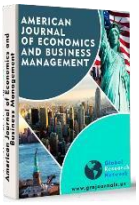

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Article

Impact Of Out-Of-Pocket Expenditure On Malaria And Labour Productivity In Nigeria: A Case Study Of Tertiary Institution In Imo State.

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Abstract: The study investigated the impact of Malaria on Labour Productivity in Nigeria; A study of tertiary institutions in Imo state. The objective of the study is to examine the impact of malaria on Labour Productivity. The study used coded data obtained from a field survey conducted with a well-structured questionnaire. The model has Health seeking behaviour (HSB) and Cost of Malaria Treatment (COT) as explanatory variable while Labour Productivity (LAB-Prod) as dependent variable. The mean response of the respondents were calculated and compared with the criterion mean to determine if the question is positive or negative. Ordinary Least Square estimate was used to analyze the impact of the Independent Variables on the dependent variable. The result revealed that HSB has positive effect on Lab-Prod while COT has negative effect on Lab-prod. The OLS result also found that COT has significant impact on Lab-Prod while HSB is found to have an insignificant impact on Lab-Prod. The adjusted R2 (0.72) shows that the model is very robust and has a good fit. The D-statistics showed that there is no presence of autocorrelation. The F-statistics showed that the explanatory variables jointly affect the dependent variable. Thus, we recommend that the Federal Government through its ministry of education should initiate policies and programmes that will build a good hospital in every institutions of higher learning to enable staffs, staffs children, students, and any biological relations of staffs to have quality medical care at a reduced cost. This will help enhance the productivity of staffs in tertiary institutions in the country.

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1. Introduction

Malaria constitutes 10 per cent of Nigeria's working population hospital admission and loss of productive time in their various working institution (WHO, 2015). Malaria morbidity and mortality rate vary from region to region in Nigeria, which makes malaria the number one public health problem in Nigeria (Onwujekwe, Malikel, Mustafa & Moiznvaa, 2006). Malaria contributes to about 300,000 deaths yearly (Enato, 2014). Approximately 90% of the Nigerian working population suffers at least one episode per year. However, official estimate suggests as much as four episodes per person per year on the average (WHO, 2012). In addition to this, malaria imposes substantial socio-economic costs on workers, institutions and governments (Onwujekwe et ai, 2003). For instance, the costs of malaria to workers includes expenses like buying drugs for malaria treatment at

home; cost incurred in travelling to clinics and cost of treatment; loss in man hours at work; absenteeism from work; cost for preventive measures and cost for burial of workers who died due to malaria. Alternatively, the costs to governments include supplies, staffing, maintenance of health centers, provision of adequate drugs and medical supplies and also provision of malaria preventive and intervention supplies like insecticides treated bed net, and subsidizing insecticide sprays to households (WHO, 2011). The above facts have serious socio-economic implications on health outcome and welfare with indirect impact on economic growth.

Although the correlation between malaria, loss of hours at work, low productivity and poverty is apparent because of malaria morbidity, the nature of the linkages in terms of directions and mechanism of causation is less so, and different methodological approaches may provide widely divergent perspectives concerning the impact of the disease on the productiveness of labour in any organization in Nigeria. Many researchers like (Olalekan and Nurudeen, 2013; Onwejekwe, 2000), and (Jimoh, Chioma and Okonkwo, 2007) have also revealed that malaria may be responsible to place substantial difficulties on workers that have sick family members, these comprises possible loss of productive time from work by the infected individuals, productive time spent by an active workers on other family member, loss of productivity, other expenses like transportation and medical care, and depletion of the labour force through premature mortality. Having treated the impact of malaria on the overall labour force productivity and its incidence on the various occupational groups, to this end, the fulcrum of this current research work investigated the impact of malaria on labour productivity in the selected tertiary institutions in Imo State. To solve the above problem, the work looked at the health seeking behaviour of workers due to malaria, cost of malaria treatment, and how they affect labour productivity of workers in the tertiary institutions in Imo state, Nigeria.

Objectives Of The Study

The main objective of this research work is to investigate the impact of malaria on labour productivity.

The specific objectives are to:

Examine health seeking behaviour of workers due to malaria on labour productivity

Determine the cost of malaria treatment of workers on labour output.

Research Hypotheses

The hypotheses below were the reflection of our objective and research questions which were subjected to empirical test.

HOi: There is no significant relationship between health seeking behavior of workers due to malaria and labour productivity

H02: There is no significant relationship between cost of malaria treatment of workers and labour output.

Scope of the Study

This research work centers on the impact of malaria on labour productivity. A study of tertiary institutions in Imo State. Tertiary institutions in Imo state are Imo University (IMSU) Owerri, Federal University of Technology (FUTO) Owerri, Federal polytechnic Nekede, Imo state Polytechnic (IMOPOLY) Umuagwo and Alvan Ikoku Federal College of Education.

LITERATURE REVIEW

Conceptual Framework

Expenditures On Malaria

Malaria control expenditure on household made up of two components. These include expenditure on malaria treatments and expenditure on malaria prevention. Malaria prevention consists of expenditures on aerosol sprays, mosquitoes repellents, mosquito coils, insecticides treated bed net, and other preventive measure taking by house to prevent malaria infestation that deplete their income. Expenditures on malaria treatment by household include out of pocket expenditure made on malaria treatments. These

treatments involve fees paid for medical care, drugs, transportation cost, and other expenses of subsistence at a distant health facility.

The cost of malaria treatment and prevention could be quite high on poor household. This could deplete their disposable income to the extent that it will affect their food consumption and welfare negatively. Alternatively, there investment in agricultural production in the household could also be affected negatively. This is evident in sub-sharan Africa; household expenditure on malaria could be as high as US$2.00 and US$25.00 and between US$0.20 and US$15.00 on malaria prevention monthly. In Nigeria and Kenya, malaria treatment expenditure to small farmers was estimated to be 5% to 13% respectively to their household expenditure (WHO, 1999).

Depletion of labour force or premature mortality due to malaria is one event that cost money to both the family member of the deceased and his colleagues at work, also household economic activities are also affected based on time lost taking care of the victims during hospital admission and funeral when the victims dies.(Assenso-Okere and Dzator, 1997). Family members of the bereaved, community members, and friends who attend the burial and funeral rites give up their respective productive activities to meet up with the burial. Evidently, it is clear that in situation where malaria treatment is free based on free health care system, malaria is still potent and viable in influencing labour productivity of the infected victims. The loss of capital stock and depletion of domestic savings due to expenses made on malaria treatment prevention especially with introduction of high cost Artemisia-class combination therapy (ACTs) in the African continent could lead to reduction in agricultural investment by the household that have high malaria incidence.

Malaria effect on the demand of household has often been ignored in the discussion, Labour productivity and household cash reserves are affected negatively by malaria infestations. This affects the demand for agricultural inputs and also demand of other commodities.

Measurement Of Labour Productivity

The hourly measure of output of workers in an economy is called labour productivity. Alternatively, the real gross domestic product (GDP) produced by human labour hourly by active workforce is also considered as labour productivity. Labour productivity growth depends on three main factors namely savings and investment of physical capital, human capital and technology (Investopedia, 2019). Labour productivity is also called workforce productivity. It is referred as real economic output per labour hour. Labour productivity growth is determined by the change in economic output per labour hour over a specified period of time. Employee productivity is different from labour productivity because employee productivity is a measure of an individual worker output per hour.

Theoretical Issues

Health Wages Economic Theory

In Economic theory of malaria burden, two channels affect individuals' income. These, are the role of health over wage rate and the part it plays in the decisions relating to supply of labour and, decisions on how many hours of labour to supply.. According to Alves et al. (2003) healthy individuals, are expected to possess a higher level of human capital, would be more productive than those with poor health. At the household level, where fundamental decisions are made, malaria strip families of their main sources of financial and non-financial resources.

For the affected individuals, the consequences include emotional distress caused by illness and sometimes death. Associated with this is the critical need to care for those infected and to find ways of replacing their contributions to the household and the community. A decrease of labour productivity resulting in loss of income, reduction of savings, and food, reduced support for the elderly; death of adult children, and the growing burden of orphanage is left to the family and concerned friends which finally trickle down to the national economy. This translates into substantial direct, indirect, intangible costs, and life time loss of earnings, all of which determine poverty and welfare status of the households and finally the economy at large.

Health Capital Theories

Although Fuchs (1966) opined that health capital is one of the components of the stock of human capital, Michael Grossman however was the first to argue health as a form of human capital different from other forms of human capital. In an article titled "On the Concept of Health Capital and the Demand for Health," he was able to bring a distinction of health capital as a separate component of human capital (Grossman, 1972). Another review of the article was undertaken in the year 2000 in other to respond to certain criticisms of and create extensions to the model he developed in his analysis.

The motivation for developing theory was his perceived difference between health and medical care (health care), of which he viewed health as an output and medical care as one of those inputs used in the production of health, and also, the difference between health capital and other forms of human capital. The theory hinged on and drew from the works of famous economist like Becker (1964, 1967), Ben-Porath (1967) and Mincer (1974) (Grossman, 2000). Relying on the household production theory, Grossman argues that health enters both the utility function of the household's production and also determines wages or wealth in the life cycle context.

In the theory, health is defined in a broader manner to include longevity and illness free days. The theory posits that individuals are both consumers and producers of health. On the demand side, the consumer demands health for two basic reasons. For consumption, it is highly desired as it is deemed to increase utility, meaning that, individuals do not want to fall ill because of the negative effect it will exert on their labour market productivity, capacity and outcomes. Or to put it differently, health is more of a necessity and having little or no measure of inferiority. For investment, it determines the availability of time that will be used for both market and non-market performance. This simply means the higher the stock of health, the lower the time losses as a result of sickness or ill health, thereby making more time available for individuals to supply their services in the labour market, hence, leading to higher returns on investing in health.

Empirical Review

2.3.1 Relationship between malaria and poverty

Though poverty and malaria is recognized to have positive correlation, there is no proof on how malaria and poverty are correlated. Many researchers have estimated the direct cost of malaria treatment and prevention (including transportation cost of seeking treatment and expenses on feeding during the treatment) and the indirect cost includes the productive time lost in treating malaria, reallocation of work and untimely death due to malaria. This study revealed that direct cost of malaria to workers ranges from $0.40 in Malawi to $7.38 in Ghana. Some studies have estimated cost of malaria treatment on household ranges from 2.0% to 2.9%. These figures are under 10% or more of household total income is an evidence of the cost of malaria to household. Just two studies compared the variation of malaria cost burden on socio-economic status. The studies hint that the costs of malaria to household are highly regressive (meaning that poor household spend higher proportion of their income on malaria treatment than the rich household). Alternatively, poor countries tend to suffer more of malaria incidences than their rich counterparts. The total cost of malaria burden in Malawi for example average 7.2% per month on household but poor countries incur an average malaria cost of 32%. Onwujekweet ah, (2000) in their study compared financial and economic impact of malaria infestations to combination of other household illness in five (5) highly endemic malaria communities. The study revealed that malaria treatment cost only accounted for 49.87%) of health care cost burden by the sampled household. The household average expenditure was $1.84 monthly, while the combination of other illness, the average household cost of working days lost due to malaria on infected person were almost equal to other illness episode. Combining the financial cost of treating malaria and other illness, the cost will deplete an estimated 7.03% of the total household income, with only cost of malaria treatment mopping up 2.91% of the total cost of health care illness cost. Thus, the study concludes that malaria is very potent and significant contributor to economic burden that harm economic growth of highly endemic countries.

Kaneto et al. (2000), studied weekly mass drug administration either with chloroquine or pyrimethamine, sulfadoxineandprimaquine was carried out on theentire population of 718 inhabitants of Aneityum Island for 9 weeks in 1991. Two additional islands of Vanuatu, one with and one without malaria transmission were monitored for comparison. Community involvement as measured by drug compliance (88.3%) and bed net provision (one net per person in the village) resulted in sustained interruption of malaria transmission. The surveys showed complete absence of Plasmodium falciparum and P.vivax after mass drug administration, from 1996 onwards, with the exception of two instances of imported infections (one mixed infection in 1993 and one P.vivax infection in 1999 Kaneko et al, (2000).

The Roll Back Malaria 2011 report revealed that in sub-sharan Africa, 72% of companies that operate in these countries reported an adverse impact of malaria with 39% considering these impacts to be severe in a 2004 survey. Most companies in Africa reported that malaria has a great negative impact on their businesses (WBABO, 2009). With women and poor children in the remote or rural areas the people that suffers premature mortality due to malaria the most and severe debility from malaria which depletes the resource of affected families (WHO, 2008).

2.3.2 Approaches to cost of Malaria Treatments

Arshad& Malik (2015), investigated the quality of human capital and labor productivity in Malaysia using panel data analysis covering 14 states in the country. The estimation technique used for the study is the fixed effect Generalized Least Squares (GLS) model with the data spanning from 2009 to 2012. The results from the estimation showed that the human capital quality variables (higher educational levels and better health status) were positively significant in improving labour productivity levels in Malaysia. The estimates also suggest that the effect of health on labour productivity is greater than that of education, showing that health was a major determinant of labour productivity.

The World Health Organization (WHO), states in 2016 that there were an estimated 216 million cases of malaria in 91 countries and this is corroborated in the work of Acemoglu and Johnson (2007), which supports the view that malaria mortality, is on the increasing side. They are of the view that mortality rate is higher in African countries, with an estimated value of 584000 death (90%) of all malaria death occur in Africa. This high rate of malarial mortality negatively affects labour productivity of the economy as a greater percentage of the victims are active members of the labour force.

The ecosystem and the savannah type in South East Nigeria regulate the population density of mosquitoes such that owing to these climatic factors as temperature, rainfall and relative humidity (Guinea savannah), there is greater influence on victim frequency via the vector development rate, mortality and morbidity (Ebi et al, 2005). Transmission is associated with changes in temperature, rainfall humidity as well as level of immunity (Monsuru et al, 2013).

The approach for measuring the burden of a disease is the Willingness To Pay (WTP) approach. The WTP approach is one of the two subsets of the method of Contingent Valuation (CV). The WTP and its twin concept, the Willingness To Accept (WTA), are the two approaches that are often used to implement the method of contingent valuation of health-care programmes (Morrison and Gyldmark 1992; Donaldson, 1990). The method of CV is founded in welfare economics and in value theory in particular. It has been suggested that CV is a method of choice when valuing health programmes for the purposes of decision making and priority setting in the health-care sector (Johannesson, 1993; Johannesson and Jonsson, 1991). It has been used widely to value public safely, disease prevention and control programmes (or services in general), and to value health outcomes or states (Berwick and Weinstein, 1985; Johannesson et al, 1991; Thompson, 1986).

The CV method in general and the WTP in particular, are particularly suitable for evaluating the burden (or cost) of malaria and especially for valuing malaria control programme. However, because WTP involves asking individuals to state the maximum amount that they would be willing to pay to acquire a service (or to prevent an undesirable

health outcome), it is important that relevant questions be asked in a correct manner and after making available to the respondents all information relevant to making a sound decision; the sample must also be representative.

One advantage that can be derived from using the WTP to value the disease burden of malaria is that it is capable of measuring the intangible costs that neither the production function nor cost of illness approach is equipped to measure (World Health Organization, 2001). This is because after a respondent knows what it would cost him to treat an episode of malaria and the indirect cost (in terms of lost outputs during the sick days), whatever he states in excess of the sum would reflect his valuation of the pains/trauma, etc. (the intangible costs) that are not contained in the direct and indirect costs. Thus, it is a powerful tool for analysts in providing evidence-based policy prescriptions, although some studies have applied the WTP approach to some malaria interventions in Nigeria (Onwujekwe, 2001; Onwujekwe et al., 2004; Onwujekweet ah, 2005; Uzochukwu and Onwujekwe, 2004).

However, another conventional Instruments for measuring the burden of malaria are malaria mortality, annual blood examination rate (ABER), annual parasite incidence (API), and infant parasite rate and parasite species index. However, a new instrument, called disability adjusted life years (DALY) lost, developed by Murray and Lopez, for measuring the burden, combines the squeal due to malaria (mortality, malarial fever episodes, malarial anemia and neurological squeal) into a single parameter which helps in comparison across the diseases to help prioritization in disease control.

Summary and Research Gap

The literatures reviewed show the evidence that a relationship exist both in theory and practice between malaria and labour productivity. Empirically, many researchers like Jimoh. A. et al. (2007); Onwujekwe et al. (2000); Bello (2005);

Egbotukun et al (2014), Fallahi et al (2010), etc. have researched and showed that relationships exist between malaria and some economic variable like economic growth, output growth, workers' productivity etc. Most researchers like Jimoh et al. (2007) used willingness to pay (WTP) approach. The WTP approach is one of the two subsets of the method of Contingent Valuation (CV). The WTP and its twin concept, the Willingness To Accept (WTA), are the two approaches that are often used to implement the method of contingent valuation of health-care programmes. The method of CV is founded in welfare economics and in value theory in particular .It has been suggested that CV is a method of choice when valuing health programmes for the purposes of decision making and priority setting in the health-care sector. It has been used widely to value public safety, disease prevention and control programmes (or services in general), and to value health outcomes or states. The CV method in general and the WTP in particular, are particularly suitable for evaluating the burden (or cost) of malaria and especially for valuing malaria control Programme. However, because WTP involves asking individuals to state the maximum amount that they would be willing to pay to acquire a service (or to prevent an undesirable health outcome), it is important that relevant questions be asked in a correct manner and after making available to the respondents all information relevant to making a sound decision; the sample must also be representative.

Some others researchers like Onwujekwe et al. (2000); Olalekan and Nurudeen (2013) etc. used cost of illness approach, which we captured in the theoretical literature review. Researcher from health sciences and other health related fields looked at malaria from their fields and the studied to cover areas like Drug administrations', effectiveness of free long lasting insecticide treated nets, effectiveness of free malaria treatments in pregnant woman, etc. using medical analytical tools and making reasonable conclusions.

Malaria has both direct and indirect cost. Direct costs include time lost from work and medical treatment costs (including transportation and medical care). Indirect costs, which are typically harder to measure include loss of work efficiency and time and work reallocation within the household. The indirect costs of malaria are also widely felt as

worker productivity lowers with increased sick leave, absenteeism, and premature mortality of the workforce.

Looking at the WTP, and COI approach they explained direct impact of malaria because the theory is based on out-of-pocket expenditure and the indirect impact is often being giving less attention due to its cross sectional nature from the empirically reviewed works cited in the empirical literature review.

Thus, these early researches by different scholars from different academic background have set the precedence for further research. This research work will seek to study malaria and labour productivity from the out-of-pocket expenditure but captures some variables that explain the indirect impact of malaria looking at some approaches, concept and theories to address and capture the direct and indirect impact of malaria on labour productivity.

This work will adopt and modify Nnamocha and Agba (2019) in their study of malaria and labour productivity in Imo state university Owerri, they used loss of income to capture the out of pocket expenditure which represents direct effect of malaria. They used willingness of workers to report to work due to malaria, work efficiency of the worker due to malaria, working capacity of workers due to malaria, ability of workers to report to work across employment sectors (academic and nonacademic) and mortality rate of workers due to malaria to capture the indirect effect of malaria and labour productivity. This work modified the above model by eliminating loss of income as a measure of out-of-pocket expenditure and introduces cost of malaria treatment. Alternatively, this study modified the existing model by eliminating willingness of workers to report to work due to malaria, work efficiency of workers due to malaria, ability of the workers to report to work due to malaria cross employment sectors as indirect effect of malaria on labour productivity and introducing Health seeking behaviour of workers due to malaria, loss of man hour of workers due to malaria. This work adopted or retained working capacity of workers due to malaria, depletion of workers (mortality) due to malaria as captured in the above model, these variables makes the independent variable (health seeking behaviour, cost of malaria treatment, depletion of workers due to malaria, loss of man-hour and working capacity). Finally the work retained labour productivity as the dependent variable.

The scope was increased as the model we adopted looked at Imo state University Owerri only. This study increased the scope to tertiary institutions in Imo State; these institutions are Imo State University (IMSU) Owerri, Federal University of Science and Technology (FUTO) Owerri, Federal Polytechnic (FEDPOLY) Nekede, Imo State Polytechnic Owerri, and Alvan-Ikoku Federal College of Education.

The previous work used Logit regression analysis which only captured the relationship between malaria and labour productivity using bivariate question (yes/no) in the questionnaire, the current study made use of multivariate or likert question in the questionnaire and the helped to expand the questions and also generate reliable data for the analysis. To ensure that impact analysis is done to estimate the impact of malaria on labour productivity, Ordinary least square estimate were introduced to replace the previous Logit regression analysis.

The work has been able to provide a rating scale to measure workers' productivity based on four (4) point scales. It is believe that this scale having been proved reliable and valid can also be applied to ascertain the productivity of workers any sector in Nigeria economy.

Materials and Methods

Population of The Study

The population of the study comprises of the total Academic and non-academic staff of tertiary institutions in Imo state distributed as follows: Federal University of Technology (FUTO), Owerri = 2126 Imo State University (IMSU), Owerri = 1 7 1 8 Federal Polytechnic Nekede (FEDPOLY) = 1 8 8 8

Imo State polytechnic (IMOPOLY) = 1100 Alvan Ikoku Federal college of Education = 2315

These data were gotten from the Personnel Department of Federal University of Technology (FUTO), and Imo state University (IMSU). Data for Federal Polytechnic Nekede (FEDPOLY), Imo state Polytechnic (IMOPOLY), and Alvan Ikoku Federal College of Education (Alvan) were sourced from the Registry Departments of the institutions.

Sample Size Determination

The sample size "n" was obtained using the Taro Yamane's formula viz.: N

$^{71} = \mathbf{1} + N(e^{2})$

Where:

N = population size,

e = level of precision or margin of error (usually 5% or 0.05) Thus given the total population of 9147 staff of tertiary institutions in Imo state and 5% margin of error, we have:

$$n = \frac{9147}{1+914790.05)^{2}}$$

$$n=\frac{9147}{1+914790.05)^{2}}$$

n = 383.24 n ~ 3 8 3

3.4 Sources of Data

The study utilized both primary and secondary data. The primary data were obtained from questionnaires which will be used as the primary instrument for data collection. Other primary sources of data include interviews of staff on their work ethics due to malaria sickness and where necessary observation of the researcher was paramount. The questionnaires were circulated among the staff of three selected tertiary institutions in Imo state - Imo state university, Federal University of Technology Owerri and the Federal Polytechnic Nekede.

Instrument for Data Collection

As mentioned earlier, the major instrument to be used to get the needed information for the study is the questionnaire. The questionnaires are well structured in a 4-point likert scale format and were administered to the staff of the selected tertiary institutions in Imo state. The instrument was further subjected to validity and reliability test to ensure that it measures the responses accurately.

3.7 Proportional Representation

To ensure that we represent the distribution of the questionnaire proportionally and with a very good representation of the population given the sample size, we calculated the percentage of population from different institutions, namely Federal University of Technology (FUTO) Owerri, Imo State University (IMSU) Owerri, Federal Polytechnic Nekede (FEDPOLY), Imo State Polytechnic (IMOPLOY), and Alvan Ikoku Federal College of Education (ALVAN).

According to the data available given the sample size,

To get the actual percentage that perfectly represent our population proportionally, we calculate the percentage of the population that represent the sample size.

Total staff =9147

FUTO = 2126

IMSU= 1718

FEDPOLY = 1888

IMOPOLY-1100 and

ALVAN = 2315

FUTO = 2126x100/9147 = 212600/9147 = 23.24% = (2126/9147x383) = 89 IMSU = 1718x100/9147 = 171800/9147 = 18.78% = (1718/9147x383) = 72

FEDPOLY^ 1888x100/9147 = 188800/9147 = 20.64% = (1888/9147x383) = 79

IMOPOL Y= 1100 x 100/9147 = 110000/9147 = 12.03 % = (1100/9147 x 3 83) = 46 ALVAN = 2315x100/9147 = 231500/9147 = 25.31% = (2315/9147x383) = 97

3.9 Model Specification

Lab_Prod = /(HSB, COT,) ...(3.1)

Where:

Lab Prod = Labour productivity

HSB = Health Seeking Behavior of the workers

COT = Cost of Treatment incurred by the workers

The model can be stated in an econometric form as follows:

$Lab\_Prod = a_0 + a_1HSB + a_2COT + u$ ...(3.2)

Where $a_1 - a_2$ represent the unknown coefficients of the model to be estimated, αO is the intercept of the model while "μ" is the stochastic error term.

3.10 Descriptions/Justification of the Variables

Labour Productivity (Lab-Prod): Labour productivity refers to the output of workers given the absence of every form of ailment or impediment. In the context of this study, labour productivity measures the rate at which workers or employees in tertiary institutions carry out their primary duty of impacting knowledge to undergraduates and every other sundry duty without experiencing breakdown or health challenges. One of the ailments that usually affect workers is malaria hence output of the lecturers and workers are deemed to be dependent on their health status (malaria).

Health Seeking Behaviour (HSB): Health seeking behaviour refers to the attitude of workers to seeking treatment when they are suffering from an illness (malaria). The workers knowledge of the ailment will determine his treatment behaviour. In this context, the illness in view is malaria, some workers will choose to consult a pharmacist, some will go to a good hospital for medical treatment, and some will choose self-medication with local remedies, while others might seek religious help.

Thus, the behaviour of the workers towards seeking treatment will determine or influence how quick his recovery will be, and also when his is going to be fit to discharge his duties at work efficiently/productively. Thus, this objective captured the health seeking behaviour of workers in tertiary institutions in Imo state towards malaria treatment and how it affect the dependent variable which is labour productivity.

Cost of Treatment due to Malaria: Cost of treatment refers to the out-of-pocket expenditure or other cost of seeking medical treatment of an ailment. The objective/variable captured the direct cost of treating malaria by workers in tertiary institutions in Imo state. These costs may deplete workers financial capacity and disposal income. If the cost of treating the ailments is considered high, it may lead to workers trying to cope with the cost of treatment by borrowing or selling of unproductive assets. To this end, this variable is to determine the effect of these costs on workers' productivity.

2. Results

Data presentation and analyses

4.1 Data Presentation

From the sample size which is three hundred and eighty three (383). The structured questionnaires was distributed to the five (5) tertiary institutions in Imo State Proportionally as calculated in our chapter three (see proportional representation). From the 383 questionnaires distributed, three hundred and fourty eight (348) were properly filled and returned. Thus, this analysis will be done using 348 as our new sample size which represents the total population of staff in the five tertiary institutions in Imo State that received, filled and returned the questionnaires that was given to them.

The cumulative responses from the questionnaires are presented under this section^ The weighted mean are also computed and compared with the criterion mean as obtained in the previous chapter. The end remark is made and preliminary conclusion is drawn from the results. The data are presented as follows:

The Table 4.1.1 above summarizes the responses on the labour productivity of the workers in the tertiary institutions in Imo state.

S/N	LABOUR PRODUCTIVITY	SA	A	DA	SD	MEAN(X)	REMARK
1.	My efficiency is reduced whenever I am diagnosed of malaria.	130	142	40	36	2.777	Positive
2	I have been awarded formally for my efficiency and meritorious service at work.	119	150	32	47	2.71	Positive
3	There is improved efficiency at work when my family members are malaria free.	168	136	23	21	2.99	Positive
4	The money I spend on treating malaria makes me to be less motivated and decreases my labour output.	90	133	97	28	2.56	Positive
5	The health insurance package of my institution increases my chances of getting quality treatment from malaria hence increasing my labour output.	98	127	87	36	2.57	Positive
6	Incidence of malaria in my work place increases my labour output.	87	66	103	92	2.20	Negative
7	I suffer from malaria at least ones in a month and this reduces my productivity.	118	139	54	37	2.70	Positive
8	The after effect of malaria decreases my productivity for weeks.	76	174	77	21	2.61	Positive
9	Immunity to malaria enhances my productivity.	125	115	67	41	2.66	Positive
10	Labour productivity in tertiary institutions is on the increase despite the increasing scourge of malaria in the country.	54	137	95	62	2.30	Negative
	Grand Mean					26.08	

Source: Field Survey (2019) ** decision arrived at based on 2.5 criterion mean

Item 1 My efficiency is reduced whenever I am diagnosed of malaria. From the table above, the total numbers of staff that strongly Agreed (S A) and Agreed (A) to the questions as regard to their efficiency based on the question above are 130 and 142

respectively while 40 and 26 staff Disagreed and Strongly Disagreed respectively. The calculated mean for this question is revealed to be 2.77 which is greater than the criterion mean value of 2.5.this shows that question is positive, and we conclude that the efficiency of workers in the tertiary institutions in Imo State are reduced whenever they are diagnosed of malaria

Item 2: I have been awarded formally for my efficiency and meritorious service at work. This question is designed to capture the commitment of workers to the work when they are free from malaria infection. From the results it revealed that the sampled populations are committed staff given their responses to the question. The table above revealed that 119 and 150 of the respondents strongly agreed and Agreed respectively, while 32 and 47 of the respondents Disagreed and Strongly Disagreed. The calculated mean value is 2.71 which are greater than the criterion mean of 2.5. Thus, this show that the response to the question is positive and we conclude that the sampled populations are committed staffs in their respective tertiary institutions in Imo state.

Item 3: There is improved efficiency at work when my family members are malaria free. From the table above, 168 and 136 of the total sampled populations Strongly Agreed and Agreed respectively while 32 and 47 of the respondent Disagreed and Strongly Disagreed respectively. This question revealed how the working efficiency (productivity) of staffs when their family members are malaria free. From the table above the calculated mean value are 2.99 which are greater than the criterion mean of 2.5. This shows that the responses of the respondents to the question are positive. Thus, we conclude that the efficiency, concentration, dedication and productivity of the staff in tertiary institution in Imo state at work improve when their family members are malaria free.

Item 4: The money I spend on treating malaria makes me to be less motivated and decreases my labour output. From the table above, the total respondents that Strongly Agreed and Agreed are 90 and 133 respectively while 97 and 28 of the total respondents Disagreed and Strongly Disagreed to the question respectively, The calculated mean as showed in the labour productivity table above revealed the value to be 2.56 which is greater than the criterion mean of 2.5. This shows that the question is positive. Thus, we conclude that money spend on malaria treatment by the workers in tertiary institution in Imo state affect their labour productivity or labour output.

Item 5: The health insurance package of my institution increases my chances of getting quality treatment from malaria hence increasing my labour output. From the responses as revealed in the table above, 98 and 127 of the respondents Strongly Agreed and Agreed respectively while 87 and 36 of the total respondents Disagreed and Strongly Disagreed respectively. The calculated mean value as shown in the table is 2.57 which is greater than the criterion mean of 2.5. This shows that the question is positive in influencing workers labour output in the tertiary institutions in Imo state. Thus, we conclude that health insurance package in tertiary institution in Imo state increases the chances of staff getting quality treatment from malaria hence increase their labour output or productivity.

Item 6: Incidence of malaria in my work place increases my labour output. From the table above, 87 and 66 of the total respondents that from the returned questionnaire Strongly Agreed and Agreed to the question, while 103 and 92 of the respondents Disagreed and Strongly Disagreed to the question. The calculated mean value is 2.20 which is less than 2.5. This shows that the question is negative. Thus, we conclude that incidence of malaria at work place in the tertiary institutions in Imo state does not increase labour output.

Item 7: I suffer from malaria at least ones in a month and this reduces my productivity. This question tries to determine the least possible time our population which is duly represented by our sample size suffers from malaria infestation and how this vector affects their productivity. From the table above, 118 and 139 of the respondents Strongly Agreed and Agreed to the question, while 54 and 37 of the respondents Disagreed and Strongly

Disagreed to the question. From the labour productivity table, the calculated mean value is 2.70 which are greater than the criterion mean of 2.5. Thus, we conclude that from the result above, workers/staff of tertiary institutions in Imo state suffers malaria at least ones in a month and this reduces their productivity.

Item 8: The after effect of malaria decreases my productivity for weeks. The question above looks at the aftermath of malaria infestation in relation to workers' productivity in the tertiary institutions in Imo state. From the above, 76 and 174 of the respondents Strongly Agreed, and Agreed while 77 and 21 of the respondents Disagreed and Strongly Disagreed. The calculated mean value for these responses is 2.61 which are greater than criterion mean of 2.5. This shows that the question is positive in determining the productivity of staff in the five tertiary institutions in Imo State. Thus, we conclude that the after effect of malaria decreases the productivity of staff in the tertiary institutions in Imo state.

Item 9: Immunity to malaria enhances my productivity. The questions try to look at immunity from malaria. From our literature, there are some blood group that is prone to malaria and there are some that hardly contact the parasite, also, immunity can also come inform of having good knowledge of malaria and trying to reduce the chances of contacting the parasite at all cost. Thus this question deals with how this immunity enhances productivity of workers in the tertiary institution in Imo state. From the table above, 125 and 115 of the respondent Strongly Agreed and Agreed while 67 and 41 Disagreed and Strongly Disagreed respectively. The calculated mean value is 2.66 which are greater than criterion mean of 2.5. This shows that the question is positive in determining the productivity of workers in tertiary institutions in Imo state. Thus, we conclude that immunity to malaria enhances productivity of staff in tertiary institutions in Imo state.

Item l0. Labour productivity in tertiary institutions is on the increase despite the increasing scourge of malaria in the country. From the table, 54 and 137 of the respondents Strongly Agreed and Agreed respectively while 95 and 26 of the respondents Disagreed and Strongly Disagreed. The calculated mean value as revealed in the table above is 2.30 which is less than the criterion mean of 2.5. This shows that the question is negative from the responses of the respondents. It reveals that increasing malaria scourge in the country is affecting the labour productivity of tertiary institutions through its negative externality. Thus, we conclude that increasing malaria scourge in the country affect labour productivity in tertiary institutions in Imo state.

	HEALTH SEEKING BEHAVIOUR	**SA**	**A**	**DA**	**SD**	**MEAN (X)**	**REMARK**
11	Self-medication when I am down with malaria makes me lose man-hour.	112	164	48	24	2.77	Positive
12	I seek medication from a standard hospital and this gives me confidence I need to improve my productivity at work.	108	172	34	34	2.74	Positive
13	I resort to no treatment and fall back on faith based medication which makes me to be absent for work during working hours.	49	99	97	103	2.06	Negative

14	1 report to work and put in my best even after being diagnosed of malaria.	70	130	67	81	2.31	Negative
15	I can miss work for days in order to seek for medication for my malaria.	90	115	78	65	2.42	Negative
	Grand Mean					12.30	

Item 11: Self-medication when I am down with malaria makes me lose man-hour. This question focuses on the health seeking behavior of workers when they are sick due to malaria. Self-medication is a human behavior in which an individual uses a substance to self-administer treatment for a particular ailment. From the table above, 112 and 164 Strongly Agreed and Agreed to the question that self-medication when they are down with malaria makes them lose man-hour while 48 and 24 of the total respondents Disagreed and Strongly Disagreed to the question.

The calculated mean value of the responses stood at 2.77 which are greater than the criterion mean of 2.5. This shows that the question on health seeking behavior influences labour productivity due to man-hour loss of worker in the tertiary institutions in Imo state. Thus, we conclude that self-medication by workers when they are down with malaria makes them loss productive hours at work.

Item 12: I seek medication from a standard hospital and this gives me confidence I need to improve my productivity at work. From health seeking behaviour table above, 108 and 172 of the total respondents Strongly Agreed and Agreed to the question above, while 34 and 34 of the respondents Disagreed and Strongly Disagreed to the question. The calculated mean value is 2.74 which are greater than criterion mean of 2.5. This shows that the question on health seeking behaviour is found to be positive in determining the labour productivity of workers in the tertiary institutions in Imo State. Thus, we conclude that seeking medication from a standard hospital when workers are sick due to malaria, aid fast recovering and also boost the confidence of quality diagnosis, treatment and prevention, which will enhance workers' productivity to its multiplier effect.

Item 13: I resort to no treatment and fall back on faith based medication which makes me to be absent for work during working hours. From the table 4.1.2 above 49 and 99 of the total respondents Strongly Agreed and Agreed to the question, while 97 and 103 Disagreed and Strongly Disagreed to the question. The calculated mean value is 2.06 which is less than criterion likert mean of 2.5. This shows that the question is negative. Thus, we conclude that faith based medication based on no treatment affect the working hours of workers negatively.

Item 14: I report to work and put in my best even after being diagnosed of malaria. From the table 4.1.2 above, 70 and 130 of the total respondents Strongly Agreed and Agreed while 67 and 81 of the total respondents Disagreed and Strongly Disagreed. The calculated mean value of responses from the respondents is 2.31 which are less than 2.5 criterion likert mean. This response is termed negative. We conclude that the workers do not put their best performance after being diagnosed of malaria. This also revealed that when a worker is diagnosed of malaria, their performance at work will be reduced.

Item 15: I can miss work for days in order to seek for medication for my malaria. From the above table, 90 and 115 of the total respondents Strongly Agreed and Agreed respectively, while 78 and 65 of the respondents Disagreed and Strongly Disagreed to the question. The calculated mean response of the respondents is 2.42 which is less than the criterion likert mean of 2.5. This shows that the responses is negative and we conclude that workers who are diagnosed of malaria may not miss work for days in other to seek

treatment but may be seeking treatment while coming to work or might miss a considerable less days to seek treatment given the mean response at 2.42.

	COST OF TREATMENT OF MALARIA	SA	A	DA	SD	MEAN (X)	REMARK
16	The amount I spend on Malaria treatment is very high	91	127	76	54	2.48	Negative
17	The high amount I spend on medication depletes my financial capacity and affect my productivity	79	145	64	60	2.45	Negative
18	The amount spent on malaria treatment affect my disposable income	91	142	77	38	2.56	Positive
19	Borrowing to treat malaria depletes my morale and also affect my work input.	35	151	111	51	2.26	Negative
20	The drugs I take are very efficient and enhances my productivity.	115	172	34	27	2.80	Positive
	Grand mean					12.56	

Item 16: The amount I spend on malaria treatment is very high. From the table 4.1.3 above, 91 and 127 of the total respondents Strongly Agreed and Agreed respectively to the question, while 76 and 54 of the respondents favoured the options Disagreed and Strongly Disagreed respectively. The calculated mean responses are 2.48 which is less than the criterion mean of 2.5. This signifies that the question is negative. Thus, we conclude that the amount spend on treating malaria isn't so high to the sampled population.

Item 17: The high amount I spend on medication depletes my financial capacity and affects my productivity. From the table 4.1.3 above, 79 of the respondents Strongly Agreed, 145 Agreed, 64 Disagreed while the remaining 60 Strongly Disagreed to the question. The calculated mean of the responses is 2.45 which is less than 2.5 criterion mean. This shows that the question is negative. Thus, we conclude that the amount spent on medication due to malaria do not affect the productivity of the staff of tertiary institutions in Imo state.

Item 18: The amount spent on malaria treatment affects my disposable income. From the table above, 91 respondents Strongly Agreed, 142 Agreed, 77 Disagreed and 38 Strongly Disagreed to the question. The calculated mean response is 2.56 which are greater than the criterion mean of 2.5. This shows that the question is positive. Thus we conclude that the amount spent on malaria treatment affect the disposable income of the sampled population.

Item 19: Borrowing to treat malaria depletes my morale and also affects my work input. From the table 4.1.3 above, 35 respondents Strongly Agreed, 151 Agreed, 111 Disagreed and 51 Strongly Disagreed to the question. The calculated mean of their responses is 2.26 which is less than 2.5. This shows that the question is negative. Thus, we conclude that majority of the respondent doesn't borrow to treat malaria and for those that borrowed, the borrowing doesn't affect their work input.

Table: 4.2.2 The Ordinary Least Square Estimate Result

Variable	Coefficient	Std. error	T- test	P-value
C	0.278	0.278	0.041	0.968
HSB	0.166	0.087	1.898	0.059
COT	-0.017	0.005	-3.400	0.029

Source: comuted by the author. 2019

R^2 = 0.785 F. Sat. =2.450 F.stat. P-Value = 0.034
ADJ R^2 = 0.720 D.W Stat = 2.002

Presentation Of Ordinary Least Square Result.

From the ordinary least square estimate, the following results were obtained.

Health Seeking Behaviour (HSB) = (0.166): The explanatory variable HSB is found to be positive given its positive coefficient. Also the ordinary least square result revealed that it is statistically insignificant given its probability value of 0.059 (which is above 0.05% level of significance). This result showed that health seeking behaviour of workers in tertiary institutions in Imo state is positively related with their labour productivity. The reasons health seeking behaviour is found to be statistically insignificant can be seen in the responses given by the sampled population looking the mean responses of the questions asked and how they responded to them, it revealed that the staffs in the tertiary institutions have good knowledge of malaria and resort to effective self-medication and also seek for medication from a standard hospital rather than resorting to no treatment or faith based medication. Thus, we conclude that health seeking behaviours of workers in tertiary institutions in Imo state when they are infected with malaria positively affects the labour productivity of tertiary institution in Imo state. This finding is in line with findings of Nnamocha and Agba (2019) and Olalekan and Nurudeen (**2013).**

Cost of Malaria Treatment (COT) = (-0.17): The explanatory variable COT is found to be negative given its negative coefficient. Also the OLS result revealed that cost of malaria treatment (COT) is statistically significant. This result showed that the cost of treatment of malaria by workers in tertiary institution in Imo State do not influence their labour productivity although it is significant. Being significant as revealed in this OLS result, shows that the money lost affects the worker significantly. Although it doesn't affect their labour productivity, commitment, efficiency, output etc. but it does affect their disposable income as revealed in their responses in question (18). This result when it's compared with their responses revealed that the workers in tertiary institutions do not consider the amount spent on malaria very high in question (16), they also don't believe that this cost incurred deplete their financial capacity in question (17). This responses might be credited to their level of income which may be favourably high to the extent that they don't feel the pain in bearing the cost of treating themselves when they are sick or it might also be that they don't feel the pain of these cost because of their responses in question (20) which revealed that the get the value of their money because of how efficient the malaria drugs

they buy enhances their productivity. Thus, we conclude that cost of malaria treatment do not affect the labour productivity of workers in tertiary institutions in Imo state. This finding supports the works of Nnamocha and Agba (2019), Kioko, Mwabu, and Kimuyi (2013), and Fallahi, Sojoodi and Aslaninia (2010).

4.2.4.2 Hypothesis one (1)

HO: Health Seeking Behaviours (HSB) Due to Malaria does not have significant impact on labour Productivity in tertiary institutions in Imo state.

HI: Health Seeking Behaviours (HSB) Due to Malaria has significant impact on labour productivity in tertiary institutions in Imo state.

Decision Rule

:. Sig = 0.059. The level of significance is 0.059 which is greater than 0.05. This shows that health seeking behaviours of workers due to malaria does not significantly affect labour productivity in tertiary institutions in Imo state. Thus, we reject the alternative hypothesis (HI) and accept null hypothesis (HO) and conclude that health seeking behaviours does not significantly affect labour productivity of workers in tertiary institutions in Imo state.

4.2.3.3 Hypothesis Two (2)

HO: Cost of Malaria Treatment (COT) does not have significant impact on labour Productivity in tertiary institutions in Imo state.

HI: Cost of Malaria Treatment (COT) has significant impact on labour productivity in tertiary institutions in Imo state.

Decision Rule

.. Sig = 0.029. The level of significance is 0.029 which is less than 0.05. We reject the Null hypothesis (HO) and accept the Alternative hypothesis (HI). We conclude that cost of malaria treatment has significant impact on Labour productivity of workers in tertiary institutions in Imo state.

4.2.5 The Goodness of Fit Criteria

The estimated Adjusted R-square for Robustness of the model obtained as shown above indicates that the adjusted R2 = 0.720 (72%) showing high explanatory power of the regressors. Thus, this revealed that the model has a good fit.

4.2.6 Durbin Watson Statistics

From our result our D-stat. = 2.002. This shows that there is no presence of Autocorrelation in the model.

3. Conclusion

Having studied the impact of out of pocket expenditure on malaria in Nigeria, a study of tertiary institutions in Imo state, the model revealed that the explanatory variables Health seeking behaviour of worker due to malaria and cost of malaria treatment, jointly affects labour productivity in tertiary institutions in Imo state.

Recommendations

Based on the findings, the following recommendations were made:

1. The Nigerian government should strengthen the reorientation programmes to educate Nigerians on the possible causes, preventions and cure of malaria. Making them understand that malaria isn't a spiritual that people go religious house to seek for cure but it's a parasite that is only found in mosquitoes. Thus, educating their mindset to seek for treatment with proven local drugs, approves drugs sold in good pharmacy, or a standard hospital. This will lead to speedy recovery and lessen the number of reported death from malaria. This will also lead to improved productivity in the country.

5. Government should also remove import taxes on malaria drugs or subsidize malaria drugs to make it accessible and affordable so that people that is infected with malaria would get the require malaria drugs easily and at a very affordable price. By doing this, the cost of treating malaria will reduce and many people won't find it difficult treating

malaria. Thus this would ensure speedy recovery and improve output. Alternatively, health insurance scheme should be strengthened to insure that the health of working population in Nigeria is in reliable hands, with a reliable insurance company to ensure prompt, quality and affordable health care delivery mainly in the case of epidemic diseases like malaria.

5.3 Contribution To Knowledge

1. This study impact of malaria on labour productivity in Nigeria to the best of my knowledge is the first of its kind in economic literature to utilized four point likert scale in its cross-sectional analysis. This study provides a strong theoretical and empirical background to further researchers to explore fields in economic research.
2. The work has been able to provide a rating scale to measure workers' productivity based on four (4) point scales. It is believe that this scale having been reliable and valid can also be applied to ascertain the productivity of workers in any sector in Nigeria economy.
3. The formulated model for this research provide a strong foundation for further researchers to expand the horizon for issues, factors and variables that affect labour output, efficiency and productivity.

Our finding empirically showed that our model is potent in determining the productivity of workers in tertiary institutions in Imo state and Nigeria at large.

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CALCULATION RESPONSES FOR LABOUR PRODUCTIVITY

S/N	SA	A	D	SD	TOTAL
1	130	142	40	36	348
2	119	150	32	47	348
3	168	136	23	21	348
4	90	133	97	28	348
5	98	127	87	36	348
6	87	66	103	92	348
7	118	139	54	37	348
8	76	174	77	21	348
9	125	115	67	41	348
10	54	137	95	62	348

w1	w2	w3	w4	Total	Mean
520	426	80	36	1062	2.77
476	450	64	47	1037	2.71
672	408	46	21	1147	2.99
360	399	194	28	981	2.56
392	381	174	36	983	2.57
348	198	206	92	844	2.20
472	417	108	37	1034	2.70
304	522	154	21	1001	2.61
500	345	134	41	1020	2.66
216	411	190	62	879	2.30

						2.607832898	Average mean
						26.07832898	Grand mean

CALCULATION OF MEAN RESPONSES FOR HEALTH SEEKING BEHAVIOURS TO MALARIA

S/N	SA	A	D	SD	TOTAL		
1	112	164	48	24	348		
2	108	172	34	34	348		
3	49	99	97	103	348		
4	70	130	67	81	348		
5	90	115	78	65	348		
w1	w2	w3	w4	TOTAL	MEAN		
448	492	96	24	1060		2.77	
432	516	68	34	1050		2.74	
196	297	194	103	790		2.06	
200	390	134	81	885		2.31	
360	345	156	65	926		2.42	
						2.46	Average Mean
						12.3	Grand Mean

CALCULATION OF MEAN RESPONESES FOR COST OF MALARIA TREATMENT

S/N	SA	A	D	SD	TOTAL		
1	91	127	76	54	348		
2	79	145	64	60	348		
3	91	142	77	38	348		
4	35	151	111	51	348		
5	115	172	34	27	348		
W1	W2	W3	W4	TOTAL	MEAN		
364	381	152	54	951		2.48	
316	435	128	60	939		2.45	
364	426	154	38	982		2.56	
140	453	222	51	866		2.26	
460	516	68	27	1071		2.80	
						2.511	Average mean
						12.56	Grand Mean