



GOVERNMENT HEALTH EXPENDITURE AND HEALTH OUTCOMES IN NIGERIA

Alex Bointa¹, Dr. T. O. Awogbemi²

¹Masters Student, ²Lecturer

¹Department of Economics

¹Delta State University, Abraka, Nigeria.

ABSTRACT

Health is a critical factor which determines the quality of human capital that drives every economy. There is need therefore for the government to prioritize health expenditure. On the basis of this, the study examines the government health expenditure on the health outcomes in Nigeria. The study used data from 1981 to 2020, employing Autoregressive Distributed Lag as well as the Error Correction Model (ECM) techniques. The ARDL Bounds Test results confirmed that there is a long-run equilibrium relationship among the variables. The results of the Error Correction Mechanism (ECM) accentuated the connection between government healthcare expenditure and health outcomes in Nigeria through establishment of stable long-term equilibrium relationship among the variables employed in the model. The study therefore conclude that government should increase the amount of its expenditure on the health sector as discovered in the result that it enhances improvement in the life expectancy rate. Also government should improve the welfare of health care personnel. This will help to improve the health outcomes indices of under 5 mortality rate and life expectancy level.

Keywords: Under 5 Mortality Rate, Life Expectancy, Health Outcomes, Health Expenditure, ARDL, ECM.

1.0 INTRODUCTION

The health of an individual in particular and that of the nation in general is very important. The wellbeing of the inhabitants of a nation could be regarded as one of the necessary conditions to achieving a sustainable long-term economic development. Health can be defined to mean general physical condition; that is condition of the body or mind especially in terms of the presence or absence of illness, injuries or impairments (Oduola, 2005). The popular cliché that health is wealth is more than just a mere statement, it is a fact. This is essentially so because the wealth of any nation is essentially linked to her health. The importance of health expenditure has been greatly underestimated not only by policy analysts but also by many African country's governments.

A healthier population will definitely create wealth (*ceteris paribus*). Health is not only a priority objective in its own right but also a very indispensable factor input into sustained economic growth and development.

The role of health in influencing sectorial performance and economic outcome has been well understood more especially at the micro level. For instance, healthier worker are likely to be able to work longer, be generally more productive than their relatively less healthy counter-parts. A healthy worker would consequently be able to secure higher earnings, *ceteris paribus*. Illness and disease shorten the working lives of people thereby reducing their lifetime earnings (Mehrare & Musai, 2011). Better health care is thus a primary human need. According to the World Health Organization (WHO, 2005), fifty percent of economic growth differentials between developed and developing nations is attributable to ill health and low life expectancy. Developed countries in the realization of the role of health in driving growth spend a high proportion of their gross domestic income (GDI) on health care on account that their residents' health can serve as a major driver for economic activities and development. To this end, governments in Nigeria, over the years have been making frantic efforts at ensuring that there is an increase in the level of public expenditure on health. It should however be noted that despite the increase in government expenditure in health care in Nigeria the contribution of this to health status of her citizens is marginally low and the magnitude on health outcomes is yet uncertain.

The huge deficiency in provision of health infrastructure in both rural and urban centers remains a thing of concern as over 80% of the productive force lacks access to good health care (WHO, 2012)- a very key efficiency booster. In many rural settlements, the working population is prone to several illnesses which affect their ability to work and grow the economy. Government's response overtime to these health challenges have been questionable on the account that most transitional government in the 36 states of the federation have paid less attention to the health care needs of the people (WHO, 2005). It was also observed that there is lack of decentralization of specialist hospitals from the cities to urban and other rural areas. Hence, many patients travel far distances to get treatment. The implication of this is that citizens waste many hours in search of health care facilities leading to many labour hour loss, thereby increasing the cost of getting treatment which eventually affects the income, productivity and economic growth (Weil, 1995). Access to essential medicines remains low in these parts of the world; over 50 percent of Africans lack access to essential medicines (WHO, 2005). Around the world, over 10 million children in developing countries die unnecessarily from diseases that are easily preventable and increasingly cheap to treat, such as diarrhea, measles and malaria (WHO, 2012). Furthermore, majority of patients in LDCs still have to pay for healthcare out of their own pockets (WHO, 2012).

Riman and Akpan (2012) also allude that the pattern of health financing is closely and indivisibly linked to the quality of health outcomes, capable of achieving the long term goal of enhancing nation's economic development.

Health care financing does not only involve how to raise sufficient resources to finance health care needs, but also on how to ensure affordability and accessibility of healthcare services, equity in access to medical services as well as guarantee financial risk protection. Xu et al., (2007) and Riman and Akpan (2012) demonstrated that how health systems are financed largely determines whether people can obtain needed health care and whether they suffer financial hardship at the instance of obtaining care. Given the predominance of public health spending in promoting access to health care and population health status for developing economies, the effectiveness of such spending should be top priority in policy makers' agenda. This, again, is important because for developing economies, government revenue is generated from a small tax base due to their highly informal nature. To improve health status from public intervention in the health sector, there is indeed need for improvement in the overall state of governance in Nigeria (Osakede, 2020).

Health undoubtedly is one of the most important factors that determine the quality of human capital, a necessary factor for economic growth. Therefore, any public expenditure on health can be viewed as a form of investment in the overall health status of a nation (Dang et al., 2016). While increase in budgetary allocation to social services is highly desirable, it is not sufficient to guarantee enhancement in better health outcome. It could be argued that the system of health care financing in Nigeria is disproportionate, such that, it pushes the burden and risk of obtaining health services to the poor. With these efforts, Nigeria overall health status performance outcomes have not been encouraging (Edeme & Olisakwe, 2019). In recent times the life expectancy level and infant mortality rate figures have not been encouraging. Nigeria has the highest rate of infant mortality in Sub-Saharan Africa and third in the world according to the World Health Organization (WHO, 2017). It therefore leaves one to wonder if government is doing enough on the aspect of health expenditure. Hence the need for this study to investigate if government health expenditure has yielded the desired outcome. This study therefore investigate the impact of government health expenditure on health outcomes in Nigeria. The remaining part of the study is structured as follows: section two captures the literature review, while in section three the methodology of the study is

presented. Lastly, the analysis of the results of the empirical survey is captured in section four, while section five entails the conclusions reached and recommendations of the study.

2.0 LITERATURE REVIEW

Empirical Review

Ahmad and Hasan (2016) analyzed the impact of public health expenditure and governance on health outcome in Malaysia using data from 1984-2009. The result based on Autoregressive Distributed Lag (ARDL) cointegration framework reveals that a stable, long-run relationship exists between health outcomes and public health expenditure and governance. The finding also suggests that public health expenditure and corruption affect long and short run health outcome.

Boachie *et al.* (2018) re-examined the relationship between public health expenditures and health outcomes in Ghana. The result suggests that, apart from income, public health expenditure contributed to the improvement of health outcome for the period covered by the study. In all, increasing public health expenditure by 10 percent leads to 0.12 – 4.4 reduction in infant and under-five deaths while increasing life expectancy at birth by 0.77 – 47 days a year. The cost per childhood mortality prevented as a result of improving public health spending ranged from US\$0.20 – US\$16 while the cost per extra life year gained is from US\$7 to US\$593.

Leah (2014), found that health targeted aid does have an effect on performance of health systems in developing countries. Moreover, results suggest that policy makers should promote the situation when more health targeted aid is distributed bilaterally than multilaterally. Proving further empirical evidence on the impact of public health expenditure on health outcomes, Matthew *et al.* (2015) used data from Nigeria from 1979-2012 and found that public health spending has significant relationship with health outcomes. In view of this, it was recommended that they should further improve expenditure on the health sector in order to reduce environmental hazards such as carbon dioxide emissions that negatively affect health condition of the citizens. With the provision of appropriate healthcare, a large population of the citizens could have better health care and thus improving human capital that could contribute to economic growth. But as argued by Wang (2015) recent economic down turns have caused dramatic reduction in health care spending by many countries, especially developing ones. Applying

the experience of countries from Organisation for Economic Co-operation and Development (OECD), he indicated that when the share of health expenditure is less than optimal level of 7.6 percent, increase in health expenditure leads to better economic performance but more spending does not guarantee better care.

Ojo and Ojo (2022), examined the link between health expenditure and life expectancy in Nigeria using autoregressive distributed lag from the year 1981 to 2018. Their study found that health care expenditure had insignificant impact on life expectancy. However, Owuni and Eboh (2021) found that an increase of government health expenditure in Nigeria lead to an increase in life expectancy in Nigeria. They concluded that healthcare system funding influenced life expectancy in Nigeria for the past years from 2000 to 2017.

Makiyan et al (2016), analyzed the health expenditure and life expectancy in Islamic countries from 1995 to 2013. Their results showed that government health expenditure has a positive relation with life expectancy in high per capita income countries but a negative relation in low per capita income countries. In turn, their results showed positive relationship between education and life expectancy. They concluded that health improvement should be accompanied by improvement of education and water resources.

Rahman and Bassey (2018) investigated the impact of government health care expenditure on the Nigeria health sector covering the period of 1980 - 2015. The study employed the Error Correction Mechanism (ECM) regression technique. The results indicate that health sector performance proxies by life expectancy and literacy rate were inversely correlated with health sector expenditure. The recommendation given by the author is that government should increase its spending on the healthcare delivery, as this could warrant improvement in the health sector performance in the economy.

Onofrei et al (2021), analyzed the relationship between public health expenditure and health outcomes among EU developing countries. Using regression analysis and factor analysis, they documented that public health expenditure and health outcomes are in a long-run equilibrium relationship and the status of health expenditure can improve life expectancy and reduce infant mortality. Secondly, they studied how the status of good governance, health care system performance, and socioeconomic vulnerabilities affect the public health outcomes in the selected countries. They found that the effectiveness of health and the way to reduce infant mortality or to improve life quality is directly conditioned by good governance status. Moreover, the consolidation of the health

care system's performance directly improves the quality of life among EU developing countries, which indicates that public policy makers should intervene and provide political and financial support through policy mixes.

3.0 RESEARCH METHODOLOGY

3.1 Research Design and Data Source

This study will use secondary time series data for the period of 1981-2020. The data will be sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin (2021) and World Bank Data base (WDI) 2021. The variables used in the study include Life Expectancy (LEXP), under five mortality rate (U5MR), Real Gross Domestic Products (RGDP), Government recurrent health expenditure (GRHE), Government capital health expenditure (GCHE) and Carbon Dioxide Emission (CO₂E).

3.2 Model specification

Based on theoretical exposition in the work of Akbar et al (2021) and Aziz et al (2021), health production function model was adopted. Their work which had earlier been reviewed in the empirical studies examined Public Health Expenditures and Health Outcomes in Pakistan & Health Expenditure and Maternal Mortality in South Asian Countries, made use of basic form of the relationship between the variables drawn from the theoretical framework. We adopt the above models with some modifications.

The model formulated for the study in its functional form is given as:

$$LEXP = f(U5MR, GCHE, GRHE, RGDP, CO_2) \quad (i)$$

The econometrics form of equations (i) is given as;

$$LEXP = \beta_0 + \beta_1 U5MR + \beta_2 GCHE + \beta_3 GRHE + \beta_4 RGDP + \beta_5 CO_2 + \mu_1 \quad (ii)$$

Where;

LEXP is Life expectancy, U5MR is under five mortality rate, RGDP is Real Gross Domestic Products (RGDP), GRHE is Government recurrent health expenditure, GCHE is Government capital health expenditure and (CO₂E) is Carbon Dioxide Emission.

4.0 RESULT AND DISCUSSION

4.1 Unit Root Test

It is important to carry out unit root test since we are applying time series data set for the study in order to check for stationarity of the data because the use of non-stationary data can result in spurious regression.

Table 1: ADF Unit Root Test Result

Source: Author's computation

Variables	ADF Test Statistics	Critical Values	Order of Integration	Level of Significance	Remark
LEXP	-3.514644	-3.615588	I(0)	5%	Stationary
U5MR	-3.862398	-3.621023	I(1)	1%	Stationary
RGDP	-2.717309	-2.609066	I(1)	10%	Stationary
GRHE	-7.019703	-3.615588	I(1)	1%	Stationary
GCHE	-6.310995	-3.615588	I(1)	1%	Stationary
CO₂E	-4.683000	-3.615588	I(1)	1%	Stationary

From table 1 above, it can be observed that the variables used in the study are integrated at levels and order one. While the dependent variable LEXP is integrated at order one, the independent variables U5MR, RGDP, GRHE, GCHE and CO₂E are integrated at levels. All the variables are significant at the 1% level except RGDP and LEXP which are at the 10% and 5% level respectively. The outcome from the unit root test makes the ARDL approach the best technique for analysis. This is so since there is mixed order of integration. The next step is to check for the existence of long run relationship among the variables.

4.2.2 Cointegration Test

The ARDL-bound test approach to cointegration was applied, because the Johansen cointegration cannot be applied in this case, due to the mixed order of integration. The bound test approach makes it possible to test for the existence of long run relationship among the variables by conducting an F-test for the joint significance of the coefficients of the lagged levels of the variables. The hypotheses for the ARDL-Bounds test are stated below;

H_0 : No longrun Relationship Exist

H_1 : Longrun Relationship Exist

The outcome of the cointegration test is presented below.

Table 2: Bounds Test for Cointegration

Null hypothesis: No longrun Relationship Exist		
Test Statistic	Value	K*
F-statistic	28.08925	5
Critical Value Bounds		
Significance	Lower	Upper
10%	2.26	3.35
5%	2.62	3.79
2.50%	2.96	4.18
1%	3.41	4.68

From table 2 above, we reject the null hypothesis of no cointegration between the dependent and independent variables since the computed F statistic (28.08925) is greater than the upper bound at the 1% significance level (4.68). Thus we can infer that there exist a long run relationship among the variables in the study. The series can then be combined in a linear fashion as shocks in the short run experienced by individual series can be corrected in the long run. That is, there will be convergence.

Table 3: Long run Model

Dependent Variable: LEXP				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.05827	3.319835	3.632191	0.0011
LEXP(-1)	0.792824	0.069165	11.46278	0.0000
U5MR	0.015683	0.014735	1.064350	0.2963
U5MR(-1)	-0.028452	0.017387	-1.636422	0.1129
RGDP	-8.00E-13	1.78E-12	-0.450661	0.6557
RGDP(-1)	4.35E-12	2.02E-12	2.155513	0.0399
GRHE	0.000398	0.000522	0.761459	0.4527
GRHE(-1)	-0.001107	0.000516	-2.143894	0.0409
GCHE	0.001388	0.000536	2.591657	0.0150
GCHE(-1)	-0.001185	0.000455	-2.601673	0.0147
CO2E	-2.00E-06	7.30E-07	-2.733810	0.0107
	F-statistics= 8457.258		Prob.(F-statistics)= 0.000000	
R-squared= 0.99	Adjusted R-squared= 0.99		Durbin-Watson stat= 1.522878	

Source: Author's computation

From the long run estimates presented in table 3 above, real GDP as well as the lagged values of under 5 mortality rate, carbon dioxide emission, government recurrent and capital health expenditure are negatively related with life expectancy. The lagged value of the dependent variable is positively related to the dependent variable. All the variables are statistically significant except under 5 mortality rate (U5MR). The adjusted R-squared 0.99 shows that the independent variables adequately explained the dependent variable. The residual from the long run model estimate is then used to estimate the Error Correction Model which is presented below.

Table 4: Error Correction Model

Dependent Variable: D(LEXP)				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.014653	0.016999	-0.861973	0.3966
D(LEXP(-1))	0.817434	0.083207	9.824121	0.0000
D(U5MR)	0.025022	0.027112	0.922912	0.3645
D(U5MR(-1))	-0.037735	0.029010	-1.300768	0.2047
D(RGDP)	1.22E-12	1.49E-12	0.817353	0.4212
D(RGDP(-1))	1.89E-12	1.50E-12	1.255170	0.2206
D(GRHE)	0.000318	0.000324	0.983406	0.3345
D(GRHE(-1))	-0.000631	0.000359	-1.759062	0.0903
D(GCHE)	0.001202	0.000390	3.081545	0.0048
D(GCHE(-1))	-0.000769	0.000357	-2.153831	0.0407
D(CO2E)	-1.27E-06	9.23E-07	-1.373317	0.1814
ECM(-1)	-0.721418	0.216391	-3.333861	0.0026
	F-statistics= 803.1752		Prob.(F-statistics)= 0.0000	
R-squared=0.9590	Adjusted R-squared= 0.9418		Durbin-Watson stat.=1.552152	

Source: Author's computation

From the Error Correction Model output presented in table 4, the government recurrent health expenditure is negative and significant while both the current and lagged values of capital health expenditure is negative and has a significant impact on life expectancy at the 5% level, under five mortality rate is negative and insignificant. The carbon dioxide emission is negative and insignificant. Although, there is a joint significance among the independent variables used in the model. The error correction term is negative and significant at the 1% level which according to econometric literature implies that any divergence from equilibrium in the short run can be corrected. The adjusted R-squared of 0.9418 indicates that about 94 percent of the variation in the dependent variable are explained by the independent variables used in the study. The Durbin-Watson stat. of 1.552152 indicates that the model does not suffer from autocorrelation. The CUSUM test for stability presented below shows that the model is stable as the plot falls within the 5% significance line.

5.0 CONCLUSION AND RECOMMENDATIONS

Having examined the impact of government health expenditure and health outcomes in Nigeria using the ARDL approach, the findings showed that there exists a long-run equilibrium relationship between government health expenditure and the health outcomes (life expectancy rate) which is the same with the findings of Onofrei et al, (2021). In line with the results obtained, the following recommendations are provided: government should increase the amount of its expenditure on the health sector as discovered in the result that it enhances improvement in the life expectancy rate. As this is a major way to guarantee tremendous improvement in the life expectancy and also warrants reduction in the mortality rate in Nigeria. Government should make health care services both available and affordable especially for under 5 and the elderly. Government should improve the welfare of health care personnel. This will help to improve the health outcomes indices of under 5 mortality rate and life expectancy level.

REFERENCES

- Ahmad, R and Hasan. J. 2016. Public Health Expenditure, Governance and Health Outcomes in Malaysia, *Journal Ekonomi Malaysia*, 50(1): 29-40.
- Akbar, A. and Ali, S. 2021. Public Health Expenditures and Health Outcomes in Pakistan: Evidence from Quantile Autoregressive Distributed Lag Model. *Risk Management and Healthcare Policy*, 14: 3893–3909.
- Aziz, N., He, J., Sarker, T., and Sui. H. 2021. Exploring the Role of Health Expenditure and Maternal Mortality in South Asian Countries: An Approach towards Shaping Better Health Policy. *Int. J. Environ. Res. Public Health*, 18, 11514. <https://doi.org/10.3390/ijerph182111514>.
- Boachie, M. K., Ramu, K. and Polanjeva. T. 2018. Public health expenditures and health outcomes. *Economics*, 6(4): 58. Available at: <https://doi.org/10.3390/economies6040058>.
- Dang, A., Likhar, N. and Alok. U. 2016. Importance of economic evaluation in health care: An Indian perspective. *Value in Health Regional Issues*, 9(1): 78-83. Available at: <https://doi.org/10.1016/j.vhri.2015.11.005>.
- Edeme, R. K., and Olisakwe. O. 2019. Public Health Expenditure, Economic Growth and Health Outcomes in Nigeria. *International Journal of Public Policy and Administration Research, Conscientia Beam*, 6(1): 23-32.
- Leah, R. B. 2014. Effects of foreign aid for health on health outcomes in developing countries. Thesis, University of Denver.
- Makiyan, S. N., Taherpour, E., and Zangiabadi. P. 2016. Health Expenditure & Life-expectancy in Islamic Countries: A Panel Data Approach. *Quarterly Journal of the Macro and Strategic Policies*, 4(13): 25-40.
- Matthew, O. A., Folasade, A., B. and Fagbeminiyi, F. F. 2015. Public Health Expenditure and Health Outcomes in Nigeria. *International Journal of Financial Economics*, 4(1): 45-56.

- Mehrare, M. and Musai, M. (2011). Health Expenditure and Economic Growth: An ARDL Approach for the Case of Iran. *Journal of Economics and Behavioural Studies*, 3(4): 249-256
- Oduola, A. O. 2005. Human capital investment and the empirics of economic growth in Nigeria. Rekindling investment for economic development in Nigeria, the Nigerian Economic Society (NES) Annual Conference. 2005: 257-271.
- Ojo, T. J. and Ojo, S. I. (2022). Health Expenditure, Education and Economic Growth in Nigeria. *Open Journal of Social Science and Humanities*, 3(1): 1-17.
- Onofrei, M., Vatamanu, A. F., Vintilă, G., and Cigu. E. 2021. Government Health Expenditure and Public Health Outcomes: A Comparative Study among EU Developing Countries. *Int. J. Environ. Res. Public Health* 2021, 18, 10725. <https://doi.org/10.3390/ijerph182010725>.
- Osakede, U. A. 2020. Public health spending and health outcome in Nigeria: the role of governance. *International Journal of Development Issues*. 20: 95–112. doi:10.1108/IJDI-10-2019-0169.
- Owuni, B. and Eboh A. 2021. An Assessment of the Contribution of Healthcare Expenditure to Life Expectancy at Birth in Nigeria. *Journal of Public Health*; 30(9) DOI:10.1007/s10389-021-01546.
- Rahman, H. and Bassey, J. U. 2018. Healthcare Financing and Health Outcomes in Nigeria. *International Journal of Humanities and Social Sciences*; 2(1): 296-305.
- Riman, H. and Akpan E. 2012. Healthcare financing and health outcomes in Nigeria: A state level study using multivariate analysis. *International Journal of Humanities and Social Science*, 2(15): 296-309.
- Wang. L. 2015. Health Outcomes in Poor Countries and Policy Options: Empirical Findings from Demographic and Health Surveys, *World Bank Policy Research Working paper No. 2831*, April.
- Weil, T. P. 1995. Comparisons of medical technology in Canadian, German, and US Hospitals. *Hospital & Health Services Administration*, 40(4): 524.
- World health organization 2005. *World health development indicators*. Washington DC.
- World Health Organization 2017. *World Health Statistics: monitoring health for the SDGs, Sustainable Development Goals*. Geneva: World Health Organization; 2017.
- World Health Organization. 2012. *World Health Report, Health systems financing: the path to universal coverage*. World Health Organization. Geneva.
- Xu, K., Evans, D. B., Carrin, G., Aguilar-Rivera, A. M., Musgrove, P., and Evans, T. 2007. Protecting Household from Catastrophic Health Spending. *Health Affairs (Project Hope)*, 26(4): 972-983.