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## Healthcare Financing and Changes in Health Status: Case study of selected sub-saharan African Countries

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### Abstract

*This paper empirically examined the link between healthcare financing and changes in health status in selected sub-Saharan African (SSA) countries. The persistent high mortality rate and low life expectancy in the region creating growth instability and human capital detours was the motivation for this paper. To carry out the empirical study, sixteen SSA countries were selected based on the availability of required information. Data were collected from World Bank data catalog, world economic outlook and World Health Organization on key variables such as private and public health expenditure, mortality rate and life expectancy. A model was formulated which consist of a set of structural equation made up of two equations. Error correction estimation technique by Baltagi and Li was used to estimate the structural model. The result indicated that Private health expenditure and Per capita income do not have any significant impact on life expectancy and mortality rate in the region suggesting that private health financing have been inadequate in the region. Furthermore, recommendations were made, one of which is the promotion of more equitable income distribution measures in the region to improve health status.*

**Key words:** Healthcare, Finance, Health Outcomes, Productivity, Sub-sahara Africa, Health status

### INTRODUCTION

One of the basic functions of government in any country is to provide quality and effective health care services to its citizens. For the health care services to be effective and efficient, the health sector must be adequately funded, and the fund must be efficiently or adequately utilized with adherence to priorities vis-à-vis goals in the sector while being devoid of fraudulent and corrupt practices. In recent times, health sector financing have attracted extensive research and policy attention in both developed and developing countries. One of the foremost issues is how to raise sufficient resources to finance health care needs for all citizens (WHO, 2015).

There is increasing empirical evidence to show that health status is *sin qua non* for economic growth and development. Health status is one of the significant factors that determine the quality of human capital which is a necessary factor for economic growth. Literature on economic growth clearly shows the role of health in influencing economic performance, at least at the micro level. All things being equal, healthier workers are more likely to be able to work longer periods, be generally more productive than their relatively less healthy counterparts, thus able to secure higher earnings. Schultz (2009) postulated that good health has positive impact on the learning ability of children which lead to better educational outcome, school completion rate, higher means of years schooling, achievement and increases the efficiency of human capital formation by individuals and households. Martins (2005) opined that health is one of the major components of human capital formation and that human resources constitute the ultimate basic for the wealth of a nation. Based on this paradigm, developing countries have attempted to enhance the human capital through public health expenditure as well as government spending on education and other social services.

Health is one of the most important assets a human being can acquire. It enables persons to fully develop inherent capabilities and potentials. Where these potentials are eroded or is not optimally developed, it may result in physical and emotional weakening, causing irreparable obstacles in the lives of people (Hennaand and Muhammed, 2014). Hence, health gains have the economic consequences of widespread economic growth and an escape of ill-health traps in poverty (World Health Organization, 1999). In this connection, Bloom (2004) opined that health is a capital productive asset and an engine of economic growth. Using this argument, we can consider health as a determinant of human capital. Likewise, Gupata, G.S., Imram I.O. and Khan, M. (2012) indicates that achieving human capital formation through healthcare services and education, people develop themselves which permits them to earn a future return in their endeavors and be able to attain higher productivity levels.

In a broad sense, health is not only the absence of illnesses; it is also the ability of people to develop to their potential during their entire lives. In that sense, health is an asset individuals possess, which has intrinsic value (being healthy is a very important source of well-being) as well as instrumental value. In instrumental terms, health impacts economic growth in a number of ways. Therefore, health can affect production level of a country through various channels. The first channel that its impact has been referred in most studies is better efficiency of healthy employees comparing with others. Healthy employees work better and more than others and have a creative and more prepared mind. Beside this direct impact, health has indirect impacts on production as well. For instance, health improvement in the human force will be followed by motivation to continue education and obtain better skills. Improvement of health conditions will increase investment attraction in education and educational opportunities on one hand and will prepare the individuals to continue education and obtain more skills by enhancement of learning capability on the other hand. Similarly, enhancement of health and health indexes in the society will encourage individuals towards more savings through reduction of mortality and increasing of life expectancy. Following increased savings, the society's physical capital is enhanced and this will indirectly have effect on labour force productivity and economic growth (Grossman 2000).

Health expenditure and real gross domestic product of a country have mutual relationship based on theoretical principles and experimental observations (Bakare and Olubokun, 2011). According to the World Health Organization (2015), the health of people in a country directly affects the growth and development of the country, as 50% of economic growth differentials between developed and developing nations are attributable to ill health and low life expectancy. So for a

country to grow and develop, it has to spend a high proportion of its gross domestic product (GDP) or national income on health care.

In 2010, African heads of state pledged to spend 15% of their government revenue on healthcare at the summit meeting of the African Union in Abuja. Notwithstanding this pledge, the financing of health sector in sub-Saharan African Countries have often been described as inadequate with budgetary provision to health hardly exceeding 3% of the nation's total budgetary provisions. The health sector is generally poorly funded in many low income countries (LICs). Several multilateral and regional organizations often stipulate minimum benchmarks for the funding of the health sector for countries but these are in reality hardly ever met in sub-saharan African (SSA) countries. For example, the Macroeconomic Commission on Health (2001) stipulated that LICs should spend a minimum of 2% of their GDP on funding of their health sector but most LICs including Nigeria hardly ever meet this minimum benchmark.

Achieving a successful health care financing system has thus continues to be a challenge in sub-Saharan African countries. Limited institutional capacity, corruption, unstable economic, and political context have been identified as factors why some mechanisms of financing health care have not worked effectively (Anand and Ravallion, 2010).

Generally, challenges facing health sector financing in sub-Saharan African countries include: Inadequate political commitment to health, leading to poor funding of health care in general, and primary health Care in particular; gaps in the area of stewardship and governance as evidenced by lack of clarity of the role of government, at all levels in financing health care; Inadequate or non implementation of health policy that clearly spells out how funds are to be allocated and spent in the health sector; governance issues with health insurance and poor buy-in by the states limit coverage; dominance of out-of-pocket payments presents possibilities of under/over supply of services depending on financial abilities; non exploitation of other sources of health financing.

Several stakeholders, including development partners finance health independently and not in accordance with government's policy thrust. This has led to inefficient use of scarce resources and duplication of efforts.

## EMPIRICAL REVIEW

The interactions between health care financing (expenditure) and health outcome have received a lot of attention of researchers. Baldacci (2004) explore the role played by health expenditures. He constructed a panel data set of developing countries from 1995-2000 and found that spending on health within a period of time affects growth within that same period while lagged health expenditures appear to have no affect on growth. He inferred from this result that the direct effect of health expenditure on growth is a flow and not a stock effect.

Furthermore Aluko and Aluko (2017) highlight the place of income disparity and health outcome in Nigeria and the implication for economic growth in the FCT, Nigeria where they further analysed the determinants of health outcomes between the high and low income families in Nigeria society and the impact on economic growth. With the use of panel data, the study engaged the one-way error component panel modeling technique as its methodology, with the outcome showing that the existence of correlation between income inequality and mortality rate (Health outcomes) across income quintiles, while mortality was found to impact negatively on growth through a decline in the level of individual incomes.

Available studies so far document a range of effects - from no impacts, to limited impacts, and to impacts on only specific interventions. Early studies as summarized by Grossman (1972) found no evidence that total spending on Health has any impact on Mortality rate. Filmier and Pritchett (2005) presented empirical evidence that suggests that public spending on Health is not the dominant drive of child Mortality outcome, income inequality, female education, and cultural factors such as: the degree of ethno - linguistic fractionalization explain practically all of the variation in child Mortality across countries. Based on these findings, policies that encourage economic growth, reduce poverty and income inequality and increase female education would do more for attaining child Mortality reductions than increasing public spending on Health.

Similar findings of lack of significance of public Health expenditure have been presented by others among which is Filmier and Pritchett (2005) who found that Government Health expenditure accounts for less than one-seventh of one percent variation in Mortality across country, although the result was not statistically significant. They conclude that 95 percent of the variation in under-five Mortality can be explained by factors such as: a country's per capita income, female educational attainment, and choice of region.

A number of other studies have linked changes in Mortality rates in terms of resource use at hospital, managed care, educational status of an individual and technological change. In the work of Bloom et al (2003), there is no significant relationship between Health expenditure spending and the change in infant Mortality in low-income countries.

The good policies and institutions (as measured by the world bank's country policy and institutional assessment or CPIA index) are important determinants of the impact of Government Health expenditures on outcomes, in particular, as the quantity of policies and institution improves (as the CPIA index rises), the impact of Government Health expenditures on maternal Mortality, underweight children under-five and tuberculosis Mortality also increase and is statistically significant (Wananyana and Younger, 2004). However, they conclude that impact of Government expenditures on under-five Mortality remains not significantly different from zero.

The effects of public financing of Health expenditures, insurance coverage and other factors on Health outcomes are examined by Berger and Messer (2002) with Health production models estimated, using 1960-1992 data across 9 OECD countries. They find that Mortality rates depend on the mix of Health care expenditures and the type of Health coverage. In particular, increases in the publicly financed share of Health expenditures are associated with increase in Mortality rates. These authors therefore conclude that as countries increases the level of their Health expenditures they may want to avoid increasing the proportion of their expenditures that are publicly financed.

Nixon and Ulmann (2016) show that although Health expenditure and the number of physicians have made significant contribution to improvements in infant Mortality, Health care expenditure has made relatively marginal contribution to the improvement in life expectancy in the countries over the period of the analysis covering 1980-1995. Also in a cross-sectional data covering 117 countries for the year 1993, Wunnva (1997) found that Government expenditure on the Health care as a percentage of GNP does not play a major role in determining infant Mortality rates. They provide a detailed review of 16 studies that have examined the relationship between Health care inputs and Health outcome, using macro-level data. They also undertook their own study using data for 15 European countries over the period 1980-1995. They concluded that Health expenditure and the number of physicians have made a significant contribution to improvements in infant Mortality.

Strheger (2014) found that, in Uganda, increase in Health care expenditures particularly on vaccination is expected to impact positively on infant Mortality rate in Uganda by 2015. According to them, increase in vaccination rate to 100 percent would have the largest and probably most cost effective, impact, reducing infant Mortality by 16 deaths per thousand births.

Baldacci, E.B. Clement, S. Gupta and O. Cui (2014) and Gupata et al (2012) concluded that social spending is an important determinant of Health and education outcomes. These studies found that the effect of social spending on human development indicators is stronger in cross-sectional samples than when the time dimension is also added. They opined that education spending has a greater effect on social indicators than Health outlays.

The positive effect of social spending on social indicators is also supported by Anand and Ravallion (2010), who equally found a positive relationship between public expenditure on Health care and the Health status of the poor.

Day and Tousignant (2015), among others, examine the relationship between Health outcomes and Health spending in Canada for the periods 1970-1997, 1980-2007 and 1970-2009 and concluded that although some causal relationship between a measure of the Health status of the population and real per capita Health expenditure were statistically significant. These relationships were not very strong. The authors indicated that their findings may be due to model mis-specification or may reflect the fact at high level of population Health, the return to increases in Health spending are small.

Nolte and Mckee (2015) examined the relationship between Health indicators such as infant Mortality rates and life expectancy and total (public & private) per capita spending on Health, using pooled time-series cross-section data for the ten provinces for the period 1992-2010. Outcome of the study shows a positive and significant relationship between the indicators tested and the resources available at various levels for health care purposes.

Cremieux, P-Y, M-C. Meilleur, P. Oucellete, P. Petit, M. Zelder, and K. Potvin (2014) estimated a similar model using data for the period 1991-2008, but disaggregated per capita Health spending into three categories: public spending on drugs private spending on drugs, and non-drug Health care spending.

Kee (2016), used pooled time - series cross sectional data for the ten provinces for the 1995-2009 period similar to Cremieux et al (2014), Kee (2016) regressed indicators of population Health status (infant Mortality rates, life expectancy and age standardized Mortality variables, including real per capita public expenditure on Health. However, unlike Cremieux et al. (2014), who use a pooled generalized least square estimation procedure, Kee (2016) used instrumental variables estimation to control for possible simultaneity between Health status and public spending on Health. All three of these studies found a statistically significant relationship between Health status and both Health spending and per capita income.

In the same vein, Awe and Ogungbenle (2009) in their study titled social spending, human capital formation and output expansion in Nigerian economy using annual time series data spanning from 1977 to 2005 exploited A Vector Autoregressive (VAR) model approach found that there existed a casual linkage among social spending, human capital formation and output expansion in Nigeria.

Using demographic and Health survey (DHS) data, Wang (2012) investigated the low-income countries both at the national level, and for rural and urban areas separately. He found that at the

national level, public Health expenditure significantly reduces Mortality. While Renny (2012) found that access to Health infrastructure is important for child Mortality, socio-economic factors are often found to be good determinants of Health outcomes. Numerous studies (especially those using micro-data) show a close association between Mortality rate and public spending.

From indication, previous studies on healthcare financing have mainly analyzed the longitudinal relationship within only one country (e.g. 20 years in the Nigeria). This does not provide a comparative picture among different countries. Other studies compared different countries at two or three time points by employing a “pooled panel data analyses” Thus neglecting the heterogeneity of country of analysis. Consequently, this study has taken cognizance of some of the identified gap to embark on a longitudinal analyzes of eighteen (18) sub-Saharan countries for a 27-year period (1990-2016). The resulting analysis shows within-country as well as between-country dynamics regarding the relationship between health spending (Private and Public spending) and national health outcomes. In addition, this study employed a “random-effect model” to adjust for cross-sectional and time specific idiosyncrasies in cross-country panel data.

### THEORETICAL FRAMEWORK

The theoretical framework of this study is the augmented Solow’s growth model developed by Mankiw, J., Romer, D. and Malaney, P. (1992). Due to the shortcomings of Solow’s growth model, the augmented version of the model was specified by Mankiw et al (1992). In other words, in the Solow’s growth model, capital accumulation is the main determinant of output. However, the difficulty in explaining economic growth led economists to recognize and attribute the missing factor in growth to factors other than physical capital, and consequently human capital theory evolved. In this respect, Mankiw *et al.* (1992) in their contribution to growth theory extended the Solow growth model to account for the changing trends in human capital accumulation.

The augmented Solow model assumes human capital to be an important input in a neoclassical production function. Along this line, human capital (e.g., health and education) can be seen as separate input or labour augmenting in the production process. Thus, growth in output is due to improvement in capital accumulation (both physical and human) given the level of technology in the economy.

By adding human capital accumulation to the Solow’s growth model, Mankiw *et al.* (1992) stressed that human capital in the form of health investment/expenditure is important in explaining growth. According to the authors, the augmented Solow’s growth model is given as:

$$Y_t = K_t^\alpha (A_t L_t)^\beta H_t^{(1-\alpha-\beta)} \tag{2.1}$$

Where;

H is the human capital acquired by workers, often as the result of specific investment in education and health;

Y is output (economic growth);

K is physical capital;

L is labour;

A is technological progress;

AL is effective labour;  
 $\alpha$  is output elasticity of capital;  
 $\beta$  is output elasticity of labour;  
 $1 - \alpha - \beta$  is output elasticity of human capital; and  
 $\alpha + \beta + 1 - \alpha - \beta = 1$  indicates constant returns to scale.

**METHODOLOGY**

**Study Area**

Based on the augmented Solow Model, this study seek to examine the response of health outcome to health spending in sixteen (16) sub-Saharan African countries. The selected countries are divided into two group namely middle-low income countries and low income countries. Eight (8) countries are selected from each income group. The selection is based on the availability of data over the sample period 1990-2016. For middle-low income countries the selected countries are; Cameroon, Ghana, Nigeria, Congo Republic, Cote d’Ivoire, Gabon, Kenya and Zambia. The selected low income sub-Saharan African countries are; Burkina-Faso, Central African Republic (CAR), Togo, Democratic Republic of Congo, Gambia, Guinea, Guinea-Bissau, Mali.

**Model Specification**

To examine the impact of health spending on health status a set of structural equations are formulated. Health spending consists of public and private health spending while health status indicators are life expectancy and mortality rate. The model used is similar to that of Kee (2016) who used instrumental variables estimation to control for possible simultaneity between Health status and public spending on Health. The functional relationship is given as;

$$LE = f(PHE, PRHE, PCI, GR) \tag{3.1}$$

$$MR = f(PHE, PRHE, PCI, GR) \tag{3.2}$$

Where;

LE is Life Expectancy

PHE is Public Health expenditure, made up of government capital and recurrent expenditure on health.

PRHE is Private Health Expenditure, made up of private spending including local and international NGO such as UNICEF

PCI is Per capita Income measured in dollars

GR is Growth Rate of Gross Domestic Product

MR is Mortality Rate

Equation 3.1 and 3.2 are expanded to form the structural equation for this research and these gives;

$$LE_{it} = \alpha_0 + \alpha_1 PHE_{it} + \alpha_2 PRHE_{it} + \alpha_3 PCI_{it} + \alpha_4 GR_{it} + \mu_{1t} \tag{3.3}$$

$$MR_{it} = \lambda_0 + \lambda_1 PHE_{it} + \lambda_2 PRHE_{it} + \lambda_3 PCI_{it} + \lambda_4 GR_{it} + \mu_{2t} \tag{3.4}$$

$\mu_{1t}$  and  $\mu_{2t}$  follows a one way error component (see Baltagi, 2006) such that;

$$\mu_{1t} = \mu_i + v_{it} \text{ and } \mu_{2t} = \mu_i + v_{it}$$

$\alpha_0 - \alpha_4, \lambda_0 - \lambda_4$  are structural parameters

$\mu_{1t}$  and  $\mu_{2t}$  are error term and;

$$\mu_{1t} \sim \text{IID}(0, \sigma_{\mu 1}^2), \mu_{2t} \sim \text{IID}(0, \sigma_{\mu 2}^2)$$

The Structural equations appears to be free from endogeneity problem since the dependent variables (LE and MR) do not appear in the right hand side of the equation.

The two way error correction method (random effect) will be used to estimate equation 3.3 and 3.4 to examine heterogeneity among the countries under survey.

This study is based on large sample size as such large sample statistical test will be use such as chi-square and Z test instead of small sample statistical test such as F test and t test. The robust standard errors will be used to correct for possible heteroscedasticity and autocorrelation of the error term variance

**Stationarity Test**

To test for stationarity, the unit root method will be used and will take the form of an Autoregressive model process, with each variable regressed on its own lagged value and a deterministic variable. The model to be adopted is:

$$\Delta y_{it} = \rho y_{i,t-1} + \sum_{L=1}^{p_i} \theta_{iL} \Delta y_{it-L} + \alpha_{mi} d_{mi} + \varepsilon_{it}$$

$$m = 1, 2, 3$$

Where;

y represents all the variables under consideration.

$\rho$  represents the unit root coefficient.

$\Delta$  is the difference operator.

$y_{t-i}$  represents the lagged terms included

$d_{mi}$  represent deterministic variables

$\alpha_{mi}$  represent the coefficient of the deterministic variable

$\varepsilon_{it}$  represents pure white noise error term.

The null hypothesis to be tested is such that the variable possess unit root, and as such is non-stationary.

$H_0: \rho = 1$  Panels contain unit root (non stationary)

$H_0: \rho < 1$  Panels does not contain unit root (stationary)

The stationarity test (unit root test) will be carried out using the Harris and Tzavalis stationarity test on each variable to test for stationarity. Harris and Tzavalis (1999) test is more appropriate because of the structure of the panel data used in this study since  $T > N$  that is time interval in greater than number of panel.

However non stationarity in panel data does not usually lead to spurious regression (Im et al. 2003). Some of the distinctive results that are obtained with non-stationary panels are that many



test statistics and estimators of interest have normal limiting distributions. This is in contrast to the non-stationary time series literature where the limiting distributions are complicated functional of Weiner processes. Using panel data, one can avoid the problem of spurious regression (see Kao 1999). Unlike the single time series spurious regression literature, the panel data spurious regression estimates give a consistent estimate of the true value of the parameter as both  $N$  and  $T$  tend to  $\infty$ . This is because, the panel estimator averages across individuals and the information in the independent cross-section data in the panel leads to a stronger overall signal than the pure time series case (Maddala and Wu 1999 and Choi 2001).

**DATA ANALYSIS**

The results of the unit root test presented are based on Harris and Tzavalis stationarity test on each variable.

**Table 4.1: Unit Root Stationarity Test Using Harris and Tzavalis Test**

Variables	Harris- Tzavalis Statistics	Critical Value at 5% LOS	P- Value	Stationary Status
LE	-5.5242	-1.3922	0.0017	I(0)
MR	-3.5263	-2.9620	0.0015	I(0)
PHE	-7.1952	-3.8662	0.0000	I(0)
PRHE	-8.6112	-5.4581	0.0000	I(0)
PCI	-4.0681	-2.3349	0.0065	I(0)
GR	-4.0381	-3.3092	0.0065	I(0)

Source: Author’s Computation, 2017

From the Unit root test conducted above using the Harris and Tzavalis unit root test, all the variables are stationary at level at 5% level of significant (LOS). Thus the error correction or random effect regression can be carried out since all the variables are all stationary at level. The result of the random effect model is presented below

**Table 4.2 Random Effect Regression Result for first equation**

Dependent Variable	LE			
Independent Variables	Co-efficient	Standard Error	Z-Statistics	P-Value
PHE	6.24622	1.776110	3.516798	0.01931
PRHE	0.02529	0.01290	1.604651	0.22193
PCI	1.02296	0.837207	1.221872	0.19325
GR	0.02143	0.001132	19.604651	0.00001
Constant	11824.5	945.7305	12.50303	0.00001
R <sup>2</sup>	0.660975			
Wald Chi-Square	29.46172			
P-Value of Chi-Sq	0.002316			

Source: Author’s Computation, 2017

From the result obtained, all the independent variables have a positive impact on life expectancy. A unit increase in Public Health Expenditure (PHE) gives 6.24622 increase in Life Expectation., Also a unit increase in Private Health Expenditure (PRHE) gives 0.02529 increase in Life expectancy. Furthermore, a unit increase in Per-Capita Income (PCI) gives 1.02296 increment in Life expectancy. Finally, a unit increase in Growth Rate (GR) will lead to 0.02143 increase in Life expectancy (LE).

Public Health Expenditure (PHE) and Growth Rate (GR) are statistically significant at 5% level of significance while Private Health Expenditure (PRHE) and Per-Capita Income (PCI) are statistically insignificant. R<sup>2</sup> is high and the Model is statistically significant following the wald chi-square test. This indicate that the equation is suitable for analysis

**Table 4.3 Random Effect Regression Result for Second equation**

Dependent Variable	MR			
Independent Variables	Co-efficient	Standard Error	Z-Statistics	P-Value
PHE	-3.589985	1.392158	-3.578720	0.00251
PRHE	-1.384911	1.257017	-0.130327	0.80942
PCI	-0.001366	0.001114	-1.226426	0.49024
GR	-1.382012	0.450392	-3.23831	0.00242
Constant	0.111929	0.035809	3.125736	0.00391
R <sup>2</sup>	0.86607			
Wald Chi-Square	43.4902			
P-Value of Chi-Sq	0.00001			

Source: Author's Computation, 2017

From the result obtained, all the independent variables have a positive impact on life expectancy. A unit increase in Public Health Expenditure (PHE) gives 3.589985 decrease in Mortality Rate. Also a unit increase in Private Health Expenditure (PRHE) gives 1.384911 decrease in Mortality rate. Furthermore, a unit increase in Per-Capita Income (PCI) gives 0.001366 decrease in mortality rate. Finally, a unit increase in Growth Rate (GR) will lead to 1.382012 decrease in Life expectancy (LE).

Public Health Expenditure (PHE) and Growth Rate (GR) are statistically significant at 5% level of significance while Private Health Expenditure (PRHE) and Per-Capita Income (PCI) are statistically insignificant. R<sup>2</sup> is high and the Model is statistically significant following the wald chi-square test. This indicate that the equation is suitable for analysis

### CONCLUDING REMARKS

This study was carried out to examine the effect of health care financing on changes in health status. It is clear from the econometrics analyses that per capita income do not impact on life expectancy and mortality rate in the selected sub-Saharan African countries, as such it is important for the governments in various sub-Saharan African countries to ensure that greater attention are given in to income distribution policies and programmes which ensures relatively equitable income distribution in the region, in an attempt to improve life expectancy and reduce mortality rate in the region.

Overall, public health expenditure had significant impact on health outcomes and poverty level in the selected sub-Saharan African countries, accordingly, indigenous governments should

strive to increase expenditure on health care which will reduce mortality rate and improve life expectancy in the region thereby translating to economic growth. Also the increase in health expenditure will without doubt translate to the expected health outcomes if the process of utilizing the fund allocated to the health sector is judiciously monitored and its efficiency is ensured.

Furthermore, the empirical results of this study have revealed an insignificant relationship between private health spending and health outcome namely life expectancy and mortality rate. This has shown that the activities of private sector financing in the health sector have not been substantial enough to create any significant impact on health care delivery. Also, the role of international organization such as World Health Organization (WHO) and others have been inadequate in reducing mortality rate and improving life expectancy in sub-Saharan countries. This result has questioned the presence, role and activities of these international organizations in ensuring proper healthcare in developing countries.

Finally, it was discovered that economic growth promotes health status as such sustained economic growth in sub-Sahara African Region will lead to improvement in health status in the region.

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