Author’s response to reviews

Title: Inequities in maternal health services utilization in Ethiopia 2000-2016: magnitudes, trends, and determinants

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Author’s response to reviews:

Authors’ response to reviewers’ comments

Reviewer #1

Thank you for this article which gives insight in inequity in Ethiopia, which is need of attention!

Authors’ response: Thank you very much for your positive comments.

Reviewers’ comment: Introduction: - "Inequities in maternal health services utilization has been reported in Ethiopia [6-11], although the approaches were divergent." Could you discuss the different approaches? And suggest why your approach is needed?

Authors’ response: We accept the comment and have provided further information in the revised manuscript (Introduction, paragraph 4, line number 2) now reads “Some of these studies were based on a subset of population that were on the two extreme poles of wealth continuum between the richest and the poorest segment of the population [1]. This approach excludes the subset of population between these two poles and thus does not provide a full picture of the effect of wealth index on maternal health services utilisation [2]. Utilisation of health services and health inequality do not only depend on a wealth factor but also other need factors that increase individual’s attendance of health care can confound the effect of wealth index on maternal health services utilisation. The effect of such need factors was not taken into account in some studies.
Studies that include all the population segments irrespective wealth status of individuals as well as those that account for the effect of potential confounders (need factors) are required to fully understand health inequalities and its determinants [2, 4].”

Reviewers’ comment: Methods: This section is well-written and explained in detail, but in my opinion the statistical section may be written more compact.

Authors’ response: We accept this comment and modify it on the manuscript.

Reviewers’ comment: I would suggest describing the ANC, SBA and PNC instead of ANC, PNC, and SBA. That order makes more sense in my opinion

Authors’ response: We accept this comment and changed the order in the manuscript as suggested (Methods section, measures subsection, paragraph 1).

Reviewers’ comment: How did you compare the Wealth index with the variables from the PCA?

Authors’ response: We did not compare the wealth index with variable incorporated in the PCA rather we calculated the wealth index using the PCA.

Reviewers’ comment: Results: I would suggest referring to the tables, in the main text.

Authors’ response: We have now referred the tables in the main text.

Reviewers’ comment: The region in where the women live are unknown for non-African readers, so maybe you could describe if the region is rural or civilised, etc?

Authors’ response: We agree and add some information to read “The study participants in Ethiopia DHS were taken from the nine geographic regions and two administrative states (Addis Ababa City administration and Dire Dawa city council). The proportion of population that resides in rural area in each of these nine regions ranges from 50% in Harari region to 90% in SNNPR.”
Reviewers’ comment

Discussion: Well-written section, but maybe you could add some suggestions for further research or implementation: what should we do with your information?

Authors’ response: We have provided that further information. (Conclusion section, last line)

“…. The poorer, illiterate, rural residents, not working, and mass media unexposed women (the majority in Ethiopia) were the disadvantaged segments in Ethiopia and health interventions should target them.”

Reviewer #2

General Comments: The manuscript is well written and easily understood by the readers. As authors described it, inequities in maternal health services utilization constitute a major challenge in maternal mortality reduction in Ethiopia. Therefore, the results of this study may be relevant for targeting maternal health interventions for the under-served women is essential to reduce maternal mortality in the country. However, the period in the manuscript title may lead to misunderstanding of the nature of the data used. From the title it seems that the source of the data was time series data. However, it is actually a two times surveys i.e., survey conducted in 2000 and 2016. It may be difficult to understand the trends of inequities in maternal health services utilization in Ethiopia by using only two time periods. If you had wanted to show the trends in inequities in maternal health services utilization in Ethiopia, it would have been good to use the other DHS also i.e. 2005 and 2011

Ethiopian DHS.

Authors’ response: We thank the reviewer for this important comment. To fully understand the trend across time, a proper time series analysis would have been required. We have only four data points (2000, 2005, 2011, and 2016) from four nationally representative demographic and health surveys that are not sufficient to perform proper time series analysis. The interest of this study is to compare the status of health inequality in a most recent year with the base line inequalities some 15 years ago using recent methodological developments that enable
concentration index comparison between two time points or groups. In line with this, we have now provided trends in maternal health service utilization gap between poorest and richest as a supplementary material supporting the findings provided in the main text, (Supplementary Material: figures 1, 2, and 3).

Reviewers’ comment: Abstract

Method section: This section did not explain what was the study design, and the method of data analysis.

Authors’ response: We have now reviewed and revised the method section for additional clarity in line with this comment (Abstract section, method subsection, line number 2) “The study utilized data from the 2000 and 2016 Ethiopia Demographic and Health Surveys, which were done based on a cross-sectional survey design. The wealth-related inequities were assessed by concentration curve and horizontal inequity indices. Trends in inequities were assessed by comparing the concentration indices of maternal health service utilization variables between the 2000 and 2016 surveys using Wagstaff two groups concentration indices comparison method. Finally, the inequities were decomposed into its contributing factors using Wagstaff method of analysis.”

Reviewers’ comment

Plain English summary: Line 16: This increased from 2000 to 2016. Which one? This statement is a little bit confusing; you can merge with the previous statement to make it clearer.

Authors’ response: We have made it clear by removing “this” from the sentence and merged to the previous statement as suggested.

Reviewers’ comment

Introduction: Paragraph 1, lines 27-30: Maternal mortality in Ethiopia is among the highest in the world, although the causes are preventable.
This sentence is not specific enough. How much is the maternal mortality ratio in Ethiopia? Where does Ethiopia stand compared with other countries? This is the place you are expected to indicate the magnitude of the problem maternal mortality in general, and inequalities in maternal health services in particular in the world, developing countries, and Ethiopia.

Authors’ response: We have now reviewed and revised the introduction section for additional clarity in line with this comment. (Introduction section paragraph 1, 2, 3, 4)

Reviewers’ comment

It would also be wise to describe the Sustainable Development Goals and targets in relation to maternal mortality ratio as it is a relatively recent initiative after Millennium Development Goals.

Authors’ response: We have added that information (Introduction section, paragraph 4, line number 6)

Reviewers’ comment: In this section, you are also expected to describe the rational/justification and significance of conducting this study. What was the motives that motivated the authors to conduct this study? Was it lack of evidence in this area? Was it methodological flaw of the previous studies? Or any other reasons?

Authors’ response

We have provided further elaborations as follows (Introduction section, paragraph 5, line number 2) to read “Some of these studies were based on a subset of population that were on the two extreme poles of wealth continuum between the richest and the poorest segment of the population [1]. This approach excludes the subset of population between these two poles and thus does not provide a full picture of the effect of wealth index on maternal health services utilisation [2]. Utilisation of health services and health inequality do not only depend on a wealth factor but also other need factors that increase individual’s attendance of health care can confound the effect of wealth index on maternal health services utilisation. The effect of such need factors was not taken into account in some studies [3]. Studies that include all the
population segments irrespective wealth status of individuals as well as those that account for the
effect of potential confounders (need factors) are required to fully understand health inequalities
and its determinants [2, 4].”

Reviewers’ comment

Methods

Data

The study participants were interviewed after written consent was taken. This sentence may not
be required. 1st, it may be part of ethical issues; and 2nd, it seems you yourself managed to get
written consent from study participants.

Authors’ response:

We accept this comment and removed the sentence from the manuscript.

Reviewers’ comment

Socioeconomic status: Do you believe that variables such as refrigerator, television, motorcycle,
and bicycle are relevant for PCA in rural settings in Ethiopia? How did you determine the
variables to be included in the PCA?

Authors’ response: Thank you for this important comment. Wealth index in the 2016 survey is
computed taking into account variables that are relevant to rural and urban independently.
However, many of such variables that could indicate wealth status of rural residents were
missing from the 2000 EDHS survey making separate wealth index analysis not possible. Thus,
we have constructed nation-wide wealth index for 2000 data [5]. Although both nation-wide
wealth index and “urban - rural” segregated computations are common, both have their own
advantages and limitations. The nation-wide (global) method is preferred over “rural-urban’
segregated as it makes comparison meaningful because similar variables common to both urban
and rural are used and criticised for its attempt to determine wealth index using variables not
meaningful in a particular location. On the other hand, comparison using urban-rural segregated wealth index is not suitable as wealth index for rural and urban settings are computed based on different sets of variables. However, we have indicated these methodological differences between the year 2000 and 2016 in the main text (Discussion section, paragraph 2, last line) “. However, it should be noted that the computation of wealth indices for the two surveys is different with urban-rural differences taken into account in the 2016 survey”.

Reviewers’ comment

Measures: The 2000 and 2016 definitions for Skilled Birth Attendants (SBA) and Postnatal Care (PNC) are not similar. In this case, how did you manage the bias related to the definition itself? For example in SBA definition, health officers are included in the 2016; and for PNC, the definition was postnatal check-up within two days after delivery for the last birth in five years preceding the survey except for the 2016 surveys (within two years preceding the survey). From this we can understand that the variation might be due to the differences in definitions other than in terms of other characteristics.

Authors’ response

It is true that there were some differences in the definition of these variables between 2000 and 2016 surveys, which we have now discussed it as a limitation. (Discussion section, paragraph 7, line number 8-11)

Reviewers’ comment

Line 28-33: Throughout this paper yes ANC, SBA, and PNC services utilization represent when women attended the services according to the above-mentioned definitions but no indicates that women did not utilize the service. You can modify it as follows: Throughout this paper, ANC, SBA, and PNC services utilization represent "Yes" if women attended the services according to the above-mentioned definitions and "No" if otherwise. Here, it would be nice if the authors described the definitions rather than referring back to the previous definitions.
Authors’ response: We removed the sentence realizing that it was a repetition. (Methods section, measures sub-section)

Reviewers’ comment

Explanatory variables descriptions: The explanatory variables were women low wealth status, rural resident, education, occupation, mass media exposure, respondent current age and current marital status. You can modify it as follows: The explanatory variables were women wealth status, resident, education, occupation, mass media exposure, respondent current age and current marital status.

Authors’ response

We have revised the main text as suggested. (Methods, explanatory variable description)

Reviewers’ comment

Results: check percentage of age categories: it should be 100%.

Authors’ response

We have corrected this section. (Results section, table 1)

Reviewers’ comment

Discussion: Generally, the likelihood of ANC, PNC, and SBA services utilization increased significantly among better-off than poor women from 2000 to 2016. This sentence is not convincing. You compared the ANC, PNC and SBA services utilization for the two periods 2000 and 2016. The word from 2000 to 2016 may not be appropriate.

Authors’ response

We have revised as suggested (Abstract result, plain English abstract, discussion section, paragraph 1)
“Compared to the baseline, 2000 survey; the likelihood of ANC, SBA and PNC services utilization was significantly higher among better-off than poor women in 2016”.

Supplementary material

Figure 1: ANC service utilization gap trend among poorest and richest population, in Ethiopia from 2000 - 2016.

Figure 2: SBA service utilization gap trend among poorest and richest population, in Ethiopia from 2000 - 2016.

Figure 3: PNC service utilization gap trend among poorest and richest population, in Ethiopia from 2000 - 2016.

Reference


5. Wealth Index Construction [https://www.dhsprogram.com/topics/wealth-index/Wealth-Index-Construction.cfm. ]