Reviewer’s report

Title: An outline of anemia among adolescent girls in Bangladesh: findings from a cross-sectional study

Version: 0 Date: 14 Mar 2017

Reviewer: Sharon Cox

Reviewer's report:

General comments:

This paper describes a cross-sectional study to assess the prevalence of anaemia in adolescent girls in Bangladesh and investigate social and reproductive status risk factors along with protein energy malnutrition, correctly using BMI-for-age z-score. The manuscript is sometimes lacking in clarity and there are errors in presentation of the data, but overall the methods are appropriate and basic interpretations of the statistical results correct. The results could be a little more critically discussed considering the somewhat surprising finding that pregnancy was protective for anemia.

From the methods, it appears that the sample was selected to be representative of the Bangladeshi population of adolescent girls. Can more details be provided (or reference made to a publically available protocol for the "multistage, cluster sampled, nationally representative cross-sectional survey" (p6 lines 109-110) from which this study population was drawn? For example, only 15% of the sample were designated as "urban" is this representative of Bangladesh? According to World Bank country data it was 34% in 2015.

How was the sample size of 1,314 arrived at for this sub-study? On what basis were the 1314 girls selected from the 4,536 adolescent girls in the main survey households?

Abstract: minor comments.

1. Lines 44-48. Suggest rewriting - don't include repeat the covariates for which you report the AOR in the text here. Were any of the co-variates included in models "a priori"?

2. Line 47 - Define "poverty" in the text as 1.54 is the AOR of the bottom wealth quintile compared to the richest quintile.
Introduction: minor comments:

1. line 65. Suggest rewording to "though anemia has multifaceted etiology, the most common contributing factor is iron deficiency". Otherwise it reads as if you are suggesting that iron deficiency is the distal cause of all anaemia, even if other factors are also involved.

2. Line 72 - SCD is most common in Africa. Are any of these inherited disorders common in Bangladesh?

3. Lines 77-81. Are there any studies that suggest that cognitive defects in iron deficient adolescents or adults can be reversed by iron supplementation/improvement in anemia?

Methods: minor comments:

1. Lines 113-114 The text reads to suggest that all the adolescents in the survey were mothers of children under 5, revise to improve clarity.

2. Line 122 - what version of ODK was used? What is meant by "7" android?

3. Lines 125-140 - Was ODK being used offline during data collection or online. If offline, how often was data uploaded? Where was he ODK server hosted and who maintained it? Can you give any specific examples of het the QC checks and data validation?

4. Lines 151 - finger prick is "capillary" blood - not venous.

5. Line 163 - "stadiometer"? Make? Or were these made locally by local artisans? If so - How were different ones compared to ensure measurements were similar across research teams?

6. Lines 174-180 - were any variables included a-priori in multivar models? What criteria was used for including variables in multivar model, what strategy was used in model building?

7. Lines 180-184 - not necessary to show the equation for multivariable logistic regression.

Results: major comment

1. Tables 2. It is more appropriate to present the percentages as column percentages. For example, present the proportion of girls who were currently married for the anemic and non-anaemic groups = 251/678 = 37% vs 252/636 = 39%.
Results: minor comments:

1. Why was pregnancy set as the baseline value for comparison in logistic regression? Pregnancy was quite rare and it would be more normal to use non-pregnancy as the baseline and compare the effect of pregnancy compared to non-pregnancy.

2. Table 2 - the numbers of currently pregnant in the non-anaemic group add up to more than the total number in this group.

3. Table 2 - the starts indicating the range of p-values are not required as the actual values are presented. Note - do not report p=0.000, report the actual value or <0.001 or <0.0001 as per author guidelines.

4. Lines 227-231 - rewrite the text more concisely. Don't repeat all the results in the text that are in the tables.

5. Lines 234-5 - interpreting an OR of 1.42 as increasing the risk by 42% is not quite correct. This is only true for risk ratios. The odds are increased by 42%.

6. Table 3 and results text for multivariable logistic regression results - see previous comments about model building and how and what co-variates were included in the final model. No results presented for age, literacy? I would suggest age should be included "a priori" and as a continuous variable in years.

Discussion: minor comments:

1. Line 252 - "the prevalence of all form (sic) of anemia were found (51.6%), most of them (45.97%) were mildly anemic …" rewrite as:

2. "mild anaemia was the most common at 46% of the study population, with only 5.4% moderately anemic and 0.23% severely anemic. Can you see the difference in these sentences? The first suggests that only 46% of the anemic cases were mildly anemic!

3. Line 258 - in the DHS anaemia data quoted - who were the study population?

4. Lines 270-78 -Critically evaluate this study in comparison to the other studies - Ref No 32? Comparable or not? Sample size?
5. Lines 300-308  -The prevalence of pregnancy was quite low in this study population compared to the 31 % reported in ref [40]. Was any data collected on if the girls had ever been pregnant? Or were breast-feeding?

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

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If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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