Review of: "Health Outcome and Economic Growth: The Case of Malaria in Nigeria"

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Title

The title of the article is "Health Outcome and Economic Growth: The Case of Malaria in Nigeria". This topic is interesting to me. Although there were previous studies on the relationship between health outcome/health expenditure and economic growth, and studies on the economic impact of malaria, this study focuses on the relationship between health outcome and economic growth specific to malaria.

Abstract

The first two sentences explain the aim of this study, which is to determine the complex interaction between health outcomes and economic growth. However, the two sentences are reiterative, except the first sentence has mentioned the specific focus on the impact of malaria. Additionally, the aim does not reflect the reader's expectation from the title and does not explain the rationale of this research question specific to malaria.

The sentences from "The multifaceted exploration ... (ARDL)" explain the methods used in this study. It is good that you explain the variables used in predicting economic growth.

The findings are summarized well. However, in the sentence, "Meanwhile ... growth in Nigeria," you wrote "parameters used." It is not clear, and you should be more specific about which parameters are used. And you do not mention the impact of malaria outcomes.

It is good to mention the target audience of the research findings in the conclusion part and recommend the possible actions to be taken.

Overall, the abstract can explain what is done and what is found in the study, and what is recommended to the target audience according to the findings. However, the language used in the abstract is more like aesthetic content writing rather than scientific writing because you use unnecessary adjectives (for example, "profound intricacies," "illuminating proxy"). For scientific or academic articles, your writing needs to be clear and concise to convey your information effectively.

Introduction

The first paragraph of the Introduction states the research question or rationale of the study clearly. Here, we can see clearly that the author would like to know whether improved health outcomes reciprocally heighten economic growth when increased health expenditure improves health outcomes. But the rationale is somehow reiterating, and you can make it

more concise. More, here in the manuscript, you put the rationale first, and then it is followed by background information on the Nigeria health system. I would like to suggest that you'd better put the rationale in the latter part of the Introduction, with such an order 1) background information on Nigeria's health sector, 2) economic sector, 3) health expenditure and economic growth, 4) brief literature review regarding your research question, and 5) your rationale and aim for this study. You put a specific section of literature review in the manuscript, and I think Literature Review is not usually involved in a research manuscript. But it is okay if it is your house style or journal style to put Literature Review in a separate section. At least, you should clearly describe the aim for this study in a separate sentence.

Additionally, the background information on the subject is not sufficiently provided in the Introduction. There is not a sentence mentioning the impact of malaria on economic growth. Moreover, the data for Nigeria's health indicators needs to mention the source of the data along with a citation. Also, the data on health expenditure is not up to date, covering only up to 2011. There is also an issue with the in-text citations. The citation styles are not consistent in the same section.

Literature Review

I would like to compliment the theories mentioned in the Literature Review. They can explain the facts that the public demand more services as the economy grows and increased government spending promotes economic growth. They explain the relationship between economic growth and health expenditure. The Literature Review also explains about health financing methods, importance of health financing, positive correlation between better health outcomes and economic growth, context of Nigeria encompassing challenges, importance of health investment, and gaps for improvement of health outcomes. The Literature Review covered the importance of investment in healthcare and the association between economic growth and health expenditure plus health outcome.

Methods

In **Research Design**, you mention the aim of this study, causal link between health outcomes and economic growth. You should also mention the study design, econometric modelling you have mentioned in the abstract. It is very good that you also mention the outcome and explanatory variables.

In **Data and Variable Sources**, it is good you mention the data sources were CBN and World Bank from 1985 to 2021. It is also admirable to mention that the reliability and relevance of the study results depended upon the quality of their reports.

As I am not from the health economics field, I would not comment beyond my knowledge on model specification. But it would be better to mention the unit of the variables in the model so that readers can interpret the results more easily.

Analysis and Interpretation of Data

In this section, you interpret the descriptive statistics with mean and standard deviation for outcome and explanatory variables. But in Table 1, you should order the columns starting with the outcome variable followed by the explanatory variables. And is it really necessary to take six decimal places for descriptive statistics?

It is a bit confusing in the following paragraph:

"The analysis indicates an impressive correlation coefficient, with no evidence of multicollinearity among the variables. Each variable exhibits a weak correlation with the independent variable, and the fallouts are statistically significant, except for SES, which demonstrates a very weak and negative correlation. It is essential to interpret these correlation coefficients as indicative of either weak or strong positive/negative correlations".

What I understand is that there is potential for multicollinearity between the explanatory variables if the correlation coefficients between all explanatory variables are close to 1 or -1. According to the correlation matrix, the correlation coefficient between all the explanatory variables ranged from 0.63 to 0.94. But you interpreted them as no evidence of multicollinearity. And I think you mistyped "independent" for RGDP in the sentence, "Each variable exhibits a weak correlation with the independent variable". What Table 2 showed is the weak correlation coefficients between the outcome (RGDP) and explanatory variables. As I wrote before, it would be more readable if you put RGDP in the first row and first column of your matrix.

In **Decision Rule** of F-Bound Test, there are typos. In "If Lower Limit < F-Statistics (BT) > Upper Limit ↔ Long-run relationship exist", two "less than" signs are required to show the F statistics is between the upper and lower limits. It should be written as, "If Lower Limit < F-Statistics (BT) < Upper Limit ↔ Long-run relationship exists".

In **Interpretation of Results and Discussion of Findings,** in the third paragraph, you found that the results were different from the findings of Saheed and Samuel (2021). But you did not give your explanation or implication for the difference between your study and theirs. In short, it is better to explain the implications of your results in addition to mentioning that your results support the previous literature and evidence. Regarding malaria incidence (IOM), your interpretation should clearly state that an increase in malaria incidence (for example, one case per midyear population or whatever your unit for IOM) could increase / decrease economic growth by some units or percentage.

Conclusion and Recommendation

Your conclusion of your study and your recommendation should be based on your interpretation of study results and discussion of these findings. In the conclusion and recommendation, you should not mention that private health expenditure surpasses public sector health expenditure in Nigeria. Instead, the fact should be in the discussion section regarding the health expenditure findings.

Overall, you have conducted a good study and contributed well to the health science community with your findings. However, you should be more focused on your research objectives in communicating your findings and write in a simple and concise manner to be more effective in communication.