Reviewer's report

Title: Determinants of ANC adequacy in rural versus urban: results from two health and demographic surveillance sites in Vietnam

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Reviewer: Mats Malqvist

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Review of manuscript
Determinants of ANC adequacy in rural versus urban: results from two health and demographic surveillance sites in Vietnam

Thank you for your manuscript about determinants of ANC care and adequacy in Vietnam. As you point out there is not so much research performed on the determinants of ANC care and that makes your manuscript a valuable contribution to the field.

Some comments:

Title: “ANC adequacy” is not defined in the title, maybe think of another title summarizing your main findings instead

1. p4: In the first sentence of the background it is stated that 4 million neonates die every year. I am not able to find this figure in the reference cited, please select another reference, like Black, R. E., S. Cousens, et al. (2010). "Global, regional, and national causes of child mortality in 2008: a systematic analysis." Lancet 375(9730): 1969-1987. It is estimated that the figure is lower than 4 million due to the latest years’ of attention and progress.

2. p4: It is stated that three ANC visits are recommended in Vietnam. How does this relate to WHO recommendations, and why is it different? Are there any special recommendations on a minimum of ANC services? Is for example ultrasound considered feasible for all? On p 8 and 9 this is discussed somewhat, maybe move and extend this part to the background.

3. p6: In the methods section you mention distance to health facilities. Please state what measure is given, sis it straight-line distance or road distance? And how has it been calculated?

4. p7: For data quality a random sample of three percent were re-interviewed. Do you have any figures on the accuracy? Maybe not needed to be presented in the paper, just for personal curiosity.

5. p7: One of the criteria for high risk pregnancies are defined as nullipara. In the results 11-13 % are defined as high risk, but there are around 50 % nullipara in the material. Please correct.
6. p8: Please present how the wealth index was calculated. Was PCA used? Or any other logarithm?

7. p8: The division into low, middle and high economic condition I find a bit troublesome. The definitions differ for Bavi and Doda, yet they are presented in table 3 as comparable. And what is the division based upon, are there any socio-demographic data that can be used as reference?

8. p8: What role does distance have to the classification of economic condition. Is this considered in the results?

8. p8: I am lacking any reference to ethnicity in the manuscript. If the two sites are ethnically homogenous I think it should be mentioned and the implications that this will have for the results need to be discussed. If there are ethnic minority groups within the sites it also needs to be taken into consideration, especially for the analysis. Ethnic minority mothers are known to have a lower level of health system utilization and it could be confounding the results.

9. p9: It is stated that all variables were included in the multivariate analysis (which is presented in table 3). This seems to be a bit crude and a number of objections can be made to this approach:

- The relation between different variables are not taken into account, such as parity and age, which are by logic bound to co-incide. Also household economic status and community condition have been stated in the method section to co-incide. These correlations will affect the regression analysis if all are included.


10. p10: The tables 1 and 2 are a bit difficult to read, especially the marks for significance. Please see if it can be presented in a clearer way. Is it possible to form groups, for example it is reasonable to believe that women with low education are also more likely to be self employed and poor and live in a community with a low condition? If it is the same women in all these groups maybe all of them need not to be presented.

10. p10: As noted before, I lack the ethnicity variable in the results.

11. p11: Are there any possibilities to do interesting stratifications of the material like to look at the group that used only public services for example, or the group of women with low education.

12. The discussion I find interesting and covering what can be expected. It is a bit long though and could benefit from some sub-headings that can focus the
discussion to specific areas.

In general I think the manuscript has a good potential, but needs to be a bit more focused for readability and the comments above need to be addressed.

Yours sincerely

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**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests