



Is Health Care a Luxury? Evidence from sub-Saharan Africa

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Abstract

The proportion of gross domestic product that goes to health care is low in Sub-Saharan Africa (SSA), despite that issue of income elasticity of health care expenditure remains inconclusive. This study determines the income elasticity of total, public, and private health care spending in sub-Saharan Africa. The study is anchored on the income elasticity of demand. Private, public, and aggregate healthcare expenditure and per capita gross domestic product for the SSA countries for 2000 -2020 are used. Data were obtained from World Bank database. The data covered 44 countries across the SSA region. The pooled ordinary least square and least square dummy variable models were used to determine the income elasticity of health care spending. Estimates were validated at $p \leq 0.05$. The income elasticity (< 1) of total, public, and private health spending is inelastic. Health spending is a necessity in SSA. The government should give priority to the health sector by increasing health spending to improve health outcomes in SSA.

Keywords: Heath care expenditure, Gross Domestic Product, Income elasticity, Sub-Saharan Africa.

JEL Classification: I18

1.0 Introduction

The poor health status in Sub-Saharan Africa is attributed to a variety of socioeconomic factors like low-income, poor sanitation, low female literacy rate, and inadequate health spending (Chireshe & Ocran, 2021). Sub-Saharan Africa (SSA) has recorded improvement in the health system overtime and this include progress in the use of modern healthcare techniques, improvement in the socioeconomic amenities and health infrastructures as well as decline in infant/child survival rates since the end of the Millennium Development Goals (MDGs), and the introduction of the sustainable development goals (SDGs) in 2015. However, the region has the highest infant mortality rates of 72 deaths per 1000 live births, relative to other Europe, Asia and North America with 3.43, 27.2 and 5.35 deaths in every 1000 live births, respectively.

Meanwhile, the allocation to health in SSA when compared to other sectors in the annual budget remains relatively minimal. The per capita health spending was US\$86 and US\$74 in 2015 and 2023, respectively. Similarly, the size of per capita GDP rarely determines the allocation to health sector. Some countries with low per capita gross domestic product (GDP) tends to allocate higher fraction of their GDP to health than countries with high GDP per capita. For instance, in 2023, low-income countries in Sub-Saharan Africa (SSA) like Ethiopia, Gambia, and Malawi allocates 15% of their budget to the health sector, while Nigeria and South Africa with higher GDP devotes only 8.58% and 13.38%, respectively, of their budget to health (World Bank, 2023).



Globally, there is an improvement in health spending in recent years, with aggregate spending rising from \$8.5 trillion in 2019 amounting to 9.8% of world GDP to US\$9.8 trillion in 2021 amounting to 10.3% of global GDP (WHO, 2023). However, there exists differences among regions and countries of the world, for instance, per capita health spending in SSA is low relative to that of other regions. The average per capita health expenditure in SSA was US\$73.79 in 2020 accounting for 4.92% of GDP, while in Organization for Economic Cooperation and Development (OECD) countries the average per capita health expenditure was US\$5,295.30 in 2020, approximately 14% share of GDP. In SSA, only 6.1% of aggregate health spending comes from government relative to 10.91%, 6.94%, and 9.5% in Europe, Asia, and OECD, respectively (National Institute of Health [NIH], 2023).

Although the income level of SSA countries has been linked to increasing health care spending, the number of resources to be committed to health care by a country is an issue yet unresolved. There are two schools of thought concerning the funding and allocation of scarce resources to health care. The first is the idea that health is a luxury good and should be entrusted to market forces just like any other commodity. The opposing perspective contends that health care is a necessity that requires further government involvement in the health sector because an increase in the percentage of income spent on healthcare would directly translate to improvement in health/living standards (Kiross et al., 2020). Given the conflicting view on the responsiveness of health care to national income and the limited economic resources confronting SSA countries, there is a need to understand the income elasticity of health care spending in Sub-Saharan Africa. While there is no scarcity of literature on the impact of health expenditure on economic growth in SSA (Kiross et al., 2020, Cherishe & Ocran, 2021), there exist scanty studies on the income elasticity of health spending in SSA. Also, studies that examine the income elasticity of health spending in SSA are limited and obsolete (Lv & Zhu, 2014; Olaniyan et al., 2017). This study advance the literature by examining the income elasticity of healthcare spending in SSA.

Specifically, this study provides answer to the question: what is the income elasticity of health care spending in SSA? The study determines the income elasticity of total, public, and private health care spending in sub-Saharan Africa, that helps determine whether health spending is a luxury or a necessity good.

The study focuses on Sub-Saharan Africa and restricted to the periods between 2000 to 2020, because of the peculiar health situation of the region, and the countries having complete data for the stated period.

The choice of the study period is to understand the development in health sector in SSA as it relates to the proportion of GDP that is allocated to health spending. The choice of the period is informed by the increase in global health spending that accompanies the development of SDGs. This paper is structured into five sections. Following the introductory part, is literature review-it reviews theories and empirical issues as it relates to elasticity of health spending. section three is the methodology employed in the study. In section four, estimated results are presented and discussed. Section five is the concluding section of the study which includes summary, conclusion, recommendation and limitation of the study.

This study aimed to assess the utilization of instructional materials in teaching and learning economics in private secondary schools in Katagum local government area, Bauchi State. The specific objectives of the study were: to identify the extent of Economics teachers' utilization of instructional materials in teaching and learning Economics in public secondary schools in Katagum local government area; to identify the various instructional materials available in teaching and learning Economics in the study area and; to identify the major challenges associated with using instructional materials for teaching and learning Economics in the study area.

2.0 literature Review

The debate on the nature of elasticity of healthcare is on the increase owing to the obvious contradictory results emanating from developed countries level data and developing countries data. The issue of elasticity has remained unresolved for developed nations, and inconclusive in the developing countries despite the low proportion of gross domestic product that goes to healthcare (Bustamante & Shimoga, 2018;).

A greater than one income elasticity of healthcare implies health is a luxury, hence can be best produced and consumed by the forces of demand and supply in the market. When income elasticity of healthcare is less than one, it implies healthcare is income inelastic. Empirical evidence on the relationship between health care expenditure and Gross Domestic Growth abounds in literature. In the United States, Freeman (2003) found that the income elasticity of aggregate health care lies between 0.817 and 0.844. He concluded that health care expenditure is a necessity good and not a luxury good.

Sen (2005) estimated the income elasticity of health care using the generalized least square method on OECD data and found income elasticity's of between 0.21 and 0.51, implying health care spending in OECD countries is income inelastic and a necessity. In a study on selected fifteen Asia countries, Khan and Ul Husnain (2019), found an income elasticity of health care below unity. In a similar study, Khan and Mahmud, (2015) investigate whether healthcare expenditure (private and public) is a luxury or necessity in South-East Asian Regional (SEAR) countries. Their findings reveal that private health spending is a luxury, while public health spending is a necessity. Using the demand and supply sides of health care, real income elasticity in Taiwan is found to be less than unity, hence the health care spending is for curing (a necessity), and not for caring (Yu & Chu, 2007). In a study on whether real health expenditure is a necessity or luxury in OECD countries, Narayan et al. (2011) found that the income elasticity of per capita health expenditure is less than unity for 17 countries, hence a necessity, and found health care spending to be a luxury in one country. Using a specific health-care price index deflator for a sub-sample, the study further reveals that the use of a GDP deflator is a source of bias in the regression model, however, the income elasticity of health expenditure is less than one. Therefore, health care expenditure is a necessity in all countries. Pattanayak and Chadha (2016) analyzed the relationship between health care expenditure and income among selected emerging economies for seven years. The study reveals a long-run relationship among the series and found income elasticity to be less than unitary, thus, health care expenditure is not a luxury but a necessity. Parkin et al. (1987) found that health care is a

necessity rather than a luxury good in some selected OECD countries. Also, Costa-Font & Vilaplana (2019) found that health care in OECD countries is not a luxury good in the long run.

On the contrary, Ucieklak-Jez et al. (2018), found that the income elasticity of health care expenditure is greater than unity, thus health care is a luxury good in some selected European Countries. Few studies investigate the income elasticity of health care in SSA. Olaniyan et al. (2017) found that the income elastic of health care expenditure in SSA is less than unitary, hence, health care is a necessity good. Lv & Zhu (2014) found that income elasticity varies with income level and is not constant and, also revealed that health care is a necessity and not a luxury in Africa.

3.0 Methodology

3.1 Model Specification

The model for the actualization of income elasticity of health care spending in sub-Saharan Africa is specified as follows.

$$THE_{it} = \beta GDP_{it} + \mu_{it} \quad (1)$$

Where: GDP_{it} is per capita income and THE_{it} is total health expenditure.

Expressing equation (1) in its natural logarithm gives equation (2) as expressed below

$$\log THE_{it} = \alpha_i + \beta \log GDP_{it} + \mu_{it} \quad (2)$$

The variable transformation implies that the variable coefficients measure elasticity. The study computes the income elasticity of public and private health expenditures in SSA. The models are specified in equations 2a and 2b for public and private health spending respectively.

$$\log Puhe_{it} = \alpha_i + \beta \log GDP_{it} + \mu_{it} \quad (3)$$

$$\log Prhe_{it} = \alpha_i + \beta \log GDP_{it} + \mu_{it} \quad (4)$$

Where $Puhe$ is public health expenditure (government health expenditure per capita, Purchasing Power Parity (PPP) at current international US Dollars).

$Prhe$ refers to private health expenditure is a fraction of total health expenditure excluding public. It mainly comprises out of pocket payment (direct household expenditure) on health, premiums for voluntary health insurance or sometimes covered on behalf of the individual by employers, direct service payment by private corporations and donations as aids to support healthcare (World Bank, 2023). It is measured as household health spending per capita, PPP.

The models are estimated using Pooled least squares and the fixed effects least square estimator techniques. The Pooled least squares ignores the panel structure of the data by pooling together

data on the units. The technique disregards potential differences that may give rise to different coefficients for each country. The fixed effects estimator does not assume that the regression function is constant overtime and space, in one-way fixed effects model, each cross-sectional unit (country) has its own intercept. The intercept (fixed effect) is allowed to vary over units by including an intercept dummy variable for each unit. The model is estimated using the Least Square Dummy Variable (LSDV) technique. To avoid falling into the dummy-variable trap, this study specified a constant and dummy variables in the regression functions below.

This research employs panel data that is, time series across cross-sectional units (country). The data for GDP, and health expenditures were obtained from the World Bank database covering the period 2000 to 2020.

4.0 Results and Discussion

Descriptive Statistics

The descriptive statistics of the variables in terms of measures of dispersion and central tendency in the form of mean, standard deviation, minimum and maximum values are presented in Table 1.

Table 1: Descriptive Statistics of the Variables

	GDP	PUHE	PRHE	THE
Mean	1963.374	41.0222	42.1141	83.1363
Median	780.0170	9.3612	19.2306	31.9915
Maximum	19849.72	614.193	356.893	788.5220
Minimum	110.4609	0.1763	0.9142	3.7778
Std. Dev.	2983.371	84.0064	58.6347	134.2274
Skewness	2.9359	3.3783	2.5985	2.7272
Kurtosis	12.4404	15.7209	9.7419	10.2080
Observations	924	924	924	924

Source: Authors' Computation

Health expenditure is categorized into public, and private as well as total health expenditure. In most of the countries, the result revealed that the proportion of private health expenditure is higher than public health expenditure. The mean of private health expenditure is USD \$42.11 per capita compared to USD \$41.02 per capita of public health expenditure in the region. The average values of health expenditures (Public, Private and External) and GDP per capita shows that percentage of health spending on health is relatively low.

From Table 1 above, all variables recorded a positive skewness, which implies that the distribution tend to have a long-right tail. All the variables are not normally distributed because their skewness statistics are substantially higher than the threshold (0). Again, each of GDP,

THE, PuHE, and PrHE has kurtosis statistics that is substantially different from the threshold of 3. Thus, they are leptokurtic.

Income elasticity of health spending in Sub-Saharan Africa.

An income elasticity less than one implies that the good is a “necessity” good and income inelastic, while, income elasticity greater than one implies that the good is a “luxury” good. The results for income elasticity of total, public and private health spending in SSA is presented in the Tables 2, 3 and 4.

Income elasticity of total health expenditure in SSA

The results for income elasticity of total health spending from POLS and LSDV models are presented in Table 2.

Table 2: Income Elasticity of Total Health Spending

VARIABLES	POLS	LSDV
LGDP	0.995*** (0.0132)	0.782*** (0.0176)
Benin		-0.577*** (0.0713)
Botswana		0.714*** (0.0715)
Burkina Faso		-0.280*** (0.0739)
Burundi		0.0688 (0.0819)
Cameroun		-0.0467 (0.0704)
Central Africa Rep.		-0.249*** (0.0764)
Chad		0.00987 (0.0733)
Comoros		0.295*** (0.0705)
Congo Republic		-0.613*** (0.0773)
Cote D'Ivoire		0.0972 (0.0700)
Djibouti		-0.130* (0.0702)
Equatorial Guinea		-0.113 (0.0737)
Eritrea		-0.413*** (0.0746)
Ethiopia		-0.515*** (0.0773)
Gabon		0.147**

	(0.0726)
The Gambia	-0.719***
	(0.0732)
Ghana	0.154**
	(0.0710)
Guinea	-0.173**
	(0.0733)
Guinea Bissau	0.242***
	(0.0742)
Kenya	0.0439
	(0.0713)
Lesotho	0.445***
	(0.0716)
Liberia	0.212***
	(0.0748)
Madagascar	-0.266***
	(0.0755)
Malawi	-0.722***
	(0.0747)
Mali	-0.249***
	(0.0734)
Mauritania	-0.181**
	(0.0703)
Mauritius	0.531***
	(0.0730)
Mozambique	-0.686***
	(0.0748)
Namibia	1.098***
	(0.0706)
Niger	-0.0451
	(0.0759)
Nigeria	-0.0574
	(0.0699)
Rwanda	-0.236***
	(0.0745)
Sao Tome	0.194***
	(0.0707)
Senegal	-0.00891
	(0.0707)
Seychelles	0.700***
	(0.0760)
Sierra Leone	0.631***
	(0.0761)
South Africa	1.022***
	(0.0719)
Sudan	0.160**
	(0.0706)
Tanzania	-0.377***
	(0.0727)
Togo	-0.0872



		(0.0728)
Uganda		-0.139*
		(0.0740)
Zambia		-0.166**
		(0.0711)
Zimbabwe		0.569***
		(0.0718)
Constant	-3.232***	-1.766***
	(0.0923)	(0.144)
Observations	924	924
R-squared	0.861	0.962
country effect	NO	YES
year effect	NO	NO
F-test	5691	511.9
Prob > F	0	0

Source: Authors' Computation .

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The result confirms a positive relationship between GDP and total health spending with an aggregate income elasticity of total health spending that is inelastic at 0.995, which is less than one (1), suggesting that health expenditure in Sub-Saharan African (SSA) region is a “necessity” good and not a “luxury” good. Also, the result indicates that 2 SSA countries South Africa and Namibia (in absolute term), exhibit income elasticity of total health spending that is greater than 1, therefore, implying that total health spending in these countries is a “luxury” good and not a “necessity” good. Other countries exhibit income elasticity of total health expenditure less than unity (1), which implies that health expenditure across these countries is a “necessity”.

Income elasticity of public health expenditure in Sub-Saharan Africa

The result for income elasticity of public health expenditure is presented in Table 3.

Table 3: Income Elasticity of Public Health Spending.

VARIABLES	POLS	LSDV
LGDP	1.131*** (0.0214)	0.897*** (0.0282)
Benin		-0.982*** (0.114)
Botswana		0.883*** (0.115)
Burkina Faso		-0.253** (0.118)

Burundi	0.00187 (0.131)
Cameroun	-1.230*** (0.113)
Central Africa Rep.	-0.794*** (0.122)
Chad	-0.536*** (0.117)
Comoros	-1.014*** (0.113)
Congo Republic	-1.823*** (0.124)
Cote D'Ivoire	-0.949*** (0.112)
Djibouti	0.0540 (0.112)
Equatorial Guinea	-1.307*** (0.118)
Eritrea	-0.782*** (0.119)
Ethiopia	-0.694*** (0.124)
Gabon	-0.0311 (0.116)
The Gambia	-0.679*** (0.117)
Ghana	0.0718 (0.114)
Guinea	-1.398*** (0.117)
Guinea Bissau	-0.449*** (0.119)
Kenya	-0.106 (0.114)
Lesotho	0.842*** (0.115)
Liberia	-0.804*** (0.120)
Madagascar	-0.143 (0.121)
Malawi	-0.438*** (0.120)
Mali	-0.655*** (0.117)
Mauritania	-0.675*** (0.113)
Mauritius	0.262** (0.117)
Mozambique	-0.311*** (0.120)



Namibia		1.002*** (0.113)
Niger		-0.346*** (0.121)
Nigeria		-1.044*** (0.112)
Rwanda		-0.0991 (0.119)
Sao Tome		0.301*** (0.113)
Senegal		-0.326*** (0.113)
Seychelles		0.827*** (0.122)
Sierra Leone		-0.401*** (0.122)
South Africa		0.871*** (0.115)
Sudan		-0.318*** (0.113)
Tanzania		-0.293** (0.116)
Togo		-0.994*** (0.117)
Uganda		-0.565*** (0.118)
Zambia		-0.111 (0.114)
Zimbabwe		0.365*** (0.115)
Constant	-5.256*** (0.149)	-3.292*** (0.231)
Observations	924	924
R-squared	0.753	0.935
country effect	NO	YES
year effect	NO	NO
F-test	2805	286.7
Prob > F	0	0

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

Source: Authors' Computation

The result tends to suggest that elasticity of public health expenditure and GDP is elastic (1.13). This implies public healthcare spending is a luxury in SSA countries using the POLS technique. However, the coefficient of public health spending in relation to GDP using the LSDV technique suggests otherwise. Given that the LSDV accounts for individual and time specific effects, it can be argued that the income elasticity of public health spending in SSA is inelastic, thus public health spending a necessity. Therefore, the government should increase

allocation to health in order to provide its citizens with good and affordable healthcare system, this is in line with the work of Khan and Mahmud, 2015. The result indicates that 7 SSA countries exhibit income elasticity of public health spending that is greater than 1, these are Nigeria, Namibia, guinea, Equatorial Guinea, Cameroun, Comoros and Congo republic, implying that public health spending is a “luxury” good across these countries.

While, countries like Benin, Botswana, Burkina Faso, Burundi, central Africa republic, Chad, cote d’Ivoire, Djibouti, Eritrea, Ethiopia, Gabon, the Gambia, guinea Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Niger, Rwanda, Sao tome, Seychelles, Sierra Leone, south Africa, Sudan, Tanzania, Togo, Uganda, Zambia and Zimbabwe, exhibit income elasticity of public health spending that is inelastic (< 1), which means that health spending is a necessity good.

Income elasticity of private health expenditure in Sub-Saharan Africa

The result for income elasticity of private health expenditure is presented in Table 4.

Table 4: Income Elasticity of Private Health Spending in SSA.

VARIABLES	POLS	LSDV
;LGDP	0.891*** (0.0167)	0.701*** (0.0216)
Benin		-0.247*** (0.0875)
Botswana		0.374*** (0.0877)
Burkina Faso		-0.231** (0.0906)
Burundi		0.159 (0.100)
Cameroun		0.521*** (0.0863)
Central Africa Rep.		0.0718 (0.0937)
Chad		0.372*** (0.0899)
Comoros		0.885*** (0.0864)
Congo Republic		-0.153 (0.0948)
Cote D’Ivoire		0.627*** (0.0858)
Djibouti		-0.337*** (0.0861)
Equatorial Guinea		0.551*** (0.0903)
Eritrea		-0.126



	(0.0915)
Ethiopia	-0.361***
	(0.0948)
Gabon	0.276***
	(0.0891)
The Gambia	-0.690***
	(0.0898)
Ghana	0.262***
	(0.0871)
Guinea	0.350***
	(0.0899)
Guinea Bissau	0.524***
	(0.0910)
Kenya	0.206**
	(0.0874)
Lesotho	-0.0899
	(0.0878)
Liberia	0.684***
	(0.0917)
Madagascar	-0.300***
	(0.0926)
Malawi	-0.983***
	(0.0916)
Mali	0.0313
	(0.0900)
Mauritania	0.172**
	(0.0863)
Mauritius	0.788***
	(0.0895)
Mozambique	-1.068***
	(0.0917)
Namibia	1.211***
	(0.0866)
Niger	0.207**
	(0.0930)
Nigeria	0.490***
	(0.0857)
Rwanda	-0.305***
	(0.0913)
Sao Tome	0.0419
	(0.0868)
Senegal	0.276***
	(0.0867)
Seychelles	0.306***
	(0.0932)
Sierra Leone	1.098***
	(0.0933)
South Africa	1.157***
	(0.0881)
Sudan	0.517***

		(0.0866)
Tanzania		-0.412***
		(0.0892)
Togo		0.387***
		(0.0893)
Uganda		0.176*
		(0.0907)
Zambia		-0.264***
		(0.0871)
Zimbabwe		0.783***
		(0.0880)
Constant	-3.058***	-1.926***
	(0.117)	(0.177)
Observations	924	924
R-squared	0.755	0.938
country effect	NO	YES
year effect	NO	NO
F-test	2849	302.8
Prob > F	0	0

Source: Author's Computation. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The result shows that private health spending is inelastic with a coefficient which is less than one 1 for the two models. This suggests private health expenditure which is mostly (out-of-pocket) is a necessity, in SSA. That is, health spending through out-of-pocket spending is income inelastic. This implies that out-of-pocket health spending in Sub-Saharan Africa is a necessity. Change in income can influence the consumption behaviour of households as well as decision of any nation. Healthcare generally provided by private health spending is mostly out-of-pocket, the higher the income level of individuals, the higher the freedom of choice on healthcare, however, most households in SSA countries cannot afford quality healthcare due to lower income level and likely transfer burden on public healthcare services due to high user fee (out-of-pocket payment). The result indicates that 40 SSA countries exhibit income elasticity of private health spending that is less than 1, implying that private health spending is a necessity. While, Sierra Leone, South Africa, Namibia and Mozambique, exhibit income elasticity of public health spending greater than (1) elastic imply that private health spending is a luxury and not a necessity.

The finding that health expenditure in Sub-Saharan African (SSA) countries is a necessity and not a luxury is very informative since health quality is highly correlated with economic growth. This means that income variation affects household's consumption pattern and the decision on how scarce resources are allocated in any economy. The fact that the POLS regression reported an elastic relationship between GDP and public health expenditure might be due to the fact that resources are scarce, hence the need to negotiate resource allocation among other sectors of the economy, which result in meagre allocation to health. Also, private health expenditure was inelastic in most SSA countries that is a "necessity" good and most SSA countries cannot afford quality healthcare due to lower income level. This finding is in line with the work of



Khan & Mahmud (2015) as well as that of Khan and Ul Husnain (2019) that found that public and private health spending is income inelastic, hence a necessity good.

5.0 Conclusion

The study investigates the income elasticity of health spending in Sub-Saharan African. The result shows that health expenditure as an aggregate and when disaggregated into public and private is a necessity. The study, however, suggest that the income elasticity of health expenditure is a luxury in some sub-Saharan African countries.

The study affirms that spending on healthcare is income inelastic as such a “necessity”. That is, the share of income going to health is falling with rising income within the region. That is, change in health care spending is less than the proportionate change in income, therefore, a justification for government intervention.

Finally, the policymakers should give more priority to health sector in order to improve health outcomes in SSA by increasing health spending since health spending in SSA is proven to be a necessity good and not a luxury.

This study contributes to knowledge in that, despite the role of health expenditure in mitigating the adverse effect of negative health outcomes, studies on the income elasticity of private, public, and total health expenditures are scarce. The use of three forms of health expenditure in the determination of income elasticity of health expenditure in Sub-Saharan Africa, is unique.

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