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# Health Inequalities and the Welfare State in European Families

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*Using EU-Silc data from 2005, our aim in this article is to estimate how self-assessed health and the gradient between education and health vary among individuals in different European countries, considering their contextual socioeconomic vulnerability. In order to do this, we use a hierarchical model with individuals nested in households at the second level, and in various European countries at the third level. Our main research interest is on the modelling variables associated with better health conditions and their improvement or worsening according not only to micro/individual and macro/national levels but also to the household: a level on which social protection (of whatever nature) exerts its influence. Different household contexts receive different amounts of resources, by transfers, social care and health services, which could directly affect health and also modify the gradient between education and health. Moreover, these relations are likely to change among European countries, on the basis of various welfare assets, as the identification of beneficiaries' categories and the weight of category-based measures on the overall welfare expenditure varies among countries and among welfare models.*

Key words: *Inequalities in health, comparative studies, welfare, family, hierarchical models*

Investigation of the causes of heterogeneity in the health of a population is a fundamental topic in social sciences. From many points of view, health is the most important and ultimate outcome of the influence of social conditions. Health, in any semantic dimension, is the “embedding” in human bodies of a series of socio-economic disadvantages that individuals cumulate through their life courses. This approach is called the theory of cumulative advantage (DiPrete & Eirich, 2006; Spencer & Logan, 2002; Wilson, Shuey, & Elder, Jr., 2007).

Sociologists explain variability in health mainly through structuralist theories. In this perspective, individuals in deprived social positions would have a higher chance of working and living in the worst conditions, which are likely to provoke negative effects in their health in terms of stress, morbidity and mortality (Bartley, 2003; Drever, Daran, & Whitehead, 2004; Link & Phelan, 1995; Mackenbach et al., 2003; Regidor, Banegas, Gutiérrez-Fisac, Domínguez, & Rodríguez-Artalejo, 2004; Wilkinson & Marmot, 2003). Most research attention is given to socio-economic factors as health determinants. Health determinants are related to social position (educational levels, social class and material resources such as income, qualifications, professional characteristics and general working conditions).

The structuralist approach identifies factors of inequality as objective and systematic differences with regard to the ownership of social, economic and cultural resources and the associated capability to use such resources in order to maximize the chances of full psycho-physical efficiency of the body (Della Bella, Lucchini, Sarti, & Tognetti Bordogna, 2010; Sarti, 2006). This approach considers that individuals occupying different “social positions” are variously exposed to particular physical dangers (exposure to risk factors as toxic agents, poor housing conditions or dangerous jobs) as well as psychological dangers (stress due to financial concerns, excessive workload, low symbolic reward, lack of autonomous decision-making). These conditions are all recognised as important etiological factors of a wide range of illnesses (Cassel, 1976; Navarro, 1986; Siegrist & Marmot, 2006).

One of the most commonly used proxies of social position is the level of education, since it is an excellent predictor of health. Researchers use the expression “social gradient” to indicate the relationship between status of health and formal education. Generally, with the average increase in educational level and age being equal (*ceteris paribus*), individuals are more likely to have better health. Education is strongly correlated with better perceived health, less probability of being sick, a better lifestyle, a stronger protection from several risk factors and, more generally, a longer life expectancy (Marmot, 2005; Muller, 2002; Ross & Wu, 1996).

In addition, one should also consider socio-environmental influences which can affect the health status of the population. Scholars focusing on variations in ecological typologies take into account relations between the contextual characteristics of a certain area and the health status of the resident population (Basegãña et al., 2004; De Vogli, Mistry, Gnesotto, & Cornia, 2005; Singh & Siahpush, 2002; Wilkinson, 1996; Woods et al., 2005). Ecological contexts can exercise different influences on the basis of the grouping (level) considered. They can directly concern the context in which individuals live, such as the neighborhood or the residential area (Diez Roux, 2001; Lupton, 2003; Pickett & Pearl, 2001) or the healthcare institutions acting in a particular administrative area, city, region or country. For example, research by Woods and colleagues (2005) shows how differences in life expectancies among various areas of Wales are sensitive to economic deprivation in these areas. Another research project by Basegãña and colleagues (2004) supports the existence of an area effect, net of compositional effects. Other studies concern more directly the influence of environmental characteristics, such as pollution in a certain territory, in the development of some illnesses (Bidoli, Franceschi, Dal Maso, Guarneri, & Barbone, 1993).

Some environmental health studies regard inequality of access and performance of local health care systems in relation to the socio-economic positions of users (Van Doorslaer et al., 2000; Waters, 2000). These studies identify ‘determinants’ of social inequalities in health, over and above the typical social elements (such as cultural capital, occupational status, social support), considering also healthcare factors (such as preventive medicine and early diagnosis, patient care, etc.).

Some studies have focused on the implications arising from territorial heterogeneities and differences in healthcare systems, considering different levels of care and assistance available (Lucchini, Sarti, & Tognetti Bordogna, 2009; Pickett & Pearl 2001; Schaefer-McDaniel, O'Brien Caughy, O'Campo, & Geary, 2010; Spadea, 2004).

When using the ecological as the level of comparison, the study of contextual effects focuses on the State level. For example, healthcare systems could be differentiated on the basis of the population's demand (demographic or epidemiological), supply (available structures and services), performance (balance demand/supply), and on the political and institutional characteristics of the country (Figueras, Mossialos, McKee, & Sassi, 1994). The institutional and societal model has indeed had a great impact on the structure and specificities of healthcare and, more generally, on welfare and social protection systems.

Writing about the welfare regime, which also includes healthcare, Esping-Andersen defines it as the way through which three interdependent institutions—the state, the market and the family—distribute among themselves the production of welfare and social protection. As we will observe, family is the final recipient of the production and distribution of welfare: the place where it is consumed. A great difference consists in the way social risks are addressed and how the responsibility of social protection is divided among the state, the market and the family. The differences in this distribution of roles is a consequence of different welfare regimes (Esping-Andersen, 1999). The main concept from which Esping-Andersen derives his analysis is that of de-commodification, originally introduced by Polanyi (1949) and through which we can measure the capacity of the welfare state to reduce people's dependency on the market, guaranteeing the right to revenue and social protection, no matter the participation in the (labor) market (Esping-Andersen, 1999).

Welfare regimes did not simply allow the introduction of welfare policies through which it has been possible to face social risks, but also allowed a real renegotiation of the contract and relationship between the state and its citizens in a given historical time. Considering the welfare state and its changes, we should also take into account the main political

and institutional determinants shaping and influencing the different regimes. The “new” economic cycle finds an answer in the renewed institutional assets, which have been reconfigured following a rationale of path dependency. The great relevance of the political and institutional dimensions clearly emerge, for instance, in the classification and naming of the clusters—liberal, conservative and social democratic—attributed to the various regimes.

Similarly, in the specific case of health systems, we should consider four specific elements: the internal nature of a society; the demographic, epidemiologic and genetic characteristics of its population; the individual in its environment; and the societal system and its external nature (Ardigò, 1997; Giarelli, 2010).

If we look at the academic and political debate on the welfare state, a decisive point seems to concern expenditures. A first generation of comparative welfare state studies (Cutright, 1965; Wilensky, 1975) has mistakenly assumed that the level of expenses was the first criteria to measure states’ commitment to social policies.

Expenditures are epiphenomenal to the theoretical substance of welfare states. Moreover, the linear scoring approach (more or less power, democracy, or spending) contradicts the sociological notion that power, democracy, or welfare, are relational and structured phenomena. By scoring welfare states on spending, we assume that all spending counts equally ... . (Esping-Andersen, 1990, p. 19)

Therefore, a paradigm change has been necessary:

It is an approach that forces researchers to move from the black box of expenditures to the content of welfare states: targeted versus universalistic programs, the conditions of eligibility, the quality of benefits and services, and, perhaps most importantly, the extent to which employment and working life are encompassed in the State’s extension of citizen’s rights. (Esping-Andersen, 1990, p. 20)

Talking about the contents of social policies and welfare,

different assets of welfare regimes organized at the national level can be associated with macro-economic characteristics and can be accountable for improving people's health (or not). We can identify the socio-economic characteristics of individuals in the household, thus determining the level of available resources. These will vary depending on the national level, most obviously among countries, where different macro-structures and welfare regimes may 'decommodify' individuals to varying degrees and mitigate social vulnerabilities (Castel, 2004; Gallie & Paugam, 2000; Layte & Whelan, 2002). Social vulnerabilities describe a condition of weakness exposing individuals and households to different risk factors (illness, unemployment, etc). This lack of protection (social and economic) is associated with difficult development of exit strategies from difficult situations (Ranci, 2002; World Bank, 2001).

From our point of view, vulnerability concerns all those socio-economic conditions that contribute to the deterioration of health, giving no chance to any form of recovery. In these terms, vulnerability is the opposite of "resilience." Resilience is defined as the ability of a system to respond to disturbances quickly. Thus, contextual effects are not only territorial and spatial, but can also be eco-social. They can relate to groups of individuals sharing similar social characteristics in terms of resources or other specific issues, such as being subject to common forms of social protection and institutions. Social protection consists of all instruments (public, private and non-profit) used to alleviate poverty and inequality by means of services, transfers and benefits (Pestieau, 2006).

### Research Questions

Our main research interest is on the modelling variables associated with better health conditions and their improvement or worsening according not only to micro/individual and macro/national levels but also to the household level, where social protection exerts its influence. In this approach, we consider that members of a family commonly use resources provided by welfare. Scholars widely agree that the household is the welfare unit in which social security measures are put in place (Esping-Andersen, 1990; Paci, 2007).

As we observed, the institutions implementing social

protection and welfare (state, market and households) can affect the health status, since their function is to decrease the social disadvantage and economic difficulties faced by individuals and households. Social protection acts mainly through social insurance services (health care, family allowances, unemployment benefits) and through social assistance (transfers or benefits finalized to income support) that can positively affect the health of individuals and households (Pestieau, 2006).

Therefore, in this perspective, European households' settings and social-economic vulnerabilities constitute a useful heuristic point of view to analyze and explain health inequalities. The specific difficulties faced by European households may be strongly tied to the different levels of social attention applied from each welfare regime. For example, in a context of inefficiency of the labor market and with an unemployed member in the household, public welfare may be solicited to support families through active measures or unemployment compensations. This is, for instance, the case in Denmark (Pestieau, 2006, p. 128), while on the opposite, in Italy, households themselves can provide an internal reallocation of resources, with a male breadwinner model which is far from being totally dismissed (Layte & Whelan, 2002). Therefore, we could hypothesize that a country having some mechanisms of social protection for unemployment could guarantee a relative advantage in terms of health for those households presenting this characteristic.

Differences in access to health services can vary across socio-economic groups and play a role in the structuring of health inequalities. As far as Europe is concerned, although most countries aim at offering a universal and equal health-care system, this does not easily translate into equal access to care. In fact, even within a single system, there might be differences in the capabilities of an individual to benefit from care depending on individual and socio-economic characteristics. In addition: "not all health care systems take sufficient account of the fact that the need for health care is higher in less advantaged social groups because of higher rates of disease and disability (E.U. Commission, 2008, p. 75)

In fact, even in universal healthcare systems there are some elements that might make it more difficult for vulnerable



groups to access healthcare: lack of coverage for certain cases; high financial costs of care for individuals; variation in service availability and geographical disparities in supply; waiting times; lack of information; and other cultural elements, such as beliefs and preferences (E.U. Commission, 2008).

However, in this work we are not interested in reconstructing the impact of welfare systems on socio-economic vulnerabilities in terms of health conditions. Such a level of insight is not the aim of this study. We are more interested in describing from a comparative perspective the variation of health among and within European countries, using a specific household typology. Doing this, we expect that certain types of vulnerabilities will be associated with more intense health disadvantages in some countries rather than others.

The contribution of this work is to describe these variations, without going into the details and evaluation of each social policy facing a specific profile of vulnerability. Social policies are specific state acts addressed to particular objectives, while welfare considers the multiple actions of state, market and family (Esping-Andersen, 1999). To resume, we know that welfare services and benefits are largely distributed among people by means of policies addressing categories of individuals, characterized by particular conditions of social vulnerability (Esping-Andersen, 1990, 1999; Ferrera, 1996; Mingione, 1997).

We also know that these resources play a role in improving the health status of the individuals receiving them. At the same time, we know that health is strongly influenced by individual factors such as age, gender, and education. Thus, we are interested in the estimation of the health status, considering different household characteristics of vulnerability—since different conditions include a different amount of resources, but also individual factors.

Typical conditions of households' socioeconomic weakness can be summarized in: income poverty, absence of earned incomes, unemployment, unstable employment in un-skilled jobs, dwelling problems, presence of elderly or disabled people, children, widows, divorces, and large families (Lucchini & Sarti, 2005; Whelan & Maître, 2005).

Therefore, different familial contexts receive different amounts of resources, by transfers or health and social care

services, which could directly influence health and also modify the gradient between education and health. Moreover, these relations are likely to differ among European countries, on the basis of diverse welfare assets, as the identification of categories of beneficiaries and the weight of category-based measures on the overall welfare expenditure varies among countries and among welfare models (Jensen, 2008).

The final aim of this paper is to estimate how self-assessed health varies among individuals, considering the contextual socioeconomic vulnerability of their families and the variation across European countries.

### Methodology: Data, Methods and Hypothesis

In order to compare European societies, we used EU-Silc information from the 2005 wave. This is not the last wave available of EU-Silc, but it allows us to compare these results with another analysis conducted in a previous work (Della Bella et al., 2010) based on ESS data (European Social Survey).

Data from the EU-Silc allow us to investigate inequalities in health, using as a proxy the gradient between years of formal education and self-assessed health. This dataset also provides information about social conditions at individual and household levels. Information about socio-demographic characteristics, working status, housing conditions and poverty risk of all family members are available for each country of the European Union. In this way, we can define with precision different amounts of socio-economic vulnerability in European households. In addition, we control variation among European countries, considering respective welfare state regimes. We consider only cases older than 15 years old.

Summarizing, we use the following observed variables as operationalized proxy for our analytical indicators: (1) Self-assessed health in a scale from 1 (worse health) to 5 (better health), as a proxy of the status of health, as it was strongly associated to objective conditions of health and it is a predictor of mortality and morbidity (Ferraro & Farmer, 1999; Idler & Benyamini, 1997; Jylha, 2009); (2) Highest ISCED level attained, as proxy of socio-economic and cultural resources; (3) Sex and age of respondent; (4) Country of the respondent; (5) A series of dichotomous variables defining the familiar

vulnerability conditions (at least one unemployed in the household; nobody working in the household; presence of dwelling problems [leaking roof, damp walls/floors/foundation, or rot in window frames or floor]; risk of poverty threshold [60% of median of equivalised disposable income]; at least one person older than 79 in the household; at least one person permanently disabled or/and unfit to work; at least one person with limitations in activities because of health problems; at least one child younger than 6; single parent with children [separated/divorced person with a child younger than 6]; at least one person occupied in elementary occupations [isco88>90]).

Our hypothesis and the data structure lead us to apply hierarchical regression models (Goldstein, 1995; Snijders & Bosker, 1999). The dependent variable is perceived health, and we assume it to be a metric variable with a Gaussian distribution. We assume that the dependent variable, self-assessed health, is the realization of a Gaussian random variable (we also tested logistic models assuming health as a dichotomous variable: good health versus bad health; results are similar) (see Table 1).

Considering this variable, we can use 355,481 valid cases. We controlled for countries with more than 5% missing data. The dependent and independent variables we use in our models do not differ between valid cases and not valid cases (ANOVA tests are not significant). However, we cannot exclude other heterogeneous factors correlated with missing responses.

The main independent variable, of which we aim to estimate the effect on health, is education (a metric variable equals to the highest ISCED level attained). The independent variables used to control the relation between education and health at individual level are gender and age. The data are organized on three levels: at the first level we have individuals and their personal characteristics; at the second level we have households and contextual vulnerability indicators; at the third level we have countries, which we assume to have differences in welfare regimes.

In this way, the model allows us to confirm some of our hypotheses. As we will better observe in the analysis of the third section, we can decompose heterogeneity at various levels and estimate effects (in terms of associations) of vulnerability

characteristics, controlling the socio-demographic and across countries variations.

In this way, perceived health is the result of three components: (1) Individual heterogeneity, including gender, age and educational level; (2) Familiar heterogeneity, including a typology of social vulnerability; and (3) Country's heterogeneity, including implicit different welfare assets. Based on this decomposition, the health status of respondents can be recomposed adding the residuals of the three level components to the general intercept.

This analytical approach allows us to answer some research questions emerging from the empirical evidence (see the first section), leading us to test the following hypothesis on health inequalities and on the relationships between health and social vulnerability of European households.

On health inequalities:

H1: Are there differences in average health among countries? We expect "less developed" welfare states to have poorer health.

H2: Does the gradient between health and education change among countries? We expect there is not much of a variation, since the gradient concerns individual characteristics, all other things being equal.

On familiar vulnerabilities and welfare assets:

H3: Are familiar vulnerabilities connected to better or worse health? We expect that some kinds of socio-economic weaknesses are more correlated with poorer health.

H4: Do these associations vary across European countries? We expect there are significant differences at the contextual level of countries.

H5: Can relations among vulnerabilities and health and their variations in Europe be referred to different kind of welfare regime?

An important problem when we consider vulnerability is the accumulation of different factors. A number of socio-economic disadvantages can be often present in one family at the same time. For example, two elderly people could be at poverty risk and could also have some limitations in

functionality. Scholars tackle this problem assuming a “multiple deprivation” of the socio-economic conditions of vulnerability (Pisati, Whelan, Lucchini, & Maître, 2010; Whelan & Maître, 2007).

Thus, we applied a multivariate technique to explore multidimensional characteristics of vulnerability. The risk profiles are defined by the mean of dichotomous indicators, so we can use latent class analysis to individuate multiple areas of vulnerability (Grusky & Weeden, 2007). Thus we analyzed different kinds of socio-economic vulnerability considering the risk factors, as in the existing literature. The literature (Townsend, 1979) and some results of explorative analysis show how socio-economic vulnerabilities tend to overlap, presenting themselves in a cumulative way. For example, families at poverty risk frequently also experience other types of socio-economic disadvantage (such as occupational and dwelling problems).

Therefore, latent class analysis suggests to us a hierarchy of vulnerability factors. Thus, we created a typology of family-related vulnerabilities based on the sample size of categories, on the household's size and on the following hierarchy of vulnerability: presence of health problems, risk of poverty, presence of elderly people, presence of serious vulnerability (dwelling problems, unemployed, manual and not qualified workers, etc.) and minors younger than 6 years old. This hierarchy means that, in case of overlapping indicators, we attribute more relevance to a previously listed condition.

At this point the final model will consider more dichotomous regressors as independent variables, considering the household's condition of vulnerability. Consequently, these regressors will vary at the second (household) and third levels (national).

There are twenty-five groups of social vulnerability that we reported in the following list (in order to simplify the reading of our tables, we use abbreviations: OE, one member families; ME, medium-size families, from 2 to 4 members; LE, large families, more than 4 members): (MF) without vulnerabilities [reference category], poor with health problems, elderly person and health problems, with health problems, poor with elderly person, poor, with elderly person, without occupied persons [no retirees], dwelling problems, with manual worker not

qualified, with job frailty, with children; (OF) without vulnerabilities, with health problems, poor & elderly person, poor, elderly person, without serious vulnerabilities; (LF) without vulnerabilities, with health problems, poor, without serious vulnerabilities. We also looked at families with disabled persons who are poor, families with disabled persons who are not poor, and one-parent families with children.

### Results of Analysis

In order to answer our research questions, we realized four different models with perceived health as a dependent variable. The first two models consider only basic variables (gender, age and education) and estimate the gradient of inequality across European countries (see Table 1). From our results, we see how for each additional ISCED level (range from 1 to 5), on average, health increases 0,099 points. If we could translate education advantage in terms of years, a difference from the lowest education level to the highest should correspond to an effect of about 20 years. The value ( $0,099 \times 5 = 0,50$ ) is equivalent to about 20 years old ( $0,026 \times 20 = 0,52$ ). One year in add means -0,026 points of health. However, the main result we stress here is the national ranking of perceived health, all other things being equal.

As Table 2 shows, Baltic Republics, Central and Eastern European countries (Hungary, Poland, Slovakia, Slovenia, Czech Republic) and Portugal have the poorest health. In a medium position we find Germany, Italy and Spain. All other countries have positive values for the general intercept on self-assessed health.

In particular, we find Ireland, Greece and Denmark in a good position. All northern and Scandinavian countries (United Kingdom, Ireland, Finland, Netherlands) have a significant positive intercept on health. In this frame, the only exception seems to be Greece. Moreover, if we consider the same model with the random slope variation of education at the country level, we assume that relation between health and education can be different among countries. We also notice that the relation between education and health is similar in the countries considered (since variances in residuals in model 1.2 are very similar). All residuals on education at the country level are between -0.04 and 0.05.

Table 1. Models 1.1 and 1.2: Multilevel Linear Model for Variation in Perceived Health: Estimate of Regression Coefficients and Standard Deviations (fixed effects in model 1.1 and random effects in model 1.2).

	Model 1.1	% of variance	Model 1.2	% of variance
Intercept+	4.635 (0.065)		4.553 (0.059)	
ISCED level (1 through 5)	0.099 (0.001)		0.110 (0.005)	
Gender (male = 1)	0.069 (0.002)		0.065 (0.010)	
Age	-0.026 (0.000)		-0.025 (0.001)	
Random:				
Variance among individuals	0.479 (0.002)	62.5	0.471 (0.002)	64.3
Variance among families	0.184 (0.002)	24.0	0.176 (0.002)	24.0
Variance among countries	0.104 (0.029)	13.6	0.086 (0.025)	11.7
N	355481		355481	
IGLS Deviance	-2Ln(L)=846479		-2Ln(L)=838216	

+ Random slope variation

The rankings present some interesting elements for discussion. If we put them in relation with life expectancy and with an indicator of countries' economic well-being, we will observe an association. The ranking of self-assessed health has a good relation as far as life expectancy is concerned. In particular, countries with lower perceived health are more associated with lower life expectancy. Greece, Ireland and Denmark show higher than expected general perceived health with respect to life expectancy. On the contrary, Portugal shows lower than expected self-assessed health. More generally, we cannot exclude different semantic interpretations due to cultural and/or linguistic reasons. EUSILC's questionnaire might be interpreted differentially by interviewees of these countries. Excluding these exceptions, the correlation represents a validation of the ranking.

Table 2. Intercept of Perceived Health in Europe, Controlling for Individual Factors: sex, age and ISCED level. Residual on the Intercept of the Basic Model.

Nation	Label	Residuals
Latvia	LV	-0.64
Lithuania	LT	-0.52
Hungary	HU	-0.43
Portugal	PT	-0.38
Estonia	EE	-0.37
Poland	PL	-0.33
Slovakia	SK	-0.32
Slovenia	SI	-0.23
Czech Rep.	CZ	-0.15
Germany	DE	-0.12
Italy	IT	-0.04
Spain	ES	-0.01
Norway	NO	0.12
France	FR	0.12
Belgium	BE	0.16
Netherlands	NL	0.18
Luxembourg	LU	0.23
Austria	AT	0.24
United Kingdom	UK	0.26
Cyprus	CY	0.28
Finland	FI	0.28
Sweden	SE	0.29
Denmark	DK	0.41
Greece	GR	0.46
Ireland	IE	0.51

Note: Standard errors are approximately 0.11 for all countries.

The real gross domestic product per capita, used as an indicator of country well-being, is correlated with the ranking of perceived health. Only three countries tend to move away



from the regression line. In the case of Greece and Cyprus, GDP underestimates health, while for Norway it overestimates health. In all other cases, the macro-indicator of wealth is a good proxy for the general intercept of perceived health.

We found significant and important differences in average health among countries. Our findings show that countries with poorer health status (general intercept, all other things being equal: age, gender and education level) are correlated with a shorter life expectancy, and poorer health status is also correlated with less wealth in terms of equivalized GDP per capita. In addition, similarly to the results of the ESS survey (Eikemo, Huisman, Bambra, & Kunst, 2008) we found that the gradient between health and education is quite similar among all European countries. Through this analysis we can confirm our first two hypotheses (H1 and H2). As far as hypothesis H3 is concerned (familiar vulnerabilities), we have to take into account the socio-economic profiles of household vulnerability.

We realized two new models, models 2 and 3. In Model 2 (see Table 3), we estimated regression coefficients on the basis of profiles of households' socio-economic vulnerabilities. The modal household was used as a benchmark, the medium-size (2 to 4 members) family without vulnerabilities. We observed that households with health problems have, as expected, a poorer average health status. Individuals living in poor families tend therefore to have lower scores in health, as do individuals living in a family with an elderly member. It is worth noting that single people usually have a lower than average health status. This is probably due to the fact that their health score cannot be redistributed among other members. Some studies also show that subjects living alone tend to have worse health in comparison to subjects living in a couple (Cohen, Doyle, Skoner, Rabin, & Gwaltney, Jr., 1997). For all these reasons, we can also answer positively to the third hypothesis: familial vulnerabilities are indeed connected to chances of having good or poor health.

The third and last model (Table 4) investigates differences, negative or positive, in vulnerabilities effects among countries (we randomized the slope of the vulnerability profile variable at the national level). Using the hierarchical regression technique we can decompose the variability at different levels. Therefore, the value of perceived health status can be estimated as the sum of four elements: Intercept, Country variation,

Table 3. Model 2: Multilevel Linear Model for Variation in Perceived Health, Considering Familial Vulnerability Profiles: Estimate of Regression Coefficients and Standard Deviations (fixed effects at the second level, N = 355481)

	Regression coefficients	Variation in variance from Model 1
Intercept+	4.635 (0.065)	
ISCED level (1 through 5)	0.075 (0.001)	
Gender (male=1)	0.066 (0.002)	
Age	-0.024 (0.000)	
MF without vulnerabilities	0 <sup>a</sup>	
OF without vulnerabilities	-0.050 (0.009)	
LF without vulnerabilities	0.011 (0.009)	
OF with health problems	-1.173 (0.016)	
OF poor	-0.348 (0.009)	
OF poor and with elderly person	-0.222 (0.018)	
OF with elderly person	-0.216 (0.013)	
OF without serious vulnerabilities	-0.094 (0.007)	
MF poor with health problems	-0.881 (0.014)	
MF with health problems	-0.745 (0.007)	
MF with elderly person and health problems	-0.634 (0.013)	
MF poor with elderly person	-0.393 (0.018)	
MF poor	-0.150 (0.007)	
MF with dwelling problems	-0.183 (0.007)	
MF with manual worker not qualified	-0.087 (0.008)	
MF with job frailty	-0.076 (0.009)	
MF with children	-0.067 (0.007)	
MF without occupied persons (no retirees)	-0.043 (0.006)	
MF with elderly person	0.021 (0.011)	
LF with health problems	-0.538 (0.017)	
LF poor	-0.182 (0.011)	
LF without serious vulnerabilities	-0.088 (0.007)	
Families with disabled person (poor)	-0.870 (0.012)	
Families with disabled person (non-poor)	-0.711 (0.007)	
One parent with children	-0.250 (0.008)	
<i>Random:</i>		
Variance among individuals	0.475 (0.002)	-0.8
Variance among families	0.122 (0.001)	-33.7
Variance among countries	0.093 (0.026)	-10.6
IGLS Deviance	-2Ln(L)=816506	

<sup>a</sup> Reference category: "modal family," families without vulnerabilities (2-4 members)

Table 4. Model 3: Significant (95% c.i.) Residuals of the Models with Vulnerability Profiles (Random Effects at Second Level)

Familial Vulnerability Group	Familial Vulnerability Variation	Familial Vulnerability Variation among Countries	
		Negative residuals	Positive residuals
MF w/o vulnerabilities	0 <sup>a</sup>	-	-
OF w/o vulnerabilities	-0.041 (0.013)	-0.06 NL; -0.05 DK; -0.05 UK	0.06 SL
LF w/o vulnerabilities	0.006 (0.017)	-0.15 IE; -0.10 NL	0.10 GR; 0.09 SK; 0.07 PL
OF w/health problems	-1.192 (0.034)	-0.37 GR; -0.18 PL; -0.16 NO	0.25 DK; 0.18 NL
OF poor	-0.381 (0.028)	-0.35 CY; -0.20 GR; -0.14 AT; -0.12 LT	0.24 UK; 0.18 IE; 0.12 IT; 0.11 NL; 0.09 DK; 0.08 FI
OF poor and w/ elderly person	-0.295 (0.064)	-0.45 GR; -0.44 CY; -0.44 SK; -0.26 CZ; -0.23 HU; -0.21 LV	0.63 UK; 0.45 NL; 0.33 NO; 0.29 IE; 0.27 DE; 0.27 SE; 0.25 BE
OF w/elderly person	-0.243 (0.053)	-0.46 GR; -0.39 EE; -0.40 SK; -0.34 AT; -0.29 CY; -0.18 HU; -0.18 FI; -0.13 PL	NL 0.41; 0.37 IE; 0.32 NO; 0.26 UK; 0.18 DK; 0.17 SL; 0.17 BE; 0.17 DE
OF w/o serious vulnerabilities	-0.081 (0.022)	-0.23 PL; -0.20 SK; -0.15 GR; -0.11 LT; -0.09 CZ; -0.08 HU	0.16 DK; 0.10 DE; 0.10 UK; 0.09 IE; 0.09 SE; 0.09 LU; 0.09 NL
MF poor w/ health problems	-0.942 (0.043)	-0.29 FI; -0.27 SL; -0.23 NL; -0.23 NO; -0.19 LU; -0.16 GR; -0.15 AT	0.23 UK; 0.21 IE; 0.20 EE; 0.18 SK; 0.18 IT; 0.17 LT; 0.17 LV; 0.12 ES
MF w/health problems	-0.810 (0.048)	-0.47 FI; -0.43 SE; -0.38 NO; -0.33 SL; -0.33 NL; -0.30 DK; -0.14 PL	0.29 LT; 0.31 IE; 0.23 UK; 0.22 BE; 0.21 LV; 0.18 EE; 0.14 IT; 0.13 ES; 0.11 DE
MF w/elderly person and health problems	-0.703 (0.044)	-0.48 FI; -0.37 NO; -0.23 SK	0.24 BE; 0.23 IE; 0.22 UK; 0.21 LT; 0.19 LV; 0.15 DE; 0.14 PT; 0.10 IT
MF poor w/ elderly person	-0.365 (0.051)	-0.37 CY; -0.31 GR; -0.30 LU; -0.19 HU; -0.18 PT	0.41 UK; 0.26 DE
MF poor	-0.155 (0.011)	-0.05 FR	0.09 GR; 0.05 SK
MF dwelling problems	-0.178 (0.013)	-0.07 IT; -0.07 FR	0.11 CY; 0.08 GR; 0.05 SK; 0.04 PL

Familial Vulnerability Group	Familial Vulnerability Variation	Familial Vulnerability Variation among Countries	
		Negative residuals	Positive residuals
MF w/manual worker not qualified	-0.086 (0.011)	-	-
MF w/job frailty	-0.082 (0.012)	-	0.08 GR
MF w/children	-0.041 (0.023)	-0.18 NL; -0.16 UK; -0.16 SE; -0.15 DK; -0.10 ES; -0.09 IE; -0.08 NO; -0.07 FR	0.18 SK; 0.16 CZ; 0.13 GR; 0.09 SL; 0.09 HU; 0.08 PL
MF w/o occupied persons (no retirees)	-0.022 (0.032)	-0.31 PL; -0.29 SK; -0.18 CZ; -0.17 GR; -0.15 LV; -0.11 EE; -0.11 HU; -0.11 LT	0.25 NL; 0.22 NO; 0.21 DK; 0.17BE; 0.17 SE; 0.13 UK; 0.13 LU
MF w/elderly person	0.044 (0.033)	-0.30 PL; -0.24 GR; -0.20 SK; -0.17 CZ	0.26 SE; 0.23 NL; 0.16 DK; 0.16 NO; 0.16 IE; 0.15 UK
LF w/health problems	-0.631 (0.056)	-0.56 NO; -0.46 SL; -0.42 SE; -0.36 FI; -0.31 DK	0.38 CZ; 0.30 SK; 0.22 LV; 0.20 LT; 0.20 PT; 0.19 ES
LF poor	-0.227 (0.025)	-0.15 UK; -0.14 SE; -0.12 DE; -0.09 IE	0.17 GR; 0.14 PL; 0.14 SK; 0.09 IT
LF w/o serious vulnerabilities	-0.097 (0.016)	-0.10 NL; -0.08 IE; -0.07 SE; -0.07 UK	0.12 SK; 0.12 CY; 0.07 FI; 0.07 CZ; 0.07 GR; 0.05 PL
Families w/ disabled person (poor)	-1.005 (0.051)	-0.36 DE; -0.33 CY; -0.28 AT; -0.27 GR; -0.28 DK; -0.24 UK;- 0.24 NO	0.42 FR; 0.39 PL; 0.21 LT; 0.21 HU; 0.19 SK; 0.16 IT
Families w/ disabled person (non-poor)	-0.782 (0.033)	-0.34 SL; -0.30 UK; -0.23 CY; -0.17 BE; -0.12 DE	0.34 FR; 0.17 PL; 0.17 IT; 0.17 LU; 0.11 NO; 0.09 LT
One parent w/ children	-0.251 (0.024)	-0.25 IE;-0.16 UK; -0.13 SE	0.22 SL; 0.17 CZ; 0.11 FI

Note: <sup>a</sup>reference category

Familial vulnerability variation and Familial vulnerability variation among countries. Thanks to these results, we can give a positive answer to the question concerning the relationship between the household's vulnerabilities and the individual perceived health across European countries (H4). We will examine the details in the next section, where we will also discuss the last research question concerning associations to welfare regimes (H5).

## Discussion and Conclusion

Summarizing the findings of our analysis we can emphasize three related results. First, we can confirm a ranking of European countries in perceived health, controlling individual factors such as gender, age, and the ISCED level. What emerges on average is that individuals living in the “poorest” countries, characterized by lower social spending (Pestieau, 2006), generally also have the worst perceived health.

The compulsory character of the European health care system has two different roots and hence takes two basic forms, which in reality, however, can rarely be seen in pure form (Freeman, 2000): The Bismarckian model, which dates back to the nineteenth century, is mainly based on a public social health insurance for wage-earners (mandatory contributions deducted from salaries and mainly paid into public funds), even if the coverage is now extended to other categories (Saltman & Dubois, 2004). In the Beveridgian model, health care costs are paid from taxes and health care services are provided by a national health service covering the entire population, making it an integrated public financing and delivery model. The Bismarckian model prevails in Continental Europe, while Britain, the Nordic countries and some Southern European nations have chosen the tax-based solution for financing health care. In both systems there is some form of redistribution of costs. (André & Hermann, 2010, p. 3)

In particular, Scandinavian countries have a good position in the ranking. The general intercept of self-assessed health is positive for Denmark, Sweden, Norway and also the Netherlands. On the contrary, countries of Central and Eastern Europe have the worst ranks: Latvia, Lithuania, Hungary, Poland, Estonia, Slovakia, Slovenia and the Czech Republic. In the middle are western countries—Germany, France, Belgium and Luxembourg, generally classified as corporatist/conservative models—but also their Southern European variations: Italy and Spain. The ranking is topped by the United Kingdom, Ireland, Greece and Cyprus, which are settled in the highest positions. On the opposite end, we find Portugal in the

last position.

In the case of Great Britain it may be significant to note that, despite the fact that it has traditionally been defined as a liberal welfare regime, it provides a universal health care system. It has been indeed the first universal system in Europe, thanks also to the popular *Report of the Inter-Departmental Committee on Social Insurance and Allied Services*, commonly known as the Beveridge Report.

Second, we find the existence of significant differences among households' types as defined on the basis of socio-economic vulnerabilities. As expected, we found families with health problems or disabled members having much lower perceived health, compared to the reference household. On the other hand, we registered a better situation for those families at risk of poverty, singles or households with an elderly member. Individuals in large families and with children tend to have a reduced disadvantage, in terms of health.

Third, the existence of significant variations within European countries for different family profiles were also found. The family types we identified present differences in health status. The most obvious element is the high heterogeneity of these differences. Each country has its own specificity and it is thus difficult to recognize countries sharing identical situations. In these terms, it is very difficult to identify associations between health and familiar weaknesses with a European welfare typology. The high internal variation suggests that welfare regimes "are hardly ever pure types and are usually hybrid cases" (Arts & Gelissen, 2002, p. 738). Further, it is about models and as with all models, they are often a reduction of a more complex reality.

However, some countries show similarities and tendencies that can be more easily recognized and aggregated. Moreover, we used the welfare regime theory (Esping-Andersen, 1990) and its adjustments to set out at least some expectations about how institutional differences between countries may lead to differences in health status among familiar characteristics. In this respect, Scandinavian countries (and also the Netherlands) with their highly developed welfare state and social protections, are characterized by perceived better overall health. However, within these countries, the most vulnerable family

types are those with a larger size, having children and members suffering health problems. On the contrary, other types such as singles, families with an elderly member or with no working member (excluded retired people), seem to fare better when compared to the household of reference. For this reason, we argue that the socio-democratic welfare regime, due to the presence of numerous and specific social policies addressing particular social risks such as unemployment and old age, can improve difficult socio-economic situations.

In addition, compared to other models, it presents a set of social policies which are more oriented towards the individual. However, socio-democratic welfare regimes' action on health problems (presence of diseases and functional limitations) seems less efficient than the "liberal" welfare regime (United Kingdom and Ireland). In fact, countries with market-oriented social protection are characterized by overall good levels of perceived health. From this perspective, the most exposed families are those with children, disabled members and single parent households. People living alone are in a (relatively) good position, as are medium-size families with health problems and/or elderly members (with pensions). Following the literature (Esping-Andersen, 1990; Pestieau, 2006), in the countries belonging to this welfare regime, individuals should generally rely on the labor market for socio-economic security and are provided with less generous services (Christopher, 2003; Raiq, Bernard, & Van den Berg, 2011; Smeeding, 2006). Therefore, we might find a scarce response in terms of policies to the changes concerning familial structures, as is the case with single parent households. "When women are the primary earners, such as the case of single mothers, their employment opportunities may suffer in an environment that deprioritizes women's employment" (Misra, Buding, & Moller, 2006, p. 6).

It should be noted that in general those countries with a more developed welfare state seem to show better health for singles, with respect to other families and other countries (*ceteris paribus* gender, age and education). This could be interpreted as a symptom of the "individualization" of welfare intervention in modern societies. In fact, in the most advanced welfare regimes, social protection is addressed to specific targets (individuals) and to their particular conditions. This

process seems to encourage the so called “de-familiarization” which is a challenge in particular for the most traditional welfare regimes (Paci, 2007; Rosanvallon, 1997).

Italy, Spain and France do not show any particular specificity, registering a substantially average perceived health among vulnerability profiles. However, we highlight a slight advantage for families with health problems in Italy and Spain, where social policies are still focused on the family as the most important unit. At the same time, an advantage can be observed for households having a disabled member in Italy and France. This may be due to the presence of social policies, such as invalidity pensions, which are generally guaranteed to families having this problem, while a minor disadvantage is associated with bad housing conditions.

In Central and Eastern countries, poor households, singles and families experiencing employment problems seem to be particularly disadvantaged. We could therefore hypothesize that social protection in these countries is very much dependent on informal care at the household level. This is in part also true in the case of Southern European Countries (Italy, Spain) where healthcare performs quite well. For this reason, in Central Europe young or large families (where mechanisms of mutual support and solidarity might be possible) seem to be safer from social risks compared to others experiencing, for instance, unemployment.

To conclude, through this work we have presented a comparative study of European countries on the relationship between individual health status (measured through perceived health) and household-related socio-economic vulnerabilities. We have argued that, in general, the ranking of perceived health among countries has a significant association with life expectancy and that it is essentially associated to macro-economic variability. We have also noticed how the profile of socio-economic familiar vulnerability (people living alone, in poverty, in the presence of a disabled or elderly member, in an unstable working position, etc.) shapes the health status of individuals across Europe and shows significant differences among countries.

In order to do this, we have described how these differences are connected to various country clusters. In the end, we observed how these differences in the responses of European



households (in terms of health status) to socio-economic vulnerabilities could be somehow associated to different models of social protection, carried out by the three main actors: the market, the state and the family.

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