IMPACT OF HEALTH SECTOR SPENDING ON INFANT/MATERNAL MORTALITY IN NIGERIA

(1980-2016)

BY

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CERTIFICATION

This is to certify that this project work was carried out by **ADEBISI EMMANUEL PELUMI** with the matriculation number**EDS/14/1867.** It has been read and approved, having met the standard requirements for the award of B.Sc. Degree in the Department of Economics and Development Studies, Faculty of Social Science, Federal University Oye – Ekiti, Nigeria.

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DEDICATION

This project is dedicated to the Author of Salvation, my Father and friend, The All Knowing God for seeing me through my years in this great institution. My beloved parents, Mr. and Mrs. Adebisi for their support, your type is rare in the World.

ACKNOWLEDGEMENT

My profound appreciation goes to my source and confidence, The Almighty God for his ending Love, care, protection and provision over my life throughout my study years. In times when hope was gone, he always shows himself as my only help. To Him be all glory and honor forever and ever.

To my indispensable supervisor and lecturer Mr. Ogbuagu Matthew.I. for his support, mentorship and encouragement. Sir I really appreciate your effort. And to all my lecturers in the Department of Economics and Development Studies, Professor A.E. Akinlo, Professor Ogunleye E.O., Dr. Christopher Ehinomen, Dr. DitimiAmassoma, Dr. Nwosa Phillip I., Mrs. Adegoke Y., Dr. OmoladeAdeleke, Mr. Agu Osmond, Mr. Ugwu Ephraim, Mrs. Mbah Stella, Mr. Emma-Ebere O., Mr. S. Keji. I cannot appreciate you enough, for all you have done to invest in me over the years, may you grow to wax strong in wisdom.

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To my wonderful friends, OgunyilekaSegun, Agunsoye John, PopoolaOlayinka, the entire Lee Temple: Lawal Lee, Peter Lee, Aro Lee; I thank you for always standing by me, you are the best family on campus.

Lastly, I want to appreciate my brothers and sisters in NFCS, St. John Bosco Choir and St. Cecilia Choir, you actually helped me develop something I never thought I could do. Thank you for believing in me.

ABSTRACT

A key element of public policy is the promotion of good health in order to attain broad based economic growth. Based on this paradigm, many countries devote huge budgetary allocation to health. However, in most developing countries, this huge health expenditure failed to translate into better health status. Thus, this paper investigates how the effectiveness of public health expenditure is affected by governance in Nigeria. Data on public health expenditure is regressed on infant-mortality ratio using the Autoregressive Distribution Lag Model Approach. Thus, the result obtained shows that public health expenditure has negative effect on infant-maternal mortality ratio. Thisstudy therefore point to a greater role for multilateral development banks like the African Development Bank (AFDB). Apart from increased use of sector-wide approaches (SWAPs), other instruments of intervention in regional member countries (RMCs) include: budget support for resource transfer to the national budget, on the basis of long-term, trusting, partnerships; policy dialogue in poverty reduction strategy and assistance strategy for a about the priority due to pro-poor social sector programs in public expenditure allocations, with due recognition of the needs of evolving programs of action; sector-level dialogue on sector strategies and their implementation.

Keywords: Economic Growth   ARDL   Millennium Development Goal   Infant Mortality Maternal Mortality   Health Expenditure

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

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 health and its effect on health outcomes in Nigeria. Health is central to the well-being of the citizens. In an era of limited national budgets and pressing health and social challenges, the need to focus expenditures to achieve better outcomes is a widespread policy concern. In comparison with other OECD countries, the United States in total (public and private spending combined) spends more on healthcare yet still fares worse in many areas of health. This finding has fed an already growing interest in the relationship between health and wider societal factors. Recent research by Bradley and Taylor (2013) found that spending on welfare programmes seems to be related to health outcomes in interesting ways.

Historically, some women who were either famous by themselves or closely associated with famous persons died during childbirth. They are: Joana of Austria, Grand Duchess of Tuscany (1578); Princess Maria Luisa of Bourbon-Parma, mother of Tsar Boris III of Bulgaria (1899); Eleanor of Portugal, Queen of Denmark (1231); Mutnedjmet, wife of Pharaoh Horembeb in Egypt (13th Century BC); Constance of Castile, second wife of Louis

VII, King of France; Mary , Queen of Hungary (1319) ; Mumtaz Mahal, wife of Mughal Emperor Shah Jahan-Her memorialis the Taj Mahal (1631); Julia, daughter of Julius Caesar (54BC); Princess Zorka of Montenegro, mother of King Alexander I of Yugoslavia (1890); Christina of Norway, princess of Norway(1213);Benedicta Ebbesdother of Hvide , Queen consort of King Sverker II of Sweden (1200); Princess Charlotte Augusta of Wales , only legitimate child of the future King George IV of the United Kingdom(1817) – the obstetrician later committed suicide; Florence Kendrick, mother of Neville Chamberlain, Prime Minister (1875); Sarah Lincoln Grigsby , sister of Abraham Lincoln (1828); Alice Hathaway Lee Roosevelt, the first wife of Theodore Roosevelt.2 These countries have taken appropriate steps and strong commitments and the mortality is now low and makes a headline news if it occurs.

Globally, the total number of maternal deaths decreased from 543,000 in 1990 to 287,000 in 2010. A decline of 47% from 1990 levels. Also maternal mortality ratio declined from 400 in 1990 to 210 in 2010 representing an annual average decline of 3.1%.3 Sub-Saharan Africa and Southern Asia accounted for 85% of the global burden (245,000) of maternal deaths in 2010. At the country level, India (56,000), 19% and Nigeria (40,000), 14% account for a third of global maternal deaths.

Their research found that overall higher levels of health sector spending are associated with better health outcomes for OECD countries. Further, a higher ratio of social to health spending in OECD countries was associated with better health outcomes. If countries that spend more on social programmes than they do on health have better health outcomes, all other things being equal, then this raises strategic questions for governments who wish to improve health outcomes. Public health spending is low in emerging and

developing economies relative to advanced economies and health outputs and outcomes need to be substantially improved. Simply increasing public expenditure in the health sector, however, may not significantly affect health outcomes if the efficiency of this spending is low. This is an important question especially when budgets are constrained and there are raising costs associated with the burden of poor health. However, identifying an association between social spending and health outcomes is the first in several necessary steps towards answering this question and understanding its implications for government spending decisions.

First, there could be many reasons that an apparent association between health outcomes and social spending may appear that, when tested, would begin to unravel. For example, outliers could weigh too heavily, skewing the findings and creating an apparent effect that disappears once the outliers are removed. Or, even if the relationship between the two holds after testing in a variety of ways, it is also possible that some underlying driver is responsible for both the higher public expenditure and the better health outcomes. If this were the case, one might seek to identify factors that influence and are associated with both social spending and health and test these. If such factors were found, this would indicate a deeper level at which governments may need to intervene if they are to improve their population's health. This exploratory study sought to make progress on testing the relationship between health spending and health outcomes on infant/maternal mortality ratio and on some of the wider societal factors that could be considered candidates for driving or being related to both social spending and health outcomes.

South Africa's total expenditure on health equates to almost 9% of its gross domestic product, which is above the average of other countries classified as middle-income countries. Notwithstanding this investment, indicators of health outcomes remain relatively

lower when compared to the same countries. The aim of this paper is to investigate the e ectiveness of public health expenditure in improving health outcomes in Nigeria also comparing some other economies.

Furthermore, high rate of death among children under-5 years remains one of the most salient global health concerns. More than 10 million children below five years of age die every year around the world. In developing countries child health and survival lag behind desired targets, due to infant and child mortality. About 29,000 children under the age of five die each year mainly from preventable causes (UNICEF, 2008). According to WHO (2011), an estimated four million children die each year during the first 28 days of life, a large proportion of which occur during the first 24 hours and this is attributed to lack of adequate facilities and availability of health workers who are willing to discharge their duties and at the right time. The situation is particularly worrisome in sub-Saharan Africa where infant and child mortality rates are 10 times higher than the industrialized regions (Barbieri, 2004). The 2008 Nigerian Demographic and Health Survey (NDHS) put under five mortality rate in Nigeria at 157/1000 (NPC & ICF Macro, 2009). This is disturbing when it is compared with the target of 45/1000 set to be achieved in 2015. In most developing nations, the reduction of infant and child mortality has become a central issue in their development agenda (Ugweje, 2008). Writing on the topic, Eboh (2000) noted that infant and child health constitute the critical factors for ensuring a healthy nation and a prosperous tomorrow for the child and the whole of the society as every child has a right to sound health, to grow up and to develop happily into a productive and stimulating life.

Also, the situation of maternal health in Nigeria is among the worst in Africa and has not improved substantially and in some areas of the country, has worsened over the years. The maternal mortality ratio ranges between 800-1,800 per 100,000 live births in Nigeria

with marked variation between geo-political zones- 165 in south west compared with 1,749 in the North- east and between urban and rural areas while total fertility rate is 5.7 births per woman. It is also estimated that approximately 60,000 of maternal deaths take place annually in Nigeria as a result of pregnancy, delivery and post-delivery complications. Nigeria is second to India in terms of absolute number of maternal deaths and regrettably, despite abundant resources, contributes more than 10% of all global maternal deaths. The northern part of the country has generally worse indicators.

1.2 Statement of the problem

Provision of health is seen as a key element of a policy to promote broad-based economic growth. Therefore, every country devote huge public fund to health care provision believing this would improve the health of the citizenry so that they can contribute meaningfully to economic growth and development. While increase in budgetary allocation to social services is highly desirable in a developing country like Nigeria, this by itself is not sufficient to guarantee enhancement in service delivery. At an estimated 350 US dollars per capita annually, Nigeria still ranks near the bottom 158 out of 177 countries in the United Nations Human Development Index (HDI) in terms of per capita income, with more than half of the population living in poverty (USAID). Nigeria with a population of over 150 million has one of the weakest health systems in the world and was ranked 187th out of 191 member states by the World Health Organization (WHO) in 2000. Due to the weak health systems, maternal and child health status in Nigeria is among the worst in Africa. With approximately 2.5% of the world's population, Nigeria has more than 10% of all under-5 and maternal deaths – more than 1 million new-born, infant, and child deaths and more than

50,000 maternal deaths every year (USAID). Annually, an estimated 52,900 Nigerian women die from pregnancy related complications, out of 529,000 global maternal deaths, thus a woman's chance of dying from pregnancy and childbirth in Nigeria is 1 in 13. The main causes of maternal mortality in Nigeria are: haemorrhage (23%), infection (17%), unsafe abortion (11%), obstructed labour (11%) and toxaemia/eclampsia/hypertension (11%), Malaria (11%), anaemia (11%) and others including HIV and AIDS contribute about (5%) (UNFPA). Other factors underlying maternal mortality include lack of awareness about complications in pregnancy and on the need to seek medical intervention early; lack of transportation to the health facilities where maternal healthcare can be provided; inability to pay for services, etc. (USAID). However, there has been a reduction in National Maternal Mortality Rate (MMR) from 800/100,000 in 2005 (4) to 545/100,000 according to the recent Nigeria Demographic and Health Survey (NDHS) 2008 NPC, Nigeria). This reduction in MMR may be attributed to the various maternal and child health intervention programmes introduced by the government.

One of such intervention programmes is the Free Maternal and Child Health Care Programme (FMCHCP). Ebonyi State in South-eastern Nigeria is one of the states implementing the FMCHCP in secondary and tertiary public and private health facilities. The policy is pursued against the backdrop of existing inequities in maternity and paediatric care services accessibility and utilization, and is premised on the notion that financial barriers are one of the most important constraints to equitable access and use of skilled maternal and child healthcare. Bad budget management has been identified as one of the main reasons for ineffective public spending in many developing countries (World Bank, 1998). In Nigeria, despite the huge government expenditure on health provision, the health

status of Nigerians is consistently ranked low. Nigeria ranked 74th out of 115 countries, based on the performance of some selected health indicators (World Bank, 1999). Nigerian overall health system performance was also ranked 187th among the 191 Member States by the World Health Organisation (WHO) in 2000 (National Health Policy, 2004). The Nigeria's rate of infant mortality (91 per 1000 live births) is among the highest in the world. It therefore becomes imperative to ask if governance has an impact on the effectiveness of health expenditure in Nigeria. This paper thus investigates how effective is health sector expenditure is on infant/maternal mortality in Nigeria. CO-chairman of Bill and Melinda Gates Foundation, Bill Gates, has berated the Federal Government's investments in young people, especially in areas of health and education, saying it is not good enough. He said: "As a partner in Nigeria, I am saying the current plan is inadequate. Nigeria has all these young people and the current quality and quantity of investment in these young generations; in health and education just isn't good enough.

After the eight Millennium Development Goals that have shaped progress in the past 15 years, 17 Sustainable Development Goals (SDGs) were adopted by governments at the UN General Assembly in September, 2015. SDG3 explicitly relates to health—to "Ensure healthy lives and promote well-being for all at all ages". This goal is translated into 13 targets: three relate to reproductive and child health; three to communicable diseases, non-communicable diseases, and addiction; two to environmental health; and one to achieving universal health coverage (UHC). When supported by strong public health policies and both aligned efforts across social, economic and political domains, primary health care has a central role in achievement of sustainable development. Although differences are inevitable between countries in the organisation of primary health care and the human recourses

available, many of the challenges outlined in SDG3- related to reproductive and child health communicable diseases, chronic illness(including multimorbidity), addictions and other mental health problems can be addressed through a person centered and population based approach to primary health care. Deliveries of vaccines and drugs need a functioning primary health care system. Well integrated and primary health care has a key role in health emergency responsiveness and it is essential for the achievement of UHC equitably and cost effectively.

Moreover, primary health care can contribute to the achievement of many of the 16 other SDGs; for example, its role in addressing the social determinants of health was underlined in the report "Closing the Gap in a Generation". Primary care teams worldwide can provide examples from daily practice that illustrate their contribution across the SDGs; including helping to end poverty, improve nutrition, provide health education and promote lifelong learning, empower individuals and communities to reduce inequities and promote justices, enable access to safe water and sanitation, encourage productive and sustainable employment, foster innovation, advocate for health and sustaining living environments and promote peaceful communities.

Yet investment in realizing the full potential of primary health care still seems elusive to many governments, policy makers, funders, and health care providers. Therefore, 7 years after the *World Health Report* and *The Lancet Series* on primary health acre, and 37 years since the Alma-Ata declaration, the absence of reference to primary health care in the SDGs, and their targets seems a serious over sights. The two conclusions could be drawn: first that primary health care is dispensable and peripheral to achieving sustainable

development; or, second, that primary health care is so integral to the path towards the SDGs that reference in a goal or target would undermine its cross-cutting role.

We opt for the second conclusion, yet do so with apprehension, because one of the contributing factors to the documented failure of primary health care in many setting since the Alma-Ata declaration was "the scarcity of a proposed strategy for implementation and its monitoring for accountability and scale up purposes". This issue needs to be addressed in the development of implementation strategies for the SDGs. If the agenda is not explicit about hoe health systems with good quality comprehensive primary care can be achieved, or how to measure progress towards this goal, we risk repeating the failures of the past. National governments and other stakeholders need to be ambitious in measuring progress towards delivery of primary health care that will address the SDGs.

1.3 Research Questions

The research questions of the study are:

1. To what extent has government spending on health impacted on health outcome?

2. How does a change in Nigeria's health sector funding affects the infant/maternal mortality rate, negatively or positively?

1.4 Research Objective

The specific objectives of the study are:

1. To identify the determinants of infant-maternal mortality ratio in Nigeria.

2. To explain the trend of infant-maternal mortality ratio in Nigeria.

The broad objective of this study is to check the interaction between government health spending and infant-maternal mortality ratio in Nigeria.

1.5 Research Hypothesis

In the course of study, the following hypothesis will be tested

H_0: There is no significant relationship between public health expenditure and health outcomes in Nigeria

H_1: There is significant relationship between public health expenditure and health outcomes in Nigeria

1.6 Significance of the Study

The overall objective of the health policy in Nigeria as contained in various government policy documents is to increase access to equitable, quality and affordable healthcare. The aim of the policy is to improve the health status of the populace. One strategy to meet this objective has been continuous increase in government allocations to healthcare. Therefore, it becomes important to conduct a study to examine whether the resources allocated to healthcare have any contribution to improvement of health status in the country. The extent of the impact of health sector funding on the infant/maternal mortality rate in Nigeria has attracted the attention of this researcher.

"The 2014 millennium Development Goals reports almost one-third of all global maternal deaths are concentrated in two populous countries: India, with an estimated 50,000 maternal deaths (17%) and Nigeria, with an estimated 40,000 maternal deaths (14%) while the WHO 2014 report on maternal mortality states that Nigeria's MMR is 560 deaths per 100,000 live births."

Disturbingly too, women make up only 21% of the non-agricultural paid labour force as majority of women are concentrated in casual, low-skilled, low paid informal sector employment with only 7.2 % of women owning land that they farm, which limits their access to credit and entrepreneurship as well as business activities. In 2015, maternal mortality ratio for Nigeria was 814 deaths per 100,000 live births. Maternal mortality ratio of Nigeria fell gradually from 1,250 deaths per 100,000 live births in 1996 to 814 deaths per 100,000 live births in 2015.

The availability of health resources alone may not guarantee improved health if the underlying causes of poor health are not addressed. For instance, to what extent does the environment under which health expenditures are made matter for child and mother health? This includes the environment of the mother during child birth and the bringing up of the child. This study is geared towards informing public policy on the need to consider the effects of non-health factors that may be influencing child health, even as medical efforts are made to save children.

The gains of this research is to present the data analysis as a basis for decision making and recommendation to the public, government and future researchers in the field. This research will show how the change in the health sector funding will affect the infant/maternal mortality rate in Nigeria.

1.7 Scope of the Study

The study made use of secondary data that covers the period between 1980 and 2016. The study made use of the Grossman (1972) econometric technique of estimation for the analysis of the data.

CHAPTERTWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews the impact of health sector spending on infant/maternal mortality ratio in Nigeria. This chapter shall include the conceptual issues, theoretical framework and the empirical literatures as reviewed by various scholars and the limitation of previous studies.

2.1 Conceptual framework

2.1.1 Maternal Mortality Rate

Maternal health is the health of women during pregnancy, childbirth, and the postpartum period. It encompasses the health care dimensions of family planning, preconception, prenatal, and postnatal care in order to ensure a positive and fulfilling experience in most cases and reduce maternal morbidity and mortality in other cases. As explained in Shah and Say (2007), a maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

The United Nations Population Fund (UNFPA) estimated that 289,000 women died of pregnancy or childbirth related causes in 2013 and Nigeria accounts for about 14% of

these. These causes range from severe bleeding to obstructed labour, all of which have highly effective interventions. As women have gained access to family planning and skilled birth attendance with backup emergency obstetric care, the global maternal mortality ratio has fallen from 380 maternal deaths per 100,000 live births in 1990 to 210 deals per 100,000 live births in 2013. This has resulted in many countries halving their maternal death rates. In Nigeria, the estimated maternal mortality ratio of 576 deaths per 100 000 live births reported in 2013 was higher than the 545 deaths per 100,000 live births recorded in 2008 and fell far short of the Millennium Development Goal of 250 deaths per 100 000. Neonatal mortality declined from 48 deaths per 1000 live births in 2003 to 37 in 2013. While there has been a decline in worldwide mortality rates much more has to be done. High rates still exist particularly in impecunious communities with over 85% living in Africa and Southern Asia. The effect of a mother's death results in defenseless families, and their infants, if they survive childbirth, are more likely to die before reaching their second birthday. Both maternal mortality and strict maternal mortality (SMM) are "associated with a high rate of unavoidability. In 2010 the U.S. Joint Commission on Accreditation of Healthcare Organizations described maternal mortality as a "sentinel event", and uses it to assess the quality of a health care system.

Causes of maternal mortality are multifactorial. The medical causes are the direct and indirect causes as shown by the World Health Organizations definition of maternal death. The 3 major direct causes are: Severe pre-eclampsia /eclampsia, sepsis and haemorrhage7, in that order. Indirect causes from preexisting diseases or diseases arising during pregnancy which were aggravated by the physiological effects of pregnancy like malaria, anemia, HIV/AIDS and cardiovascular diseases also play a role in maternal deaths.

Maternal deaths are not uniform in Nigeria.8 it varies according to geographical zones. It is higher in North East 1549 and lowest in South West (165). With the present ratio, the Millennium Development Goal (MDG 5) target of 250,000 for Nigeria in 2015 has eluded the country.8 MDG 5 was aimed at improving maternal health and reduces maternal mortality by 75% between 1990 and 2015. Maternal death was chosen as the outcome with which to judge progress towards the goal.

Beyond the medical causes are the social, economic, political and cultural conditions which can only be addressed by the Government. According to Harrison, following the launching of Safe Motherhood in Nairobi (1987), nobody expected miracles overnight nor did anybody expect disasters of such immensity. Sadly, high maternal death has continued to remain with us. From the data presented on the table, childbirth has become hazardous, risky, and horrifying experience for women in the Niger Delta region of Nigeria. The death of a mother brings misery to the family especially the motherless children.

According to the WHO Factsheet (2008), 1500 women die from pregnancy or pregnancy-related complications every day. Most of these deaths occur in developing countries, and most are avoidable. Of all the health statistics compiled by the World Health Organization, the largest discrepancy between developed and developing countries occurred in maternal mortality. Ujah et al. (2005) noted that while 25 percent of females of reproductive age lived in developed countries, they contributed only 1 percent to maternal deaths worldwide. A total of 99 percent of all maternal deaths occur in developing countries. More than half of these deaths occur in sub-Saharan Africa and one third in South Asia. The maternal mortality ratio in developing countries is 450 maternal deaths per 100,000 live

births versus 9 in developed countries. Fifteen countries have maternal mortality ratios of at least 1000 per 100,000 live births, of which all but Afghanistan and India are in sub-Saharan Africa: Afghanistan, Angola, Burundi, Cameroon, Chad, the Democratic Republic of the Congo, Guinea-Bissau, India Liberia, Malawi, Niger, Nigeria, Rwanda, Sierra Leone and Somalia (WHO, 2008). Nigeria has one of the highest maternal mortality rates in the world, second only to India whose population is eight times larger than that of Nigeria.

Despite successive efforts to improve maternal health outcomes in Nigeria, relevant indicators in the country remain generally poor. A woman's chance of dying during pregnancy and childbirth in Nigeria is high, at 1 in (compared to in 31 for sub-Saharan Africa). Currently, there is only one obstetrician/gynecologist for every 181,458 individuals. Pregnancy and the period surrounding it remain very precarious times for the approximately 9.2 million Nigerian women and girls who become pregnant annually. The country is currently the second largest contributor to maternal mortality worldwide. Each day, about 109 Nigerian women die in childbirth, which approximates to one death every 13 minutes. Nigeria's estimated annual 40,000 pregnancy-related deaths account for about 14% of the global total, placing it among the top 10 most dangerous countries in the world for a woman to give birth. Currently, Nigeria's maternal mortality ratio (MMR) of 560 per 100,000 live births is higher than the sub-Saharan African average of 510. In northern Nigeria, the maternal mortality ratio is as high as 1,549 per 100,000 live births. The typical Nigerian woman currently lives five fewer years than her other sub-Saharan African counterparts and dies 18 years earlier than the rest of the world's women.

Mairiga et al. (2008) expressed the view that the world's maternal mortality ratio (the number of maternal deaths per 100,000 live births) is declining too slowly to meet Millennium Development Goal (MDG) 5 target, which aimed to reduce the number of women who die in pregnancy and childbirth by three quarters by the year 2015. While an annual decline of 5.5 per cent in maternal mortality ratios between 1990 and 2015 is required to achieve MDG 5, figures released by WHO, UNICEF, UNFPA and the World Bank show an annual decline of less than l per cent. Gains in reducing maternal mortality have been modest overall. While average global infant mortality and under five mortality have been reduced by more than half in the past 40 years, and average global life expectancy at birth has increased enormously during the same period there has been no visible progress in maternal mortality (MMR) reduction at the global level. Shah and Say (2007) noted that the trend in developing countries is much worse, as studies from various countries of sub-Saharan Africa indicate that maternal mortality has not only continued to be high, but is indeed increasing after the launch of the Safe Motherhood Initiative (SMI) in Kenya in 1987.

Four elements are essential to maternal death prevention. First, prenatal care, it is recommended that expectant mothers receive at least four antenatal visits to check and monitor the health of mother and foetus. Second, skilled birth attendance with emergency backup such as doctors, nurses and midwives who have the skills to manage normal deliveries and recognize the onset of complications.Third, emergency obstetric care to address the major causes of maternal death which are hemorrhage, sepsis, unsafe abortion, hypertensive disorders and obstructed labour. Lastly, postnatal care which is the six weeks following delivery. During this time bleeding, sepsis and hypertensive disorders can occur

and newborns are extremely vulnerable in the immediate aftermath of birth. Therefore, a follow-up visit by a health worker is assessing the health of both mother and child in the postnatal period is strongly recommended. Reducing high maternal mortality ratio is not just a technical and medical challenge but largely a political one which requires the attention and commitment of political leaders. Nigeria contributes 2% of world's population but accounts for 10% of the world's maternal death. The risk of a woman dying in Nigeria from childbirth is 1 in 18 compared to 1 in 29,800 for Sweden.

The World Health Organization's (WHO) 2014 report has stated that the maternal mortality rate in Nigeria is 560 deaths per 100,000 live births and one-third of all global maternal deaths are concentrated in two populous countries which includes Nigeria, after India. This was revealed by the executive director of Women Advocates' Research and Documentation Centre (WARDC), Dr Abiola Akiyode Afolabi at the "National Roundtable: Sustainable Development Goals Gender Equality and Maternal Health" in Abuja. She said women in Nigeria still face financial barriers, infrastructural and institutional barriers in accessing adequate maternal healthcare and are still been detained for inability to pay high user fees and lose their lives in the process.

"The 2014 Millennium Development Goals report almost one-third of all global maternal deaths is concentrated in two populous countries: India, with an estimated 50,000 maternal deaths (17%) and Nigeria, with an estimated 40,000 maternal deaths (14%) while the WHO 2014 report on maternal mortality states that Nigeria's MMR is 560 deaths per 100,000 live births." She lamented that Nigeria ranks 118 of 134 countries in the gender equality index, as fewer girls are enrolled in school in schools compared with boys.

Disturbingly too, women make up only 21% of the non-agricultural paid labour force as majority of women are concentrated in casual, low-skilled, low paid informal sector employment with only 7.2 % of women owning land that they farm, which limits their access to credit and entrepreneurship as well as business activities. In 2015, maternal mortality ratio for Nigeria was 814 deaths per 100,000 live births. Maternal mortality ratio of Nigeria fell gradually from 1,250 deaths per 100,000 live births in 1996 to 814 deaths per 100,000 live births in 2015.

Maternal mortality ratio is the number of women who die during pregnancy and childbirth, per 100,000 live births. The data are estimated with a regression model using information on fertility, birth attendants, and HIV prevalence.

Rate	Value	Change, %
015	814.0	- 0.73 %
014	820.0	- 0.12 %
013	821.0	0.24 %
012	819.0	- 0.61 %
011	824.0	- 4.96 %
010	867.0	- 1.81 %
009	883.0	6.51 %
008	829.0	- 6.22 %
007	884.0	- 0.67 %
006	890.0	- 5.92 %

Rate	Value	Change, %
005	946.0	-4.06 %
004	986.0	

2.1.2 Infant Mortality

Infancy is a period of rapid growth and increased demand for calories and proteins. In Nigeria infant mortality is a major public health concerns as debilitating picture of poverty, diseases and malnutrition still constitutes an unholy decimal in the country landscape. Presently demographic data on Infant Mortality Rate (IMR) are still hugely inadequate as many deaths occur at home and are not recorded in official statistics. However it is estimated that over 157 children per 1,000 live births or approximately 1 child out of 6 dies before reaching age five. This devastating and long standing health care crunch is influenced by combination of interrelated factors which includes high numbers of births per mother with short spacing between births, poor weaning foods, use of infants formulas (cow's milk), inadequate healthcare delivery system, unhygienic practices and sanitations, poor feeding practices and low educational attainment. A number of observational studies and survey has shown that children are particularly vulnerable to infections, malnutrition and deaths during the transition from breast milk as the chief source of nourishment to solid foods termed the weaning process. Study in poor areas of Ghana, India and Peru revealed 10.5 times the number of deaths for those not breast fed compared to infants that are exclusively breast-fed while partially breastfed infants had 2.5 times the risk of death versus those exclusively breastfed.

Although, there are vagaries of statistics and estimations for child mortality for different countries and the world by different sources, the patterns and trends are specifically similar. Among the general patterns is that the global under-five mortality rate has declined by almost 47 percent between 1990 and 2012 (measuring 90 deaths per 1,000 live births in 1990 and 48 in 2012) while the trend in sub-Saharan Africa is apt to increase (United Nations Inter-agency Group for Child Mortality Estimation (2013). Globally, several causes of under-five mortality were noted among which are: pneumonia which contribute up to 17 percent of the entire death, preterm birth complications that cause about 15 percent of child death, intrapartum-related complications (10 percent), diarrhea (9 percent) and up to seven percent due to malaria (United Nations Inter-agency Group for Child Mortality Estimation, 2013). Also, a survey carried out in Bangladesh shows that child mortality rate was highest (1.64%) for the children of illiterate mothers and lowest (0.54%) for the children whose mother's educational level is secondary and above (Uddin, Hossain & Ullah, 2009). Educated mothers are more likely than non-literate mothers to ensure a healthy environment, nutritious food, and have better knowledge about reproductive health at conception and health care facilities for their children. Literate mothers will give birth to healthier babies because they themselves tend to be healthier and are likely to experience lower mortality among their children at all ages (Pandey, 2009).

Several of diseases causing child mortality have connections with hygiene condition and unclean environment these are not limited to dirty feeding bottles, utensils, inadequate disposal of household refuse, poor storage water, to mention but few (Jinadu, Olusi, Agun & Fabiyi, 1991; NBS, 2011). Other reports have shown that maternal education is a significant factor influencing child survival (Caldwell, 2009; Osonwa, Iyam, & Osonwa,

2012). Children from poorer or rural households are reported to be more vulnerable than their counterparts from other regions (United Nations Children's Fund, 2010). A child born to a financially deprived and less educated family is at risk of prenatal death or within the first month of life. The reasons for these are obvious since the mother may be poorly nourished during pregnancy, had little or no antenatal care and likely to deliver in ill-equipped health facility. Besides, the level of competition over resources when the family is large could enhance poor care among the family members including the very young ones. All these factors are further aggravated by limited access to health services due to poor income and low levels of maternal education, often leading to the non-immunization of the child (Policy Project/Nigeria, 2002).

2.1.3 Health Sector Spending

At an estimated $350 per capita annually, Nigeria still ranks near the bottom 158 out of 177 countries in the United Nations Human Development Index in terms of per capita income, with more than half of the population living in poverty. Nigeria with a population of over 150 million has one of the weakest health systems in the world and was ranked 187th out of 191 member states by the WHO in 2000. Due to the weak health systems, maternal and child health status in Nigeria is among the worst in Africa and has not improved substantially, and in some areas of the country, has worsened over the past decade. Nigeria's health situation makes it a major factor in the global achievement of MDGs 4 and 5. With approximately 2.5 percent of the world's population, Nigeria has more than 10 percent of all

under-5 and maternal deaths – more than 1 million newborn, infant, and child deaths and more than 50,000 maternal deaths every year.

The attainment of the MDGs 4 and 5 in Nigeria is unlikely by the year 2015 with the level of maternal and child health care currently in the country. Annually, an estimated 52,900 Nigerian women die from pregnancy related complications, out of a total of 529,000 global maternal deaths, thus a woman's chance of dying from pregnancy and childbirth in Nigeria is 1 in 13. Nigeria loses 2,300 under-five year olds and 145 women of childbearing age every day, making Nigeria the second largest contributor to the under-five and maternal mortality in the world. The main causes of maternal mortality in Nigeria are: hemorrhage (23%), infection (17%), unsafe abortion (11%), obstructed labour (11%) and toxemia/eclampsia/hypertension (11%), Malaria (11%), anemia (11%) and others including HIV and AIDS contribute about (5%). Many of these complications occur during pregnancy, labour and delivery.

Although many of these deaths are preventable, the coverage and quality of health care services in Nigeria continue to fail women and children. Other factors underlying maternal mortality have been identified by a number of reports; these include lack of awareness about complications in pregnancy and on the need to seek medical intervention early; lack of transportation to the health facilities where maternal health care can be provided; inability to pay for services, etc. It is therefore important that women should have access to skilled attendants at birth, as well as, access to quality obstetric care. This care should not only be accessible but also affordable.

There exists a wide variation in maternal mortality rate (MMR) across the six Nigeria geopolitical zones, with the Northern zones generally recording higher rates than the

southern zones. Likewise, there is also a marked urban-rural variation in MMR: 351/100,000 (urban) compared to 828/100,000 (rural). However, there has been a reduction in National maternal mortality rate (MMR) from 800/100,000 in 2005 to 545/ 100,000 according to the recent NDHS 2008. This reduction in MMR may be attributed to the various maternal and child health intervention programmes introduced by the federal and state governments. One of such intervention programmes is the Free Maternal and Child Health Care Programme (FMCHCP). A number of states in Nigeria, including Ebonyi State, introduced and have been implementing FMCHCP for close to ten years in secondary and tertiary public and private health facilities. The rationale behind the implementation of FMCHCP is to ensure increased and equitable access to and use of skilled maternal and child healthcare services. The policy is pursued against the backdrop of existing inequities in maternity and pediatric care services accessibility and utilization, and is premised on the notion that financial barriers are one of the most important constraints to equitable access and use of skilled maternal and child health care. The services provided in the FMCHCP of Ebonyi State include free antenatal care ANC (including card and antenatal drugs), free vaginal and assisted vaginal delivery (forceps and vacuum), free caesarean section (elective and emergency), free post abortion care services, free management of ectopic and free laparatomy for obstetric complications. Also included are free treatment for the under 5 and free vesicovaginal fistula repairs. There is indeed a growing global movement towards the abolition of user fees as a way to redress barriers and inequity of access to maternal and child care, ensure increased access to and use of skilled healthcare services, and ultimately improve maternal and child health.

According to the National Human Resources for Health Strategy report, Ebonyi has a doctor population ratio of 6/100,000 population and 9/100,000 population for Nurses; the distribution of health manpower is skewed towards urban populations and the primary health center's do not have sufficient manpower as recommended by regulatory agencies. In much of the rural areas, traditional medical practitioners provide much of the health services; TBAs for instance are the main stay for MNCH services. This is due to near absence of health facilities in these areas. The per capita health expenditure on health is about $4, much lower than the $34 recommended by the Macroeconomic Commission on Health for the attainment of the health-related MDGs. About 70% of health expenditure is from out-of-pocket and the National Health Insurance Scheme is currently not operational in Ebonyi State. This situation has contributed to the very high maternal and infant mortality in Ebonyi State.

Sources of health system expenditure (2013-2015)

Firms ---- 3%

Development partners ----- 4%

Local Governments --------- 4%

State Governments ---------- 8%

Federal Governments --------- 12%

Household ----------- 69%

Source: Federal Ministry of Health (Nigeria's National Strategic Development Plans, 2010-2015).

2.2 EMPIRICAL LITERATURE AND METHODOLOGICAL REVIEW

The main tenets of the fourth and fifth Millennium Development Goal (MDG 4 and 5) are to reduce under-five mortality rate and improvement in maternal health which by implication increases the chance of child survival. Child mortality is a fundamental measurement of a country's level of socio-economic development as well as the quality of life especially of the mothers. Under-five mortality rate (5q0) represents the probability of a child who survives to age one, dying between age one and age five (Adlakha & Suchindra, 1984; National Population Commission and ICF Macro, 2009; World Health Organisation (WHO), 2011). Almost half of the child mortality (42%) in the world occurs in Africa and about 25,000 under-five children that die each day are concentrated in sub-Saharan Africa and South Asia (WHO, 2011). Under-five mortality rate (U5MR) is generally 29 times higher in developing nations compared to developed countries (Black & Liu, 2012; Gambrah & Adzadu, 2013; Marx, Coles, Prysones-Jones, Johnson, Augustin, Mackay, Bery, Hammond, Nigmann, Sommerfelt et al, 2005). Globally, under-five mortality has dropped significantly by almost 45 per cent between 2009 and 2011 but this progress is not the reality for all countries. Despite much progress in advanced countries, Nigeria has failed to make significant progress in checking the rising mortality rate among the under-five. Currently, about half of the world's under-five deaths occur in Nigeria, India, Congo, Pakistan and China (National Bureau of Statistics (NBS), 2011; World Bank, 2013).

Under-five mortality rate (U5MR) is the probability of a child born in a specified year dying before reaching the age of five if subject to current age-specific mortality rates and expressed as a rate per 1,000 live births (United Nations Children's Fund, 2012; UN Inter-agency Group for Child Mortality Estimation, 2013). It also refers to as the death of

infants and children under the age of five. Child mortality has remained a national and global concern and its import in socioeconomic rating of country's development cannot be overemphasized. Sub-Saharan Africa and Southern Asia face the greatest challenges in child survival, and currently accounted for more than 80 per cent of global under-five deaths (United Nations Children's Fund, 2012). Several factors had been identified as contributors to the increasing levels of child mortality in most developing countries. Studies have shown that there is a close relationship between educational attainment and lower mortality rates (Antai, 2011; Fayehun & Omolulu, 2009; National Population Commission and ICF Macro, 2009). This was further established through the results in the Nigeria Demographic and Health Survey (NDHS) Report (2009), that children born to mothers with no education have the highest under-five mortality rates (209 deaths per 1,000 live births), while mothers with secondary education have 68 per 1,000 live births.

Although, there are vagaries of statistics and estimations for child mortality for different countries and the world by different sources, the patterns and trends are specifically similar. Among the general patterns is that the global under-five mortality rate has declined by almost 47 percent between 1990 and 2012 (measuring 90 deaths per 1,000 live births in 1990 and 48 in 2012) while the trend in sub-Saharan Africa is apt to increase (United Nations Inter-agency Group for Child Mortality Estimation (2013). Globally, several causes of under-five mortality were noted among which are: pneumonia which contribute up to 17 percent of the entire death, preterm birth complications that cause about 15 percent of child death, intrapartum-related complications (10 percent), diarrhea (9 percent) and up to seven percent due to malaria (United Nations Inter-agency Group for Child Mortality Estimation, 2013). Also, a survey carried out in Bangladesh shows that child mortality rate

was highest (1.64%) for the children of illiterate mothers and lowest (0.54%) for the children whose mother's educational level is secondary and above (Uddin, Hossain & Ullah, 2009). Educated mothers are more likely than non-literate mothers to ensure a healthy environment, nutritious food, and have better knowledge about reproductive health at conception and health care facilities for their children. Literate mothers will give birth to healthier babies because they themselves tend to be healthier and are likely to experience lower mortality among their children at all ages (Pandey, 2009).

Several of diseases causing child mortality have connections with hygiene condition and unclean environment these are not limited to dirty feeding bottles, utensils, inadequate disposal of household refuse, poor storage water, to mention but few (Jinadu, Olusi, Agun & Fabiyi, 1991; NBS, 2011). Other reports have shown that maternal education is a significant factor influencing child survival (Caldwell, 2009; Osonwa, Iyam, & Osonwa, 2012). Children from poorer or rural households are reported to be more vulnerable than their counterparts from other regions (United Nations Children's Fund, 2010). A child born to a financially deprived and less educated family is at risk of parental death or within the first month of life. The reasons for these are obvious since the mother may be poorly nourished during pregnancy, had little or no antenatal care and likely to deliver in ill-equipped health facility. Besides, the level of competition over resources when the family is large could enhance poor care among the family members including the very young ones. All these factors are further aggravated by limited access to health services due to poor income and low levels of maternal education, often leading to the non-immunization of the child (Policy Project/Nigeria, 2002). Also, different analytical frameworks have been used in studies on maternal mortality. Mojekwu (2005) categorized the causes of maternal deaths

into medical factors, health factors, reproductive factors, unwanted pregnancy and socioeconomic factors. Ibe (2008) employed a multistage sampling technique while Okaro et al. (2001) carried out retrospective comparative analysis of maternal deaths for two ten-year periods.

Okonofua, Abejide, and Makanjuola (1992) examined the background factors that predisposed women to maternal mortality at the Obafemi Awolowo University hospital in Nigeria. The study investigated their sociodemographic characteristics, their use of prenatal care, and the incidence of delay in clinical management. The results showed that the maternal deaths involved women who were younger and of poorer socioeconomic status than the women in the control group. Both groups showed an equal lack of prenatal care. However, a higher incidence of delayed treatment was found in the management of the cases of maternal deaths. The study also found that maternal mortality in the study population can be reduced through improved transportation and institutional management, and, on a long-term basis, through the adoption of measures to improve the socioeconomic status of women.

Ni and Rossignol (1994) in a community-based maternal mortality surveillance study in Sichuan, China assessed the impact of family planning status on maternal mortality. They found that the leading causes of death for both planned and unplanned pregnancies were the same: hemorrhage, postpartum infection, pregnancy-induced hypertension, cardiac diseases, and pulmonary diseases. As among women with "planned" pregnancies, about 40% of maternal deaths among women with "unplanned" pregnancies occurred at home, and 20% occurred en route to a hospital. After controlling for the confounding effects of gravidity and education, with additional control for the effect of prenatal care visits the study indicates that

women with "unplanned" pregnancies have a higher risk of maternal death, which is only partially attributed to less prenatal care.

Garenne et al. (1997) in their case control study analyze risk factors for maternal mortality in three leading hospitals in Dakar, Senegal identified the leading causes of death as puerperal sepsis and other infections, hemorrhage, eclampsia, ruptured uterus, and anemia. Results of the case-control study revealed the major risk factors associated with health system failure as medical equipment failure, late referral, lack of antenatal visit, and lack of available personnel at time of admission. Various indicators of maternal status at time of admission (complications, blood pressure, temperature, oedema, and hemoglobin level) and of health history prior to admission (previous complications, previous C-section, lack of treatment) were also strong predictors of survival. Lastly, socio-demographic factors also appeared as correlates of maternal mortality, in particular: first pregnancy, pregnancy of high birth order, rainy season, being unmarried and low level of education. Okaro et al. (2001) carried out retrospective comparative analysis of maternal deaths at the University of Nigeria Teaching Hospital, Enugu for two ten-year periods (1976-1985 and 1991-2000) in order to evaluate the effect of Safe Motherhood Initiative on maternal mortality in the hospital.

2.2.1 CAUSES OF MATERNAL AND CHILD MORTALITY

Without healthy mothers, you cannot have healthy children. The issue of maternal health actually begins with the conception of the girl child in the mother's womb. The health of the baby within the mother, the circumstances and events of her birth, her early infancy, childhood, adolescence, early adulthood, her experiences as regards nutrition, child care,

education, physical, mental, intellectual and emotional development; all have vital and interdependent roles to play in what we term maternal health (Sariki,2008). Also children who are raised in physical and emotional nurturing environment will be more likely to survive and less likely to succumb to illness and disease. UNICEF observes that child and maternal mortality have many triggers, both direct and indirect. Poorly funded and culturally inappropriate health and nutrition services, food insecurity, inaccurate feeding practices and lack of hygiene are direct causes of mortality in both children and mothers. The indirect causes may be less obvious externally, but play just as large a role in mortality statistics. Female illiteracy adversely affects maternal and child survival rates and is also linked to early pregnancy. In many countries, especially where child marriage is prevalent, the lack of primary education and lack of access to healthcare contribute significantly to child and maternal mortality statistics. UNICEF also notes that discrimination and exclusion of access to health and nutrition services due to poverty, geographic and political marginalization are factors in mortality rates as well (Saraki, 2008). The major reported causes of maternal deaths in developing world are:

     i. Severe maternal bleeding

     ii. Infections

     iii. Obstructed or prolonged labor

     iv. Unsafe abortion

     v. Hypertensive disorders of pregnancy especially eclampsia (Marchie and Anyanwu, 2009).

     Hemorrhage, sepsis, toxemia and complications from abortion account for 62% of maternal deaths in Nigeria (Lindros and Lukkainen, 2004). According to Olatoye (2009),

North West has the highest maternal mortality rate, seconded by North-East. Death from post-partum hemorrhage (PPH) ranges between 23% and 44% of total maternal deaths especially in the Northern States. The ratio of women dying from PPH is 1 in 6 in the North East and North West as against 1 in 18 between South West and South East geopolitical zones. In percentage terms generally, the records read as follows: Eclampsia - 27%, PPH - 25%, Infection – 15%, unsafe abortion – 13%, other causes – 20%.

Other health issues which affect women chances of healthy livelihood in the pre-natal and post-partum period are high blood pressure, cancer, heart conditions and other non-communicable diseases. HIV/AIDS is an additional new concern for maternal/child health survival. According to Amankwah, 2009, in Ghana: Bleeding – 17%, Hypertension – 19%, Anemia – 12%, unsafe abortion – 11%, Infections – 10%, Obstructed labor – 7%, other causes – 24%

The underlying factor of most maternal deaths is ignorance and apathy by women and the society in general. Most women ignore early warning signs due to lack of adequate knowledge and information about danger signals during pregnancy and labor and so delay to seek care. Also, adequate preparation for any emergency before, during and after delivery is also lacking. Individual characteristics of mothers found to influence maternal deaths include maternal age, educational attainment, socioeconomic status and antenatal attendance. Poor socio-economic development, weak health care system and socio - cultural barriers to care utilization are also contributory. Socio-cultural variables in the prediction of maternal mortality are thus explained;

Early marriage

Early marriage accounts for about 23% of maternal mortality due to severe hemorrhage resulting from obstructed and prolonged labor. The narrow pelvis of these women may also result to fistula and often time still births.

Poor family planning practice

Unsafe abortions accounts for at least 13% of all maternal deaths. If people are not aware of good contraceptive methods, there will be a lot of unwanted pregnancies among the young age group. These most often resort to unsafe abortion with its resultant infections, hemorrhage and injuries to the cervix and uterus.

Female Genital Mutilation (FGM)

This is a major indirect cause of maternal mortality in Nigeria. It is a risk factor for obstructed labor. Pains, infections and hemorrhage result from FGM, as well as the risk of tetanus and even HIV infections. Problem following FGM is that scar tissue stretches poorly in child birth leading to perinea tear and hemorrhage which also accounts for maternal deaths due to inadequate emergency obstetric care.

In recent years, improving health conditions of people, especially among infants and children, has been the focus of policymakers. Children, especially infants, are the most vulnerable group in society. While some children escape from such childhood killer diseases as measles and diphtheria into adulthood, others die before their first birthday. Even for those who are fortunate to celebrate their first birthday some die before age five. Reducing mortality among children, thus, improves health status and welfare of children while securing future workforce for the nation. The role of healthcare services is crucial in

improving health status. Indeed, [public] provision of healthcare services has been recognized as one of the important ways to improve living conditions and human welfare (UNDP, World Bank).

In Ghana, averagely, public expenditure on healthcare has increased by about 74% in the last two decades. However, this expenditure as proportion of GDP is low as compared to the global average of 5.76% [World Bank]. Specifically, public spending on healthcare rose, from 1.7% of GDP in 1990 to 2.96% of GDP in 2012. Between 1990 and 2012, public healthcare expenditure has averaged 2.75% of GDP annually. For instance, in 2007, government allocation to health sector represented 16.24% [3.75% of GDP] of total government expenditure, an allocation that exceeded the Abuja target [World Bank]. This period witnessed significant investments in the health sector mostly in the form of construction of new health facilities (e.g. CHPS, and clinics), hiring and training healthcare personnel, upgrading of existing facilities and other health infrastructure in the country.

In recent past, however, there has been a gradual decline in government allocation to the health sector. For instance, spending between 2008 and 2012 averaged 12.32% of total government spending and, in particular, only 9.72% of total government spending in 2012 went into health [World Bank]. Much of these expenditure cuts have been born out of cost containment and the aim to reduce government budget deficit. While government spending on health (as proportion of total government spending) has seen a downward trend, there has been a remarkable improvement in health status. The progress is seen from the rising life expectancy at birth and declining mortality among children. For instance, life expectancy at birth has improved from 56 years in 1990 to 61 years in 2012. Infant and under-five mortality rates have also declined from 80 and 128 (per 1000 live births) in 1990 to 53 and

80 in 2012 respectively [World Bank]. Given this background, it becomes imperative to assess how public health expenditure has contributed to the improved health status in Nigeria, and to find, if any, other factors accounting for the improvements. Thus, the present paper seeks to examine the role of public health expenditure on health status, i.e. infant mortality, in Nigeria. Provision of health is seen as a key element of a policy to promote broad-based economic growth. The burden of diseases such as HIV/AIDS is known to slow the economic growth of developing countries. Therefore, every country devote huge public fund to health care provision believing this would improve the health of the citizenry so that they can contribute meaningfully to economic growth and development. While increase in budgetary allocation to social services is highly desirable in a developing country like Nigeria, this by itself is not sufficient to guarantee enhancement in service delivery. Bad budget management has been identified as one of the main reasons for ineffective public spending in many developing countries (World Bank, 1998).

In Nigeria, for example, despite the huge government expenditure on health provision, the health status of Nigerians is consistently ranked low. Nigeria ranked 74th out of 115 countries, based on the performance of some selected health indicators (World Bank, 1999). Nigerian overall health system performance was also ranked 187th among the 191 Member States by the World Health Organisation (WHO) in 2000 (National Health Policy, 2004). The Nigeria's rate of infant mortality (91 per 1000 live births) is among the highest in the world. It therefore becomes imperative to ask if governance has an impact on the effectiveness of health expenditure in Nigeria. This paper thus investigates how the effectiveness of public health expenditure is affected by governance. Some researchers have carried out studies on the relationship between public expenditure and outcomes. For

instance, Odusola, (1998); Gupta et al. (1999), Kaufmann et al. (1999) and Kaufman et al. (2004), Ricci and Zachariad (2006), McCarthy and Wolf (2001), Chete and Adeoye (2002), Dauda (2004), Glewwe and Kremer (2006), De La Croix and Delavallade (2006) Jayasuriya and Wodon (2007), and more recently, Fay et al (2009) and Sparrow et al, 2009. Most of these earlier studies did not focus on Nigeria. Those on Nigeria only concentrated on the effect of public expenditure on health outcome and economic growth, neglecting the role of governance.

2.3 THEORETICAL REVIEW

Public expenditure theory, traditionally, received only a scanty attention till recently. Partly, this lop-sided interest in the theory of public finance is explained by a general acceptance of the philosophy of laissez-faire and belief in the efficacy of free market mechanism. However, with the advent of welfare economics the role of the state has expanded especially in the area of infrastructural provision and theory of public expenditure is attracting increasing attention. This tendency has been reinforced by the widening interest of economists in the problems of economic growth, planning, regional disparities, distributive justice and the like (Bhatia, 2002).

2.3.1 Wagner's Law of Expending State Activity

Wagner's Law is named after the German political economist Adolph Wagner (1835-1917), which developed a "law of increasing state activity" after empirical analysis on Western Europe at the end of the 19th century. Wagner's Law as cited in Likita (1999) argued that government growth is a function of increased industrialization and economic

development. Wagner stated that during the industrialization process, as the real income per capita of a nation increases, the share of public expenditures in total expenditures increases. The law cited that "The advent of modern industrial society will result in increasing political pressure for social progress and increased allowance for social consideration by industry."

Wagner (1893) designed three focal bases for the increased in state expenditure. Firstly, during industrialization process, public sector activity will replace private sector activity. State functions like administrative and protective functions will increase. Secondly, governments needed to provide cultural and welfare services like education, public health, old age pension or retirement insurance, food subsidy, natural disaster aid, environmental protection programs and other welfare functions. Thirdly, increased industrialization will bring out technological change and large firms that tend to monopolize. Governments will have to offset these effects by providing social and merit goods through budgetary means. In his Finanzwissenschaft (1883) and Grundlegung der politischenWissenschaft (1893), Adolf Wagner pointed out that public spending is an endogenous factor, which is determined by the growth of national income. Hence, it is national income that causes public expenditure. The Wagner's Law tends to be a long-run phenomenon: the longer the time-series, the better the economic interpretations and statistical inferences. It was noted that these trends were to be realized after fifty to hundred years of modern industrial society.

2.3.2 Peacock and Wiseman Theory of Public Expenditure

In 1961, Peacock and Wiseman elicited salient shaft of light about the nature of increase in public expenditure based on their study of public expenditure in England. Peacock and Wiseman (1967) suggested that the growth in public expenditure does not

occur in the same way that Wagner theorized. Peacock and Wiseman choose the political propositions instead of the organic state where it is deemed that government like to spend money, people do not like increasing taxation and the population voting for ever-increasing social services.

There may be divergence of ideas about desirable public spending and limits of taxation but these can be narrowed by large-scale disturbances, such as major wars. According to Peacock and Wiseman, these disturbances will cause displacement effect, shifting public revenue and public expenditure to new levels. Government will fall short of revenue and there will be an upward revision of taxation. Initially, citizens will engender displeasure but later on, will accept the verdict in times of crisis. There will be a new level of "tax tolerance". Individuals will now accept new taxation levels, previously thought to be intolerable. Furthermore, the public expect the state to heal up the economy and adjust to the new social ideas, or otherwise, there will be the inspection effect.

Peacock and Wiseman viewed the period of displacement as reducing barriers that protect local autonomy and increasing the concentration power over public expenditure to the Central government. During the process of public expenditure centralization, the role of state activities tend to grew larger and larger. This can be referred to the concentration process of increasing public sector activities. Nowadays, the growth in public expenditure has become a compulsion and thus, the disturbance situations matter little.

2.3.3 The Classical versus the Keynesian Approach of Public Expenditure

The classical economists believe that the government intervention brings more harm than good to an economy and that the private sector should carry out most of the activities.

In his Welfare of Nations, Adam Smith (1776) advocated much on the "laissez-faire" economy where the profit motive was to be the main cause of economic developments. According to the classical dichotomy, an increase in the total amount of money leads to a proportionate increase in all money prices, with no change in the allocation of resources or the level of real GDP, which is known as money neutrality. The classical economists assumed that the economy was perfect: it is always at full employment level, wage rate and rate of interest is self-adjusting and as a matter of fact, the budget should always balance as savings is always equal to investment. Since they believe that the economy was always at its full employment level, their objective was certainly not growth.

Following the 1929-1930 Great Depression, the classical economists that opposed government interventions, argued that strong trade unions prevented wage flexibility which resulted in high unemployment. The Keynesians, on the other hand, favoured government intervention to correct market failures. In 1936, John Maynard Keynes' (1883-1946) "General Theory of Employment, Interest and Money", criticized the classical economists to put too much emphasis on the long run. According to Keynes, "we are all dead in the long run". Keynes believed depression needed government intervention as a short term cure. Increasing saving will not help but spending. Government will increase public spending giving individuals, purchasing power and producers will produce more, creating more employment. This is the multiplier effect that shows causality from public expenditure to national income. Keynes categorized public expenditure as an exogenous variable that can generate economic growth instead of an endogenous phenomenon. Hereby, Keynes believed the role of the government to be crucial as it can avoid depression by increasing aggregate demand and thus, switching on the economy again by the multiplier effect. It is a tool that

bring stability in the short run but this need to be done cautiously as too much of public expenditure lead to inflationary situations while too little of it leads to unemployment.

2.4 THEORETICAL FRAMEWORK

The theoretical base of this study is adopted from Grossman (1972) who developed a theoretical health production function, which is specified as:

$$H = F(X) \dots \dots \dots \dots \dots \dots \dots \dots . . \dots \dots \dots \dots . . (1)$$

Where H is a measure of individual health output and X is a vector of individual inputs to the health production function F. The elements of the vector includes: literacy rate, government health expenditure, numbers of medical physicians, real per capita income and female labor participation. In modeling the demand for health inputs, this study follows Grossman (1972), and Rosenzweig and Schultz (1983) household health production frameworks. Grossman (1972) notes that the level of health is determined by the level of resources allocated to its production. It is therefore not exogenously produced. When these resources are consumed as part of health inputs, individuals derive utility from the resultant health. The demand for health by an individual is therefore analyzed through the utility maximization framework that includes both the consumption and investment aspects of health-inputs.

$$Y_t = \beta X_t + \varepsilon_t, t = 1 \dots T \dots \dots \dots \dots \dots . . (2)$$

Where Y_t is the dependent variable, health status, at time t, and X is a vector of independent variables influencing health status, and also includes the intercept term while β is a vector coefficients of the independent variables. ε_t is the error term which is assumed to

be normally distributed with zero mean and constant variance. The functional model is specified below:

$$IN = F(G, F, R, E, N) \dots\dots\dots\dots\dots\dots. (3).$$

CHAPTER THREE

3.0 RESEARCH METHODOLOGY AND MODEL SPECIFICATION

3.1 INTRODUCTION

Here, the researcher would explain the sources of data and provide clear definition of the variables in the model. Also, the model specification would be done in a way to showcase the relationship between the independent variable and dependent variables. In addition, the various estimation technique, econometric and statistical diagnostics would be spell out.

3.2 MODEL SPECIFICATION

The analytical framework for this study is based on the household health production model developed by Rosenzweig and Schultz (1983). According to this framework, there is a direct, structural relationship between the use of an input such as medical care and the health of an individual. However, the utilization of that input is constrained by its access due to among other things, price, availability, and household socio economic and demographic characteristics. We know from Grossman (1972), Rosenzweig and Schultz (1983), and Mwabu (2007), that health is partly produced through consumption of health inputs, which could be marketed or non-marketed. Investments in health capital are produced by households through a health production technology that combines time, medical care, food, physical exercises, housing and recreation, among other inputs. That is, individuals use these inputs to produce health. Therefore, when households and the government set aside health funds, it is to provide medical care that contributes to investments in health. Hence, both household and government health expenditures become part of the health inputs. In

modeling the demand for health inputs, this study follows Grossman (1972), and Rosenzweig and Schultz (1983) household health production frameworks. Grossman (1972) notes that the level of health is determined by the level of resources allocated to its production. It is therefore not exogenously produced. When these resources are consumed as part of health inputs, individuals derive utility from the resultant health. The demand for health by an individual is therefore analyzed through the utility maximization framework that includes both the consumption and investment aspects of health inputs.

$$Y_t = \beta X_t + \varepsilon_t, t = 1 \dots T \dots \dots \dots \dots \dots (1)$$

Where Y_t is the dependent variable, health status, at time t, and X is a vector of independent variables influencing health status, and also includes the intercept term while β is a vector coefficients of the independent variables. ε_t is the error term which is assumed to be normally distributed with zero mean and constant variance. The functional model is specified below:

$$I\!M\!\!\quad = F(G\quad, F\quad, R\quad, E\quad) \dots \dots \dots \dots \dots \dots \dots (2)$$

The operational model is specified below:

$$I\!M\!\!\quad = \alpha_0 + \alpha_1 G\quad + \alpha_2 F\quad + \alpha_3 R\quad + \alpha_4 E\quad + \varepsilon_t \dots \dots \dots \dots \dots \dots (3)$$

IMMR is the observed health status (infant/maternal mortality rate) at time t whereas GHE represents government expenditure on health, $FLFPR$ represents female labour force participation rate and it captures the effect of female employment on home health production for children or how their presence on the labour market supplement family income to command more health inputs. $RPCI$ is the real per capita income. Real per capita income serves as control variable for utilization of healthcare services since income is an influencing factor in health seeking behaviour while EDU represents literacy level and it captures the

efficiency with which health is produced ε_t and $\propto$ are respectively the error term and intercept.

3.3 A PRIORI EXPECTATION

The relationship between the independent and dependent variable according to economic theory:

$\propto_1 < 0$, shows there is a negative relationship between infant/maternal mortality rate and government health expenditure;

$\propto_2 < 0$, shows there is a negative relationship between infant/maternal mortality rate and female labour force participation rate;

$\propto_3 < 0$, shows there is a negative relationship between infant/maternal mortality rate and real per capita income;

$\propto_4 < 0$, shows there is a negative relationship between infant/maternal mortality rate and literacy rate.

3.4   DATA SOURCES AND DEFINITIONS OF VARIABLES

In the present study, we use annual time series data from 1980 to 2016. The choice of this period is based on data availability. We sourced data from World Development Indicators (2016 Excel Database) and various publications of the World Bank regarding health and health expenditures.

Under-five mortality rate: It is the probability per 1,000 that a newborn baby will die before reaching age five, if subject to current age-specific mortality rates. . It is widely

documented as the most appropriate indicator of the cumulative exposure to the risk of death because it provides the best means of capturing mortality risks during the most vulnerable years of childhood, the first five years of life. It has several advantages over the infant mortality rate as a composite measure of health risks at childhood. Specifically, the risk of death from several of the diseases that are primary causes of infant mortality remains high in the early years of childhood. Consequently, it is also a suitable outcome measure in assessing the impact of various intervention programmes intended at improving child survival (United Nation, 2005).

Health expenditure, public (% of total health expenditure): Public health expenditure consists of recurrent and capital spending from government (central and local) budgets, external borrowings and grants (including donations from international agencies and non-governmental organizations), and social (or compulsory) health insurance funds. Total health expenditure is the sum of public and private health expenditure. It covers the provision of health services (preventive and curative), family planning activities, nutrition activities, and emergency aid designated for health but does not include provision of water and sanitation.

GDP per capita: It is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars.

3.5 ESTIMATION TECHNIQUES

The estimation period is from 1980-2016. The empirical approach that will be adopted in this study is the Autoregressive Distributed Lag model (ARDL Model). ARDL MODEL will be used in estimating relationship between the government health expenditure and infant-maternal mortality rate among other variables under review. The choice of ARDL methodology base on advantage of using this model is that it yields result regardless of whether the underlying variables are integrated of order 1, 0 or a combination of both [(say $X_t \sim I(0)$, $Y_t \sim I(1)$] (Pesaran *et al*. 2000).

Therefore, the ARDL approach has the advantage that the existence of a long-run relationship among a set of variables can be tested without any prior knowledge about the order of integration of the individual variables, which avoid problems associated with unit roots pretesting. Further advantage include that both dependent and independent variables can be introduced in the model with lags; the ARDL estimators have desirable sample properties (Pesaran and Shin 1999; Caporale and Pittis 1999, 2004).

The ARDL model specification is given as follows.

$$\Delta X_t = \eth 0_i + \sum_{i=1}^{k} \alpha \; X_{t-1} + \sum_{i=1}^{k} \alpha \; Y_{t-1} + \eth_1 X_{t-1} + \eth_2 Y_{t-1}$$

$$+ V_1 \; \ldots\ldots\ldots\ldots\ldots\ldots \; (3.1)$$

Where X_t = Dependent varible

 0_i = is the intercept of the model

        =   is the coefient   of changes in short run

 $_1$ =   is the coefient   of changes in long run

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t-1 =   is the time leg of dependent variable in short run

V_{1t} =   errors term.

As part of the empirical design the basic estimating equation is specified as follows:

IMMR = $_0$ + $_1$ GHE + $_2$ FLFP + $_3$ PCI + $_4$ EDU + U … … .…………………… (3.2)

Where IMMR is the Infant- Maternal Mortality Ratio

> GHE is the Government Health Expenditure
>
> FLFP is the Female Labour Force Participation
>
> PCI is the Per Capital Income
>
> EDU is the Education Rate proxied by Literacy rate

Equation (2) is rewritten into equation (1) to form ARDL MODEL for this study

$$IMMR = \beta_0 + \sum_{i=1}^{k} \beta_{1i}\ G_{t-i} + \sum_{i=1}^{k} \beta_{2i}\ F_{t-i} + \sum_{i=1}^{k} \beta_{3i}\ P_{t-i} + \sum_{i=1}^{k} \beta_{4i}\ E_{t-i}$$

$$+ \beta_1\ GHE_{t-1} + \beta_2 FLFP_{t-1} + \beta_3 P_{t-1} + \beta_4\ EDU_{t-1}$$

$$+ U\ \text{… … … … … … … … … … … .. } (3.3)$$

Where **βo =** is the intercept of the equation.

$\sum_{i=1}^{k} \beta_{1i}\ t_i$ $\sum_{i=1}^{k} \beta_{5i}$ = Is the summation of changes in government health expenditure, per capita income, literacy rate and female labour participation rate in short run.

$\beta_1\ GHE_{t-i}\ t_i\ \beta_5\ E_{t-i}\ m$ *the* Changes in government health expenditure, per capita income, literacy rate and female labour participation rate in long run.

 t-1 = is the time lag of changes in government health expenditure, per capita income, literacy rate and female labour participation rate in long run short.

The presence of co-integration will be tested using the Johansen (1991) approach. In this method, the number of co-integrating relations will be tested on the basis of trace statistics and maximum Eigenvalue. Once the presence of one co-integration is established then the estimated error correction model (ECM) will be used to determine both the long run and short run dynamics.

The purpose of ECM model is to indicate the speed of adjustment from the short run equilibrium to the long run equilibrium state. The greater the coefficients of the parameter, the higher the speed of adjustment of the model from short run to long run. Considering our base equation (iii), the ECM model is specified as follows:

$$\text{IMMR} = \beta_0 + \beta_1 \sum_{i=1}^{k} G_{t-i} + \beta \sum_{i=1}^{k} F_{t-i} + \beta \sum_{i=1}^{k} P_{t-i}$$

$$+ \beta \sum_{i=1}^{k} E_{t-i} + U \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.4)$$

Where Ui is the error term, ECM_{t-1} is the error correction term and β is the long run speed of adjustment to equilibrium steady state. The ECM_{t-1} is the lagged value of the residuals derived from the cointegrating regression of GHE, FLFP, PCI and EDU on Infant-Maternal Mortality ratio.

Whereas the short run impacts are captured through the individual coefficients of the differenced terms (β_i) applying the Wald- coefficient diagnostic test. The null hypothesis and the alternative hypothesis are stated thus:

$H_0 : \beta_{i1} = \beta_{i2} = \beta_{i3} \ldots\ldots \beta_{in} = 0$

$H_1 : \beta_{i1} \neq \beta_{i2} \neq \beta_{i3} \ldots\ldots \beta_{in} \neq 0$ ...…………………………………………….. (3.5)

The coefficient of the ECM variable contains information about whether the past values of variables affect the current values. The size and statistical significance of the coefficient of the ECM measure the tendency of each variable to return to equilibrium. If the coefficient is significant, it implies that past equilibrium errors play roles in determining the current outcomes.

3.5.1 Descriptive Statistics

The descriptive statistics will be performed to capture the inherent statistical behavior of the series. The parameters include:

Mean: This measure the average values of the distribution of the series

Median: This measure will show the middle values of the distribution of the series

Maximum: This will show the maximum values of the distribution of the series

Minimum: This will show the minimum values of the distribution of the series

Standard Deviation: This shows the dispersion of the series from their mean values

Skewness: This will show the asymmetric behavior of the series. The threshold of skewness is 0. If skewness assumes a negative value, then that means the series is negatively skewed, technically, we say the series is left tailed, but if the skewness assumes a positive value, that means the series is positively skewed, technically, we say the series is right tailed.

Kurtosis: This will show the peakednes and density of the series. The threshold of kurtosis is three. If the kurtosis assumes a value greater than 3, we say that the series is *leptokurtic*, that is, the tails are heavier than normal. If the kurtosis assume a value lesser than three, we say that the series is *platykurtic*, that is, the tails are thinner than normal. If the kurtosis

assumes a value equal to three, we say that the series is *mesokurtic*, that is, it is highly probable that the series may follow a normal distribution.

Jarque-Bera: this is used for testing the normality of the series together with its respective probability limit. It should be noted that the Jarque-Bera Statistic combines statistical attributes of skewness and kurtosis, thus, this test may be classified as a joint test and therefore, it is more reliable than the statistics obtained from skewness and kurtosis.

3.5.2 ECONOMETRICS CRITERION

In order to apply an unrestricted ARDL model, it is necessary that the variables are stationary. Analyze the properties of the times series will in the following by employing a unit root test and a co-integration test.

(i) Unit Roots

A co-integrating relationship exists between non-stationary series, if there is a stationary linear combination between them. Therefore, one needs to test the stationarity of the time series first. Augmented-Dickey-Fuller (ADF) is used to determine whether or not the series are stationary. Once a value for the test statistic is computed we shall compare it with the relevant critical value for the Dickey-Fuller Test. If the test statistic is greater (in absolute value) than the critical value at 5% or 1% level of significance, then the null hypothesis of = 0 is rejected and no unit root is present.

(ii) Cointegration Test

Cointegration implies a long run relationship or equilibrium existing between the dependent and independent variables. If the ADF test indicate that some of the variables contain a unit root, it is necessary to conduct a cointegration test to examine whether these variables have a

common stochastic trend. The cointegration test to be used is based on the methodology of Engle-Granger. Assuming a simple linear regression model, say, $Y_t = \beta_0 + \beta X_t + \varepsilon_t$, the series can be of different order of cointegration, $[Y_t \sim I(0)$ and $X_t \sim I(1)]$, the application of Engle-Granger Cointegration test becomes invalid. A more appropriate technique is the Bounds Cointegration Test. This allows for combination of different order of cointegration series in the same regression model.

3.5.3 DIAGNOSTIC TEST FOR ARDL

(i)Error Correction Mechanism

After Adopting the Johansen-Juselius cointegration test on the basis of trace statistics and maximum Eigen statistics and established the long run relationship among the variables used in this model, we estimate an error correction model (ECM) that includes both the long run and short run dynamics. Given that the residual obtained is stationary at level, signifying a long run relationship, thus, Error Correction Mechanism is used to represent the long run (static) and short run (dynamic) relationships between Investment and its explanatory variables. Also, ECM is used to indicate the speed of adjustment from the short run equilibrium to the long run steady state. The coefficient of the ECM variable contains information about whether the past values of variables affect the current values. The size and statistical significance of the coefficient of the ECM measure the tendency of each variable to return to equilibrium. If the coefficient is significant, it implies that past equilibrium errors play roles in determining the current outcomes.

(ii) Breusch-Pagan-Godfrey (Heteroscedasticity)

In a classic article, Breusch and Pagan (1979) introduced a Lagrange Multiplier test for heteroskedasticy which appears to allow for very general types of alternatives. Specifically, in a regression model $y_t = x_t^1 \beta + \epsilon_t$, where Var ($\epsilon_t$) = σ_t^2 = f($\alpha_0 + \gamma' z$), Breusch and Pagan give a test of the null hypothesis $H_0 : \gamma = 0$ for arbitrary smooth functions f. The object of this note is to show that this apparent generality is an illusion, and the test is consistent only for f(x) = x, the identity function. Nonlinear functions f is tested for as alternatives only to the extent that they are correlated with the regressor's z. In particular, for any non-zero value of γ such that Cov(f($\alpha_0 + \gamma' z_t$),z_t) = 0, the Breusch-Pagan test has no power asymptotically (i.e. is inconsistent). As a preliminary result of independent interest, we characterize situations where the F-test is consistent in regression models. We then show that the Breusch-Pagan test is asymptotically equivalent to a certain F test, and use our characterization to get the desired result.

(iii) Testing for Serial Correlation

Using graphical methods to look for serial/autocorrelation in the random error term u_t. Because we cannot observe the u_t we used the OLS residuals e_t. We looked at;

- Time series graph of $e_t, t = 1$ .If there is serial correlation this graph shows gradual changes in the u_t.

- Scatterplot of e_t versus e_{t-1}. If the AR (1) model $u_t = \rho u_{t-1} + e_t$ holds, then we expect that the scatterplot is concentrated along a straight line through 0.

Tests for serial/autocorrelation also use the OLS residuals u_t.

(iv) Normality Tests

If a variable fails a normality test, it is critical to look at the histogram and the normal probability plot to see if an outlier or a small subset of outliers has caused the non-normality. If there are no outliers, you might try a transformation (such as, the log or square root) to make the data normal. If a transformation is not a viable alternative, nonparametric methods that do not require normality may be used. Always remember that a reasonably large sample size is required to detect departures from normality. Only extreme types of non-normality can be detected with samples less than fifty observations. There is a common misconception that a histogram is always a valid graphical tool for assessing normality. Since there are many subjective choices that must be made in constructing a histogram, and since histograms generally need large sample sizes to display an accurate picture of normality, preference should be given to other graphical displays such as the box plot, the density trace, and the normal probability plot.

CHAPTER FOUR

4.0 DATA PRESENTATION AND ANALYSIS

4.1 Introduction

Here, the research analyzed and interpreted time series variables from 1980 to 2016. In order to achieve the above, the descriptive statistics, units root tests, ARDL bounds test, short-run and long-run ARDL regression. In addition to the above, diagnostics were observed from the results and interpretations provided. Lastly, the major finding arising from the results were highlighted.

4.2 Trend of Government Health Expenditure in Nigeria 1980 to 2016

Fig 1: Trend of Government Health Expenditure in Nigeria 1980 to 2016
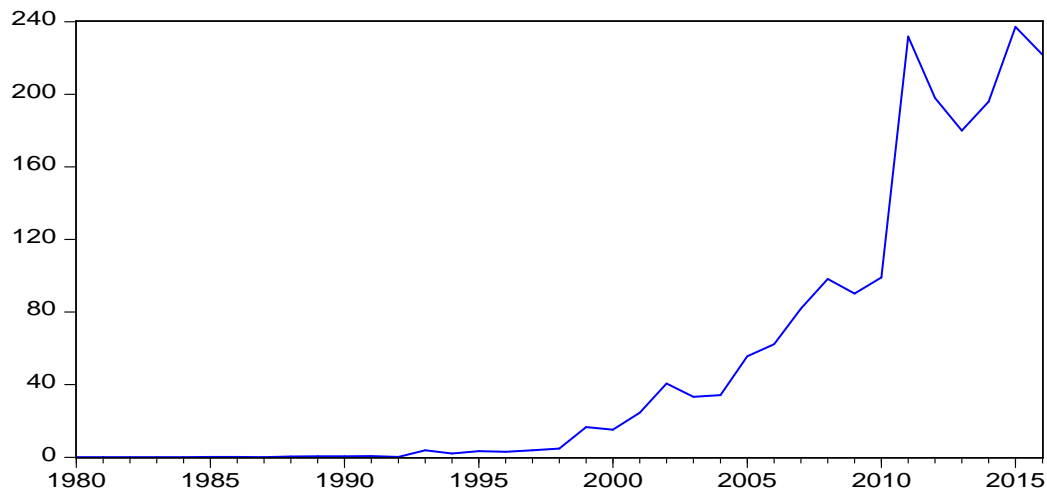
R IM
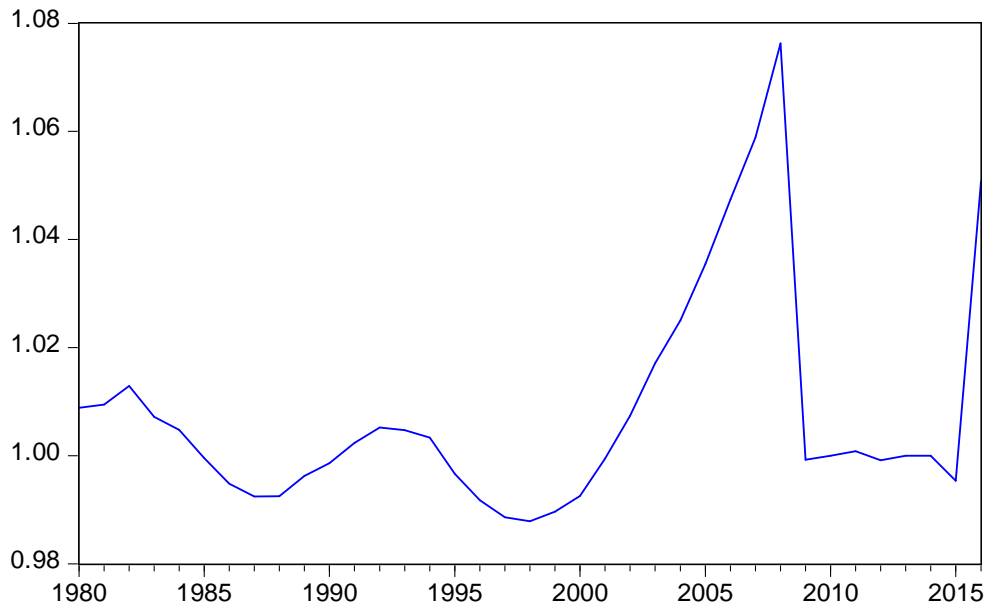
4.2 Results and Interpretations

Table 4.2.1 Descriptive Statistics

	IMMR	GHE	FLPR	EDU	PCI
Mean	1.007897	52.43807	45.25811	95.38522	252119.1
Median	1.000000	4.742267	47.31000	93.56466	214460.7
Maximum	1.076265	237.0800	50.36000	119.3699	385227.6
Minimum	0.987860	0.041315	36.70000	78.45744	173011.9
Std. Dev.	0.020555	77.04911	5.006075	10.38536	71227.57
Skewness	1.850025	1.392303	-0.899189	0.601806	0.683820
Kurtosis	5.740352	3.485263	2.030962	2.532961	1.900218
Jarque-Bera	32.68319	12.31716	6.433680	2.569658	4.748268
Probability	0.000000	0.002115	0.040082	0.276698	0.093095
Sum	37.29220	1940.209	1674.550	3529.253	9328405.
Sum Sq. Dev.	0.015211	213716.4	902.1882	3882.805	1.83E+11
Observations	37	37	37	37	37

*Source: Author's Computations (2018)

The table 4.2.1 above exhibits the descriptive statistics for the variables which appeared in

the equation 3.3. Here, the mean value of infant-maternal mortality ratio (IMMR) is 1.01;

the maximum value is 1.08; while the minimum value is 0.99. More so, the value of the skewness, kurtosis, Jarque-Bera and probability are 1.85, 5.74, 32.68 and 0.00 respectively. For instance, the value of the kurtosis at approximately 6.00 do not support the fact that the series for IMMR is normally distributed; thereby satisfying one of the assumptions of the ordinary least square (OLS) on which the autoregressive distributive lagged (ARDL) regression and most estimation techniques are built. This is in fact a pre-test of the data for analysis. Furthermore, the mean of the public health spending is 52.43 billion naira; while the maximum and minimum values are 237.08 and 0.04 billion naira respectively. Also, the values for skewness, kurtosis, Jarque-Bera and probability are 1.39, 3.48, 12.32 and 0.002 respectively. Owing from the above, it is obvious that the mean value of IMMR is high compared to those of the advanced and emerging economies. It could be deduced therefore that infant mortality is higher than maternal mortality in Nigeria, using dataset ranging between 1980 and 2016. Owing from the above, this menace of high death rate in children between ages 0-5 should be taken seriously under the current United Nations Sustainable Development Goals (SDGs). Recall that Nigeria fell very much below the Millennium Development Goals (MDGs) targets which ended in 2015. The above notwithstanding, deliberate efforts should be put in place such as the public-private-partnership targeted at reducing malaria, diarrhea, pneumonia and malnutrition which are the highest causes of infant mortality in Nigeria. Furthermore, the mean value of public health spending at 52.44 billion is very small compared to the amounted channeled to health spending in the industrialized countries. For instance, over 70% of public health budget is channeled to running and personnel costs. Drawing from the above, modern facilities required to meet world class health care delivery is usually absent or in short supply. Recently, most of the

politicians and their families prefer to seek health care services abroad; thereby increasing our balance of payment deficits. A recent World Health Organisation report ranked Nigeria at 187th out of 191th member states in terms of health system delivery.

Probing the table 4.2.2 below, the unit roots test shows that IMMR, government health expenditure (GHE), female labour participation rate (FLPR) and per capita income (PCI) are integrated of order one (I (1)) and are significant at one percent levels. On the other hand, education (secondary school enrolment) is integrated at order zero at ten percent level of significance. (See table 4.2.2).

Table 4.2.2:Units Roots Tests (Augmented Dickey-Fuller and Phillip-Perron Tests)

Variables	Coefficient	t-stats	Probability Value	Level of Integration
D(IMMR)	-1.1018	-5.3231	0.0001	I(1)*A
D(GHE)	-1.1912	-6.8980	0.0000	I(1)*P
EDU	-0.2415	-2.6295	0.0968	I(0)***A
D(FLPR)	-1.0578	-6.0828	0.0000	I(1)*A
D(PCI)	-0.7282	-4.8981	0.0000	I(1)*A

Source: Author's Computations (2018). *, ***, A and P represents 1%, 10%, Augmented Dickey-Fuller and Phillip-Perron respectively

Since it has been proven that the variables are integrated of order one (I (1)) and zero ((0)), it is important for the researcher to ascertain whether or not the variables have a long run relationship (cointegration). The ARDL bounds test result in table 4.3 below shows that the

variables are cointegrated since the upper critical value bounds for variables integrated at order one and zero is at 5.06 which is very much below the F-statistics at 12.44. The researcher therefore rejects the null hypothesis that no long run relationship exists and as such accepts the alternate that long-run relationship exists. This is shown in table 4.2.3 below.

Table 4.2.3 ARDL Bounds Test Result

Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	K
F-statistic	12.44499	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

* Source: Author`s Computation (2018)

Drawing from the above, the researcher estimates the short-run and long-run ARDL regression. This is exhibited in the table 4.4 below.

Table 4.2.4: ARDL Cointegration and Long Run Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IMMR(-1))	2.832288	0.621513	4.557089	0.0019
D(GHE)	0.000144	0.000228	0.631208	0.5455
D(GHE(-1))	0.001898	0.000370	5.135816	0.0009

D(FLPR)	0.002991	0.001701	1.757829	0.1168
D(FLPR(-1))	-0.001006	0.001300	-0.773953	0.4612
D(EDU)	-0.001719	0.000627	-2.741992	0.0254
D(EDU(-1))	-0.000636	0.000939	-0.677329	0.5173
D(PCI)	0.000001	0.000000	2.782634	0.0238
D(PCI(-1))	-0.000000	0.000000	-1.025616	0.3351
CointEq(-1)	-4.372109	0.792443	-5.517253	0.0006

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GHE	-0.000386	0.000039	-9.851937	0.0000
FLPR	0.001016	0.000386	2.632649	0.0301
EDU	0.000216	0.000215	1.005739	0.3440
PCI	0.000000	0.000000	9.685454	0.0000
C	0.850217	0.035454	23.980542	0.0000

*Source: Author`s Computation (2018)

In addition to the above, table 4.2.4 which exhibits the short run and long run coefficients of the independent variables on the dependent shows that first year lagged values of IMMR has a positive impact on current value of IMMR. Here, a percentage increase in one of IMMR will increase current value of IMMR by 2.83 percent holding other variables constant. This is because if last year`s infant-maternal mortality ratio is high, most likely this year`s IMMR

would also be high. This is because it takes some time lag to proffer solution to disease and epidemics and to fully implement new policies and methods. The result above is significant at 1% level. Also, the impact of current year public health expenditure and its lagged values have on IMMR is positive, but only the impact of the first and third lagged values are significant. This might be as a result of the fact that a large proportion of the public health expenditure is spent on wages and salaries, stationeries, diesel and other consumables. The items listed above do not have any direct impact on IMMR. More so, current and lagged values of FLPR have positive and negative impacts on IMMR, though their impacts are significant. In addition, education (school enrolment) has a negative impact on IMMR. A percentage increase in educational attainment reduces IMMR by 0.0017percent, holding other variables constant. This result is significant at 5% levels. The above finding is in tandem with our a priori expectations. In contrary to the above, a unit increase in PCI increases IMMR by 0.000001 units holding other variables constant. The above result does not support the researcher`s a priori expectations. As a result of the above findings, PCI does not reflect a good measure of the standard of living of the citizenry. However, second year lagged values of PCI have a significant negative impact on IMMR. The above results represent the short-run period.

Probing the results in table 4.4 further, it is obvious that in the long-run period public health expenditure has a significant negative impact on IMMR. Here, a unit increase in public health spending reduces IMMR by approximately 0.0004 percent. In contrast, FLPR, EDU and PCI have positive impact on IMMR; though only FLPR is significant at 5% level.

Since the variables cointegrated in the long-run after a short-run disequilibrium, it pertinent to compute the speed of convergence. Here, it will take approximately 23 years for the

disequilibrium to be cleared. Drawing From the above, workable recommendations would be tactically drafted from the above results and interpretation.

4.3 Major Findings

- Here, the mean value of infant-maternal mortality ratio (IMMR) is 1.01; the maximum value is 1.08; while the minimum value is 0.99.

- Furthermore, the mean of the public health spending is 52.43 billion naira; while the maximum and minimum values are 237.08 and 0.04 billion Naira respectively.

- The researcher therefore rejects the null hypothesis that no long run relationship exists and as such accepts the alternate that long-run relationship (cointegration) exists.

- The first year lagged values of IMMR has a positive impact on current value of IMMR. Here, a percentage increase in one of IMMR will increase current value of IMMR by 2.83 percent holding other variables constant.

- The impact of current year public health expenditure and its lagged values have on IMMR is positive, but only the impact of the first and third lagged values are significant.

- A percentage increase in educational attainment reduces IMMR by 0.0017 percent, holding other variables constant. This result is significant at 5% levels. The above finding is in tandem with our a priori expectations.

- In the long-run period public health expenditure has a significant negative impact on IMMR. Here, a unit increase in public health spending reduces IMMR by

approximately 0.0004 percent. In contrast, FLPR, EDU and PCI have positive impact on IMMR; though only FLPR is significant at 5% level.

- The speed of adjustment will take approximately 23 years for the disequilibrium to be cleared.

CHAPTER 5

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter presents the summary, conclusions and the policy recommendations based on the findings of the study. It is divided into four sections: Section One presents the introduction to the chapter. Section two provides the summary, while section three shows the conclusion of the study and finally, section four deals with the recommendations as dictated by the result.

5.2 SUMMARY

This study examined the impact of health sector spending on infant-maternal mortality ratio in Nigeria using annual time series data over the period of 1980 to 2016. The contribution of the life expectancy (health outcomes) to economic progress of any economy has been well-established in the development literature. This study made use of the recent bounds testing cointegration approach developed within the framework of the Autoregressive Distributed Lag (ARDL) econometric procedure to determine the long-run relationship between public spending on health and its outcomes in Nigeria. Using the ADF unit root test, the stationarity of the variables were confirmed, followed by the selection of optimal lag and then test for existence of co-integration. Though greater expenditure on health outcomes is being advocated by many, little empirical evidence exists on the beneficial impact of such expenditure on infant and child mortality. These results suggest that Nigeria should be interested in measures to decrease infant mortality and increase life expectancy should consider expanding public health expenditures as an effective mechanism to reach these goals. The results therefore show that the indicator selected to monitor MDG-4 goal has close, consistent relationship to levels of total and government expenditure in Nigeria.

Indeed, the model presented and estimated in this paper improves upon previous studies at the macro level in terms of including a richer palette of explanatory variables within an estimation strategy that explicitly takes into account unobservable counties-specific factors. Thus, a number of policy interventions could be effective in moving Nigeria toward the goal.

5.3 CONCLUSION

One needs to be careful, though, in terms of interpreting the empirical evidence. Focusing on aggregate and public health expenditure as determinants of under-five and infant mortality, however, may not bring out some essential compositional effects. For instance, for the same level of public health expenditure, higher allocations to primary health care as opposed to secondary and tertiary health care (the latter primarily benefiting urban elites) do appear to be effective in improving child health outcomes, especially when implemented in good governance settings (see Gupta et al., 1999; Filmer et al., 2000). A related point is that aggregate health expenditure will be a poor proxy for measuring the effect of health resources on health outcomes if it is spent ineffectively to begin with. Physical input, human resources, access, and process indicators such as number of doctors or hospitals per capita and immunization rates have been found to be significant and robust determinants, capturing the importance of effectively targeted health expenditure on health outcomes such as child and infant mortality (Hanmer et al., 2003, Anand and Barnighausen, 2004). These are precisely the same indicators that have been identified as representing health system delivery constraints to scaling up of health interventions (Ranson et al., 2003). This underscores the need for more and better information on both the cost-effectiveness and

general effectiveness of health interventions, the latter taking into account broader health system factors that may make it difficult to realize health gains on the ground. Without this background to inform policy choices, increases in health expenditure will likely not translate to better health outcomes (see Tandon, 2005). A similar point is made by Savdeoff (2004). Relative to the significant cost of raising expenditure, the strong effects of health expenditure on health outcomes also confirm the important role of reforms aimed at improving the efficiency and targeting of health outlays. If budgetary allocations for health are to boost economic growth and promote the well-being of children and infants (especially of the poor), policymakers in Nigeria need to pay attention to absolute expenditures within the health sector. Those absolute expenditures – both their size and efficiency – are an important vehicle for promoting equity and furthering second-generation reforms. It is also known that going to scale on many of the interventions will require the mobilization of additional resources and that it will take a combination of enhanced and improved domestic resource mobilization and increased ODA for this to be possible. The private sector also has a role to play in achieving the MDGs by paying their taxes regularly and on time and increasing the provision of education and essential health services.

5.4 POLICY RECOMMENDATIONS

In accordance with the findings of this study, Nigeria is unable to match decreases in mortality with increases in resources will be faced with difficult choices over the adjustment of the health services provided.

Firstly, with increased demand for health services and declining mortality, drawing on new client groups, and a wider range of choices concerning what, when, how and where to learn,

and with added demographic pressure, existing financing mechanisms may not be adequate. In particular, government resources alone may not suffice to pay both for the expansion of health systems and for improvements in health quality. These governments would need to forge new partnerships with the providers and beneficiaries of health services in order to mobilize the necessary resources, to encourage efficiency and to introduce flexibility in order to permit everyone to pursue the pathways and health service access opportunities which best meet their needs. For example, non-public institutions, such as private businesses, can provide resources to health institutions either through partnership arrangements or through more general support for the health system.

Secondly, this paper also finds that female literacy, ethnic fractionalization matter for health outcomes in Nigeria. We also find that HIV prevalence very significantly leads to higher child and infant mortality in Africa. Thus, health expenditure alone will not be enough to attain the child mortality MDG target by 2015. This underscores the importance of the health system and other non-expenditure factors to facilitate the attainment of this MDG outcome. Thus, other policy implications include improving human capital (especially female education generally and medical education for the production of more physicians), checking the brain drain of Nigerian trained medical physicians, and accelerating measures to prevent HIV infections through massive education/enlightenment, capacity building as well as use of low-cost anti-retroviral therapy for treatment.

Thirdly, the results of this paper also point to a greater role for multilateral development banks like the African Development Bank (AFDB). Apart from increased use of sector-wide approaches (SWAPs), other instruments of intervention in regional member countries (RMCs) include: budget support for resource transfer to the national budget, on the basis of

long-term, trusting, partnerships; policy dialogue in poverty reduction strategy and assistance strategy for a about the priority due to pro-poor social sector programs in public expenditure allocations, with due recognition of the needs of evolving programs of action; sector-level dialogue on sector strategies and their implementation, and on the coherence of allocations and actions with strategic options and agreed objectives; and capacity building support at both national and sector levels for performance assessment and performance management.

Lastly, although important advances have been made in improving the quality of data and policy relevance of data on national spending and external flows from public and private donors (thanks to the African Development Bank's and its partners' statistical capacity building through the ICP-Africa), the need to further improve data systems is clear. Lack of timely, accurate and relevant statistics is as a major constraint to effective monitoring of progress towards the MDGs and for policy design. For instance, many African countries do not have sufficient and timely data on which assessment of progress can be based. As a result, policy and decision making have suffered proper allocation and targeting of resources and programs has been hampered, and generally, governments have not been held to account for their decisions and their citizens remain the poorer because of it. None of the existing tracking systems or efforts provides up-to-date, comprehensive information in a form that addresses central policy questions. Without information about what resources are expected -- from whom, and for what purpose -- and without better tracking of how those funds have been spent, policy leaders, advocates and analysts are unlikely to be able to effectively raise additional resources and allocate them toward the populations and types of services that are vital to the achievement of the Millennium Development Goals. This calls for a coordinated

way to coherent and long-term support to improve government budgetary and financial systems in Nigeria; to institutionalizing standard approaches to documenting and analyzing health sector expenditures; and to providing more timely, predictable and forward-looking data on the health sector indicators and related measures. Nigeria needs to give priority attention to the problem of inadequate statistics. Accurate and timely availability of relevant data is critical for MDG-based planning, monitoring and evaluation, and reporting.

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APPENDIX

UNITS ROOTS TEST (AUGMENTED DICKEY-FULLER)
Null Hypothesis: D(IMMR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.323086	0.0001
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IMMR,2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IMMR(-1))	-1.101770	0.206980	-5.323086	0.0000
C	0.001142	0.002958	0.386185	0.7018

R-squared	0.461973	Mean dependent var	0.001567
Adjusted R-squared	0.445669	S.D. dependent var	0.023498
S.E. of regression	0.017495	Akaike info criterion	-5.198321
Sum squared resid	0.010101	Schwarz criterion	-5.109444
Log likelihood	92.97062	Hannan-Quinn criter.	-5.167641
F-statistic	28.33525	Durbin-Watson stat	1.716648
Prob(F-statistic)	0.000007		

Null Hypothesis: D(GHE) has a unit root
Exogenous: Constant
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.235019	0.0000
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	598.4225
HAC corrected variance (Bartlett kernel)	403.9882

Phillips-Perron Test Equation
Dependent Variable: D(GHE,2)
Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GHE(-1))	-1.191165	0.172684	-6.897968	0.0000
C	7.626390	4.416042	1.726974	0.0935

R-squared	0.590479	Mean dependent var		-0.439842
Adjusted R-squared	0.578069	S.D. dependent var		38.78470
S.E. of regression	25.19306	Akaike info criterion		9.346460
Sum squared resid	20944.79	Schwarz criterion		9.435337
Log likelihood	-161.5630	Hannan-Quinn criter.		9.377140
F-statistic	47.58196	Durbin-Watson stat		2.114395
Prob(F-statistic)	0.000000			

Null Hypothesis: EDU has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.629466	0.0968
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EDU)
Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EDU(-1)	-0.241475	0.091834	-2.629466	0.0130
D(EDU(-1))	0.611891	0.153370	3.989636	0.0004
C	22.98269	8.699759	2.641762	0.0127

R-squared	0.348255	Mean dependent var		0.472440
Adjusted R-squared	0.307521	S.D. dependent var		5.773035
S.E. of regression	4.804048	Akaike info criterion		6.058611
Sum squared resid	738.5240	Schwarz criterion		6.191927
Log likelihood	-103.0257	Hannan-Quinn criter.		6.104632
F-statistic	8.549496	Durbin-Watson stat		2.230178
Prob(F-statistic)	0.001060			

Null Hypothesis: D(FLPR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.082780	0.0000
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FLPR,2)
Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FLPR(-1))	-1.057799	0.173901	-6.082780	0.0000
C	0.379237	0.321454	1.179754	0.2465

R-squared	0.528573	Mean dependent var	-0.009429
Adjusted R-squared	0.514287	S.D. dependent var	2.674299
S.E. of regression	1.863802	Akaike info criterion	4.138559
Sum squared resid	114.6340	Schwarz criterion	4.227436
Log likelihood	-70.42479	Hannan-Quinn criter.	4.169240
F-statistic	37.00021	Durbin-Watson stat	2.004714
Prob(F-statistic)	0.000001		

Null Hypothesis: D(PCI) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.898091	0.0003
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(PCI,2)
Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PCI(-1))	-0.728199	0.148670	-4.898091	0.0000
C	2742.393	2562.261	1.070302	0.2922

R-squared	0.420964	Mean dependent var		849.2017
Adjusted R-squared	0.403418	S.D. dependent var		19400.98
S.E. of regression	14985.08	Akaike info criterion		22.12294
Sum squared resid	7.41E+09	Schwarz criterion		22.21182
Log likelihood	-385.1515	Hannan-Quinn criter.		22.15362
F-statistic	23.99130	Durbin-Watson stat		2.025185
Prob(F-statistic)	0.000025			