



Nigerian Government Expenditure, Economic Productivity and the Prevention of Maternal Mortality: A Call to Action

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Authors' contributions

This work was carried out in collaboration between both authors. Author RNO designed the study, wrote the protocol and wrote the first draft of the manuscript. Authors RNO and BCEE managed the analyses of the study as well as the literature searches and reviews. Both authors read and approved the final manuscript.

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ABSTRACT

Health is wealth and in order to ensure sustainable productivity in a country, citizens must be in good health. The Government is the major contributor to the financing of health care and thus ensuring that the optimal care is provided for its populace. Nigeria presently has the second highest absolute number of maternal deaths in the world. This manuscript aims to assess the Nigerian government's expenditure on health as well as its impact on maternal mortality and economic productivity. Expenditure on health was found to be yielding fruits, this was however below expectations as the rate of decline of maternal mortality ratio was not as high as the rate of increase in the GDP. Investment of more resources in health care remains crucial for improved health indices and consequently higher productivity in Nigeria.

Keywords: Government spending; economic productivity; health; maternal mortality; maternal health.

1. INTRODUCTION

As postulated by the health-led growth hypothesis, health is considered a capital on which investments are made in order to bring about increased labour productivity, income increase and a resultant increase in the general wellbeing of the populace. This has been practically illustrated in our present-day times wherein low life expectancy and ill-health are responsible for 50% of the marked difference in economic growth between developed and developing countries worldwide [1,2,3,4]. An improved level of development of human capital results in improved health status of the populace; this results in a more healthy productive life [5].

The health of an individual is crucial, more so with respect to maternal health - the health of a woman during pregnancy, childbirth and in the weeks after childbirth. For maximum productivity and output, good health is essential as is good maternal health for good babies/offspring [6]. For there to be effective, durable economic productivity in an area or nation; the health of the individuals in that particular location must first be optimal through provision of adequate health care services. Improvement in health care is a compulsory factor to be considered in the enhancement of the Human Capital Development in every single economy [2].

This inadvertently results in increased levels of productivity of labour and as well, a resultant enhancement of investments in other human capital forms which ensures that more income is earned by the populace thus resulting in an increased per capita income. Thus, for there to be a vibrant, productive, skillful and excellent achievement of productivity in economic sectors in a nation [which is best measured using the Gross Domestic Product [GDP] of that nation as well as its per capita income]; the health of the populace must be well taken care of through provision of effective and efficient health care services that is mostly achievable through optimal public [government] expenditure on health. Being a major source of financing health in many countries, government expenditure on health has been inter-related with either positive or negative health outcomes of the populace. This is to say that when government expenditure is high, there is a corresponding improvement of health outcomes e.g. increased survival rates,

reduced mortality rates etc and vice versa [2,7,8,9].

Government expenditures are mostly required in large, expanded and far-reaching interventions which have the ability to impact positively on the health of the populace. These include technology improvement initiatives, infrastructural development, widespread immunization programs, strengthening of health insurance programs and drastically reducing out-of-pocket spending on health etc. [3,8]. This notwithstanding, funding for health care services remains a major inhibitor for governments to be in good standing as responsible stewards of health systems in their countries [1].

2. MATERNAL HEALTH AND MORTALITY

The fact that women are capable of adding value to a nations' gross domestic product and using resources more efficiently in managing household budgets, loans and savings, if given the opportunity is a fact. What is more, women are the bearers, rearers and carers of the society. A basic primordial prevention strategy is economic empowerment of women and maternal mortality is the single basic measurement of a nations' care for her women. [10,11]. Allocation of public funds on health care is a fundamental task of governments yet empirical literature on the link between government expenditure and maternal mortality is sparse. The maternal mortality ratio is one of the indices used to measure the health status of a country. A maternal death is a death of a woman while pregnant or within 42 days of the termination of a pregnancy, irrespective of the site or duration of the pregnancy but from any cause aggravated from the pregnancy or its management but not from accidental or incidental causes. The maternal mortality ratio is the ratio of the number of maternal deaths per year to the number of live-births. Developing countries usually have very high maternal mortality ratios [MMR] compared to developed countries [11,12].

3. GROSS DOMESTIC PRODUCT

The Gross Domestic Product [GDP] is a monetary measure of the value of all final goods and services produced in a country over a given period e.g. a year. GDP is the single most commonly referenced figure to cover the entirety

of a national economy. There are three main ways of calculating the GDP of a country; the income, output and the expenditure approaches. GDP is commonly calculated in United States dollars [USD]. The GDP may be calculated to allow for inflation. Despite its usefulness, the GDP also has some criticism as it does not take into account the widening gap between the rich and the poor, the harm done to the environment and unpaid work. However, despite all these, it is still one of the best economic measures a country can use. Data can be sourced from various sources. An example is Quarterly National Accounts [QNA]; which are integrated system of macroeconomic accounts designed to describe the entire system of production in a nation on a quarterly basis. They provide a picture of the current economic status of the economy that is more timely and frequent than that provided by Annual National Accounts [ANA]. The key attribute of QNA is that they provide a reasonable level of detail of the economy that helps government to assess, analyze and monitor economic growth on a regular basis [13].

Data for this analysis were obtained from Surveys conducted by the National Bureau of Statistics [NBS] as well as from the Budget Office of the Federal Republic of Nigeria. Major aggregates of quarterly GDP by type of economic activity at current [2010] and constant prices are shown in this write-up. The following terms also assist in understanding the concept:

Gross Output: Consists of government production, which is a non-market service offered without charge or at a price not economically significant, and private production, offered at the market price.

Government production [non-market service]:

Gross output Basic = Intermediate consumption [Less commodity sales and fees] + Compensation of employees + Consumption of fixed capital + other taxes less subsidies on production.

Private production [market service]:

Gross output Basic = Total output - Intermediate consumption + other taxes less subsidies on production.

Intermediate consumption:

Details of the cost structure of operators including transportation fees, operational expenditure, minor repairs and maintenance etc. [13].

4. MATERNAL HEALTH AND A NATION'S ECONOMIC PRODUCTIVITY [GDP]

In different studies, reports have persistently shown that most times, there is a causal bi-directionality in the relationship between maternal health and the GDP. This is to say that when expenditure on health has been targeted to ensuring the reduction of maternal mortalities and inadvertently improving maternal health, there is usually an improvement in economic productivity [measured by the gross domestic product [GDP] and that when GDP is improved, it has a resultant effect of bringing about improved maternal health. The causal effect of maternal health on GDP is however reported to yield greater effects in high income countries than the low and middle income countries. However, the reverse is the case in terms of the causal effects of GDP on maternal health which yields greater results in low and middle income countries than high income countries [8,14,15].

In a nutshell, health investments have the capability to lead to improvement in a nation's maternal health and thus resultant improvement in human capital which is " *the stock of competencies, knowledge, social and personality attributes, including creativity, embodied in the ability to perform labour so as to produce economic value*". This resultant human capital in most cases brings about a commensurate increase in the GDP of that nation as well as reduces global health inequality gaps [5,14,16].

5. NIGERIA'S GROSS DOMESTIC PRODUCT, PER CAPITA INCOME, EXPENDITURE ON HEALTH AND MATERNAL MORTALITY INDICES

Seeing that government expenditure on health shares a proportional relationship with health outcomes around the globe, it leaves little wonder why the African Union in 2005 agreed that 15% of all government expenditure should be allocated to health care in order to tackle the disease burden prevalent within the continent.

[3,17]. This has however not exactly been the case in Nigeria and has thus inadvertently negatively affected government expenditure set aside to specifically tackle issues of maternal mortality [2,17,18].

Over the years, government expenditure on health [in naira] had steadily increased from 77,948.6 million in 2005; to 106,937.97 million in 2007; to 161,845.51 million in 2010 up till 262,742.35 million in 2014. The expenditure however declined to 259,751.74 million and 257,382.15 million in 2015 and 2016 respectively. Data on government spending to prevent maternal mortality or ensure maternal health became available in the public domain from 2009 and it is worthy to note that before this period, maternal mortality had been on the decline due to government and other stakeholders' interventions. From 2009, when this data was made available, maternal mortality marginally reduced till 2015. The maternal mortality ratios from 2000 to 2015 are shown in Table 1. [4] This marginal decline however remains unsatisfactory as Nigeria failed to achieve the targets that were set with the Millennium Development Goals [MDGs]; which was to reduce the maternal mortality ratio by three quarters between 1990 and 2015.

As part of government expenditure on health, from 2009 till date, funds have been earmarked for activities, programmes, initiatives, targets etc.; whose main objective was to curb maternal mortality in Nigeria and thus reduce the maternal mortality ratio. These programmes/initiatives include the Maternal, Newborn and Child Health

[MNCH] strategy which was put in place in 2007 to push forward a programme designed to re-energize primary health care in every local government and to a large extent extend coverage, such that maternal, newborn and under-5 mortalities are reduced in line with the country's targets for MDGs 4 and 5. Others include the National Primary Health Care Development fund required to finance the provision of a basic minimum package of health services in the nation's primary health care facilities. The Safe Motherhood Initiative put in place to improve the health and wellbeing of mothers and newborn children [19,20].

The Midwifery Service Scheme geared at increasing the training and posting of midwives [as skilled health manpower] especially to the rural areas. The Making Pregnancy Safer Initiative as well as The Free Maternal And Child Health Care Programme [FMCHCP] which was set up to break down the financial constraint to equitably accessing and using skilled maternal and child health care. The 2012 National Health Bill which was propounded to establish minimum guarantee of basic health care services for select groups including pregnant women; as well as to ensure the improvement of community health care to poorly accessible rural communities as well as other required health reforms [8,20,21,22].

Funds set aside for this ranged from 7.44 million naira in 2016 to 4,512.00 million naira in 2009. [23]. When compared with the gross domestic product per capita of Nigeria which had steadily increased

Table 1. Maternal mortality indices in Nigeria between 2000 and 2015

Year	2000	2001	2002	2003	2004	2005	2006	2007
Maternal Mortality Ratio per 100,000 live-births	1170	1140	1090	1040	986	946	890	884
Year	2008	2009	2010	2011	2012	2013	2014	2015
Maternal Mortality Ratio per 100,000 live-births	829	883	867	824	819	821	820	814

between 1993 and 1997, declined in 1998 but then picked up again and increased steadily further on till 2009, when it declined. It however picked up again in 2010 and increased steadily again till 2014 after which it declined again in 2015 and 2016. It became evident that the government expenditure on health, especially in curbing the problem of maternal mortality in Nigeria and its consequent effect on GDP; was yielding fruits despite its fluctuating tendencies. This is to say that as a result of government expenditure on maternal health, there was a decline in maternal mortality which is believed to have resulted in an increase of the per capita income of the nation and indeed increased productivity. Improved maternal health attributable to optimal government expenditure on health, has been reported to be one of the important determinants of economic growth in Nigeria. [3]. A decline in the GDP per capita of Nigeria was however noticed in 2016 when there was a drastic decrease in maternal health expenditure from 2,533.399 million

naira in 2014 to 7.438 million naira in 2016. [24,25].

Table 2 shows the progression in GDP and Maternal mortality ratio from the year 2000-2015. While there is a progressive increase in the GDP from one year to another, there is a progressive decline in the maternal mortality ratio. However, the rate of decline in the maternal mortality ratio is not as high as the rate of increase in the GDP. In addition, slight reduction in the GDP from one year to another as witnessed in 2001 and 2015 do not coincide with a reduction in the maternal mortality rate. This seems to show that an increase in the health status of the population is not a knee-jerk response to increasing wealth and a slight decrease in wealth does not immediately cause a decrease in the health status of the population.

Table 2 below illustrates in a tabular form, the relationship between government expenditure on health, expenditure on curbing maternal mortality, maternal mortality ratio and the gross

Table 2. Government expenditure on health, gross domestic product and maternal mortality indices over time

Year	GDP per capita [current US\$]	Total government health budget [Naira]	Total amount earmarked to curb maternal mortality [Naira]	Maternal mortality ratio per 100,000 live-births
1993	153.6			1280
1994	171.7			1270
1995	264.3			1250
1996	316.0			1250
1997	315.6			1240
1998	275.0			1220
1999	300.6			1220
2000	379.1			1170
2001	351.8			1140
2002	459.5			1090
2003	512.7			1040
2004	648.8			986
2005	807.9	77,948,600,000		946
2006	1,019.7			890
2007	1,136.8	106,937,970,000		884
2008	1,383.9			829
2009	1,097.7	154,567,493,157	4,512,000,000	883
2010	2,327.3	161,845,511,090	410,000,000	867
2011	2,527.9		49,138,174	824
2012	2,755.3		174 138 668	819
2013	2,997.0		147,518,208	821
2014	3,221.7	262,742,351,874	2,533,399,143	820
2015	2,655.2	259,751,742,847	624,200,000	814
2016	2,178.0	257,382,151,746	7,438,016	

Sources: [23,24,26]

Table 3. % Government expenditure on health and maternal mortality ratios comparison

Year	Nigeria		Ghana		Morocco		USA		Belgium		China		Australia	
	% EH	MMR	% EH	MMR	% EH	MMR	% EH	MMR	% EH	MMR	% EH	MMR	% EH	MMR
2000	4.46	1170	9.90	467	5.50	221	17.38	12	12.02	9	12.23	58	15.49	9
2001	5.93	1140	7.85	449	4.76	214	17.84	13	12.34	9	10.82	56	16.00	8
2002	4.50	1090	9.34	437	5.32	207	18.10	13	12.73	8	9.29	54	15.70	8
2003	3.73	1040	8.45	420	4.72	201	18.45	13	12.55	8	9.26	52	16.46	8
2004	5.89	986	8.33	396	5.12	196	18.47	13	13.55	8	9.54	50	16.32	7
2005	8.82	946	12.58	376	5.15	190	19.04	13	14.50	8	9.10	48	16.95	7
2006	7.30	890	15.08	358	4.43	185	19.01	14	13.71	8	9.79	45	16.95	7
2007	8.65	884	13.98	345	5.83	179	18.92	14	14.36	8	9.94	43	17.13	7
2008	9.19	829	16.16	337	6.32	172	18.68	14	14.41	8	11.06	40	17.48	7
2009	7.63	883	13.15	330	5.94	164	18.97	15	14.85	8	10.13	38	17.21	7
2010	7.37	867	16.45	325	6.58	153	19.46	14	14.97	8	10.31	35	16.78	6
2011	5.72	824	14.93	320	6.48	144	20.08	14	15.00	8	10.24	33	17.11	7
2012	7.42	819	14.03	324	6.05	137	20.78	14	14.95	7	10.62	31	17.65	6
2013	7.43	821	9.32	321	6.05	131	21.29	14	14.85	7	10.49	29	17.31	6
2014	6.48	820	10.58	322	5.78	126	16.51	14	15.10	7	10.28	28	17.31	6
2015	8.17	814	6.82	319	6.03	121	16.79	14	15.10	7	10.43	27	17.31	6

Key: %EH - % Expenditure on Health, MMR- Maternal Mortality Ratio; Sources: [26,27]

domestic product per capita of Nigeria (which is illustrative of the level of economic growth and development].

A comparison of the public expenditures on health from the year 2000 to 2015 between that of the Nigerian government and other nations and its effect on maternal mortality within these nations is captured in Table 3. All 7 countries reviewed [including Nigeria] exhibited fluctuating increasing and decreasing percentage government expenditures on health care over the years from 2000 to 2015. This also resulted in subsequent decreasing fluctuation in maternal mortality ratios [MMR] in the countries apart from that of the United States of America which saw increasing fluctuations of maternal mortality ratio. However, the maternal mortality ratio of the United States of America from 2000 to 2015 when compared with those from African countries was significantly very low with a mean MMR of 13.63 as against a mean MMR of 926.44 [in Nigeria] and 171.31 [in Morocco]. Belgium and China however presented with steadily decreasing MMR during this same period of time. As earlier discussed in this commentary, despite decreasing maternal mortality ratios over the years [as seen in Table 3], high income countries [e.g. Belgium, etc.] with lesser maternal mortality ratio values tend to experience the positive causal effect of maternal health on GDP [through improved human capital] in greater measure than the low and middle income countries [e.g. Nigeria etc.] whom tend to exhibit higher maternal mortality ratio values. The differing MMR values also provide a logical explanation to why the causal effects are experienced more by high income countries [5,16].

6. CONCLUSION AND RECOMMENDATIONS

This information is vital for stakeholders, budget planners and policy makers. It reveals the need for a sustained and uninterrupted funding to the health sector to improve the health of the population. Policy makers must put in more effort to do the right thing for the nation. Health Economists and Health advocates should be unrelenting in their efforts to ensure appropriate policies are made for the nation. These policies and the laws backing them should be seriously advocated for, implemented and enforced. Adequate budgeting for health and maternal health in particular cannot be over-emphasized. It is strongly recommended that in Nigeria, more effort needs to be made to ensure the investment

of more resources in health. Health care utilization for various interventions regarding maternal health is crucial including the availability of skilled birth attendants to take deliveries. Health care expenditure must be integrated into elaborate gender-sensitive strategies for the development of human capital. It is finally recommended that there should be further thrust by the Nigerian government to ensure that at least 15% of the annual budget is allocated to issues of health and health care.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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