CIVIC AGENCY: AN INVISIBLE HEALTH DETERMINANT

Jane Kabubo-Mariara and Irene van Staveren

August 2015

Table of Contents

Abstract

This paper extends a cross-country analysis of health determinants with a civil society variable. The reason is that next to government and households and the level of economic development, civil society agency is likely to play a role in health care as well. This role refers to community care, political pressure, and demands for accountability of health care providers. We use the ISD index of civic activism to measure the agency of civil society. The panel regression results for developing counties indicate that civic activism contributes to the reduction of child mortality and maternal mortality. The size effect is larger than that of almost all other variables, except those for health expenditures. This implies that in times of severe financial constraints, civic activism may be the relatively most feasible factor stimulating better health outcomes.

1. Introduction

This paper explores a health determinant that is hitherto underdeveloped in global health research: civic agency. We hypothesize that a more active civil society has a positive effect on health outcomes at the country level, next to health care expenditures, level of economic development, and the strength of formal institutions, as well as other control variables.

There is already a large literature on individual determinants of health, such as income, education and gender. But the literature on health determinants tends to ignore the role of civil society as a third domain next to public sector services and private health care consumption. There is some literature on social determinants of health, but that largely reduces the social dimension to aggregate data on education and health spending by governments, vaccination programs, or income levels and income inequalities (Hughes et al., 2011; Wilkinson and Pickett, 2009). The important conclusion from the research in that area is that public sector services are of key importance for health outcomes, and that inequality tends to reduce that effect.

Another line of research has analyzed the effect of social capital on health outcomes (see for a meta-study, Islam et. al, 2006). The results of those studies generally indicate that social capital is supportive of better health. But depending on how social capital is measured, results greatly vary in size and statistical significance (see for a discussion of this problem: Leo and Walt, 2000; Barten et. al, 2007). The mixed results in the research on social capital and health are not surprising given the critical debates about social capital in terms of its substance, reach, measurement, and impact on inequality and poverty reduction (van Staveren and Knorringa, 2008). In order to address the role of civic agency for better health outcomes, we use a cross-country panel data set in which we analyze both public sector and private contributions to health care as well as a clearly defined, broad index measuring the *agency* of civil society.

Our approach is innovative in three ways. First, we measure health outcomes with four distinct outcome measures: two mortality rates and two immunization rates. Second, we include a measure for the strength of civil society agency through an index for civic activism. This measures the agency of civil society in terms of being informed about politics and the

engagement of people with politics as well as a shared commitment to social values and community life. This civic activism measure is much broader than measures generally used in social capital studies, which often rely on subjective trust attitudes, membership of associations, or dominant social norms. The index for civic activism that we use combines both subjective and objective measures of civic participation and is taken from the online database Indices of Social Development, of the International Institute of Social Studies (IndSocDev). Third, we use cross-country panel data for developing countries for the period 1990-2010 with a full set of control variables and check for endogeneity effects.

2. Literature review and analytical framework

The empirical research on social capital and health outcomes tends to conclude that there is a positive relationship between social capital and health at the individual level, but that this is mediated negatively at the country and regional level by inequalities[1]. The meta-study by Islam et. al (2006), covering 42 studies from mostly OECD countries, finds a clear positive association between social capital and better health, but less so in more egalitarian countries.

Many studies use self-reported health measures as the dependent variable. Han, Kim and Lee (2012) found in a micro-level study done in Seoul a positive association between individual-level membership of associations and self-reported health, but not an effect of community-level participation. Sun, Rehnberg, and Meng (2009) found in an urban Chinese household survey a positive effect of trust attitudes and social relatedness attitudes on self-reported health, but only for the poor. Xue and Reed (2015) found in a panel analysis of a household social survey in China positive effects of trust and social relatedness on self-reported health but these effects were not statistically significant. It does not report a comparison between poor and non-poor groups. Vonneilich et. al (2011) found in a German study that self-reported health is not consistently related with social capital across different social-economic groups. A study on Norway by Gele and Harsløf (2010) reports that individuals indicate higher self-reported health

---

[1] See also a workshop on this relationship: http://lorenzorocco.jimdo.com/iv-workshop-social-capital-and-health/

when having more friends and being member of more associations. Alegria et al. (2007) found social cohesion to be positively related to self-rated physical and mental health among Latinos in the US. Kawachi et al. (1999) found low levels of social trust to be associated with poor self-rated health. Hyyppä and Mäki (2001) found a significant association between measures of social capital and self-reported health among Swedish and Finnish communities. Veenstra (2000) found participation in clubs and associations to be positively related to health among the elderly in Canada, but no significant effect of other components of social capital such as trust and civic participation on health.

Other studies use objective health indicators, of either access or outcomes, but use subjective measures of social capital. Hollard and Sene (2015) found in various countries in sub-Sahara Africa an effect of individual trust attitude on access to health facilities, using instrumental variable analysis, but did not go into the mechanisms of this association. Inoue et al. (2013) in a study of Japan found a positive correlation between individual perceptions of social cohesion and lower risk of all-cause mortality. A macro-level study by Knowles and Owen (2010) assesses the effect of attitudes on trust, control, and the social value of respect on life expectancy in a cross-country study. The authors focused on the role of formal versus informal institutions in contributing to life expectancy. The authors find that social capital is a stronger determinant of long-term health outcomes than governance variables. But their three measures of social capital, or informal institutions as they refer to them, are rather ad hoc and the mechanism through which they influence life expectancy is not well explained.

Finally, there are a few studies, which measure both social capital and health outcomes through objective measures. For example a micro-level study by Zachariah et. al (2007) on HIV-positive individuals in Malawi. The authors show that those individuals treated with antiretroviral medication have higher continuation rates and lower death rates when receiving community support, as compared to a control group receiving no community support.

What do we learn from these micro and macro level studies? A couple of things. First, a broader measure of social capital at the meso level, focusing on civil society rather than on individual attributes and attitudes, is likely to deliver more robust results than widely varying narrowly

measured indicators of social capital. Second, the measure should be such that the mechanism of how the strength of civil society contributes to better health outcomes is clear. This implies that the measure should be about the *agency* of civil society, rather than about its values or networks. Third, any empirical analysis should include sufficient control variables in order to measure the relative effect of civic agency as compared to effects of the public sector and of economic resources of households. Moreover, inclusion of both formal institutions (institutions of governance) and informal institutions (civic agency) will help to find out whether these two are complementary or substitutes in the production of health outcomes. This is important for policy purposes, because if the role of civic agency is complementary to governance, governments might want to strengthen both, whereas if they are substitutes, a positive effect of civic agency may merely reflect weak formal institutions rather than a factor of its own. Hu and Mendoza (2013) and UNDP (2013) both suggest in cross-country studies that good governance contributes to lower child mortality rates, and hence, that formal institutions are important. But it is unclear from the empirical literature what the relative contribution to health is of formal institutions (those of the state) and informal institutions (the role of civil society).

The three insights from the literature summarized above lead to an analytical framework for our study that follows up on Berkman et. al (2000) who have argued that health is influenced by what they label social integration. This puts the emphasis on the meso-level, away from individual social capital characteristics, precisely as suggested in our literature review. Our analytical framework helps to assess how objective measures of health at the country level are influenced. We use two health outcome measures (maternal mortality and child mortality) and two health process measures, which are effectively linked to lower morbidity rates, namely the immunization rates for DTP and measles. The key explanatory civil society variable is civic activism, emphasizing civic agency as a meso-level measure of social integration of a society. Other explanatory variables are public and private health spending, an index for democracy and a rule of law index to measure governance, doctors and clean water, and level of economic development and net official development assistance received. This analytical framework includes most likely all relevant types of variables: public sector, private sector, resources, public sector effectiveness, and civil society social integration.

3. Model specification

In our analysis, we extend a standard individualistic health production function to model health status at the cross-country level using panel data of developing counties. The health status of country 'i' at time 't' is specified as

$$H_{it} = f(EXP_{it}, GDP_{it}, ODA_{it}, DEMc_{it}, RLc_{it}, DOC_{it}, WAT_{it}, CA_{it}, \mu_{it})$$

Where H is an indicator of health status measured though under-five mortality rates (U5M), maternal mortality rates (MM), percentage of children immunized against DPT (IMDTP) and percentage of children immunized against measles (IMmeasles)[2]. $\mu_{it} = \pi_i + \varepsilon_{it}$; where π is the country specific effects, while ε is a random error term which captures unobservable factors that affect health status.

EXP is a vector of the expenditures: public health expenditure as a percentage of GDP (PUBLEX) and private health expenditure as a percentage of GDP (PRIVEX). Higher health care expenditure is expected to improve health status (Nixon and Ullman, 2006; Shaw et al., 2002; Berger and Messer, 2002; Or 2000a; Cremieux et al., 1999; Elola et al., 1995) and thus lower U5M and MM and increase the percentage of children receiving immunization against DPT and measles. Some studies have however found that increase in publicly financed health care expenditures may be associated with higher mortality rates (Berger and Messer, 2002), while other studies find little or insignificant effect of public spending on health (Thornton, 2002, Filmer and Pritchett, 1997). This may be due to inequality in access to public health care services or to the role of civil society.

GDP measures GDP per capita as an indicator of the level of economic development of a country and functions as a control variable, as is common in cross-country health regressions.

---

[2] Definition and measurement of the dependent variables are presented in Table A1, while independent variables are presented in Table A2.

ODA is official development assistance. Increased development assistance will lead to improved health status as far as the extra expenditure is spent on health and/or social welfare related needs.

DEM is a measure of the level of democracy, and RL is a measure of the rule of law. In the literature, democracy measured through freedom, political party affiliations and political policies has been found to be positively correlated with health status. Rule of law measures the extent to which countries protect their citizen's rights and safety (or at least those of the majority). Kelleher (2002) found political affiliation to be a sensitive predictor of health status. Navarro et al. (2003) analyzed the effect of political variables on among other health indicators infant mortality and life expectancy. They found that political parties were successful in improving infant mortality in OECD countries. Franco et al. (2004) found democracy, political rights and civil liberties to be associated with life expectancy, infant and maternal mortality. Besley and Kudamatsu (2006) in an analysis of the link between democracy and health found a strong correlation between health status (life expectancy) and democracy even after controlling for initial levels of human capital and political histories in a cross section of countries.

DOC is the doctor population ratio. It is hypothesized that availability of doctors will boost health status (Ramesh and Mirmirani, 2007; Nixon and Ullman, 2006; Or 2000b; Cremieux et al., 1999).

WAT is access to water. Many households in the developing world lack access to clean drinking water. The literature suggests that supply of clean water is critical to health as contaminated water contributes to outbreak of diseases (Gundry et al., 2003). Inadequate supply leads to unsanitary conditions, which may often lead to illness and death especially among children (Bartlett, 2003). Poor reliability of drinking water has also been found to increase the risk of infection from water borne pathogens (Hunter et al. 2009)

CA is the index of Civic Activism. It is the key explanatory variable in our analytical framework.

We estimate fixed effect models for determinants of the different health indicators controlling for various covariates. We control for country fixed effects because the countries may be heterogeneous in terms of covariates that affect health status and may thus bias the results if such effects are not controlled for (Joumard et al., 2008).

4. Data, sources and descriptive statistics

4.1   The data

This paper utilizes panel data for the period 1990-2010. The data are obtained from several sources. Civic Activism is sourced from the Indices of Social Development; indicators of health status are sourced from WHO, UNICEF, UNFPA and World Bank. Data on health related expenditures are sourced from World Health Organization National Health Account database. Other sources of data include World Development Indicators; Polity IV Project and the Overseas Development Assistance database (Tables A1 and A2). The empirical analysis is based on 54 low and middle income countries for which ISD data is consistently available. The countries are further broken down into regions (continents, namely Africa, Europe, Asia, Central and South America), as well as by income categorization following World Bank classification into low income, lower-middle-income and upper-middle-income countries (Tables A3 and A4).

4.2   Descriptive statistics

The descriptive statistics are presented in table 1. The data suggest relatively grim health status with under five mortality estimated at 79 out of 1000 live births and maternal mortality rates of more than 300 per 10,000. The data further suggests that on average 80% of all children are immunized against DPT and measles. The relatively high standard deviations and coefficients of variation for mortality rates suggest high dispersion in these health status indicators. The same is observed for ODA and doctors/patient ratio. The correlation matrix (table 2) suggests that there is very low correlation between our variable of interest, CA, and the two formal institutional variables, RL and DEM. Tables A1 and A2 in the annex describe the dependent and independent

variables and their sources. Table A3 in the annex shows all the indicators making up the Civic Activism index.

Table 1. Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Coef. of Variation	Min	Max
Under five mortality ratio	270	79.12	57.60	0.73	7.6	253.3
Maternal mortality ratio	270	342.09	335.46	0.98	7.0	1600
Children immunized DPT (%)	270	80.54	17.75	0.22	27	99
Children immunized measles (%)	270	80.21	17.69	0.22	33	99
Public health expenditures % GDP	270	2.66	1.41	0.53	0.27	8.02
Private health expenditures % GDP	270	2.99	1.29	0.43	0.55	10.69
GDP per capita (US dollar)	270	1430	1563	1.09	65	9133
Rule of law index	270	-0.57	0.50	-0.86	-2.23	0.77
Level of democracy index	253	2.23	5.95	2.67	-9.00	10.00
Access to water (%)	270	51.46	28.53	0.55	2.36	98.03
Net ODA received % GDP	269	42.64	60.48	1.42	-0.61	415.76
Doctor/population ratio	270	1.04	1.21	1.16	0.01	4.93
Civic activism index	270	0.46	0.06	0.13	0.13	0.60

Source: Authors' construction.

Table 2. Correlation matrix for the institutional indices

	RL	DEM	CA
Rule of law (RL)	1		
Level of democracy (DEM)	0.0567	1	
Civic activism (CA)	0.1088	0.1942	1

Source: Authors' construction.

5. Empirical Results and Discussion

We present the results of the effect of civic activism on health outcomes, controlling for other covariates. For the four measures of health, we estimate panel data models with country fixed effects to control for endogeneity. Before doing so, we first present the results for a baseline in which the level of economic development and public and private health care expenditures are the only independent variables. The results of the baseline models presented in table 3 indicate that all three independent variables have the expected signs in all four models and show statistically significant effects (except for GDP in the maternal mortality model). Comparing the parameter sizes, we find that the effect of one percent increase in health care expenditures is larger than the effect of 1000 dollar increase in GDP per capita. In other words, how income is spent is more important for health outcomes than the level of income in a country. The four models explain between 14% and 35% of the variation in health outcomes. Table 4 adds civic activism to each model, our key explanatory variable, but without full controls.

Table 3. Baseline model

Variables	U5M	MMR	IMDTP	IMmeasles
Public health expenditures % GDP	-14.4598***	-79.6567***	2.9470***	2.7097***
	[4.632]	[19.294]	[1.073]	[0.877]
Private health expenditures % GDP	-11.225***	-45.528***	3.636***	3.889***
	[3.114]	[14.645]	[1.341]	[0.884]
GDP per capita	-0.0063***	-0.0097	0.0012*	0.0017***
	[0.002]	[0.009]	[0.001]	[0.001]
Constant	160.169***	704.2053***	60.1301***	58.9323***
	[13.175]	[69.075]	[4.687]	[3.444]
Observations	270	270	270	270
R-square	0.35	0.266	0.138	0.173
No. of groups	54	54	54	54

Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1

Table 4. Baseline model plus civic activism

Variables	U5M	MM	IMDTP	IMmeasles
Public health expenditures % GDP	-12.98***	-72.08***	2.5440**	2.4272***
	[4.477]	[18.548]	[1.077]	[0.890]
Private health expenditures % GDP	-10.2874***	-40.7411***	3.3815**	3.7114***
	[3.147]	[14.967]	[1.422]	[0.957]
GDP per capita	-0.0047***	-0.0018	0.0008	0.0014**
	[0.002]	[0.008]	[0.001]	[0.001]
Civic activism	-174.08***	-888.54**	47.25**	33.13*
	[49.428]	[364.194]	[22.892]	[17.480]
Constant	231.3194***	1,067.3650***	40.8151**	45.3930**
	[25.898]	[174.233]	[10.503]	[7.734]
Observations	270	270	270	270
R-squared	0.415	0.333	0.17	0.19
No. of groups	54	54	54	54

Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1

The results of the expanded models presented in table 4 show that civic activism has the expected sign and is statistically significant in all four health models. Civic activism is negatively correlated with child mortality and maternal mortality and shows a positive correlation with the two immunization rates. The size effect of one standard deviation increase in civic activism on the two mortality rates is relatively similar to the size effect of one standard deviation increase in private health expenditures: ten less child deaths and 53 less maternal deaths. The size effect of public health expenditures on mortality rates is two to three times larger than the effect of civic activism or private health expenditures. The size effect of civic activism on immunization rates is similar up to 1.7 times less the size effect of private and public health expenditures. Interestingly, the correlation of GDP per capita has declined and is no longer statistically significant in two of the four models. The model fit has increased from the baseline model, with R^2 varying between 17% and 42%. Hence, civic activism seems to be not a

negligible factor in the generation of average country-level health outcomes. We will now present the full model with all covariates in table 5.

Table 5. Determinants of Health Status– Country Fixed Effects Full Model Results

VARIABLES	U5M	MM	IMDTP	IMmeasles
Public health expenditures % GDP	-10.5858**	-54.1440***	2.4138*	1.7655
	[4.659]	[12.353]	[1.361]	[1.165]
Private health expenditures % GDP	-7.9963**	-21.4146	2.1232*	2.4303***
	[3.099]	[15.711]	[1.194]	[0.873]
GDP per capita	-0.002	0.0117	-0.0011	-0.0001
	[0.002]	[0.012]	[0.001]	[0.001]
Rule of law	-16.2871	-117.0658*	3.6848	5.1587
	[14.363]	[68.911]	[6.122]	[5.494]
Level of democracy	-1.1509	-5.4336	-0.0291	-0.0461
	[0.745]	[4.872]	[0.293]	[0.315]
Water	-0.8429**	-5.6783*	0.4660**	0.4345**
	[0.387]	[3.012]	[0.221]	[0.203]
Net ODA received	0.1442*	0.2955	0.0045	0.006
	[0.074]	[0.293]	[0.028]	[0.020]
Doctor/population ratio	-6.0192	6.5976	5.6153*	3.2472
	[6.916]	[39.315]	[3.298]	[2.479]
Civic activism	-115.43**	-573.88*	32.66	15.59
	[47.885]	[337.438]	[23.778]	[18.775]
Constant	224.74***	1,010.74***	26.49*	38.60***
	[31.813]	[195.895]	[15.025]	[12.054]
Observations	252	252	252	252
R-squared	0.538	0.445	0.258	0.248
No. of groups	51	51	51	51

Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1

The results in table 5 show that public health expenditures is associated with lower under-five mortality rates and maternal mortality ratios. Public health expenditure further has a significant positive effect on the proportion of children immunized against DPT and measles, although the effect is not statistically significant in the case of DTP immunization. Higher public health

expenditures are likely to lead to improvements in health status through increasing access and availability of health care services. This is particularly important in Africa and in low-income countries where access to health care is still relatively low and immunization rates rather low. The results further show that higher private expenditure on health is associated with lower under-five mortality and lower maternal mortality, but not statistically significant in the case of maternal mortality. Higher private health expenditure has a positive effect on immunization against measles and DPT. Thus, as observed for public expenditure, private health expenditure will also boost health status through access to health care services and other channels such as better hygiene in the household.

The level of economic development (GDP) is no longer statistically significant. Also the level of democracy is no longer statistically significant, whereas rule of law only has a statistically significant effect on maternal mortality. ODA and doctor density each have a statistically significant effect in one of the four models, but for ODA not with the expected sign. In other words, the standard covariates become less influential or not influential at all when next to the state and the household sector civil society is taken into account.

The limited effect of doctor density (only in DTP immunization rates) is not surprising given the fact that in many countries (especially African and other low income countries) there are very few doctors and most health care services are provided by nurses. Indeed the data suggest that the doctor/population ratio in Africa and low income countries in general is zero compared to one (1) in Asia, Central and South America as well as in low-middle-income countries, two (2) in Upper-middle-income and three (3) in Europe/Eurasia.

Availability of water is included to capture the effect of local environment on health status. The results show that availability of water reduces both under five mortality rates and maternal mortality ratios. This results support studies that have found access to water to improve child mortality, more so in low income countries. Access to water has positive significant effects on immunization against DPT and measles. Access to water may lead to extra free time for mothers, providing them an opportunity to take their children for immunization. In poor countries, access to water is quite limited and women spend a lot of time fetching water for domestic use.

Finally, civic activism has a statistically significant negative effect on child mortality and maternal mortality, as in the earlier model. The size effect is a bit smaller than before. The size effect of access to safe drinking water is comparable to that of civic activism. When ten percent more people have access to clean water, child mortality declines with 8 children and maternal mortality declines with 57 deaths. As a comparison, ten percentage points more civic activism is associated with respectively 12 and 57 less child deaths and maternal deaths. Civic activism has a positive but no longer a statistically significant effect on immunization rates.

The explanatory power of the expanded models has increased substantively: R^2 now varies between 25% and 54% even though many health control variables are not statistically significant. To sum up, civic activism has a substantive negative effect on child mortality and maternal mortality, even when controlled for relevant covariates. When we compare the size effect with that of the covariates, we find that civic activism has a similar effect on mortality rates as access to safe drinking water and a stronger effect than GDP, ODA, rule of law, democracy and doctor density. Only public and private health expenditures have a larger effect on health outcomes.

Depending on whether we compare size effects in terms of standard deviations or percentage points, the difference in the size effect lies between twice and ten times as much effect of expenditures than of civic activism. But it is important to note that a substantive increase in public or private health expenditures as percentage of GDP is often difficult to realize politically, due to a wide variety of claims on the government budget and on household expenditures. This is even more difficult in times of low GDP per capita growth. It may therefore well be that in times of strong financial constraints health expenditures will not increase more than the level of economic growth, keeping the shares of GDP constant. In those circumstances, a stronger civil society may prove more effective in pressing for better health outcomes. This might be realized, for example, through public pressure for accountability of hospitals and doctors, or more efficiency in health care delivery with the same share of expenditures, or a better distribution of health care over the country so that those groups with the least access to health care will receive more and better services as before, with an immediate effect on average health outcomes of better health of the most health-care deprived.

6. Results for different levels of economic development

In this section, we show the results for the expanded model for three levels of incomes: low income countries, middle-income countries and high income countries. The reason for this disaggregation of the results is that we like to find out whether civic agency might be particularly helpful in poorer countries as compared to richer countries. Tables 6, 7, 8 and 9 show the results for each health outcome variable.

Table 6. Determinants of U5M by Income Classification of Countries

VARIABLES	Low Income Countries	Middle Income Countries	High Income Countries
Public health expenditures % GDP	-13.1355**	-3.217	5.177
	[5.736]	[2.516]	[5.840]
Private health expenditures % GDP	-13.5767**	-4.2252*	0.6575
	[5.180]	[2.153]	[3.762]
GDP per capita	-0.0143	-0.0051***	-0.0034
	[0.016]	[0.002]	[0.002]
Rule of law	-21.6187	10.3631	10.0505
	[20.791]	[8.286]	[14.527]
Level of democracy	0.0611	-1.6389***	-3.0747***
	[1.411]	[0.606]	[0.927]
Water	-0.96	-0.4676**	-0.9343***
	[0.987]	[0.223]	[0.307]
Net ODA received	0.0907	0.1656***	-0.6097
	[0.086]	[0.044]	[0.457]
Doctor/population ratio	-8.4688	-3.7911	-19.5726**
	[127.775]	[5.162]	[7.105]
Civic activism	-321.0875**	-59.6456*	22.3047
	[138.909]	[34.078]	[48.258]
Constant	349.9589***	161.2911***	125.8175***
	[60.061]	[20.212]	[35.913]
Observations	65	157	30
R-squared	0.741	0.496	0.873
No. of groups	13	32	6

Standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1

Table 7. Determinants of MMR by Income Classification of Countries

VARIABLES	Low Income Countries	Middle Income Countries	High Income Countries
Public health expenditures % GDP	-33.6658	-26.8729**	11.2711
	[24.575]	[13.217]	[11.338]
Private health expenditures % GDP	-42.6534*	-6.7656	-7.75
	[22.192]	[11.307]	[7.304]
GDP per capita	0.0538	-0.014	-0.0055
	[0.070]	[0.009]	[0.005]
Rule of law	-146.6095	55.6767	19.0106
	[89.070]	[43.521]	[28.200]
Level of democracy	1.8719	-8.1579**	-10.2008***
	[6.046]	[3.184]	[1.799]
water	-23.2890***	-1.1358	-1.4568**
	[4.230]	[1.172]	[0.597]
Net ODA received	-0.0366	0.4865**	-0.7959
	[0.369]	[0.233]	[0.887]
Doctor/population ratio	698.3712	15.7843	-20.8334
	[547.406]	[27.113]	[13.792]
Civic activism	-1,256.26**	-265.39	169.88*
	[595.109]	[178.997]	[93.681]
Constant	1,771.67***	565.48***	155.37**
	[257.311]	[106.167]	[69.717]
Observations	65	157	30
R-squared	0.825	0.298	0.887
No. of groups	13	32	6

Standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1

Table 8. Determinants of Immunization against DPT by Income Classification of Countries

VARIABLES	Low Income Countries	Middle Income Countries	High Income Countries
Public health expenditures % GDP	-0.6527	1.9795	-0.4889
	[2.648]	[1.422]	[6.042]
Private health expenditures % GDP	1.4396	0.7845	0.2345
	[2.391]	[1.217]	[3.893]
GDP per capita	-0.0028	-0.0008	0.0022
	[0.008]	[0.001]	[0.002]
Rule of law	12.8194	-5.5137	-18.2607
	[9.596]	[4.684]	[15.029]
Level of democracy	-0.6902	0.1363	0.5168
	[0.651]	[0.343]	[0.959]
water	0.5356	0.2946**	0.0303
	[0.456]	[0.126]	[0.318]
Net ODA received	0.0835**	-0.0455*	0.087
	[0.040]	[0.025]	[0.473]
Doctor/population ratio	36.2526	4.0267	10.6124
	[58.977]	[2.918]	[7.350]
Civic activism	204.29***	10.296	-32.441
	[64.117]	[19.264]	[49.926]
Constant	-33.044	47.080***	72.599*
	[27.722]	[11.426]	[37.155]
Observations	65	157	30
R-squared	0.56	0.198	0.471
No. of groups	13	32	6

Standard errors in brackets, *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 9. Determinants of Immunization against Measles by Income Classification of Countries

VARIABLES	Low Income Countries	Middle Income Countries	High Income Countries
Public health expenditures % GDP	0.9743	1.8228	-7.8415
	[2.736]	[1.352]	[8.530]
Private health expenditures % GDP	1.7959	1.8443	-2.1636
	[2.471]	[1.157]	[5.495]
GDP per capita	0.0025	-0.0002	0.0039
	[0.008]	[0.001]	[0.003]
Rule of law	6.4348	1.2908	-23.9542
	[9.917]	[4.453]	[21.216]
Level of democracy	-0.2494	-0.1666	-0.3874
	[0.673]	[0.326]	[1.353]
water	0.6911	0.2846**	0.1786
	[0.471]	[0.120]	[0.449]
Net ODA received	0.0705*	-0.0456*	0.117
	[0.041]	[0.024]	[0.667]
Doctor/population ratio	34.5606	2.7685	4.4233
	[60.951]	[2.774]	[10.376]
Civic activism	81.8794	5.317	-47.4298
	[66.262]	[18.315]	[70.481]
Constant	5.1567	51.9350***	95.6363*
	[28.650]	[10.863]	[52.451]
Observations	65	157	30
R-squared	0.431	0.213	0.327
No. of groups	13	32	6

Standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1

The results shown in the four tables above indicate that civic activism is a particularly relevant variable for low-income countries. Civic activism is statistically significant with the expected sign in three of the four health models for low-income countries, only once for middle income countries and also once for high income countries, but with the wrong sign.

When we compare the size of the parameter for civic activism between the full country sample on the one hand and low income countries on the other hand, we find again interesting results. For low-income countries, the size of the civic activism parameter on under-five mortality is

almost three times as large as compared to the all-country sample. When we compare the parameter sizes of civic activism for maternal mortality, we find that it is more than double the size for low-income countries as compared to the all-country sample. Finally, comparing the parameter sizes of civic activism for the immunization rate against DTP, we find that it is nearly eight times higher for low-income countries vis-a-vis all countries. For immunization against measles we also find a size difference (five times bigger for low-income countries), but, as reported, the parameter is not statistically significant.

The findings for the breakdown according to income level of countries seem to reinforce our earlier results for all developing countries, namely that civic activism may be a relevant factor for generating better health outcomes in developing countries. This seems to be even more the case for the poorest developing countries. For example, a ten percentage point increase in civic activism in low-income countries is correlated with 32 less child deaths and 126 less maternal deaths. For all developing countries, the size effect is 12 and 57 respectively.

7. Conclusion

The objective of the analysis was to test how civic activism contributes to health outcomes in the developing world. We found that it does seem to have an impact on reducing mortality rates, in particular those of children under five years old and maternal mortality. But it does not have any statistically significant effect on immunization rates once all relevant controls are added to the analysis. We also found that the size of the effect on mortality rates is quite substantive as compared to other possible explanatory variables. More precisely, formal governance institutions, doctor density, income levels and ODA are not or much less effective as compared to civic activism. Only public and private health expenditures appeared to have a larger effect on health outcomes. Hence, civic activism seems a relevant indicator for measuring the impact of an active civil society on health outcomes in developing countries. Moreover, under serious financial constraints, the agency of civil society may be more feasible in affecting better health care delivery than an increase in healthcare expenditures. This is likely because civic agency can

demand and pressure for higher quality, better distribution, and more efficiency of health care services.

For these reasons, civil society agency should not be ignored by health care advocates as a potential factor for more effective health care delivery. This seems even more relevant in the case of low-income countries, where we find even stronger effects of civic activism on health outcomes, both absolutely and relative to the size effects of the control variables. Moreover, we hope to contribute with our preliminary findings on the potential role of civil society on health not only to the health policy discourse but also to the civic engagement discourse, which discusses a wide variety of potential development gains from an active civil society (Biekart and Fowler, 2012). It seems that improved health outcomes may be one such potential development outcome, in particular in low-income countries.

REFERENCES

Á Franco, C. Álvarez-Dardet and M.T. Ruiz (2004). Effects of Democracy on Health: Ecological Study. bmj.329(7480):1421-1423. *doi: 10.1136/bmj.329.7480.1421*

Alegria M., W.,Sribney, and N. E. Mulvaney-Day (2007).Social Cohesion, Social Support and Health Among Latinos in the United States. Social Science and Medicine 64(2): 477–495. *doi:10.1016/j.socscimed.2006.08.030*

Barten, Francoise, Diana Mitlin, Catherine Mulholland, Ana Hardoy, and Ruth Stern (2007) 'Integrated Approaches to Address the Social Determinants of Health for Reducing Health Inequity', Journal of Urban Health: Bulletin of the New York Academy of Medicine (84) 1, pp. i164-i173.

Bartlett S, 2003. Water, sanitation and urban children: the need to go beyond "improved" provision. Environment and Urbanization 15(2):57-70.

Berger, M. and J. Messer (2002), "Public Financing of Health Expenditure, Insurance, and Health Outcomes", Applied Economics, Vol. 34, No. 17, pp. 2105-2113.

Berkman, Lisa, Thomas Glass, Ian Brissete, and Teresa Seeman (2000) 'From Social Integration to Health: Durkheim in the New Millennium', *Social Science & Medicine* 51, pp. 843-857.

Besley T. and M. Kudamatsu (2006). Health and Democracy. American economic Review 96(2):313-318

Biekart, Kees, and Allan Fowler (2012) 'A Civic Agency Perspective on Change', *Development,* 55 (2), pp. 181-189.

Crémieux, P.-Y., P. Ouellette and C. Pilon (1999), "Health Care Spending as Determinants of Health Outcomes", Health Economics, Vol. 8, pp. 627-639.

Elola, J., A. Daponte and V. Navarro (1995), "Health Indicators and the Organisation of Health Care Systems in Western Europe", American Journal of Public Health, Vol. 85, No. 10, pp. 1397-1401.

Filmer, D. and L. Pritchett (1997), "Child Mortality and Public Spending on Health: How Much Does Money Matter?". Policy Research Working Paper No. 1864. The World Bank Washington D.C.

Gele, Abdi A. and Ivan Harsløf (2010) 'Types of Social Capital Resources and Self-Rated Health Among the Norwegian Adult Population', *International Journal for Equity in Health* 9 (8), 9 pp.

Gundry S., R. Conroy and J. Wright (2003). A systematic review of the health outcomes related to household water quality in developing countries. J Water Health 02: 1-13

Han, Sehee, Haeseung Kim, and Hee-Sun Lee (2012) 'A Multilevel Analysis of Social Capital and Self-Reported Health: Evidence from Seoul, South Korea', *International Journal for Equity in Health,* 11 (3).

Hollard, Guillaume, and Omar Sene (2015) Social Capital and Access to Primary Health Care in Developing Countries: Evidence from sub-Saharan Africa. Economix Working Paper 2015-06. Paris: Universite de Paris Ouest Nanterre La Defense.

Hu, Bingjie, and Ronald U. Mendoza (2013) 'Public health Spending, Governance and Child Health Outcomes: Revisiting the Links', *Journal of Human Development and Capabilities* 14 (2), pp. 285-311.

Hunter P.R., D. Zmirou-Navier and P. Hartemann (2009). Estimating the impact on health of poor reliability of drinking water interventions in developing countries. Science of the Total Environment. 407(8):2621–2624

Hughes, Barry B. et al. (2011) *Improving Global Health – patterns of potential human progress.* Vol. 3. Boulder: Paradigm Publishers.

Hyyppä M. T. and J. Mäki (2001). Individual-Level Relationships between Social Capital and Self-Rated Health in a Bilingual Community. Preventive Medicine. 32(2):148–155

Inoue S., T. Yorifuji, S. Takao, H. Doi, and I. Kawachi (2013). Social Cohesion and Mortality: A Survival Analysis of Older Adults in Japan. American Journal of Public Health: (12):e60-e66. *doi: 10.2105/AJPH.2013.301311*

Islam, M. Kamrul, et al. (2006) 'Social Capital and Health: does egalitarianism matter? A literature review', *International Journal for Equity in Health* 5 (3).

Joumard I., C. André, C. Nicq and O. Chatal (2008), "Health Status Determinants: Lifestyle, Environment, Health Care Resources and Efficiency", *OECD Economics Department Working Papers*, No. 627, OECD Publishing. *doi: 10.1787/240858500130*

Kawachi I., B.P. Kennedy, R. Glass (1999). Social capital and self-rated health: a contextual analysis. *American Journal of Public Health*: 89(8) 1187-1193

Kelleher C. (2002). How exactly do politics play a part in determining health? New perspectives on an age old issue. J Epidemiol Community Health. 56(10): 726. doi: 10.1136/jech.56.10.726

Knowles, Stephen, and P. Dorian Owen (2010) 'Which Institutions are Good for Your Health? The Deep Determinants of Comparative Cross-country Health Status', *Journal of Development Studies* 46 (4), pp. 701-723.

Navarro V., C. Borrell, J. Benach, C. Muntaner, A. Quiroga, M. Rodríguez-Sanz, N.Vergés, J. Gumá, MI Pasarín (2003). The importance of the political and the social in explaining mortality differentials among the countries of the OECD, 1950-1998. Int J Health Serv. 2003;33(3):419-94.

Leon, David, and Gill Walt (2009) 'Poverty, Inequality, and Health: an International Perspective', *Oxford Scholarship Online*, DOI: 10.1093/acprof:oso/9780192631961.003.0008, 18 pp.

Nixon, J. and P. Ullmann (2006), "The Relationship between Health Care Expenditure and Health Outcomes – Evidence and Caveats for a Causal Link", European Journal of Health Economics, Vol. 7, No. 1, pp. 7-19.

Or, Z. (2000a), "Determinants of Health Outcomes in Industrialised Countries: A Pooled, Cross-country, Time Series Analysis", OECD Economic Studies, No. 30, 2000/I.

Or, Z. (2000b), "Exploring the Effects of Health Care on Mortality Across OECD Countries", OECD Labour Market and Social Policy, Occasional Paper No. 46.

Ramesh M. and S. Mirmirani (2007). An assessment of OECD Health Care System Using Panel Data Analysis. Available at http://mpra.ub.uni-muenchen.de/6122/. Accessed 23/12/2014.

Shaw, J.W., W.C. Horrace and R.J. Vogel (2002), "The Productivity of Pharmaceuticals in Improving Health: An Analysis of the OECD Health Data", WUSTL Economics Working Paper, HEW series, http://129.3.20.41/eps/hew/papers/0206/0206001.pdf. Accessed 23/12/2014.

Sun, Xiaojie, Clas Rehnberg, and Qingyue Meng (2009) 'How are Individual-Level Social Capital and Poverty Associated with Health Equity? A Study from Two Chinese Cities', *International Journal for Equity in Health* 8 (2), 13 pp.

Thornton, J. (2002), "Estimating a Health Production Function for the US: Some New Evidence", Applied Economics, Vol. 34:1, pp. 59-62.

UNDP (2013) Humanity Divided: Confronting Inequality in Developing Countries. New York: UNDP.

Veenstra G. (2000). Social Capital, SES and Health: An Individual Level Analysis. Social Science and Medicine. 50(5):619-629.

Van Staveren, Irene, and Peter Knorringa (eds.) *Beyond Social Capital*. London: Routledge, 2008.

Van Staveren, Irene, and Ellen Webbink, 'Civil Society, Aid and Development: a Cross-Country Analysis', IOB Study, Ministry of Foreign Affairs of the Netherlands, The Hague, June 2012.

Vonneilich, Nico, Karl-Heinz Jöckel, Raimund Erbel, Jens Klein, Nico Dragano, Simone Weyers, Susanne Moebus, Johannes Siegrist, and Olaf von dem Knesebeck (2011) 'Does Socioeconomic Status Affect the Association of Social Relationships and Health? A Moderator Analysis', International Journal for Equity in Health 10 (43), 11 pp.

Wilkinson, Richard, and Kate Pickett (2009) *The Spirit Level – why greater equality makes societies stronger*. New York: Bloomsbury Press.

Xue, Xindong, and W. Robert Reed (2015) The Relationship between Social Capital and Health in China. Department of Economics and Finance, College of Business and Economics Working Paper no. 5/2015. Christchurch: University of Canterbury.

Zachariah, R., R. Teck, L. Bughendwa, M. Fitzerland, S. Labana, C. Chinji, P. Humblet, and A.D. Harries (2007) 'Community Support is Associated with Better Antiretroviral Treatment Outcomes in a Resource-Limited Rural District in Malawi', *Transactions of the Royal Society of Tropical Medicine and Hygiene* 101, pp. 79-84.

APPENDIX

Table A1. Definition of Dependent Variables and Sources

Variable	Definition	Source
Maternal mortality ratio (MM)	The number of women who die during pregnancy and childbirth, per 100,000 live births. The data are estimated with a regression model using information on fertility, birth attendants, and HIV prevalence.	WHO, UNICEF, UNFPA and World Bank[1]
Under 5 mortality (U5M)	Under-5 mortality (per 1,000 live births). Under-five mortality rate is the probability per 1,000 that a newborn baby will die before reaching age five, if subject to current age-specific mortality rates.	UN Inter-agency Group for Child Mortality Estimates (UNICEF, WHO, World Bank, UN DESA Population Division)[2].
Immunization DTP (IM_DPT)	DPT immunization measures the percentage of children ages 12-23 months who received DPT vaccinations before 12 months or at any time before the survey. A child is considered adequately immunized against diphtheria, pertussis (or whooping cough), and tetanus (DPT) after receiving three doses of the vaccine.	WHO and UNICEF[3]
Immunization measles (IM_Measles)	Measles Immunization measures the percentage of children ages 12-23 months who received measles vaccination before 12 months or at any time before the survey. A child is considered adequately immunized against measles after receiving one dose of vaccine.	WHO and UNICEF[3]

Notes:

[1] http://www.searo.who.int/maldives/documents/Trends_in_maternal_mortality_A4__1990-2010.pdf

[2] www.childmortality.org

[3] http://www.who.int/immunization_monitoring/routine/en/

[4] http://www.unaids.org/

Table A2. Definition of Independent Variables and Sources

Variable	Definition	Source
Civic activism (CA)	The civic activism index measures the social norms, organizations and practices, which facilitate greater citizen involvement in public policies and decisions. It includes access to civic organizations, participation in the media, and the means to participate in civic activities such as nonviolent demonstration and petitions.	Institute of Social Studies, Indices of Social Development[1].
Public Health Exp. (%GDP) (PUBLEX)	Public health expenditures % GDP. Public health expenditure consists of recurrent and capital spending from government (central and local) budgets, external borrowings and grants (including donations from international agencies and nongovernmental organizations), and social (or compulsory) health insurance funds.	World Health Organization National Health Account database[2]
Private Health Exp. (%GDP) (PRIVEX)	Private health expenditures % GDP - Private health expenditure includes direct household (out-of-pocket) spending, private insurance, charitable donations, and direct service payments by private corporations.	World Health Organization National Health Account database[2].
Doctors ratio (DOC)	No. of doctors per 10,000 population. Physicians (per 10,000 people). Physicians include generalist and specialist medical practitioners.	World Health Organization, Global Atlas of the Health Workforce.[5]
Democracy (DEM)	Level of democracy index. Democracy indices are based on an evaluation of elections for competitiveness and openness, the nature of political participation in general, and the extent of checks on executive authority.	Polity IV Project, Political Regime Characteristics and Transitions, 1800-2013[3]
Rule of Law (RL)	Rule of law index. This index measures perceptions of the extent to which agents have confidence in and abide by the rules of society, in particular the quality of contract enforcement, property rights, the police and the courts, as well as the likelihood of crime and violence.	World Bank, Worldwide Governance Indicators
Water (WATER)	Access to safe drinking water (% of population with access).	World Bank. World Development Indicators.
GDP per capita (GDP)	GDP per capita. GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products, measured in US dollars. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.	World Bank national accounts data, and OECD National Accounts data files.

ODA assistance (ODA)	Net ODA received (% of gross capital formation). Net official development assistance (ODA) consists of disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions, and by non-DAC countries to promote economic development and welfare in countries and territories in the DAC list of ODA recipients. It includes loans with a grant element of at least 25 percent (calculated at a rate of discount of 10 percent).	Development Assistance Committee of the Organisation for Economic Co-operation and Development, Geographical Distribution of Financial Flows to Developing Countries, Development Co-operation Report, and International Development Statistics database.[4]

Notes:

[1] http://www.IndSocDev.org/

[2] http://apps.who.int/nha/database/DataExplorerRegime.aspx for the most recent updates).

[3] http://www.systemicpeace.org/polity/polity4.htm

[4] http://www.oecd.org/dac/stats/idsonline. World Bank gross capital formation estimates are used for the denominator.

[5] http://apps.who.int/globalatlas/

Table A3. Indicators of the Civic Activism Index

Proportion of public who have listened to radio news in the last week

Proportion of public who have watched TV news in the last week

Proportion of public who have read newspaper news in the last week

Civicus civil society rating — Structure

Civicus civil society rating — Environment

Civicus civil society rating — Values

Civicus civil society rating — Impact

Radios per capita

Radios per household

Proportion of public who 'have' or 'would be prepared' to take part in a peaceful demonstration

Proportion of public who 'have' or 'would be prepared' to sign a petition

Proportion of respondents who either 'have done' or 'might' join a boycott

Respondent says they use the newspaper to inform themselves about politics

Respondent says they use the television to inform themselves about politics

Percentage of respondents who watch TV news a great deal or very much

Percentage of respondents who read newspaper news a great deal or very much

Percentage of respondents who listen to radio news a great deal or very much

Average number of days spent watching TV news, per week

Average number of days spent reading newspaper news, per week

Average number of days spent listening to radio news, per week

Density of international organisation secretariats of international non-governmental organisations in given country

Extent to which organisations and individuals in each country are members of INGOs, number of INGOs with members in that country

Percentage of the workforce employed in the NGO sector

Newspapers per capita

Proportion of respondents who have used printed magazines in the last week to find out what is going on in the world

Proportion of respondents who have used in depth reports on radio or TV in the last week to find out what is going on in the world

Proportion of respondents who have used books in the last week to find out what is going on in the world

Proportion of respondents who have used internet or email in the last week to find out what is going on in the world

Source: www.indsocdev.org

Table A4. List of Sample Countries by Continent

Africa	Asia	Central & South America	Europe/Eurasia
Burkina Faso	Bangladesh	Argentina	Armenia
Cameroon	Bhutan	Cabo Verde	Azerbaijan
Egypt	Cambodia	Dominican Rep.	Bolivia
Ethiopia	China	Ecuador	Georgia
Ghana	El-Salvador	Guatemala	Kyrgyz Rep.
Kenya	India	Honduras	Macedonia
Lesotho	Indonesia	Nicaragua	Moldova
Liberia	Iran	Paraguay	Serbia
Libya	Jordan	Peru	Ukraine
Madagascar	Mongolia		
Malawi	Pakistan		
Mali	Philippines		
Morocco	Vietnam		
Mozambique			
Namibia			
Nigeria			
Rwanda			
Senegal			
Swaziland			
Tanzania			
Tunisia			
Uganda			
Zambia			