

Progressive Health Spending and Health Outcomes in Nigeria: The Case of Malaria

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ABSTRACT

In Nigeria, malaria incidence has been observed to impose sizable economic burden on households and national health outcomes at large. Evidence suggests this illness affects production by reducing household's labour supply and the household's ability to effectively utilize resources. Successive Nigerian governments have been making efforts at ensuring that there is an improvement in the level of health outcome through health expenditure on malaria incidence, in addition to increased health spending nationally to meet a subset of the millennium development goals six which is malaria reduction. Yet, health outcomes reports in Nigeria are still worrisome. Thus, this study investigated the progressive implication of Malaria incidence and malaria spending on Nigeria health outcomes using the production function health model with macroeconomic variables from 1970 to 2013. The study observed that health expenditure and educational expenditure are the major means government spends on malaria incidence in terms of providing essential infrastructural services. This paper argues that implementing necessary health policies will enhance national productivity. This is because healthier people work more and are physically and cognitively stronger.

KEYNOTES: *Incidence, malaria spending, health outcome, Malaria cases and under_5 mortality*

JEL Classification: I1; H50; J13;

1.1 Introduction

Health outcomes have been described as measures of the end result of what happens to patients or individuals as a consequence of their encounter(s) with a particular disease or the healthcare system, (Krousel-Wood, 1999). Health outcomes can be classified into two categories; positive and negative health outcomes. The positive health outcomes for people include being alive; functioning well mentally, physically, socially; and having a sense of well-being. Negative outcomes include death, malfunction, and lack of well-being. Meanwhile, diseases are the intermediate factors that influence the likelihood of achieving a state of positive health outcomes, (Henderson, 2002). As such, malaria incidence has been observed to impose sizable economic burden on households and national health outcome at large. Evidence suggests this illness affects production by reducing household's labour supply and the household's ability to effectively utilize resources, (Singh, Shukla & Sharma, 1999). The effect is higher among poor households who spend a significant proportion of their income on medical expenditures, and are less able to rely on employed labour, thus reducing farm output significantly.

However, different government regimes have contributed in their effort for malaria eradication in Nigeria. Some of the progress that have been made in the financing and implementation of the malaria control agenda which include increased coverage of preventive interventions such as insecticide-impregnated bed nets for malaria control as well as the provision of free artemisinin-based combination therapies to treat malaria in children, through improved health behaviour and improved quality of health service delivery, (Olufunke & Olumuyiwa, 2011). For example, it was observed that between the period 1977-1979 economic plan, which was during the military regime led by General Olusegun Obasanjo, an average of 0.6% was spent on malaria control out of 11.5% of the total government health expenditure during the period. This is in contrary to Buhari/Idiagbon regime that placed austerity measure on government spending. At this period also, much focus was not on the health sector despite the fact that there were some diseases that were prevalent, (Akintunde, 2011).

Successive Nigerian governments have been making efforts at ensuring that there is an increase in the level of health outcome through health expenditure on malaria prevalence. For instance, successive years like, 1980, 1990, 2000 and 2010, the public expenditure on health were N302.5m, N658.1m, N20,201.8m and N76,876.5m. All these reveal that there has been an increase in the level of public expenditures on health and progressive spending in malaria eradication efforts with the hope that this will boost the level of health output in Nigeria.

Even in the recent times, the proportion of these government health spending goes to malaria control and eradication effort as in line with MDG and Nigeria Vision 20:2020. In pursue of this, government invests in different malaria programmes and campaigns as efforts to eradication of this disease in human society as well as actualization of MDGs and Vision 20:2020, thus suggesting a progressive malaria spending. For instance, government has made investment so far in malaria control which included; the distribution of insecticide nets, the scaling-up of access to case management using Artemisinin Combination Therapy (ACTs) and Rapid Diagnostic Tests (RDT) for malaria.

But with all these investment in malaria programmes, the health outcomes reports in Nigeria are still worrisome. For instance, the maternal mortality increased to 545 per 100,000 in 2008. Infant mortality rate was 91 per 1000 live births in 1990 which later rose to 100 per 1000 live births in 2003, (WHO, 2010). A similar trend was observed for the under-five mortality rate which worsened from 133 per 1000 live births in 1999 to 201 per 1000 live births in 2003. More than 2,400 under-five children die daily from preventable diseases like malaria and malnutrition. This is really invariant with the MDG target which was to reduce the under-five mortality rate by two-thirds. So far instead of the situation to improve, it is not, rather it is getting worse.

Considering these high mortality and morbidity rates caused by malaria, high cost of treatment of this malaria incidence, low life expectancy, poor, increasing malaria cases and its consequence on health outcome, this study seeks to investigate the progressive implication of malaria spending on Nigeria health outcomes. In an explicit, the study seeks to investigate extent the health spending on malaria incidence has impact health outcome in Nigeria.

1.2 Socio-Economic Effects of Malaria

Malaria is a major global health problem and one of the leading causes of morbidity and mortality in the developing world. The socio-economic impact of malaria in Nigeria has been a subject of concern in the recent times. According to Nwanosike, (2014), one major socio-economic impact of malaria is school absenteeism. He argued that school absenteeism as a result of malaria incidence negatively impairs long-term learning capacity, thereby reducing the accumulation of human capital over time. This is because; frequent absenteeism reduces the efficiency of learning, results in greater redundancy, reduction in the scope for specialization, labour mobility and the quality of skills.

Malaria is a leading cause of death among children and also has negative impact on the outcome of pregnancy, including premature delivery and delivery of low birth babies. Malaria also causes blood shortage (anaemia) in pregnant women, (WHO, 2010). In addition, malaria reduces productivity in all ages, thereby contributing to decreased academic performance of school children and lower earning of the adult.

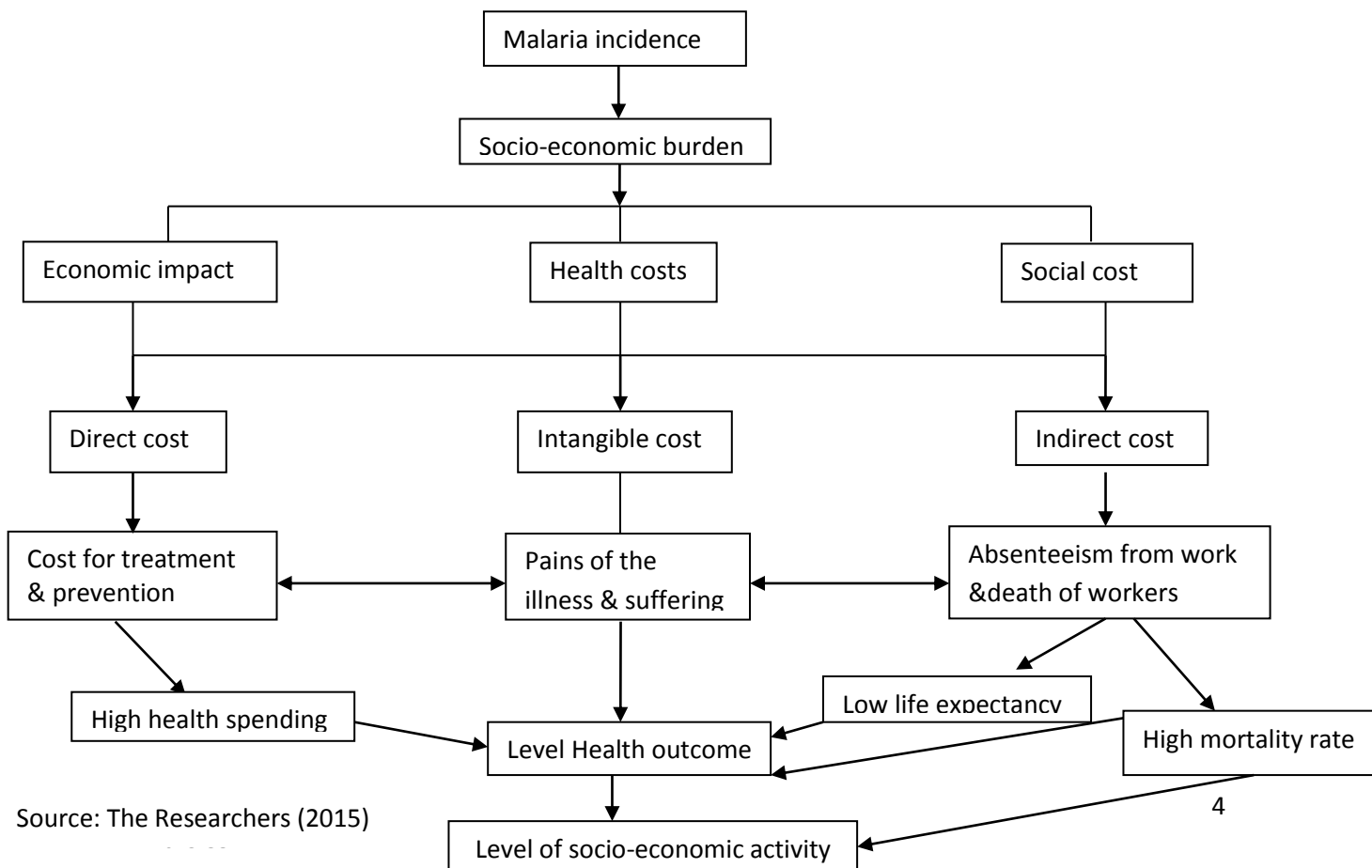
Apart from school absenteeism, malaria is equally responsible for employee absenteeism, increased health care spending, and decreased productivity. All of these negatively impact on health outcomes and economic growth. It should be noted that poor and women in rural areas are at the greatest risk of death or severe debility from malaria, which drains the resources of families. The true cost of malaria exceeds the cost of seeking treatment; over 25% of income of households is lose to this disease, (WHO, 2010). According to Olalekan and Nurudeen (2013), socioeconomic cost of malaria is usually highly regressive and consuming a larger proportion of income in the poor households to the extent that slow economic growth limits malaria control funds.

In fact, Economists estimate that malaria causes an “economic growth penalty” of up to 1.3% per year in malaria endemic areas, (WHO, 2010). This is so because, malaria discourages investments, tourism, affects land use, thereby leading to crops selection, sub-optimal agricultural production, reduction in labour productivity and impairs learning. Malaria can

strain national economies, by impacting negatively on some nations' gross domestic product through costs of health care; days lost in education and decreased productivity due to brain damage from cerebral malaria. It should be noted that malaria impacts directly on health outcome which include child mortality, malaria in pregnancy, life expectancy, among others. WHO, (2012) noted that Nigeria life expectancy is 51.1 for male and 52 for female in the year 2012 which is still low when compared to 58 for male and 59 for female for Ghana in the year 2012.

This socio-economic effect of malaria is better shown with incidence of malaria flow chart, where malaria incidence is a concept referring to the number of cases of malaria that are present in a particular population at a given time. Malaria incidence has been observed to impose sizable economic burden on households and national economy at large. Evidence suggests this illness affects production by reducing household's labour supply and the household's ability to effectively utilize resources, (Singh, Shukla & Sharma, 1999). The effect is higher among poor households who spend a significant proportion of their income on medical expenditures, and are less able to rely on employed labour, thus reducing farm output significantly. However, Socio-economic impact here refers to individual's economic and social progress, stagnate and/or regress as a result of malaria incidence through government effort or neglect. It is a way of studying economic and social effects of malaria incidence on individual well beings or health outcomes, (NPC, 2008).

Chart 1.1 **Flow chart of impact of malaria incidence on health outcome in Nigeria (Flows of socioeconomic burden of malaria).**



Source: The Researchers (2015)

From the chart 1.1, the socioeconomic effect of malaria endemic is categorized into three, namely: health, social and economic burden. The health burden is measured in terms of life years lost to premature death and morbidity due to malaria. The social cost represents pains and hindrances to usual social participation, while the economic cost measures monetary expenses in preventing and control of malaria. These burdens however, are further classified into direct, indirect and intangible costs. The direct costs are narrowed down to cost of treatment by households, community and government. The indirect costs link to absenteeism from work, while intangible costs point to low life expectancy and poverty as a result of depletion of savings. Thus, the malaria incidence asserts in the economy a high socio economic burden that directly results to reduction in labour supply, inefficient human capital, low productivity and low income. In summary, therefore, malaria morbidity in contrast reduces national output by increasing absenteeism from work activities, and by reducing work capacity or effort of household members.

2.1 Review of Related Literature

Malaria mortality is still very much a global socio-economic problem but the greatest burden is in Nigeria. In a study to determine the relationship between deaths from malaria, public health and non-health expenditure in Nigeria, Bello (2004), adopted gross output transfer models on data from 1975-2001. The study revealed that there is a negative relationship between deaths from malaria, public health expenditure, per capita income and non-public health, but a positive relationship between deaths from malaria and political instability. The study further found that between 1975 and 2001, average of 5.86% of the GDP was lost to malaria death annually. The study recommended that in addition to the current ₦14,000 per capita health expenditure, a transfer of an additional ₦45,684.00 per head from other sectors to the health sector to avert death from malaria.

In a similar study, Jimoh, Sofola, Petu and Okorosobo (2007) showed that households would be willing to pay \$3.6 in excess of the average current expenditure on malaria treatment per month and \$22.6 in excess of the current costs for protection and control in malaria. While Olufunke and Olumuyiwa (2009) estimation show that about 10% of gross domestic output of Oyo state is being lost annually to malaria attack. This has serious implications for the achievement of development blueprint in the National Economic Empowerment and Development Strategies (NEEDS) and the MDG target. This is similar to Nwanosike (2014) assertion that if greater resources are available for malaria control, a high economic growth and successful malaria reduction will be recorded before the end of 2015 in Nigeria. Ichoku *et al.* (2010) also found that the incidence of catastrophic payments was about 29% at the 5% threshold and that more people are caught up in catastrophic financing when the threshold is 5%. The numbers are quite high. This study showed that such private health spending (either for malaria or any other illness) accounted for more than 20% of household non-food expenditure.

To examined the trends in health outcomes and infant mortality in Nigeria as a wake-up call for intervention towards achieving the 2015 MDGs target, Ojewumi and Ojewumi (2012) applied data on the Trends in Infant and Child Mortality in Nigeria and noted that between 1990 and

$$Under_t = \varphi_0 + \varphi_1 Mspend_t + \varphi_2 Eduexp_t + \varphi_3 Mcase_t + \varphi_4 Litrt_t + \varphi_5 PCI_t + V_t \quad \dots \quad 4.6.$$

Where φ s are the coefficient, V_t is assumed to be normally distributed and white noise. The study covered the periods from 1970 to 2013 making a 37 years experiment. The choice of the period is due to availability of data. The data is obtained from Central Bank of Nigeria Statistical Bulletin and World development indicator. The data is analyzed section 4.1 using Eview 8.0 software.

4.1 Results Presentation and Discussion

The models to be estimated are time series models that imply that, stationarity and other times series pre-estimation tests ought to be examined.

Table 4.1 Unit Root Test Result summary

VARIABLES	ADF stat	crit. value at 5%	crit. value at 10%	Order of Integration
Under_5	-6.420	-3.532	-3.199	I(0)
Mspend	4.366	-2.950	-2.608	I(1)
PCI	3.386	2.950	-2.608	I(1)
Mcase	-6.961	2.950	-2.608	I(1)
Litr	-8.692	-2.952	-2.610	I(1)
Eduexp	-8.201	-2.952	-2.610	I(1)

Source: Researchers' computation

The variables were subjected to the Augmented Dickey-Fuller test for unit root at the 5% critical value and the result is presented below as table 4.1 with the null hypothesis being that the series has a unit root if the t-statistics is less than the critical value (5%). The summary of the result is presented below as shown in table 4.1.

From table 4.1, it can be observed that life expectancy, health expenditure, Education expenditure, malaria cases, under-five mortality, literacy rate and per capita income were stationary after taking their first difference. This means that these variables were integrated of order one; I(1). The variables were tested basically at 5% critical value but all the variables were stationary at the two critical values of 5% and 10%. The presence of unit root in a model is a necessary condition for co-integration. Therefore, the result of the co-integration is presented below as table 4.2.

Co-integration estimation was done to test the long run relationship in the model. The regression was therefore run and the residual was generated and tested for unit root by the augmented Dickey Fuller. The co-integration tests were done by checking for the unit root of the residual using the Augmented Dickey fuller for the model under consideration. The results of the unit root tests for the residuals are shown below on Table 4.2.

Table 4.2 Co-integration Results

Variable	ADF test statistic	Critical values	Stationarity level
Residual for model one	-3.612	At 5% = -2.950 At 10% = -2.608	Stationary at 5% & 10% significant level

Source: Researchers' computation

The results for the residual as evident on table 4.2 above suggests that residual is significant given that the t-test statistic is higher than the critical values (5% and 10%). This means that the residual was stationary and therefore there exists a long run relationship for the regression models. This result is in line with the findings by Olalekan and Nurudeen (2012) who observed that there was a linear long-run impact of health spending on malaria reduction in Nigeria. The finding is also in conformity with the findings of Nwanosike (2014) who in his study identified a long run relationship between health spending on malaria and economic growth. Hence the multivariate regression model was estimated ordinarily using the OLS estimation techniques at their different orders of integration.

Table 4.3 OLS Estimation of the Regression Model

Dependent variable = (Under_5 mortality)

Variables	Coefficients	t-statistics	Probability
C	149.2944	110.5512	0.0000
MCASE	5.1318	2.350219	0.0241
MSPEND	-3.6985	-0.081249	0.9357
EDUEXP	0.00069	3.705437	0.0007
PCI	-0.02176	-12.17407	0.0000
LITR	5.98605	17.78624	0.0000
R ² = 0.957500 p-value= 0.0000 DW=1.094555 F-statistic=171.2240			

Source: Researchers' computation

From the result, all the coefficients of the variables are positive and in conformity to the standard economic theory supporting them except the per capita income which is negative and variant with the postulated economic theory. The reason for this variance in PCI has been identified to be the skewed or the uneven distribution of national income that has made an average individual in the country unable to afford basic preventive facilities of malaria which is in conformity with the findings of Bello (2004) and Nwanosike (2014). Again, the t-values of the variables are statistically significant at 5% except malaria expenditure on malaria which is proxy by government expenditure, which is not significant implying that more financial commitment is still needed from the government for eradication of malaria and improvement of health outcome of the population before the end of 2015, which is in line with MDGs postulations for malaria eradication.

4.2 Findings of the Study

The primary policy concern that motivated this research was to investigate the progressive implication of malaria spending and malaria incidence on Nigeria health outcomes. To do this, however, it was considered expedient to analyze the progressive impact of malaria spending (proxy by health spending) and malaria incidence on health outcomes in Nigeria, which accentuates the need for policies that address the effects of health outcomes and malaria financing in Nigeria. In general, the results show that health expenditure and educational expenditure are the major means government spends on malaria incidence in terms of providing essential infrastructural services like insecticide treated nets and free anti-malaria drugs in the health sector in order to eradicate malaria prevalence and promote health outcomes while per capita income is the main source of household/individual spending on malaria reduction and health outcomes in Nigeria.

The study equally found low per capita income as a significant socioeconomic factor that causes low health outcomes especially higher rate of under-five mortality. This is so, because, with the low per capita come, individuals and households find it difficult to purchase malaria drugs for their sick children, thereby increasing under-five mortality and lowering health outcome.

The findings revealed the literacy rate is a direct socioeconomic factor that affects health outcome proxy by under-fiver mortality in Nigeria. This finding was similar to those of previous studies such as Singh, Shukla and Sharma, (1999) and Adesola (2012) in which ignorance of the causes and mode of transmission of malaria increased the risk of under-five mortality, thereby reducing the level of health outcome in Nigeria.

Finally, it is obvious that malaria incidence imposes progressive socioeconomic costs on the health outcome through progressive government and individuals spending on malaria programmes and drugs. This implies that health outcome is skewed to the left. That is, with increasing spending on malaria campaign/programme and provision of long lasting insecticides, there is still proportional increased evidence of malaria incidence in the country. This therefore, causes the health outcome to have negative outlook over time.

4.4 Policy Implications and Recommendation

The federal government should increase the annual allocation to health sector and education sector based on the United Nations benchmark. This is to reduce the socioeconomic effects and progressive nature of malaria incidence on health outcomes and enhance the health status of the population as well as drawing closer towards the eradication of malaria in Nigeria. This can be done by channeling more funds to malaria control programmes which have the potential of promoting health outcomes in Nigeria.

There should be joint partnership between the government and the private sector in providing essential infrastructural services like insecticide treated nets and free anti-malaria drugs in the health sector in order to eradicate malaria prevalence and promote health outcomes especially under-five mortality, infant mortality and life expectancy.

Consequently, government should ensure full health policy formulation and implementation by states and LGAs nationwide. There is need to ensure an effective health management

information system and a communication strategy for mobilizing and sustaining the Health System Reform Programme (HSRP). This is because, proper implementation of health care expenditure especially on malaria is a necessary condition for enhancing health outcomes and reduction of malaria prevalence in Nigeria. In other words, malaria eradication and quality health outcomes will eventually lead to skillful, efficient and effective labour force.

Government should improve and implement free or subsidized health services and facilities especially on malaria to improve health outcomes. This will enable the poor to benefit as much as the better-off groups (the political class and the middle income class), from the public subsidies in health. The incidence of large scale health problems (such as high infant mortality rate and low life expectancy) are as a result of the scarce health resources and infrastructure.

5.1 CONCLUSION

This research has provided reliable evidence of the impacts of malaria prevalence and government health expenditure on the health outcomes (under-five mortality). The conclusion to be drawn from this study is that malaria incidence (malaria cases and malaria death) have a significant socio-economic impact on health outcomes as well as labour force efficiency in Nigeria. Nevertheless, to achieve high and sustainable health outcomes, we suggested some policy recommendations which when properly implemented will surely stimulate health outcomes and reduction on malaria incidence.

Apart from government health expenditure, the study concludes that household income (per capita income) and education affect individual's rate of survival from malaria incidence in Nigeria. In addition to this, poor coverage, affordability, inequality, quality and sustainability of malaria programmes are still major challenges to health care services and malaria eradication campaign in Nigeria. It will pay for Nigeria to invest in health outcomes and malaria eradication. Paying attention to the population health outcomes is not merely of political value, but also in the interest of national and global economic development. Health expenditure and health status have impact on national economy, households and individuals. Therefore putting health high on the political agenda and implementing the necessary health policy will uplift national productivity because, healthier people work more and are physically and cognitively stronger.

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