Reviewer's report


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Reviewer: Heribert Ramroth

Reviewer's report:

Title: Trends in neonatal morality and assessment of associated risk factors in … Ethiopia.
Authors: Gizaw et al.

The authors describe mortality trends over a period of around 20 years, which might not be available so far for Central Ethiopia.
Thus, it is a relevant paper, but the analyses and the paper require some major revision.
Main comments are listed below. Minor comments will be found in the text.

Major Compulsory revision:
- The multivariable Poisson regression model has to be recalculated, following a standardized selection process. If already done so, please mention this in the methods and exclude those variables from the resulting table 2.
- The trend analyses have to be recalculated, to test for breakpoint in linear regression /"segmented regression".
- Both analyses will influence results and regression.

English: possibly be checked is not enough. Please give the manuscript to a native speaker or a proofreading service!
Examples:
- “over the pool 20 years”
- “uneven variations in … across neonatal period”
- Page 8, first paragraph, please check the English language.
- “Those who were born to mothers living in thatched roof adjusted IRR..”
- “The confidence intervals .. was wide..”
- “This finding justifies that we can a lot of work needs to be done…”

Minor essential revisions:

Abstract:
- Intro: English: “a 22 years dataset” please reformulate
- Methods: “with the objective”
- Results: decimals: please be consistent: 1 decimal only.
- Results: The 3rd sentence doesn’t flow: “Male neonates …, distance…, …were more likely to die. (please reformulate).
- Conclusion: “and individual level factors, which significantly influence neonatal mortality”. Please name these factors, this is your conclusion.

Methods:
The chosen moving average method has to be described here (including the chosen weights).

Results:
To answer the comment: if the risk of dying is higher at the end of the period, there might be a trend. But a variation deals with confidence intervals. Thus, it is still not clear to me and might not be to the reader what is meant by this.

Page 8, 1st para: I do not agree with the results of showing an incremental mortality trend first, and declining larger. This seems to be a bit artificial, depending on the cutpoint chosen. The authors state that their analysis doesn’t show any trend (which seems to be obvious). Thus, there is no base for an increase first, followed by a decrease. The authors might discuss the possibility of changing quality of data over the years, especially for the first years, as it can be often observed using DSS data.

For the trend analyses, it is required to conduct an analysis in which trends are allowed to vary over time, as it appears that the trend is not constant throughout. “Testing for a breakpoint in linear regression.” However, the authors chosen cut point seems not to be a methods driven cutpoint.

In the second paragraph for the trend analysis, the authors show an overall increasing trend, although not significant. These are the same data points, this time only cumulated using a 4-year moving average. This might be sufficient to be reported (data not shown). However, the weights chosen for the moving average methods are not introduced (has to be done in the methods section). Nevertheless, this result contradicts the first two trend analyses, driven by the chosen cutpoint.

Page 8, last para: Multivariate analyses should be explained. How was the selection process done? Are all other variables listed used for the adjusted analyses? And if so, why? Why were non-significant variables not excluded?
In the methods, the selection of variables sounds a bit arbitrary, but not systematic, how it should be.
So, please use some selection process (backward, etc.). What about the final model, excluding the non-significant variables (as they cover effects from the other ones).

Discussion:
The discussion might change again, after redoing the multivariable Poisson regression model!

Conclusion:
- again: “and individual level factors, which significantly influence neonatal mortality”. Please name these factors, this is your conclusion.

1. Is the question posed by the authors well defined? - yes
2. Are the methods appropriate and well described? - no
3. Are the data sound? - yes
4. Does the manuscript adhere to the relevant standards for reporting and data deposition? –yes
5. Are the discussion and conclusions well balanced and adequately supported by the data? - no
6. Are limitations of the work clearly stated? …
7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished? - yes
8. Do the title and abstract accurately convey what has been found? - yes
9. Is the writing acceptable? - no

Level of interest: An article of importance in its field

Quality of written English: Not suitable for publication unless extensively edited

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:
'I declare that I have no competing interests