Author’s response to reviews

Title: Factors associated with diarrheal morbidity among under-five children in Jigjiga town, Somali Regional State, eastern Ethiopia: A cross-sectional study

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Responses for comments given by reviewer #2

Reviewer #2: Background:

The first three paragraphs of the background could be consolidated into a single paragraph describing the worldwide importance of diarrhea, and the particular relevance of Ethiopia.
Response: we have consolidated the three paragraphs in to one paragraph which describes magnitude of underfive diarrhea briefly. (Line 49, Page 3)

Response: We have revised the number of deaths to 1.3 million by taking data from the suggested references. (Line 50, Page 3)
Line 66: 90% of deaths occur in SSA and SA needs a citation
Response: we have removed the sentence.

Line 91: IMCI implementation led to a reduction in under 5 mortality needs a reference. While I agree with this in theory, I'm curious about the evidence proving this point.
Response: we have removed the sentence. (Line 75, Page 4)

Line 95/95: I would caution against using the word "cause" to describe risk factors for diarrhea as the cause is most often an enteric infection: Consider revising "Studies show that cause of occurrence of diarrhea..." to Sociodemographic, household, environmental, and host characteristics play an important role in determining risk and recovery from diarrheal episodes"
Response: we have deleted the paragraph which contains the word “cause”, and revised it with the one recommended as a replacement. (Line 79, Page 4)

Methods:
Line 119: Consider revising "majority is Muslims by religion" to, and most residents are Muslim"
Response: we have replaced the sentence "majority is Muslims by religion" with “most residents are Muslim".(Line 100, Page 5)

Line starting at 124. The sample size calculations were based on a single proportion formula, a method which is useful for a study with the goal of obtaining a precise estimate of prevalence. However, the goal of this study as I understand it was to determine correlates of diarrhea, and such an analysis requires sample size calculations which are based on the anticipated measure of association (in this case odds ratio), anticipated prevalence of diarrhea etc. Suggest either revising the sample size calculations, removing, or adapting the goal to primarily focus on estimating the prevalence of diarrhea in this setting.
Response: we initially calculated two sample sizes, one for each objective. For objective one: prevalence of diarrhea; and for objective two: predictors (risk factors) of diarrhea. Then we came up with two sample sizes. In order to increase representativeness of the sample, we chose the
larger sample size, which was the sample size calculated for the prevalence, and yielded a sample size of 530. This sample size was calculated using a prevalence of diarrhea from a study conducted in Somali Region. (Line 106, Page 6)

In addition, we have now modified the topic to clearly indicate both the objectives as - “Prevalence and predictors of diarrheal morbidity among under-five children in Jigjiga town, Somali Regional State, eastern Ethiopia”.

Line 192: "Binary" is probably not the correct term to indicate univariate (single-predictor) models. Instead consider using the term univariate. Elsewhere in the paper the authors use bivariate.

Response: we have replaced the terms “Binary” and “Bivariate” with the word “Univariate” (Line165,167 Page 8; Line 195, Page 10)

Line 197: Please add what p-value cut-off was used to remove variables from the model when using backwards step-wise regression?

Response: we have added the p-value cut-off point. (Line 170, Page 9)

Results:

Describing the prevalence of various risk factors could be done more concisely, simply by stating only the most important ones and then referring to the tables.

Response: we have merged the three separate sub-sections under “Results” namely: “Socio-demographic characteristics”, “Environmental conditions”, and “Child characteristics and maternal hygiene behavior” in to a single paragraph referring to a single “Table 1” by stating only pertinent variables. (Line 178, Page 9)

Would suggest against using the word determinants of diarrhea, because this is a cross-sectional analysis and therefore it's not known whether these factors preceded the diarrhea or whether they are simply associated.
Response: based on the previous suggestion given by the reviewer to use either “predictors” or “risk factors”, we have replaced “determinants” with “predictors”.

Line 258-263: Consider including some estimates to substantiate the statement about some variables being associated with diarrhea

Response: we have added crude odds ratios to the variables associated upon univariate analysis. (Line 195, Page 10)

Tables 1-3 consider making into a single Table 1 which describes the population included in the study.

Response: we have merged tables 1-3 into one Table 1 which includes only pertinent variables that describe the population. (Line 387, Page 19)

Table 4. In the univariate (crude) analyses, there are numerous 95% confidence intervals that do not cross the null value of 1.0 yet there is no asterisks indicating statistical significance of 0.05, for example: the latrine being shared (OR: 0.548(95%CI: 0.305-0.987). Also table 4 does not include all the variables (ie age, feeding etc) all of which would be interesting to see the odds ratios for

Response: we have added the “asterisks” to all the significant (at p value 0.05) variables. We have also added variables which were not previously displayed in the table including: age of child, age of mother, number of underfive children with in a household, and type of latrine. (Line 390, page 22)

Discussion:

The discussion is well written and puts many of the findings in context with other studies. The limitations section could be expanded upon, such as self-report of diarrhea over a two week period which may underestimate true diarrhea (or capture more severe diarrhea only). Also, given the study was cross-sectional, for some of the factors like hand-washing, it's impossible to know if the risk factor preceded the diarrhea or whether it was changed because of the diarrhea. Another limitation is the lack of data on the distribution of pathogens among the children with diarrhea. Given some pathogens have unique risk factors and unique presentations, the
generalizability of the identified risk factors may apply only to other settings where the pathogen distribution is similar to the one in this study.

Response: we have added the three additional limitations pointed out by the reviewer i.e. the true magnitude of diarrhea being underestimated; not being able to know whether the risk factor preceded the outcome or changed because of it; and lack of data on the pathogens affecting generalizability.(Line 264, page 13)