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Government Health Spending and Outcomes in Nigeria: The HIV Case (1985 – 2021)

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Abstract
In this study, from 1985 to 2021, the empirical relationship between health outcomes and government health spending in Nigeria is examined. Johansen Co-integration and the Vector Error Correction Model (VECM) econometric approaches are used to ascertain the long-term link between Nigerian public health spending and HIV. According to the report, public health investment, especially when used wisely, significantly affects HIV in Nigeria. Additionally, it was found that HIV in Nigeria is positively impacted by poverty and the literacy rate. Accordingly, based on the results of this study, the government should carefully plan and implement policies and programs that will reduce poverty at the level of the individual, the family, and the community. Additionally, government officials at all levels should step up their efforts to reduce the number of newly affected individuals through functional education. Additionally, the provision of public funds to the health sector needs to be increased and reorganized by the government.

Keywords: *Poverty, literacy, health, government, VECM*

Introduction

The state of a nation's residents' health is viewed as both a crucial prerequisite and a result of sustainable economic development. Thus, one of the main social and economic development objectives for the majority of nations is to improve the health statuses or health outcomes of its population. Further highlighting the significance of health, Moreno and Smith (2011) note that every citizen's access to the highest attainable standard of health is acknowledged as a fundamental human right and a key element in reversing socioeconomic and health system inequities. Public health spending is the most prevalent type of policy tool used to improve health outcomes in the majority of countries (World Health Organization 2001). But while some research (Anyanwu and Erhijakpor 2007; Ashiabi 2013) supports the idea that increased public investment in health care has a positive impact on health outcomes, other research (Filmer and Pritchett 1999; Thornton 2002) contends that public health expenditure is ineffective in improving health outcomes. The true nature of this relationship has significant policy ramifications as a result, particularly for emerging nations where achieving economic growth and other developmental goals depends on the wise use of limited public resources.

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Global Statistics (2018) estimates that at the end of 2016, there were 36.7 million persons living with HIV/AIDS worldwide. 2.1 million of them (or those under the age of 15) were kids. In 2016, an estimated 1.8 million people globally contracted HIV for the first time, or 5,000 new infections per day. There are 160 000 kids under the age of 15. The majority of these kids were infected by their HIV-positive moms during pregnancy, delivery, or breastfeeding and currently reside in sub-Saharan Africa. In 2020, over 70% of those with HIV around the world were aware of their status. Over 11 million of the remaining 30% still require access to HIV testing services. A key entry point for HIV prevention, care, and treatment and support services is HIV test. Antiretroviral medication (ART) was available to 20.9 million people living with HIV as of June 2017, up from 15.8 million in June 2015, 7.5 million in 2010, and less than one million in 2000.

In 2016, 1 million people passed away from AIDS-related illnesses, bringing the total number of AIDS-related deaths since the epidemic's beginning to 35.0 million. The second-lagest HIV epidemic in the world is in Nigeria (NACA, 2017). Even though Nigeria's adult HIV incidence is substantially lower (2.9%) than that of other sub-Saharan African nations like South Africa (18.9%) and Zambia (12.4%), UNAIDS estimates that 3.1 million persons in Nigeria were HIV positive in 2017. (UNAIDS, 2018). Nigeria is thought to have been the site of almost two-thirds of all new HIV infections in West and Central Africa in 2017. According to UNAIDS, the nation, together with South Africa and Uganda, is responsible for around half of all new HIV infections in sub-Saharan Africa each year (UNAIDS, 2018). Even if new infections decreased by 5% between 2010 and 2017, UNAIDS (2018) 80% of new HIV infection in Nigeria are caused by unprotected heterosexual intercourse, with the majority of the remaining HIV infections happening in affected communities like sex workers (NACA, 2015). According to NACA, 41% of HIV-positive people in Nigeria live in six states: Kaduna, Akwa Ibom, Benue, Lagos, Oyo, and Kano (2017). With a 5.5% incidence, HIV is most prevalent in the southern states of Nigeria (sometimes referred to as the South South Zone). The South East Zone in the southeast (where the frequency is 1.8%) has the lowest prevalence. HIV prevalence is greater in rural (4%) than urban (3%) settings NACA (2015). According to UNAIDS, in Nigeria, AIDS-related illnesses claimed the lives of almost 150,000 individuals in 2017 because only 33% of Nigerians with positive AIDS diagnoses are receiving antiretroviral therapy (ART), there has been a small decline in the number of AIDS-related fatalities each year since 2005 (UNAIDS, 2018).

Nigeria spends less than 1% of GDP on health and this trend has persistent since the country's independence. Despite the fact that income per capita has increased dramatically over the previous few years, this has had less of an impact on health spending, contributing to the population's noticeably poor health (Edeme, 2017). Edeme (2017) notes that between 1995 and 2014, Nigeria's GDP averaged 97.52 US billion, with a record high of 568.499 US billion in 2014 and a record low of 25.547 US billion in 1995. While it barely changed between 1995 and 1999, health spending as a percentage of GDP between 2010 and 2014 averaged 0.978 percent. Despite significant fluctuations in recent years, Nigeria's health spending as a percentage of GDP is expected to rise from 2001 to 2015, reaching 3.6 in 2015 (Yodatai, 2015). Olaniyi and Adam (2003) noted that when comparing Nigeria's performance to that of other African nations, government spending on health in 1990 was 2.7 percent of GDP, compared to 3.5 percent in Ghana, 4.3 percent in Kenya, and 4 percent between 1995 and 1997 in the Seychelles. The inverted form of the health expenditure pyramid exacerbates the low level of spending on the health sector in the majority of poor nations.A small percentage of the population residing in metropolitan areas receives expensive medical treatment for about three-quarters of all public health expenditures. Hospitals account up a significant percentage of the health budget, 80 to 90 percent in some nations, and nearly all of them are located in urban areas (Olaniyi and Adam 2003).

Research Problem

The Nigerian government has made attempts to increase government health spending over time in order to promote human capital development and achieve a worldwide World Health Organization target (Bakare and Sanmi, 2011). The cost of healthcare was $12.50 million in 1970. In 1980 and 1990, respectively, this number increased geometrically to 52.8 million and 500.7 million. The spending constantly increased from 15.3 billion in 2000 to 102.7 billion in 2010 and then increased further to 236.2 billion in 2020, demonstrating the persistence of this trend. This demonstrates unequivocally how hard the Nigerian government worked to improve health outcomes over time. Social capital expenditures totaled 1.9 billion in 1980. In 1990, the value rose to 2.2 billion, and in 2000 and 2010 it reached 28.1 billion and 151.9 billion. The amount spent on social capital in 2020 was 168.2 billion. These also demonstrate that the Nigerian government has made an effort to promote development of human resources through healthcare services. The fact that HIV/AIDS is still on the rise in Nigeria, however, means that despite all of these increases in government health spending, little has changed in terms of health outcomes.

According to estimates, Nigeria has one of the highest rates of HIV/AIDS patients in the world (1 in every 100 live births compared to 1 in every 4000 in North America) (Dedini, 2014). In Nigeria, the downward trend in health has been very concerning. In 1995, there were approximately 2 million AIDS-related deaths in Nigeria (Filmer, 2010). According to Jamison and Sandbu (2015), of the 189 UN member states that have endorsed the organization's development goals, Nigeria's total health system performance is ranked 182nd by the WHO. Nigeria has one of the lowest levels of human development in sub-Saharan Africa and the entire world (Abrahams, 2011).

Whether government spending on health results in health benefits, particularly in the form of positive health outcomes, is one of the most fundamental yet unresolved concerns in health policy. Public health service provision is justified by economic factors like the availability of competitive and cost - effective public health interventions, public goods, externalities, caused by natural disasters costs, and the inadequacy of the health care market (Anomaly, 2015). We would anticipate a significant correlation between Nigerian government health spending and health outcomes if these factors were significant. This study aims to investigate the relationship between government health spending and health result.

However, ethical justifications for health as a fundamental good necessary for human capabilities and public demand for health care have also been significant drivers of public spending on health (Musgrove 2019), and health care spending may be influenced by these factors in addition to economic effectiveness (Anomaly, 2015)

Research Objectives

Examining health outcomes and government health spending in Nigeria is the study's main goal while the specific objectives of this work includes to:

(a) Investigate the effect of HIV on government health spending in Nigeria.
(b) Analyze the impact of the HIV prevalence rate on Nigeria's literacy rate
(c) Assess the impact of the HIV prevalence on the poverty level in Nigeria.

Empirical Review

HIV and government spending have always been divisive topics, particularly in Nigeria. As a result, a few earlier works on the subject are now offered. Serdar (2015) looked at the connection between Turkish

government spending and economic expansion. A Feder-Ram Approach was used in the study as an estimating method. According to the results, there was a positive correlation between government health spending and economic growth during the study period. In other words, as government spending on health care improves, both economic growth and Serap (2016) investigated the link between health spending and economic growth in a few particular emerging nations. Peter (2017) investigates the connection between malaria in Nigeria and government health spending. The empirical findings using co-integration and error correction models show that government health spending, especially when used wisely, is significant in lowering malaria mortality in Nigeria. In explaining malaria mortality in Nigeria, the coefficient of malaria case (prevalence) is found to be significantly important. In a related investigation, Bakare and Olubokun (2011) looked at health care spending and economic growth in Nigeria using data from Joda and Yommoto (1995) and Dolado and Luthkepoh (1996). The estimating method used in the study was ordinary least square. The study's findings showed a strong and favorable correlation between health care spending and economic growth in Nigeria throughout that time. The study by Kambou (2003) used an eleven-sector computable general equilibrium (CGE) model for the years 1966-1991 to examine the effect of AIDS in Cameroon. They come to the conclusion that throughout the study period, the loss of one urban worker had a negative impact on production seven times more than the loss of a rural worker, and GDP growth rate was lowered by 1.9% annually. Indicators of economic growth rates in a few selected industrialized and developing nations from 1965 to 1990. As an estimating method, panel co-integration was used. The study's findings revealed a favorable and statistically significant correlation between economic growth and health in the countries that were chosen. Ke etal, (2011) conducted a study to better understand the factors that influence the cost of healthcare in developing nations. The study's results reveal significant regional variance in health spending as a percentage of GDP, which spans from less than 5% to 15%. In addition to money, a variety of factors, from demographics to the peculiarities of the health system, affect this difference. Their findings imply that after accounting for other considerations, overall health expenditure does not expand more quickly than GDP. Income elasticity in the fixed effect model is between 0.75 and 0.95, whereas it is substantially lower in the dynamic model. They discovered no distinction in health spending between tax-based and insurance-based financing methods for healthcare.

Numerous academics have conducted in-depth research on the relationship between public health spending and population health outcomes. The relationship between public health spending and health outcomes, particularly as it relates to under-five mortality, newborn mortality, and life expectancy at birth, has been

the subject of a number of literary works in recent years. The studies that are now available provide evidence of a variety of outcomes, including none, only minor effects, and affects on only a few interventions. Anyawu and Erhijakpo (2007) conducted a study on health spending and health outcomes in Africa, and they used data from 47 African nation between 1999 and 2004 to provide econometric evidence connecting the per capita total, government health spending and per capita income to two outcomes: infant mortality and under-five mortality. It was discovered that health spending has a statistically significant impact on baby and under-five mortality. The findings suggest that total health spending in African nations (together with the public portion) is unquestionably a significant factor to health outcomes.

Additionally, they discovered a positive and substantial association between Sub-Saharan Africa and under-five mortality. The North Africa operates in the opposite manner. Higher rates of physicians and female literacy dramatically reduce these health outcomes, but ethnolinguistic fractionalization and HIV prevalence have a positive and significant impact on health outcomes.

The Novignon et al. study (2012) used fresh data from panel data analysis spanning 44 sub-Saharan African countries from 1995 to 2010 to explore the relationship between public and private healthcare spending and health status in the region. To ascertain the effects of health care spending on population health status and to investigate the influence by public and private expenditure sources, fixed and random effects panel data regression models were constructed. The data they gathered demonstrates that healthcare spending has a considerable impact on health status by increasing birth weight, lowering death and infant mortality rates, and enhancing life expectancy at birth. Both public and private healthcare spending showed strong positive association with health status even though public health care spending had relatively higher impact. Boachie and Ramu (2015) looked at Ghana's health status and public health spending. Using standard OLS and Newey-White estimation, they looked at the effect of public health spending on health status in Ghana from 1990 to 2002. The analysis discovered evidence that, among other things, public health spending has had an impact on Ghana's lowering or falling infant death rate after adjusting for real per capita income, literacy level, and female labor market involvement. They came to the conclusion that increased public healthcare spending is linked to a decline in newborn mortality and an improvement in health status.

Theoretical Literature

Peacock and Wiseman Theory of Public Expenditure

In 1967, this theory was created based on observations made in England. According to Peacock and Wiseman, an increase in government spending does not follow Wagner's predetermined order. The authors chose to utilize a political argument to demonstrate how rising government spending results from individuals' votes for greater social services rather than higher taxes, which is contrary to popular belief. The idea also allows for disagreements over taxation and public expenditure restrictions, but these can be reduced by widespread shocks like major wars.

The administration will make plans to restore the economy to its pre-disturbance condition during these times. To pay for the rehabilitation procedure, an increase in tax will be necessary.

The citizens initially attempted to vote against the tax increase because it lowers their available money. However, as time goes on and the populace becomes familiar with the new tax structure, government spending will rise. After such rehabilitation, a tax decrease won't be necessary, which will result in continued high government spending. According to Peacock and Wiseman, the period of expulsion hindered a state's sovereignty and required the state to spend money on the federal government. The central government's role in spending will inevitably expand due to the centralization of the government. Consequently, the exposure theory of public spending is another name for this theory.

Classical Theory of Government expenditure

The classical theory supported the free market system and held that government spending hurts the economy since it should be left to market forces to establish the price and quantity levels that are at equilibrium. Adam Smith (1776) promoted laissez-faire, a kind of capitalism in which the processes of economic growth are driven by profit. According to this theory, the economy is constantly in full employment and any rise in spending will result in an increase in the economy's nominal variables. Since the economy's real variable is fixed, a rise in government spending will result in higher prices because it will increase the amount of money in circulation. The term "neutrality of money" refers to the increase in money those results from an increase in government spending without a corresponding increase in output. Here, it is assumed that the economy is flawless and free of externalities. The budget is constantly in balance since saving equals

investing in the economy. Therefore, since full employment is regarded to be the equilibrium state, government spending is not necessary because it would further disrupt the equilibrium.

Theoretical Framework

The Serap (2016) health investment model served as the basis for the theoretical foundation for this investigation. The question of how people utilize their resources to promote health was addressed by Serap (2016). Given that it extends beyond conventional demand analysis, the model has had a significant impact on health economics. The notion of the individual as a producer of health is also used in this approach. The health investment model, according to Serap (2016), posits that today's health + future investments in health less depreciation equals health tomorrow.

$H_{t+1} = H_t + I - \delta H_t$ ……1

An individual is born with a base amount of H_t which they can increase through investments. The effectiveness and level of investment in H determine the rate of production of H. H_t is the current health stock, and H_t+1 is the health stock for one further period. The stock of H will lose value due to aging, mishaps, negligence, and unexpected illness. The depreciation rate is represented by. H_t represents the current value of health depreciation as a result. The model goes on to say that investment in health is a function of products purchased for consumption (M), including medicine, time spent creating health (TH), and training (E).

Thus, $I = f(M, T_H; E)$ ……2

Consumption goods; $Z = f(X, T_c, E)$

Health investment = I, M = Market inputs for health care, TH = Time devoted to enhancing health, Z = Good composite consumption, X = Products made by the market, T_c = Time invested in good composite consumption, E stands for education/training. By substituting equation 2 into equation 1;

$H_{t+1} = H_t + M + T_H + E - \delta H_t$ ……3

The projected value of HIV in this study is future health. H_t represents the level of current HIV status, TH represents private and governmental health spending, and literacy rate represents training.

Empirical Model

The empirical model for this study is described below in accordance with Serap's (2016) health investment model. Prior to that, it should be emphasized that the variable HIV will be utilized as a proxy for the demand for HIV care and will acts as the explained variable, with other variable-public health spending, the literacy rate, and the poverty rate-acting as the explanatory variables.

The functional form of this model is given as; based on these variables.

HIV = f(Ghe, Lr, Pr)

HIV = human immune deficiency syndrome, Ghe= Government Health Expenditure,

Lr = Literacy rate, Pr = Poverty Rate,

According to empirical econometric data, the aforementioned model could be described as;

$HIV = \beta_0 + \beta_1 Ghe + \beta_2 Lr + \beta_3 Pr + U$ ……4

The intercept, which measures the person's initial or fatal endowment health value, is equal to β_0 while the empirical model's impact measuring parameters are 1 through 3 (β_1- β_3)

Source of Data

The secondary annual time series data used in this analysis were obtained from the Central Bank's statistical bulletin. It spans a 36-year period (1985-2021). HIV, government health spending, literacy rate and poverty rate are the variables of interest.

Research Methodology

A stationarity test is performed to confirm that the variables are stationary and that shocks are only transient, thus they will disperse over time and return to their long-run mean. The series' stationarity status and, thus, the sequence of intergration are determined using the Argmented Dickey Fuller unit root test. The variables are subjected to a co-integration test. This test aims to determine whether the variables have a long-term association. A vector error correction model is estimated to look at the short-run dynamics of the variables, and the study uses the Juselius (1990) and Johansen (1991) multivariate co-integration approach to see if a long-run link exists between the regress and the model's regressors.

Results and Interpretations

Unit Root Test

Before estimating the variable, the data's qualities must be looked at. The Augmented Dickey-Fuller (ADF) test for the presence of unit root must be performed since time series data are trended. This is because time series data's trended nature unintentionally violates the unbiasedness and efficiency characteristics of the ordinary least square method (OLS). The table below shows the results of the unit root test:

Table1: Unit root tests results

Variables	ADF Test Statistics	90%Critical Value of ADF	Remark	ADF Test Statistics	90% Critical Value of ADF	Remark	Order of Integration
LHIV	-3.50850	-3.24859	stationary				*I* (0)
LGHE	-1.69899	-3.20709	Non-stationary	-3.93440	-3.215267	Stationary	*I* (1)
LPr	-2.01323	-3.20470	Non-stationary	-5.42536	-3.207094	Stationary	*I* (1)
LLr	-4.13832	-3.21236	stationary	-7.93292	-3.212361	Stationary	*I* (0)
LENF	-1.64277	-3.20245	Non-stationary	-5.96294	-3.204699	Stationary	*I* (1)

Source: Estimate by the author using Stata 13

At initial difference and level, the test was administered. HIV prevalence rates and literacy rates were determined to be stable at their current levels, as shown in Table 1. Therefore, they are integrated of order zero I according to ADF value (0). According to ADF and a critical value reported at a 10% significance level, poverty rate and environmental factors are stationary at their first difference in the case of government health expenditures. They are integrated of order I (1) As a result; we reject the null hypothesis that the variables are not stationary.

The Results of the Johansen Co integration Test

The co-integration result examines relationship's supporting evidence, which is demonstrated by the significance of the fisher statistics, the trace test, and the results of the max-Eigen test in table 2. All the variables are stationary at their first difference, according to the results of the ADF and stationarity tests. As a result, we can move on to test for the long-term relationship between the variables using the Johansen co integration test, which is more appropriate for this study due to its multivariate and vector nature. The results show that there are four co-integrating equations at 5%, as shown in table two below.

Table 2: The Results of the Johansen Co integration

Hypothesized No OF CO-INTEGRATION EQUATION	MAXIMUM EIGEN VALUE	0.05 CRITICAL VALUES	PROBABILITY	TRACE STATISTICS	0.05 CRITICAL VALUE	PROBABILITIES
None *	69.9945	33.8769	0.0000	164.4390	69.8189	0.0000
At most 1	51.8379	27.5843	0.0000	94.4444	47.8563	0.0000
At most 2	24.7384	21.1316	0.0150	42.6064	29.7971	0.0010
At most 3	17.0188	14.2646	0.0180	17.8680	15.4947	0.0220
At most 4	0.84917	3.84147	0.3570	0.8492	3.8415	0.3570

Source: Estimate by the author using Stata 13

Vector Error Correction Mechanism (VECM)

The vector error correction mechanism (VECM) was estimated in order to investigate the systematic disequilibrium adjustment process and the short-run transmission mechanism among the variables, as shown in table 3 below.

Since the goal equation is in the first column of the table 3 above, that column will be taken into account for the interpretation. The coefficient of the ECM in table 3 above illustrates the adjustment term of the vector error correction technique (VECM). The HIV has an adjustment coefficient of 0.466743, meaning that the previous period's divergence from long-run equilibrium is corrected in the present period at an adjusted speed of 49.7%. It is also correctly signed and significant at the 5% level. In addition, a percentage change in LHIV in lag one and two is linked with, respectively, a 0.56% and 0.32% decrease in HIV on average in the short run, despite the fact that the variable LHIV is lagged on one and two periods and is negatively signed and significant in the lag one period. This is true because the prior prevalence of HIV cases has decreased as a result of the employment of cutting-edge technology, advancements in medicine, and increased public knowledge of HIV's effects.

Table 3: Vector Error Correction Mechanism (VECM) Estimates

System Equation				
Explanatory variable	**D(LHIVPR)**	**D(LGHEXP)**	**D(LLITR)**	**D(LPVR)**
ECM	-0.4667	-0.3241	-0.0059	-0.0847
	[-5.1554]	[-2.1687]	[-0.2232]	[-2.1788]
D(LHIV(-1))	-0.5573	-0.4656	0.0168	-0.03903
	[-2.5900]	[-1.3107]	[0.2684]	[-0.4224]
D(LHIV(-2))	-0.3199	-0.1400	-0.0253	-0.0555
	[-1.8580]	[-0.4924]	[-0.5053]	[-0.7507]
D(LGHE(-1))	0.0230	-0.1342	-0.0317	-0.0431
	[0.1185]	[-0.4180]	[-0.5610]	[-0.5169]
D(LGHE(-2))	0.1117	-0.0694	0.0123	-0.1251
	[0.6144]	[-0.2315]	[0.2334]	[-1.6031]
D(LLr(-1))	1.1876	1.4519	-0.5355	0.4652
	[1.8031]	[1.3353]	[-2.7958]	[1.6445]
D(LLr(-2))	0.5813	-0.6831	-0.9090	0.5754
	[0.8058]	[-0.5736]	[-4.3327]	[1.8570]
D(LPr(-1))	-0.1452	0.8574	0.2727	-0.1003
	[-0.2846]	[1.0179]	[1.83773]	[-0.4575]
D(LPr(-2))	0.1592	-1.2186	-0.0037	0.0884
	[0.3072]	[-1.4247]	[-0.0249]	[0.3971]
C	0.0633	0.0560	0.0041	0.0117
	[4.0108]	[2.1520]	[0.8953]	[1.7210]
Summary Statistics				
R-squared	0.5006	0.7578	0.5693	0.5693
Adj. R-squared	0.1260	0.5762	0.2463	0.2463
Sum sq. resids	0.0639	0.0020	0.0043	0.0043
S.E. equation	0.0730	0.01285	0.0190	0.0190
F-statistic	1.3363	4.1729	1.7624	1.7624
Log likelihood	33.0410	71.24042	62.6624	62.6624
Akaike AIC	-2.0946	-5.5673	-4.7875	-4.7875
Schwarz SC	-1.5987	-5.0714	-4.2916	-4.2916
Mean dependent	0.0222	0.0008	0.0059	0.0059
S.D. dependent	0.0781	0.0197	0.0219	0.0219

Source: Estimate by the author using Stata 13

Government spending exhibits a positive sign but is not statistically significant in lagged one and two periods; specifically, a change in government health spending in lagged one and two is linked to, respectively, a short-term average increase in HIV of 0.02% and 0.11%. The health sector's underfunding, some avaricious government employees' theft of authorized funds, improper use of finances, and eventually corruption are to blame for the outcome not living up to a priori expectations. Additional, the literacy rate is negative but statistically insignificant at the 5% level in periods one and two. This means that, on average, a percentage change in literacy rate between lags one and two is linked to an increase in HIV prevalence of 1.19% and 0.58%, respectively. In the short run, this is also contrary to a priori expectations since increased literacy rates should lessen the causes of HIV prevalence. This is true because some members of the elite must maintain close bonds with their employers in order to be hired or promoted. Additionally, in order to get good grades, some students engage in romantic relationships with their lecturers or teachers, which raise the HIV prevalence. Because of their timidity, the elite may have intimate relationship with their superiors. One might draw the conclusion that since the majority of the elite engage in these relationships under duress, they will also be afraid to request protected sex. Consequently, HIV is becoming more prevalent and is spreading.

Finally, compared to the lag 2 periods, where HIV prevalence rate is positively correlated, poverty rate in the lagged one period is adversely skewed. However, they are statistically negligible for both times. This means that, on average, in the short run, a percentage change in the poverty rate, lagged one (lag two), is associated with a 0.15% drop (0.16% increase) in HIV prevalence. This is true because HIV patients' poor financial situations take it difficult for the poor to pay for quality medical care. It also implies that people engage in prostitution as a result of their poverty, raising the prevalence of HIV in the nation. The model's overall goodness of fit is generally adequate, as indicated by the coefficient of 0.50. According to the R-squared analysis, all of the explanatory factors together account for up to 50% of the systemic variation in HIV prevalence. The error term is the cause of the remaining 50% that is unaccounted for. Regarding the F-statistic, we accept the null hypothesis because, according to the study, the computed F. which is 1.34, is higher that the F tabulated, which is 2.701 at the 5% level of significance.

The adjustment of the economy to changes in the variable reflected by the coefficient of the ECM is the main problem in the estimate of the vector error correction model (VECM).

According to theory, the HIV has an adjustment coefficient of 0.466747 (in absolute terms), which is correctly signed and significant at the 1% level.

The adjustment coefficient of literacy rate (L) was 0.0059 (in absolute terms), which indicates that HIV prevalence adjust to change in L by 0.59% in a given period, which is rightly signed but not significant as required by theory. In contrast, GHE has an adjustment coefficient of 0.3241 (in absolute terms), which indicates that HIV prevalence adjust to change in GHE by approximately 32.4% in a given period, which is rightly signed and significant at 1% level.

The size of the ECM's absolute value clearly demonstrates that the rapid return to equilibrium is an instance of transient disequilibrium. As a result, it moves fairly slowly.

Last but not least, the L's adjustment coefficient shows that HIV was 0.0847 (in absolute value), which was impressive compared to L. According to the L's adjustment coefficient, HIV will fluctuate by around 8.47% over the course of a particular period. The coefficient is correctly signed and 1% level significant.

Policy Implications

Based on the findings from results discuss above, the study's conclusion can be summarized as follows: The findings indicate that current government health spending deviates from apriori expectations. That is, there is a correlation between public health spending and the HIV prevalence rate. The policy relevance of this is that the government should raise awareness in order to lower the number of HIV cases, and that increasing budgetary resources for health may not always be the best or most efficient method to boost output. In other words, costs could go up without there being any development. This could be due to bureaucracy, poor planning, misappropriation of finances, or corruption.

The government should provide a more fair distribution of income and improve the number of job available to residents because, as predicted, there is a positive association between poverty rate and HIV prevalence rate. Implementing the National Policy on Poverty Alleviation consistently and religiously will help to stop further infection and lower the incidence of the incurable diseases. HIV prevalence rate and literacy rate are positively correlated; hence rising levels of literacy will raise the prevalence of the virus.

The policy conclusion is that government should provide high-quality education, which is contrary to the a priori beliefs. To prevent sexual interactions between instructors or lecturers and students, the educational system should have an effective and efficient disciplinary body. Employers and employees should establish an effective and efficient middleman to ensure that employments are offered without sexual requirements. A country will benefit if its government properly considers the impacting roles of government health spending, literacy rate, and HIV prevalence rate and pays close attention to them by investing both time and resources in them, to sum up the policy implications discussed above.

Conclusion and Recommendation

Recommendations

Based on the study's findings, it is advised that the Nigeria government take the following steps in order to prevent and control the spread of HIV. First, Government at all level should step up efforts to lower the number of newly infected people. This can be done by raising the literacy rate (Education) and launching health campaigns, particularly in underdeveloped rural regions, to raise awareness of the virus and how to prevent it. Religious leaders, village chiefs, transport union officials, and others should all be involved in the fight to accomplish this. Secondly, policies that expose students to their supervisors and employees to their employers should be eliminated, and education should be made more functional. Thirdly, to reduce poverty at all levels—individual, family, and community—the government should carefully plan and implement the right policies and initiatives. These initiatives should promote youth empowerment by establishing centers for skill development and capacity building. Also included are funding for school costs, food programs for the kids, home-based care for HIV/AIDS patients, and foster care for AIDS orphans. Fourthly, the effectiveness of government spending on health should be given more consideration, and the government should ensure that the bottlenecks that cause the transfer of funds to the health sector are reduced. And lastly, the government should allocate more money for health and make sure that it is used wisely.

Conclusions

In Nigeria, the study demonstrates the empirical link between public health spending and health outcomes (HIV). The estimate method known as the vector error correction model (VECM) was employed. The findings demonstrated that HIV in Nigeria is significantly impacted by public health spending. The findings of this study also demonstrate the importance of literacy rates, government health spending, and poverty

rates in lowering HIV rates. This necessitates effective monitoring of the implementation strategy, increased government focus on HIV awareness campaigns, employment development, and effective funding allocation to the health sector.

References

Ashiabi, P.R (2013): "Health and Infrastructure in a model of Endogenous Growth" Journal of Macroeconomics Vol. 28, p768-774.

Anyanwu, J.C., E.O. Andrew and A. Erhijakpor (2007). "Health expenditures and health outcomes in Africa", African Development Bank Economic Research Working Paper Series No 91.

Abrahams,Z.(2011).Diet and mortality rates in Sub-Saharan Africa: Stages in the nutrition transition. Journal of Public Health, 11(1), 47-58

Anomaly, J. (2015). Public Goods and Government Action. Journal of Political Philosophy and Economics Review, 14 (2). p109-128

Bakare, A.S and Sanmi, O. (2011). Health Care Expenditure and Economic Growth in Nigeria: An Empirical Study. Journal of Emerging Trends in Economics and Management Sciences (JETEMS) 2 (2): 83-87.

Boachie, K., &. Ramu, k. (2015). Public Health Expenditure and Health Status in GHana Department of Economics, Annamalai University, Annamalai Nagar- 608002 (TN), India 10. July 2015 Paper No. 66371, posted 13. January 2016 07:24 UTC.

Dolado, R., & Jacob, O. (1996). Investment in Education and Economic Growth in Nigeria: An Empirical Evidence. International Research Journal of Finance and Economics, 55:158-169, [27]. anadian Social Science, Vol.7(4), pp.207-218.

Dedini, S. (2014). Regional Variations in Infant and Child Mortality in Nigeria: A Multilevel Analysis. Journal of Biosocial Science, 47(02), 165–187.

Edeme, D. (2017). Growth, public investment and corruption with failing institutions. Working Paper, Society for the Study of Economic Inequality, 2006.

FILMER, D., & PRITCHETT, L. (1999). The impact of public spending on health: does money matter? Social Science and Medicine, 49(1): 1309-1323.

Filmer, H. (2010). Public Health Expenditure, Governance and Health Outcomes in Malaysia. Journal of Economics Vol. 50(1):2940

Global AIDS monitoring (2018). Indicators for monitoring the 2016 United Nations Political Declaration on HIV and AIDS. Geneva: UNAIDS; 2018(http://www.unaids.org/sites/default/files/media_asset/2017-Global-AIDS Monitoring_en.pdf).

"HIV/AIDS Fact sheet N^{0}360". WHO. November 2015. Archived from the original on February 17, 2016. Retrieved February 11, 2016.

Johansen, S. and Jesulius, K. (1990): Maximum Likelihood Estimation and Estimation and Inference on Co-integration: with Applications to the Demand for Money. Oxford Bulletin of Economics and Statistics, Vol.52, pp.169-210.

Joda, R., & Yommoto (1995). Efficiency in improving health and education outcomes: provincial and state-level estimates for Argentina and Mexico. Estudios Economicos, 22 (1),57-97, 2007.

Kambou, K. (2003). Modern infectious disease epidemiology concepts, methods, mathematical models, and public health (Online-Ausg. ed.). New York: Springer. p. 88. ISBN 9780387938356.

Ke, X., Saksena, P. and Holly, A. (2011), "The Determinants of Health Expenditure: A Country-Level Panel Data Analysis". *Results for Development Institute (R4D) Working Paper*.

MORENO-SERRA, R. & SMITH, P. (2011). The effects of health coverage on population outcomes: a country-level panel data analysis. A Working Paper of the Results for Development Institute. London: Imperial College London.

Musgrove, P (2019). Public Spending on Health Care: How are different criteria relate. US National Library of Medical, National Institute of Health.

Novignon, J., Solomon, A., & Justice, N. (2012). The Effects of Public and Private Health Care Expenditure and Health Status in Sub-Sahara Africa: New Evidence from Panel Data Analysis Article· December 2012, DOI: 10.1186/2191-1991-2-22·

Olaniyi, O., & Adams, A. (2003). Public expenditures and Human Development in Nigeria" Human Resource Development in Africa. 2002 Annual Conference papers, NES, U.I. Ibadan pp 157-198.

Peter, S. (2003). Government Expenditures Effect on Economic Growth: The Case of Sweden 1960-2001. A Bachelor Thesis Submitted to the Department of Business Administration and Social Sciences, Lulea University of Technology, Sweden.

Seraph, B. (2016). Healthcare expenditure and economic growth in developing countries Advances in Economics and Business 4 (2), 76-86, 2016.

Sandbu, M. (2015). Determinants of Public Health Outcomes: A Macroeconomic Perspective, Computing in Economics and Finance. Society for Computational Economics.

Thornton, H. (2002). "Vector Auto-regressions and Causality: A Theoretical Overview and Simulation Study", Econometric Reviews 13, 259- 285.

UNAIDS (2018). "The quest for an HIV vaccine". Archived from the original on May 24, 2018.

World Health Organization (2011). Environment and health: Healthy environments for healthy people Available at:http://www.euro.who.int/en/what-we-do/health-topics/environment-and-health.