PUBLIC HEALTH EXPENDITURE AND INFANT MORTALITY RATE IN NIGERIA

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ARTICLE INFO

Review Scientific Paper
Received: 20.03.2020.
Revised: 14.05.2020.
Accepted: 07.10.2020.

doi 10.7251/ACE2033079O

UDC
314.4(669):[616.981.55+616.831

Keywords:
public health spending, infant mortality rate, female literacy, Diphtheria, Pertussis, and Tetanus.

JEL Classification:
C22, H51, I10, I12, I18.

ABSTRACT

One of the numerous responsibilities of the government of any country is to invest in the various sectors of the economy. This should, however, be channeled to the appropriate sectors, such as the health sector, that will lead to a continual growth of the country. It is in the light of this, that this study looks at government spending on the health sector and its effect on infant mortality rate (INFM) in Nigeria. Health is central to the well-being of the citizens. This study made an attempt to provide empirical evidence of the impact of public health expenditure on infant mortality rate in Nigeria between 1991 and 2018 using time series data. The Fully Modified Ordinary Least Square (FMOLS) analytical method was used to examine the relationships. Various robustness checks were carried out to ensure the reliability of the result for policy makers. Findings revealed that all variables employed positively impacted INFM except for Diphtheria, Pertussis, and Tetanus (DPT) immunization and female literacy rate. It was therefore recommended that more public enlightenments on the importance of taking DPT immunization for infants should be embarked upon for the target audience to be able to produce a positive effect, nursing mothers should be educated more on the need to take good care of their children especially at the early stage and not leave chance to the faith of the day care, all in the name of being literate and answering the call of their job at the expense of their parental role among others.

1. INTRODUCTION

*Health, a very important aspect of an individual's wellbeing, is one of the indispensable nec*essary conditions for achieving a sustainable long-term economic development. It has been established in the literature that improvement in health care is an important prerequisite for enhancing Human Capital Development in every economy. Siddiqui, Afridi and Haq (1995) are of the opinion that improved health status of a nation creates outward shift in labour supply curve which implied increased productivity of labour with a resultant increase in the productivity of investment in other forms of human capital. Thus, the level of government expenditure on health determines the ultimate level of human capital development which eventually leads to better, more skillful, efficient and productive investment in other sectors of the economy (Muhammad & Khan, 2007).

To this end, provision of good health has been seen by many governments as a key element of any policy aimed at promoting a broad based economic growth. Mocan, Tekin and Zax (2004) also affirm that good health is a crucial part of well-being and a key of social and economic development. In contrast, poor health can be detrimental to the welfare and development of a country. Good health is not only basic to human welfare but also to social and economic development. Poor health shackles human capital, reduces returns on learning, impedes entrepreneurial activities as well as growth and development of a nation. Consequently, it has become a focused policy by governments at all levels.

Without doubt, an increased proportion of the nation's resources is today being spent on health and medical care value as it was nearly six decades ago. This perhaps is in recognition of the importance of health which of course has also been recognized as a multi sectorial responsibility inseparably linked to a nation socio-economic development.

In recent years, improvement in the health condition of people has been the focus of policy makers. Children, especially infants, are the most vulnerable group in the society. While some children escape childhood killer diseases such as measles and diphtheria and transit into adulthood, others die before their first birthday. Those who are fortunate to survive the first twelve months are likely to die even before reaching age five. Reducing mortality rate among children therefore is a major way of improving health status and welfare of children as well as securing healthy future workforce for the nation.

In line with the above, UNDP (1990) and World Bank (1993) have recognized the public provision of health care services as one of the important ways to improve living conditions and human welfare of a nation. To this end, Nigerian government has taken different measures at reducing children mortality rate hav-

ing known the peculiarity of the country's parents. One of such measures is a random house to house immunization for children at intervals, and yet the mortality rate is still high compared to other developing nations of the world.

In addition, it is usual to find long queues of patients in Nigeria public hospitals waiting patiently for medical attention despite the fact that the nation has, over the years, made steady progress in terms of improved quality and quantity of medical manpower and health facilities. For instance, despite Nigeria's rapid population growth, there has been a tremendous decrease in the nation's population per health resources from 47,330 in 1960 to 6,200 in 1986 per doctor which still decreases to 4,222 patients or 2.27 per 10,000 people as in 2018 all of which is above WHO consideration of one doctor per 600 people in a country (Chris Ngige, Channels television, April, 26, 2019, IndexMundi).

In spite of the above achievement however, a high percentage of infant in Nigeria above the MDGs target still die before their first year. The National Strategic Health Development Plan 2009-2013 (NSHDP) also realized that "the health status indicators for Nigeria, starting from infant mortality rate are among the worst in the world and that on the average, health status of the population has declined, compared to indicators of a decade earlier. Besides general poor health status, Nigeria has also huge disparities in health status between geopolitical regions and income groups".

The questions that now come to mind are: What is the trend of infant mortality in Nigeria? Why, despite the huge amount spent on the health sector, the rate of infant mortality is still high? Why has the country failed to meet the MDGs target of reduction in child mortality by 2/3? Is there any statistically significant relationship between government health expenditure and infant mortality rate in Nigeria? These and many other reasons prompted the research work with the following objectives:

(i) to examine the trend of infant mortality rate;
(ii) to estimate the effects of government health expenditure on infant mortality rate in Nigeria;
(iii) to draw policy implications based on the finding of the study.

2. STATEMENT OF THE PROBLEM

The World Health Organization (WHO, 2009) has recommended that 15% of the total annual budget of the nation should go to the health sector. However, it was discovered that a small percentage of the total budget, which is not even up to half of WHO's recommendation, is usually allocated to health sector by Nige-

rian government. The percentage allocated to health sector was 6.1% in 1996, in 2002, it dropped to 3.7%. It rose to 9.2% in 2007 while there was a slight drop to 8.2% in 2014. In 2016 it dropped to 4.23%, whereas in 2017 it slipped to 4.16%. In 2018 it dropped drastically to 3.9% which is #340.45b out of #8.6tn. In addition, it is also worth noting that the country is struggling with several disease outbreaks including Monkey pox, Measles and Lassa fever, in addition to efforts to end poliomyelitis and tackle the country's noticeable high mortality and child death.

According to WHO, Nigeria is rated as 187th out of 191 countries of the world in terms of health care delivery. Also, one third of more than 700 health facilities have been destroyed in the country and about 3.7 million people are in need of health assistance. The health body placed Nigeria at third highest in infant mortality rate in the world (healthnews.ng).

Findings also revealed that health services in Nigeria had suffered decades of neglect, resulting in poor health conditions and decreasing national productivity (Mathias, Dickson & Bisong, 2013). Although improvements have been recorded lately but still fail to meet the MDGs (WHO, 2016) and the need to improve health, in order to do this, policy makers have to be guided by knowledge of those factors that will drive the health status. Some of these factors include education, availability of doctors, immunization taking, etc. This is the reason why several researchers have dwelt into this based on the factors mentioned above.

However, despite all the commendable efforts of these researchers, there are still many gaps left unfilled, as it will be revealed under the reviewed literature which thus makes this study imperative, in order to fill those gaps and also guide policy makers in the right direction.

3. CONCEPTUAL CLARIFICATION

3.1 Health

Health has been defined in different ways by various scholars. According to Dorland (1981), it has been defined as "a state of optimal, physical, mental and social wellbeing, and not merely absence of disease or infirmity. This definition conforms to that of World Health Organization (WHO, 1926:47) which states that health is "a state of complete physical, social and mental well-being and not merely absence of disease or infirmity". Nwabuaze (2003) also considers a healthy condition as a state of being sound in the body, mind or spirit. Generally speaking, the definition of health boils down to being seen as a state of wellness and completeness of a person.

3.2 Infant Mortality Rate (INFM)

The infant mortality rate is the number of deaths of infants under one year of age occurring among the live births in a given geographical area during a given year, per 1,000 live births occurring among the population of the given geographical area during the same year (OECD, 2001; WHO, 2012; Novignon & Lawanson, 2017).

3.3 DPT Immunization (*DPT*)

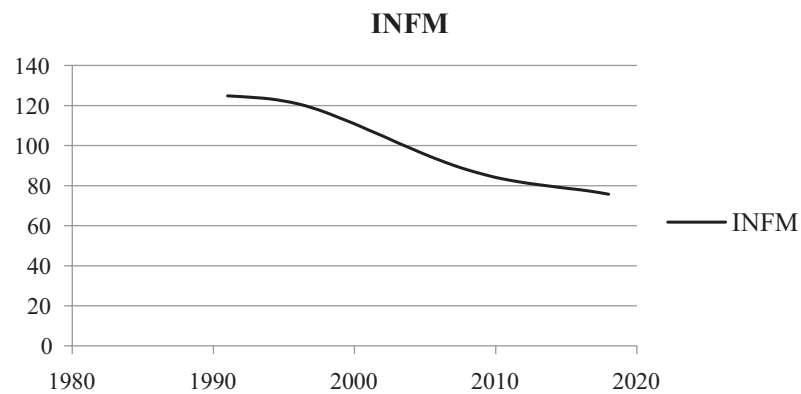
This is the class of combination of vaccines against three infectious diseases in human: Diphtheria, Pertussis and Tetanus. Findings revealed that there exists a positive correlation between DPT immunization and fall in infant mortality rates (see Murunga, Mogeni & Kimono, 2019; Oluyole & Afeikhna, 2015); this implies that as DPT immunization increases, the IMR should decrease.

3.4 Female Literacy rate (FLR)

This refers to the number of females who are literate (i.e. those who are able to read and write); this is proxy by female gross enrolment ratio which is the ratio of total enrolment for primary education, regardless of age, to the population of the aged group that officially corresponds to the level of education shown.

4. TREND ANALYSIS OF INFANT MORTALITY RATE IN NIGERIA

The trend analysis shows graphical movement of infant mortality rate in Nigeria (INFM) over time which is in line with the first objective of the study.



Graph 1. Trend of infant mortality rate in Nigeria
Source: Author's calculation (2020)

Although INFM experienced a decline from 1990 to date, the trend remains unacceptable compared to exploding trend of health sector expenditure. In addition, the failure of the MDG to meet its target of reducing INFM by 2/3 by the end of 2015 as targeted is also a cause for concern. The above scenario therefore calls for a re-examination of the established relationship between health care expenditure and INFM in Nigeria.

5. EMPIRICAL REVIEW OF RELATED LITERATURE: A SYNOPSIS

Several studies explored the relationship between public health care expenditure and health status both in developing and developed countries but there seems to be limited studies on Nigeria.

In general, there seems to be some level of inconsistency in the exact relationship that exists between government health care expenditure and health outcomes. Some studies showed that public health expenditure has no impact on health outcome (Santerre, Grubaugh & Stollar, 1991; Kim &Moody, 1992; Musgrave, 1996; Filmer & Pritchet, 1999; Berger & Messer, 2002; Williamson, 2008; Wilson, Gebhard, Kitterman, Mitchell & Nielson, 2009; Kamiya, 2010). Contrary to the above, some studies found strong positive relationships between public healthcare expenditure and healthcare outcome, and their findings revealed that healthcare spending reduces INFM (Nixon & Ulmann, 2006; Murthy & Okunade, 2009; Anyanwu & Erhijakpor, 2009; Rhee, 2012; Farag, Nandakumar, Wallack, Hodgkin, Gaumer & Ebril, 2013; Olaniyan, Onisanwa & Oyinlola, 2013; Imougbele & Ismaila, 2013; Bidza, 2015) while studies like Lawanson (2012) present a mixed result.

In most of these studies reviewed the presence of female literacy, number of doctors and DPT immunization rate were elusive while copious literature exists on the theme. It should also be noted that most of the work reviewed are cross-country in nature while literature on Nigeria is scanty, it is against this background that this study sought to fill the vacuum.

6. METHODOLOGY

6.1 Theoretical framework

This study leans on health production function as the theoretical model adopted to measure the impact of public health expenditure on health outcome in Nige-

ria. These production functions include the application of the economic concept of a production function in the field of health services. The health production function specifies the relationship between government expenditure on health and health status and helps to determine which input produces a single output on health status.

This study considered Grossman (1972) model which envisages that individual health status is a function of individual inputs and is specified as shown below

$$Y = f(X) \qquad \text{(i)}$$

where Y is a measure of individual health status (IFMR) and X is a measure of inputs to the health function (GDPPC, $\frac{pubexp}{GDP}$, FLR, Immunization, Z); Z here is other explanatory variable introduced which is not captured by Grossman (1972) and here represented the number of doctors per 1000 patients.

6.2 Sources of Data and Data requirements

This research work used data covering the period 1991-2018 in the empirical analysis.

$$INFM_t = A + \beta_1 lnGDPPC_t + \beta_2 \left(\frac{pubexp}{GDP} \right)_t + \beta_3 DOC_t + \beta_4 FLR_t + \beta_5 DPT_t + \mu_t \qquad \text{(ii)}$$

where

INFM = Infant mortality rate

GDPPC = Gross Domestic Product Per Capita

DOC = Number of doctors per 1000 patient

($\frac{pubexp}{GDP}$) = Total government expenditure on health as a fraction of the GDP (henceforth written as PUBEXP for analytical convenience)

FLR = Female Literacy Rate

DPT = Diphtheria, Pertussis (whopping cough), and Tetanus immunization.

On a priori, $\beta_1 - \beta_5$ are expected to be < 0

6.3 Presentation and discussion of results

This section presents the statistical estimates and empirical results from the estimations of the model.

6.3.1 Descriptive Statistics

The result of the descriptive statistics computation is presented in Table 1 below:

Table 1. Descriptive statistics results

	INFM	GDPPC	PUBEXP	FLR	DOC	DPT
Mean	99.39	281593.5	4.36	43.13	153.89	40.07
Median	97.10	274232.8	4.59	43.32	150.65	41.00
Maximum	124.90	385349.0	9.45	52.66	208.80	63.00
Minimum	75.70	202704.0	0.91	41.39	107.30	21.00
Std. Dev.	17.81	68375.68	3.06	2.16	31.57	11.32
Skewness	0.16	0.213	0.36	3.05	0.19	0.28
Kurtosis	1.47	1.43	1.64	14.73	1.76	2.12
Jarque-Bera	2.85	3.10	2.78	203.78	1.97	1.28
Probability	0.24	0.21	0.25	0.00	0.37	0.53
Sum	2782.8	7884617.	122.17	1207.885	4309.00	1122.00
Sum Sq. Dev.	8561.1	1.26E+11	252.6	125.633	26915.18	3461.86
Observations	28	28	28	28	28	28

Source: Author's calculation (2020)

Table 1 above shows that all the series display a high level of consistency as their mean and median values are perpetually within the minimum and maximum values of these series. Moreover, the standard deviation which measures the level of variation of the variable from their mean is relatively low for most of the series indicating that the deviations of actual data from their mean values are very small. The table also reveals that the mean value of INFM, GDPPC and DOC are greater than their respective median values which suggests that the variables are positively skewed, while the mean value of PUBEXP, DPT and FLR are less than their respective median values suggesting that the variables are negatively skewed. This positive and negative skewness are formally confirmed by the skewness statistics for the variables. The wide ranges suggest that all the variables exhibit high variations in their distributions.

6.3.2 Correlation matrix

In order to have a preliminary idea of the direction of relationship between the variables, the correlation matrix of dependent and independent variables is computed. This is reported below.

Table 2. Correlation matrix

		INFM	GDPPC	PUBEXP	DPT	DOC	FLR
INFM	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	28					
GDPPC	Pearson Correlation	-.954**	1				
	Sig. (2-tailed)	.000					
	N	28	28				
PUBEXP	Pearson Correlation	-.812**	.814**	1			
	Sig. (2-tailed)	.000	.000				
	N	28	28	28			
DPT	Pearson Correlation	-.690**	.749**	.710**	1		
	Sig. (2-tailed)	.000	.000	.000			
	N	28	28	28	28		
DOC	Pearson Correlation	-.980**	.954**	.728**	.685**	1	
	Sig. (2-tailed)	.000	.000	.000	.000		
	N	28	28	28	28	28	
FLR	Pearson Correlation	.207	-.266	-.381*	-.129	-.132	1
	Sig. (2-tailed)	.291	.172	.045	.514	.503	
	N	28	28	28	28	28	28

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Author's calculation (2020)

From the table, the correlation of INFM with GDPPC has a coefficient of -0.954, with a p-value of 0.000 meaning that an increase in GDPPC will reduce INFM and it is statistically significant. Also, its correlation with PUBEXP has a coefficient of -0.812 with a p-value of 0.000 meaning that the coefficient is statistically significant and an increase in it brings a fall in INFM.

DPT which is another variable considered to have effect on INFM shows a negative coefficient of -0.690 with a p-value of 0.000 implying a negative statistically significance. On the other hand, coefficient of FLR presents a positive value of 0.207 with a p-value of 0.291 indicating that it has positive coefficient that is statistically not significant. Finally, its correlation coefficient with DOC is -0.980 with a p-value of 0.000. This implies that an increase in DOC will cause INFM to fall and it is statistically significant.

The second column shows that GDPPC is positively correlated with PUBEXP, DPT and DOC and statistically significant except for FLR with which it has a negative and non-statistically significant relationship. The third column displays the coefficient of correlation between PUBEXP and FLR to be negative and significant at 5% while it presents a positive and significant coefficient with DPT and DOC. The fourth column shows a negative and non-significant value with FLR while it has positive and significant correlation with DOC. The last column shows a negative and non-significant value with FLR. However, care must be taken while interpreting the correlation matrix because they cannot provide a valuable indicator of association in a manner which controls additional explanatory variables, hence there is a need for other robustness checks.

6.3.3 Unit root test Result

The results of the unit root test for the variables used in the study based on Augmented Dickey Fuller (ADF) unit root test procedure (with constant and trend) to see whether the variables are significant at level, i.e. whether it is I(0) series, or at first difference, i.e. whether it is I(1) series, are presented in Table 3 below.

Table 3. Unit Root Test Results

Variable	ADF	1% critical value	5% critical value	10% critical value	Order of integration
INFM	4.414***	3.711	2.981	2.630	I(0)
GDPPC	1.839*	2.755	1.971	1.604	I(1)
PUBEXP	3.999**	4.004	3.099	2.690	I(0)
FLR	4.120***	3.920	3.066	2.673	I(1)
DPT	5.601***	3.711	2.981	2.630	I(1)
DOC	3.889***	3.724	2.986	2.632	I(1)

***denotes significant at 1%, ** denotes significant at 5%, * denotes significant at 10%.

Source: Author's computation (2020) using E-view 9

The unit root test is carried out with intercept specifications for the respective series since it is a single variable and it is also the default that comes with the E-view. The lag-selection was based on the default selection of the Newey-West Bandwidth (NWB). The table contains the ADF test statistic at levels and levels and intercept of the time series with the null hypothesis which states that there is no unit root. The result based on 1% significant level shows the orders of integration of the variables, being stationary at levels and levels and intercept. In particular, the stationarity of the general unit root process for the set of time series data for the variables shows that they are all significant at 1 % except for

GDPPC which is significant at 10%. Thus the null hypothesis of unit root in the data can be upheld.

6.3.4 Long Run Relationship between the Variables

Co-integration is carried out based on test proposed by Johansen. Below is the test result:

Table 4. Long Run Relationship between the Variables

Series: INFM GDPPC PUBEXP FLR DPT DOC

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.900	173.472	95.754	0.000
At most 1 *	0.861	113.476	69.819	0.000
At most 2 *	0.698	62.129	47.856	0.001
At most 3 *	0.503	30.991	29.797	0.036
At most 4	0.389	12.816	15.495	0.121
At most 5	0.000	0.010	3.841	0.920

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.90	59.99	40.08	0.00
At most 1 *	0.86	51.35	33.88	0.00
At most 2 *	0.70	31.14	27.58	0.02
At most 3	0.50	18.18	21.13	0.12
At most 4	0.39	12.81	14.27	0.08
At most 5	0.00	0.01	3.84	0.92

Max-eigenvalue test indicates 3 co-integrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Author's computation (2020) using E-view 9

As evident in the table above, the co-integration tests included the INFM, GDP-PC, PUBEXP, FLR, DOC and DPT. The trace test and the maximum Eigenvalue statistics show the existence of four (4) and three (3) integrating equation respectively between INFM and the variables influencing it at 5% level of significance. The implication of this result is that there exists a unique long run relationship between INFM and GDPPC, PUBEXP, FLR, DOC and DPT.

6.3.5 Robustness and diagnostic test results

This study performs an auxiliary regression using the residuals from the original equation since it is conventionally believed that the conventional computed standard errors are no longer valid even with the consistency of OLS estimates in the presence of heteroscedasticity. Thus there is a need to test for heteroscedasticity in a formal way in this study by applying Breusch-Pagan-Godfrey approach. The test is conducted using the probability value with the decision rule that we accept the null hypothesis if the p-value is less than 5% and reject if otherwise with conclusion that there is no heteroscedasticity. The result is presented below:

Table 5. Heteroscedasticity Test: White

Heteroscedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.65	Prob. F(6,20)	0.19
Obs*R-squared	8.93	Prob. Chi-Square(6)	0.18
Scaled explained SS	5.06	Prob. Chi-Square(6)	0.54

Source: Author's computation

From Table 5 above, R^2 value is 8.93 and resulting Chi-square is 0.18, implying that the probability value is greater than 5% significant level, thus we reject the null hypothesis and conclude that there is no heteroscedasticity in the model.

Table 6. Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	20.51	Prob. F(1,19)	0.0002
Obs*R-squared	14.02	Prob. Chi-Square(1)	0.0002

Source: Author's computation (2020)

This study employed Breusch Godfrey serial Correlation Langranger Multiplier test, and the result revealed that null hypothesis of serial correlation is rejected. This shows that the model is free from the problem of autocorrelation. However, to ensure that the model is free from multicollinearity problems the study conducts the Variance Inflation Factor (VIF) test, the result of which is presented below.

Table 7. Variance Inflation Factor (VIF) test

Variance Inflation Factors: INFM			
Date: 12/02/2020 Time: 15:11			
Sample: 1991 2018			
Included observations: 28			
Variable	Coefficient Variance	Uncentered VIF	Centered VIF
PUBEXP	0.074	76.16	2.67
GDPPC	1.10E-1	11.57	7.37
FLR	0.802	3853.3	2.33
DPT	0.002	88.62	6.64
DOC	0.001	425.36	19.84
C	199.49	4662.5	NA

Source: Author's computation (2020)

As presented in Table 7, it was revealed that the model is free from multicollinearity as each of the centered VIF of the variables is below 20 above which a variable is considered as having linear relationship with another variable.

6.3.6 Regression Result

Having evaluated the general diagnostic statistics above, we can now proceed below to examine the performance of each explanatory variable from the regression result

Table 8. Fully Modified Least Squares (FMOLS)

Method: Fully Modified Least Squares (FMOLS)				
Date: 01/03/20 Time: 09:57				
Sample (adjusted): 1992 2018				
Included observations: 27 after adjustments				
Cointegrating equation deterministics: C				
Long-run covariance estimate (Bartlett kernel, Newey-West fixed bandwidth = 3.0000)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GDPPC)	-3.18	6.61	-0.48	0.64
PUBEXP	-1.24	0.23	-5.51	0.00
FLR	0.07	0.18	0.41	0.69
DPT	0.11	0.05	2.39	0.03
DOC	-0.47	0.04	-10.98	0.00
C	208.53	78.69	2.65	0.02
R-squared	0.98	Mean dependent var		98.44
Adjusted R-squared	0.98	S.D. dependent var		17.42
S.E. of regression	2.64	Sum squared resid		146.06
Long-run variance	2.87			

Source: Author's computation (2020)

Table 8 above presented the Fully-Modified co-integration regression on INFM in Nigeria. It was revealed that GDPPC has an inverse effect on INFM, thus a 1%-point increase in GDPPC reduces INFM by 3.2 units. This led credence to Grossman theory which states that good health status is a positive function of individual income level. Although the result is not significant even at 10% this justifies the notion that an increase in income per capita does not necessarily imply improvement in INFM in Nigeria as considered in this study. This problem could be traced to the widening gap in income among all levels of citizens in the country. This suggests that the government should concentrate on its income redistribution role so as to bridge the gap and enhance the significance of per capita income on improving INFM to meet the Sustainable Development Goal target of Reducing Infant Mortality by 2/3.

In the case of doctors per 1000 population, findings revealed that every additional doctor employed reduces INFM by 0.5 units. PUBEXP also showed a negative sign and was found to be significant at 1% significant level; a unit rise in PUBEXP tends to reduce INFM by 1.2units. DPT immunization presents a positive sign as against the *a priori* expectation. Perhaps, these could be attributed to poor sensitization and corruption in the procurement of the required vaccines and also in the administration of the programmes.

FLR also presents a positive sign and insignificant even at 10%. This might be due to the current trend of literate female devoting more time to work at the expense of their home leaving the care of their baby at early days to day care operators and the whim and caprice of nannies.

The reported R-squared of the model shows that the model explains about 98.1% of variations in INFM in Nigeria. The adjusted R-squared also showed a value of 97.7 % which means that other variable outside the model only covered about 2.3% and most variables included are significant, which showed that the model is a good fit.

7. COMPARISON OF THE STUDY WITH PREVIOUS EMPIRICAL STUDIES REVIEWED

Summarily, the findings of this study are in conformity with Santere, Grubaugh and Stollar (1991) as well as with Berger and Messer (2002), whose findings also revealed that PUBEXP is unable to reduce INFM while it is against other studies (Rhee, 2012; Farag, et al. 2013; Bizda, 2015) whose findings revealed that PUBEXP reduces INFM. However, it should be noted that all reviewed studies whose findings contradict our findings are either cross country in nature or not

carried out specifically on Nigeria and what is obtained in these countries may not be applicable to the situation in Nigeria.

8. SUMMARY, CONCLUSION AND RECOMMENDATIONS

Alluding to the fact that the pattern of financing is closely and indivisibly linked to the quality of health outcomes most especially in developing world (Nigeria inclusive), which over the years has necessitated increased spending on the sector. The result of the spending has generated controversy among scholars making some believe it is non-productive as expected, while others are against this notion. The mixed believe calls for this study which examined the effect of public health expenditure on INFM factoring in other explanatory variables, such as FLR, DPT immunization, GDPPC, and DOC, which are considered capable of hindering the desired outcome of increased government spending on infant mortality rate. Summarily, findings revealed that all variables positively impacted INFM except for DPT and FLR and possible reasons were adduced for that.

Based on the findings of this study the following recommendations are proffered if Nigerian health status (INFM) is to improve and build a virile labour force capable of moving the nation towards development.

- Government should intensify efforts by increasing the percentage of its allocation to heath sector to make it reach the suggested percentage from the country's annual budget by WHO.
- Government should endeavor to reduce income inequality among citizens through its redistributive role so that GDPPC has a statistically significant impact on the reduction of INFM in Nigeria.
- Findings should be made on why DPT immunization failed to produce the desired outcome and proffer solution.
- More public enlightenments on the importance of taking DPT immunization for infants should be embarked upon for the target audience to be able to produce a positive effect.
- Nursing mothers should be educated more on the need to take good care of their children especially at the early stage and not leave chance to the faith of the day care all in the name of being literate and answering the call of their job at the expense of their parental role.

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ПОТРОШЊА НА ЈАВНО ЗДРАВСТВО И СТОПА СМРТНОСТИ НОВОРОЂЕНЧАДИ У НИГЕРИЈИ

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САЖЕТАК

Једна од бројних одговорности владе било које земље јесте улагање у различите секторе привреде. Међутим, улагање би требало да се усмјери у одговарајуће секторе, попут здравственог, који ће довести до континуираног раста земље. У свјетлу овога, ова студија разматра државну потрошњу на здравствени сектор и њен утицај на стопу смртности новорођенчади у Нигерији. Здравље је најважније за добробит грађана. Ова студија је покушала да пружи емпиријске доказе о утицају потрошње на јавно здравство на стопу смртности новорођенчади у Нигерији између 1991. и 2018. године користећи податке из временских серија. За испитивање односа коришћена је аналитичка метода потпуно модификованих обичних најмањих квадрата. Извршене су разне провјере робусности како би се креаторима политика обезбиједила поузданост резултата. Резултати су открили да су све примијењене варијабле позитивно утицале на стопу смртности новорођенчади, осим имунизације против дифтерије, пертусиса и тетануса (ДПТ), и стопе писмености жена. Стога је препоручено да се приступи већем јавном просвјетљењу о важности ДПТ имунизације за новорођенчад како би циљна публика могла да произведе позитиван ефекат, дојиље би требало више едуковати о потреби добре бриге о својој деци посебно у раним годинама и непрепуштању бриге другима због описмењавања и одласка на посао, а на штету њихове родитељске улоге.

Кључне ријечи:
потрошња на јавно здравство, стопа смртности новорођенчади, писменост жена, дифтерија, пертусис и тетанус.