Reviewer’s report

Title: Spatial variation in the use of reproductive health services over time: A decomposition analysis

Version: 0 Date: 07 Aug 2017

Reviewer: Hilary Davies

Reviewer’s report:

Thank you for the opportunity to review this paper. The authors used the Demographic and Health Survey data from Ghana to examine the regional variation of utilization of reproductive health services between the years 1998 and 2014. It was an interesting and relevant paper, however my main concern is the way the article has been written as it distracts the reader from the focus of the paper. It would benefit from a more succinct writing style and verb tense consistency. Furthermore, there are also a few sentences that lack a correct citation.

Introduction

Overall this section could be shortened and structure improved. The sentences are somewhat long and verbose and could be made more succinct. A brief description about other studies and where they took place could also help strengthen the rationale for the study.

Methods

Page 5, lines 4-29.

This section could be improved by expanding on the GDHS dataset (e.g how individuals were selected to complete the survey and why were men and women selected from different age ranges)

Page 6, lines 19-59.

Although the authors have mentioned that they chose covariates based on previous literature, it would benefit to show how the model was built and if including all these covariates improved the model of best fit.

The authors also mentioned that they would use the following two variables NSCPHGW and NSCPHGT as proxies to capture availability and accessibility to health facilities. It would be better to give the cut-off values to suggest lower levels of access rather than saying "values closer to 0"

Page 7, line 3.
The regional names in the text need to correspond with names in tables i.e the authors used "Greater Accra" in the text, but used "Capital" in the tables which made it confusing to interpret.

Page 7, line 34 to page 11 line 26.

The description of the econometric model is unnecessarily detailed. This section could be improved by focusing on the important aspects of the model.

Results

I had some difficulty understanding the focus of this section. This authors could improve this section by emphasizing the significant values rather than repeating most of the values in the tables. This would allow the reader to concentrate on the important results and can look at the tables for more clarity. Including number of participants as well as percentages would also clarify the results section.

Page 13, line 12.

It is unclear what the authors mean by the term "dummy" and specifically "muslim dummy"

Figures

Figures 1 & 2 would benefit from a key to indicate which administrative/political regions are incorporated in the four ecological zones. The figure should be able to stand on its own and therefore a key for acronyms is necessary (eg. CHPS). The heading for Figure 2 is incorrect.

All tables:

The authors need to indicate the table in the text when they are referring to a particular table. This occurred on page 11 line 35. The units of measurement are not clear in most of the tables and values should be reported using ASM criteria for reporting.

In order to allow the reader better understanding of the results, the authors could include the results from the regression analysis rather than only reporting the marginal effects. 95% CI should also be reported for marginal effects, rather than only reporting Standard Errors.

Table 1: The table would benefit with the actual number and percentage in each age group, rather than just reporting the mean and sd.

It is unclear why you have reported age-squared in all tables except for table 5.

Discussion
This section could be improved by restructuring and using the following sub-sections:

Summary of results

Strengths and limitations of the study

Comparison to previous literature

Implications to policy and/or research

Conclusion

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Unable to assess

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

Quality of written English
Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

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