Health Aid and Health Improvement in Sub Saharan Africa

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Abstract:

Using a sample of 28 sub-Saharan African countries during the period of 2000-2010, this paper examines the effect of health aid on health outcomes. After taking into account the endogeneity and using the instrumental variable approach, the results reveal that health aid improves health outcomes in sub-Saharan African countries. More specifically, for each additional unit of health aid, life expectancy increases by 0.14, prevalence of HIV decreases by 0.05 and infant mortality decrease by 0.17. This effect operates mainly through the improvement of primary completion rate of female. However, the magnitude of the effects is too small if African countries would like to achieve MDGs through additional health aid. Furthermore, the Oaxaca-Blinder decomposition indicates that differences in terms of the amount of health aid received do not explain the health outcomes gap between post conflict countries and stable countries. The relevant variables are governance and the female primary completion rate. The policy implications of the paper are further discussed.

Key Words: Health Aid, Health outcomes, Instrumental variable, Sub-Saharan Africa

JEL Classification: C23, F35, I10

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INTRODUCTION

Studies undertaken on health care in developing countries evoked several arguments. First of all, the health status of the populations is a major preoccupation as it determines the level of productivity of the labor force and contributes to growth as well as to poverty reduction (Bloom et *al*., 2004; Carstensen & Gundlach, 2006; Weil, 2007). The key role of health as input for development has been reaffirmed at the international level, as proofed by the Millennium Development Goals (MDGs). Indeed, three out of the eight objectives of the MDGs are centered directly on health (child mortality reduction, improve maternal health and fight against HIV/AIDS, malaria and other disease). Secondly, the paradox that developing countries face relies on the size of their needs in the access to health care services in a context of severe financial constraints. Foreign aid remains one of the main sources of the external financing of health care services in developing countries in general and in Africa in particular (Ebeke & Drabo, 2011). This could be explained by the widely shared belief that foreign aid improves health outcomes in developing countries by relaxing resource constraints and directly improving health service delivery.

According to some researchers, Sub-Saharan Africa (SSA) has been a major recipient of health aid for decades (Gomanee et *al*., 2005a ; Williamson, 2008), yet this part of the world has exhibited poor health performance. A variety of factors have contributed to poor health indicators in SSA, including a lack of political will to put in place major reforms (e.g. improving governance, tackling corruption) and a lack of resources for financing the health sector.

Despite the recent global economic and financial crisis, gross ODA (Official Development Assistance) aid disbursement for health in SSA, has increased from one billion in 2000 to four billion in 2009 (World Bank, 2011). SSA is also making progress in the health sector. Maternal mortality rates have decreased from 777 deaths per 100,000 births in the 1990s to 588 per 100,000 in 2008. Similarly, the national under-five mortality rate has also dropped from 147 in 2000 to 118 in 2009. Life expectancy has improved and gone up from 52 in 1990 to 55 in 2009 (World Bank, 2011). In spite of these improvements, SSA still has a long way to go. Both maternal and under-five mortality rates should decrease by half in order to meet the fourth and fifth objectives of MDGs by 2015[2]. SSA has the highest HIV prevalence rate of

[2] The fourth goal is to reduce child mortality by two-third over its 1990 level ; the fifth goal is to reduce maternal mortality by two-third over its 1990 level

5%, followed by the Caribbean (1.1%), and Eastern Europe and Central Asia (0.8%) [Youde, 2010].

Despite the empirical literature considering the effect of foreign aid on growth, there is little disaggregated evidence on how overall foreign aid affects health, as well as how health aid affects health outcomes. Moreover within the available literature (Chauvet et *al*., 2008; Williamson, 2008, Ebeke & Drabo, 2011; Mishra and Newhouse, 2009; Masud & Yontcheva, 2005; Bell & Fink, 2005), there is no agreement or strong evidence of the effect of health aid on health outcomes. In fact, while Ebeke & Drabo (2011), Mishra & Newhouse (2009) find a strong positive effect of health aid, Williamson (2008), Wilson et *al*. (2008) do not observe any significant effect. One of the major concern in this literature is about the wide variety of health indicators used, ranging from life expectancy, infant mortality (Williamson, 2008; Wilson et *al.*, 2008; Mishra & Newhouse, 2009) to access to health care services (Ebeke & Drabo, 2011). This makes difficult the comparison across studies. Furthermore, most of the studies make use of a full sample of developing countries. Although they control for country and regional effect, this kind of studies are not able to fully account for regional specificity as it is the case for SSA countries. Another issue is related to the fact that there is almost no paper accounting for the vulnerability of countries. Yet, this is important because, as stated by Collier and Hoeffler (2002), Collier et *al* (2010), aid could be most effective in post conflict situation which is characterized by a high level of vulnerability. Thus it is important to investigate whether observed health outcomes gap between post conflict countries and stable ones be explained in terms of the differences in the amount of aid received. Finally, in the literature, both direct and indirect effects of foreign aid on the health indicators are not considered. This call for more investigation on the effect of health aid on the health improvement, mostly in SSA where the standards of living are very low. Thus the overall objective of the paper is to examine the effect of health aid on health outcomes in SSA.

The contribution of this paper is twofold. First the effectiveness of health aid in SSA is assessed while accounting for both direct and indirect impacts on the health indicators namely infant mortality, life expectancy and the prevalence of HIV AIDS. These indicators represent the main priorities of health system in SSA countries; and related data are available for a large set of countries. Second, the study leans upon the hypothesis that the effect of health aid on health indicators may differs according to the political environment. Specifically, we evaluate the contribution of differences in the amount of health aid received in explaining the health outcomes gap between post conflict states and stable states. For this purpose, we make use of the well know Oaxaca-Blinder decomposition which to our knowledge has not yet been used

in such macro analysis. Following Collier and Hoeffler (2002), post conflict countries are defined as countries having known civil war in the two last decades and that record some pocket of rebellion[3]. Our hypothesis comes from the fact that in African post conflict countries, there is more challenges of health service delivery. Post conflict countries may present bad indicators of health than countries in normal situation, due to the complexities of the sector, poor infrastructure, security issues, and the need to implement small-scale operations. The study concerns 28 SSA countries during the period 2000-2010.

The rest of the paper is organized as follows. Section 2 provides a literature review with emphasis on the recent literature. Section 3 outlines the empirical model and describes the data. Section 4 presents the results; section 5 discusses some robustness check while Section 6 concludes.

2. LITERATURE REVIEW

This section provides a review of the available literature on the relationship between foreign aid and health. The question of foreign aid impact on health outcome is highly controversial and excites polarized opinions. There are two competing hypothesis about how foreign aid affects health income in recipient countries. The first hypothesis is optimistic about aid impact on health. According to this view, foreign aid can have a positive effect on developing countries' health indicators by improving them (Drabo & Ebeke, 2011; Mishra & Newhouse, 2009; Chauvet *et al*., 2008). The second hypothesis is pessimistic. According to this view, aid is not only unable to promote health in recipient nations, but often has the opposite effect (Wilson et *al.,* 2009; Williamson, 2008).

In the first view, foreign aid is needed to enhance the quality of the health's indicators. In this vein, Chauvet et *al*. (2008) analyzed the respective impact of aid and remittances on human development as measured by infant and child mortality rates with a panel data on a sample of 109 developing countries, and cross-country quintile-level data on a sample of 47 developing countries. Their results suggest that health aid significantly improve child health outcomes. The impact of health aid is non-linear, though, suggesting that aid to the health sector is more effective in the poorest countries. Recent work by Ebeke & Drabo (2011) finds that remittances, health aid and public spending are important determinants of access to health services in recipients' countries. In the same vein, Mishra & Newhouse (2009) examine the relationship between health aid and infant mortality, using data from 118 countries between

[3] Angola, Burundi, CAR, Chad, DRC, Ivory Coast, Liberia, Uganda, Sierra Leone, Rwanda, Guinea Bissau.

1973 and 2004. They find that increased health aid is associated with a statistically significant reduction in infant mortality. The estimated effect of doubling health aid is a 2% reduction in infant mortality rates, which is small in light to the desired goals of the MDGs. In contrast, they fail to find concrete evidence for a statistically significant effect of overall aid in reducing infant mortality. The results are consistent with suggestive evidence that unlike overall aid, health aid is associated with a statistically significant rise in health spending. The estimated effect of health aid on infant mortality should be mitigated because the health aid data are likely to suffer from underreporting.

Masud & Yontcheva (2005) assessed the effectiveness of foreign aid in reducing poverty through its impact on human development indicators. Their results show that NGOs aid reduces infant mortality and does so more effectively than official bilateral aid.

The opposite view is that foreign aid is ineffective to improve health indicators in recipient countries. In this line, Wilson et *al.* (2009) find that the extensive funds going to the health sector aid basically have no impact on the level of mortality across countries. In short, health aid is not able to meet health needs, and health sector aid has had little visible effect on improvements in mortality. Likewise, Williamson (2008) finds a negligible impact of health sector aid on a variety of health outcomes, including Infant mortality, life expectancy and death rate. Kosack & Tobin (2006) find no impact of development assistance on infant mortality or life expectancy. Negative findings are not universal; Goomanee et *al.* (2005b) find that total aid flows (as a percentage of GDP) do lead to higher levels of aggregate welfare (as measured by the Human Development Index (HDI), though the effects are weaker for infant mortality. Kosack (2003) argues that development aid has a positive effect on HDI when the country is a democracy, but a negative effect in an autocracy.

Very little is known, however, about health aid effectiveness at the sub-aggregate level, such as the effect of projects targeted at particular health problems or at particular communities. White (2003) looks at specific health interventions in Bangladesh and finds that health outcomes are not related to health aid, but are related to aid in other sectors. From a 15 year, carefully controlled study in rural Gambia, Hill (2000) reports that both villages with assistance in providing primary care and those without assistance experience a decline in child health. Some works show the effectiveness of some types of targeted aid. Du Lou et *al.* (1995), for instance, evaluate a vaccination program in Senegal and find, unsurprisingly, a negative relationship between vaccination rates and child mortality.

Despite the empirical literature considering the effect of foreign aid on health, systematic evidence that aid improves HIV prevalence rates is surprisingly scarce. To the best of our

knowledge, the paper of Youde (2010) is the first empirical study to examine the effect of health aid on adult HIV prevalence rates. He finds that there exists a negative statistically significant relationship between adult HIV prevalence rates and the amount of foreign aid.

In the nutshell, most of the previous studies on the effect of foreign aid on health have mainly focused on large sample of developing countries. For the best of our knowledge, there is no study which focused exclusively on a sample of SSA. Though, Africa continues to trail the rest of the world on human development indicators including life expectancy; infant mortality; undernourishment; school enrollment; and the incidence of HIV/AIDS, malaria, and tuberculosis. The international aid lobby advocates more foreign aid and greater debt relief for Africa as impetus for development.

This study is a contribution to the clarification of the debate on the effects of Foreign Aid on Health indicators. It makes difference between African post conflict countries and countries in normal environment.

3. EMPIRICAL FRAMEWORK

In order to explore the effectiveness of health aid in health sector, we follow the bulk of the previous literature, notably Ebeke & Drabo (2011), Youde, (2010), Mishra & Newhouse (2009) and Williamson (2008). The uniqueness of our investigation framework lies on two points. 1) In addition to assessing the direct effect of health aid as it is done in the previous literature; we account for transmission channel (indirect effects) between health aid and health outcomes. 2) We use the well-known decomposition of Oaxaca Blinder in order to evaluate the contribution of health aid in explaining the health outcome gap between post conflict states and stable states.

3.1. Direct effect of health aid in sub-saharan African countries

3.1.1 Ordinary least square

We begin by running a simple OLS fixed effect estimates. Our baseline specification is as follows:

$$Health_{it} = haid_{it}\theta_1 + X'_{it}\beta + \alpha_i + \tau_t + \varepsilon_{it} \quad (1)$$

Where $Health_{it}$ refers to health indicator for country i at time t, $haid_{it}$ is health aid per capita for country i at time t and X is a set of control variables. The main variable of interest is

foreign aid to the health sector. This is the aggregate total for general health and basic health. It includes health policy and administrative management; medical education/training; medical research and medical services. Related data are drawn from the World Bank (ADI[4], 2011). This is the more recent database made available by the World Bank for African countries. Data are collected for 28 SSA countries over the period of 2000-2010 for which information are available. In fact the less availability of data specific to African states, notably for various indicators of health justifies the short time period of the study. Moreover, using the most recent data permit to better appreciate the major progress of African states toward the MDGs[5]. Data are yearly. This could raise the issue of stationarity. Though, it is not the case because the maximum years of observations per country stand at 4. Likewise, most of the unit root tests in panel data cannot be handled with a number of years lower than 9 (this is for instance the case for the Im-Pesaran-Shin test). Finally, one could use a five years average, but we lose a high number of observations and it becomes difficult to run a regression.

Three main health indicators are used to capture the overall quality of health in each sub-Saharan country. These include life expectancy, HIV prevalence and infant mortality at birth. Life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life. Prevalence of HIV refers to the percentage of people aged from 15 to 49 years that are infected with HIV. Infant mortality rate is the number of infants dying before reaching one year of age, per 1,000 live births in a given year. All these variables are taken from the World Bank (ADI, 2011). Following Williamson (2008), we expect a positive impact of health aid on life expectancy, while this effect should be negative for infant mortality (see also Mishra & Newhouse, 2009, Wagstaff, 2011). Furthermore, we expect that the flow of health aid in health sector may lead to a decline in the HIV prevalence as far as more funds are spent for the prevention of HIV infection.

A full set of control variables are included in the model: the urban population in percentage of the total population, an index of governance to control for changes in institutional environment (see Williamson, 2008), lagged variable of GDP[6] per capita constant 2000 US$, Gross fixed capital formation, school enrollment rate in primary, female primary completion rate, lagged variable of fertility rate, inflation (CPI) and labor force. Except governance for

[4]African development indicator
[5]The list of countries is in appendix
[6] It is well know that GDP is an endogenous variable and is also to some extend correlated to governance (Williamson, 2008)

which data are from the World Wide Governance Indicator of the World Bank[7], all the aforementioned data are from World Bank (ADI, 2011). Using the GDP per capita, we control for the level of development as far as high level of development may be correlated with high health expenditure (Acemoglu & Johnson, 2006). Besides all education variable should positively impact life expectancy and negatively affect infant mortality and HIV prevalence. The respective effect of fertility and urban population are mixed (see Williamson, 2008; Kalemli-Ozcan & Turan, 2011)[8]. As far as governance is concerned, one expects a positive effect on life expectancy and a negative effect on HIV prevalence and infant mortality. This could be explained by the fact that countries with high level of governance attract more aid which is also better managed (Fielding, 2011).

It would be appropriate to include in the model other control variable such as the number of physicians. However, this variable does not have enough observation over the short period retained for this paper. Moreover, the fact that the marginal effect of health aid on life expectancy should decrease as the life expectancy increase raises the issue of non linearity. Although we address a short time relationship, the squared of health aid is included in equation (1), for the purpose of robustness check. Table 1 presents the descriptive statistics of variables used in the regression while Table 2 displays the OLS fixed effects estimates (to be discussed in the section devoted to results).

[Insert Table 1 about here]

3.1.2. Instrumental variable estimates

The main drawback behind OLS is that OLS results are biased if aid is correlated with the unobserved component of health indicator (life expectancy, infant mortality or prevalence of HIV). For instance, if countries receive more health aid as infant mortality increases, the beneficial effect of aid would be underestimated (Mishra & Newhouse, 2009; Ebeke & Drabo,

[7] We compute an index of governance using Principal Component Analysis and based on the six aggregate dimensions of governance. Afterward, this index is standardized using the following formula : $\frac{governance - \min(governance)}{\max(governance) - \min(governance)}$

[8] Fertility is mainly used for robustness check. However in order to account for its potential endogeneity (Kalemli-Ozcan & Turan, 2011), one makes use of the lagged variable of fertility.

2011). Another potential source of bias is measurement error. Since the health aid data are reported by donors, any measurement error is likely to be correlated with the characteristics of the recipient country, which would imply that any beneficial effect of aid would be further underestimated (Mishra & Newhouse, 2009).. OLS results could be therefore biased toward zero and they can underestimate the 'true' impact. To deal with the endogeneity bias, one makes use of an instrumental variable approach.

Four instruments are used following the instrumentation procedure initiated by Tavarez (2003) and recently revisited by Brun et *al.* (2006), Chauvet et *al.* (2008) and Ebeke & Drabo (2011).

The idea behind this procedure is that the level of foreign aid received by a given country from each one of the major donors is related to the various aspects of the proximity (geographical and cultural proximities) between the considered developing country and the donors (Ebeke & Drabo, 2011). In this vein, we make use of 1) the amount of aid given by each donor weighted by an indicator of common language between recipient country and donors. 2) the amount of aid given by each donor weighted by an indicator of common dominant religion in both recipient and donor country. 3) Conventional deficit in the donor country weighted by the inverse geographical distance between the recipient and the donor country. 4) Global donation weighted by the inverse geographical distance between the recipient and the donor country. Data related to these instruments are taken from Ebeke & Drabo (2011).

In order to check the quality (to ensure that instruments are not weak) of the considered instruments, we rely on the Stock and Yogo (2005) weak instrument test. Results are reported in each table of result according to the specification adopted.

3.1.3. Contribution of Health aid to the health outcome gap between post conflict states and stable states

This subsection is built on the idea that aid could be more effective in post conflict countries than in stable ones (see Collier & Hoeffler, 2002; Collier et *al*, 2010).

The rationale behind this statement relies upon the fact that during the first few years of peace, the absorptive capacity of aid is about twice what it is usually. Moreover, as highlighted by Collier et *al* (2010), aid stabilizes post-conflict environment and increase the probability of the success of aid projects. Following this view, we want to investigate whether

differences in the amount of aid received, between post conflict countries and stable countries could explain their health outcome gap.

This approach differs to the usual methodology where an interaction variable between aid and a dummy of conflict (1 for post conflict countries and 0 otherwise) is included in the regression. In fact, using this methodology, we are able to evaluate the contribution of each explanatory variable to the gap (in terms of health outcomes) between post conflict countries and stable countries.[9] Let us recall that post conflict countries are defined as countries having known civil war in the two last decades and that record some pocket of rebellion. For the sake of simplicity, we adopt a general presentation following Yun (2005). Suppose that we have a variable of health which is a function of a linear combination of independent variables such that:

$$h = F(V\psi) \qquad (2)$$

F is a function which itself may be or may not be linear. h is a variable for health. V is the $K \times N$ matrix of independent variables and among which we have health aid. Suppose that we have two groups A (stable countries) and B (post conflict countries).

The mean difference between A and B can be decomposed as follows:

$$h_A - h_B \equiv \left[\bar{F}(V_A\hat{\psi}_A) - \bar{F}(V_B\hat{\psi}_A) \right] + \left[\bar{F}(V_B\hat{\psi}_A) - \bar{F}(V_B\hat{\psi}_B \right] \quad (3)$$

Where $\hat{\psi}$ is the estimated vector of coefficients from equation (2). The first component in bracket measures differences in observable characteristics (explained components) and the second component measures differences in coefficients (unexplained components).

Following Even and Macpherson (1990; 1993), Yun (2005), the contribution of a variable k to health outcomes differential in explained component is given as follows:

$$C_k = \left[\bar{F}(V_A\hat{\psi}_B) - \bar{F}(V_B\hat{\psi}_B) \right] \left[\frac{(\bar{V}_A^k - \bar{V}_B^k)\hat{\psi}_A^k}{(\bar{V}_A - \bar{V}_B)\hat{\psi}_A} \right] \quad (4)$$

Where $\bar{V}_g^k$ is the mean of observations of the variable k in the group g: A, B. $\hat{\psi}_g^k$ is the estimated coefficient of variable k in group g.

[9] This should need many dummies and raises an issue of high collinearity between explanatory variables if one makes use of the traditional methodology.

3.2. Indirect effect of health aid in sub-Saharan African countries

Any assessment of health aid effectiveness needs to identify the key channels through which aid may impact several health outcomes such as life expectancy, prevalence of HIV or infant mortality. In this vein, two main channels have been highlighted in the literature.

According to Schmidt (2009), Levine et *al* (2004), Mishra and Newhouse (2009), aid leads to improved outcomes in poor countries by reducing resource constraints and directly improving health service delivery. Specifically, aid leads to the increase of health spending and therefore an improvement of health outcomes. However, one should be cautious as regard to this channel. In fact, in poor countries, health aid constitutes a huge part of health spending (Williamson, 2008; Youde, 2010) due to lack of internal resources. Thus, health spending cannot be seen as a channel through which health aid may affect health outcomes.

Besides, past studies indicate that health aid may be used to improve female literacy and consequently generalize the adoption of health best practice (Wagstaff, 2011; Mishra and Newhouse, 2009). It is this later channel which is tested in this paper.

In order to evaluate the indirect effects of health aid, we rely upon the paper of Karlson et *al* (2010).[10] This is a well known approach according to which the indirect effect of health aid on health outcomes is the difference between the total effect of health aid and the direct effect of health aid. The total effect of health aid is the one obtained when we run a simple regression of health aid on health outcomes. The direct effect is the one obtained when we control for a full set of potential explanatory variables.

4. RESULTS

In this section, we turn to the discussion of statistical and econometric results.

4.1. Aid trend and health outcomes: some basic correlations

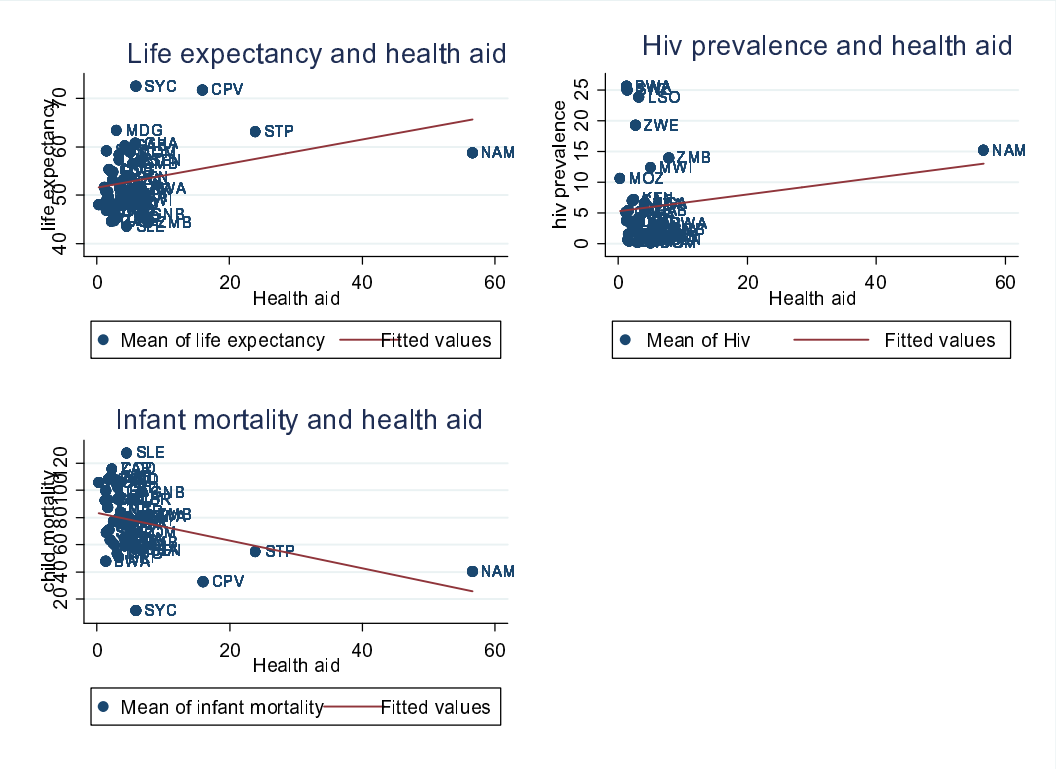
A useful starting point is to examine the bivariate relationship between health aid and each health outcome.

Figure 1 presents a combined graph of the correlation between health aid and each health outcome. The first graph in the up left side shows an intuitive positive correlation between health aid and life expectancy. The third graph in the down side shows a negative association between health aid and infant mortality. Finally, the second graph in the up right side exhibits

[10] This approach is preferred to the residual generated regressor of Pagan (1984) used by Gomanee et al (2005). The main drawback of their methodology is that one cannot always know the properties of the residuals.

a counterintuitive positive correlation between health aid and the prevalence of HIV. This positive association likely reflects the endogeneity of aid, as more aid flows to countries where health indicators are deteriorating.

Figure 1: basic correlation between health aid and selected health outcomes



The scatter plot is only suggestive, and the next subsection presents results from regression analysis that includes additional control variables.

4.2. Health aid and health outcomes: some econometric results

The main objective of this subsection is to present and discuss the results drawn from econometric analysis. Specifically, we discuss both observed direct and indirect effect of health aid on some health outcomes.

4.2.1. Does health aid directly affect health outcomes in selected sub-Saharan African countries?

Table 2 provides the OLS fixed effect estimates of the impact of health aid on respectively life expectancy, prevalence of HIV and infant mortality. According to this table, health aid has a positive and significant (at the 1% level) effect on life expectancy, while its influence is negative as regard to the prevalence of HIV. Especially, for each additional unit of health aid,

life expectancy increases by 0.03 while the prevalence of HIV decrease by 0.04. The effect of health aid on infant mortality is not significant.

[Insert Table 2 about here]

To determine these results more accurately, an instrumental variable estimation is implemented to control for the potential endogeneity bias driving the effect of health aid. Let us recall that health aid is instrumented by the amount of aid weighted by indicators of geographical and linguistic proximity between the receiver and the main donors (see section 2). The instrumental variable estimates are presented in table 3. The results confirm the previous observations. In fact, after taking into account the endogeneity, the effect of health aid remains significant. More specifically, for each additional unit of health aid, life expectancy increases by 0.14, prevalence of HIV decrease by 0.05 and infant mortality decrease by 0.17. Furthermore, the respective values of Cragg–Donald Wald Fisher statistics of weak identification are all above the Stock-Yogo critical values (Stock and Yogo, 2005), suggesting that the instrument chosen are not weak. In the same vein, the Hansen's test for over-identifying restrictions does not reject the null hypothesis that the instruments used are not correlated with the residuals of the structural equation. The magnitude of the 2SLS estimates of the effect of health aid on health outcomes is higher than that of the OLS estimate. This is consistent with a positive correlation between the unobserved components of each health outcome measure and health aid. The increased magnitude of the 2SLS estimate relative to the OLS estimate could also be attributed to noise in the per capita health aid variable, which would attenuate the OLS estimates towards zero (Mishra and Newhouse, 2009). Turning to other control variables, better governance improves health whatever the indicator chosen. This result is similar to that of Chauvet et *al.* (2008) and may find an explanation on the fact that in poor countries there is a huge lack of health infrastructure as regard to health demand and low ability to pay for health care services. Furthermore, GDP per capita is more likely to reduce infant mortality and the prevalence of HIV while they have no effect on life expectancy. This latter result is quietly surprising. However, this is a short run effect since improvement in health outputs implies some structural changes in health inputs (infrastructures, human capital, and governance) that only occur in the long run.

[Insert Table 3 about here]

Finally, both OLS and 2SLS estimates suggest that health aid in sub-SSA is effective in solving health issues. This is true for all the used indicators which are life expectancy, prevalence of HIV and infant mortality.

In order to refine the analysis, we make a comparison between post conflict countries and stable ones. As stated earlier in the paper, this choice is in accordance with the idea that aid could be more effective in post conflict states than in stable one[11]. Before presenting the results of the Oaxaca-Blinder decomposition, the T-test of difference in sample mean is computed in order to assess whether there is a significant difference between post conflict states and stable states in terms of the amount of health aid per capita, life expectancy, prevalence of HIV and infant mortality. Table 4.1 displays the results. The main observation drawn from this table is that there is a significant difference (at the 1% level) between post conflict countries and stable countries in terms of both the amount of health aid received and health outcomes. Precisely, post conflict countries receive less aid than stable ones (3.4 USD per capita against 6.5 USD per capita) while they exhibit a higher rate of infant mortality (148/1000 against 120/1000). Besides, life expectancy is higher in stable states (53 years) than in post conflict states (50 years). On contrary, the results of the sample mean test show that the prevalence of HIV is higher in stable countries (7.17 %) than in post conflict ones (3.47%). Once this mere comparison has been done, it is useful to see whether the observed differences in the amount of health aid received can explain the observed differences in health outcomes. Table 4.2 gives an answer to this question as it presents the contribution of health aid to the health outcome gap between post conflict countries and stable countries. The first remark which can be made is that whatever the measure of health outcomes, differences in the amount of aid received do not explain differences in health outcomes[12]. On the contrary, differences in terms of the primary completion rate for female and in terms of governance seem to be the main explanation of the differences in health outcomes.[13]

[Insert Table 4.1 & Table 4.2 about here]

[11] The reader may wonder why the paper does not make the comparison according to the level of governance. It is well established that post conflict countries are those who receive an important amount of aid during the early years following the conflict. Then it seems appropriate to assess its effectiveness in this specific context as regard to stable countries.

[12]For the purpose of interpretation, let us underline that what is useful is the columns related to endowments, that is the contribution of the differences in explanatory variables (columns 2, 6, 10 and 14). Table 4.3 in appendix provides the results of an alternative approach based on a regression which control for conflict dummy.

[13] However this result does not hold for the prevalence of HIV.

4.2.1. Does health aid indirectly affect health outcomes in selected sub-Saharan African countries?

Table 5 shows the results of the estimation of the indirect effects of health aid on health outcomes. According to the relevant literature (Schmidt, 2009; Mishra and Newhouse, 2009), we test one main channel[14]: the primary completion rate for female. The results show that this channel is valid as regard to infant mortality and life expectancy. This suggests that investing the amount of health aid on the improvement of female education may be a way to improve health outcomes. Such an effect can operate through a better prevention and reduction of risk behavior.

[Insert Table 5 about here]

5. ROBUSTNESS CHECK

Three types of robustness check are implemented[15].

Following Williamson (2008), we make use of an alternative measure of health aid. For this purpose, the aid devoted to general health is chosen. This is described as aid allocated for health policy and administrative management; medical education/training; medical research and medical services. Data are from World Bank (ADI, 2011). Table 6.1 shows that the results still hold for life expectancy and the prevalence of HIV. However, one may notice that the magnitude of the effects is much higher.

As a second robustness check, we account for non linearity by including the squared of health aid in the model. The results displayed in table 6.2 do not provide any evidence of a non linear relationship between health aid and respectively life expectancy and the prevalence of HIV. Nevertheless, this result can be explained by the short period of the study which does not permit to assess the long run effects of health aid. Yet, the results provide a support to the hypothesis of a non linear relationship between health aid and infant mortality. Specifically, above a threshold of 41US$ per capita, the effect of health aid diminish. The only country

[14] We discussed about the relevance of health expenditure as a channel in the section devoted to the methodology.

[15] We also add fertility as an additional control. According to Kalemli-Ozcan & Turan (2011), there is a reverse causal relationship between fertility and health outcomes, notably, the prevalence of HIV. This is a way to address this issue.

which has reached this level is Namibia which records an amount of 44.24 US$ per capita of health aid.

Finally, following Hadi (1992) and Mishra and Newhouse (2009), a regression is ran on an alternative sample excluding Namibia which exhibit an average of health aid that represents more than 10 times the mean of the amount received by the remaining countries in the sample. The results presented in table 6.3 shows that the main results are to some extent very sensitive to dropping these observations. In fact the effect of health aid is not longer significant as regard to the prevalence of HIV and infant mortality.

[Insert Table 6.3 about here]

To summarize, we found a positive effect of aid in improving health outcomes in SSA countries. Moreover, the obtained results suggest that this effect operate mainly through the improvement of female primary completion rate. Besides, the results show that differences in the amount of aid received between post conflict states and stable states does not explain the observed health outcomes gap.

6. CONCLUDING REMARKS

Despite the long standing debate on the effectiveness of health aid, studies related to the effects of health aid on health outcomes are surprisingly very scarce. This paper adds to the existing literature by providing the evidence of health aid effectiveness using a sample of 28 SSA countries over the period of 2000-2010.

After factoring in the endogeneity, the obtained results suggest that health aid help improving health outcomes in sub SSA. More specifically, for each additional unit of health aid, life expectancy increases by 0.14, prevalence of HIV decrease by 0.05 and infant mortality decrease by 0.17. This effect is quite small as regard to what is needed to achieve the millennium development goals. Moreover, the results seem to be very sensitive to the amount of aid received. However, this study adds to microeconomic works and provides evidence that reinforces the common believe according to which health aid improve health outcomes in SSA countries which are the most vulnerable countries within the block of developing countries. Furthermore, the current study has been able to identify a valid channel through which health aid affect health outcomes. In other words, the estimate shows that at the sole exception of HIV prevalence, the female primary completion rate is the main channel through

which health aid affects health outcomes. Finally, the analysis indicates that differences in terms of the amount of health aid received do not explain the health outcomes gap between post conflict countries and stable countries. The relevant variables are governance and the female primary completion rate.

Given the fact that health aid improves the health of the citizens of SSA, one policy recommendation could be to encourage external funding from donor agencies and international organizations, and the policymakers receiving these aids must managed them accordingly and be accounted. Furthermore, health aid should be oriented toward sub sector that are relevant to achieve MDGs.

To sum up, this paper has demonstrated that health aid matters in Sub Saharan african countries. Even though the magnitude of the effect is quietly small, the results are robust to various falsification tests. Moreover, as far as health aid suffer for under-reporting; our estimates are likely to underestimate the true effect of health aid mainly in the OLS specification. Besides, due to lack of data this study only provide a short term evidence on the effect of health aid on health outcomes in SSA. In this vein, an avenue for future research may focus on an improvement of identification strategy and the increase of the length of the period under analysis in order to be able to assess a long run effect of health aid in Africa.

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APPENDIX

Table 1: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Life expectancy	92	52.43036	4.888486	42.85856	64.11217
Prevalence of HIV	88	6.130682	7.307064	.2	26.3
Infant mortality at birth	92	78.10217	18.16568	38.6	114
Health aid per capita	92	4.177379	7.77335	.1441504	51.18747
General health aid per capita	91	2.261319	4.001701	.0102973	24.95076
GDP per capita	92	656.1136	930.389	109.1669	4015.086
Gross fixed Capital formation	92	20.52117	6.86806	6.097673	59.72307
School enrolment rate primary	92	92.3457	25.05032	39.38571	144.8676
Female primary completion rate	82	48.1951	22.73648	16.8888	97.75262
Lagged variable of fertility	92	5.321522	.9974156	3.019	7.421
Urban population% total	92	32.81522	16.17466	8.78	82.9
Inflation CPI	92	6.311129	6.119928	-5.3554	26.67495
Labor force	92	53.31933	2.689961	48.57729	61.56084
Composite index of governance	92	.5076966	.1373029	.2690155	.8897291
Instrument 1	92	35.92705	73.90722	-19.97155	619.0123
Instrument 2	92	28.82295	74.43278	-38.76798	631.3417
Instrument 3	92	-.0031469	.0010753	-.0061496	-.001516
Instrument 4	92	4.30876	1.552522	1.125351	8.606515

Table 2: Estimated effects of health aid on health outcomes, 2000-2010, OLS fixed effect

	(1)	(2)	(3)
Dependent variables	Life expectancy	Hiv prevalence	Infant mortality
Health aid per capita	0.0343**	-0.0418***	0.0228
	(0.0157)	(0.00601)	(0.0645)
GDP per capita	0.00210	-0.00174***	-0.0203***
	(0.00128)	(0.000549)	(0.00629)
Gross fixed Capital formation	0.0375*	-0.0140	-0.0567
	(0.0209)	(0.0108)	(0.0607)
School enrolment rate primary	0.0125	-0.00588	0.00885
	(0.0223)	(0.0108)	(0.0813)
Primary completion rate female	0.0499***	0.00910	-0.228***
	(0.0160)	(0.00758)	(0.0629)
Urban population% total	0.400**	0.0197	-1.422
	(0.183)	(0.0957)	(0.868)
Inflation CPI	0.0237**	-0.00939	0.00591
	(0.0113)	(0.00842)	(0.0383)
Labor force	0.0130	0.0524	-1.035
	(0.211)	(0.190)	(1.342)
Composite index of governance	8.512**	-2.579**	-38.98***
	(3.414)	(1.102)	(12.42)
Constant	28.03**	6.554	224.4***
	(11.77)	(8.798)	(71.93)
Number of observations	147	140	147
R-squared	0.765	0.525	0.752
Prob>Chi2	[0.000]	[0.000]	[0.000]
Number of countries	29	28	29

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

Table 3: Estimated effects of health aid on health outcomes, 2000-2010, IV fixed effect

	(1)	(2)	(3)
Dependent variables	Life expectancy	Hiv prevalence	Infant mortality
Health aid per capita	0.145***	-0.0530***	-0.171*
	(0.0288)	(0.0140)	(0.0978)
GDP per capita	0.000662	-0.00111***	-0.0251***
	(0.000670)	(0.000390)	(0.00274)
Gross fixed Capital formation	0.0210**	-0.00703	-0.0203
	(0.00899)	(0.00554)	(0.0193)
School enrolment rate primary	0.0237	0.00234	-0.130***
	(0.0159)	(0.00477)	(0.0463)
Primary completion rate female	0.0216	0.00457	-0.0675
	(0.0162)	(0.00933)	(0.0694)
Urban population% total	0.351**	0.0513	-1.651**
	(0.150)	(0.107)	(0.613)
Inflation CPI	0.0229***	-0.0131	-0.000121
	(0.00812)	(0.00824)	(0.0305)
Labor force	-0.163	-0.117	-0.0255
	(0.145)	(0.117)	(0.670)
Composite index of governance	8.771***	-2.877*	-18.26*
	(2.739)	(1.556)	(9.826)
Number of observations	91	87	91
Number of countries	27	26	27
Number of excluded instruments	2	3	4
F-test of aid instrumentation equation: *P*-value	[0.000]	[0.000]	[0.000]
F-test values	224.16	163.23	124.6
Hansen OID test-p-value	0.39	0.28	0.18

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The endogenous variable is health aid. The Cragg–Donald Wald F-stat. of weak identification are all above the Stock-Yogo weak ID test criticl values.

Table 4: Instrumentation equations, first step of IV estimation

	(1)	(2)	(4)
Dependent variables	Health aid	Health aid	Health aid
Instrument 1	0.0313**	0.0309**	0.0309**
	(0.0131)	(0.0134)	(0.0133)
Instrument 2	-0.00663	-0.00643	-0.00663
	(0.0132)	(0.0136)	(0.0131)
Instrument 3		128.4	135.2
		(195.4)	(181.9)
Instrument 4			0.0412
			(0.147)
GDP per capita	-0.00341	-0.00345	-0.00334
	(0.00249)	(0.00254)	(0.00283)
Gross fixed Capital formation	0.00794	0.00817	0.00820
	(0.0226)	(0.0224)	(0.0217)
School enrolment rate primary	-0.00432	-0.00550	-0.00566
	(0.0349)	(0.0354)	(0.0355)
Primary completion rate female	0.103*	0.102*	0.102*
	(0.0530)	(0.0512)	(0.0514)
Urban population% total	0.166	0.181	0.148
	(0.285)	(0.295)	(0.353)
Inflation CPI	0.0110	0.0157	0.0148
	(0.0251)	(0.0207)	(0.0202)
Labor force	0.474	0.468	0.446
	(0.394)	(0.385)	(0.422)
Composite index of governance	-1.989	-2.009	-1.892
	(5.928)	(6.188)	(6.221)
Constant	-28.89	-28.53	-26.53
	(20.10)	(19.69)	(23.42)
Observations	93	93	93
R-squared	0.433	0.436	0.436
Number of countries	29	29	29

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Instruments are defined in appendix

Table 4.1: T-test for difference in sample mean between post conflict states and stable states

Variables	Health aid		Life expectancy		HIV prevalence		Infant mortality	
	Post conflict	**Stable**	**Post conflict**	**Stable**	**Post conflict**	**Stable**	**Post conflict**	**Stable**
Mean	3.419502	6.684717	49.8465	53.10571	3.470833	7.015417	147.9477	120.0255
Difference	3.265215		3.259217		3.544583		-27.92219	
T-statistic	3.7304		6.2832		6.7521		-7.9514	

Table 4.2: Contribution of Health aid to the health outcome gap between post conflict states and stable states,

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Life expectancy				Hiv prevalence				Infant mortality at birth			
	Overall	Endowments	Coefficients	Interaction	Overall	Endowments	Coefficients	Interaction	Overall	Endowments	Coefficients	Interaction
Health aid per capita		-0.569	0.751	1.054		-0.523	0.0634	0.0845		3.769	-3.216**	-4.513
		(0.786)	(0.471)	(1.074)		(0.638)	(0.364)	(0.490)		(3.547)	(1.349)	(4.091)
GDP per capita		2.077	-3.035	-3.645		-1.048	3.765**	3.713		-12.99	11.92	14.32
		(3.714)	(3.117)	(4.224)		(1.482)	(1.902)	(2.978)		(11.10)	(7.432)	(11.78)
Gross fixed Capital formation		0.280	3.392	0.440		-0.255	-4.239**	-0.736		-0.532	-9.439	-1.224
		(0.321)	(2.192)	(0.508)		(0.231)	(1.761)	(0.685)		(0.672)	(8.243)	(1.586)
School enrolment rate primary		-1.176	19.14***	1.677		0.205	-0.945	-0.0633		2.856	-39.24**	-3.437
		(1.377)	(7.400)	(2.012)		(0.384)	(6.364)	(0.438)		(3.350)	(19.24)	(4.252)
Primary completion rate female		4.207*	-10.52**	-5.155		-0.580	4.943	2.202		-16.45*	16.18	7.930
		(2.456)	(5.053)	(3.214)		(0.761)	(4.248)	(2.150)		(8.444)	(13.33)	(7.251)
Urban population% total		-0.881	6.075	1.455		0.359	-11.92***	-1.788		4.593	-16.40	-3.926
		(1.386)	(5.246)	(1.900)		(0.649)	(4.534)	(2.940)		(4.988)	(10.000)	(4.532)
Inflation CPI		0.118	-1.432	-0.191		-0.106	1.398	0.672		-0.223	3.038	0.406
		(0.266)	(1.106)	(0.450)		(0.104)	(0.872)	(0.562)		(0.506)	(3.072)	(0.991)
Labor force		0.619	0.763	0.0110		-0.243	30.86	0.380		-1.384	17.09	0.246
		(0.913)	(38.82)	(0.559)		(0.452)	(33.39)	(0.792)		(2.024)	(87.71)	(1.309)
Composite index of governance		3.866	-2.542	-1.521		2.317	-4.941	-3.154		-14.24*	12.63	7.555
		(2.832)	(5.878)	(3.523)		(1.650)	(4.622)	(2.985)		(8.167)	(15.79)	(9.512)
Stable states	53.50***				7.718***				71.47***			
	(1.183)				(2.020)				(4.535)			
Post conflict states	51.45***				4.157***				84.62***			
	(1.286)				(0.531)				(5.084)			
difference	2.050				3.561*				-13.15*			
	(1.747)				(2.088)				(6.813)			
endowments	8.542**				0.127				-34.61**			
	(3.863)				(1.677)				(14.80)			

coefficients	-0.615				2.124				4.099			
	(2.257)				(3.043)				(5.298)			
interaction	-5.877				1.309				17.36			
	(4.325)				(3.936)				(13.20)			
Constant			-13.21				-16.86				11.53	
			(37.53)				(31.25)				(83.16)	
Observations	150	150	150	150	143	143	143	143	150	150	150	150

Table 5: Indirects effects of health aid on health outcomes

	(1)	(3)	(5)
Dependent variable	Life expectancy	Hiv prevalence	Infant mortality at birth
Total effect	0.0620***	-0.0425***	-0.0500
	(0.0188)	(0.00995)	(0.0754)
Direct effect	0.0448**	-0.0427***	0.0168
	(0.0183)	(0.00972)	(0.0736)
Indirect effect	0.0173**	0.000230	-0.0667**
	(0.00823)	(0.00129)	(0.0319)
Transmission channel	female primary completion rate	female primary completion rate	female primary completion rate
Observations	149	141	149

Table 6.1: Robustness check, IV fixed effect, Changing the interest variable (health aid general)

	(1)	(2)	(3)
Dependent variables	Life expectancy	Hiv prevalence	Infant mortality at birth
Health aid general per capita	0.219***	-0.112***	-0.331
	(0.0634)	(0.0327)	(0.200)
GDP per capita	0.000796	-0.00104***	-0.0256***
	(0.000612)	(0.000347)	(0.00298)
Gross fixed Capital formation	0.0174**	-0.00854*	-0.0155
	(0.00729)	(0.00482)	(0.0213)
School enrolment rate primary	0.0249	-0.00289	-0.108**
	(0.0166)	(0.00557)	(0.0496)
Lagged variable of fertility	0.00990	0.00479	-0.0856
	(0.0135)	(0.00822)	(0.0632)
Primary completion rate female	-3.203**	-1.425	2.243
	(1.362)	(0.850)	(5.288)
Urban population% total	0.185	-0.00835	-1.402*
	(0.153)	(0.0908)	(0.726)
Inflation CPI	0.0166*	-0.0107	0.00182
	(0.00880)	(0.00706)	(0.0331)
Labor force	-0.548**	-0.281*	0.294
	(0.256)	(0.143)	(1.022)
Composite index of governance	8.713**	-1.167	-20.62*
	(3.254)	(1.350)	(11.23)
Observations	90	86	90
Number of countries	27	26	27
Number of excluded instruments	2	3	4
F-test of general health aid instrumentation equation	149.49	70.26	84.12
Hansen OID test-p-value	0.98	0.16	0.11

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The endogenous variable is health aid. The Cragg–Donald Wald F-stat. of weak identification are compared with the Stock-Yogo weak ID test critical values. [19.93 (10%); 11.59 (15%); 8.75 (20%); 7.25 (25%)] for (1) &(4), [9.08 (10%); 6.46 (20%); 5.39 (25%)] for (2) & (3).

Table 6.2: Robustness check, IV fixed effect, accounting for non linearities

	(1)	(2)	(3)
Dependent variables	Life expectancy	Hiv prevalence	Infant mortality at birth
Health aid general per capita	0.272*	-0.0527	-1.229**
	(0.152)	(0.0813)	(0.489)
Health aid general per capita squared	-0.00233	0.000393	0.0149*
	(0.00226)	(0.00130)	(0.00847)
GDP per capita	0.00136	-0.000753	-0.0300***
	(0.000837)	(0.000475)	(0.00461)
Gross fixed Capital formation	0.0178***	-0.00569	-0.0318
	(0.00571)	(0.00644)	(0.0346)
School enrolment rate primary	0.0172	0.00265	-0.0505
	(0.0142)	(0.00482)	(0.0421)
Lagged variable of fertility	0.00983	0.00154	-0.00286
	(0.0161)	(0.0114)	(0.0838)
Primary completion rate female	-3.179**	-1.012	8.745
	(1.175)	(0.933)	(5.731)
Urban population% total	0.0794	-0.0692	-0.641
	(0.182)	(0.111)	(1.010)
Inflation CPI	0.0115	-0.0116	0.0357
	(0.0100)	(0.00905)	(0.0367)
Labor force	-0.580**	-0.207	1.815
	(0.235)	(0.179)	(1.265)
Composite index of governance	8.987***	-2.687	-22.54*
	(2.473)	(1.966)	(11.05)
Observations	91	87	91
Number of countries	27	26	27
Threshold of health			41.33637 US$
Number of countries above the threshold			1
Number of excluded instruments	2	3	4
F-test of excluded instruments	7.23	10.15	10.59
Hansen OID test-p-value	0.62	0.08	0.54

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The endogenous variable is health aid. The Cragg–Donald Wald F-stat. of weak identification are compared with the Stock-Yogo weak ID test critical values. [19.93 (10%); 11.59 (15%); 8.75 (20%); 7.25 (25%)] for (1) &(4), [9.08 (10%); 6.46 (20%); 5.39 (25%)] for (2) & (3).

Table 6.3: Robustness check, IV fixed effect, excluding ouliers (see Hadi,1992, 1994)

	(1)	(2)	(3)
Dependent variables	Life expectancy	Hiv prevalence	Infant mortality at birth
Health aid per capita	0.249**	-0.0338	-0.447
	(0.119)	(0.0461)	(0.398)
GDP per capita	0.00112	-0.000759	-0.0269***
	(0.000851)	(0.000455)	(0.00391)
Gross fixed Capital formation	0.0185***	-0.00609	-0.0187
	(0.00577)	(0.00699)	(0.0222)
School enrolment rate primary	0.0187	0.000602	-0.0837*
	(0.0140)	(0.00479)	(0.0438)
Primary completion rate female	0.00726	0.00276	-0.0902
	(0.0144)	(0.00827)	(0.0630)
Lagged variable of fertility	-2.880**	-1.198	3.973
	(1.255)	(1.008)	(5.339)
Urban population% total	0.151	-0.0736	-1.061
	(0.208)	(0.105)	(0.889)
Inflation CPI	0.0131	-0.0134	0.0229
	(0.0102)	(0.00853)	(0.0373)
Labor force	-0.526**	-0.235	0.599
	(0.246)	(0.181)	(1.169)
Composite index of governance	8.974***	-2.555	-21.07**
	(2.447)	(1.854)	(9.249)
Observations	88	84	88
Number of countries	26	25	26
Number of excluded instruments	2	3	4
Instrument F-stat	7.9	8.00	6.40
Hansen OID test-p-value	0.50	0.20	0.19

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The endogenous variable is health aid. The Cragg–Donald Wald F-stat. of weak identification are compared with the Stock-Yogo weak ID test critical values. [19.93 (10%); 11.59 (15%); 8.75 (20%); 7.25 (25%)] for (1) & (4), [9.08 (10%); 6.46 (20%); 5.39 (25%)] for (2) & (3).

Table 7.a: List of countries according to the political situation

Post conflict states	**Stable States**		
Burundi	Benin	Madagascar	Swaziland
Central African Republic	Botswana	Malawi	Tanzania
Chad	Burkina Faso	Mali	Togo
Congo, Rep.	Cameroon	Mauritania	Zambia
Ethiopia	Gabon	Mozambique	
Rwanda	Gambia, The	Namibia	
Sudan	Ghana	Niger	
Uganda	Kenya	Senegal	

Note: This is the minimum number of countries used for regressions

Table 7.b: Countries

Countries	Number of observations
Benin	4
Botswana	4
Burkina Faso	4
Burundi	4
Cameroon	3
African Republic	2
Chad	4
Congo, Rep.	4
Ethiopia	4
Gabon	2
Gambia, The	3
Ghana	4
Kenya	1
Madagascar	4
Malawi	2
Mali	4
Mauritania	2
Mozambique	3
Namibia	3
Niger	4
Rwanda	4
Senegal	4
Sudan	3
Swaziland	4
Tanzania	3
Togo	3
Uganda	4
Zambia	2

Table 8: Composite Index of Governance, Principal Component Analysis

Dimensions de la gouvernance	Indice de qualité de la gouvernance
Control of corruption	0.4217
	(0.89)
Rule of law	0.4367
	(0.9295)
Regulatory quality	0.4055
	(0.86)
Governance effectiveness	0.4284
	(0.90)
Political stability	0.3672
	(0.79)
Voice and accountability	0.3856
	(0.84)

Note: We report the first eigenvector resulting from the first principal component analysis of governance quality. The aggregate index of governance is obtained using the following formula: Inst = 0.42*K1 + 0.43*K2 + 0.40*K3 + 0.428*K4 + 0.36*K5 + 0.38*K6, where K1, K2, K3, K4, K5, and K6 represent *standardized* measures of Control of corruption, Rule of law, Regulatory quality, Government effectiveness, Political stability, and Political stability, respectively. In addition, the numbers in parentheses (below the different eigenvectors) represent the the correlation of the first principal component with the corresponding governance variable. The governance quality variables have been rescaled so that high values indicate high level of bad governance.