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Institutional Quality and Health Outcomes in Sub-Saharan Africa

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Abstract

The objective of this research is to identify the institutional dimensions that are the most relevant to the improvement of health outcomes in sub-Saharan Africa. To this end, institutional quality measures are integrated into a health production model. This model is estimated by the Two-stage least squares method on a panel of 45 countries observed over the period 1996-2018. The data used are from the World Bank. The results show that the most relevant institutional dimensions that improve health outcomes in the region are by order: rule of law, control of corruption, government effectiveness, voice and accountability and political stability and absence of violence. For these reasons, African decision-makers who often have limited resources can focus on a few key components of these institutional qualities or their combinations to improve health outcomes in their countries.

Keywords: Health outcomes, Institutional quality, Sub-Saharan Africa, Two-Stage Least Squares

1. Introduction

Since North's (1990) seminal work, there has been an ever-increasing interest in taking into account the institutional quality in explaining countries' economic performance. Improving institutional quality can be a crucial determinant of health. For example, it can affect their health through control of corruption, protection of property rights, economic liberalisation, political system, rule of law, political stability and absence of violence, decentralisation, etc. However, the relationship between institutional quality and health is often controversial and it is not a priori possible to say without risk of error which are the institutional dimensions that improve health in a particular context.

For example, some authors argue that corruption kills. Indeed, it can fatally affect health through reduced public spending and medical interventions (Gupta et al., 2002), absenteeism of health workers (Friedman, 2018), distrust in the health system (Mohseni and Lindstrom, 2007; Radin, 2013). However, according to Huntington and Fukuyama (2006) and Leff (1964), bribes can be a mechanism to overcome over-centralized government bureaucracy, red tape, waiting times and delays. In this case, the amount of a bribe may be an effective solution to the acquisition of a health service that would not otherwise be available and accessible. There is also a controversial relationship between property rights protection and health. Household 's health can be improved through the protection of land rights, especially those held by women, which provide them with income and enable them to care for their children and their family members (Allendorf, 2007; Menon et al., 2014). Protection of property rights can also affect health through pharmaceutical patents which, when highly protected, can reduce access to essential medicines by the poorest (Hoen, 2016; Jung and Kwon 2015).

The objective of this article therefore is to identify institutional quality dimensions that improve health outcomes in Sub-Saharan Africa (SSA). Identifying these dimensions is important because it can enable African decision-makers who often have limited resources to focus on a few key components of these institutional quality to improve health in their countries. But one of the difficulties lies in the direct measurement of health. The empirical literature generally suggests that life expectancy at birth, under-five and infant mortality rates and maternal mortality ratio are health indicators. Health variables used in this research are life expectancy at birth, under-five mortality rate and maternal mortality ratio.

In the context of achieving the United Nations Sustainable Development Goals (SDGs), the African Union (AU) Agenda 2063 and national development plans, the governments of African countries have made improving health outcomes a priority economic policy objective. For example, in SDGs, the peoples of the United Nations aspire to good health and well-being. Goal 3 aims to enable all people to live in good health and to promote the well-being of all people at all ages (United Nations, 2015). Through Agenda 2063, the peoples of Africa aspire to a high standard of living and quality of life, good health and well-being by 2063 (African Union Commission, 2015). However, the achievement of these goals and aspirations requires the implementation of adequate health policies. It requires knowledge and understanding of the mechanisms that explain the formation of health capital. Analysing to identify these mechanisms through the lens of institutional quality is the main concern of this article.

In this work, we hypothesize that better institutional quality improves health outcomes in SSA and that some institutional dimensions are more relevant than others. The institutional quality is integrated into Grossman's (1972, 2000) health production function and adapted for the context. This function is estimated using the World Bank's World Development Indicators (WDI) and Worldwide Governance Indicators (WGI) on a sample of 45 countries in SSA. 2SLS estimation technique is used to take into account endogeneity problems related to institutional quality, health and other variables and also measurement errors in these variables.

To the best of our knowledge, this is the first analysis on the role of institutional quality on health outcomes in SSA. In most cases, the existing body of work focuses on developing countries in general. Those who studied the role of institutional quality have often limited themselves to a single dimension of these institutions. The contribution of this article is fivefold. First, the aim of the paper is to investigate whether some institutional dimensions are more relevant than others in explaining health outcomes in SSA. Therefore, it uses six institutional dimensions to analyse the role of institutional quality on health outcomes. Second, an aggregate institutional quality dimension is calculated using Principal component analysis (PCA). Third, it integrates institutional dimensions in a previous theoretical health model that overlooked them. It Fourth, it takes into account the endogeneity issues associated mainly with institutional quality and health outcomes. Fifth, it covers a panel of 45 SSA countries observed over a relatively long period from 1996 to 2018.

Our robust results show that institutional quality that foster health outcomes in SSA are in order: rule of law, control of corruption, government effectiveness, voice and accountability, and political stability and absence of violence. Aggregated institutional quality that we built using PCA is also relevant (after rule of law) in improving health outcomes in the region.

In section 2 of the paper, we review the existing literature on the relationship between institutional quality and health outcomes. Section 3 presents the methodology. While section 4 presents the main results and discusses them, section 5 tests for robustness. Section 6 concludes.

2. Literature Review

Economic analysis is extremely sparse on the specific institutional dimensions that are the best suited to a particular context (Perkins et al., 2006), particularly in terms of improving health. Moreover, there seems to be a particularly lively debate on the precise form of the most important institutions that promote economic development, including health improvement, in developing countries (Dias and Tebaldi, 2012). The relationship between institutional dimensions and the formation of health capital can be organized thematically through corruption, protection of property rights, economic reforms, rule of law, political regime, political stability and absence of violence.

Corruption appears to be lethal. It can fatally affect the health of populations through the reduction of public spending and medical interventions (Gupta et al., 2002), absenteeism of health personnel, theft of medical equipment and public medicines for resale on the market (Friedman, 2018). It can undermine confidence in the health system (Mohseni and Lindstrom,

2007; Radin, 2013). However, moral condemnation of corruption should not prevent the point that, in economic terms, its harmfulness is not necessarily proven. For example, Huntington and Fukuyama (2006) and Leff (1964) seem to see benefits in corruption. Indeed, corruption can reduce state constraints by speeding up transactions. Bribes can be a mechanism to overcome overly centralized government bureaucracy, red tape and waiting times, and speed up transactions. Bribe can be an effective solution to acquiring a health service that would otherwise not be available and accessible.

Household health can be improved through the protection of land property rights, especially those held by women, which provides them with income and enables them to care their children (Allendorf, 2007; Menon et al., 2014). The protection of property rights can also affect health outcomes through pharmaceutical patents which, when heavily protected, can reduce access to essential medicines by the poorest (Hoen, 2016; Jung and Kwon 2015).

Economic reforms and their effects can also affect health, particularly through trade and financial reforms. Trade reforms can affect health through economic growth (Levine and Rothman, 2006; Oster, 2012) and the movement of people (Bergh and Nilson, 2010; Oster, 2012). It can also affect health outcomes through improved food security and nutrition (Labonté et al., 2011; Thow, 2009). Its potentially harmful effect on health is also contested through structural adjustment policies (Stuckler and Basu, 2009; Yasar, 2010) and changes in labour market conditions (Corrigall et al. 2008; Polakoff, 2007). Other mediating effects through urbanization, westernization, (Levine and Rothman, 2006), environmental quality (Levine and Rothman, 2006; Owen and Wu, 2007) are also relevant.

The attractiveness and inflows of Foreign Direct Investment (FDI) promoted by financial reforms in developing countries can have negative effects on health outcomes in host countries through organic water pollution (Burns et al., 2017; Jorgenson, 2009). The effect of the attractiveness of FDI may also be conditional on the types of sectors in which investment is made, the maintenance of policies that favour domestic over foreign investors, the control of corruption, or in general if they are introduced strategically (Reiter and Steensma, 2010).

Rule of law can improve health outcomes through the promotion of growth (Boettke and Subrick, 2003), the improvement of market efficiency and the development of civil society (Dawson, 2010). It can also contribute to improving health through its stabilizing role, controlling corruption, protecting property rights and redistribution (Pinzon-Rondon et al., 2015). Similarly, rule of law is a determinant of health through equity, respect for human rights and the idea of justice (Horton, 2016).

As far as democracy is concerned, it can expose decision-makers to popular demands. Through constraints on the executive, public deliberation, institutional capacity, citizen participation in the decision-making process, electoral competition, respect for individual rights and civil liberties, respect for human rights, the free flow of information, the democratic regime is likely to increase health capital. It can be a means of giving voice to the health needs of the poor. But this generally accepted idea is being defeated, at least historically.

Historically, a certain amount of authoritarianism would be the basis for improved health

outcomes. Examples of the success of authoritarian regimes in improving health are the reduction of infant mortality under Pinochet in Chile (McGuire, 2001). Similarly, quality health care in Cuba and Libya, Universal health coverage (UHC) and relatively low tuberculosis prevalence rates in the Union of Soviet Socialist Republics are examples of successes. High vaccination rates are reported to have been achieved in Chinese villages often reached by coercive means (Cutler et al., 2006). The extension of basic health insurance to the rural population in 1971 under military rule in Brazil (Falleti, 2009) is also noted in the literature. Better still, countries described as non-democratic such as Cuba, Russia and China are now coming to the bedside of democratic countries that have been severely shaken by the coronavirus pandemic, in this case Italy. These countries rescue Italy in 2020 with epidemic specialists, medical equipment and protective masks. In the same context, a monarchic regime like one in Morocco was even able to produce more protective masks than a democratic one in France.

Armed conflicts and violence can degrade health outcomes. They contribute to the spread of HIV/AIDS (Iqbal and Zorn, 2010) or malaria (Montalvo and Reynal-Querol, 2007). They can affect the health of children and the rest of the population through nutrition and lack of drinking water, which are themselves caused by the destruction of economic assets and the forced displacement of populations (Akresh et al., 2012; Bundervoet et al., 2009). Conflicts can also negatively affect children health through stress and the parents' reaction to violence (Duque, 2017).

In order to disentangle and identify the most relevant dimensions of institutional quality that improve health outcomes in SSA, a methodological framework in section 3.

3. Methodology

This section presents the methodological framework. It covers model specification, data description and presentation of estimation technique.

3.1 Econometric Model

We propose to estimate a health production function for SSA based on Grossman's model (1972) which treats social, economic and environmental factors as inputs to the health production system and to which we add institutional quality. Grossman's model provides an appropriate theoretical framework for explaining health demand (Nocera and Zweifel, 1998). The model provides a simple but logically consistent framework for the study of optimal health trajectories and longevity (Grossman, 2000). One of the advantages of estimating an aggregate health production function is that estimates of the effects of institutional quality on health outcomes can be obtained.

Grossman's (1972, 2000) health production function can be specified as follows:

$$H = F(X) \quad (1)$$

With H, a measure of the individual's health and X, a vector of factors that explain the health of the individual. These explanatory factors for the health of the individual include nutrient intake, income, consumption of public goods, education, time spent on health-

related procedures, cigarette smoking, alcohol consumption, initial individual endowments such as genetic make-up, and community endowments such as the environment.

This theoretical model by Grossman (1972, 2000) was designed to analyse health production at the micro level. Since the interest of this work is to analyze the production of health outcomes at the macroeconomic level, it is necessary to move from microeconomic analysis to macroeconomic one without losing the theoretical basis. To this end, and following Fayissa and Gutema (2005), the elements of vector X are represented by per capita variables and grouped into vectors of economic, social and environmental factors and presented as follows:

$$h = F(Y,S,V) \quad (2)$$

With Y, a vector of economic factors per capita, S is a vector of social factors per capita, V is a vector of environmental factors per capita. In its scalar form, equation (2) can be rewritten as follows:

$$h = f(y_1, y_2, ..., y_n, s_1, s_2, ..., s_m, v_1, v_2, ..., v_l) \quad (3)$$

With h, the health of the individual as represented by life expectancy at birth in years. (y_1, y_2,…,y_n) =Y; (s_1, s_2,…,s_m) = S; (v_1,v_2,…,v_l)=V and n , m and l are the number of variables in each group of factor , respectively.

Equation (3) can be transformed into its explicit form and given the following equation (4):

$$h = \Omega \, \Pi y_i^{d_i} \; \Pi s_j^{\beta_j} \; \Pi y_i^{\gamma_k} \quad (4)$$

With $\alpha_i, \beta_j, \gamma_k$ are elasticities.

The observation of equation (4) shows that the initial stock of health highlighted by Grossman (1972, 2000) is estimated. It measures the state of health that would have been observed if there had been no depreciation of health or improvement in health due to changes in the socio-economic and environmental factors used in the health production system.

In the empirical analysis, the list of variables is not necessarily identical to that used by Grossman (1972, 2000) or Fayissa and Gutema (2005). This is because the factors may be partly related to the existing cultural and environmental conditions of a country or region. Care must be taken in empirical analysis to consider an appropriate range of inputs, not just those identified with public health measures or curative medicine in developed countries. In addition, the availability of continuous, reliable and sufficient data on variables may be another limiting factor.

Therefore, in addition to the institutional quality (INST), a crucial factor that Grossman (1972, 2000) seems to have overlooked in explaining health capital formation, the variables representing economic factors are GDP per capita (y1), current health expenditure per capita (y2); the variables representing the social factors are the primary school enrolment ratio (s1),

the access to basic drinking water services (s2), the rate of access to electricity (s3) and the proportion of the population living in rural areas (s4); the environmental factor used is the proportion of forest area (% land) per capita (v1). In this model, health, GDP per capita, current health expenditure per capita, education and the institutional quality are endogenous. By taking the logarithm of equation (4) and rearranging it, equation (5) is obtained:

$$\text{Ln(h)}=\ln(\Omega)+\sum\alpha_i(\ln y_i)+\sum\beta_j(\ln s_j)+\sum\gamma_k(\ln v_k)+\sum\lambda_l Inst_l \quad (5)$$

With i=1, 2; j=1,2, 3,4; k=1; l =1,…,6. The modified model assumes that good institutional quality improves health outcomes. Good institutional quality reduces general uncertainty in the economy and improves health outcomes. For example, in an environment of less uncertainty, people suffer less from stress-related illness and invest more in their own health (Kozlov and Rosenberg, 2018). Uncertainty about the effectiveness of public health care in a country can reduce the incentives for individuals to invest in their health (Asano and Akihisa, 2011). This may lead patients to resort to other non-pharmaceutical types of treatment, self-medication, anything that may prove dangerous to their health. If overall good institutional quality is good for health, we also assume some of these institutional dimensions are more relevant than others. Examining each individual measure of these institutions to better disentangle and identify the most relevant one could be of a particular interest for policy makers who lack most of the time resources to carry out reforms that tackle all these dimensions at the same time. Health decision- makers could indeed focus more on the most relevant one to enable their fellow citizens to enjoy better health outcomes.

The empirical specification of the model is given by equation (6):

$$h^*(g,t)=X^*(g,t)\Phi+\psi(g,t) \quad (6)$$

With $h^*(g,t)$, the neperian logarithm of the health status variable in country g at period t; $X^*(g,t)$ is a vector of the explanatory factors of health status, i.e. institutional quality and other explanatory factors (controls), (y_1, y_2 ; s_1, s_2, s_3, s_4, v_1, $inst_1$,…,$inst_7$) ; the number of countries is g=1,2,…,45 and the period t=1,2,…,23. Φ is a vector of parameters $(\alpha_1\alpha_2\alpha_3,\beta_1\beta_2\beta_3\beta_3,\gamma_1\gamma_2,\lambda_1,...,\lambda_7)$; $\psi(g,t)$ are the errors terms. In sub-section 3.2 we describe the variables to be used.

3.2 Data Description

The estimation of the health production function given by equation (6) requires data on health as well as on institutional quality, socio-economic and environmental variables. Life expectancy at birth is the main health outcomes that is used in this research. Life expectancy at birth is widely used as a reliable and easily interpretable indicator of mortality (Preston et al., 2001).

The variables of interest are the six institutional dimensions of Kaufman et al. (2010), namely (i) government effectiveness (GE), (ii) control of corruption (CC), (iii) regulatory quality (RQ); (iv) voice and accountability (VA); (v) rule of law (RL) and (vi) political stability and absence of violence (PSAV). They are from world governance indicators of World Bank. Following Reidpath and Allotey (2006), an indicator of overall institutional quality (INST) is calculated using PCA given the strong correlation between institutional dimensions, which can lead to problems of multicollinearity and simultaneity bias when all dimensions of institutional quality are included simultaneously in the same regression. PAC is increasingly used in studies (David et al., 2015). With the PCA a new variable is created as linear combinations of the original set of six variables. PCA identifies how the six dimensions may be summarized in a simple way to give a new meaningful measure of institutional quality measure. Therefore, each institutional dimension, including the institutional quality index is considered individually in the regressions. The formula for this institutional quality index is given by equation (7):

$$INST_{it} = 18{,}114\ \mathrm{GE}_{it} + 16{,}710\ \mathrm{CC}_{it} + 16{,}788\ RQ_{it} + 15{,}561\ \mathrm{VA}_{it} + 19{,}643\ \mathrm{RL}_{it} + 13{,}184\ PSAV_{it} \quad (7)$$

With i=1,…,45; t=1,…,23. Coefficients are in percentages. The manner in which these coefficients are calculated by the PCA is available upon request.

For the controls, the economic factors are GDP per capita and current health expenditure per capita. The social factors are the primary school enrolment rate, the access to basic drinking water services, the rate of access to electricity and the proportion of the population living in rural areas. The environmental factor used is the proportion of forest area per capita. The control variables are form world development indicators of World Bank.

The data used are annual. They cover a panel of 45 countries in SSA collected over the period 1996-2018. The sample size is relatively large compared to the study period. Data availability justifies the choice of study period and sample size. Table 1 presents descriptive statistics for the selected variables.

Over the period 1996-2018, the average life expectancy at birth in SSA is estimated at 56.33 years, which is even less than 60 years. 77.78% of countries in this region have citizens with a life expectancy at birth of less than 60 years. On the other hand, Seychelles, Mauritius, Cabo Verde, Sao Tome and Principe, Mauritania, Senegal, Madagascar, Sudan and Comoros have citizens with the longest life expectancies above 60 years in the region. Conversely, countries such as Sierra Leone, Central African Republic (CAR), Chad, Lesotho, Eswatini, Nigeria and Zimbabwe have citizens whose life expectancy at birth is even less than 50 years over the period 1996-2018.

Descriptive analysis of institutional quality indicate that institutional quality remains poor in SSA. All institutional dimensions are negative: government effectiveness (-0.74), control of corruption (-0.63), regulatory quality (-0.68), voice and accountability (-0.59), rule of law (-0.70), political stability and absence of violence (-0.52) and institutional quality index (-0.65). Government effectiveness is the weakest point in institutional quality in SSA while political stability and absence of violence is the strongest.

Table 1. Descriptive Statistics, 1996-2018

Variables	Observations	Mean	Standard deviation	Min	Max
Life expectancy at birth	990	56.33	7.31	35.38	74.52
Government effectiveness	1035	-0.74	0.60	-1.89	1.06
Control of corruption	1035	-0.63	0.61	-1.83	1.22
Regulatory quality	1035	-0.68	0.60	-2.30	1.13
Voice and accountability	1035	-0.59	0.73	-2.23	1.01
Rule of law	1035	-0.70	0.63	-2.13	1.08
Political stability and absence of violence	1035	-0.52	0.90	-2.85	1.28
Institutional quality index	1035	-0.65	0.59	-2.08	0.87
GDP per capita	1019	4025.32	5645.25	348.85	38790.90
Current health expenditure per capita	755	184.84	210.17	6.60	1206.74
Primary school enrollment	832	97.35	23.75	28.01	151.79
Access to basic drinking water services	808	60.98	16.60	18.70	99.87
Access to electricity	883	35.18	25.58	0.41	100
Rural population	1028	38.38	16.19	7.41	89.37
Forest area per capita	1028	0.01	0.03	0.00	0.20

Source: Authors, based on WGI and WDI (World Bank, 2019a, 2019b)

Table 1 also shows that the gross enrolment ratio in primary education is on average 97.35%, the GDP per capita (in US dollars, purchasing power parity, PPP) per year is 4025. 32. On average, current health expenditure (expressed in US dollars at PPP) per capita is estimated at 184.84. Access to basic drinking water services, access to electricity, rural population and forest area per capita have averages of 60.98%, 35.18%, 38.38%, 0.01 square km respectively.

3.3 Estimation Technique

The estimation of equation (6) can pose the problem of endogeneity. Endogeneity can arise from three sources, namely the double causality between health and institutions, health and education, health and income and problems of omitted variables, and also errors in the measurement of these variables. For example, according to Okada (2018) when health conditions are worse, the poor could feel discontent with the government and demand a more democratic regime. The theory of health demand (Grossman, 1972, 2000) also suggests that not only does health depend on medical care and income, but medical care and income also depend on health: healthier people demand less medical care and generate greater money earnings. With regard to the problem of omitted variables, indicators of institutional and health quality could be correlated with unobserved, country-specific variables. This means that there are other explanatory factors for health that are not taken into account. The statistical

relationship between institutional quality indicators and health care may then be only incidental. Errors in the measurement errors are inherent to macroeconomic variables like those used in this study. Accurate measurement of social indicators in developing countries is also notoriously difficult.

Consistent estimates of the health production function can be obtained from 2SLS estimates (Grossman, 2000). The 2SLS estimation technique addresses the problem of variable endogeneity (Wooldridge, 2016). This estimation method is commonly used in applied social sciences. The instruments used are the lagged variables of endogenous variables: health outcomes, institutional quality, education, GDP per capita and current health expenditure per capita. Robust standard errors (robust) are computed in order to solve first-order heterogeneity and autocorrelation problems (Wooldridge, 2016).

4. Baseline Results

We first discuss the estimated effects of institutional quality on health outcome in SSA. Second, we discuss others determinants of health outcomes (control variables) in the region.

4.1 Estimated Effects of Institutional Quality on Health Outcomes in SSA

As a preliminary step in our investigation, we report in table 2 the 2SLS estimates of the effect of institutional quality on life expectancy at birth. Specification tests indicate that the instruments used are correctly specified. For example, the Hansen specification test indicates that the instruments used are valid for all regressions because they are not correlated with the error term: p-values > 0,10. Furthermore, the Kleibergen-Paap rk LM test rejects the null hypothesis that the first step is under-identified. F-statistic on the excluded instruments are also all safe because they are all above 10. R-squared also suggest that autocorrelation with the error terms are not a concern. Therefore, the statistical tests do not invalidate the econometric method.

As we show in table 2, improvement of overall institutional quality fosters health outcomes in SSA. More importantly, we find that the most relevant institutional dimensions that improve health are in order rule of law, control of corruption, government effectiveness, voice and accountability, and political stability and absence of violence. They are all positive and strongly significant at the 1 percent level.

They are in order of relevance institutional dimensions that improve health outcomes in SSA.

But the coefficient on regulatory quality is not positively significant. Although institutional quality is an important determinant of health capital, Grossman (1972, 2000) does not consider it in his model. Taking it into consideration is therefore an added value to the existing literature.

Table 2. Effects of Institutional Quality on Life Expectancy at Birth in SSA

	Estimation technique: 2SLS						
Variables	Life expectancy at birth						
Government effectiveness	0.050***						
	(0.012)						
Control of corruption		0.054***					
		(0.010)					
Regulatory quality			0.011				
			(0.012)				
Rule of law				0.066***			
				(0.010)			
Voice and accountability					0.036***		
					(0.008)		
Political stability						0.026***	
						(0.008)	
Aggregated institutional quality							0.056***
							(0.011)
GDP per capita	0.036**	0.035**	0.033**	0.041***	0.048***	0.032**	0.040**
	(0.016)	(0.015)	(0.016)	(0.016)	(0.017)	(0.016)	(0.016)
Primary school enrollment	0.074***	0.063***	0.074***	0.069***	0.078***	0.057***	0.069***
	(0.018)	(0.017)	(0.018)	(0.018)	(0.018)	(0.017)	(0.017)
Current health expenditure per capita	-0.064***	-0.058***	-0.046***	-0.070***	-0.063***	-0.047***	-0.065***
	(0.017)	(0.016)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Rural population	-0.074**	-0.073**	-0.065**	-0.086***	-0.053**	-0.059*	-0.068**
	(0.029)	(0.029)	(0.030)	(0.029)	(0.027)	(0.031)	(0.029)
Forest area per capita	-0.017***	-0.018***	-0.018***	-0.018***	-0.018***	-0.020***	-0.018***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Access to basic drinking water services	0.022	0.004	0.027	-0.003	0.000	0.007	0.003
	(0.019)	(0.018)	(0.019)	(0.019)	(0.019)	(0.020)	(0.019)
Access to electricity	0.058***	0.059***	0.062***	0.057***	0.062***	0.060***	0.060***
	(0.011)	(0.010)	(0.010)	(0.011)	(0.010)	(0.011)	(0.010)
Constant	3.691***	3.776***	3.530***	3.859***	3.540***	3.678***	3.721***
	(0.203)	(0.201)	(0.209)	(0.201)	(0.198)	(0.203)	(0.200)
Observations	534	534	534	534	534	504	534
Number of countries	45	45	45	45	45	45	45
R-squared	0.393	0.401	0.365	0.418	0.386	0.369	0.400
Cragg-Donald Wald F Statistics	438.841	477.323	270.160	450.544	456.598	190.943	463.110
KP LM Statistics p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hansen p-value	0.425	0.911	0.489	0.202	0.353	0.784)	0.187

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Source: Authors, based on WGI and WDI (World Bank, 2019a, 2019b)

The result is in accordance with our theoretical expectations. Indeed, better quality institutions improves the quality of health services and promotes their accessibility and use (Ablo and Reinikka, 1998; Azfar and Gurgur, 2008). Furthermore, better institutions provide incentives for households, enterprises and governments to spend more on health and education (Sen, 2015). The finding that overall good institutional quality is a key determinant of good health outcomes in SSA is consistent with previous studies, such as Bousmah et al. (2016) and Lazarova and Mosca (2008) and Dhrifi (2019). In North Africa and the Middle East region, Bousmah et al. (2016) find that overall institutional quality is also a key determinant of health outcomes. Similarly, Lazarova and Mosca (2008) while hypothesizing that it is overall institutional quality, not income inequality that fosters life expectancy at birth, come to confirm their hypothesis. Dhrifi (2019) found that life expectancy at birth raises with the quality of institutions in Africa. This result is, however, contrary to Kamiya (2011), who does not find evidence for any significant and consistent relationships between the overall institutional quality and health outcome in developing countries. As we have seen some institutional dimensions are more relevant than others.

The rule of law has the strongest positive and statistically significant effect at the 1% threshold on life expectancy at birth. It is the first most relevant institutional dimension that improves life expectancy in SSA. Boettke and Subrick (2003) Pinzon-Rondon et al. (2015) find similar results in their studies. This is consistent with Boettke and Subrick (2003) and Pinzon-Rondon et al. (2015) findings. Rule of law can improve health outcomes through the promotion of growth, market efficiency and development of a strong civil society. Through its stabilizing role, control of corruption, protection of property rights, equity, respect for human rights and the idea of justice it can foster health outcomes.

Tables 2 also shows that control of corruption is the second most relevant individual institutional dimensions that improves life expectancy at birth in SSA. This result is consistent with previous studies, such as Atangana (2017) and Holmberg and Rothstein (2010) who find that health outcomes ameliorate as the level of control of corruption improves. Controlling corruption is associated with both reduced mortality and HIV/AIDS prevalence because public resources are well used in less corrupt countries.

Government effectiveness is the third most individual relevant institutional dimensions that fosters life expectancy in SSA. This result implies that the quality of the government machinery determines the level and quality of health policy implementation (see for example Mackenbach and McKee, 2015). Professional public health service delivered by well-trained physicians, nurses and midwives can also ensure the provision of public health services, and improves health outcomes.

Health outcome also ameliorate as the level of democracy improves: the possibility for Africans to live a long life is significantly explained by democracy. It is the fourth most relevant individual institutional dimensions that foster health outcomes in SSA. Our result is consistent with other studies which find that people living in democratic regimes have a longer life expectancy (Lin et al., 2012; Patterson and Veenstra, 2016). For example, Patterson and Veenstra (2016) show that electoral democracies have on average 11 years longer life

expectancy and 62.5% lower infant mortality rates than autocracies Democratic regimes are more likely to spend more public money on health than autocratic ones. People also tend to have more access to health facilities, immunization and vaccinations in democratic regimes. However, Kozlov and Rosenberg (2018) find rather the opposite effect in post-communist countries in economic transition. They show that democracy leads to increased stress-related mortality rates, a stress that could be attributed to increased uncertainty, as well as to short-term political objectives that, in times of transition, often overshadowed the economic interests of society.

Political stability and absence of violence is the last most individual relevant institutional dimensions that improves health outcomes in SSA. The stability of the political environment is a critical dimension of institutional quality that determines the interest of policy makers in improving health. In a context where the political environment is stable and certain, governments are more willing to invest in health (Klomp and Haan, 2013; Liang and Mirelman, 2014). Liang and Mirelman (2014) suggest that there is an intrinsic difference in the goals of stable and unstable governments. For them, a stable government is able to place more emphasis on long-term social programs, such as health. Many public health programs require substantial financial support, while the benefits can only be seen in the long term. In this context, when a government does not have the capacity to stay in power, it may have less incentive to pursue such programs. In addition, political instability caused by riots, civil war or strikes can disrupt a country's health system (Klomp and Haan, 2009). Bousmah et *al.* (2016) and Akbulut (2014) find similar results. In the Middle East and North Africa region, Bousmah et al. (2016) find that violent conflict reduces life expectancy at birth. Violent conflicts can contribute to the spread of HIV/AIDS and/or malaria. They can also deteriorate the health of children and the rest of the population through nutrition and lack of clean water, which are themselves caused by the destruction of economic assets and the forced displacement of populations (Akbulut, 2014).

We find that regulatory quality is not positively significant. Our finding is consistent with that of Bussmann (2009) who finds no empirical evidence that economic regulations linked to economic liberalization and integration improve life expectancy at birth for women in a mixed panel. However, the effects of regulatory quality on health outcomes is controversial in the literature. According to Hymer (1992) and Muller (1979) strong regulation is likely to reduce life expectancy at birth due to adverse effects of economic reforms in favour of the private sector. For example, financial reforms that facilitate foreign direct investment (FDI) inflows into developing countries can have adverse effects on the health of populations. Indeed, multinational corporations are sometimes able to reduce the funds that would otherwise be available to the host government for public health and social welfare programmes by hiding profits or requiring the government to invest in infrastructure at the expense of health (Hymer 1992; Muller, 1979). FDI in the manufacturing sector can also increase the intensity of industrial organic pollution of water. While other researchers find positive results from trade regulations (Levine and Rothman 2006; Owen and Wu, 2007; Sakyi et al. 2018) and financial regulations (Burns et al., 2017; Alam et al., 2015) on life expectancy at birth, some also find that regulatory quality effects on health outcomes is conditional. Reiter and Steensma (2010)

show that FDI inflows are more positively and strongly related to improvements of Human Development Index when FDI attraction policies limit the entry of foreign investors in certain economic sectors and when they discriminate against foreign investors in favour of domestic investors.

4.2 Other Determinants of Health Outcomes in SSA

We now briefly discuss other determinants of health outcomes in SSA. As shown by table 2, economic factors such as GDP per capita and current health expenditure per capita also explain health capital formation in SSA. Increasing GDP per capita foster life expectancy at birth in SSA. This result is consistent with that predicted by Grossman's model, which considers that rising income improves health status. It is also consistent with Gerring et al. (2012) and Fayissa and Gutema (2005) findings. Income reduces mortality rates because it is a resource for meeting social needs. It is a purchasing power that can be used to consume, purchase food, health care and vaccinations and to protect against security risks. People living in countries with better economic conditions are likely to have better access to food, sanitation, education, adequate housing, decent employment and health care, all of which can contribute to better health.

Increasing current health expenditure per capita which decreases life expectancy at birth in SSA. This is consistent with Fayissa and Gutema (2005) who find that per capita health expenditure lowers life expectancy at birth in the region. This is due to the inefficiency of health services in terms of opportunity cost of food, clothing and housing. Health services obtained would not have been able to restore the health benefits related to better nutrition, clothing and housing that individuals had foregone.

Primary school enrolment rate, rate of access to safe drinking water, rate of access to electricity and the proportion of the population living in rural areas are the social factors that can also explain health in SSA. We find that education is good for health in SSA. This result is consistent with the prediction of the Grossman model (1972, 2000): education has positive and statistically significant coefficients in the health demand function. It is also consistent with other previous studies, such as Atangana (2017), Fayissa and Gutema (2005) Kozlov and Roserberg (2018). Education is inversely related to a number of unhealthy behaviours, including smoking, excessive alcohol consumption and physical inactivity. Educated people are also more likely to adopt medical technologies. Better-educated people are more effective producers of health (Grossman, 2000).

Although access to basic drinking water services effect is positive, it is not significant. On the contrary, access to electricity is good for health: its coefficient is positive and statistically significant at the 1% threshold level. In a study by Adair-Rohani et al. (2013), access to electricity was found to be essential for health care delivery and the overarching goal of UHC. Unreliable access to electricity can lead to the deterioration of vaccines, interruption of the use of essential medical devices and diagnostics, and lack of lighting and communications for maternal delivery and emergency procedures. As disease patterns change, even more energy is needed to expand services for the prevention and treatment of non-communicable diseases.

We find that living in rural areas is not good for health. Life expectancy at birth is lower in rural areas. Atangana (2017) finds similar results with neonatal mortality, infant mortality and child mortality. The high income, the concentration of public health infrastructure such in urban areas offer more favourable sanitary conditions in urban than in rural areas. Access to health care and health information in rural areas is generally very limited. Health care services where available locally are often not equipped. According to Balabanova et al. (2012), rural population is also less likely to seek medical help in the event of illness. They are often less likely to go to hospital due to poverty and illiteracy and a culture of waiting for the final stage of illness before rushing to hospital. This gives their patients less chance of recovery.

The environmental factor, which is the proportion of forest area per capita contributes to the reduction of life expectancy at birth, probably due in particular to the expansion of malaria it can cause. This result is consistent with previous studies, such as Antagana (2017). The idea is that malaria, one of the causes of child and maternal mortality, is widespread in forested areas. By conducting studies on deforestation, poverty and malaria in two protected areas in Indonesia Pattanayak et al. (2005) find inverse correlations between deforestation and malaria infection in both areas.

5. Robustness Checks

In this section, we test the robustness of our results. To that end, we undertake three exercises. First, we use under-5 mortality rates and maternal mortality ratio as alternative health outcomes to life expectancy at birth. Second, we add number of physicians per 1,000 people as a control variable to our model. Third, we employ Limited Information Maximum Likelihood (LIML) as alternative estimation technique.

5.1 Different Health Outcomes

Under-five mortality rate is the probability per 1,000 that a newborn baby will die before reaching age five, if subject to age-specific mortality rates of the specified year. Maternal mortality ratio is the number of women who die from pregnancy-related causes while pregnant or within 42 days of pregnancy termination per 100,000 live births.

Table 3. Effects of Institutional Quality on under-5 Mortality Rates in SSA

	Estimation technique:2SLS						
Variables	Under-5 mortality rates						
Government effectiveness	-0.298***						
	(0.041)						
Control of corruption		-0.342***					
		(0.036)					
Regulatory quality			-0.010**				
			(0.049)				
Rule of law				-0.481***			
				(0.057)			
Voice and accountability					-0.197***		
					(0.031)		
Political stability						-0.160***	
						(0.031)	
Aggregated institutional quality							-0.319***
							(0.040)
GDP per capita	-0.319***	-0.318***	-0.310***	-0.366***	-0.384***	-0.291***	-0.344***
	(0.065)	(0.063)	(0.073)	(0.081)	(0.071)	(0.076)	(0.066)
Primary school enrollment	-0.587***	-0.521***	-0.591***	-0.581***	-0.612***	-0.502***	-0.558***
	(0.056)	(0.055)	(0.056)	(0.082)	(0.058)	(0.067)	(0.056)
Current health expenditure per capita	0.191***	0.162***	0.103	0.272***	0.173***	0.093	0.189***
	(0.062)	(0.058)	(0.065)	(0.081)	(0.064)	(0.065)	(0.061)
Rural population	-0.123	-0.127	-0.175	0.033	-0.245**	-0.194	-0.160
	(0.120)	(0.112)	(0.134)	(0.127)	(0.115)	(0.136)	(0.117)
Forest area per capita	0.045***	0.051***	0.0488***	0.033*	0.052***	0.057***	0.052***
	(0.014)	(0.015)	(0.016)	(0.017)	(0.015)	(0.017)	(0.014)
People using at least basic drinking water	-0.328***	-0.210***	-0.354***	-0.230**	-0.211***	-0.274***	-0.223***
	(0.074)	(0.069)	(0.086)	(0.101)	(0.078)	(0.096)	(0.071)
Access to electricity	-0.164***	-0.164***	-0.185***	-0.102**	-0.184***	-0.171***	-0.171***
	(0.032)	(0.030)	(0.032)	(0.040)	(0.031)	(0.038)	(0.032)
Constant	11.11***	10.52***	12.01***	9.589***	12.03***	11.23***	10.98***
	(0.813)	(0.807)	(0.915)	(0.993)	(0.828)	(0.920)	(0.804)
Observations	534	534	534	543	534	534	534
Number of countries	45	45	45	45	45	45	45
R-squared	0.625	0.644	0.582	0.651	0.603	0.593	0.630
Cragg-Donald Wald F Statistic	438.841	477.323	360.507	107.024	441.407	145.903	463.577
KP LM p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hansen p-value	0.839	0.661	0.907	0.415	0.222	0.358	0.938

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Source: Authors, based on WGI and WDI (World Bank, 2019a, 2019b)

Data are from the World Bank World Development Indicators. Tables 4 and 5 show respectively the results when using these dependent variables. In general, the results are consistent with our preliminary findings (table 2): our baseline findings remain unchanged.

Table 4. Effects of Institutional Quality on Maternal Mortality in SSA

				Estimation technique: 2SLS			
Variables				Maternal mortality ratio			
	-0.539***						
Government effectiveness	(0.052)						
		-0.567***					
Control of corruption		(0.052)					
			-0.369***				
Regulatory quality			(0.056)				
				-0.697***			
Rule of law				(0.076)			
					-0.471***		
Voice and accountability					(0.042)		
						-0.369***	
Political stability						(0.044)	
							-0.646***
Aggregated institutional quality							(0.051)
	-0.198**	-0.191**	-0.223**	-0.331***	-0.376***	-0.159	-0.255***
GDP per capita	(0.089)	(0.088)	(0.099)	(0.110)	(0.100)	(0.097)	(0.086)
	-0.502***	-0.391***	-0.531***	-0.630***	-0.644***	-0.297***	-0.445***
Primary school enrollment	(0.081)	(0.075)	(0.081)	(0.102)	(0.099)	(0.087)	(0.071)
	0.060	-0.009	-0.001	0.195*	0.111	-0.094	0.086
Current health expenditure per capita	(0.085)	(0.083)	(0.093)	(0.109)	(0.095)	(0.090)	(0.083)
	0.173	0.158	0.091	0.447**	-0.015	0.045	0.111
Rural population	(0.158)	(0.141)	(0.173)	(0.177)	(0.136)	(0.162)	(0.144)
	0.019	0.029	0.023	0.004	0.022	0.051**	0.031*
Forest area per capita	(0.019)	(0.019)	(0.021)	(0.023)	(0.021)	(0.022)	(0.018)
People using at least basic	-0.412***	-0.224**	-0.429***	-0.064	-0.072	-0.171	-0.193**
drinking water	(0.089)	(0.087)	(0.098)	(0.113)	(0.101)	(0.109)	(0.080)
	-0.142***	-0.146***	-0.179***	-0.099**	-0.179***	-0.176***	-0.153***
Access to electricity	(0.036)	(0.033)	(0.035)	(0.045)	(0.037)	(0.040)	(0.034)
	10.84***	10.02***	12.14***	8.938***	12.26***	10.33***	10.35***
Constant	(1.019)	(0.981)	(1.150)	(1.316)	(1.029)	(1.116)	(0.924)
Observations	534	534	534	534	534	534	534
Number of countries	45	45	45	45	45	45	45
R-squared	0.655	0.676	0.604	0.692	0.655	0.640	0.693
Cragg-Donald Wald F Statistic	438.841	477.323	409.722	107.024	268.641	145.903	463.577
KP LM p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hansen p-value	0.442	0.904	0.553	0.515	0.644	0.398	0.596

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Source: Authors, based on WGI and WDI (World Bank, 2019a, 2019b)

5.2 Alternative Estimation Technique

In this sub-section, we use LIML as robustness checks. LIML is an alternative estimator which has better small sample properties than 2SLS with weak instruments. It is a linear combination of the OLS and 2SLS estimates and the weights happen to be such that they eliminate the 2SLS bias. We find that LIML estimates are similar to those of the 2SLS (table 3). There is no problem of weak instruments in the 2SLS estimations. Therefore, our baseline results hold regardless of the econometric method used.

6. Conclusion

The purpose of this study was to identify the institutional dimensions that are more relevant in improving health outcomes in SSA. We used 2SLS and data from World Bank for 45 countries observed over the period 1996-2018. The results show that the most important institutional dimensions that improve health outcomes are by order: rule of law, control of corruption, government effectiveness, voice and accountability and political stability and absence of violence. Other findings also show that economic development, access to basic education and access to electricity also improve health outcomes. The results are robust to alternative health outcomes and alternative estimation technique.

In order to foster health outcomes in SSA, public officials should improve their institutional quality. They should particularly improve rule of law, control of corruption, government effectiveness; voice and accountability and political stability and absence of violence this order. They should also increase access to electricity and the level of development of their countries in this perspective. Universal access to primary education can also improve health status of the region. Rural populations should not be left out of the picture: inequalities in access to health care between rural and urban areas should be reduced.

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References

Ablo, E., & Reinikka, R. (1998). Do budgets really matter? Evidence from public spending on education and health in Uganda. Policy Research Working Paper 1926, World Bank, Development Research Group, Washington, DC. https://doi.org/10.1596/1813-9450-1926

Adair-Rohani, H., Zukor, K., Bonjour, S., Wilburn, S., Kuesel, A. C., Hebert, R., & Fletcher, E. R. (2013). Limited electricity access in health facilities of sub-Saharan Africa: A systematic review of data on electricity access, sources, and reliability. *Global Health:*

Science and Practice, *1*(2), 249-261. http://dx.doi.org/10.9745/ghsp-d-13-00037

Akbulut, Y. M. (2014). Children of war. The long–run effects of large-scale physical destruction and warfare on children. *The Journal of Human Resources*, *49*(3), 634-662. http://dx.doi.org/10.1353/jhr.2014.0021

Akresh, R., Lucchetti, L., & Thirumurthy, H. (2012). Wars and child health: evidence from the Eritrean–Ethiopian conflict. *Journal of Development Economics*, *99*(2), 330-340. http://dx.doi.org/10.1016/j.jdeveco.2012.04.001

Allendorf, K. (2007). Do women's land rights promote empowerment and child health in Nepal? *World Development*, *35*(11), 1975-1988. http://dx.doi.org/10.1016/j.worlddev.2006.12.005

Asano, T., & Akihisa S. (2011). Risk and uncertainty in health investment. *European Journal of Health Economics*, *12*(1), 79-85. http://dx.doi.org/10.1007/s10198-010-0238-2

Atangana, O. H. (2017). The effects of heavily indebted poor countries initiative on the Millennium development goals for Health. *International Journal of Public Administration*, *40*(1), 12-23. http://dx.doi.org/10.1080/01900692.2015.1072213

Azfar, O., & Gurgur, T. (2008). Does corruption affect health outcomes in the Philippines? *Economics of Governance, 9*(3), 197-244. https://doi.org/10.1007/s10101-006-0031-y

Balabanova, D., Bayard, R., Erica, R., Christian, H., & McKee, M. (2012). Health care reform in the former Soviet Union : Beyond the transition. *Health Services Research, 47*(2), 840-864. http://dx.doi.org/10.1111/j.1475-6773.2011.01323.x

Bergh, A., & Nilson, T. (2010). Good for living? On the relationship between globalization and life expectancy. *World Development, 38*(9), 1191-1203. http://dx.doi.org/10.1016/j.worlddev.2010.02.020

Boettke, P., & Subrick, R. (2003). Rule of law, development, and human capabilities. *Supreme Court Economic Review*, *10*, 109-126. http://dx.doi.org/10.2307/1147140

Bousmah, M.-a.-Q., Ventelou, B., & Abu-Zaineh, M. (2016). Medicine and democracy: The importance of institutional quality in the relationship between health expenditure and health outcomes in the MENA region. *Health Policy, 120*(8), 928-935. http://dx.doi.org/10.1016/j.healthpol.2016.06.005

Bundervoet, T., Verwimp, P., & Akresh, R. (2009). Health and civil war in Rural Burundi. *Journal of Human Resources*, *44*(2), 536-563. http://dx.doi.org/10.1353/jhr.2009.0000

Burns, D. K., Jones, A. P., Goryakin, Y., & Suhrcke, M. (2017). Is foreign direct investment good for health in low and middle income countries? An instrumental variable approach. *Social Science & Medicine, 181*, 74-82. http://dx.doi.org/10.1016/j.socscimed.2017.03.054

Bussmann, M. (2009). The effect of trade openness on women's welfare and work life. *World Development*, *37*(6), 1027-1038. http://dx.doi.org/10.1016/j.worlddev.2008.10.007

Commission de l'Union africaine. (2015). *Agenda 2063. L'Afrique que nous voulons*. Addis Abeba: Commission de l'Union africaine.

Corrigall, J., Plagerson, S., Lund, C., & Myers, J. (2008). Global trade and mental health. *Global Social Policy*, *8*(3), 335-358. http://dx.doi.org/10.1177/1468018108095632

Cutler, D., Deaton, A., & Lleras-Muney, A. (2006). The Determinants of mortality. *Journal of Economic Perspectives*, *20*(3), 97-120. http://dx.doi.org/10.2307/30033668

David, A. C., Mlachila, M., & Moheeput, A. (2015). Does international integration matter for financial development in Africa? *Applied Economics*, *47*(15), 1525-1549. http://dx.doi.org/10.1080/00036846.2014.997925

Dawson, A. (2010). State capacity and the political economy of child mortality in developing countries revisited: From fiscal sociology towards the rule of law. *International Journal of Comparative Sociology*, *51*(6), 403-422. http://dx.doi.org/10.1177/0020715210387522

Dias, J., & Tebaldi, E. (2012). Institutions, human capital, and growth: the institutional mechanism. *Structural Change and Economic Dynamics, 23*(3), 300-312. http://dx.doi.org/10.1016/j.strueco.2012.04.003

Duque, V. (2017). Early-life conditions and child development: evidence from a violent conflict. *Population Health*, *3*, 121-131. http://dx.doi.org/10.1016/j.ssmph.2016.09.012

Falleti, T. G. (2009). Infiltrating the state: The evolution of health care reforms in Brazil, 1964-1988. In J. Mahoney & K. Thelen (Eds.), *Explaining institutional change: Ambiguity, agency, and power* (pp. 38-62). Cambridge : Cambridge University Press.

Fayissa, B., & Gutema, P. (2005).Estimating a health production function for Sub-Saharan Africa (SSA). *Applied Economics*, *37*(2), 155-164. http://dx.doi.org/10.1080/00036840412331313521

Friedman, W. (2018).Corruption and averting AIDS deaths. *World Development*, *110*, 13-25. http://dx.doi.org/10.1016/j.worlddev.2018.05.015

Gerring, J., Thacker, S. C., & Alfaro, R. (2012). Democracy and human development. *Journal of Politics*, *74*(1), 1-17. http://dx.doi.org/10.2307/41407630

Grossman, M. (2000). The human capital model. In Dans, Culyer, A. J., & Newhouse, J. P. (Eds.), *Handbook of health economics*, *1A*, 348-408. Amsterdam: The Netherlands.

Grossman, M. (1972). On the concept of health capital and the demand for health. *Journal of Political Economy*, *80*(2), 223-255. http://dx.doi.org/10.2307/1830580

Gupta, S., Davoodi, H. R., & Tiongson, E. (2002). Corruption and the provision of health care and education services. *Governance, Corruption and Economic Performance*, 245-249. Washington, D. C: International Monetary Fund.

Hoen, E. (2016). *Private patents and public health. Changing intellectual property rules for access to medicines*. Amsterdam: Health Action International

Holmberg, S., & Rothstein, B. (2010). Dying of corruption. *Health Economics, Policy and Law*, *6*(4), 529-547. http://dx.doi.org/10.1017/s174413311000023x

Horton, R. (2016). Offline: the rule of law-an invisible determinant of health. *The Lancet*, *387*(10025), 1260. http://dx.doi.org/10.1016/s0140-6736(16)30061-7

Huntington, S. P., & Fukuyama, F. (2006). *Political order in changing societies*. London: Yale University Press.

Hymer, S. (1992). The multinational corporation and the law of uneven development. *International Economic Policies and Their Theoretical Foundations,* 436-463.

Iqbal, Z., & Zorn, C. (2010). Violent conflict and the spread of HIV/AIDS in Africa. *The Journal of Politics, 72*(1), 149-162. http://dx.doi.org/10.1017/s0022381609990533

Jorgenson, A. K. (2009). Foreign direct investment and the environment, the mitigating influence of institutional and civil society factors, and relationships between Industrial pollution and muman health : A panel study of less-developed countries. *Organization & Environment*, *22*(2), 135-157.

Jung, Y., & Kwon, S. (2015). The effects of intellectual property rights on access to medicines and catastrophic expenditure. *International Journal of Health Services*, *45*(3), 507-529. http://dx.doi.org/10.1177/0020731415584560

Justesen, M. S. (2012). Democracy, dictatorship, and disease: political regimes and HIV/AIDS. *European Journal of Political Economy*, *28*(3), 373-389. http://dx.doi.org/10.1016/j.ejpoleco.2012.02.001

Kamiya, Y. (2011). Effects of health systems and socioeconomic factors in reducing child mortality in developing countries: Empirical results from system generalised method of moments. *Applied Econometrics and International Development, 11*(2), 29-42.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2010). The worldwide governance indicators: methodology and analytical issues. *World Bank Policy Research Working Paper,* (5430).

Klomp, J., & Haan, J. d. (2009). Is the political system really related to health? *Social Science & Medicine, 69*(1), 36-46. https://doi.org/10.1016/j.socscimed.2009.03.033

Kozlov, V. A., & Rosenberg, D. Y. (2018). Institutional deficit and health outcomes in post-communist states. *Economic Systems*, *42*(1), 119-131. http://dx.doi.org/10.1016/j.ecosys.2017.05.006

Labonté, R., Mohindra, K. S., & Lencucha, R. (2011). Framing international trade and chronic disease. *Globalization and Health*, *7*(21). http://dx.doi.org/10.1186/1744-8603-7-21

Lazarova, E. A., & Mosca, I. (2008). Does governance matter for aggregate health capital? *Applied Economics Letters*, *15*(3), 199-202. http://dx.doi.org/10.1080/13504850600721916

Leff, N. H. (1964). Economic development through bureaucratic corruption. *American*

Behavioral Scientist, *8*(2), 8-14. http://dx.doi.org/10.1177/000276426400800303

Levine, D., & Rothman, D. (2006). Does trade affect child health? *Journal of health Economics*, *25*(3), 538-554. http://dx.doi.org/10.1016/j.jhealeco.2005.10.001

Liang, L.-L., & Mirelman, A. J. (2014). Why do some countries spend more for health?An assessment of sociopolitical determinants and international aid for government health expenditures. *Social Science & Medicine*, 161-168. https://doi.org/10.1016/j.socscimed.2014.05.044

Lin, R.T., Chen, Y. M., Chien, L. C., & Chan, C. C. (2012). Political and social determinants of life expectancy in less developed countries: a longitudinal study. *BMC Public Health*, *12*(1). http://dx.doi.org/ 10.1186/1471-2458-12-85

Mackenbach, J. P., & McKee, M. (2015). Government, politics and health policy: a quantitative analysis of 30 European countries. *Health Policy, 119*(10), 1298-1308. http://dx.doi.org/10.1016/j.healthpol.2015.08.017

McGuire, J. W. (2001). Social policy and mortality decline in East Asia and Latin America. *World Development*, *29*(10), 1673-1697. http://dx.doi.org/10.1016/s0305-750x(01)00062-6

Menon, N., Rodgers, Y., & Nguyen, H. (2014). Women's land rights and children's human capital in Vietnam. *World Development*, *54*, 18-31. http://dx.doi.org/10.1016/j.worlddev.2013.07.005

Mohseni, M., & Lindstrom, M. (2007). Social capital, trust in the health-care system and self-rated health: the role of access to health care in a population-based study. *Social Science & Medicine*, *64*(4), 1373-1383. http://dx.doi.org/10.1016/j.socscimed.2006.11.023

Montalvo, J. G., & Reynal-Querol, M. (2007). Fighting against malaria: prevent wars while waiting for the "miraculous" vaccine. *Review of Economics and Statistics*, *89*(1), 165-177. http://dx.doi.org/10.2307/40043082

Muller, R. (1979). The multinational corporation and the underdevelopment of the third world. Dans C.K. Wilber (Eds.), *The political economy of development and underdevelopment* (pp. 151-178). Random House.

Nations unies (2015). *Transformer notre monde : le programme de développement durable à l'horizon 2030.* Washington, D.C.: Nations unies.

North, D. C. (1990). *Institutions, institutional change and economic performance.* New York, NY: Cambridge University Press.

Okada, K. (2018). Health and political regimes: Evidence from quantile regression. *Economic Systems*, *42*(2), 307-319. http://dx.doi.org/10.1016/j.ecosys.2017.06.003

Oster, E. (2012). Routes of infection: exports and HIV incidence in Sub-Saharan Africa. *Journal of the European Economic Association*, *10*(5), 1025-1058. http://dx.doi.org/10.1111/j.1542-4774.2012.01075.x

Owen, L., & Wu, S. (2007). Is trade good for your health? *Review of International Economics*, *15*(4), 660-682. http://dx.doi.org/10.1111/j.1467-9396.2007.00677.x

Pattanayak, S. K., Corey, C. G., Dickinson, K. L., Sills, E. O., Kramer, R. A., & Murray, B. C. (2005). *Deforestation, malaria and poverty*. Raleigh, North Carolina: RTI International.

Patterson, A., & Veenstra, G. (2016). Politics and population health: Testing the impact of electoral democracy. *Health and Place*, *40*, 66-75 http://dx.doi.org/.10.1016/j.healthplace.2016.04.011

Perkins, D., Radelet, S., & Lindauer, D. (2006). *Economics of development.* W.W. Norton & Company, Inc.

Pinzon-Rondon, A., Attaran, A., Botero, J., & Ruiz-Sternberg, A. (2015). Association of rule of law and health outcomes: an ecological study. *British Medical Journal Open*, *5*(10). http://dx.doi.org/10.1136/bmjopen-2014-007004

Polakoff, E. G. (2007). Globalization and child labor: Review of the issues. *Journal of Developing Societies*, *23*(1-2), 259-283. http://dx.doi.org/10.1177/0169796X0602300215

Radin, D. (2013). Does corruption undermine trust in health care? Results from publicopinion polls in Croatia. *Social Science & Medicine*, *98*, 46-53. http://dx.doi.org/10.1016/j.socscimed.2013.08.033

Reiter, S. L., & Steensma, H. K. (2010). Human development and foreign direct investment in developing countries: The influence of FDI policy and corruption. *World Development*, *38*(12), 1678-1691. http://dx.doi.org/10.1016/j.worlddev.2010.04.005

Sakyi, D., Bonuedi, I., & Evans Osei Opoku, E. (2018). Trade facilitation and social welfare in Africa. *Journal of African Trade,* *5*(1-2), 35-53. http://dx.doi.org/10.1016/j.joat.2018.08.001

Sen, K. (2015). Governance and development outcomes in Asia. In A. B. Deolalikar, S. Jha, & P. F. Quising (Eds.), *Governance in developing Asia: Public service delivery and empowerment* (pp. 78-100). Manila.

Stuckler, D., & Basu,S. (2009). The international monetary fund's effects on global health: before and after the 2008 financial crisis. *International Journal of Health Services*, *39*(4),771-781. http://dx.doi.org/10.2190/HS.39.4.j

Thow, A. M. (2009). Trade liberalization and the nutrition transition: mapping the pathways for public health nutritionists. *Public Health Nutrition*, *12*(11), 2150-2158. https://doi.org/10.1017/S1368980009005680

Wooldridge, J. M. (2016). *Introductory econometrics. A modern approch* Boston, MA: Cengage Learning.

[dataset]World Bank. (2019a). *World development indicators.* Washington,World Bank.

[dataset]World Bank. (2019b). *Worldwide governance indicators.* Washington,World Bank.

Yasar, Y. (2010). Gender, development, and neoliberalism : HIV/AIDS in Cambodia. *Review of Radical Political Economics*, *42*(4), 528-548. http://dx.doi.org/10.1177/0486613410375062

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