Author's response to reviews

Title: Individual and Community Level Determinants of Childhood Full Immunization in Ethiopia: A Multilevel Analysis

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Version: 5
Date: 12 May 2015

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Responses to Major and Minor Comments [All the responses are based on the first draft of the manuscript submitted to the BMC]

1. We have strictly reviewed the whole sections of the manuscript to reduce the grammar and punctuation mark errors.
2. Study area which was discussed under Methods Section (line 94-104, page 5) of the manuscript was shortened and moved to background section.
3. Categorization was done for continuous variables using information from different literatures (line 137, page 6)
4. The reason for using P-values and 95%CI independently to assess the effect of IV on the outcome is the 95% CI is used to calculate the interval estimate of the significance while the P-value estimates the single point estimate of significance.
5. Since we have used secondary data for this analysis the immunization status of the child was already collected by the owners of the data (Ethiopian Demographic and Health Survey) using both sources of report. This is the main reason that we have mentioned it as a limitation under discussion section (line 395-397, page 21).
6. Stepwise regression analysis was used to fit the model (line 162-175, page 8), simply by removing independent variables that become insignificant during insertion of every other independent variable to the model
7. Interactions between individual level and separate community level characteristics were added to the models to test whether the community level characteristic effects on full immunization were modified by individual level characteristics.
8. Although there are many methods to treat missing data, the authors had agreed to exclude observations having missing data.
9. We have provided information on missing data under table 1a and 1b
10. Regarding the inclusion of the last child as study participant, The Ethiopian
Demographic and Health Survey had collected data on children 12-59 months which dictates the probability of the child being included in the study to be in the last or other birth order.

11. Throughout the whole document of the manuscript we have substituted $P$-Value$=0.000$ with $P$-Value $< 0.001$

12. As indicated under model specification (line 149-175, page 7-8) since the model was built by stepwise regression independent variables which were not significant during model development would not be candidates for the final model; therefore non significant variables were not included under the discussion. In addition to this, some observations were excluded from the final analysis to full fill the concept of minimum 5 observations per cluster, because clusters having less than five observations are not valid candidates for the multilevel analysis as suggested by some literatures.

13. According to this study, number of under five years children and child birth order were two different independent variables; the analysis result had depicted that the number of under five years children in the household was significantly associated with childhood immunization (line 309-323 page 17-18)

Number of Under Five Children:
• It is a continuous type of variable
• Total number of children resident in the household and aged 5 years and under.
• Used to check association between full immunization status of the child in the study (12-59 months) and the number of under five years children in the household

Children Birth Order
• It is a categorical type of variable
• It is the birth order of the child, having values ranging from 1 to 18, categorized as $0 =$ first birth; $1 = 2$nd - $4$th ; $2 = 5$th and above
• Used to check association between full immunization status of the child in the study (12-59 months) and his birth order (whether he is first, second to fourth or fifth and above)