Determinants of Health Inequity in Sub-Saharan Africa Health Economics

Edema Odeworitse Meshach

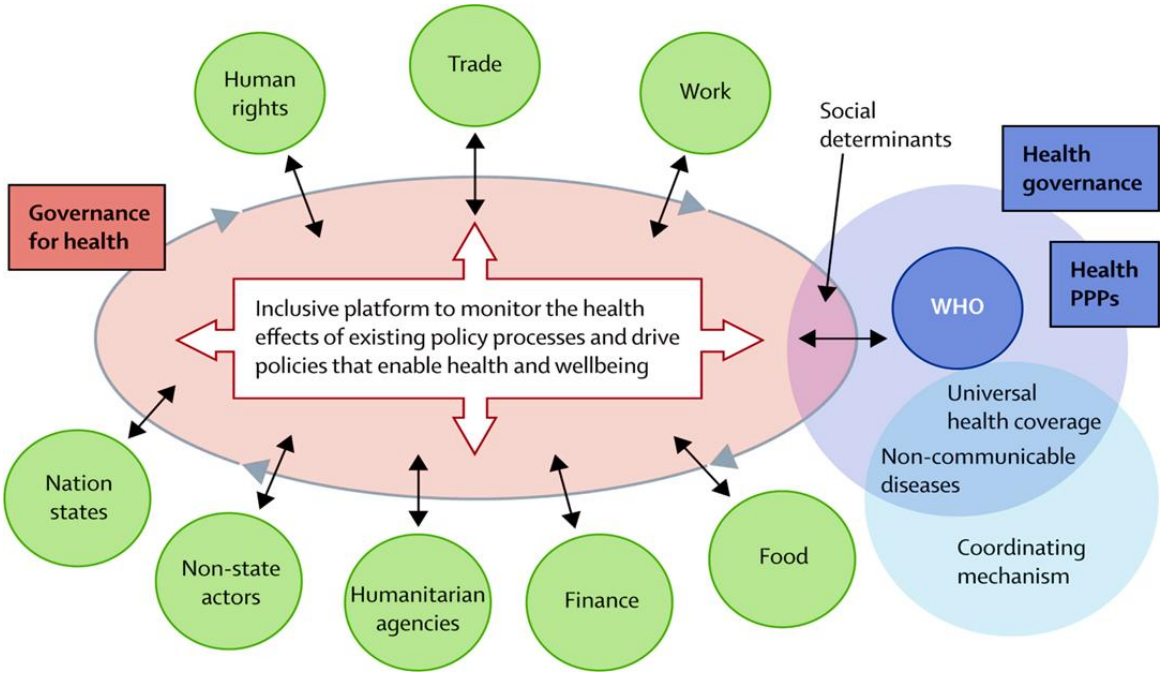
University of Benin, Nigeria

DOI: https://dx.doi.org/10.47772/IJRISS.2025.90300272

Received: 26 April 2024; Accepted: 02 May 2024; Published: 13 April 2025

ABSTRACT

This paper examined the determinants of health inequity in fifteen (15) Sub-Saharan African economies for a period of seventeen (17) years spanning from 2004 to 2020. Data were sourced from the World Bank (2020), World Food Programme (2020), WHO Global Health Expenditure database (2020), and global database on child growth and malnutrition (2020). Child malnutrition measured by incidence of malnourished children under the age of five was used to proxy health inequity, while net official flows from world food programmes, income poverty, GDP per capita, and domestic general government health expenditure per capita were used as explanatory variables. Panel Fully Modified Least Squares (FMOLS) regression technique was employed**.** The result showed that one-period lagged of health inequity (HINEQ (-1)), one-period lagged of domestic general government health expenditure per capita (DGGHEPC (-1)), net official flows from world food programme (NOFWFP), and income poverty (INPOV) exerts positive impact, whereas GDP per capita (GDPPC), INPOV (-1), NOFWFP (-1) and DGGHEPC exerts negative impact on the Child malnutrition in Sub-Sahara Africa. However, only NOFWFP (-1), INPOV and DGGHEPC with their lagged values had a statistically significant impact on Child malnutrition in Sub-Sahara Africa. Thus, there is need for budget increase allocation to health and humanitarian sectors in Sub-Saharan African to boost basic health and nutritional needs particularly for disadvantaged households. Also, GDP per capita should be raised in order to reduce poverty levels and combat child malnutrition.



INTRODUCTION

Background

Sub-Saharan African economies are associated with low per capita income, high rates of income poverty,

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume IX Issue III March 2025

extremely low domestic savings, coupled with high level of GDP per capita, weak government health expenditure per capita, poor health outcomes such as rising infant and maternal deaths, incidences of child malnutrition, unfavourable general government balance, rising debt profile, high population growth rate, rising corruption perception indices, low life expectancy, policy failures particularly in key sectors such as the health sector of the economy (World Bank, 2013a; 2013b; 2019).

Health plays a significant role in the development of any nation (Weil, 2020, Lilley, Lilley, & Rinaldi, 2020). This is because a healthy nation is a wealthy nation. When individuals are healthy, they will have the capacity to work and earn a living for themselves. They will also have the ability to contribute meaningfully to the growth and development of the society where they live. When a nation is healthy, such country will tend to spend less on health-related challenges.

Thus, the need to promote good health across all strata of life was the primary focus of the Sustainable Development Goals (SDG). For instance, Goal 3 of the SDG is "to ensure healthy lives and promote well-being for all at all ages (Good Health)". That means, it is not just enough to promote good health, but ensuring inclusiveness is fundamental in the pursuit for good health. This is the crux of health equity (United Nations, 2015).

In the submission of the World Health Organization (2017), "The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition". Similarly, Weil (2020) noted that living in good health is one of the fundamental human rights that must be benefited by all irrespective of age, gender, social class, race or religion. According to the World Health Organization (2014), social determinants of health are the "complex, integrated, and overlapping social structures and economic systems" that have the propensity to influence health inequities in the society.

Nevertheless, there are a number of socioeconomic, biological, political, cultural and behavioural factors that tend to deprive some individuals from reaping from the benefit of good health in the society. These factors thus, create room for health inequity in the wider economy. Current global health programmes are largely designed with a view to addressing the rising spate of health inequity both in emerging and advanced economies. Amponsah and Amuasi (2020) submitted that factors such as inadequate or ineffective health system design, illness and diseases exhibit adversative influence on the work lives, life time earnings of individuals which eventually translate to a fall in the growth projections of a country.

World Health Organization (n.d) further explains that social determinants of health (SDH) are the "specific non-medical circumstances that effect the behaviours of health outcomes in a society". These intervening forces often manifest in certain circumstances in which people are born, grow, work, live, and age, as well as the wider arrangement of socio-economic factors and engagements that have the proclivity to dictate the circumstances of daily life of individuals in the society. Tseng and Wu (2021) pinpointed such socio-economic factors as economic policies and systems, government intervention agendas, social standards, social norms and ethics in addition to the political structure and activities that affect the actions and behaviours of people in the global economic system.

World Health Organization (2010) defines Health equity as "the absence of unfair and avoidable or remediable differences in health among population groups defined socially, economically, demographically or geographically". It therefore follows that health inequity is "the occurrences of unfair and avoidable or remediable differences in health outcomes among population groups defined socially, economically, demographically or geographically"

According to the Facts and figures from the United Nations Development Programme (UNDP, 2021), over 6 million children die prior to attaining their fifth birthday. Most of the children that are born and raised in a poverty setting are almost two time probable to die prior to attaining the age of 5 compared to those who are born and raised in wealthier households.

It was further revealed that about 16,000 children under the age of 5 still die daily as a result of causes that can

be prevented. To demonstrate the degree of health inequity across the globe, the United Nations Development Programme (2021) further submits that, not more than 56 per cent of births in rural communities in the emerging economies receive care attention from skilled health workers, while over 87 per cent of such births in urban areas receive care attention from skilled health workers.

Statement of the Problem

The outbreak of the COVID-19 pandemic has created a huge gap in the health sector among the economically disadvantaged individuals who find it difficult to pay for test kits and other services, as well as the wealthy class who can afford whatever it takes to receive similar services (Zhao, Zhou, Fan, Nawaz, Zhao, Xu & Lai, 2021) particularly as individuals are compelled to carry out such test before they are allowed to travel on air.

There exists a gap between the way patients are treated in terms of age (Lee, 2021). The elderly that are more susceptible to the virus are given disproportionate attention (Noel-London, Grimsley, Porter and Breitbach, 2021). This is due to unequal consequences of the pandemic which has demonstrated a heavy magnitude of health inequity across several strata in the global health care system.

Hogan, Kyle, Mohsen, Stephanie, Mengru, Susanna, Alan, Rafael and Christopher (2010) noted that, approximately 342,900 women die as a result of complications due to pregnancy and childbearing. with over 800 women dying in the course of pregnancy or from complications arising from childbirth (UNDP, 2021). Also, 99 percent of these pregnancy and childbirth related deaths take place in developing nations (Hogan, *et al*, 2010). Globally, UNICEF (2011) reports that out of every 100,000 live babies born, approximately 251 women pass away due to haemorrhagic shock. However, in some technologically advanced nations like the U.S, there are about 13 deaths for every 100,000 live births.

Similar report from UNICEF (2011) revealed that, in some nations like Afghanistan over 1,600 women pass away for every 100,000, as a result of pregnancy and childbearing. In the submission of WHO (2004), out of every 30 women who die as a result of pregnancy and childbearing, there is at least 1 woman who suffers severe disability sequel to a maternal morbidity (complications arising from pregnancy or childbirth) and 10 of those women witness a “near miss mortality”, a life-threatening obstetric impairment. According to Commission on Behavioral and Social Sciences and Education (CBASSE, 2000), morbidities can develop into a situation that is severe, thus, leading to lifelong disorders which threatens a woman's ability to take part in community life, family health, productivity, quality of life and general well-being.

United Nations Development Programme (2021) further submits that, a rising percentage of child mortality occurs in sub-Saharan Africa in addition to Southern Asia with 80 percent of such child death below the age of five arising from these regions. Unfortunately, the maternal mortality ratio which measures the share of mothers dying during childbirth in relation to mothers who survive, is still 14 times higher in emerging nations compared to the situation in the advanced countries.

The largest proportions of maternal deaths occur in the region of sub-Saharan Africa as well as in the Southern Asian region. In 2013, for instance, this represents 86 per cent of such deaths worldwide. There is currently a huge gap between people who enjoy healthy living compared to those with the worst health status. World Health Organization (n.d) averred that, this gap is ascribed to the manifestation of social forces that influence health and they account for about 30 percent to 55 percent of health outcomes on global level.

In the submission of Cockerham (2021), health inequities occur as a result of social prejudice which are by-and-large preventable. Studies such as Dover and Belon (2019) averred that health inequalities are influenced by social forces which often lead to deprivation of the poorer population from benefiting from health services thus, inhibit their ability to achieve the desire health status in the society.

Following the recognition of the increasing health gap among the various strata of people globally, several initiatives and programmes have been designed to bridge the gap. Notable among these programmes is the sustainable development goal. In spite of such initiatives, the health gap still remains with rising spate. Thus, this is the motivation for this study which is designed to empirically examine the determinants of health inequity in the context of Sub-Saharan Africa.

Research Questions

In the light of the above discussion, the following research questions will be addressed in the course of this study:

i. What is the impact of GDP per capita on health inequity in Sub-Saharan Africa?
ii. What is the impact of Net official flows from World Food Programme on health inequity in Sub-Saharan Africa?
iii. What is the impact of Income poverty rate on health inequity in Sub-Saharan Africa?
iv. What is the impact of Domestic general government health expenditure per capita on health inequity in Sub-Saharan Africa?

Objectives of the Study

The main aim of this paper is to examine the determinants of health inequity in Sub-Saharan Africa. The specific aims include to:

i. examine the impact of GDP per capita on health inequity inflow in Sub-Saharan Africa
ii. examine the impact of Net official flows from World Food Programme on health inequity in Sub-Saharan Africa; and
iii. examine the impact of Income poverty on health inequity in Sub-Saharan Africa;
iv. examine the impact of Domestic general government health expenditure per capita on health inequity in Sub-Saharan Africa;

Research Hypotheses

The hypotheses of the study are specified in the null form as shown below:

i. H_{01}: GDP per capita has no significant impact on health inequity inflow in Sub-Saharan Africa.
ii. H_{02}: Net official flow from World Food Programme has no significant impact on health inequity in Sub-Saharan Africa;
iii. H_{03}: Income poverty has no significant impact on health inequity in Sub-Saharan Africa;
iv. H_{04}: Domestic general government health expenditure per capita has no significant impact on health inequity in Sub-Saharan Africa;

Scope of the Paper

The study aims to examine the determinants of health inequity in fifteen (15) Sub-Saharan African economies for a period of seventeen (17) years spanning from 2004 to 2020 for each country. This is due to data availability on the selected variables and countries. The selected countries are Nigeria, South Africa, Ethiopia, Kenya, Angola, Ghana, Tanzania, Cote d'Ivoire, Congo, Dem. Rep., Cameroon, Uganda, Sudan, Senegal, Zambia and Zimbabwe in order of economic performance as ranked by the World Bank (2020). This study therefore covers a total of 225 observations for the selected countries.

LITERATURE REVIEW

Introduction

The poor development fundamentals across the sub-Saharan African region, coupled with the volatility of overseas health-oriented official development assistance/grants, continue to intensify the need to boost investments in health, particularly as they relate to child and maternal survival as well as child malnutrition in the region.

The Concept of Health

Essentially, the World Health Organization (WHO, 1948) defined Health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." According to Kühn, & Rieger (2017),

this definition captures the basis of optimal health which ought to be enjoyed by every individual notwithstanding the socioeconomic setting.

The general financing and promotion of the health of the citizens remain at the heart of the state and in order to accomplish this responsibility, health services must be accessible to all individuals without any restrictions. In line with the submission of World Health Organization (2015), the implication of this is that, healthcare should be treated as one of the essential human rights and therefore health service should be freely available or at a highly subsidized cost to as to make their affordable to all, rather than that selective delivery.

According to Renzaho (2020), there are several forces that mutually affect the health of people in the society. They include political, socio-economic, socio-cultural, environmental or medical factors. Renzaho (2020) further averred that the state of health of individuals can result from their personal disposition or lifestyle as well as the condition of the environment. Thus, Persons' routine activities, educational attainment, genetics, household income, poverty, as well as the state one's environment, usually dictate how well they can benefit from health services, hence general wellbeing.

Concept of health Inequity

World Health Organization (2010) defines health equity as "the absence of unfair and avoidable or remediable differences in health among population groups defined socially, economically, demographically or geographically". It therefore follows that health inequity is "the occurrences of unfair and avoidable or remediable differences in health outcomes among population groups defined socially, economically, demographically or geographically"

According to the definition advanced by Foundation (RWJF), "Health equity means that everyone has a fair and just opportunity to be as healthy as possible". Following the submission of Braveman, Arkin, Orleans, Proctor & Plough (2017), this therefore suggests that health inequity is the manifestation of hindrances to good health such as poverty, discrimination, and their consequences leading to lack of access to good jobs with fair pay, quality education and housing, safe environments, and health care".

Noel-London, Grimsley, Porter and Breitbach (2021) describe Health inequity as "a systemic and longstanding concern with dire consequences that can have marked effects on the lives of minority patients". A lot of differences or disparities in health are deep-rooted in disparities in opportunities and resources that are essential for the achievement of the highest state of wellbeing. Several forces that often trigger health inequity include living and work conditions of the individuals, unhindered availability of clinical services, level of education, income flows, racial and ethnic discriminations, neighborhood characteristic, in addition to the degree of social segregation in the society (Lee & Ahmed, 2021; David & Collins, 2021).

There are several social and physical determinants of health that which in turn lead to health inequity if not properly managed. these include, availability of resources to meet day-to-day requirements such as food, affordable and safe housing, social support, rising spate of poverty, recreational settings, racism, public safety, physical hazards, linguistic and learning problem, exposure to toxic materials, distrust of government, discrimination, infirmities, culture, climate change, aesthetic elements, access to quality education, as well as unhindered access to health care services.

Review of Previous Studies

Nutbeam and Lloyd (2021) carried out a study on the impact of health literacy on health. The study found that health literacy may serve as in intervening factor influencing health; it however doesn't automatically translate into mitigating health inequities which resulted from the misallocation of socioeconomic prospects and resources in the society. The study further reiterated that current interventions programmes prove the viability of refining and stimulating health literacy particularly as it relates to individuals with higher-risk.

It was therefore recommended that in the near future, research in relevant health literacy involvement should be carried out to adequately address ways of enhancing the quality of health communication in order to extend

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume IX Issue III March 2025

public health awareness to the wider society with much emphasis on individuals who are affected by poor health literacy. This can be achieved by boosting frontline expert skills and support as well as creating an enabling environment for individuals to develop transferable skills and competency that will enable them to easily access, understand analyze, as well as internalize relevant health information in the society.

World Health Organization (2020) employed a number of health indices from the WHO Health Equity Monitor database to measure six scopes of inequality. These indicators include subnational region, sex, place of residence, education, economic position, and age. Economic status was proxied by wealth index. Education was captured using the highest level of schooling achieved by the woman or the mother, for neonatal and child health interventions. Other measures of health inequity include child malnutrition in addition to child mortality rate.

Swope and Hernández (2019) evaluated the impact of housing on health disparities using a holistic conceptual model. Specifically, the study discussed some pathways through which structural disparities dictate unequal delivery or disproportionate access to health. It was established that housing affordability, quality, residential stability in addition to neighborhood opportunity form the four pillars that have the tendency to trigger increasing burden of health disparities.

Dover and Belon (2019) adopted a comprehensive Health Equity Measurement Framework to address several determinants of equitable health service utilization and by controlling quantitative analysis for public health investigation and policy formulation. The study presented the Health Equity Measurement Framework, which was precisely developed for measuring the direct and indirect impact that several determinants of equitable health service utilization exert on health equity. It was found that the socioeconomic, cultural, and political context, biological factors, environment, health policy setting, healthcare utilization frequency, health-related behaviours and views, material and social conditions, quality of care, social location, social stratification, and stress, influence health equity in one way or the other.

American Academy of Family Physicians (2019) evaluated several factors responsible for health inequity. These factors include social, economic, and political mechanisms, Social factors such as tobacco, alcohol, or explicit drug use, Chronic Stress and Embodiment, governance, culture, and societal values and public policies, which trigger long-held social inequities in the society.

Lee, Schram, Riley, Harris, Baum, Fisher and Friel (2018) examined health equity through action on the social determinants of health and established that there is a rising number of a wide range of policies that are currently under assessments for health equity outcomes with the aid of different research designs such as cross-sectional research design, experimental designs, meta-analysis, observational research design, as well as simulation modelling.

Most of the earlier studies attributed variations in physical or mental health outcomes to the policy currently being appraised. The study however concluded that this research area of policy evaluation still necessitates further research efforts in the light of the growing health inequalities in the global healthcare sector.

Baciu, Negussie, Geller, Weinstein, & National Academies of Sciences, Engineering, and Medicine (2017) assessed the root causes of health inequity and found that disability, access to good food, housing and water, living conditions, and the quality of schools, employment and socioeconomic status, gender, geography, immigration status, race and ethnicity are the social, environmental, economic, and cultural determinants of health equities.

Jayasinghe (2015) evaluated several scopes of health inequality and applied the principles of systems approach and complexity science in conceptualizing social determinants of health disparities among individuals in the society. This was achieved by assessing health inequalities from the angle of a systems approach with special coverage on complexity science. This approach incorporates factor like political freedom, educational outcomes and economic development as key factors influencing health inequalities.

Moonesinghe, Bouye and Penman-Aguilar (2014) examined the social determinants of health with special consideration to factors such as the distribution of wealth, income, power as well as influence which serve as

triggers for risk of disease. The study found a significant variation in inequity among two populations as a result of a risk factor which they considered to be discriminating and preventable for a specific disease. The variation was occasioned by the occurrence of the risk factor in the two populations.

Chapman (2010) examined the social determinants of health, health equity, by leveraging on the publications of the World Health Organization Commission on Social Determinants of Health. It was established that the right to health necessitates greater consideration to the social determinants of inequalities such as income and social status, access to health services, biology and genetic endowment, childhood experiences, culture, education and literacy, employment and working conditions, gender, healthy behaviours, physical environments, race and social supports and coping skills.

Bates, Hankivsky and Springer (2009) evaluated the Final Report of the World Health Organization (WHO) Commission on the Social Determinants of Health in an attempt to examine the extent to which gender and other social factors influence global health inequities. The study however submits that, gender remains one of the principal social causes of health. It was noted that the conceptual approach adopted by the Final Report of the World Health Organization (WHO) Commission on the Social Determinants of Health incorrectly associates gender and health with women's health.

Analysis of Research Gaps in the Literature

The reviewed literature revealed that previous studies relating to the subject matter have not empirically measure the nature; direction and magnitude of the impact of the various factors such as GDP per capita, net official flows from world food programmes, income poverty and domestic general government health expenditure per capita on health inequity proxied by child malnutrition.

To the best knowledge of the author, studies of this nature are lacking in the context of Africa as a whole. Also, the literature seems to be lacking in terms of recent studies addressing similar issues by employing data set covering most recent years. Thus, this study is an attempt to bridge such gap by examining the determinants of health inequity in fifteen (15) Sub-Saharan African economies for a period of seventeen (17) years spanning from 2004 to 2020.

RESEARCH METHODOLOGY

Theoretical Underpinning

This study follows the procedure adopted by Dover and Belon (2019), who advanced a wide-ranging Health Equity Measurement Framework to assess the determinants of equitable health service consumption. The study of Dover and Belon (2019) identified factors such as socioeconomic, political setting, health policy setting, social conditions, among other, which impact on health inequity.

The Model

Arising from the above submission, the theoretical models that form the basis upon which all estimations and discussions will be established for this study are expressed below;

$Y = F(X)$

Where;

Y= Dependent Variable

X= Independent Variable

Also,

Y = HINEQ = Health Inequity (Child malnutrition measured by incidence of malnourished children under the

age of five) from global database on child growth and malnutrition (2020).

X = set of explanatory variables

In line with the specific objective of this study, the following expressions are provided;

X_1 = GDPPC = GDP per capita (constant 2017 international $) (World Bank, 2020).

X_2 = NOFWFP = Net official flows from World Food Programmes measured in current US$. (World Food Programme, 2020).

x_3 = INPOV = Income poverty measured as the proportion of population below US$1.90 per day. (World Bank, 2020).

X_4 = DGGHEPC = Domestic general government health expenditure per capita Measured in current US$. (WHO Global Health Expenditure database, 2020).

Thus,

From the foregoing, the functional relationship is established below;

$Y = F(x_1, x_2, x_3, x_4)$

The respective variables are substituted into the above equations yielding the following;

HINEQ = F (GDPPC, NOFWFP, INPOV, DGGHEPC) …… (i)

Therefore, equation i, represents the main objective of the study and shows the combined effect of all the variables on health inequity in the sub-Saharan African region. Variables in equation (i) are substituted into equation (ii) to yield the following structural equation;

$$\text{HINEQ}_{it} = \beta_0 + \sum_{i=0}^{p} A_{ij}\,\text{GDPPC}_{it} + \sum_{i=0}^{q} .\,\text{B}_{ij}\text{NOFWFP}_{it} + \sum_{i=0}^{r} C_{ij}\,\text{INPOV}_{it} + \sum_{i=0}^{s} D_i\,\text{DGGHEPC}_{it} + u_t \ldots\ldots \text{(ii)}$$

Where; Subscript *'t'* implies time period, Subscript *'i'* denotes specific country in the sub-Saharan African region; β_0 is the intercept in the regression model, "A, B, C and D" are the impacts measuring parameters of the respective variables captured in the model, μ_t is the stochastic disturbance term that captures every other extraneous variable that influences health equity but not included in the estimation model.

The Data

The study aims to examine the determinants of health inequity in fifteen (15) Sub-Saharan African economies for a period of seventeen (17) years spanning from 2004 to 2020 for each country. The selected countries are Nigeria, South Africa, Ethiopia, Kenya, Angola, Ghana, Tanzania, Cote d'Ivoire, Congo, Dem. Rep., Cameroon, Uganda, Sudan, Senegal, Zambia and Zimbabwe in order of economic performance as ranked by the World Bank (2020). This study therefore covers a total of 225 observations.

Table 1: Leading economies in Sub-Saharan Africa

S/N	**COUNTRY**	**GDP ($Billion)**
1	Nigeria	448.12
2	South Africa	351.43
3	Ethiopia	95.91
4	Kenya	95.50

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume IX Issue III March 2025

5	Angola	88.82
6	Ghana	66.98
7	Tanzania	63.18
8	Cote d'Ivoire	58.54
9	Congo, Dem. Rep.	50.40
10	Cameroon	39.01
11	Uganda	35.17
12	Sudan	30.51
13	Senegal	23.58
14	Zambia	23.31
15	Zimbabwe	21.44

Source: World Bank (2020)

Technique for Data Analysis

The study follows a panel data procedure. The procedure for data analysis for this study is divided into two phases; the first phase entails the preliminary analysis, while the second phase involves the main estimation. The preliminary analysis entails the descriptive characteristics of the variables to be utilized in this study. Such characteristics include mean, median and standard deviation. The main estimations on the other hand, encompass the evaluation of the parameters of the Panel Fully Modified Least Squares (FMOLS) model.

Empirical Analysis and Presentation of Results

Introduction

This section covers the presentation and analyses of the data as well as the discussion of the various findings of the study. The overall objective of this study was accomplished using the Panel Fully Modified Least Squares (FMOLS) regression procedure.

Descriptive Statistics

From the result, Child malnutrition, domestic general government health expenditure per capita, income poverty, net official flows from world food programme and GDP per capita averaged 74.77%, $29.77, 0.56%, $5.08 million, $3889.45, respectively, while their standard deviation was 25.35%, $56.53, 0.30%, $10.31 million, $2765.16 respectively. In addition, domestic general government health expenditure per capita, net official flows from world food programme and GDP per capita were found to be positively skewed or skewed to the right, while Child malnutrition and income poverty, were negatively skewed.

Also, domestic general government health expenditure per capita, health-oriented Net official flows from World Food Programme, and GDP per capita had excess kurtosis values indicative of leptokurtic behaviour, while income poverty was found to be platykurtic in its distribution. Child malnutrition was however mesokurtic in its distribution. Table 2 reports the descriptive statistics of the variables below.

Descriptive Statistics

	Child malnutrition	Domestic general government health expenditure per capita	Income poverty	Net official flows from world food programme	GDP per capita
Mean	74.77	29.77	0.56	5.08	3889.45

Median	66.67	13.75	0.67	2.16	3313.31
Std. Dev.	25.35	56.53	0.30	10.31	2765.16
Skewness	-0.76	3.66	-0.16	7.19	1.75
Kurtosis	3.11	16.23	2.22	76.90	6.34
Observations	255	255	255	255	255

Source: Author's Computation using E-views 11, 2021

ANALYSIS OF REGRESSION RESULTS AND DISCUSSION OF FINDINGS

Essentially, the estimation results from the Panel Fully Modified Least Squares (FMOLS) regression method are reported in Table 3. Essentially, the result covers a panel of 15 sub-Saharan African countries highlighted above. From the regression result, a 1-period lagged health inequity exerted a positive and statistically significant impact on its current value. The implies that the previous trends in health inequity have the tendency to influence the current situation depending on the effectiveness of the policy put in place to address the situation in previous time. Specifically, the result shows that 1 unit increase in 1-period lagged health inequity will cause its current trends to rise by 0.66 unit.

From the regression result also, GDP per capita exerted a positive, though, statistically insignificant negative impact on Child malnutrition in Sub-Sahara Africa. Nevertheless, this is also in disagreement with theoretical a priori expectation, since a rise in GDP per capita is expected to boost the socio-economic strength of the people which in turn provides the avenue for them to obtain the basic nutritional needs, thus reducing the incidence of malnutrition. Specifically, the result depicts that, 1 unit rise in GDP per capita will cause a corresponding 0.00017unit rise in health inequity in Sub-Sahara Africa.

From the regression result also, net official flows from world food programme exerted a statistically insignificant positive impact on the Child malnutrition in Sub-Sahara Africa, while its period lag was found to significantly exert negative impact on child malnutrition at 5% significance level. Precisely, the result thus suggests that, 1 unit rise in 1-period lagged net official flows from world food programme will cause a corresponding 0.01 unit drop in child malnutrition (health inequity) in Sub-Sahara Africa. This suggests that, the more the region receives inflows from international organizations such as World Food Programme, the more resources will be made available to provide the basic nutrition needs for all. This further reduces the spate of child malnutrition in the region.

From the regression result also, income poverty exerted a statistically significant positive impact on the Child malnutrition in Sub-Sahara Africa at 1% significance level, while its 1-period lag values exerted a statistically significant negative impact on the Child malnutrition in Sub-Sahara Africa at 1% significance level. Interestingly, the first instance of this result is in consonance with theoretical a priori expectation, since increasing level of income poverty is expected to reduce the economic power of people who may find it difficult to obtain the necessary resources to feed their families thus, leading to incidences of malnutrition in the society. Exactly, the result shows that, 1 unit rise in income poverty will cause a corresponding 9.30 units rise in health inequity in Sub-Sahara Africa. Nevertheless, the result further revealed that 1 unit fall in 1-period lagged income poverty will cause a corresponding 9.30 units fall in child malnutrition in Sub-Sahara Africa.

Also, domestic general government health expenditure per capita exerted a statistically significant negative impact on the Child malnutrition in Sub-Sahara Africa at 1% significance level, while its associated 1-period lag exerted a statistically significant positive impact on the Child malnutrition in Sub-Sahara Africa at 1% significance level. The implication is that, when there is an increase in the domestic general government health expenditure per capita, there will be an improvement in the welfare of the individual. This could lead to a reduction in health inequity in the system. Specifically, the result reveals that 1 unit increase in domestic general government health expenditure per capita among Sub-Sahara African countries will trigger a fall in health inequity by 0.02 units. However, 1 unit decline in 1-period lag will lead to a decline in health inequity by 0.03 units.

Finally, the result showed that, about 66% of the systematic changes in health equity in Sub-Sahara Africa is attributed to the cooperative effects of all the explanatory factors captured in the study (net official flows from world food programmes, income poverty, GDP per capita and domestic general government health expenditure per capita), whereas about 34% of the remaining innovations, is due to the error term. Thus, the above statistic further suggests that the model has a good fit. The regression results from the Panel Fully Modified Least Squares (FMOLS) regression method are presented in Table 3 below.

Table 4: Panel Data Estimation Results

Dependent Variable: HINEQ

Method: Panel Fully Modified Least Squares (FMOLS)

Panel method: Pooled estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HINEQ(-1)	0.66	0.01	100.50	0.00***
GDPPC	0.00017	0.00013	1.29	0.20
NOFWFP	0.0024	0.01	0.18	0.86
NOFWFP(-1)	-0.03	0.01	-2.17	0.03**
INPOV	9.30	0.96	9.64	0.00***
INPOV(-1)	-7.62	0.97	-7.87	0.00***
DGGHEPC	-0.02	0.01	-3.20	0.00***
DGGHEPC(-1)	0.03	0.01	3.73	0.00***
R-squared	0.66	Mean dependent var		76.58
Adjusted R-squared	0.64	S.D. dependent var		25.86
S.E. of regression	15.42	Sum squared resid		43997.92
Long-run variance	3.54			

NB: **(***) indicates significant at 5%(1%).

Source: Author's Computation using E-views 11, 2021

CONCLUSION AND RECOMMENDATION

Introduction

This paper examined the determinants of health equity in the context of sub-Saharan Africa, with the aid of panel data of fifteen (15) sub-Saharan African countries spanning 2004 to 2020, using the Panel Fully Modified Least Squares (FMOLS) regression procedure.

Summary of Findings

1. From the regression result, a 1-period lagged health inequity exerted a positive and statistically significant impact on its current value. The implies that the previous trends in health inequity have the tendency to influence the current situation depending on the effectiveness of the policy put in place to address the situation in previous time.
2. From the regression result also, GDP per capita exerted a positive, though, statistically insignificant negative impact on Child malnutrition in Sub-Sahara Africa.
3. In addition, net official flows from world food programme exerted a statistically insignificant positive impact on the Child malnutrition in Sub- Sahara Africa, while its period lag was found to significantly

exert negative impact on child malnutrition at 5% significance level.

4. Also, income poverty exerted a statistically significant positive impact on the Child malnutrition in Sub-Sahara Africa at 1% significance level, while its 1-period lag values exerted a statistically significant negative impact on the Child malnutrition in Sub-Sahara Africa at 1% significance level.
5. Also, domestic general government health expenditure per capita exerted a statistically significant negative impact on the Child malnutrition in Sub-Sahara Africa at 1% significance level, while its associated 1-period lag exerted a statistically significant positive impact on the Child malnutrition in Sub-Sahara Africa at 1% significance level.

Recommendations

1. The study thus recommends that sub-Saharan African countries should strengthen their budgetary allocations to the health and humanitarian sectors so as to make adequate resources available to provide the basic health and nutritional needs especially for the severely disadvantaged households. Thus, the region should make conscious efforts to bolster the flow of domestic general government health expenditure per capita so as to make health services more available to the wider society.

2. Basically, GDP per capita and poverty are negatively correlated, suggesting that an increase in per capital income tends to reduce the level of poverty in the country. Thus, African community should boost its productive base so as to raise per capital income thereby reducing the poverty level in the region. This will health to fight against the rising spate of child malnutrition in the region.

3. Similarly, net official flows from world food programme exerted a statistically significant negative impact on the Child malnutrition in Sub-Sahara Africa, suggesting that most inflows from UN agencies and other international agencies to the sub-Sahara African sub-region have been very helpful in curbing child malnutrition in the region. This call for the need for the region to call for more support and cooperation among their foreign partners in the quest for achieving the sustainable development goals.

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APPENDIX

Dependent Variable: HINEQ
Method: Panel Fully Modified Least Squares (FMOLS)
Date: 03/27/21 Time: 21:01
Sample (adjusted): 2006 2020
Periods included: 15
Cross-sections included: 13
Total panel (unbalanced) observations: 208
Panel method: Pooled estimation
Cointegrating equation deterministics: C
First-stage residuals use heterogeneous long-run coefficients
Coefficient covariance computed using default method
Long-run covariance estimates (Bartlett kernel, Newey-West automatic bandwidth (with offset=77), NW automatic lag length)
Warning: one more more cross-section have been dropped due to estimation errors

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HINEQ(-1)	0.657850	0.006546	100.4967	0.0000
GDPPC	0.000172	0.000133	1.294681	0.1972
NOFWFP	0.002353	0.013241	0.177675	0.8592

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume IX Issue III March 2025

NOFWFP (-1)	-0.028817	0.013262	-2.172931	0.0312
INPOV	9.304653	0.964918	9.642950	0.0000
INPOV (-1)	-7.615051	0.967330	-7.872234	0.0000
DGGHEPC	-0.019617	0.006121	-3.204749	0.0016
DGGHEPC (-1)	0.030182	0.008083	3.734022	0.0003
R-squared	0.660827	Mean dependent var		76.58128
Adjusted R-squared	0.644326	S.D. dependent var		25.85856
S.E. of regression	15.42163	Sum squared resid		43997.92
Long-run variance	3.535921			