

## 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>	Vulnerability to fatal drowning among the population in Southern Bangladesh: findings from a cross-sectional household survey
<b>AUTHORS</b>	Rahman, Aminur; Jagnoor, Jagnoor; Baset, Kamran; Ryan, Dan; Ahmed, Tahera; Rogers, Kris; Hossain, Mohammad; Ivers, Rebecca; Rahman, AKM

### VERSION 1 – REVIEW

<b>REVIEWER</b>	Amy Peden Royal Life Saving Society - Australia and James Cook University, Australia
<b>REVIEW RETURNED</b>	26-Mar-2019

<b>GENERAL COMMENTS</b>	<p>Abstract: Objectives – mention drowning here – Clarify that includes both intentional and unintentional. Participants – adults only? Please reframe to capture the information from the methods in the paper proper regarding age 18+ head of household etc. Results – a typo in the CI for the male OR with a dash needed, rather than a comma. Can you also add the result for residing in a household with 4 or more children?</p> <p>Main manuscript Introduction: Page 4 – line 47 – is there any discussion around why this rose alarmingly? Is it better data?? I think an indication here of possible explanations for this increase would be helpful. Methods: Page 5 – lines 30-40 - Consider adding a map of Bangladesh to show the division in question and then districts where the survey was conducted. Measures: Page 6 – line 5 – close the inverted commas around the definition Page 6 – line 24 – Could you please add examples here of pre event, event and post drowning event risk factors to enhance readability? Data collection and procedures Was informed consent gained? Add detail here. Maybe clarify that people could answer for all household members or immediate family members? What were the reasons for non-refusal? Is there anything to be learnt for future conduct of surveys in such environments. Statistical analysis Lines 18-21 – this sentence reads as incomplete to me. Please reword. Ethical considerations It is standard practice to add the ethics approval numbers here.</p>
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	<p><b>Results</b></p> <p>Page 7 – lines 48-51 – again clarify that only those over 18 years were interviewed but they could respond on behalf of the entire household including children. If this is done in the methods, I think it will be clearer here.</p> <p>Page 10 – lines 9-13 – incomplete sentence, please re-write.</p> <p>Page 10 – individuals involved in rescue – the second half of this section doesn't relate to the heading. Perhaps needs to be in a different section. Or relate it back to mean if on their own, then no one to rescue etc.</p> <p><b>Factors associated with fatal drowning</b></p> <p><b>Discussion</b></p> <p>Page 13 – lines 17-29 – can you also comment here on why female drowning risk is higher than males in the 10-14 years age group in the discussion?</p> <p>Page 12 – line 37 – incomplete sentence please reword</p> <p>Page 13 – line 8 – probably best to explain semidiurnal as a term as it is something I am unfamiliar with</p> <p><b>Strengths and limitations</b></p> <p>An additional strength of the study is the codes used are more representative of the true burden of drowning, eg including transportation and flood related drowning (see Peden et al <a href="https://bmjopen.bmj.com/content/7/12/e019407">https://bmjopen.bmj.com/content/7/12/e019407</a> ) and intentional (see also Cenderadewi et al <a href="https://bmcpublikealth.biomedcentral.com/articles/10.1186/s12889-019-6476-z">https://bmcpublikealth.biomedcentral.com/articles/10.1186/s12889-019-6476-z</a> ) which has not been widely reported in the drowning prevention literature.</p> <p>There are no limitations listed. There must be limitations associated with this work. Are there any learnings from how the interviewers were received that would assist in future similar studies in the country or other similar studies. Any gender issues in who responded to the survey? Were men more or less likely to respond, were they more or less likely to be home when the survey was conducted? What were the limitations mentioned around the use of a tablet and lack of internet, presumably? There were surely limitations around the report of intentional drowning, in particular through a face to face survey method??</p> <p><b>Tables and Figures</b></p> <p>Supplementary files – can the survey tool be included (in English)... would give good context to the method.</p>
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<b>REVIEWER</b>	Stephen B Beerman University of British Columbia Canada
<b>REVIEW RETURNED</b>	06-Apr-2019

<b>GENERAL COMMENTS</b>	<p>Thank you for undertaking and presenting this foundational work that adds to everyone's understanding of a significant child mortality burden in Bangladesh. You have done a strong piece of work that warrants thanks and acknowledgement.</p> <p>I have some points for your consideration:</p> <p>Title: Drowning Mortality in Southern Bangladesh: findings from BHASA baseline survey</p> <p>Abstract: b</p> <p>Objective: Your method identified all mortality but you share drowning data in the tables provided. Consider sharing the overall mortality data in a short table if this can be achieved in the</p>
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	<p>publication length guidelines. Given the strong focus on drowning mortality consider placing the word drowning in line 7 - such as To determine the drowning mortality burden and associated risk factors in Southern Bangladesh.</p> <p>Participants: Not sure that the word "last" is helpful in this statement. I appreciate that your survey period was 6 months - might be better to state - All residents during the 6 month survey period -----.</p> <p>Abstract conclusion - consider minor change to line 31 with removal of "known to be" consider moving this line to an introduction. Project BHASA was established to implement a coordinated multisectoral program to prevent drowning in the Barishal division of Southern Bangladesh. Prior to the implementation of the programme, a baseline survey was conducted to determine the magnitude of drowning mortality and factors associated with fatal drowning.</p> <p>this allows to add to the conclusion and the learning from this good work that has been so well done.</p> <p>Strengths and limitations of this study. May want to comment on your level of confidence in the baseline population data as this is used for your denominator calculations so low confidence or inaccuracy in this population data has big implications to your drowning mortality rates.</p> <p>Your statement about under reporting of children under 5 mortality may benefit from a comment or words about why if that is appropriate?</p> <p>Introduction: Shortening this section from line 8-57 may be helpful. Consider not using the word "riverine" which I think is a term that is rarely used and might be better if replaced by river and large river country.</p> <p>On page 5 line 10 your state the population of Pirojpur district of Barishal is 8,147,000 - how confident are you in this and for the calculations you do later the age distribution of this would be helpful to see in a short table or statement.</p> <p>Methods "Regionally representative" - how did you do this? The survey data collection was conducted for 6 months, September 2016 to Feb 2017. 95,124 household with 386,016/8,147,000 = 4.7% of population</p> <p>Measures How was the door to door field survey data translated to ICD 10 codes - by the survey person, the software or the research office? You asked for retrospective death reporting for a 2 yr period prior to this survey - was that by date ie Sept 2014-Sept 2016 or by 2 yrs prior to the time of the face to face interaction? I am unaware of any research that would inform us if when asked to recall a catastrophic event during a time period window, is the reporter more likely to include events from before that window because of the significant memory imprinting?</p> <p>Data collection and procedures</p>
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	<p>Do you want to comment on the data quality from the data collectors??</p> <p>if 50 trainers (let me say there was only 45 per work day with sickness, absence etc for a few each day) saw 25 households per day = 1125 households per day for 24 weeks of 5 days per week = 135,000 household capacity to be surveyed. 95,124 households were surveyed - why this difference?? Did you exclude some household from the data or did you not achieve 25 households per day or not achieve 5 days per week or not achieve 24 weeks (6 months is 26 weeks)? Is there some real life factors here that are worth sharing for others who do this work in the future or in similar real world settings?</p> <p>Statistical Analysis because you display rates and not raw numbers your rates are very dependent on the denominator and that comes from a 2011 Bangladesh Population and Housing Census. That incredible and extensive census was done for 5 days in March 2011. They report the census error rate in rural areas of 3.5% and 4.5% in urban areas. The population growth in Bangladesh from 2011 to 2016 is ~2% per year or 10% in that span, this changes the denominator (larger) and reduces the reported drowning mortality rates. This issue may warrant inclusion in the study limitations section.</p> <p>Ethical considerations - thank you for having appropriate ethics approvals in Bangladesh and Australia</p> <p>Results</p> <p>Table 1 - BHIS 2016 may have over represented urban (lower drowning rates) /Table 2 - remarkably high rates - the global public health community needs this illumination I would like to see some raw numbers incorporated into these tables if that was possible.</p> <p>Figures are well done!</p> <p>Discussion pg 13 line 52 the word "aquatic" is not needed. pg 14 line 12 the word "these" is not needed. pg 14 line 35 may wish to change the term lack of adult supervision to challenges to achieve adult supervision - which is less judgemental??</p> <p>Strengths and limitations - see comments above</p>
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### VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Amy Peden

Thank you for the opportunity to review manuscript bmjopen-2018-027896 entitled “Vulnerability to fatal drowning among the population in Southern Bangladesh: findings from the baseline survey of the BHASA project”

This is an interesting study and I have a few general comments and then some specific comments for the authors to consider when drafting their revision. Overall this is a well written study and quite clear for the reader to follow. I hope that my comments will assist the authors in further improving the manuscript. Please see my comments below:

#### General comments

Throughout the results, there is inconsistent presentation of percentages as whole numbers or to one decimal place. Please make consistent throughout.

Response: Both the percentages and the rates have been presented to one decimal place.

The entire article needs a thorough proof read as there are many incomplete sentences or sentences lacking joining words to enhance readability.

Response: We have proof read the entire article and some of the sentences have been rephrased for clarity and enhance readability.

It is hard to differentiate between the unintentional and intentional in the study, although both were included as per the methods. Can further findings on the differences in the profile of drowning between the two be discussed further.

Response: During describing the ICD 10 codes we mentioned that we included intentional drowning, however, none of the fatal intentional drowning was reported in our survey

#### Specific comments to authors.

#### Abstract:

Objectives – mention drowning here – Clarify that includes both intentional and unintentional.

Response: Our broader definition of fatal drowning included both intentional and unintentional drowning.

Participants – adults only? Please reframe to capture the information from the methods in the paper proper regarding age 18+ head of household etc.

Response: “Participants” meant survey population of all ages not just the respondents. So we kept as it was previously but just included the word “residing” to clarify other Reviewer’s comment.

Participants: All residents (residing over last 6 months) of the Barishal division, Southern Bangladesh.

Results – a typo in the CI for the male OR with a dash needed, rather than a comma. Can you also add the result for residing in a household with 4 or more children?

Response: The typo has been addressed and the result for residing in a household with 4 or more children have been added.

#### Main manuscript

#### Introduction:

Page 4 – line 47 – is there any discussion around why this rose alarmingly? Is it better data?? I think an indication here of possible explanations for this increase would be helpful.

Response: Explanation is already there.

Methods:

Page 5 – lines 30-40 - Consider adding a map of Bangladesh to show the division in question and then districts where the survey was conducted.

Response: We have included a map

Measures:

Page 6 – line 5 – close the inverted commas around the definition

Response: We put the inverted commas around the drowning definition.

Page 6 – line 24 – Could you please add examples here of pre event, event and post drowning event risk factors to enhance readability?

Response: Examples given as follows

.....For all cases of fatal drowning additional information was collected on potential risk factors such as socio-demographic characteristics, access to water, and risk factors pre-event (e.g. location and type of water body, activity of the person prior to drowning, person accompanying prior to drowning, accompanying person's age) , event (e.g. time and season of drowning) and post-drowning event (e.g. time of rescue, person rescued, action taken after rescue), knowledge, attitudes and perceptions/practices related to drowning, drowning prevention and disaster preparedness. Information on all mortality, followed by all causes of injury mortality was collected.

Data collection and procedures

Was informed consent gained? Add detail here.

Response: We added.... "Information was gathered from household heads, mothers or any adults aged of 18 years or above through face-to-face interviews after obtaining written informed consent".

Maybe clarify that people could answer for all household members or immediate family members?

Response: Clarification provided - "Each selected respondent provided information of all household members including children".

What were the reasons for non-refusal?

Response: We had a very low rate of refusal, and we did not explore the reason for refusal. In the context, household survey have reported over 95% participation rates.

Is there anything to be learnt for future conduct of surveys in such environments.

Response: There are some lessons learnt which could be shared but need to be detailed in a separate document.

Statistical analysis

Lines 18-21 – this sentence reads as incomplete to me. Please reword.

Response: The sentence has been revised. "Multivariable logistic regression was used to examine associations between various socio-demographic factors with fatal drowning. Less than 1.0% of variables had missing data.

#### Ethical considerations

It is standard practice to add the ethics approval numbers here.

Response: Ethics approval numbers are included.

#### Results

Page 7 – lines 48-51 – again clarify that only those over 18 years were interviewed but they could respond on behalf of the entire household including children. If this is done in the methods, I think it will be clearer here.

Response: We addressed this in the method section.

Page 10 – lines 9-13 – incomplete sentence, please re-write.

Response: The sentence has been re-written

"Among children aged 1-4 years most fatal drownings occurred between the hours of 12 p.m. and 4 p.m. (58.0%) which was followed by 8 a.m. to 12 p.m. (31.0%) (data not shown)".

Page 10 – individuals involved in rescue – the second half of this section doesn't relate to the heading. Perhaps needs to be in a different section. Or relate it back to mean if on their own, then no one to rescue etc.

Response: We made two different sections

#### Discussion

Page 13 – lines 17-29 – can you also comment here on why female drowning risk is higher than males in the 10-14 years age group in the discussion?

Response: The difference is not statistically significant as the CI's are very wide.

Page 12 – line 37 – incomplete sentence please reword

Response: Revised

Page 13 – line 8 – probably best to explain semidiurnal as a term as it is something I am unfamiliar with –

Response: Revised

#### Strengths and limitations

An additional strength of the study is the codes used are more representative of the true burden of drowning, eg including transportation and flood related drowning (see Peden et al <https://bmjopen.bmj.com/content/7/12/e019407> ) and intentional (see also Cenderadewi et al <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-019-6476-z> ) which has not been widely reported in the drowning prevention literature.

Response: As suggested by the reviewer the above two references have been incorporated.

There are no limitations listed. There must be limitations associated with this work. Are there any learnings from how the interviewers were received that would assist in future similar studies in the country or other similar studies. Any gender issues in who responded to the survey? Were men more or less likely to respond, were they more or less likely to be home when the survey was conducted? What were the limitations mentioned around the use of a tablet and lack of internet, presumably?

There were surely limitations around the report of intentional drowning, in particular through a face to face survey method?? –

Response: We included the challenges of using tablets and internet. A separate paper will address the operational challenges of collecting this kind of data in the field.

Tables and Figures

Supplementary files – can the survey tool be included (in English)... would give good context to the method.

Response: we have included the survey tool (in English)

Reviewer: 2

Reviewer Name: Stephen B Beerman

Institution and Country: University of British Columbia Canada Please state any competing interests or state 'None declared': No competing interests

Please leave your comments for the authors below Thank you for undertaking and presenting this foundational work that adds to everyone's understanding of a significant child mortality burden in Bangladesh. You have done a strong piece of work that warrants thanks and acknowledgement. I have some points for your consideration:

Title: Drowning Mortality in Southern Bangladesh: findings from BHASA baseline survey

Abstract: b

Objective: Your method identified all mortality but you share drowning data in the tables provided. Consider sharing the overall mortality data in a short table if this can be achieved in the publication length guidelines.

Response: We need to consider the length of the paper, and therefore we did not include any other table.

Given the strong focus on drowning mortality consider placing the word drowning in line 7 - such as To determine the drowning mortality burden and associated risk factors in Southern Bangladesh.

Response: We have included the word "drowning" in the objective.

Participants: Not sure that the word "last" is helpful in this statement. I appreciate that your survey period was 6 months - might be better to state - All residents during the 6 month survey period -----  
The reviewer did not get the point.

Response: We have revised it.

Abstract conclusion - consider minor change to line 31 with removal of "known to be"



consider moving this line to an introduction. Project BHASA was established to implement a coordinated multisectoral program to prevent drowning in the Barishal division of Southern Bangladesh. Prior to the implementation of the programme, a baseline survey was conducted to determine the magnitude of drowning mortality and factors associated with fatal drowning. this allows to add to the conclusion and the learning from this good work that has been so well done.

Response: We have revised the conclusion.

Strengths and limitations of this study.

May want to comment on your level of confidence in the baseline population data as this is used for your denominator calculations so low confidence or inaccuracy in this population data has big implications to your drowning mortality rates.

Your statement about under reporting of children under 5 mortality may benefit from a comment or words about why if that is appropriate? –

Response: We have explained.

Introduction:

Shortening this section from line 8-57 may be helpful. Consider not using the word "riverine" which I think is a term that is rarely used and might be better if replaced by river and large river country.

Response: We consider that the content will be helpful for the readers and would like to keep section We revised the sentence and did not use the word "riverine".

On page 5 line 10 yo. ur state the population of Pirojpur district of Barishal is 8,147,000 - how confident are you in this and for the calculations you do later the age distribution of this would be helpful to see in a short table or statement.

Response: 8,147,000 is the population of Barishal division not Pirojpur.

Methods

"Regionally representative" - how did you do this?

Response: Instead of "regionally" we revised it as Representative of the Division

The survey data collection was conducted for 6 months, September 2016 to Feb 2017. 95,124 household with  $386,016/8,147,000 = 4.7\%$  of population.

Response: We are unsure of reviewers concern here. Kindly clarify.

Measures

How was the door to door field survey data translated to ICD 10 codes - by the survey person, the software or the research office?

Response: In the questionnaire we included those as drowning deaths which were caused by the following external cause codes from Chapter XX ICD-10[10, 12]: codes W65 – W74 (unintentional drowning), X36 – X39 (exposure to forces of nature –water related, V90 (drowning or submersion due to accident to watercraft), V92 (drowning and submersion due to accident on board watercraft, without accident to watercraft), X71 (intentional self-harm by drowning and submersion) or X92 (assault by drowning and submersion while in bath tub).

You asked for retrospective death reporting for a 2 yr period prior to this survey - was that by date ie Sept 2014-Sept 2016 or by 2 yrs prior to the time of the face to face interaction? I am unaware of any research that would inform us if when asked to recall a catastrophic event during a time period window, is the reporter more likely to include events from before that window because of the significant memory imprinting?

Response: It was from the day of interaction, and whilst there is an issue of recall bias previous literature from Verbal autopsy reporting cause of death has shown high validity (<https://pophealthmetrics.biomedcentral.com/articles/10.1186/s12963-016-0105-1>). High sensitivity is reported in conditions requiring a symptomatic history for diagnosis, within 12 months however for conditions like injury and cancers, high sensitivity is reported for up to 3 years.

#### Data collection and procedures

Do you want to comment on the data quality from the data collectors??

if 50 trainers (let me say there was only 45 per work day with sickness, absence etc for a few each day) saw 25 households per day = 1125 households per day for 24 weeks of 5 days per week = 135,000 household capacity to be surveyed. 95,124 households were surveyed - why this difference?? Did you exclude some household from the data or did you not achieve 25 households per day or not achieve 5 days per week or not achieve 24 weeks (6 months is 26 weeks)? Is there some real life factors here that are worth sharing for others who do this work in the future or in similar real world settings?

Response: We agree that there is significant methodological learning from this paper however not feasible to include this here

#### Statistical Analysis

because you display rates and not raw numbers your rates are very dependent on the denominator and that comes from a 2011 Bangladesh Population and Housing Census. That incredible and extensive census was done for 5 days in March 2011. They report the census error rate in rural areas of 3.5% and 4.5% in urban areas. The population growth in Bangladesh from 2011 to 2016 is ~2% per year or 10% in that span, this changes the denominator (larger) and reduces the reported drowning mortality rates. This issue may warrant inclusion in the study limitations section.

Ethical considerations - thank you for having appropriate ethics approvals in Bangladesh and Australia

#### Results

Table 1 - BHIS 2016 may have over represented urban (lower drowning rates) /Table 2 - remarkably high rates - the global public health community needs this illumination I would like to see some raw numbers incorporated into these tables if that was possible.

Figures are well done!

#### Discussion

pg 13 line 52 the word "aquatic" is not needed.

pg 14 line 12 the word "these" is not needed.

pg 14 line 35 may wish to change the term lack of adult supervision to challenges to achieve adult supervision - which is less judgemental??

Response: We addressed all the above suggestions for the Discussion section.

**VERSION 2 – REVIEW**

<b>REVIEWER</b>	Amy Peden Royal Life Saving Society - Australia, Australia
<b>REVIEW RETURNED</b>	10-May-2019

<b>GENERAL COMMENTS</b>	<p>Thank you for the opportunity to review manuscript ID bmjopen-2018-027896.R1. I believe most of my revisions have been actioned appropriately. While the authors say the manuscript was proof-read, there remain grammar issues and several sentences that could be revised, which I hope I have captured below, alongside some other minor comments based on the revised manuscript:</p> <p>Mortality not morbidity so why not be clear its fatal drowning? Specific comments:</p> <p>Abstract – participants – reword residing – I wasn't sure what this meant, the survey went over a 6 months period or they had to have been residents for a minimum of 6 months prior to being surveyed?</p> <p>Abstract – intervention – line 3 – data were not data was</p> <p>Abstract – results – household four or more children but the results seem to relate to age of child? I find this confusing – is this mean to be a 4 or more child household and a 5 or more child household or mortality among four year olds in a four child household – which I think is a little odd? Please clarify and re-word.</p> <p>Strengths and limitations – learnings are drawn out as a key finding but should also be further challenges summarised here?</p> <p>Introduction – page 4, line 33-35 – duplicate use of every day, please reword.</p> <p>Introduction – page 5, line 22 – this should be fatal drowning here, as I don't see any non-fatal drowning reported in the study.</p> <p>Methods – statistical analysis – consider define upazilas for those not familiar with the term</p> <p>Were the records with variables with missing data removed prior to analysis? Was there any bias in the missing data?</p> <p>Reasons for refusal were not collected – add to limitations</p> <p>Results – drowning burden and mortality rates – line 23 – 35.1% is more than one third – please remove the 'almost'</p> <p>Results – drowning burden and mortality rates – lines30-32 – drownings found unintentional – incomplete sentence – reword.</p> <p>Results – factors associated with fatal drowning – line 17-19 – double use of 'more' – remove one to aid in comprehension of the sentence.</p> <p>Limitations – I still feel the issue of intentional drowning is likely to be non-existent due to the method used and limitations around self-reporting intentional drowning deaths. I feel this should be discussed.</p> <p>Similarly, while challenges aside from the data and technology capture methods are being saved for a secondary paper, I feel it may be worth touching on them in this paper.</p>
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## VERSION 2 – AUTHOR RESPONSE

Reviewer 2

2C1. previously asked you to revise your strengths and limitations section to "comment on your level of confidence in the baseline population data as this is used for your denominator calculations so low confidence or inaccuracy in this population data has big implications to your drowning mortality rates". Please make this revision or justify why you haven't not done so.

2R1: Apologies, we did not clarify well on this comment in the earlier revision. The denominator population data is based on Bangladesh Bureau of Statistics, which in fact provides growth rate accommodated data at the rate of 1.37, based on census 2011. This is an accepted methodology and we have high confidence in the accuracy of the mortality rates reported.

The following text has been added. "Denominator population data was based on Bangladesh Bureau of Statistics, accommodating for growth rate of 1.37 from census 2011."

2C2: previously asked "How was the door to door field survey data translated to ICD 10 codes - by the survey person, the software or the research office?" Please clarify in your manuscript how this was done.

2R2: We realise our statement in abstract is misleading. ICD codes were used as operational definition of a drowning event as referred to in the main text. We have revised the abstract to say the same:

"International Classification of Diseases, 10, Chapter XX codes for drowning W65 – W74, X36 – X39, V90, V92, X71 or X92, were used as operational definition of a drowning event."

2C3: previously asked you to explain how your sample is representative of the division when the survey data has been collected from only 4.7% of the population. Please revise your manuscript to address this comment.

2R3: Thank you, perhaps our manuscript text is not clear in describing the sampling frame and thus we have added the following text:

"...The sampling frame for upazilas (county)/villages was designed to give a probability of selection proportional to population, and that household sampling was conducted with the WHO EPI approach...."

However we do not see the sample size as an issue for representation. The proportion of the population captured doesn't really matter so long as it's representative and 4.6% of the population sampled is quite high for a household survey. There are several examples of nationally representative surveys with sampled population less than 2% of the population it represents, such as the Million Death Study, India and Bangladesh Health and injury Survey.

2C4: previously asked you for clarification on the retrospective death reporting for a 2 yr period prior to the survey. You have explained in your response that the 2 year period was from the day of face-to-face interaction. Please add this information to your manuscript and discuss the potential for recall bias.

2R4: Thank you, we have clarified the recall period and discussed the potential for recall bias and included a reference to support it:

“... was collected over a two-year recall period from day of survey. Whilst there is a potential issue of recall bias, previous literature from Verbal autopsy reporting cause of death has shown high validity and sensitivity for up to three years for causes of death involving injury”

2C5: previously asked you to comment on the data quality from the data collectors. You have stated in your response that "there is significant methodological learning from this paper". Please elaborate on this further indicating any challenges or limitations with the data collection.

2R5: The following text has been added:

“To best of our knowledge, this is the first survey using offline application for electronic data capture (Redcap), in the region. The survey was huge with over 250 variables collecting information on multiple drowning events in each household. With English and Bangla translations, the screen size of a hand held Android device posed challenge for accuracy in data entry, which was mitigated by division of survey into multiple sections/tools and optimising the font size. Some of the contextual issues for example access to electricity for charging of devices, access to internet or recharging the power banks also needs to be considered. Some of the learnings which has since enhanced the features within the Redcap application are synchronising of auto generated identification on an offline application, preventing data loss or duplication of data. It is the success of using electronic data capture, utilising internal validity checks that high quality and completeness of dataset was achieved.”

2C6: You have not responded to Reviewer 2's comments on the Statistical Analysis and Results sections. Please provide raw numbers in the tables as requested and discuss the dependence of your analysis on the Population and Housing Census data from 2011 as a limitation of the study.

2R6: Thank you, we have added the numerators and denominators to table S1. As discussed above we high have high confidence in the accuracy of the mortality rates reported- the denominator population data is based on Bangladesh Bureau of Statistics, which in fact provides growth rate accommodated data at the rate of 1.37, based on census 2011.

Reviewer(s)' Comments to Author:

Reviewer: 1

Reviewer Name: Amy Peden

Institution and Country: Royal Life Saving Society - Australia, Australia Please state any competing interests or state 'None declared': None declared.

1CG1: Please leave your comments for the authors below Thank you for the opportunity to review manuscript ID bmjopen-2018-027896.R1. I believe most of my revisions have been actioned appropriately. While the authors say the manuscript was proof-read, there remain grammar issues and several sentences that could be revised, which I hope I have captured below, alongside some other minor comments based on the revised manuscript:

Mortality not morbidity so why not be clear its fatal drowning?

1RG1: Thank you for taking the time to review the paper for us again, we hope that we have now sufficiently addressed all your comments. Please see our responses below:

Thank you we have changed drowning mortality to fatal drowning throughout the manuscript.

Specific comments:

1C1: Abstract – participants – reword residing – I wasn't sure what this meant, the survey went over a 6 months period or they had to have been residents for a minimum of 6 months prior to being surveyed?

1R1: Thank you, we have amended it for clarity to:

“All residents (for a minimum 6 months prior to survey) of the Barishal division, Southern Bangladesh”

1C2: Abstract – intervention – line 3 – data were not data was Abstract – results – household four or more children but the results seem to relate to age of child? I find this confusing – is this mean to be a 4 or more child household and a 5 or more child household or mortality among four year olds in a four child household – which I think is a little odd? Please clarify and re-word.

1R2: Thank you, now changed to:

“Data were collected...”

We have also corrected the text to read:

“...residing in a household with 4 or more children (4 or more children OR 1.8, 1.1 – 2.9; and 5 or more children OR 2.1, 1.2 – 3.7)”

1C3: Strengths and limitations – learnings are drawn out as a key finding but should also be further challenges summarised here?

1R3: As above, we added this to the strengths and limitations section:

“To best of our knowledge, this is the first survey using offline application for electronic data capture (Redcap), in the region. The survey was huge with over 250 variables collecting information on multiple drowning events in each household. With English and Bangla translations, the screen size of a hand held Android device posed challenge for accuracy in data entry, which was mitigated by division of survey into multiple sections/tools and optimising the font size. Bi-lingual presentation was essential, as statistical programmes are primarily compatible with English, only.

The contextual issues for example access to electricity for charging of devices, access to internet or recharging the power banks also needed to be considered. Some of the learnings that have since led to enhanced features within the Redcap application are synchronising of auto-generated identification on an offline application, preventing data loss or duplication of data. It is due to the success of using electronic data capture and utilising internal validity checks that the high quality and completeness of the dataset was achieved.”

1C4: Introduction – page 4, line 33-35 – duplicate use of every day, please reword.

1R4: Thank you, we have reworded to:

“According to the 2016 BHIS, every day 40 children (aged between 0-17 years) lost their life due to drowning...”

1C5: Introduction – page 5, line 22 – this should be fatal drowning here, as I don't see any non-fatal drowning reported in the study.

1R5: Thank you, we have changed it to fatal drowning as suggested.

‘.....Comprehensive Drowning Reduction Strategy was designed to reduce fatal drowning and morbidity utilizing evidence-based interventions’

1C6: Methods – statistical analysis – consider define upazilas for those not familiar with the term. Were the records with variables with missing data removed prior to analysis? Was there any bias in the missing data?

1R6: Thank you, we have added extra detail on the missing data:

“Due to electronic data capture and in-built internal validity checks, missing data was minimised with only 1.01%; 977 records were not used due to missing data. We also have inserted a definition of Upazilas:

“....information (number of upazilas - sub-divisions ....”

1C7: Reasons for refusal were not collected – add to limitations Results – drowning burden and mortality rates – line 23 – 35.1% is more than one third – please remove the ‘almost’

1R7: Thank you we have changed the word ‘almost’ to ‘more than’:

“.....years drowning was the cause of more than one-third of all deaths (35.1%)....”

We have also added not collecting reasons for refusal to the limitations section:

‘Although the proportion of refusals was small (2%), collecting data on reasons for non-participation could have added to the strength of the study’

1C8: Results – drowning burden and mortality rates – lines 30-32 – drownings found unintentional – incomplete sentence – reword.

1R8: Thank you, we have reworded this sentence to also take into account the self-report nature of this data:

“.....were reported to be unintentional”

1C9: Results – factors associated with fatal drowning – line 17-19 – double use of ‘more’ – remove one to aid in comprehension of the sentence.

1R9: Thank you we have made this edit.

“...households with four or more children had almost two times higher odds of experiencing a drowning fatality..”

1C10: Limitations – I still feel the issue of intentional drowning is likely to be non-existent due to the method used and limitations around self-reporting intentional drowning deaths. I feel this should be discussed.

1R10: Thank you, we appreciate your thoughts on the limitation of self-report for collecting data on intentional injuries/deaths. We have included it in our limitations section:

“Intentional drownings particularly suicides are culturally stigmatised in Bangladesh. Household surveys thus are not the best source of data for determining intent of drowning. However, given the high burden among children, intent has little implications on the study findings.”

1C11: Similarly, while challenges aside from the data and technology capture methods are being saved for a secondary paper, I feel it may be worth touching on them in this paper.

1R11: Thank you we have now added as above in 1R3.

### VERSION 3 – REVIEW

<b>REVIEWER</b>	Amy Peden Royal Life Saving Society - Australia, Australia & School of Public Health and Community Medicine, UNSW, Australia.
<b>REVIEW RETURNED</b>	23-Jul-2019

<b>GENERAL COMMENTS</b>	Thank you to the authors, they have addressed all of my concerns. I am now satisfied that this paper is suitable for publication.
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### VERSION 3 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Amy Peden

Institution and Country: Royal Life Saving Society - Australia, Australia & School of Public Health and Community Medicine, UNSW, Australia.

Please state any competing interests or state 'None declared': None declared.

I revised it as follows

Response

**COMPETING INTERESTS**

Competing interests or state 'None declared': None declared.