Reviewer's report

**Title:** Country Characteristics and Acute Diarrhea in Children from Developing Nations: A Multilevel Study

**Version:** 2  **Date:** 16 November 2014

**Reviewer:** Shannon Majowicz

**Reviewer's report:**

Major compulsory revisions.

1. Throughout the paper, results (e.g., CI's, OR's) are reported to two decimal places; however, as the authors note there are instances where this is not enough to demonstrate the difference between the values. I suggest the authors report a greater number of decimal places so the reader can see how the values differ.

2. Please provide more details as to the source of the DHS and World Bank Data (e.g., reference or website).

3. I am unfamiliar with the Bernoulli regressions mentioned in the methods. Can you please explain more or give a reference?

4. Page 7, paragraph 2, what does this mean?

5. There is great repetition of the results between the text and tables, and again in the Discussion. Please consider having your results in the text or tables, but not repeated in both. Throughout the discussion, the link between your findings and other literature, as well as discussion about what the results mean was limited. Please consider including deeper discussion of the meaning of your findings. For example, you suggest that interventions should be tailored depending upon the country characteristics; how specifically would we do this based on your results? Can you give some specific suggestions about what policy makers could do differently based on your findings?

6. Did you look at interactions in your regression models? If yes, what did you find? If no, why not?

7. I am not sure I agree that your results support the importance of social determinants of health as 'causally' as you state in the discussion. It would be good to explore this further... how might GDP and income inequality lead to diarrhea as you observed? This is a very powerful study in terms of sample size and data, and a deeper discussion of the results would be helpful. Are there possible biological mechanisms that may differ between groups? Can you suggest reasons for these observed differences? What kind of expenditure WOULD you expect to decrease diarrhea, if not money invested in health? Infrastructure investment? And could you have looked at those data (i.e., was
there other economic information you could have included, not just health expenditure?

8. Please be clear in your results why you’re discussing the results of the bivariable analysis and not focusing on the multivariable results. It seems to me that you should focus on discussing results of the multivariable model only, as that adjusts for the presence of other factors. Why would you also discuss the bivariable results?

Minor essential revisions.

1. I suggest you use the term 'diarrhea' in place of the abbreviation "ADD", since ADD is a common abbreviation for Attention Deficit Disorder (and not commonly used for diarrhea), and may be confusing.

2. This paper would benefit from an editor to improve the overall english, conciseness, and flow (e.g., 'Albany' in para 2, page 4; 'data' as plural). Additionally, please spell out acronyms the first time they are used (with the abbreviation in brackets, e.g., 'gross domestic product' on page 3).

3. Please report ORs in the Abstract along with CI's

4. In the intro you reference a paper by Christa Fishcer-Walker, as being from industrialized nation(s). Is this correct?

5. The way the variables are described, starting on page 5, is difficult to read. Consider displaying in a Table? or describing in full sentences?

6. Page 6, please give the year instead of 'current' US dollars. Is it 2014?

7. How does your work relate to the work of the WHO's FERG and CHERG groups?

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

I declare that I have no competing interests.