken in charitable organizations, groups or clubs, while informal volunteering is proxied by voluntary activities (performed on an individual basis) to help someone (such as cooking for others, taking care of people in hospitals/at home). Third, by focusing on self-perceived health in European countries, the paper investigates on cross-countries differences between volunteering and self-perceived health in Europe, after controlling, among others, for human capital, social capital and cultural factors. To the best of our knowledge, there are no economic studies which consider at the same time the relationship between formal and informal volunteering and self-perceived health comparing European countries.

The rest of the paper is organized as follows: section 2 describes the benefits of volunteering as well as the channels through which volunteering may affect health. The dataset and the methodology are presented in sections 3 and 4, while the empirical analysis is showed in sections 5. Section 6 discusses the results and section 7 concludes.

2. Volunteering and health

A growing strand of the socio-medical literature has focused on the link between volunteering and health (Musick and Wilson 2003; 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. In other words, it seems possible to identify links between the determinants of volunteering and potential channels through which volunteering benefits health. The parallel study of the two strands of literature seems to suggest that, when motivations, which push people to supply volunteer work, are largely fulfilled, volunteering can affect positively health.

Volunteering may contribute to make volunteers feel «good» (Andreoni 1990). Following this approach, volunteering is an ordinary consumption good (Menchik and Weisbrod 1987; Cappellari et al. 2011; Fiorillo 2011; Bruno and Fiorillo 2012) from which individuals receive a direct utility: volunteers bear utility also from the act of volunteering in itself, not only from the goods they contribute to provide offering their time. In this case, volunteering gives people the opportunity to be recognized as «good» by society. So, volunteering impacts positively on volunteers' social recognition: volunteers are recompensed with gratitude and admiration. This is likely to happen since volunteering activities are appreciated by society and people who volunteer are thought as altruist. Therefore, being engaged in these activities may promote feelings of self-worth and self-esteem. In addition, providing help is a self-validating experience. In certain settings, it can foster trust and intimacy and can encourage the provider to anticipate that reciprocal help will be forthcoming when it is needed (Wilson and Musick 1999). Finally, whilst performing social roles connected to volunteering, volunteers may be distracted from personal problems and become less self-preoccupied, fill their life with meaning and purpose. All this, in turn, produces positive effects on socio-psychological factors (Musick and Wilson 2003; Choi and Bohman 2007).

Another strand of the literature suggests that people are motivated to volunteer to gain work experience, which raises a volunteer's future employability, when unemployed, and earning power, when employed. Still, some empirical studies show that there is a wage premium for volunteers (Day and Devlin 1998; Hackl et al. 2007; Bruno and Fiorillo 2014).

In addition, volunteering can boost workers' career prospects (Wilson 2000). This is likely to happen as organizational theory documents the importance of altruistic characteristics in workers (Smith et al 1983; Organ 1988). Altruists will be more productive in the work place, since they are "team players" who are willing to cooperate with others (Kats and Rosemberg 2005). Both the possibility of role enhancement and wage premium connected to volunteering may increase job satisfaction (Fiorillo and Nappo 2014) which, in turn, produces significant positive effects on health. A growing number of studies suggests a link between job satisfaction levels and 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 improve social skills too (Clotfelter 1985; Schiff 1990; Prouteau and Wolff 2004, 2006). There is a link between this strand of the literature and the social integration theory, following which multiple social roles provide meaning and purpose in life, promote social support and interactions (Musick and Wilson 2003; Li and Ferraro 2005; Choi and Boham 2007). Social integration connects and validates people each other within a community. The theory assumes that people gain mental, emotional and physical benefits when they think themselves as a contributing, accepted part of a collective. Without such a sense of connection, people can experience depression, isolation and physical illness.

From the above discussion, we would aspect a positive relationship among formal and informal volunteering and self-perceived health in our study. Anyway, in the empirical investigation, two theoretical features may affect these positive links.

First, since informal volunteering is not performed via official groups but on an individual basis and, often, there is not a process of recognition of volunteers' activities by society as for formal volunteering, the potential channel of "social recognition" might be weakened for informal volunteers. Generally, informal helpers do not enhance their roles and have fewer opportunities to be appreciated by society than formal volunteers who, often, prefer volunteer in well-known and prestigious organizations, which give them visibility with its advantages also in terms of health. Nevertheless, such lessened channel through which formal volunteering benefits health might be compensated by the assumption that informal volunteering is likely performed for purely altruistic reasons, which, according to Freud - who perceived altruism as acting for one's own well-being - may affect positively health. Following a strand of the literature (see Batson 1991), altruistic persons do not help in order

to benefit others, but rather to receive benefits, avoid distress and discomfort, and relieve their sense of obligation.

Second, volunteering is a cultural and an economic phenomenon, therefore, rates of participation at such activity depend on how societies are structured and how social responsibility are allocated within them (Haski-Leventhal 2009). In different countries, characterised by different political regimes, people volunteer not only at different rates, but also induced by different motivations (Anheir and Salomon 1999). In addition, in countries with different culture, volunteering is perceived in different ways (Handy et al. 2000; Meijs et al. 2003). Consequently, the impact of volunteering on health is expected to be different by countries. Following a strand of the literature (see Triandi 1995), patterns of social behaviour could be explained by "individualism versus collectivism". Different dimensions of "individualism versus collectivism" may imply dissimilar association between pro social behaviour and health: in very individualistic societies, within which social behaviours are rare, they may affect more health than in societies where social support is a more frequent behaviour. A significant difference as regards the impact of volunteering on health is among Northern European countries, which encourage volunteering and countries where rates of volunteering are lower. Following the "individualism versus collectivism" approach, the effects of volunteering on health should be minor in countries where volunteering is a social norm and rates of volunteering are high. Another way of explaining the effects of volunteering on health is considering the regime of welfare state in each country. It is likely that in countries where the welfare regime is strong and provides most of the services, people volunteer motivated by solidarity, not induced by a condition of social necessity. This implies smaller effects in terms of well-being than in countries where the welfare regime is weak and therefore volunteering activities are thought as necessary (Haski-Leventhal 2009). It is the feeling of doing something valued as necessary for the community that produces a sense of well-being and therefore impacts positively on health. A different explanation moves from the Social Origins Theory (Salomon and Anheier 1998), following which, countries differ in their "non-profit regimes". Salomon and Anheier (1998) propose four regimes of welfare: Liberal, Statist, Social Democratic and Corporatist. Two main dimensions classify such regimes: the amount of government social welfare spending and the size of the non-profit sector. The Social Democratic regime, typical of the Northern Europe, provides large welfare protections and abundant services, so in those countries the non-profit sector has fewer opportunity to develop and volunteering is seen as less necessary with lower impact on well-being and health.

3. Data and descriptive statistics

We use 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 provides comparable multidimensional data on income, 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, neighborhood quality, size of municipality, social and cultural participation. Information on social and cultural participation, not provided in other waves of the survey, regards respondents aged 16 and above. Hence, no panel dimension is available for our study.

Health measure

Our 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. Self-perceived health (*SPH*) is widely used in the literature as a good proxy for health and, despite its very subjective nature, previous studies have shown it is correlated with objective health measures such as mortality (Idler and Benyamini, 1997).

Volunteering

We consider two different kinds of volunteering: formal and informal. Formal volunteering (*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. Informal volunteering (*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. It excludes any activity that the respondent undertook for his/her household, in his/her work or within voluntary organizations.

Control variables

In order to account for other factors that might influence simultaneously health status and formal and informal volunteering, we include in the analysis a full set of control variables: age, gender, marital status, education, the respondents' country of birth, the number of

individuals living in the household, the natural logarithm of total disposal household income, unmet need for medical examination and treatment, tenure status and self-defined current economic status. We also control for housing features, neighborhood quality and size of municipality. We further control for a number of other activities which imply a certain degree of relational engagement, such as religious, recreational, professional, political and other participations, meetings with friends and several forms of cultural consumption, i.e. the frequency with which interviewees go to the cinema, live performances (plays, concerts, operas), cultural sites and sport events. Finally, regional fixed effects are also included. Table A1, in Appendix A, describes all variables employed in the empirical analysis in detail.

We consider 13 European countries separately: Austria (AT), Belgium (BE), Germany (DE), Denmark (DK), Spain (ES), Finland (FI), France (FR), Greece (GR), Italy (IT), Netherlands (NL), Norway (NO), Portugal (PT) and Sweden (SE).

Because of the many missing values as regards the informal volunteering variable for NO, we do not include this variable in the empirical analysis. Moreover, we also exclude the informal volunteering variable for BE and DE due to the absence of variability.

Descriptive statistics

The weighted summary statistics for SPH, ForVol and InfVol are showed in Figures 1-3, and reported in Table 1 (with the full control variables). Fig. 1 reports that, on average, respondents rate their health as good and/or very good, except for DE, IT and PT. According to Figures 2 and 3, formal and formal volunteering differ substantially among European countries. Formal volunteering is lowest in FR and GR where only 1% and 3%, respectively, of respondents supply voluntary activities in charitable organizations, groups or clubs. By contrast, in the NL 32 % of respondents perform formal volunteer work. The NL also has the highest number of respondents (more than 50%) who undertake informal volunteering. The other European countries that display relatively higher informal volunteering are ES and FI, with a rate of 45% and 38% respectively. At the other end of the range is DK, where only 3% respondents supply informal voluntary activities.

The correlation matrix between the main variables of interest is reported in Table 2 below. We can note that the key independent variables are positively correlated with one another in all countries, and positively correlated with the dependent variable in almost all countries, except in DE, DK and IT. This last descriptive evidence will be not entirely true in the multivariate analysis.

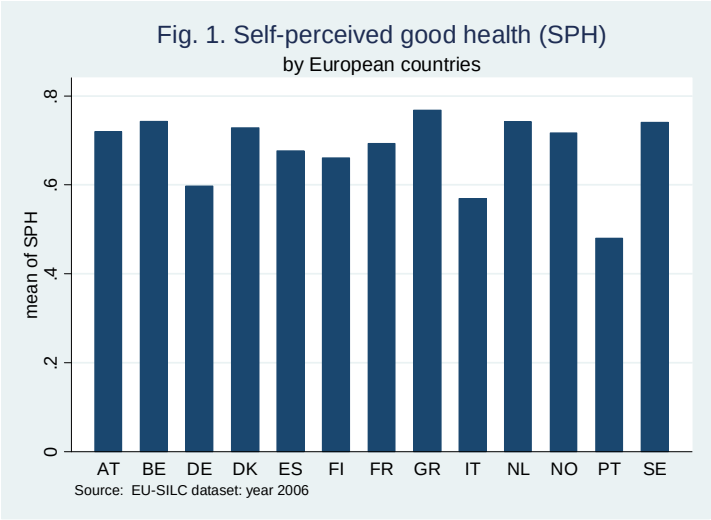
Fig. 1. Self-perceived good health (SPH)
by European countries
mean of SPH
0
.2
.4
.6
.8
AT BE DE DK ES FI FR GR IT NL NO PT SE
Source: EU-SILC dataset: year 2006

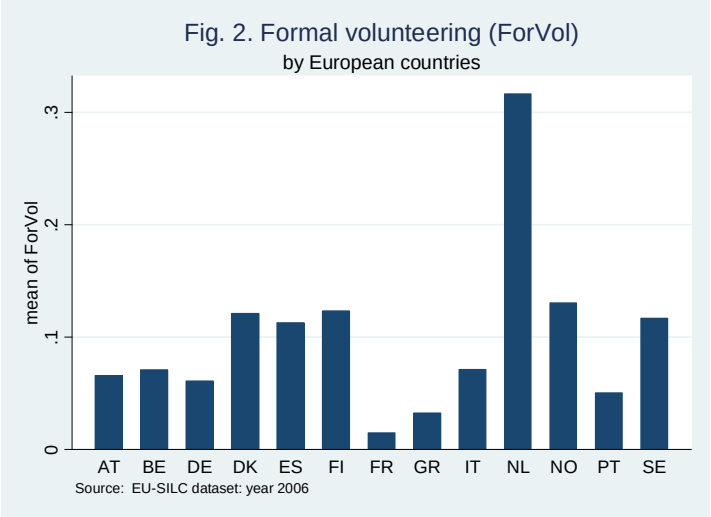
Fig. 2. Formal volunteering (ForVol)
by European countries
mean of ForVol
0
.1
.2
.3
AT BE DE DK ES FI FR GR IT NL NO PT SE
Source: EU-SILC dataset: year 2006

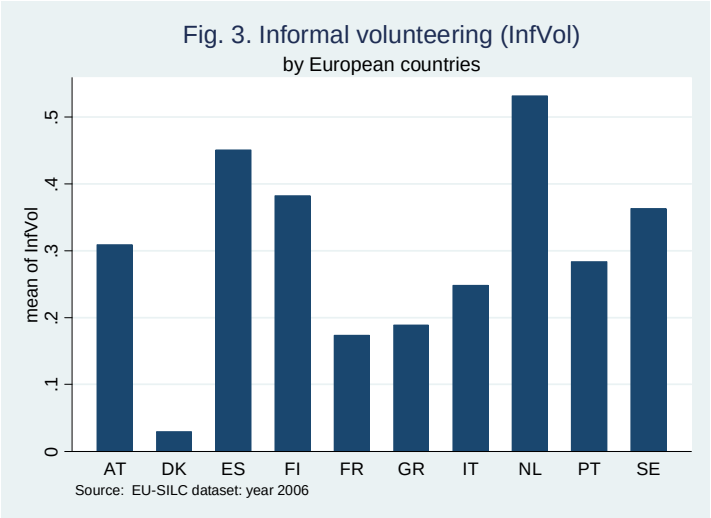
Fig. 3. Informal volunteering (InfVol)
by European countries
mean of InfVol
0
.1
.2
.3
.4
.5
AT DK ES FI FR GR IT NL PT SE
Source: EU-SILC dataset: year 2006

Table 1. Descriptive statistics (mean)

	AT	BE	DE	DK	ES	FI	FR	GR	IT	NL	NO	PT	SE
SPH	0.72	0.74	0.60	0.73	0.68	0.66	0.69	0.77	0.57	0.74	0.72	0.54	0.74
ForVol	0.06	0.07	0.06	0.12	0.11	0.12	0.01	0.03	0.07	0.32	0.13	0.05	0.12
InfVol	0.31			0.03	0.45	0.38	0.17	0.19	0.25	0.53		0.30	0.36
Female	0.52	0.51	0.52	0.52	0.51	0.54	0.52	0.51	0.52	0.53	0.52	0.50	0.52
Married	0.54	0.53	0.54	0.39	0.59	0.39	0.53	0.62	0.58	0.46	0.37	0.63	0.33
Separated/divorced	0.10	0.08	0.07	0.12	0.10	0.10	0.07	0.09	0.12	0.10	0.13	0.06	0.13
Widowed	0.07	0.10	0.10	0.12	0.01	0.14	0.07	0.02	0.02	0.10	0.10	0.03	0.15
Age 31- 50	0.38	0.36	0.37	0.34	0.39	0.32	0.35	0.35	0.37	0.38	0.36	0.40	0.33
Age 51- 64	0.21	0.22	0.20	0.23	0.19	0.24	0.22	0.20	0.20	0.23	0.21	0.21	0.22
Age > 65	0.21	0.20	0.23	0.23	0.21	0.25	0.21	0.23	0.24	0.21	0.24	0.14	0.25
Lower second. edu	0.26	0.16	0.15	0.35	0.23	0.33	0.16	0.13	0.30	0.23	0.30	0.18	0.11
Secondary edu	0.56	0.36	0.53	0.42	0.22	0.40	0.39	0.35	0.33	0.38	0.44	0.16	0.50
Tertiary edu	0.16	0.32	0.29	0.23	0.24	0.27	0.20	0.16	0.10	0.27	0.25	0.11	0.28
Household size	2.89	2.77	2.54	2.02	3.20	2.12	2.66	3.09	2.95	2.27	2.09	3.30	2.10
EU birth	0.05	0.06		0.01	0.01	0.01	0.04	0.01	0.01	0.01	0.03	0.01	0.05
OTH birth	0.11	0.06	0.10	0.04	0.04	0.02	0.08	0.06	0.05	0.05	0.04	0.02	0.06
Househ. income (ln)	10.35	10.26	10.12	10.24	9.95	10.07	10.21	9.81	10.16	10.14	10.47	9.67	10.02
Uneed meet f.m.e.	0.02	0.01	0.12	0.01	0.06	0.03	0.04	0.07	0.07	0.02	0.03	0.04	0.15
Homeowner	0.59	0.74	0.50	0.58	0.84	0.67	0.63	0.76	0.74	0.55	0.78	0.76	0.61
Employed part time	0.09	0.11	0.18	0.07	0.05	0.06	0.09	0.05	0.05	0.22	0.07	0.05	0.12
Unemployed	0.04	0.07	0.06	0.03	0.07	0.06	0.06	0.06	0.05	0.02	0.02	0.07	0.03
Student	0.06	0.07	0.07	0.10	0.07	0.06	0.08	0.08	0.06	0.06	0.07	0.08	0.08
Retired	0.27	0.23	0.25	0.26	0.15	0.26	0.27	0.21	0.22	0.15	0.22	0.15	0.26
Disabled	0.00	0.03	0.02	0.06	0.02	0.06	0.03	0.01	0.01	0.05	0.07	0.01	0.05
Domestic tasks	0.09	0.07	0.06	0.00	0.13	0.02	0.04	0.15	0.14	0.12	0.00	0.06	0.00
Inactive	0.01	0.02	0.01	0.02	0.05	0.01	0.01	0.01	0.05	0.04	0.03	0.02	0.01
Home warm	0.96	0.86	0.95	0.90	0.91	0.97	0.94	0.87	0.90	0.97	0.98	0.63	0.97
Home dark problem	0.10	0.14	0.15	0.08	0.17	0.04	0.12	0.21	0.22	0.16	0.08	0.17	0.06
Noise	0.19	0.22	0.29	0.20	0.27	0.18	0.19	0.20	0.25	0.32	0.13	0.26	0.14
Pollution	0.08	0.16	0.24	0.08	0.17	0.13	0.16	0.17	0.22	0.14	0.08	0.21	0.07
Crime	0.12	0.18	0.12	0.14	0.20	0.17	0.16	0.08	0.15	0.17	0.04	0.13	0.14
Densely popul. area	0.36	0.53	0.49	0.36	0.52	0.29	0.47	0.39	0.44		0.50	0.42	0.21
Intermediate area	0.24	0.43	0.34	0.29	0.20	0.17	0.35	0.14	0.39		0.17	0.31	0.14
Political parties/t.u.	0.05		0.06	0.12	0.04	0.10	0.03	0.05	0.04	0.04	0.10	0.03	0.09
Professional part.	0.04	0.07	0.03	0.11	0.04	0.08	0.01	0.06	0.05	0.11	0.11	0.04	0.10
Religious part.	0.14		0.15	0.11	0.17	0.16	0.01	0.29	0.19	0.43	0.13	0.42	0.20
Recreat. Part.	0.23	0.33	0.20	0.30	0.14	0.37	0.23	0.08	0.10	0.46	0.37	0.12	0.37
Other org. part.	0.02	0.08	0.16	0.08	0.07	0.17	0.11	0.06	0.05	0.21	0.11	0.02	0.24
Meetings with f.	0.60	0.64	0.55	0.59	0.66	0.68	0.48	0.79	0.66	0.58	0.67	0.78	0.63
Cinema	0.18	0.24	0.34	0.29	0.21	0.29	0.23	0.22	0.22	0.25	0.26	0.18	0.34
Live performance	0.17	0.28	0.38	0.35	0.22	0.33	0.32	0.24	0.19	0.32	0.32	0.33	0.39
Cultural site	0.12	0.26	0.43	0.32	0.25	0.28	0.27	0.12	0.17	0.28		0.24	0.33
Sport events	0.21	0.11	0.22	0.14	0.12	0.20	0.14	0.13	0.12	0.13	0.16	0.19	0.16
Observations	11960	11219	24827	5708	28055	10757	19236	12606	45975	8985	5758	8556	6581

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

	AT		BE		DE	
	SPH	ForVol	SPH	ForVol	SPH	ForVol
ForVol	0.0433*		0.0210*		-0.0262*	
InfVol	0.0578*	0.1730*				
	DK		ES		FI	
	SPH	ForVol	SPH	ForVol	SPH	ForVol
ForVol	-0.0100		-0.0048		0.0535*	
InfVol	0.0236	0.2316*	0.0437*	0.0897*	0.0487*	0.1019*
	FR		GR		IT	
	SPH	ForVol	SPH	ForVol	SPH	ForVol
ForVol	0.0043		0.0323*		0.0323*	
InfVol	0.0290*	0.0755*	0.0414*	0.1848*	-0.0189*	0.1808*
	NL		NO		PT	
	SPH	ForVol	SPH	ForVol	SPH	ForVol
ForVol	0.0373*		0.0296*		0.0121	
InfVol	0.1167*	0.1745*			0.0696*	0.1981*
	SE					
	SPH	ForVol				
ForVol	0.0274*					
InfVol	0.0693*	0.1736*				

4. Empirical models

Our empirical strategy involves two models. First, 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:

$$\Pr(H_{ij} = 1) = \Phi(\alpha - \beta FV_{ij} - \theta IV_{ij} - \chi Y_{ij} - Z_{ij}\varphi) \qquad (2)$$

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

Moreover, the possibility of reverse causality has to be taken into account: individuals in poor health may be induced to reduce their unpaid contribution of time against their will. The available data does not allow us to identify suitable instruments for formal and informal volunteering but only whether self-perceived good health, formal volunteering and informal help are joint or independent behaviours and perceptions.

Thus, we jointly estimate self-perceived good health, formal volunteering and helping behaviour using a Multivariate Probit Model (where these variables are the dependent variables and the independent variables are all those reported in Table 1)[2]:

$$H_{ij}^{*} = \alpha + \chi Y_{ij} + Z_{ij}\varphi + \varepsilon_{ij},\ H_{ij} = 1 \text{ if } H_{ij}^{*} > 0,\ 0 \text{ otherwise,}$$

$$FV_{ij}^{*} = \omega + \psi Y_{ij}^{'} + Z_{ij}^{'}\delta + \mu_{ij},\ FV_{ij} = 1 \text{ if } FV_{ij}^{*} > 0,\ 0 \text{ otherwise,} \qquad (3)$$

$$IV_{ij}^{*} = \sigma + \tau Y_{ij}^{''} + Z_{ij}^{''}\pi + \eta_{ij},\ IV_{ij} = 1 \text{ if } IV_{ij}^{*} > 0,\ 0 \text{ otherwise,}$$

with

$$\begin{pmatrix} \varepsilon \\ \mu \\ \eta \end{pmatrix} \sim N_3, \left[\begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & \rho_{HFV} & \rho_{HIV} \\ \rho_{FVH} & 1 & \rho_{FVIV} \\ \rho_{IVH} & \rho_{IVFV} & 1 \end{pmatrix} \right]$$

the error terms distributed as a normal 3-variete, with zero mean and variance-covariance matrix with values equal to 1 on the main diagonal and correlations ρ outside. From the estimates of correlations ρ we test whether the problem of reverse causality remains open to question.

5. Empirical analysis

The univariate probit estimates for the 13 European countries separately are showed in tables 3-5. For the sake of clarity, we present the results for Nordic countries (Table 3), Continental countries (Table 4) and Mediterranean countries (Table 5). For each country, the first column shows marginal effects and the second column presents the standard errors, which are corrected for heteroskedasticity. Model (1) presents the findings with all the covariates except for social and cultural participation variables which are included in Model (2) where we conduct a robustness analysis.

[2] See Green (2012, cap. 17.5)

Table 3. Probit estimates results: Nordic countries #1

	DK (1)		DK (2)		FI (1)		FI (2)	
ForVol	0.010	0.017	-0.005	0.018	0.048***	0.014	0.038***	0.014
InfVol	0.010	0.033	-0.003	0.034	0.015	0.010	0.010	0.010
Female	-0.008	0.012	-0.002	0.012	0.030***	0.010	0.037***	0.010
Married	-0.005	0.018	-0.004	0.018	-0.054***	0.015	-0.051***	0.015
Separated/divorced	0.010	0.027	0.007	0.027	-0.072***	0.027	-0.073***	0.027
Widowed	0.014	0.023	0.010	0.023	-0.015	0.019	-0.018	0.020
Age 31- 50	-0.115***	0.025	-0.111***	0.025	-0.166***	0.021	-0.155***	0.021
Age 51- 64	-0.214***	0.034	-0.201***	0.034	-0.260***	0.025	-0.239***	0.025
Age > 65	-0.170***	0.045	-0.160***	0.045	-0.367***	0.037	-0.332***	0.038
Lower secondary edu								
Secondary edu	0.046***	0.013	0.045***	0.013	0.033***	0.012	0.027**	0.013
Tertiary edu	0.094***	0.014	0.092***	0.014	0.095***	0.013	0.089***	0.014
Household size	0.001	0.007	0.003	0.007	0.012**	0.005	0.013**	0.005
EU birth	-0.029	0.050	-0.027	0.050	-0.006	0.066	-0.001	0.064
OTH birth	-0.067*	0.038	-0.058	0.038	0.051	0.061	0.071	0.059
Household income (ln)	0.046***	0.014	0.042***	0.014	0.025***	0.009	0.025***	0.009
Uneed meet f.m.e.	-0.192***	0.076	-0.177***	0.075	-0.270***	0.037	-0.260***	0.037
Homeowner	0.053***	0.015	0.050***	0.015	-0.005	0.014	-0.007	0.014
Employed part time	-0.084***	0.024	-0.082***	0.024	-0.066***	0.021	-0.070***	0.021
Unemployed	-0.148***	0.044	-0.146***	0.043	-0.154***	0.024	-0.150***	0.025
Student	0.009	0.029	0.006	0.030	0.024	0.027	0.016	0.027
Retired	-0.170***	0.030	-0.157***	0.030	-0.119***	0.028	-0.125***	0.028
Disabled	-0.570***	0.034	-0.567***	0.035	-0.433***	0.025	-0.434***	0.025
Domestic tasks	-0.149*	0.091	-0.107	0.088	0.027	0.033	0.026	0.033
Inactive	-0.150***	0.055	-0.147***	0.055	-0.043	0.059	-0.036	0.059
Home warm	0.044**	0.022	0.043**	0.022	0.065**	0.034	0.058*	0.034
Home dark problem	-0.066***	0.024	-0.066***	0.024	-0.055**	0.025	-0.050**	0.025
Noise	-0.015	0.016	-0.015	0.016	-0.040***	0.016	-0.038**	0.016
Pollution	-0.003	0.023	-0.001	0.023	-0.037**	0.017	-0.038**	0.017
Crime	-0.054***	0.019	-0.054***	0.019	-0.040***	0.015	-0.040***	0.015
Densely populated area	0.048***	0.014	0.052***	0.013	0.033**	0.014	0.035**	0.014
Intermediate area	0.016	0.013	0.016	0.013	0.033**	0.014	0.032**	0.014
Political parties/t.u.			-0.028	0.018			0.002	0.016
Professional part.			0.051***	0.017			-0.028	0.018
Religious part.			0.004	0.018			-0.030**	0.014
Recreational part.			0.030**	0.012			0.035***	0.011
Other org. part.			-0.011	0.022			-0.005	0.013
Meetings with friends			0.034***	0.012			0.039***	0.011
Cinema			-0.020	0.012			0.022*	0.011
Live performance			0.024**	0.012			0.031***	0.011
Cultural site			0.012	0.012			0.026**	0.011
Sport events			0.012	0.016			0.007	0.012
Regional dummies					Yes		Yes	
Pseudo R2	0.151		0.158		0.164		0.169	
Observations	5494		5468		9148		8999	
Log likelihood	-2464.31		-2429.65		-4672.04		-4546.55	

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

Table 3. Probit estimation results: Nordic countries #2

	NO (1)		NO (2)		SE (1)		SE (2)	
ForVol	0.009	0.017	0.000	0.018	0.020	0.016	0.005	0.017
InfVol					0.007	0.011	0.000	0.011
Female	0.028**	0.012	0.034***	0.012	-0.007	0.011	-0.003	0.011
Married	-0.030*	0.018	-0.027	0.018	0.006	0.015	0.007	0.015
Separated/divorced	-0.040	0.030	-0.041	0.030	-0.011	0.026	-0.015	0.026
Widowed	0.003	0.025	0.002	0.025	0.010	0.019	0.011	0.018
Age 31- 50	-0.097***	0.023	-0.095***	0.023	-0.118***	0.021	-0.109***	0.021
Age 51- 64	-0.170***	0.031	-0.156***	0.031	-0.214***	0.029	-0.195***	0.030
Age > 65	-0.088**	0.046	-0.064	0.044	-0.166***	0.047	-0.136***	0.046
Lower secondary edu					0.044**	0.020	0.039*	0.020
Secondary edu	0.072***	0.013	0.066***	0.014	0.076***	0.018	0.068***	0.018
Tertiary edu	0.117***	0.014	0.109***	0.014	0.111***	0.016	0.096***	0.017
Household size	0.014**	0.006	0.012**	0.006	-0.006	0.005	-0.004	0.006
EU birth	-0.043	0.041	-0.043	0.041	-0.050**	0.025	-0.038*	0.024
OTH birth	-0.086**	0.039	-0.071**	0.038	-0.066***	0.025	-0.048**	0.024
Household income (ln)	0.022**	0.009	0.020**	0.009	0.029***	0.010	0.022**	0.010
Uneed meet f.m.e.	-0.386***	0.050	-0.387***	0.050	-0.233***	0.019	-0.230***	0.019
Homeowner	0.013	0.018	0.014	0.018	0.019	0.013	0.015	0.013
Employed part time	-0.108***	0.025	-0.111***	0.026	-0.125***	0.020	-0.126***	0.020
Unemployed	-0.039	0.047	-0.042	0.048	-0.228***	0.039	-0.200***	0.039
Student	-0.011	0.029	-0.018	0.029	-0.044	0.028	-0.046*	0.029
Retired	-0.243***	0.043	-0.237***	0.043	0.252***	0.040	-0.254***	0.041
Disabled	-0.556***	0.028	-0.546***	0.029	-0.639***	0.028	-0.625***	0.030
Domestic tasks	-0.203	0.149	-0.210	0.153	-0.203**	0.097	-0.189**	0.099
Inactive	-0.296***	0.044	-0.290***	0.044	-0.055	0.076	-0.047	0.076
Home warm	0.183***	0.069	0.175***	0.070	0.092***	0.038	0.092***	0.038
Home dark problem	-0.027	0.023	-0.027	0.023	-0.053**	0.023	-0.053**	0.023
Noise	-0.015	0.020	-0.014	0.020	-0.047***	0.018	-0.048***	0.018
Pollution	-0.063***	0.026	-0.063***	0.026	-0.025	0.021	-0.026	0.021
Crime	-0.047	0.032	-0.049	0.032	-0.045***	0.017	-0.044	0.017
Densely populated area	0.028**	0.013	0.030**	0.013	0.007	0.014	0.007	0.014
Intermediate area	0.031*	0.016	0.033**	0.016	0.032**	0.014	0.029**	0.0014
Political parties/t.u.			-0.000	0.021			-0.000	0.019
Professional part.			0.002	0.020			0.055***	0.016
Religious part.			-0.040**	0.019			-0.012	0.014
Recreational part.			0.051***	0.012			0.024**	0.011
Other org. part.			-0.013	0.018			0.006	0.012
Meetings with friends			0.033**	0.013			0.034*	0.011
Cinema			0.037**	0.013			0.018	0.011
Live performance			-0.003	0.012			0.018	0.011
Cultural site							0.024**	0.011
Sport events			0.032**	0.015			0.050***	0.013
Regional dummies								
Pseudo R2	0.186		0.193		0.203		0.212	
Observations	5578		5576		6109		6062	
Log likelihood	-2479.14		-2456.47		-2559.64		-2510.05	

Table 4. Probit estimates results: Continental countries #1

	AT (1)		AT (2)		BE (1)		BE (2)	
ForVol	0.037**	0.016	0.022	0.017	-0.007	0.017	-0.031*	0.018
InfVol	0.008	0.009	-0.003	0.009				
Female	0.033***	0.010	0.041***	0.010	-0.035***	0.009	-0.027***	0.009
Married	-0.018	0.014	-0.013	0.014	-0.027*	0.014	-0.027**	0.014
Separated/divorced	-0.104***	0.022	-0.095***	0.022	-0.074***	0.024	-0.078***	0.024
Widowed	-0.031	0.021	-0.025	0.020	-0.068***	0.020	-0.073***	0.020
Age 31- 50	-0.175***	0.019	-0.152***	0.019	-0.142***	0.018	-0.139***	0.018
Age 51- 64	-0.373***	0.025	-0.335***	0.025	-0.202***	0.024	-0.193***	0.025
Age > 65	-0.453***	0.028	-0.402***	0.029	-0.324***	0.032	-0.308***	0.033
Lower secondary edu					0.028**	0.013	0.020	0.013
Secondary edu	0.104***	0.010	0.092***	0.010	0.043***	0.012	0.031**	0.012
Tertiary edu	0.144***	0.010	0.128***	0.010	0.087***	0.012	0.069***	0.013
Household size	-0.013***	0.004	-0.011***	0.004	0.011**	0.004	0.012***	0.004
EU birth	0.034*	0.019	0.034*	0.019	-0.025	0.018	-0.017	0.018
OTH birth	-0.029*	0.016	-0.017	0.016	-0.022	0.020	-0.009	0.019
Household income (ln)	0.068***	0.008	0.062***	0.008	0.034***	0.008	0.032***	0.008
Uneed meet f.m.e.	-0.309***	0.040	-0.300***	0.040	-0.206***	0.075	-0.173***	0.074
Homeowner	0.027***	0.010	0.022**	0.010	0.032***	0.011	0.028***	0.011
Employed part time	0.016	0.016	0.011	0.016	-0.019	0.015	-0.026*	0.016
Unemployed	-0.135***	0.028	-0.127***	0.028	-0.118***	0.021	-0.115***	0.021
Student	0.123***	0.023	0.117***	0.023	0.027	0.025	-0.004	0.027
Retired	-0.127***	0.016	-0.123***	0.017	-0.087***	0.020	-0.089***	0.020
Disabled	-0.618***	0.069	-0.589***	0.082	-0.622***	0.027	-0.625***	0.029
Domestic tasks	-0.013	0.017	-0.004	0.017	-0.044**	0.020	-0.048**	0.021
Inactive	-0.158***	0.050	-0.098**	0.049	-0.127***	0.035	-0.125***	0.035
Home warm	0.035	0.023	0.041*	0.023	0.100***	0.014	0.085***	0.014
Home dark problem	-0.053***	0.015	-0.046***	0.015	-0.035***	0.013	-0.033***	0.013
Noise	-0.044***	0.012	-0.040***	0.012	-0.029***	0.011	-0.029***	0.011
Pollution	-0.020	0.017	-0.020	0.017	-0.057***	0.013	-0.058***	0.013
Crime	-0.019	0.014	-0.021	0.014	-0.068***	0.012	-0.059***	0.012
Densely populated area	0.035***	0.011	0.027**	0.011	-0.035	0.022	-0.040*	0.022
Intermediate area	-0.009	0.011	-0.018*	0.011	-0.029	0.022	-0.038*	0.023
Political parties/t.u.			0.005	0.018				
Professional part.			-0.007	0.022			-0.011	0.017
Religious part.			-0.001	0.012				
Recreational part.			0.045***	0.010			0.050***	0.009
Other org. part.			-0.003	0.028			0.030**	0.014
Meetings with friends			0.086***	0.009			0.045***	0.009
Cinema			0.023*	0.012			0.027***	0.010
Live performance			-0.004	0.011			0.018*	0.009
Cultural site			0.019*	0.011			0.025**	0.010
Sport events			0.045***	0.013			0.008	0.013
Regional dummies	Yes		Yes					
Pseudo R2	0.227		0.234		0.190		0.198	
Observations	11927		11595		10488		10243	
Log likelihood	-5421.64		-5158.75		-4640.24		-4439.05	

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

Table 4. Probit estimates results: Continental countries #2

	DE (1)		DE (2)		FR (1)		FR (2)		NL(1)		NL (2)	
ForVol	0.015	0.013	-0.012	0.015	0.032	0.026	0.030	0.026	0.029***	0.010	0.022**	0.010
InfVol					0.041***	0.008	0.024***	0.009	0.045***	0.009	0.041***	0.009
Female	-0.004	0.008	-0.004	0.008	-0.000	0.007	-0.000	0.007	0.028**	0.011	0.027**	0.011
Married	-0.058***	0.012	-0.056***	0.012	-0.008	0.011	-0.005	0.011	-0.021	0.015	-0.019	0.015
Separated/divorced	-0.044**	0.018	-0.045**	0.018	-0.043**	0.018	-0.045***	0.018	-0.039*	0.022	-0.043**	0.022
Widowed	-0.028*	0.016	-0.032**	0.016	-0.042***	0.016	-0.040**	0.016	-0.046**	0.021	-0.043**	0.021
Age 31- 50	-0.228***	0.016	-0.211***	0.016	-0.162***	0.015	-0.153***	0.016	-0.059***	0.020	-0.054***	0.020
Age 51- 64	-0.411***	0.017	-0.385***	0.017	-0.285***	0.019	-0.269***	0.020	-0.106***	0.025	-0.093***	0.026
Age > 65	-0.441***	0.020	-0.414***	0.021	-0.450***	0.023	-0.431***	0.024	-0.155***	0.033	-0.139***	0.033
Lower second. edu	0.056**	0.027	0.058**	0.027	0.067***	0.011	0.057***	0.011	0.044***	0.015	0.039**	0.015
Secondary edu	0.113***	0.027	0.108***	0.028	0.074***	0.009	0.065***	0.010	0.079***	0.015	0.069***	0.016
Tertiary edu	0.160***	0.026	0.148***	0.027	0.125***	0.010	0.113***	0.010	0.115***	0.015	0.104***	0.015
Household size	0.006	0.004	0.005	0.004	0.006*	0.003	0.007**	0.006	0.018***	0.005	0.019***	0.006
EU birth					-0.033*	0.019	-0.028	0.019	-0.038	0.041	-0.036	0.041
OTH birth	-0.014	0.012	-0.011	0.012	-0.044***	0.014	-0.038***	0.014	-0.033	0.025	-0.027	0.025
Househ. Inc. (ln)	0.050***	0.007	0.049***	0.007	0.046***	0.007	0.042***	0.007	0.028***	0.011	0.023**	0.011
Uneed meet f.m.e.	-0.171***	0.012	-0.168***	0.012	-0.146***	0.021	-0.131***	0.021	-0.313***	0.049	-0.314***	0.049
Homeowner	0.027***	0.008	0.020**	0.008	0.020**	0.008	0.016*	0.009	0.054***	0.011	0.048***	0.011
Empl. part time	-0.021**	0.010	-0.025**	0.011	-0.065***	0.014	-0.066***	0.014	-0.073***	0.016	-0.075***	0.015
Unemployed	-0.152***	0.017	-0.135***	0.017	-0.110***	0.017	-0.110***	0.017	-0.045	0.044	-0.033	0.043
Student	0.021	0.021	0.002	0.021	0.018	0.021	0.006	0.021	0.010	0.031	0.004	0.032
Retired	-0.203***	0.016	-0.208***	0.016	-0.128***	0.015	-0.130***	0.015	-0.144***	0.024	-0.143***	0.024
Disabled	-0.597***	0.013	-0.595***	0.014	-0.349***	0.021	-0.334***	0.022	-0.688***	0.023	-0.680***	0.025
Domestic tasks	-0.047***	0.016	-0.047***	0.016	-0.080***	0.019	-0.078***	0.019	-0.170***	0.025	-0.164***	0.025
Inactive	-0.204***	0.030	-0.207***	0.031	-0.277***	0.035	-0.264***	0.037	-0.135***	0.032	-0.136***	0.032
Home warm	0.123***	0.019	0.114***	0.019	0.110***	0.016	0.098***	0.016	0.133***	0.047	0.122***	0.047
Home dark prob.	-0.047***	0.010	-0.047***	0.011	-0.064***	0.012	-0.060***	0.012	-0.037***	0.014	-0.038***	0.014
Noise	-0.040***	0.009	-0.034***	0.010	-0.036***	0.010	-0.040***	0.010	-0.030***	0.011	-0.028***	0.011
Pollution	-0.033***	0.010	-0.035***	0.010	-0.050***	0.011	-0.051***	0.011	-0.054***	0.014	-0.054***	0.014
Crime	-0.050***	0.011	-0.049***	0.012	-0.039***	0.010	-0.042***	0.010	-0.054***	0.014	-0.052***	0.014
Densely popul. a.	0.054***	0.011	0.054***	0.011	0.019*	0.011	0.022**	0.011				
Intermediate area	0.025**	0.010	0.025**	0.011	0.012	0.010	0.013	0.010				
Political parties/t.u.			-0.043***	0.015			-0.023	0.021			-0.012	0.023
Professional part.			0.035*	0.018			-0.032	0.035			0.025*	0.014
Religious part.			0.001	0.010			0.015	0.026			-0.002	0.009
Recreational part.			0.034***	0.009			0.043***	0.008			0.028***	0.009
Other org. part.			0.020**	0.009			-0.019*	0.011			0.003	0.012
Meetings w. friends			0.070***	0.007			0.030***	0.007			0.015	0.009
Cinema			0.032***	0.007			0.007	0.008			0.026**	0.010
Live performance			0.008	0.007			0.039***	0.007			0.023**	0.010
Cultural site			0.018***	0.007			0.015*	0.008			0.018*	0.010
Sport events			0.045***	0.008			0.022	0.010			-0.007	0.014
Regional dummies	Yes		Yes		Yes		Yes					
Pseudo R2	0.185		0.195		0.215		0.215		0.192		0.196	
Observations	24159		23301		18929		18231		8868		8608	
Log likelihood	-13086.48		-12435.47		-8982.22		-8547.24		-3749.93		-3700.07	

Table 5. Probit estimates results: Mediterranean countries #1

	ES (1)		ES (2)		GR (1)		GR (2)	
ForVol	-0.003	0.009	-0.008	0.010	0.037*	0.019	0.020	0.020
InfVol	0.029***	0.006	0.021***	0.006	0.025***	0.009	0.018*	0.009
Female	-0.029***	0.007	-0.022***	0.006	-0.007	0.009	-0.003	0.009
Married	-0.009	0.009	-0.003	0.009	0.008	0.015	0.008	0.015
Separated/divorced	-0.072***	0.015	-0.070***	0.015	-0.051***	0.021	-0.049**	0.021
Widowed	-0.047*	0.026	-0.047*	0.026	-0.123***	0.040	-0.120***	0.040
Age 31- 50	-0.179***	0.013	-0.163***	0.013	-0.117***	0.023	-0.105***	0.022
Age 51- 64	-0.360***	0.015	-0.333***	0.016	-0.306***	0.031	-0.282***	0.031
Age > 65	-0.457***	0.018	-0.425***	0.019	-0.475***	0.032	-0.442***	0.033
Lower secondary edu	0.049***	0.008	0.043***	0.008	0.064***	0.010	0.060***	0.010
Secondary edu	0.079***	0.008	0.070***	0.009	0.084***	0.009	0.076***	0.009
Tertiary edu	0.118***	0.008	0.108***	0.009	0.096***	0.010	0.085***	0.010
Household size	0.005**	0.003	0.007***	0.003	0.006*	0.003	0.008**	0.003
EU birth	0.022	0.030	0.022	0.030	0.015	0.038	0.032	0.034
OTH birth	0.004	0.016	0.012	0.016	-0.047**	0.020	-0.029	0.019
Household income (ln)	0.016***	0.004	0.014***	0.004	0.029***	0.006	0.024***	0.006
Uneed meet f.m.e.	-0.113***	0.014	-0.107***	0.014	-0.222***	0.021	-0.211***	0.021
Homeowner	0.012***	0.014	0.010	0.010	-0.011	0.010	-0.014	0.010
Employed part time	-0.039***	0.015	-0.041***	0.015	-0.027	0.020	-0.027	0.020
Unemployed	-0.067***	0.014	-0.065***	0.014	-0.067***	0.024	-0.066***	0.024
Student	0.076***	0.017	0.067***	0.017	0.036	0.028	0.025	0.028
Retired	-0.158***	0.014	-0.156***	0.014	-0.174***	0.016	-0.166***	0.016
Disabled	-0.612***	0.018	-0.606***	0.019	-0.768***	0.031	-0.752***	0.036
Domestic tasks	-0.093***	0.012	-0.093***	0.012	-0.111***	0.016	-0.105***	0.016
Inactive	-0.159***	0.017	-0.160***	0.017	-0.187***	0.047	-0.175***	0.047
Home warm	0.116***	0.012	0.107***	0.012	0.042***	0.012	0.041***	0.012
Home dark problem	-0.081***	0.008	-0.079***	0.009	-0.057***	0.010	-0.051***	0.010
Noise	-0.044***	0.008	-0.044***	0.008	-0.045***	0.012	-0.045***	0.011
Pollution	-0.043***	0.009	-0.042***	0.009	-0.031**	0.014	-0.023*	0.013
Crime	-0.051***	0.009	-0.050***	0.009	-0.017	0.016	-0.009	0.016
Densely populated area	0.012	0.008	0.013	0.008	-0.006	0.010	-0.005	0.010
Intermediate area	0.010	0.009	0.008	0.009	0.002	0.014	0.002	0.013
Political parties/t.u.			-0.027*	0.016			0.012	0.020
Professional part.			0.002	0.015			0.009	0.020
Religious part.			-0.007	0.008			0.018**	0.008
Recreational part.			0.031***	0.009			0.010	0.016
Other org. part.			-0.020	0.012			-0.000	0.020
Meetings with friends			0.051***	0.007			0.048***	0.010
Cinema			0.036***	0.008			0.012	0.012
Live performance			0.015*	0.008			0.027**	0.011
Cultural site			0.017**	0.007			0.037**	0.013
Sport events			0.037***	0.010			0.023	0.014
Regional dummies	Yes		Yes		Yes		Yes	
Pseudo R2	0.232		0.234		0.378		0.381	
Observations	26157		25755		12088		12008	
Log likelihood	-12495.85		-12216.04		-4192.49		-4114.56	

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

Table 5. Probit estimates results: Mediterranean countries #2

	IT (1)		IT (2)		PT (1)		PT (2)	
ForVol	0.032***	0.010	0.005	0.011	0.011	0.029	0.012	0.030
InfVol	-0.010	0.006	-0.023***	0.006	0.034**	0.014	0.031**	0.014
Female	-0.026***	0.006	-0.021***	0.006	-0.076***	0.013	-0.056***	0.014
Married	-0.041***	0.008	-0.038***	0.008	-0.001	0.021	0.009	0.021
Separated/divorced	-0.108***	0.012	-0.104***	0.012	-0.059*	0.033	-0.051	0.034
Widowed	-0.051**	0.021	-0.057***	0.021	0.024	0.040	0.024	0.041
Age 31- 50	-0.206***	0.011	-0.185***	0.011	-0.226***	0.022	-0.213***	0.023
Age 51- 64	-0.390***	0.011	-0.369***	0.012	-0.437***	0.020	-0.421***	0.021
Age > 65	-0.542***	0.011	-0.523***	0.011	-0.493***	0.019	-0.474***	0.021
Lower secondary edu	0.097***	0.008	0.083***	0.008	0.106***	0.018	0.087***	0.019
Secondary edu	0.154***	0.008	0.135***	0.008	0.186***	0.020	0.166***	0.020
Tertiary edu	0.199***	0.009	0.176***	0.010	0.233***	0.022	0.217***	0.023
Household size	0.019***	0.003	0.021***	0.003	0.020***	0.005	0.022***	0.005
EU birth	0.100***	0.022	0.108***	0.022	-0.013	0.061	-0.029	0.060
OTH birth	0.098***	0.014	0.107***	0.014	0.028	0.050	0.044	0.050
Household income (ln)	0.018***	0.005	0.017***	0.005	0.008	0.010	0.003	0.011
Uneed meet f.m.e.	-0.229***	0.011	0.224***	0.011	-0.242***	0.028	-0.231***	0.028
Homeowner	-0.005	0.006	-0.010	0.007	-0.015	0.016	-0.013	0.016
Employed part time	-0.032***	0.012	-0.030**	0.012	-0.141***	0.026	-0.139***	0.026
Unemployed	-0.056***	0.013	-0.028**	0.013	-0.084***	0.024	-0.083***	0.024
Student	0.061***	0.016	0.058***	0.016	0.032	0.032	0.019	0.032
Retired	-0.097***	0.010	-0.084***	0.010	-0.225***	0.023	-0.223***	0.023
Disabled	-0.465***	0.017	-0.467***	0.019	-0.503***	0.013	-0.501***	0.014
Domestic tasks	-0.044***	0.009	-0.028***	0.010	-0.106***	0.025	-0.102***	0.025
Inactive	-0.134***	0.014	-0.109***	0.014	-0.232***	0.038	-0.243***	0.038
Home warm	0.048***	0.010	0.037***	0.010	0.057***	0.014	0.046***	0.014
Home dark problem	-0.111***	0.007	-0.107***	0.007	-0.090***	0.017	-0.083***	0.017
Noise	-0.035***	0.007	-0.036***	0.007	-0.057***	0.016	-0.057***	0.016
Pollution	-0.025***	0.008	-0.026***	0.008	-0.023	0.017	-0.027	0.018
Crime	-0.024***	0.009	-0.019**	0.009	-0.013	0.021	-0.020	0.021
Densely populated area	0.034***	0.007	0.037***	0.007	-0.002	0.017	0.008	0.017
Intermediate area	0.025***	0.007	0.022***	0.007	-0.022	0.016	-0.007	0.016
Political parties/t.u.			-0.042***	0.014			-0.051	0.035
Professional part.			0.043***	0.013			0.020	0.036
Religious part.			0.000	0.007			-0.064***	0.013
Recreational part.			0.029***	0.009			0.014	0.021
Other org. part.			0.014	0.013			0.094**	0.045
Meetings with friends			0.078***	0.006			0.094***	0.015
Cinema			0.049***	0.007			0.033*	0.018
Live performance			0.035***	0.007			0.020	0.014
Cultural site			0.017**	0.008			0.023	0.017
Sport events			0.023***	0.009			0.064***	0.017
Regional dummies	Yes							
Pseudo R2	0.264		0.270		0.281		0.290	
Observations	45497		43808		8536		8495	
Log likelihood	-22880.91		-21748.39		-4249.49		-4174.70	

As regards the Nordic countries, we find a positive correlation between formal volunteering and self-perceived good health only for Finland: the marginal effect is statistically significant at 1 percent and decreases a bit from model (1) to (2) indicating that social and cultural variables are also relevant covariates in driving the self-perceived health of Finnish people. Supplying formal voluntary work in FI raises the probability of reporting self-perceived good health by 3.8 percent. For the other Nordic countries, i.e. DK, NO, SE, we do not find a statistically significant difference between individuals who do unpaid work (formal and informal) and individuals who do not.

Regarding Continental countries, we observe a positive relationship between formal volunteering and self-perceived good health only for the Netherlands. The marginal effect of formal volunteering is statistically significant at conventional level increasing the probability of reporting self-perceived good health by 2.2 percent (Model 2). For Austria, the positive association, statistically significant at 5 percent (Model 1), disappears in Model (2) when we insert the key social and cultural variables: recreational participation, meetings with friends and sports events (all statistically significant at 1% with high marginal effects). On the contrary, the absence of correlation for Belgium in Model (1) appears with negative sign and statistically significant at 10 percent in Model (2), when we perform the robustness analysis with social and cultural variables. In Belgium, undertaking formal voluntary activities reduces the probability of reporting self-perceived good health by 3.1 percent. Informal volunteering is significantly positive only in France and in the Netherlands (at 1%). In FR and in the NL, supplying informal voluntary work raises the probability of reporting self-perceived good health respectively by 2.4 and 4.1 percent.

In all Mediterranean countries informal volunteering matters. We show a positive and robust correlation between informal volunteering and self-perceived good health in Spain and Portugal. In ES and PT the marginal effect of helping behaviour is statistically significant, respectively, at 1 and 5 percent rising the probability of reporting self-perceived good health by 2.1 and 3.1 percent (Model 2). In Greece, the positive association statistically significant at 1 percent in Model (1) collapse to 10 percent in Model (2), even so indicating that informal voluntary activities increases the probability of reporting self-perceived good health of Greek by 1.8 percent. Despite ES, PT and GR, in Italy informal volunteering shows a statistically significant (at 1%) negative correlation with health (Model 2). In IT, undertaking informal voluntary activities to help someone reduces 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 statistically positive association between formal voluntary work 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, indicating that social and cultural participation are relevant factors in driving the self-perceived health of Italian and Greek people.

As regards the other covariates, we observe similar findings across European countries for several variables. Self-perceived good health decreases with age, unmet need for medical examination and treatment, self-defined current economic status (unemployed, retired and disabled), housing features (home dark problem) and neighbourhood quality (noise, pollution and crime). On the other hand, self-perceived good health rises with human capital (education), household income, home warm and social capital (recreational participation and meetings with friends[3]).

Limitations

The above results has to be treated with caution. Although we control for many covariates, the data cross-section design does not allow us to treat unobservable individual characteristics (as a panel data does). Moreover, a reverse causality has to be taken into account. The available data allow us to identify whether self-perceived good health, formal volunteering and informal help are joint or independent behaviors. Thus, we jointly estimate self-perceived good health, formal volunteering and helping behaviour using Multivariate Probit Models where shared independent variables are all reported in Table 1. Estimated covariances are showed in Table 6.

We report only European countries for which we found a statistically significant correlation among formal and informal volunteering and self-perceived good health in previous section. Unsurprisingly, findings point to a joint process. For all European countries, the LR test of the estimate correlation coefficient across the error terms of the three equations is positive and statistically significant at 5% and more, indicating that the null hypothesis of the absence of correlation among the error terms can be rejected at the usual level of confidence. In other words, one's own perception of good health status is likely to depend also on unobservable variables which affect participation in formal and informal volunteering.

[3] The result on meetings with friends is in line with previous investigations concerning Italy (Fiorillo 2013; Fiorillo and Sabatini 2011b; Fiorillo and Sabatini 2011a).

Table 6. Multivariate probit estimates: covariances

FI			**AT**		
ρ_{FVH} =	$Cov(\varepsilon_{ForVol}, \varepsilon_{SPH})$	0.068*** (0.024)	ρ_{FVH} =	$Cov(\varepsilon_{ForVol}, \varepsilon_{SPH})$	0.045 (0.028)
ρ_{IVH} =	$Cov(\varepsilon_{InfVol}, \varepsilon_{SPH})$	0.030 (0.019)	ρ_{IVH} =	$Cov(\varepsilon_{InfVol}, \varepsilon_{SPH})$	0.005 (0.018)
ρ_{IVFV} =	$Cov(\varepsilon_{ForVol}, \varepsilon_{InfVol})$	0.117*** (0.021)	ρ_{IVFV} =	$Cov(\varepsilon_{ForVol}, \varepsilon_{InfVol})$	0.321*** (0.022)
LR test $\rho_{FVH} = \rho_{IVH} = \rho_{IVFV} = 0$, Chi2 = 40.04 (0.000)			LR test $\rho_{FVH} = \rho_{IVH} = \rho_{IVFV} = 0$, Chi2 = 191.47 (0.000)		
BE			**FR**		
ρ_{FVH} =	$Cov(\varepsilon_{ForVol}, \varepsilon_{SPH})$	-0.059** (0.029)	ρ_{FVH} =	$Cov(\varepsilon_{ForVol}, \varepsilon_{SPH})$	0.042 (0.037)
			ρ_{IVH} =	$Cov(\varepsilon_{InfVol}, \varepsilon_{SPH})$	0.046*** (0.016)
			ρ_{IVFV} =	$Cov(\varepsilon_{ForVol}, \varepsilon_{InfVol})$	0.177*** (0.033)
LR test $\rho_{FVH} = 0$, Chi2 = 4.11 (0.043)			LR test $\rho_{FVH} = \rho_{IVH} = \rho_{IVFV} = 0$, Chi2 = 39.69 (0.000)		
NL			**ES**		
ρ_{FVH} =	$Cov(\varepsilon_{ForVol}, \varepsilon_{SPH})$	0.064*** (0.022)	ρ_{FVH} =	$Cov(\varepsilon_{ForVol}, \varepsilon_{SPH})$	-0.008 (0.015)
ρ_{IVH} =	$Cov(\varepsilon_{InfVol}, \varepsilon_{SPH})$	0.103*** (0.021)	ρ_{IVH} =	$Cov(\varepsilon_{InfVol}, \varepsilon_{SPH})$	0.042*** (0.012)
ρ_{IVFV} =	$Cov(\varepsilon_{ForVol}, \varepsilon_{InfVol})$	0.172*** (0.018)	ρ_{IVFV} =	$Cov(\varepsilon_{ForVol}, \varepsilon_{InfVol})$	0.141*** (0.014)
LR test $\rho_{FVH} = \rho_{IVH} = \rho_{IVFV} = 0$, Chi2 = 115.04 (0.000)			LR test $\rho_{FVH} = \rho_{IVH} = \rho_{IVFV} = 0$, Chi2 = 117.23 (0.000)		
GR			**IT**		
ρ_{FVH} =	$Cov(\varepsilon_{ForVol}, \varepsilon_{SPH})$	0.061 (0.041)	ρ_{FVH} =	$Cov(\varepsilon_{ForVol}, \varepsilon_{SPH})$	-0.004 (0.013)
ρ_{IVH} =	$Cov(\varepsilon_{InfVol}, \varepsilon_{SPH})$	0.055** (0.023)	ρ_{IVH} =	$Cov(\varepsilon_{InfVol}, \varepsilon_{SPH})$	-0.035*** (0.009)
ρ_{IVFV} =	$Cov(\varepsilon_{ForVol}, \varepsilon_{InfVol})$	0.414*** (0.027)	ρ_{IVFV} =	$Cov(\varepsilon_{ForVol}, \varepsilon_{InfVol})$	0.258*** (0.012)
LR test $\rho_{FVH} = \rho_{IVH} = \rho_{IVFV} = 0$, Chi2 = 196.99 (0.000)			LR test $\rho_{FVH} = \rho_{IVH} = \rho_{IVFV} = 0$, Chi2 =451.71 (0.000)		
PT					
ρ_{FVH} =	$Cov(\varepsilon_{ForVol}, \varepsilon_{SPH})$	0.019 (0.034)			
ρ_{IVH} =	$Cov(\varepsilon_{InfVol}, \varepsilon_{SPH})$	0.045** (0.021)			
ρ_{IVFV} =	$Cov(\varepsilon_{ForVol}, \varepsilon_{InfVol})$	0.388*** (0.027)			
LR test $\rho_{FVH} = \rho_{IVH} = \rho_{IVFV} = 0$, Chi2 = 173.68 (0.000)					

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

Table 6 shows two relevant results. First (i), the estimated covariances between the error terms of formal and informal equations (ρ_{IVFV}) are significantly and positively correlated at the 1% level. This means that the choices to supply formal and informal unpaid work are taken jointly. Second (ii), the estimated covariances between the error terms of self-perceived good health and formal volunteering (ρ_{FVH}) and between the error terms of self-perceived good health and formal volunteering (ρ_{IVH}) are statistically significantly correlated, at the conventional level and more, and in the expected sign. Hence, the problem of reverse causality remains open to question.

Despite these limitations, our findings offer significant insights to the debate on the relationship between volunteering and health, encouraging us to develop this course of research. Results on the covariances between the error terms of formal and informal equations are in line with literature (Wilson and Musick 1997; Plagnol and Huppert 2010; Lee and Brudney 2012) and point out that the two phenomena are correlated. Even if formal volunteering and informal

behaviours are correlated choices, results reported in Tables 3-5 and Table 6 show that there are differences between formal and informal volunteering and self-perceived good health within and across European countries.

6. Summary and discussion

Overall, results from cross-countries estimates confirm the presence of health disparities across European countries based on socio-economic status (Carlson 1998; 2004). Even though the National Health System of the European countries analyzed are in principle designed to provide universal coverage for all citizens, poorer and less educated individuals are more likely to report poor health conditions. This is the case of unemployed and retired workers too.

Volunteering is confirmed to be a predictor of heath. Our findings of a significant and positive association between formal volunteering and self-perceived health in FI and the NL, on one hand, and of a significant and positive correlation between informal volunteering and self-perceived health in FR, the NL, ES, GR and PT, on the other hand, support the claim on the beneficial role on health of both volunteering and community cohesion. However, we also remark negative correlations between health and formal volunteering in BE and health and informal volunteering in IT.

Hence, relevant cross-countries differences exist. Among Nordic countries, i.e. FI, DK, NO, SE, Finland is the only country for which we found a positive correlation between formal volunteering and self-perceived good health. In the other Nordic countries, there is no difference, in terms of health, between individuals who volunteer (formally and informally), and individuals who do not. Such difference between Finland and the other Nordic countries may be explained considering that, in 2006, Finnish welfare provision started changing from a strong welfare state towards welfare pluralism. At that time, private sector, families, and civil society started participating more and more in welfare provision. This implies that the role of volunteering was changing too, becoming more central in welfare. Therefore, differently from Finland, since in the other Nordic countries, volunteering was less necessary, its impact on well-being and health was lower. In other words, doing something thought helpful to the society is rewarding, and, therefore, affects positively health. On the other side, when there is the certainty that, in any case, social needs are satisfied with or without our contribution, gratifications coming from volunteering are less significant with lower or none positive impact on health.

We found a positive relationship between formal volunteering and self-perceived good health in the Netherlands too, where 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 (GHK, 2010). Again, it could be said that where volunteering is perceived as more necessary in terms of social benefits, its impact on health is greater. The same could be said as regards Greece and Italy, whose results show a statistically positive association between formal voluntary work and health in Model (1), Tables 5-6. Such results might be explained considering that both Greece and Italy are characterised by a weak welfare regime, so people who volunteer could perceive their activity as supportive.

By contrast, although the importance of complementarities between public services and services provided by associations, as regards Belgium, we found that undertaking formal voluntary activities reduces the probability of reporting self-perceived good health. Negative effects of volunteering on health may be caused by too many hours of volunteering, which may limit or delate its physical and mental health benefits (Moen et al. 1992; Morrow-Howell et al. 2003; Musick et al. 1999; Van Willigen 2000). This seems to be especially true as regards formal volunteering which should be scheduled by the organization through which volunteers work. In other words, it seems reasonable that the organization within which volunteers donate their time, should size the amount of volunteer work which should be performed by volunteers: when it is too much volunteers are likely to feel both tired and neglected by the organization, with a negative impact on health.

As regards informal volunteering, we found a significantly positive correlation with self-rated health in France and in the Netherlands, and among Mediterranean countries in Spain, Portugal and Greece. People informally volunteer especially induced by altruistic motivations and it may happen that altruistic volunteer gain themselves great benefit from volunteering, which in turn, have a positive impact on health (see section 2). In other words, altruists, helping other, help themselves to feel well, since lessen, or avoid distress and anxiety. However, as seen, results are different for Italy, where performing informal voluntary activities to help someone 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 Italian are altruistic and care about others without caring about their own health, probably because they are particularly aware of others' need to be helped in a context where public provision of services is quite low. Therefore, Italian informal volunteers volunteer even if their health deteriorates.

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 (see section 5). As stated in section 2, one of the reasons why people volunteer is making friends and meeting with other people. Social relationships have effects on health. In particular, greater overall involvement with formal (for instance recreational organizations and volunteering organizations) and informal (for instance friends and neighbour) social ties affect positively health by several channels, among which: 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 - Uchino 2004). Our results confirm the above statement for volunteering in Models (1) and for some social and cultural participation covariates in Models (2). In fact, 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 disappear: as seen in the case of Finland, 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). In other words, 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 unpaid work in formal organizations, obtain health benefits from other kinds of social relationships.

7. Conclusions

In this paper, we compare the correlation among formal and informal volunteering and self-perceived health across 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 and multivariate probit models using data from the Income and Living Conditions Survey carried out by the European Union Statistics on Income and Living Conditions (EU-SILC) in 2006.

Our results expand the existing literature highlighting that formal and informal volunteering are correlated each other, have a distinct correlation with health perception, and stating that such effects differ across countries. Hence, our main conclusions are that formal and informal volunteering measure two different aspects of volunteering and that correlations among these kinds of volunteering and perceived health depend on country-specific socio-economic and cultural characteristics.

At this stage, the analysis still has some limitations, which should inform further developments of the research. Distinguishing the effect of volunteering from unobservable individual characteristics that potentially influence health is difficult and it is plausible that individuals in poor health may be forced to reduce their participation in volunteering. Thus, endogeneity problems suggest a certain caution in advancing casual interpretations of the estimates.

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Appendix A.

Table A1.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