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## Formal and informal volunteering and health across European countries

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# **Formal and informal volunteering and health across European countries**

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## **Abstract**

In this paper we compare the correlation among formal and informal volunteering and self-perceived health across 14 European countries after controlling for socio-economic characteristics, housing features, neighborhood quality, size of municipality, social participation and regional dummies. We find that formal volunteering has a significantly positive association with self-perceived health in Finland and the Netherlands, but none in the other countries. By contrast, informal volunteering has a significantly positive correlation with self-perceived health in the Netherlands, France, Spain, Portugal and Greece, and a significantly negative relationship in Italy. Our conclusion is that formal and informal volunteering measure two different aspects of volunteering whose correlations with perceived health seem to depend on specific cultural and institutional characteristics of each country.

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

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

## **I. Introduction**

Volunteering is an activity, which people undertake of their free will without asking for monetary compensation in return. Such activity contributes in a sizable measure to the production of public goods (education, health care, general community services), improving well-being both of individuals who volunteer and of community (Meier and Stutzer, 2008; Blinder and Freytag, 2013).

A large strand of the socio-medical literature suggests that volunteers are more likely to enjoy good physical and mental health and that they have lower rates of mortality (Moen et al., 1992; Musick et al., 1999; Post, 2005). Only recently have economists started studying the impact of volunteering on health, mostly analyzing American and UK samples. Borgonovi (2008), focusing on the US, finds a positive correlation between volunteer labor and self-reported health.

This paper seeks to make a twofold contribution to the literature. First, it adds new evidence to the existing literature on the topic by comparing the effect of two kinds of volunteering on health across 14 European countries: we study in depth the correlation of formal and informal volunteering with health. Informal volunteering consists in voluntary activities (performed on an individual basis) to help someone (such as cooking for others, taking care of people in hospitals/at home) while formal volunteering consists in voluntary activities undertaken in charitable organizations, groups or clubs. Second, to the best of our knowledge, there are no economic studies which consider the impact of informal volunteering on health.

We consider self-perceived health, i.e. how healthy people feel, as a proxy for health. The main conclusion of the empirical analysis, which employs the 2006 wave EU-SILC micro data, is that formal and informal volunteering have a distinct correlation with health perception, and these effects differ across 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; section 3 describes the dataset and the empirical analysis; section 4 concludes.

## **II. Volunteering and health**

There are many benefits to formal and informal volunteering for volunteers. People, who formally volunteer, get work experience which, in turn, raises their future employability, when unemployed, and earning power, when employed (Menchik and Weisbrod, 1987; Bruno

and Fiorillo, 2014). In addition, since formal volunteering is an activity generally performed in a group, it is a way to make friends (Clotfelter, 1985; Prouteau and Wolff, 2004, 2006; Schiff, 1990), to expand one's personal network, and to improve social skills. Furthermore, volunteering may contribute to make volunteers feel «good» (Andreoni, 1990). In this case, volunteering is an ordinary consumption good (Menchik and Weisbrod, 1987), and gives people the opportunity to be recognized as «good» by society. Lastly, a growing strand of the socio-medical literature has focused on the possibility that volunteering is good for health (Casiday et al., 2008; Kumar et al., 2012; Musick and Wilson, 2003; Piliavin and Siegel, 2007; Tang, 2009).

Contrary to formal volunteering, informal volunteering is an unpaid activity, likely performed for purely altruistic reasons, since it is not performed via official groups but on an individual basis. However, it seems reasonable that also informal volunteering may confer some of the same benefits associated to formal volunteering (albeit to a lesser extent). For example, also helping people on an individual basis may indirectly and inevitably yield a potential result in terms of human capital accumulation. Also, informal volunteering means interactions among individuals (probably within smaller groups compared with formal volunteering), with the opportunity to make friends and to improve social skills.

Potential channels through which volunteering benefits health may work all simultaneously, in partial combination or each on its own. This is likely to depend also on the characteristics of the activity in question, which entail the following:

1) *Self-esteem, self-efficacy*. 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, and expand social interactions. All this, in turn, produces positive effects on socio-psychological factors (Musick and Wilson, 2003; Choi and Bohman, 2007).

2) *Reciprocity*. Reciprocity can be defined as a situation in which individuals are involved in mutual exchanges, based not on obligations linked to a contract, but on the willingness to build and to reinforce a social network of cooperation (Zamagni, 1998). “Doing good” for others develops trust among people, which, in turn, produces a feeling of security and reciprocal acceptance among volunteers and those who receive their help (Post, 2005).

3) *“Buffering effect”*. Volunteering provides moral and affective support, which mitigates psychological distress related to sickness (Lin et al, 1999). Moreover, expanded social

contacts and improvements in self-confidence, coming from volunteering, are likely to buffer stress and lessen risks of disease.

4) *Reputation*. Since society appreciates volunteering activities, volunteers may enhance feelings of self-worth which, in turn, may benefit health.

5) *Social norms*. Volunteering may foster the development of social norms that support health-promoting behaviors, such as prevention and physical activity, or may constrain unhealthy habits, such as drinking and smoking.

Volunteering benefits seem to be stronger for elderly people. As suggested by activity theory (Lemon et al., 1972; Kart and Longino, 1982), keeping active and sharing social relationships in old age is good for health because it protects the elderly from isolation in difficult periods. Furthermore, since volunteering allows people to be active and productive and to gain self-esteem, such activity can be considered a good substitute for paid work when people retire (Midlarsky, 1991). This has a positive impact on health particularly in a society where the transition from work to retirement is not easy, since being useful is everybody's priority.

### **III. Empirical analysis**

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 performed 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 and social participation. Information on social participation is not provided in other waves of the survey and regards respondents aged 16 and above.

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 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).

As stated in section I, we consider two different kinds of volunteering: formal and informal. Formal volunteering 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 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.

In order to account for other factors which might influence simultaneously health status and formal and informal volunteering, we include in the analysis a 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, tenure status and self-defined current economic status. We further control for housing features, neighborhood quality, size of municipality and for other measures of social participation: religion participation and meetings with friends. Finally, regional fixed effects are also included. Table A1, in Appendix A, describes all variables employed in the empirical analysis in detail.

We consider 14 European countries separately: the United Kingdom (UK), Norway (NO), Finland (FI), Sweden (SE), Denmark (DK), Austria (AT), the Netherlands (NL), France (FR), Belgium (BE), Germany (DE), Italy (IT), Spain (ES), Portugal (PT) and Greece (EL).

Because of the many missing values on the informal volunteering variable for the UK and 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.

The weighted summary statistics (Table 1) show that, on average, respondents rate their health as good, except for PT. In terms of key independent variables, formal and formal volunteering differ substantially among the European countries. Formal volunteering is lowest in FR and EL 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 same country 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 39% respectively. At the other end of the range are FR and DK, where only 17% and 3% respondents supply informal voluntary activities, respectively.

Our empirical model of self-perceived good health can be represented through the following estimation equation:

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

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  $\varepsilon$  is a random-error term.  $\alpha, \beta, \theta, \chi, \varphi$  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 probit model.

Table 2 presents results of the probit estimates for the 14 European countries separately. For each country, the first column shows marginal effects and the second column presents the standard errors, which are corrected for heteroskedasticity.

Formal volunteering is significantly positive only in FI and in the NL. Supplying formal voluntary work in FI and in the NL raises the probability of reporting self-perceived good health, respectively, by 4.3% and 2.6%. Since on average formal volunteering in these countries is not very different from some other European countries, i.e. NO, SE, DK and ES (see Table 1), the correlation between formal volunteering and perceived health seems to depend on country-specific cultural and institutional characteristics.

Informal volunteering matters more across European countries. It has a statistically significant positive correlation with health in the NL, FR, ES, PT, and EL. In these countries, marginal effects lie in the interval [0.022, 0.043]. Informal volunteering shows a statistically significant negative correlation with health in IT. In Italy, undertaking informal voluntary activities to help someone reduces the probability of reporting self-perceived good health by

Table 1. Descriptive statistics (mean)

	UK	NO	FI	SE	DK	AT	NL	FR	BE	DE	IT	ES	PT	EL
Self-perceived good health	0.77	0.72	0.66	0.74	0.73	0.72	0.74	0.69	0.74	0.60	0.57	0.68	0.48	0.77
Formal volunteering	0.08	0.13	0.13	0.12	0.12	0.06	0.32	0.01	0.07	0.06	0.07	0.11	0.05	0.03
Informal volunteering			0.39	0.37	0.03	0.31	0.53	0.17			0.25	0.45	0.28	0.19
Female	0.51	0.52	0.56	0.52	0.52	0.52	0.53	0.52	0.51	0.52	0.52	0.51	0.52	0.51
Married	0.51	0.37	0.36	0.33	0.39	0.54	0.46	0.53	0.53	0.54	0.58	0.59	0.61	0.62
Separated/divorced	0.10	0.13	0.11	0.13	0.12	0.10	0.10	0.07	0.08	0.07	0.12	0.10	0.10	0.09
Widowed	0.07	0.10	0.15	0.15	0.12	0.07	0.10	0.07	0.10	0.10	0.02	0.01	0.03	0.02
Age 31- 50	0.36	0.36	0.32	0.33	0.34	0.38	0.38	0.35	0.36	0.36	0.37	0.38	0.35	0.35
Age 51- 64	0.21	0.21	0.24	0.22	0.23	0.21	0.23	0.22	0.22	0.20	0.20	0.19	0.20	0.20
Age > 65	0.19	0.24	0.25	0.25	0.23	0.21	0.21	0.21	0.20	0.24	0.24	0.21	0.22	0.23
Lower secondary edu	0.31	0.30	0.32	0.11	0.35	0.26	0.23	0.16	0.16	0.15	0.30	0.23	0.18	0.13
Secondary edu	0.40	0.44	0.40	0.50	0.42	0.56	0.38	0.39	0.36	0.53	0.33	0.22	0.16	0.35
Tertiary edu	0.28	0.25	0.28	0.29	0.23	0.16	0.27	0.20	0.32	0.29	0.10	0.24	0.11	0.16
Household size	2.81	2.09	2.02	2.10	2.02	2.89	2.27	2.66	2.77	2.52	2.95	3.19	3.20	3.09
EU birth	0.01	0.03	0.01	0.05	0.01	0.05	0.01	0.04	0.06		0.01	0.01	0.01	0.01
OTH birth	0.10	0.04	0.01	0.06	0.04	0.11	0.05	0.08	0.06	0.10	0.05	0.04	0.01	0.06
Household income (ln)	10.41	10.47	10.03	10.02	10.24	10.35	10.14	10.21	10.26	10.12	10.16	9.95	9.58	9.81
Homeowner	0.73	0.78	0.66	0.61	0.58	0.59	0.55	0.63	0.74	0.50	0.74	0.84	0.76	0.76
Employed part time	0.12	0.07	0.06	0.12	0.07	0.09	0.22	0.09	0.11	0.18	0.05	0.05	0.05	0.05
Unemployed	0.02	0.02	0.07	0.03	0.03	0.04	0.02	0.06	0.07	0.06	0.05	0.07	0.06	0.06
Student	0.05	0.07	0.06	0.08	0.10	0.06	0.06	0.08	0.07	0.07	0.06	0.07	0.07	0.08
Retired	0.20	0.22	0.26	0.25	0.26	0.26	0.15	0.27	0.23	0.26	0.22	0.15	0.21	0.21
Disabled	0.04	0.07	0.07	0.04	0.06	0.00	0.05	0.03	0.03	0.02	0.01	0.02	0.01	0.01
Domestic tasks	0.06	0.00	0.02	0.00	0.00	0.09	0.12	0.04	0.07	0.06	0.14	0.13	0.07	0.15
Inactive	0.01	0.03	0.01	0.01	0.02	0.01	0.04	0.01	0.02	0.01	0.05	0.05	0.02	0.01
Home warm	0.95	0.98	0.97	0.97	0.90	0.96	0.97	0.94	0.86	0.95	0.90	0.91	0.59	0.87
Home dark problem	0.13	0.08	0.05	0.06	0.08	0.10	0.16	0.12	0.14	0.15	0.22	0.17	0.19	0.21
Noise	0.22	0.13	0.18	0.13	0.20	0.19	0.32	0.19	0.22	0.29	0.25	0.27	0.25	0.20
Pollution	0.13	0.08	0.14	0.07	0.08	0.08	0.14	0.16	0.16	0.24	0.22	0.17	0.20	0.17
Crime	0.27	0.04	0.17	0.14	0.14	0.12	0.17	0.16	0.18	0.12	0.15	0.20	0.12	0.08
Densely populated area	0.74	0.50	0.29	0.21	0.36	0.36		0.47	0.53	0.49	0.44	0.52	0.39	0.39
Intermediate area	0.18	0.17	0.17	0.14	0.29	0.24		0.35	0.43	0.34	0.39	0.20	0.32	0.14
Religious participation	0.10	0.13	0.16	0.20	0.11	0.14	0.43	0.01		0.16	0.19	0.17	0.43	0.29
Meetings with friends	0.70	0.67	0.68	0.63	0.59	0.60	0.58	0.48	0.64	0.55	0.66	0.66	0.76	0.79
Observations	17006	5755	9312	6581	5708	12000	8984	19237	11218	25942	45975	28131	10148	12606



Table 2. Probit estimation results

	UK		NO		FI		SE	
Formal Volunteering	0.007	0.042	0.003	0.017	0.043***	0.014	0.017	0.016
Informal Volunteering					0.010	0.010	0.002	0.011
Female	-0.016	0.039	0.030**	0.012	0.039***	0.010	-0.012	0.011
Married	-0.005	0.039	-0.026	0.017	-0.050***	0.016	0.009	0.015
Separated/divorced	-0.089*	0.048	-0.045	0.030	-0.074***	0.027	-0.003	0.026
Widowed	-0.063	0.054	-0.000	0.025	-0.021	0.020	0.013	0.019
Age 31- 50	-0.174***	0.047	-0.097***	0.023	-0.159***	0.021	-0.111***	0.021
Age 51- 64	-0.382***	0.055	-0.157***	0.031	-0.245***	0.025	-0.183***	0.029
Age > 65	-0.483***	0.069	-0.066	0.045	-0.345***	0.037	-0.111***	0.044
Lower secondary edu			-0.106	0.133			0.042*	0.021
Secondary edu	0.208***	0.030	-0.022	0.118	0.031**	0.012	0.077***	0.018
Tertiary edu	0.343***	0.034	-0.035	0.112	0.095***	0.013	0.113***	0.017
Household size	0.043***	0.012	0.015**	0.006	0.013**	0.005	-0.003	0.006
EU birth	-0.124	0.109	-0.053	0.042	0.000	0.064	-0.055**	0.026
OTH birth	-0.057	0.043	-0.082**	0.039	0.053	0.062	-0.071***	0.026
Household income (ln)	0.060***	0.019	0.021**	0.009	0.027***	0.009	0.031***	0.010
Homeowner	0.239***	0.029	0.017	0.018	-0.002	0.014	0.025*	0.013
Employed part time	-0.139***	0.040	-0.110***	0.026	-0.071***	0.021	-0.128***	0.019
Unemployed	-0.356***	0.081	-0.051	0.049	-0.158***	0.025	-0.222***	0.039
Student	0.102	0.081	-0.016	0.029	0.022	0.027	-0.039	0.028
Retired	-0.473***	0.048	-0.250***	0.044	-0.126***	0.028	-0.262***	0.040
Disabled	-1.833***	0.064	-0.567***	0.027	-0.441***	0.025	-0.646***	0.026
Domestic tasks	-0.249***	0.053	-0.199	0.148	0.022	0.033	-0.211**	0.097
Inactive	-0.493***	0.112	-0.309***	0.043	-0.043	0.059	-0.025	0.072
Home warm	0.216***	0.057	0.189***	0.067	0.071**	0.034	0.100***	0.038
Home dark problem	-0.133***	0.036	-0.035	0.023	-0.056**	0.025	-0.071***	0.024
Noise	-0.078**	0.030	-0.021	0.020	-0.043***	0.016	-0.057***	0.018
Pollution	-0.113***	0.035	-0.066***	0.026	-0.039**	0.017	-0.037*	0.022
Crime	-0.136***	0.027	-0.066**	0.032	-0.043***	0.015	-0.054***	0.017
Densely populated area	-0.074	0.049	0.029**	0.013	0.033**	0.014	0.009	0.014
Intermediate area	-0.100*	0.054	0.030*	0.016	0.036**	0.014	0.030	0.014
Religious participation	0.042	0.037	-0.033*	0.018	-0.024*	0.014	-0.001	0.014
Meetings with friends	0.151***	0.025	0.040***	0.013	0.044***	0.011	0.043***	0.011
Regional dummies					Yes			
Pseudo R2	0.177		0.176		0.159		0.175	
Observations	16597		5577		9009		6104	
Log likelihood	-7498.09		-2508.39		-4601.01		-2646.48	

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

Table 2. Probit estimation results (continue)

	DK		AT		NL		FR	
Formal Volunteering	0.005	0.018	0.027	0.017	0.026**	0.010	0.024	0.027
Informal Volunteering	0.005	0.033	0.001	0.009	0.043***	0.009	0.031***	0.009
Female	-0.005	0.012	0.037***	0.010	0.027**	0.011	0.002	0.007
Married	-0.003	0.018	-0.007	0.014	-0.019	0.015	-0.005	0.011
Separated/divorced	0.009	0.027	-0.088***	0.022	-0.038*	0.022	-0.043**	0.018
Widowed	0.009	0.023	-0.022	0.020	-0.046**	0.021	-0.042***	0.016
Age 31- 50	-0.105***	0.025	-0.157***	0.019	-0.053***	0.020	-0.156***	0.015
Age 51- 64	-0.196***	0.033	-0.343***	0.025	-0.096***	0.025	-0.276***	0.020
Age > 65	-0.153***	0.045	-0.413***	0.029	-0.146***	0.033	-0.443***	0.024
Lower secondary edu	-0.295*	0.182	0.088**	0.036	0.048***	0.015	0.059***	0.011
Secondary edu	-0.218	0.158	0.195***	0.043	0.080***	0.015	0.071***	0.010
Tertiary edu	-0.171	0.175	0.192***	0.023	0.116***	0.015	0.118***	0.010
Household size	0.003	0.007	-0.012***	0.004	0.018***	0.005	0.006*	0.003
EU birth	-0.029	0.051	0.031	0.019	-0.041	0.041	-0.032*	0.019
OTH birth	-0.084**	0.039	-0.030*	0.016	-0.031	0.025	-0.044***	0.014
Household income (ln)	0.049***	0.014	0.067***	0.008	0.029***	0.010	0.048***	0.007
Homeowner	0.053***	0.015	0.025**	0.010	0.054***	0.011	0.023**	0.008
Employed part time	-0.083***	0.023	0.013	0.016	-0.071***	0.016	-0.065***	0.014
Unemployed	-0.149***	0.044	-0.126***	0.028	-0.035	0.044	-0.116***	0.017
Student	0.010	0.029	0.120***	0.022	0.003	0.031	0.006	0.021
Retired	-0.167***	0.030	-0.126***	0.017	-0.147***	0.024	-0.123***	0.015
Disabled	-0.573***	0.034	-0.578***	0.085	-0.687***	0.023	-0.336***	0.022
Domestic tasks	-0.137*	0.090	-0.007	0.016	-0.167***	0.024	-0.082***	0.020
Inactive	-0.161***	0.055	-0.105**	0.049	-0.139***	0.032	-0.260***	0.037
Home warm	0.044**	0.023	0.049**	0.023	0.148***	0.047	0.110***	0.016
Home dark problem	-0.064***	0.024	-0.051***	0.015	-0.037***	0.014	-0.066***	0.012
Noise	-0.013	0.016	-0.039***	0.012	-0.032***	0.011	-0.041***	0.010
Pollution	-0.005	0.023	-0.021	0.017	-0.054***	0.014	-0.050***	0.011
Crime	-0.053***	0.019	-0.023*	0.014	-0.053***	0.014	-0.042***	0.010
Densely populated area	0.048***	0.014	0.027**	0.011			0.020*	0.011
Intermediate area	0.015	0.013	-0.019***	0.011			0.015	0.010
Religious participation	0.005	0.018	0.008	0.012	0.002	0.009	0.022	0.026
Meetings with friends	0.040***	0.012	0.093***	0.009	0.021**	0.009	0.035***	0.007
Regional dummies			Yes				Yes	
Pseudo R2	0.152		0.225		0.187		0.210	
Observations	5477		11670		8634		18363	
Log likelihood	-2452.25		-5244.06		-3751.65		-8652.67	

Table 2. Probit estimation results (continue)

	BE		DE		IT		ES	
Formal Volunteering	-0.011	0.017	-0.001	0.014	0.016	0.010	-0.005	0.009
Informal Volunteering					-0.024***	0.006	0.023***	0.006
Female	-0.031***	0.009	-0.003	0.007	-0.025***	0.006	-0.024***	0.007
Married	-0.027*	0.014	-0.046***	0.012	-0.039***	0.008	-0.003	0.010
Separated/divorced	-0.076***	0.024	-0.040**	0.018	-0.109***	0.012	-0.072***	0.015
Widowed	-0.072***	0.020	-0.025	0.015	-0.058***	0.021	-0.046*	0.026
Age 31- 50	-0.142***	0.018	-0.215***	0.016	-0.191***	0.011	-0.173***	0.013
Age 51- 64	-0.198***	0.025	-0.386***	0.017	-0.376***	0.011	-0.349***	0.016
Age > 65	-0.317***	0.033	-0.417***	0.020	-0.530***	0.011	-0.444***	0.019
Lower secondary edu	0.027**	0.013	0.056**	0.026	0.090***	0.008	0.045***	0.008
Secondary edu	0.041***	0.012	0.114***	0.026	0.149***	0.008	0.075***	0.009
Tertiary edu	0.086***	0.012	0.158***	0.025	0.197***	0.009	0.115***	0.008
Household size	0.010**	0.004	0.003	0.004	0.019***	0.003	0.006***	0.003
EU birth	-0.018	0.018			0.108***	0.022	0.022	0.030
OTH birth	-0.021	0.020	-0.015	0.012	0.101***	0.014	0.011	0.016
Household income (ln)	0.037***	0.008	0.057***	0.007	0.025***	0.005	0.016***	0.004
Homeowner	0.034***	0.011	0.027***	0.008	-0.008	0.007	0.011	0.009
Employed part time	-0.025	0.016	-0.022**	0.010	-0.032***	0.012	-0.040***	0.015
Unemployed	-0.122***	0.022	-0.154***	0.017	-0.030**	0.012	-0.063***	0.014
Student	0.003	0.026	0.024	0.020	0.067***	0.016	0.073***	0.017
Retired	-0.090***	0.020	-0.198***	0.016	-0.089***	0.010	-0.152***	0.014
Disabled	-0.629***	0.028	-0.593***	0.013	-0.474***	0.018	-0.604***	0.019
Domestic tasks	-0.049**	0.021	-0.048***	0.016	-0.031***	0.010	-0.088***	0.012
Inactive	-0.135***	0.035	-0.197***	0.031	-0.114***	0.014	-0.156***	0.017
Home warm	0.094***	0.014	0.142***	0.019	0.062***	0.010	0.114***	0.012
Home dark problem	-0.033***	0.012	-0.057***	0.010	-0.115***	0.007	-0.084***	0.008
Noise	-0.029***	0.010	-0.041***	0.009	-0.039***	0.007	-0.046***	0.008
Pollution	-0.058***	0.013	-0.034***	0.010	-0.030***	0.008	-0.043***	0.009
Crime	-0.059***	0.012	-0.057***	0.011	-0.021**	0.009	-0.052***	0.009
Densely populated area	-0.040*	0.022	0.056***	0.011	0.036***	0.007	0.014*	0.008
Intermediate area	-0.036	0.022	0.026**	0.010	0.023***	0.007	0.009	0.009
Religious participation			0.008	0.009	0.008	0.007	-0.004	0.008
Meetings with friends	0.053***	0.009	0.080***	0.007	0.087***	0.006	0.055***	0.007
Regional dummies			Yes		Yes		Yes	
Pseudo R2	0.190		0.182		0.261		0.230	
Observations	10246		24039		43808		25867	
Log likelihood	-4477.21		-13053.00		-22026.06		-12320.98	

Table 2. Probit estimation results (continue)

	PT		EL	
Volunteering	0.032	0.029	0.027	0.020
Informal help	0.035**	0.014	0.022**	0.009
Female	-0.066***	0.013	-0.005	0.009
Married	0.007	0.021	0.003	0.015
Separated/divorced	-0.061*	0.033	-0.058***	0.021
Widowed	0.021	0.040	-0.127***	0.040
Age 31- 50	-0.221***	0.022	-0.116***	0.023
Age 51- 64	-0.432***	0.020	-0.306***	0.031
Age > 65	-0.485***	0.020	-0.459***	0.033
Lower secondary edu	0.103***	0.018	0.061***	0.010
Secondary edu	0.182***	0.020	0.086***	0.009
Tertiary edu	0.232***	0.022	0.102***	0.009
Household size	0.022***	0.005	0.006	0.003
EU birth	-0.025	0.061	0.028	0.017
OTH birth	0.032	0.049	-0.043	0.020
Household income (ln)	0.008	0.011	0.032***	0.006
Homeowner	-0.011	0.016	-0.012	0.010
Employed part time	-0.141***	0.026	-0.034*	0.021
Unemployed	-0.091***	0.024	-0.078***	0.024
Student	0.030	0.032	0.035	0.028
Retired	-0.227***	0.023	-0.172***	0.016
Disabled	-0.505***	0.013	-0.767***	0.030
Domestic tasks	-0.107***	0.025	-0.108***	0.016
Inactive	-0.246***	0.038	-0.207***	0.052
Home warm	0.060***	0.014	0.054***	0.012
Home dark problem	-0.088***	0.017	-0.062***	0.010
Noise	-0.057***	0.016	-0.052***	0.010
Pollution	-0.029*	0.017	-0.017	0.013
Crime	-0.022	0.021	-0.014	0.016
Densely populated area	0.011	0.017	-0.005	0.010
Intermediate area	-0.006	0.016	-0.000	0.014
Religious participation	-0.062***	0.013	0.017**	0.008
Meetings with friends	0.102***	0.015	0.057***	0.010
Regional dummies			Yes	
Pseudo R2		0.282		0.365
Observations		8523		12008
Log likelihood		-4237.22		-4215.89

2.4%<sup>1</sup>. For the other European countries, informal volunteering is not statistically significant. Since on average informal volunteering is lower in FR, IT, PT, EL than in other European countries, i.e. FI, SE, AT (see Table 1), the correlation between informal volunteering and perceived health seems to depend on country-specific cultural and institutional characteristics, too.

Table A2 (Appendix A) shows the third result. For countries with regard to which we have information both on formal and informal volunteering, we detail three specifications: the first includes only formal volunteering, the second only informal volunteering, and the third includes both measures of volunteering (Table 2 reports the last specification). We observe that formal and informal volunteering are not collinear. The marginal effects of formal volunteering do not vary significantly once informal volunteering is introduced (and vice versa). Such results indicate that the two proxies measure two different aspects of volunteering.

Both formal and informal volunteering are pro-social behaviors undertaken on personal free will without asking for monetary compensation in return. However, the former, since performed through charitable organizations, is more likely to give higher social visibility to volunteers than the latter, implemented on individual bases.

All the other control variables show interesting results across countries. Being female increases the likelihood of declaring self-perceived good health in NO, FI, AT and in the NL, while it decreases the probability of reporting self-perceived good health in BE, IT, ES and PT. Marital status is significantly and negatively associated with good health in nearly all countries (except in NO, SI and DK). In all countries, self-perceived good health decreases with age and rises with education (except for DK). Household size increases good health in almost all countries, except for AT where perceived bad health rises with the number of individuals living in the household. Household income is important in all countries (except PT). In almost all countries, *employed part time*, *unemployed*, *retired*, *disabled*, *domestic tasks* and *inactive* are significantly and negatively correlated with good health. In AT, IT and ES being a student is significantly and positively associated with good health. Housing and neighborhood problems diminish self-perceived good health in nearly all countries.

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<sup>1</sup> Considering the Italian economic scenario, it is likely that, in Italy, people, who provide informal help, have economic problems, so, helping others may worsen their condition because channels through which their health should benefit do not work as generally do. So, Italian informal volunteers would be likely altruist people who help others without caring about their own health.

In the health equation (1), we include other indicators of social participation, i.e. religious participation and the frequency of meetings with friends too. Table 2 shows that religious participation is not a significant predictor of good health, except for NO, FI and PT, where religious participation is significantly and negatively associated with good health and in EL where the significant correlation (at 1%) has a positive sign. By contrast, the frequency of meetings with friends is a significant predictor of good health in all countries: meeting friends has a positive effect on self-perceived good health across Europe. This finding is in line with previous investigations concerning Italy (Fiorillo 2013; Fiorillo and Sabatini 2011b; Fiorillo and Sabatini 2011a).

#### **IV. 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 participation and regional dummies. We use data from the income and living conditions survey carried out by the European Union Statistics on Income and Living Conditions (EU-SILC) in 2006. We measure formal volunteering by a dummy variable, equal to 1 if the respondent supplied unpaid work for charitable organizations, groups or clubs, while we measure informal volunteering by a binary variable equal to 1 if the respondent undertook (on a private basis) voluntary activities to help someone. We use probit models in the empirical analysis.

Our results show that formal and informal volunteering have a distinct correlation with health perception, and that such effects differ across countries. Hence, our main conclusions are that formal and informal volunteering measure two different aspects of volunteering and that the correlations among these kinds of volunteering and perceived health seem to depend on country-specific cultural and institutional characteristics.

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## Appendix A.

Table A1. Variable definitions

<i>Variable</i>	<i>Description</i>
<i>Dependent variable</i>	
Self-perceived good health	Individual assessment of health. Dummy, 1=good and very good; 0 otherwise
<i>Key independent variables</i>	
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
<i>Demographic and socio-economic characteristics</i>	
Female	Dummy, 1 if female; 0 otherwise. <b>Reference group: male</b>
Married	Dummy, 1 if married; 0 otherwise; <b>Reference group: single status</b>
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. <b>Reference group: age 16 - 30</b>
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. <b>Reference group: no education/primary education</b>
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. <b>Reference group: country of residence</b>
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)
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; <b>Reference group: employed full time</b>
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
<i>Housing feature</i>	
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

<i>Variable</i>	<i>Description</i>
<i>Neighborhood quality</i>	
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
<i>Size of municipality</i>	
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. <b>Reference Group: Thinly-populated area</b>
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.
<i>Other social participation variables</i>	
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
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

Table A2. Selection of probit estimation results

	FI			SI			DK		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Formal Vol.	0.044*** (0.014)		0.043*** (0.014)	0.018 (0.016)		0.017 (0.016)	0.006 (0.017)		0.005 (0.018)
Informal Vol.		0.012 (0.010)	0.010 (0.010)		0.003 (0.010)	0.002 (0.011)		0.007 (0.033)	0.005 (0.033)
	AT			NL			FR		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Formal Vol.	0.028 (0.016)		0.027 (0.017)	0.031*** (0.010)		0.026** (0.010)	0.028 (0.026)		0.024 (0.027)
Informal Vol.		0.004 (0.009)	0.001 (0.009)		0.046*** (0.009)	0.043*** (0.009)		0.031*** (0.009)	0.031*** (0.009)
	IT			ES			PT		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Formal Vol.	0.010 (0.010)		0.016 (0.010)	-0.002 (0.009)		-0.005 (0.006)	0.042 (0.029)		0.032 (0.029)
Informal Vol.		-0.023*** (0.006)	-0.024*** (0.006)		0.023*** (0.006)	0.023*** (0.006)		0.038*** (0.014)	0.035** (0.014)
	EL								
	(1)	(2)	(3)						
Formal Vol.	0.036* (0.019)		0.027 (0.020)						
Informal Vol.		0.024*** (0.009)	0.022** (0.009)						

Note: Robust standard errors in brackets. The symbols \*\*\*, \*\*, \* denote that the marginal effect is statistically different from zero at 1, 5 and 10 percent, respectively.