Review report

Final title: Association of climate variability with hepatitis A and E infections in Dhaka (2016–2023)

Title at submission: Unraveling the link between climate variability and the seroprevalence of Acute Hepatitis A and E virus infection in Dhaka City from 2016 to 2023

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Reviewer B: Nahida Sultana, 0000-0001-6936-218x

Overview

This study examines how climate factors influence Hepatitis A and E infections in Dhaka from 2016 to 2023. Using a large set of hospital data, the authors found that Hepatitis A mostly affects children and teenagers, while Hepatitis E is more common in young adults, especially men. Seasonal patterns were clear: Hepatitis A cases increased in late autumn, and Hepatitis E was highest during the rainy months. The findings highlight that temperature, rainfall, and humidity shape infection trends. Overall, the paper adds useful public health insights, though its hospital-based scope may not fully represent the wider population.

1. Comment — **Appropriateness of the Title**
The title is clear and informative. It directly explains that the study looks at the link between climate changes and Hepatitis A and E infections in Dhaka from 2016 to 2023. It matches well with the content of the paper. However, it is a bit long. A shorter version like "Climate variability and Hepatitis A and E infections in Dhaka (2016–2023)" could be easier to read while keeping the main message.

Response — As per the comment, the title has been revised (Page 1, Line 2).

2. Comment — **Completeness and accuracy of the Abstract**
The abstract is clear and matches the study well. It gives background, methods, main findings, and the conclusion. The numbers and results are described correctly, showing who was most affected and in which seasons. It also explains the role of climate factors. Overall, it is complete and accurate. Still, it could be made shorter and simpler by focusing only on the key results and their public health importance.

Response — An abstract was prepared in short form and only the key results have been presented. The total word count for the abstract is 247 words (Page 2).

3. Comment — **Clarity and appropriateness of the Objective(s)**
The objectives are clear and fit the study. The authors wanted to find out how common Hepatitis A and E infections are in Dhaka and how climate factors like temperature, rainfall, and humidity affect them. This is simple, relevant, and matches the results they presented. The wording could be made even shorter, for example: "To see how often Hepatitis A and E occur in Dhaka and how weather conditions influence their spread."

Response — The objective has been revised as per your comments (Page 2, Line 33-35).

4. Comment — **Clarity of the rationale for conducting the study is given in the Introduction section**
The introduction clearly explains why the study was done. It says Hepatitis A and E are big health problems in Bangladesh because of poor sanitation, unsafe water, and street food. It also mentions that changes in weather, like temperature, rain, and humidity, may affect how these infections spread. Since little was known about this link in Dhaka, the study was needed. In simple words: The study was done to understand how weather conditions affect the spread of Hepatitis A and E in a crowded city with many health risks.

Response — The sentence has been rephrased as per your opinion (Page 5, Line 102-105).

5. Comment — **Major redundancy between text and tables/figures in the Results section**
There is some repetition between the text and the tables/figures. The same numbers and trends are explained in both places. In simple words: The results repeat some information, but the tables and figures already show it clearly.

Response — Repetitions have been identified and omitted. Only the necessary information was stated (Page 7, Para 3).

Reviewer C: Umme Shahera, 0000-0002-8811-578X

Overview

The Article looks into the seroprevalence of acute Hepatitis A (HAV) and Hepatitis E (HEV) infections in Dhaka City (2016-2023) and their association with climatic variability. By using retrospective laboratory data from over 42,000 suspected cases, the study explore that HAV is most common among children and adolescents, while HEV predominates in young adults, with a clear male predominance. Seasonal trends show HAV peaking in late autumn and HEV in the rainy season. Overall, the study is well-structured, addresses an important public health gap, and provides valuable insights into the climate–disease relationship, though its hospital-based design may limit generalizability.

6. Comment — **Appropriateness of the Title**
The title specifies both the diseases studied (HAV, HEV), the context (climate variability), the location (Dhaka City), and the study period, which makes it precise and reader-friendly. However, it could be slightly shortened for improved readability. For example, the phrase "Unraveling the link" could be replaced with a more academic wording such as "Association" or "Impact", which may align better with scientific writing conventions.

Response — As per the comment, the title has been revised (Page 1, Line 1).

7. Comment — **Clarity of the rationale for conducting the study is given in the Introduction section**
The Introduction provides a strong rationale by outlining the global and national burden of HAV and HEV, their transmission routes, and the challenges posed by sanitation and urbanization in Bangladesh. The link between climatic variability and disease transmission is highlighted. However, the rationale could be made clearer by more explicitly stating why Dhaka City was chosen as the study site.

Response — It has been written in the manuscript (Page 5, line 93-101).

8. Comment — **The Methods are described in sufficient details so that the study can be reproduced. Whether ethical concerns have been well described**
The Methods section is well-detailed, covering study design, population, laboratory procedures, climatic data sources, and statistical analysis. The inclusion of assay types (CLIA, ELISA), sample sizes, age categorization, and use of logistic regression models enhances reproducibility. Ethical concerns are appropriately addressed. The manuscript mentions Institutional Review Board approval. This is adequate, though a brief note on informed consent (whether waived for retrospective analysis) would improve completeness.

Response — This study was based on data retrieved from the laboratory information system, and there was no direct contact with the patients. Therefore, there was no need for informed consent. During the analysis, no personal identifiers were used in the presentation of results.

9. Comment — **Clarity and appropriateness of the Design to achieve the objective(s)**
By using a large dataset (over 42,000 samples) strengthens the reliability of findings and allows seasonal trends to be meaningfully examined. However, the hospital-based design may introduce selection bias, as asymptomatic or mild community cases are likely underrepresented. Overall, the design is suitable to achieve the objectives, though a community-based or multicenter approach would enhance generalizability.

Response — The statement has been added to the study limitation section (Page 11, line 255-256).

10. Comment — **Appropriate and thorough description of the Statistical methods**
The manuscript provides a generally clear description of the statistical approach, including use of descriptive statistics, chi-square tests for associations, and multinomial logistic regression models incorporating demographic, climatic, and temporal variables.
How missing data (if any) were handled. Overall, the statistical methods are appropriate for the study objectives, but a slightly more detailed justification of model choices and assumptions would improve transparency and reproducibility.

Response — Descriptive statistics were used to summarize the gender and age categories. A multivariable logistic regression model was constructed to identify predictors of HAV and HEV infections (Page 6, Line 142).

11. Comment — **Quality, clarity and appropriateness of the Table(s)**
In Table 1, some percentages exceed 100% when compared across categories (since they are within-group proportions); a clarifying note would help readers interpret correctly.
In Table 2, significance markers (*P<0.05) are noted, but clearer highlighting (e.g., bold font) could make key predictors more evident.
Overall, the tables are appropriate and adequately support the study, but minor formatting and explanatory additions would improve clarity.

Response — For table 1, a necessary note has been given to improve the clarity and minor formatting was done. In table 2, significant markers has been marked in bold font (Page 16 and 17).

12. Comment — **Quality, clarity and appropriateness of the Figure(s), if any**
The figures illustrating monthly and seasonal distribution of HAV and HEV infections are highly relevant to the study objectives and visually support the link between climate variability and infection trends. Axis labels (temperature, rainfall, humidity, infection counts) should be more prominently displayed with units.
Adding confidence intervals or trend lines (where applicable) could strengthen visual representation of variability.

Response — As per the comments, the axis label has been revised and units were added (Page 18-19).

13. Comment   **Major redundancy between text and tables/figures in the Results section**
Redundancy occurs when the text narrates every single value or detail that is already clearly displayed in a table or figure. Tables and figures are meant to summarize data visually, while the text should highlight key findings or interpret them, not list all numbers again.

Response   The repetitions have been checked and only the necessary information was stated (Page 7, Para 3-4).

Reviewer E: Munira Jahan , 0000-0002-5976-0122

Overview

This laboratory-based retrospective observational study was conducted at the Department of Virology, BMU, Dhaka, using data collected from 2016 to 2023. Results of anti-HAV IgM and anti-HEV IgM tests, along with demographic information such as age and gender, were retrieved from the Laboratory Information System (LIS). The seasonal distribution of HAV and HEV infections was also analyzed.

Its's not clear whether the data retrieved from the LIS or collected directly from patients during blood collection. Additionally, although temperature, rainfall, and humidity were discussed in relation to viral infection, no relevant meteorological data or results were presented to support these discussions.

14. Comment   **Appropriateness of the Title**
If meteorological data or relevant results cannot be presented, the term "climate variability" in the title should be replaced with "seasonal variability."

Response   The month-wise and season-wise meteorological data has been presented in the results section and figures, along with the percentages of detection for Anti HAV-IgM and Anti-HEV-IgM (Page 7, Para 3-4).

15. Comment   **Completeness and accuracy of the Abstract**
    a.   In line 35: "and examine their links with climatic factors, such as temperature, humidity, and rainfall" should be replaced by "and examine their links with seasonal variation" or proper relevant meteorological data or results should be shown.
    b.   In line 38-40: "It analysed blood samples for testing anti-HAV-IgM and anti-HEV-IgM received from individuals suspected of having acute hepatitis". As this was a laboratory-based retrospective observational study, those lines should be omitted and the description should be revised to align with the study design.
    c.   Line 47: "Autumn and late autumn favoured HAV transmission" This study did not investigate transmission but focused on assessing prevalence. Please correct it accordingly.

Response   a.   The meteorological data has been mentioned in the result section (Page 7, Para 4) and more data has been presented in the Supplementary figure 1 a & b and 2 a & b (Page 20-23).
    b.   The sentence has been revised and corrected (Page 2, Line 38-39).
    c.   It has been corrected accordingly (Page 2, Line 47-48).

16. Comment   **Clarity and appropriateness of the Objective(s)**
This study focuses on the prevalence of acute HAV and HEV infections in Dhaka City and examines their association with seasonal variation; therefore, the objectives should be aligned accordingly.

Response   Dear reviewer, this study not only analyzed acute hepatitis HAV and HEV but also aimed to examine their association with month-by-month weather data, including temperature, humidity, and rainfall, as well as seasonal variations. Therefore, the results align with the stated objectives. Meteorological data are discussed in the results section, and additional data are shown in figures in Supplementary Figures.

17. Comment   **Clarity of the rationale for conducting the study is given in the Introduction section**
Rationale for conducting the study is discussed in the introduction section, but there are some issues to be clarified. Prevalence of HAV and HEV infection in Bangladesh should be mentioned in the first paragraph of introduction with appropriate citations.
Line 81-83: All the references cited here to support the text were from the other countries. Citation should include Bangladesh perspectives.
The relevance of the study is described in terms of the variability of temperature, humidity, and rainfall on disease dynamics, without any focus on seasonal variation. The introduction should be revised to clarify the study's rationale, or appropriate meteorological data along with their effects on HAV and HEV infections should be presented in the results section.

Response   The prevalence of HAV and HEV infection in Bangladesh has been mentioned. To maintain the scientific flow, the prevalence has been discussed here rather than being stated in the first paragraph (Page 4, Line 85-87).
Meteorological data are mentioned in the result section and additional data are presented in Supplementary Figures.

18. Comment   **Quality, clarity and appropriateness of the Table(s)**
The tables are clear and easy to understand. They show the main results, like age, gender, infection rates, and climate effects. The information is well organized and supports the text. In simple words: The tables are good quality, clear, and suitable for the study.

Response   The titles in tables 1 and 2 have been corrected accordingly (Page 16-17).

19. Comment   **Quality, clarity and appropriateness of the Figure(s), if any**
Figures are appropriate and clear. "HAV positive" and "HEV positive" should be replaced by "anti HAV IgM positive" and "anti HEV IgM positive" in all figures and legends.

Response   The titles in figures have been corrected accordingly (Page 18-19).

20. Comment   **Major redundancy between text and tables/figures in the Results section**

In line 169, the authors refer to Supplementary Figure 1a, which is not included in the manuscript.

In line 171, the authors refer to Supplementary Figure 1b, which is not included in the manuscript.

In line 172-173: "HAV transmission was highest (20%) in Late Autumn, coinciding with 172 moderate temperature (27.8° C), humidity (69.8%), and rainfall (62.3 mm)"- No result regarding temperature, humidity and rainfall are included in the manuscript

In line 174, the authors refer to Supplementary Figure 2a, which is not included in the manuscript.

In line 175: "characterised by the highest levels of rainfall (289 mm) and humidity (78.7%)"- No result regarding these parameters are included in the manuscript

In line 176, the authors refer to Supplementary Figure 2b, which is not included in the manuscript.

"HAV " and "HEV" should be replaced by "anti HAV IgM" and "anti HEV IgM" in line 156, 158, 161, 163,

Response   The meteorological data has been mentioned in the result section (Page 7, Line 162-171), and more data has been presented in the Supplementary figure 1 a & b and 2 a & b (Page 20-23).

The necessary changes have been made as per the comments (Page 7, para 3).

21. Comment   **Pertinence of the Discussion section whether it justify the main message of the manuscript without repeating the results**

a. Major part of discussion was based on temperature, rainfall, and humidity in relation to viral infection, but no relevant meteorological data or results were presented to support these discussions.

b. Line 224-225: "Our study found a positive correlation between HAV and temperature; however, the association was not statistically significant." No such data/result was included in the manuscript.

c. Line 234-236: "The relationship between rainfall and HAV transmission was nonlinear. While our findings point toward a statistically significant weak correlation," No such data/result was included in the manuscript.

d. The results discussed In line 242-243, 247-248 are not presented in any table or figure of the manuscript.

Response   a. The meteorological data has been mentioned in the result section (Page 7, Line 162-171), and more data has been presented in a figure in the Supplementary figures.

b. The sentences related to correlation have been omitted.

c. The sentences related to correlation have been omitted.

d. The meteorological data has been mentioned in the result section and more data has been presented in the Supplementary figures.