Author's response to reviews

Title: Health care seeking behavior for diarrhea in children under 5 in rural Niger: results of a cross-sectional survey

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Author's response to reviews: see over
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Gabriella Anderson
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Dear Dr Anderson,

Thank you for reviewing our manuscript, “Health care seeking behavior for diarrhea in children under 5 in rural Niger: results of a cross-sectional survey”

We are grateful to the editors and reviewers for their insightful comments, all of which have been carefully considered and incorporated in the revised version that we are enclosing.

Please also find a point-by-point response to each of the editors’ and reviewers’ comments.

We thank you for the consideration of our work and look forward to hearing back from you.

Sincerely,

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Referee 1

1. In definitions section, last sentence reads: The diarrhea was considered severe if the child received an intravenous oral rehydration solution. I think, it should be ....intravenous rehydration solution.

   Response: This mistake was corrected and modified to ‘intravenous rehydration solution’.

2. In results section - Diarrheal episodes, the first line reads: Of the 2940 children selected for inclusion 1099 (68.0%) caregivers...here percentage of 68% needs to be rechecked.

   Response: Thanks for pointing out this mistake. The percentage was removed and the final prevalence from the weighted analysis is given later in the paragraph.

Referee 2

Major compulsory revisions

1. Background: If there are guidelines on management and referral for severe diarrhoea (from IMCI) this needs to be explained. For example, are children with severe diarrhoea given intravenous fluids and then discharged home at every level of care? Under what circumstances do the protocols advise health workers to refer children with severe diarrhea?

   Response: The IMCI- recommended management of severe diarrhea is now explained more explicitly in the introduction:
   “Diarrhea with severe dehydration is the only exception of a severe condition that does not automatically lead to referral to a hospital. In the absence of other severity signs, diarrhea with severe dehydration is managed by injection of intravenous fluid at the health center level.”

2. There is a lack of clarify in the definition of severe diarrhoea, between what is mentioned in the methods and what is mentioned in the results (do the criteria for severe diarrhoea include only unconsciousness, or is fatigue also a criterion?)

   Response: We used the definition of severe diarrhoea provided in the methods. Fatigue was reported but not used for the definition of severe diarrhoea, and we have removed it from the results to avoid confusion.

3. Results: The analysis presented is almost entirely incorrect, most of the proportions presented that can be calculated are incorrect. The analysis (including all the tables) needs to be carefully checked, redone and corrected.

   Response: As stated in the methods, proportions were calculated using sampling weights to account for the different household composition and the population of
each stratum. This explains why most of the proportions do not correspond to the ratio of numerator and denominator. We added a note to each table specifying that proportions are weighted proportions to remind the reader of the methodology.

4. All proportions presented should include a numerator and denominator

**Response:** In tables 2, 3, and 5, numerators and denominators are given either in the table or the title.
Table 1 was modified to include the number of households or respondents, which are the denominators for the proportion of households with a given number of children under 5 years of age, or the proportion of respondents with a certain education level. All other numerators and denominators are given in the table.

5. In table 1 number of education years is unclear – does this refer to the mother or the respondent?

**Response:** As now stated explicitly in Table 1, the number of education years refers to the respondent. The respondent was the mother in 94.4% of the cases, as reported in the results.

6. I do not think table 3 is relevant. There is no discussion/comment about the differences observed between districts and this is not the focus of this paper.

**Response:** We have removed table 3 from the text and added a sentence describing these results in the text, as we do think that it is important to note that similar proportions of consultations in urban and rural areas were found. This result is also mentioned in the discussion.
“In addition, the proportions were consistently high throughout districts, with no significant differences between the urban district (Maradi CU) and the three rural districts.”

7. The main message of this paper is to determine at what level surveillance of severe diarrhoea would be most effective, it is therefore important to know where those children with severe diarrhoea received care.
The authors state that 1/3 of carers sought care at health posts staffed by community health workers, is intravenous rehydration available at this level? If not, how many of the diarrhoea cases were referred and where were they referred to? Few carers sought care at the hospital but this does not mean they were not referred on to a higher level of care. It is not possible to determine from these results how many of the children received care at another level to that at which care was sought. This is mentioned in the discussion and the authors state their assumption that children in urban areas are referred but not those from rural areas, but no data is presented to support this. This makes the main conclusion of the paper inappropriate, since it is possible that all children with severe diarrhoea were referred to the district hospital and received treatment there.

**Response:** Intravenous rehydration solution is not available at the level of health posts, and referral of severe patients from health posts is recommended. This referral may be to a health center, where children may be kept overnight and IV rehydration solution administered. We documented overnight stays (hospitalization) irrespective
of where this occurred. We recognize that the absence of precise information on referrals is a limitation of this study. In addition, we agree that the assumption stated previously in the discussion that children from urban areas are referred but not those from rural areas is not documented by any strong data. As a consequence, we now base our discussion on our data that best reflects hospital stay, i.e. hospitalization for at least one night:

“Referrals were not precisely documented here, but hospitalizations for at least one night were recorded and reported in only 44% of severe cases. As this also includes patients who stayed overnight at a health center, it is an over-estimate of the proportion of severe cases who reached the hospital. This, together with the decentralized healthcare organization and recommendations for treatment of severe dehydration at the health centre level, suggests that the majority of children with severe diarrhea would be missed by a hospital-based surveillance system.”

8. The discussion should be shorter and more focussed on the main message of the paper.

Response: The discussion is now shorter and focuses on the 2 main messages of the paper: the increase in the number of consultations since 2006 and the low coverage of a hospital-based surveillance for severe diarrhea.

Minor compulsory revisions

9. The last sentence in paragraph 3 of the background paper is not clear. Please clarify that severe dehydration can be managed at the facility, and exactly at what level of care this can be done.

Response: The last sentence in paragraph 3 was modified to clarify the recommendations for management of severe dehydration (see comment 1).

10. Last sentence of definitions paragraph is incorrect not ‘intravenous oral rehydration solution’.

Response: This mistake was corrected and modified to ‘intravenous rehydration solution’.

Discretionary revisions

11. The introduction and methods could be made more succinct without losing information

Response: We have revised and shortened the introduction and methods sections.