

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Households' access to improved drinking water sources and toilet facilities in Ethiopia: A multilevel analysis based on 2016 Ethiopian Demographic and Health Survey
<b>AUTHORS</b>	Andualem , Zewudu; Dagne, Henok; Azene, Zelalem; taddese, Asefa; Dagne, Baye; Fisseha, Roman; Muluneh, Atalay; Yeshaw, Yigizie

### VERSION 1 – REVIEW

<b>REVIEWER</b>	T. Senghore School of Medicine and Allied Health Sciences, University of The Gambia, The Gambia
<b>REVIEW RETURNED</b>	07-Sep-2020

<b>GENERAL COMMENTS</b>	<p>General Remarks</p> <p>The authors have conducted a study on a very important public health issue. The findings of the study could be of relevance in addressing the WASH problem in Ethiopia. However, several issues in the paper need to be addressed or clarified.</p> <p>Minor revision Comments</p> <ol style="list-style-type: none"><li>1. Some estimates are missing in the abstract. E.g. better wealth index and region.</li><li>2. This acronym (EDHS) should be written in full the first time it is used in the main text.</li><li>3. Although the sampling procedure is else were, I suggest giving a summary of the procedure and response rate of the survey.</li><li>4. It is not clear how authors define and consider variables for use as household or community level variables. E.g In the DHS variables such as wealth index and No. of household members are aggregated at the household level. The authors used these as cluster (community level) variables. This needs to be clarified.</li><li>5. The authors did not address any ethical concerns such as permission to use the data.</li><li>6. It is not clear how variables were selected for use in the analysis.</li><li>7. The authors should include the strengths and limitations of the paper in the discussion.</li></ol>
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<b>REVIEWER</b>	Pascal Agbadi Kwame Nkrumah University of Science and Technology, Ghana
<b>REVIEW RETURNED</b>	09-Oct-2020

<b>GENERAL COMMENTS</b>	Thanks for the opportunity to review this paper on a very important global south public health issue. It is a well-written paper, and I
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	<p>have a few comments for the authors. These comments are meant to guide the authors to improve the quality of the research paper.</p> <p>Comment:</p> <p>The authors should provide context for their work. Tell the readers about previous work on the subject in Ethiopia. Are the authors the first to use the DHS data to develop a model of associated factors of access to improved water and toilet facilities? If works exist already on the subject either using the DHS or other available data (whether secondary or primary), how different is the present study from them? It will be great to identify inadequacies with previous studies on the subject and briefly indicate how your study has addressed the identified issues.</p> <p>Thank you.</p>
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### VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Comments to the Author

General Remarks

The authors have conducted a study on a very important public health issue. The findings of the study could be of relevance in addressing the WASH problem in Ethiopia. However, several issues in the paper need to be addressed or clarified.

Minor revision

Comments

1) Some estimates are missing in the abstract. E.g. better wealth index and region.

Author's Response: Thank you for the comment. Unfortunately, we can't include estimates of variables wealth index and region due to presenting limited amounts of words in the abstract section. Due to this, we are unable to include the estimates of all significantly associated variables.

2) This acronym (EDHS) should be written in full the first time it is used in the main text.

Author's Response: Thank you for the comment. We have written it in the abstract section. Page 2 line 31

3) Although the sampling procedure is elsewhere, I suggest giving a summary of the procedure and response rate of the survey.

Author's Response: Thank you for the comment. We have included detail procedures. Page 7 line 111 to 113.

4) It is not clear how authors define and consider variables for use as household or community level variables. E.g in the DHS variables such as wealth index and No. of household members are aggregated at the household level. The authors used these as cluster (community level) variables. This needs to be clarified.

Author's Response: Thank you for the comment. Wealth index and No. of household members aggregated at the household level. However, household members that share the wealth considered community-level factors. Therefore, wealth index and a number of household members are considered as community-level factors as well as previous similar studies consider as community-level variables.

5) The authors did not address any ethical concerns such as permission to use the data.

Author's response: We have stated in the declaration section of ethics approval. Page 23 lines 323 to 327.

6) It is not clear how variables were selected for use in the analysis.

Author's response: The variables selected for analysis through professional judgment and from studies conducted previously.

7) The authors should include the strengths and limitations of the paper in the discussion.

Author's Response: Thank you for the comment. Already we have included the strength and

limitations of the study in our manuscript. Page 4 line 52-59

Reviewer: 2

Comments to the Author

1) Thanks for the opportunity to review this paper on a very important global south public health issue. It is a well-written paper, and I have a few comments for the authors. These comments are meant to guide the authors to improve the quality of the research paper.

Comment:

The authors should provide context for their work. Tell the readers about previous work on the subject in Ethiopia. Are the authors the first to use the DHS data to develop a model of associated factors of access to improved water and toilet facilities? If works exist already on the subject either using the DHS or other available data (whether secondary or primary), how different is the present study from them? It will be great to identify inadequacies with previous studies on the subject and briefly indicate how your study has addressed the identified issues.

Author's Response: Thank you for the comment. We have included additional information from page 6 line 85 to 90

### VERSION 2 – REVIEW

<b>REVIEWER</b>	Thomas Senghore, PhD. University of The Gambia, School of Medicine and Allied Health Sciences, The Gambia
<b>REVIEW RETURNED</b>	15-Jan-2021

<b>GENERAL COMMENTS</b>	<p>The authors have not adequately addressed comments raised in the previous revision. Response to comments should be reflected in the manuscript.</p> <p>Comments:</p> <ol style="list-style-type: none"> <li>1. The abstract is a stand-alone report and must provide a complete summary of your findings. A 300 word limitations is enough to accommodate important findings. Other parts of the abstract could be better summarized.</li> <li>2. It is standard practice to have all acronyms be written in full the first time they are been used both in the abstract and main text as these two can be stand-alone reports.</li> <li>3. Your methodology is not clear on how you defined and considered variables for used as household or community level variables, including how variables were selected for inclusion in the analysis. This needs to be described in the methods. The methods should be comprehensive enough to allow replication. It is also an important aspect in appraising your paper. Authors should not assume that readers will know this.</li> </ol>
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<b>REVIEWER</b>	Pascal agbadi Kwame Nkrumah University of Science and Technology, Kumasi, Ghana
<b>REVIEW RETURNED</b>	16-Jan-2021

<b>GENERAL COMMENTS</b>	The authors should indicate in the abstract which of the factors were positive or negative associated with the outcome.
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## VERSION 2 – AUTHOR RESPONSE

Reviewer: 1

Comments to the Author

1. The abstract is a stand-alone report and must provide a complete summary of your findings. A 300 word limitations is enough to accommodate important findings. Other parts of the abstract could be better summarized.

Authors Responses: Thank you for the comment. We try to summarize the abstract section based on reviewers comment. Page 2 line 38 to 46

2. It is standard practice to have all acronyms be written in full the first time they are been used both in the abstract and main text as these two can be stand-alone reports.

Authors Responses: Thank you for the comment. We accept reviewers' comments and we act accordingly. Page 6 line 85 to 86

3. Your methodology is not clear on how you defined and considered variables for used as household or community level variables, including how variables were selected for inclusion in the analysis. This needs to be described in the methods. The methods should be comprehensive enough to allow replication. It is also an important aspect in appraising your paper. Authors should not assume that readers will know this.

Authors Responses: Thank you for the comment. We have included the basis of individual and community-level factors classification and we have clearly stated the outcome variables and explanatory variables. Page 8 line 115 to 131

Reviewer: 2

Comments to the Author:

1. The authors should indicate in the abstract which of the factors were positive or negative associated with the outcome.

Authors Responses: Thank you for the suggestion. We have entertained the reviewer's suggestion accordingly. Page 2 line 38 to 46

## VERSION 3 – REVIEW

<b>REVIEWER</b>	Dr. Thomas Senghore University of The Gambia, The Gambia
<b>REVIEW RETURNED</b>	17-Feb-2021
<b>GENERAL COMMENTS</b>	The authors have adequately addressed comment raised in the previous version of the manuscript. I recommend publication.