Peer Review Report

Review Report on Evolving Landscape of Modern Contraceptive Use in Ethiopia: A Two-Decade Analysis

Original Article, Int. J. Public Health

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EVALUATION

Q 1 **Please summarize the main findings of the study.**

The study examines the trends and determinants of modern contraceptive use among married women in Ethiopia using data from the Ethiopian Demographic and Health Surveys (EDHS) from 2000 to 2019. The analysis reached 36,969 married women. The paper reveals a notable increase in contraceptive use over the past two decades. However, significant regional disparities persist, highlighting the need for targeted interventions to improve access and utilization of family planning services. The key findings indicate that socioeconomic factors, including wealth, residence, age, education, and number of children, were strongly associated with modern contraceptive use. Notably, the study observed the most substantial increase in contraceptive use among young women aged 15–24. To address the ongoing challenges and disparities in contraceptive use, the study proposed a tailored contraceptive intervention at both individual and community levels. These interventions should focus on increasing awareness, improving access to quality services, and addressing social and cultural barriers.

Q 2 **Please highlight the limitations and strengths.**

The study attempted to incorporate both individual- and community-level factors, how ever, the list of factor are not exhaustive and other potential factors such access to health services, and socio cultural, behavioral factors were not included. The data was solely based on self-reports, the potential for social desirability bias. The authors did not checked for a potential interaction or effect modification between the variables used in the model.

Q 3 **Please provide your detailed review report to the authors. The editors prefer to receive your review structured in major and minor comments. Please consider in your review the methods (statistical methods valid and correctly applied (e.g. sample size, choice of test), is the study replicable based on the method description?), results, data interpretation and references. If there are any objective errors, or if the conclusions are not supported, you should detail your concerns.**

Dear Authors,
- I am happy to read your manuscript about this important issue. The paper explores interesting topic about "Trends and Associated Factors of Modern Contraceptive Use in Ethiopia Between 2000 and 2019". This is important article talking about modern contraceptive use among married women. I strongly believe understanding the trends and factors associated with modern contraceptive use in Ethiopia is crucial for developing effective reproductive health interventions and policies.
- Please carefully consider the following comments/suggestions

Title: The topic could be made more catchy. I could suggest "Evolving Landscape of Modern Contraceptive Use in Ethiopia: A Two-Decade Analysis"

Abstract:

The statement “The Health Extension Program in Ethiopia has promoted modern contraceptive use among married women for two decades”. Where is this generalization from? I don’t see any supporting evidence from your findings and in fact not part of your objectives

Introduction:
The authors failed to mention important global and national FP agendas in the paper: The SDGs and the Ethiopian ministry of health FP policy are totally forgotten. More specifically about “Ethiopia FP 2020” aimed to reduce the high fertility rate to 3.0 by 2020.
Line 34: what does “work” mean, is it referring to being employed or type of job
Line 52: It is clear that pregnant women are not expected to be on contraceptives. The question rather would be why unmarried women and adolescent girls are excluded from the study. This is also corroborates with study findings where the greatest use of contraceptive was reported among youths aged 15-24
Line 53-55: I think there is no need to mention specific goals for the study as this can be rewritten as the objective of the study in line 50-52.
Line 88: The statement “Literature review served for the selection of explanatory….”. make the statement full.
Why only two level classification of variables as individual and community level was chosen? Did the authors considered latent class analysis model (LCA) to estimate class membership probabilities based on BIC score. Even though it is possible to conduct a two level class membership for a very basic multilevel analysis, it is important to note that the power of multilevel modeling increases with more levels (three or more) in the hierarchy. With only two levels, the benefits may be more limited, and you need to reconsider other statistical techniques depending on your research question and data structure.
Line 95: number of births in the last three years, why it is limited to only for last three years? Is it because the DHS data set is available in this form.
What criteria did the authors used to separate individual level and community level factors? To my understanding, exposure to radio, TV, newspapers, visits to health facilities might be strongly related to access factors (electricity, road access, and nearby health facilities) in the community.
What does community-level religion mean in the statement from line 101 through 110? This paragraph is not entirely clear to the readers.
I appreciate that the authors used a weighted analysis, which is a common and effective technique to address potential biases in such national survey data. However, the accuracy of a weighted analysis heavily relies on the quality and reliability of the auxiliary data used to estimate the weighted average. Because of the nature of a secondary data, the probability of inaccurate or incomplete auxiliary data can lead to biased estimates. How the authors did considered this limitation the analysis?

The authors used the lower AIC and BIC score to choose the best model fit that is the one that provides the most accurate and stable predictions. Of course AIC and BIC are important criteria they should be used in conjunction with other models. What the authors did in a scenario where a model exhibits a lower AIC but a higher BIC, or vice versa, it indicates a trade-off between model fit and complexity which is not avoidable in larger data sets.

Result
Some of the percentages are presented with absolute numbers and some are not , see line 165-167 make it uniform
Line 173-180; include the percentages to clearly show the increment
Line 196: The AIC value for each survey year was smallest in the fourth model (Model III/combined model), which incorporated both individual- and community-level factors. Is it fourth model or third model?
Line 212-213: Please include the percentage and CI for the statement “The higher a woman's educational level, the greater her odds of using modern contraceptives”.
Line 217-224: Same problem, the whole paragraph lacks the percentage and CI. Please be consistent throughout reporting the findings.
Line 218-222: I foresee a potential interaction effect or effect modification between the two variables used. This interaction effect occurs when the effect of one variable on an outcome depends on the level of another variable. It is clear that those women who had visited a health facility will more likely to use contraceptives. Again, woman whose husband is looking for more children will put a woman to discontinue using contraceptives. It creates a synergistic relationship between two variables, where their combined effect is

greater than the sum of their individual effects. Thus, I strongly suggest the authors to check for a potential interaction or effect modification between the variables used in the model.
Line 227-235: Same problem, the whole paragraph lacks the percentage and CI.
Line 229: why Tigray region is used as a reference category? The authors reported Addis Ababa, Dire Dawa, and Harari vs Somali region to compare the prevalence of contraceptive use in the abstract and discussion sections. Again, it is not clear at which phase was this statistically significant variation seen where Somali region scored the lowest percentage. The percentage point in Afar also looks far lower (6.5) and I think it is important to bring this in the findings and discussion section.
Line 246/247: In the statement "...we have broadly divided the trend period into two phases: phase 1 (2000-2011) and phase 2 (2011-2019)" where is the year 2011 included?

Discussion
Line 340-343: The statement from "Despite the significant rise in the use of modern contraceptives in Ethiopia, significant regional variation persists. This suggests the need for enhanced focus on family planning services, thereby promoting more equitable access across the country" is inappropriately placed. Take it to conclusion and recommendation section. Again, the recommendation to promote equitable access is not part of the study, not considered in the analysis.
- The discussion should be clearly based on the key findings. Key findings are either missed or new findings are introduced in this section
- I would recommend the authors to split the section in to different paragraphs based on key findings. As currently written, the text is disjointed and does not provide a coherent summary of key findings.
- Line 328-333: what do the authors think about the flagship Ethiopian health extension program? This is never mentioned in the discussion section but in the abstract does.
- Why FP Percentage point difference decreased from 1st decade to 2nd decade (22.4 vs 16.1) in table 2. Does this important finding mentioned in the result and discussion sections?
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Conclusion: this section needs to show key determinant variables at both
Line 351: The term reproductive health services needs to be replaced with family planning services

Table 2:
- The cut points are not clear. In which decade does the year 2011 belongs and also 2019?
- What is primary, secondary and higher education mean.
- Which religions are categorized as "others?"
- Why only FP message via media is chosen? Why not Health information from health care providers, Health extension workers, families, school, friends....
- I see that newly formulated regions in Ethiopia are not included in the paper. I understand the reason but the authors needs to make this clear to avoid misunderstanding
Table 3:
Experience of terminated pregnancy is shown to have negative effect on FP use in 2011 and 2016 model. This is important finding but not discussed

Minor: The paper requires extensive rewrite, coherence, and proofreading for errors in English language.

PLEASE COMMENT

Q 4 Is the title appropriate, concise, attractive?

I feel that the title could be made more catchy. I could suggest "Evolving Landscape of Modern Contraceptive Use in Ethiopia: A Two-Decade Analysis"

Q 5 Are the keywords appropriate?

More explanatory key words could be added: Demographic and Health Surveys (EDHS), Multilevel analysis, Regional disparities

Q 6 **Is the English language of sufficient quality?**

No. I would recommend a native English speaker for proofreading for English-language fluency, grammar, punctuation, capitalization required through the entire paper.

Q 7 **Is the quality of the figures and tables satisfactory?**

No.

Q 8 **Does the reference list cover the relevant literature adequately and in an unbiased manner?)**

The authors failed to mention important view points the paper: The global SDGs and the Ethiopian ministry of health contraceptive policy are not included. More specifically about “Ethiopia FP 2020” aimed to reduce the high fertility rate to 3.0 by 2020.

QUALITY ASSESSMENT

Q 9	**Originality**	■■■□□
Q 10	**Rigor**	■■■□□
Q 11	**Significance to the field**	■■■■□
Q 12	**Interest to a general audience**	■■■□□
Q 13	**Quality of the writing**	■■□□□
Q 14	**Overall scientific quality of the study**	■■■■□

REVISION LEVEL

Q 15 **Please make a recommendation based on your comments:**

Major revisions.