Social Capital and Health Relationship: What is the Evidence in MENA Countries?

Moheddine Younsi
Assistant of Economics at Higher Institute of Business Administration,
University of Gafsa, Tunisia.
younsimoheddine@gmail.com

Mohamed Chakroun
Associate professor of Economics at Saudi Electronic University,
Riyadh, Arabie saoudite.
chahroun.mohamed2000@gmail.com

Abstract:
This study investigates the influence of social capital on health by using simultaneous equation transversal data models for 14 MENA countries over the period 2012-2014. The results indicate a positive and proper causal effect of social capital on health confirming the circular and positive relationship between the two variables. These findings confirm that a higher educational attainment level and higher income seems to be an important determinant of trust and social participation that positively influence health at the individual and community levels. In addition, education and higher income levels would lead to healthier lifestyles and greater use of preventive services that policymakers might consider to targeting deprived groups to improve their health.

Key words: Social capital, Health status, Qualitative method, MENA.

JEL classification: D63, I12, I19, I31.

1. Introduction

The notion of social capital and related concepts apply to many disciplines, including health. Definitions vary, the theory is the subject of debate and measurement techniques are not harmonized. Researchers wonder especially if social capital is a relevant concept on an individual or collective level (Cobb, 1976; Lynch, 1977; Brown & Harris, 1978; Berkman & Syme, 1979; Coleman, 1988; Putnam, 1993). However, theorists agree perhaps more on this point that one would think at first glance.

To illustrate this observation, a second distinction is useful: the answer might depend on the meaning of the question. Is it to know where is located the social capital (is it an attribute of individuals or relationships?) or how it is measured and how it can be accessed? Most theories of social capital retain the idea that it is an attribute of the individual relationships within societies rather than an attribute of individuals themselves (Islam et al., 2006; Poortinga, 2006a; Folland, 2007; Kawachi, Subramanian & Kim, 2008). Within the problem that continues to divide the theorists we find the following question: Is social capital a resource that an individual can raise (consciously or unconsciously) in which case the individual would be nice its legitimate scale?

While referring to Coleman (1988), Putnam (1993) and Fukuyama (1995), the central idea of the theory of social capital is that social networks have value. Social capital is an aspect that covers all aspects of social life - networks, norms and relationships – is allowing people to act together, to create synergies and to forge partnerships. Social capital is the glue that binds communities, organizations, businesses and various social and ethical groups (Coleman, 1988; Putnam, 1993). These authors define social capital as "*networks together with shared norms, values and understandings that facilitate cooperation within or among groups.*"

Social relationships support the rules of social life by producing social capital that benefits individuals but also to the community (Coleman, 1988, Putnam, 2000). Social capital can therefore be simultaneously a "*private good*" and a "*public good*". Social networks based on mutual obligations, they are not simply contacts (Fukuyama, 1995; Ghos & Ray, 1996; Kranton, 1996; Kawachi et al., 2000). They produce a specific reciprocity and, above all, a general reciprocity. The measurement of social capital is problematic. Most of the measures are focused on the interpersonal trust and levels of engagement or interaction in social activities (La Porta et al., 1997; Alesina & LaFerrara, 2002; Poortinga, 2006b; Folland, 2007; d'Hombres et al., 2010).

Putnam (1996) defines social capital as "*features of social life - networks, norms, and trust - that enable participants to act together more effectively to pursue shared objectives*", with both individual and collective aspects. Putnam argues that trust (interpersonal or institutional) can be seen a proxy of social capital. Therefore, variation in levels of interpersonal trust or trust in the institutions may well reflect differences in levels of social capital.

To access the private benefits of social capital, an individual needs to be integrated into a network and maintain direct relationships with other network members. But public effects of social capital are felt for all community members, regardless of their personal relationships with others. This concept of social capital likening it to be a "*public good*" is shared by several authors, who see social capital as a characteristic of ecological order, it is possible to measure correctly at the collective level (Berkman & Syme, 1979; Kawachi & Berkman, 2000; Cannuscio *et al.*, 2003; Mc Kenzie, Whitley & Weich, 2002). These authors suggest that social capital is inherent in the structure of social relations, in other words, it is an ecological feature, which should be seen as an attribute of the collective (neighborhood, community, society) to which a individual belongs.

In addition, to the benefits derived from membership in a network, the social capital has positive social control. However, it can also have negative aspects: limiting the opportunities for non-members of the network, making excessive demands for group members, restrict individual freedoms and strengthen criminal behavior where such behavior defined the group (in the field of health, a tenuous friendship network can reduce the risk of suicide but also increase the risk of smoking, alcohol or illicit drug use). As written Hawe & Shiell (2000), "*Social capital is not one thing*." It is necessary to distinguish the sources of its consequences. It can have both negative and positive effects on individual health.

This study contributes to the debate from an empirical perspective by investigating the influence of social capital on health status for 14 MENA countries over the period 2012-2014.

This article is distributed as follows. Section 2 presents the relevant review of literature on the subject topic under the study. Section 3 discusses the empirical methodology used. Section 4 discusses data description and interprets the empirical results. Section 5 concludes by summarizing the main results.

2. Literature review

The concept of social capital is used for the first time by Pierre Bourdieu in the 1980s to refer to one of the types of resources available to individuals and social groups. They mobilize according to his analysis, three types of resources, to increase or maintain their position within the social hierarchy and receive material and symbolic privileges attached there to: economic capital, cultural capital and social capital. The latter includes relationships and support networks that can be mobilized in socially useful purposes. In this context, "social capital" appears as the property of the individual and a group, both stock and basis for a process of accumulation that will allow individuals well equipped with initially better lie in social competition.

Social capital has led to multiple definitions and conceptualizations. Several researchers consider trust as a result of the social capital, while others see it rather as a prerequisite (Ghosh & Ray, 1996; Kranton, 1996; Scheffer, Brown & Rice, 2007; Olsen & Dahl, 2007). These divergent views depend on the distinctions made between interpersonal trust and trust in the institutions.

Pierre Bourdieu (1980) defines social capital as "*the set of actual or potential resources related to possession of a durable network of more or less institutionalized relationships*." This definition reflects the idea that social capital is a resource that can be accessed and that can be measured at the individual level.

Bourdieu (1986) goes further and considers that "*the volume of social capital held by a given agent depends on the size of the network of relationships that can effectively mobilize and on the volume of capital (economic, cultural or symbolic) held by each of its relations*". This definition also corroborates the idea that social capital is an attribute of the relations within the network: if individuals are not connected to each other, there is no social capital.

Following, Coleman (1988) focused on the role of social capital in the creation of human capital. He defines social capital as its functions: "*social capital is not a single entity, but a variety of different entities having two characteristics in common: they all consist of some aspect of social structures, and they facilitate certain actions of individuals who are within the structures. Like other forms of capital, social capital is productive, making possible the achievement of certain ends that would not be attainable in its absence*." Despite the vagueness of this definition and the lack of distinction between the mechanisms generating social capital and the consequences of its possession. The merit of Coleman (1988) is to have

introduced the concept in American sociology emphasizing its role in the acquisition of human capital.

For Putnam (1993), social capital refers to "*features of social organization, such as trust, norms, and networks that can improve the efficiency of society by facilitating coordinated actions*." Vision of the trust that maintains Putnam is centered on the company as it seeks to understand how social interactions generate interpersonal trust.

Referring to Coleman (1988) and Putnam (1993), many theoretical analyzes have been published as a result of the pioneering work, they generally tend to develop the differences in definitions. Portes (1998) notes that a consensus is emerging literature: "*social capital stands for the ability of actors to secure benefits by virtue of membership in social networks or other social structures*." This definition distinguishes a relational element: social organization to which the individual belongs and a material element: resources claimed by the individual due to his membership to this social organization (Hawe and Shiell, 2000). The relationship is based on trust and reciprocity and generates a system of expectations and obligations.

Descriptions of the qualitative nature of social capital mainly operate a distinction between two kinds of interactions: those that "*bonding*" and those that "*bridging*" (Putnam, 2001; Szreter & Woolcock, 2004). The bonding social capital refers to links between groups whose members share common characteristics. These groups can, for example, be defined on the basis of social identity or ethnicity, and whatever that may strengthen linkages, this can also result in the division and isolation excluding others groups. The bridging social capital refers to social links that make connections between various groups and therefore serve to cement the community. Szreter & Woolcock (2004) find a third qualitative category: a linking social capital, they explained the vertical relationships fostered between agents / groups at different degrees of the scale of social power.

Other concepts related to social interactions and the manner in which the latter can be associated with the health of communities and individuals, and are thus useful for understanding of social capital are support, networks and cohesion. Social networks and social support are generally considered to be located and measured resources at the individual level (Kawachi & Berkman, 2000; Berkman & Glass, 2000; Mc Kenzie, Whitley & Weich, 2002; Mellor & Milyo, 2005). The concepts mentioned in the discussions on social networks are multiple, we can cite the social support (i.e. relationships with family and friends who can bring to the individual emotional support and practical assistance), social

engagement (i.e. relationships with family and friends, participation in group activities and role in the community), and access to material resources (Berkman & Glass, 2000).

Although the various concepts mentioned above may at first sight appear distinct and easily compartmentalized, it might be better to design social interactions and their health implications as a continuum. This is even true that several authors and theorists sometimes use the same term to refer to concepts or to different but related terms. Thus, the idea of social engagement, measured by participation in a frame in group activities of "*social networks*", i.e. at the level of the individual (Berkman & Glass, 2000) encroaches on the concept of social capital to Bourdieu (1980), which can be accessed and can be measured both at the individual and the community level, as well as the designs of Putnam (1996) and Kawachi et al. (2000), who consider social capital in ecological terms, how they approach what others call "*social cohesion*". Consequently, analyzes of Bourdieu (1980) and Putnam (1993), who see social capital as a relevant resource capital both at individual and collective level, can bring the concepts of social network at the individual level and the collective theories of social capital. Several authors even suggest that this variable use of terminology is an asset because it allows authors to adapt the concepts in the debates in their specific field (Berkman & Glass, 2000; Osberg, 2003). Nevertheless, it stresses the need for a clear definition of the terms in the discussion of these concepts.

The most important distinction between the multiple forms of social links creating social capital is that which differentiates between "*open*" and "*closed*" links. The links between people moving in different circles are more useful than the strong links that connect to their relatives. A strong links are good for recharge and comfort. Weak links are good for advance and evolve. The bonding social capital acts as a "*glue*" sociological, the linking capital acts as a "*lubricant*" sociological (Bourdieu, 1986; Portes, 1998; Berkman & Glass, 2000).

3. Econometric issues

3.1. Models specifications

To examine the relationship between social capital and health in MENA counties, we use the following tree equations:

$$H = \alpha_0 + \alpha_1 S^* + \alpha_2 \bar{S}^* + \delta_1 X + \varepsilon \quad (1)$$

$$S = S^* + (1- \lambda) (\bar{S} - S^*) + \gamma H + \theta \quad (2)$$

$$S^* = \beta H + \delta_2 Z + \omega \quad (3)$$

Eq. (1) states that the individual health (H) can be depended on the true individual social capital (S^*) and the true communitarian one ($\overline{S}^*$) as well as the exogenous variables (X) such as gender, age, marital status, education level, household income level, religion and occupational status, we assume that the error terms are independent. Eq. (2) states that the self-reported individual social capital (S) can be depended on the true individual social capital (S^*), the average social capital in the community ($\overline{S}$) and the level of individual health. Eq. (3) states that the average true social capital (S*) can be depended on the level of individual health (H) and other variables of controls (Z).

By introducing the individual health status in Eq. (3), we argue that the relationship between health and social capital is circular. In fact, the dynamics of interaction with other people are produced by the health status of the individual interviewed. The most striking case is reported by mental health, but also physical one plays a crucial role in determining the individual trust.

Given the average of Eq. (2) and substituting it back into (2), we can obtain the specification as follows:

$$S = \lambda S^* + (1-\lambda)\overline{S}^* + \left[\frac{(1-\lambda)\gamma}{\lambda}\overline{H} + \frac{(1-\lambda)\overline{\theta}}{\lambda} + \gamma H + \theta\right] = \lambda S^* + (1-\lambda)\overline{S}^* + \Omega \qquad (4)$$

From Eq. (4), we can express both S^* and $\overline{S}$, which we substitute in Eq. (1), and we obtain the following form:

$$H = \alpha_0 + \alpha_1 \frac{S - (1-\lambda)\overline{S} - \Omega}{\lambda} + \alpha_2 \frac{S - \lambda S^* - \Omega}{1-\lambda} + \delta_1 X + \varepsilon \qquad (5)$$

Eq. (5) is a function of the reported average social capital $\overline{S}$ and individual reported social capital *S*, solving for *H*, the edited form can be written as follows:

$$H = \frac{\alpha_0}{\left(1-\frac{\alpha_1}{\lambda}\gamma\right)} + \frac{\frac{\alpha_1}{\lambda}}{\left(1-\frac{\alpha_1}{\lambda}\gamma\right)} S + \frac{\left(\alpha_2 - \frac{\alpha_1(1-\lambda)}{\lambda}\right)}{\left(1-\frac{\alpha_1}{\lambda}\gamma\right)}\overline{S} + \frac{\alpha_2\gamma}{\left(1-\frac{\alpha_1}{\lambda}\gamma\right)} H - \frac{\alpha_2\frac{\theta}{\lambda}}{\left(1-\frac{\alpha_1}{\lambda}\gamma\right)} + \frac{\delta_1 X}{\left(1-\frac{\alpha_1}{\lambda}\gamma\right)} - \frac{\frac{\alpha_1}{\lambda}\theta}{\left(1-\frac{\alpha_1}{\lambda}\gamma\right)} + \varepsilon$$

We note δ the quantity $\left(\frac{1}{\left(1-\frac{\alpha_1}{\lambda}\gamma\right)}\right)$, we then obtain the edited form as follows:

$$H = \omega\alpha_0 + \omega\frac{\alpha_1}{\lambda}S + \omega\left(\alpha_2 - \frac{\alpha_1(1-\lambda)}{\lambda}\right)\overline{S} + \omega\left(\alpha_2\frac{\gamma}{\lambda}\right)H + \omega\,\alpha_2\frac{\theta}{\lambda} + \omega\,\delta_1 X + \delta\frac{\alpha_1}{\lambda}\theta + \varepsilon \qquad (6)$$

We then substitute Eq. (3) in Eq. (2), we obtain the reduced form as follows:

$$S = \lambda\left(\beta + \frac{\gamma}{\lambda}\right)H + \lambda\,\delta_2 Z + (1-\lambda)\overline{S} + \lambda\,\mu + \theta \qquad (7)$$

After taking λ into Eq. (6), we can determined the structural parameters α_0, α_1, α_2, and $\frac{\gamma}{\lambda}$.

Following Stern (1989), to estimate the simultaneous equations (6) and (7), we use two-step procedure to solve the endogeneity problem. In the first stage, we transform the reduced form of Eq. (6) and Eq. (7) in the two equations defined as follows:

$$H^* = X\,\Psi_h + u_h \quad (8)$$

$$S^* = X\,\Psi_s + u_s \quad (9)$$

Where X is the exogenous variables defined in Eq. (6) and Eq. (7). We estimate the reduced form coefficients of Eq. (8) and Eq. (9) using probit prototype equation by equation. After the estimation of the first stage, the predicted values H^* and S^* will constructed in the second stage by using the estimated coefficients of the first stage, that is, Ψ_h and Ψ_s and substituting them into Eq. (6) and Eq. (7).

3.2. Regional and time dummies

This study uses three sets of controls (i) individual variables (i.e. gender, age, marital status), (ii) parental characteristics (i.e. place of birth of the parents, level of education of fathers and mothers, occupational status, household income, religion), and (iii) regional characteristics length (i.e. GDP per capita, hospital beds per 1,000 people, health workers per 100,000 inhabitants, burglary victims).

In addition, in our setting three variables are considered endogenous; the self-reported health status, the individual social capital and the communitarian one, since one of its determinant, θ enters in the health equation (Eq. (6)). In order to solve the endogenity problem, we have to find proper instruments. Given the multiple endogenous variables in this case, all instruments must fulfill two conditions: the relevance (i.e. the instrumental relevance must be correlated with the endogenous variables) and exogeneity (i.e. the instrumental exogeneity must affect individual health only via the instrumental variables).

In accordance with considerable numbers of empirical studies (e.g. Alesina & La Ferrara, 2002; La Porta et al., 1999; Easterly & Levine, 1997), we propose, in this study, as a determinant of trust not correlated with health, an exogenous negative shock the individual experienced: being a victim of a burglary. Having been a victim of a burglary is certainly related to the degree of trust in other people, a similar shock is likely to induce a widespread feeling of fear and distrusts against people outside a relatively narrow circle of close friends and relatives (Subramanian, Kim & Kawachi, 2002; Buonanno, Montolio & Vanin, 2009). Moreover, it is expected that the risk of burglary can be increased with the population's characteristics like age, gender, lower household income and with the crime intensity in the region of residence (Mohan et al., 2005; Rocco & Suhrcke, 2012). In this case, we require to introduce these variables among individual and regional controls so what we can claim that the instrument for individual social capital has no independent effects on health status.

As discussed above, we instrument the average trust in the region using a transformation of the previous instrument, that is, the percentage of people in the region who have been victim of a crime. Since one of the regressions is the average of another one, the coefficient of the aggregate variable can be positive even if such a variable does not have an independent power in determining the dependent one (Acemoglu & Angrist, 2000).

In order to have consistent estimates, we need to use the IV strategy that treats both regressors as endogenous and the instruments for the two regressors should generate the same coefficient when only one variable is considered endogenous. Our instruments meet such a condition for the self-reported individual health: the instruments we consider are the number of hospital beds in the area in which the individual lives and the number of health workers. There is evidence that the supply of health care does have a positive and significant impact on the individual health, but we keep out the possibility that health care infrastructure directly affects individual social capital (d'Hombres et al., 2010; Rocco & Suhrcke, 2012).

4. Results and discussion

4.1. Data and descriptive statistics

The data used in this study are taken from the World Values Survey (WVS) 2012-2014 (http://www.worldvaluessurvey.org) for 14 MENA countries namely; Algeria, Bahrain, Egypt, Iran, Jordan, Kuwait, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, and Turkey. The frequency of observation by country is presented in Table 1. Overall, 53,742 individuals were studied (33,582 male and 20,160 female). Individuals reported information on socio-demographic variables such as gender, age, marital status, religion, education, household income and occupational status.

Table 1. Frequency of observation by country

Country	Frequency	Percent	Cumulative
Algeria	4 268	7.942	7.942
Bahrain	3 105	5.778	13.720
Egypt	4 378	8.146	21.866
Iran	3 872	7.205	29.071
Jordan	4 251	7.910	36.981
Kuwait	3 375	6.280	43.261
Morocco	4 267	7.940	51.201
Oman	3 254	6.055	57.256
Qatar	3 539	6.585	63.841
Saudi Arabia	5 031	9.361	73.202

Sudan	2 565	4.773	77.975
Syria	2 998	5.578	83.553
Tunisia	4 575	8.513	92.066
Turkey	4 264	7.934	100.00
Total	53 742	100.00	

Source: data processed by authors using WVS (2014).

The descriptive statistics of the different indicators of health and social capital are given below in Table 2. The participants were mostly male with an average percentage of 60.5%. The mean age and formal education of the respondents were 42.50 and 13.46 years, respectively. The mother's education and the father's education levels declared were 3.35 and 5.42, respectively. The mother's employed and father's employed declared were 0.45 and 0.85, respectively.

The social networks, participation and trust on health appeared important ways through which the people's health status can be enhanced. We raise the *question* of whether the relationship between health and social capital can reflected reverse causal impact or there are other relevant factors that are also expected to affect social capital and health.

Table 2. Descriptive statistics of the different indicators of health and social capital

Variables	Description	Mean	Std.dev	Min	Max
Health	Indicator of self-reported health of respondents, value 1 means bad perceived health and value 5 means good perceived health	2.96	0.68	1.00	5.00
Trust	Interpersonal trust	-0.42	1.85	-5.00	5.00
Male	Indicator taking value 1 if the respondent is male and zero if the respondent is female	0.38	0.26	0.00	1.00
Age	Age in years	42.50	13.56	18.00	85.00
Age squared	Age squared	1806.25	1013.48	214	5932
Mother birth	Birthplace of respondent's mother	0.58	0.21	0.00	1.00
Father birth	Birthplace of respondent's father	0.74	0.33	0.00	1.00
Married	Marital status	0.65	0.10	0.00	1.00
Education level	Education level declared (in years)	13.46	5.15	4.00	20.00
Mother education	Mother's education level declared	3.35	0.34	5.00	10.00
Father education	Father's education level declared	5.42	0.88	6.00	15.00
Mother employed	Mother's employed declared	0.45	0.22	0.00	1.00
Father employed	Father's employed declared	0.85	0.14	0.00	1.00
Household income	Household income declared	7.63	1.32	3.00	15.00
GDP per capita	GDP per capita at regional level	11.54	1.97	4.95	25.76
Hospital beds	Hospital beds per 1,000 people at regional level	1.53	1.19	1.04	2.39
Health workers	Health workers per 100,000 residents	134.75	101.42	85.34	228.54

Mental health	Indicator of mental health of respondents, value 1 means bad mental health and value 5 means good mental health	3.24	0.15	2.22	5.00
Crime victim	Burglary victims during the five years period	0.17	0.08	0.00	1.00
Religious	Self-reported rate of religiosity	1.96	0.62	0.00	5.00

Notes: Regional dummies are Algeria, Bahrain, Egypt, Iran, Jordan, Kuwait, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, and Turkey.
Source: Authors' estimations.

4.2. Regression results and discussions

Table 3 reports the results of significance of the structural parameters of equations Eqs. (1-3). The estimated parameters of Eq. (1) as shown in first column ($\alpha_1 = 0.415$, $\alpha_2 = 0.038$) have both positive sign, but these parameters differ in magnitude and significance. In fact, individual trust has a positive and significant effect on health at the 1% level, and this effect is larger than the impact of communitarian social capital, which is small and not significant. Eq. (2), which describes the true and reported social capital relationship, gives some interesting insights. However, the estimations reveal the existence of some level of misreporting of the value of social capital. These results indicate that the individuals adjust the reported level of social capital according to the difference between individual trust and the average trust in their region. Specifically, if the average trust is greater than the individual one, people would report a value which is greater than the true one.

Furthermore, in Eq. (2), the estimation of parameter γ indicates that health can play a significant role in the misreporting of social capital. In fact, the negative sign (-2.205) of γ indicates that people in good health tend to declare a worth of individual social capital lower than the true latent value. In addition, the negative sign of γ may give misleading results and leads to underestimating the impact of health on the true social capital. This result is not surprising considering the nature of the measure of social capital we are considering. A justification of this is that people in good health are less dependent on other people's help, they underestimate the level of trust that they have. The negative sign of γ suggests also that the weakness to consider misreporting in social capital gives misleading results, that is, the impact of health on the true social capital is underestimated. In Eq. (3), the estimation of parameter β indicates that social capital has a positive and proper causal impact on health status confirming the circular and positive relationship between the two later variables.

Table 3. Significance of structural parameters of Eqs. (1-3)

Parameters	Coefficient	Std.dev.	t-Statistics	p-Value
α_1	0.415***	0.047	5.22	0.000

α_2	0.038	0.011	1.47	0.142
λ	0.796***	0.005	67.41	0.000
γ	-2.205**	1.422	-4.53	0.051
β	1.995**	0.936	3.77	0.033

Source: Authors' estimations.
, * indicate significance at 5%, and 1%.

Our empirical results confirm the evidence that social capital promotes people's health. It is worth noticing that we cannot compare the results in tables and with ones contained in other studies given that they are just the coefficients con the reduced form equations such that they do not have any causal interpretation and they just reflect the amount of social capital and health in equilibrium. However, the first stage regression for Eqs. (1-3) as shown below in Table 4 can give us an assessment of our strategy and the validity of our exclusion restrictions. We believe that our model is identified given that one of our instrumental exogenous variables '*the average health in the region*' is in fact significant and with the expected sign in the first stage. In addition, our instrument for the individual social capital, whether the respondent has been victim of a crime, is relevant.

Table 4. Regression results for Eqs. (1-3)

	Health		Ind. Social Capital		Comm. Social Capital	
Variables	Coefficient	t-Statistics	Coefficient	t-Statistics	Coefficient	t-Statistics
Age	-0.054***	-5.835	-0.008***	-7.254	-0.003	-2.275
Age squared	0.000***	4.367	0.000***	5.368	0.000	2.542
Male	0.069***	7.622	0.052***	5.972	-0.005	-9.361
Religious	-0.005**	-2.196	0.023***	3.572	0.001	1.085
Married	0.094***	7.581	0.025**	3.665	0.006	2.580
Education level	0.042***	7.315	0.035***	6.842	-0.003	-0.113
Mother's education	0.031**	2.472	0.098**	3.165	0.014**	1.293
Father's education	0.010**	1.264	0.017**	1.288	0.075**	4.753
Mother's employed	0.051***	2.183	0.063***	2.246	0.036**	1.205
Father's employed	0.022***	5.249	0.026***	6.359	0.012**	1.382
GDP per capita	0.075**	3.012	-0.000	-2.663	-0.000	-0.495
Crime victim	-0.166***	-9.553	-0.112***	-7.451	0.005	1.442

Hospital beds	0.001	0.742	0.004*	1.369	0.015***	5.581
Hospital workers	0.002	1.558	0.005**	2.473	0.008***	4.763
Average health	0.261***	8.462	-0.048	-1.762	0.455***	6.955
Household controls	Yes		Yes		Yes	
Individual controls	Yes		Yes		Yes	
Parental controls	Yes		Yes		Yes	
Regional dummies	Yes		Yes		Yes	
Observations	53 742		53 742		53 742	

Source: Authors' estimations.
*, **, *** indicate significance at 10%, 5%, and 1%.

By comparison with the regression results in the first stage, the results reported in the second stage, as shown below in Table 5, confirm the strong evidence obtained in the first stage that communitarian social capital affected health in a further shaded way once compared with the individual one. The results suggest that in societies with a higher social capital the marginal effect of individual social capital on health can be increases individual trust and therefore increase the probability of being in good health. Moreover, the negative sign of coefficient associated with the interaction between the size of community and the instrument indicates that in smaller communities trust has a significant impact on individual health than in larger communities and organizations given that cooperation is more likely to be achieved over time, yielding therefore to considerable benefits. However, trust between individuals and cooperation may allow setting up informal institutions based on reciprocity, even among extended families rather than only between individuals, which can bring more positive support and higher opportunities of repeated interactions.

Table 5. Regression results for Eqs. (8-9)

	Social Capital		Health	
Variables	Coefficient	t-Statistics	Coefficient	t-Statistics
Ind. Health (*predicted value*)	-0.264*	-2.228		
Ind. Social Capital (*predicted value*)			1.673***	9.356
Community Social Capital	0.045***	2.951	0.042	1.378
Age	0.022***	3.592	-0.038***	-7.958
Age squared	0.000***	3.547	0.000***	4.673
Male	0.064***	6.262	0.007	0.925
Religious	0.019***	7.885	0.030***	6.959
Married	0.065***	4.336	0.078***	5.643
Education level	0.043***	7.693	0.009*	2.560
Mother's education	0.036**	3.155	0.024**	2.541
Father's education	0.058**	3.147	0.051**	2.983
Mother's employed	0.016*	2.862	0.012*	2.449
Father's employed	0.041***	4.663	0.035***	4.935
GDP per capita	-0.000	-0.452	0.000	0.658
Crime victim	-0.136***	-5.933		
Hospital beds			-0.003	-1.972
Hospital workers			-0.005*	-2.245
Average health			0.248***	5.963
Household controls	Yes		Yes	
Individual controls	Yes		Yes	
Parental controls	Yes		Yes	
Regional dummies	Yes		Yes	
Observations	53 742		53 742	

Source: Authors' estimations.
*, **, *** indicate significance at 10%, 5%, and 1%.

These results correspond to the justification of the relative deprivation assumption as proposed in the sociological literature: the deleterious effect of social capital on health is inversely related to the social and economic conditions of neighborhoods or region of residence (Kawachi et al., 2000; Lochner et al., 2003; Mellor & Milyo, 2005). In large cities, social activities are carpeted to be more developed implying that the expected average level of social capital is higher, and the perception of social capital and its negative effect on health is less accentuated (Wilkinson, 1996; La Porta et al., 1997; Berkman & Glass, 2000).

The empirical results confirm that a higher educational attainment level and higher income seems to be an important determinant of trust and social participation that positively influence health at the individual and community levels. In addition, education level and higher income level would lead to healthier lifestyles and greater use of preventive services that policy-makers might consider to targeting deprived groups to improve their health.

These findings correspond to the justification bias as proposed by Richard and Nicolas (2008) according to which social capital has a moderating effect on the relationship between socioeconomic status and health, leading to greater health improvements among the worse off, compared to the lower cultured and those living in poorer socioeconomic conditions. In addition, most studies hold in a cross-country perspective, suggest that communities with more social capital are *healthier life*, *happier*, live *longer* and *enjoy better mental health* than do their counterparts (Folland, 2007; D'Hombres et al., 2010; Rocco & Suhrcke, 2012).

Finally, we have recognized that community social capital changes the relationship of the individuals, individual social capital proved indispensable in producing reliable and sensitive results. In fact, this effect is very significant and sufficient to determine the negative impact of community social capital that is obtained in models 2 and 3, while community social capital plays no independent role.

5. Conclusions

The theoretical definition of social capital and its relevance for health is a seductive studies topic, but the discussion would be incomplete if we left out the wider considerations of public policy (McKenzie et al., 2002; Pearce & Davey Smith, 2003; Osberg, 2003). The potential negative aspects of social capital and social cohesion must be taken into account alongside the benefits identified (Portes, 1998).

Social capital is a key factor for the interventions that aimed to improve the quality of civic life and therefore improved health care. The corpus of evidence demonstrating correlations

between social capital and health in the general population and among older people is beginning to grow. Some fear that assigning a poor health to the weakness of social capital of a community can lead to "*blame the victims*" and reorient the political programs on interventions to enhance social capital, disregarding the impact on health of economic and social policies more ambitious (Pearce & Davey Smith, 2003 ; Szreter & Woolcock, 2004). Others fear that the promotion of social capital be raised only as a pretext to reduce investment in the development of the community (Baum, 1999; Muntaner, 2004).

It should therefore take into account the impact on economic and social policy of any research project seeking to establish a link between social capital and health. Given these concerns, it appears important to replace these problems in a broader context for the purposes of public policy and carefully review the existing data. As Putnam says: "*social capital is not a substitute for effective public policy but rather a prerequisite for it and, in part, a consequence of it*" (Putnam, 1993).

Finally, new research on social capital, health and functional status on elderly populations would clarify and elucidate these correlations. The consequences of perspective of public policy are therefore far from being obvious and studies of interventions to increase social capital are justified. In addition, it should be taken into account carefully the effects of broader public policy decisions on social capital.

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