**Response to the Reviewer**

**Manuscript title: Global Landmark: 2023 Marks the Worst Year for Dengue Cases with Millions Infected and Thousands of Deaths Reported**

**Manuscript reference number: IJREGI-D-24-00150**

We would like to thank the Reviewer for his constructive comments and guidance to improve the paper. Following up on the reviewer’s suggestions and recommendations, we have revised the manuscript, and each modification has been highlighted in track change version. We have modified the result section as suggested by the reviewer. We have also corrected the grammatical mistakes and proofread the manuscript line-by-line. Our detailed response is found below.

We strongly believe that the reviewer's comments have helped us to improve the presentation, readability and technicalities of the manuscript. We thank you again for your valuable comments.

**Reviewers' comments:**  
Haider et al. in this study, examine the 2023 dengue outbreak, which resulted in millions of infections and thousands of deaths. The manuscript presents a significant analysis of the global dengue virus (DENV) outbreak in 2023, marking it as the worst on record. The study aims to identify regions and continents with a high burden of dengue during this period, utilizing data on DENV cases and deaths reported to the WHO. The results highlight significant dengue hotspots in South America and South and Southeast Asia, underscoring the urgent need for a comprehensive global approach to DENV control.  
  
While the study addresses a critical public health issue and provides valuable data, I would recommend a major revision for the following reasons:  
  
**Descriptive Nature of the Study:**  
The study is primarily descriptive, and it's unclear how these findings significantly advance our current understanding of dengue epidemiology. To enhance the impact of this work, the authors could explore deeper analytical insights or identify new patterns that build on existing knowledge.

Response: Thank you, for your valuable time for this comment. We conducted a one-way ANOVA to assess statistical differences in cases and deaths across continents. The results were summarized in the abstract and the article. We have also included the method used for the analysis.

We have added (which are tracked in the revised manuscript):

Page 1: “We observed a statistically significant difference in the number of cases and deaths per million across different continents (P < 0.001).”

Page 2: “A one-way analysis of variance (ANOVA) was employed to determine whether dengue variables differ significantly across geographic regions.”

Page 3: “One-way ANOVA analysis revealed a statistically significant difference in case incidence and death rates per million across continents (P < 0.001), indicating a substantial influence of geographic location on these variations.”   
**Data Sources and Methodology:**  
The manuscript lacks detailed information about the data sources and the methodology used for data collection and analysis. Clarification is needed on how the data was standardized across different countries and how potential reporting biases were addressed.

Response: We appreciate your valuable comment. We have now included detailed information about the data sources, data collection and methods used for analysis.

On page 2, we have added- “We collected data from countries where WHO aids in outbreak confirmation, offers technical support for dengue management, and helps improve reporting systems to accurately capture the disease's burden [1]. The WHO recommends several serologic tests for diagnosing dengue infections, including: Hemagglutination-inhibition (HI), Complement fixation (CF), Neutralization test (NT), and IgM-capture enzyme-linked immunosorbent assay (MAC-ELISA). In addition, some countries use nonstructural protein 1 (NS1) antigen test for DENV. The details of the laboratory test are discussed elsewhere [2].” There are potential risks for dengue case definition as different country used different case definition but we relied on the number that the country shared with WHO or shared in government websites. We have now acknowledged this limitation in our manuscript.   
  
**Regional Focus and Generalizability:**  
Although the study identifies key hotspots, the analysis would benefit from a more detailed examination of other regions with emerging DENV risks. Additionally, the generalizability of the findings to regions with different epidemiological profiles should be discussed.

Response: Thank you for this comment. As this is a short communication, and there is word limitation and data unavailability, we could not provide further analysis on other regions with emerging DENV risks. However, we have added a short discussion on Page 5 as seen below.

The generalizability of global dengue findings to regions with distinct epidemiological profiles can be limited due to variations in climate, vector species, population immunity, and health infrastructure. While global studies provide valuable insights, local factors such as mosquito abundance, behavior, urbanization patterns, and public health responses can significantly influence disease transmission. Therefore, findings from one region may not fully apply to another, highlighting the need for region-specific research and tailored public health interventions to address the unique epidemiological context of each area [13].   
  
**Interpretation of Case-Fatality Ratios:**  
The manuscript reports case-fatality ratios (CFR) without providing sufficient context or comparison to historical data. A deeper discussion of these figures, including potential factors influencing regional differences in CFR, would strengthen the conclusions.

Response: Thank you. We included CFR values in Table 1 and presented the ANOVA results. Additionally, we provide a detailed discussion of CFR, including potential factors that may influence regional differences.

In Page 2: However, the case fatality rate (CFR) does not differ significantly across continents (P-value = 0.123).

In page 3: However, when analyzing the case fatality rate (CFR) with the same method, the results indicated that CFR does not significantly differ across continents (P-value = 0.123).

In page 4: Prior to 2023, the highest historical dengue caseload occurred in 2019, with over 3.18 million cases, 28,208 severe cases, and 1,823 deaths (CFR 0.06%) [4]. In 2023, within the South-East Asia Region, Bangladesh observed a rise in deaths from 281 (CFR 0.45%) to 1705 (CFR 0.52%), while Thailand's death toll increased from 34 (CFR 0.07%) to 147 (CFR 0.11%). Other countries reported CFRs ranging from 0.04% in Nepal to 0.72% in Indonesia. In the Western Pacific Region, the Philippines reported 167,355 cases and 575 deaths (CFR 0.34%), and Viet Nam reported 149,557 cases and 36 deaths (CFR 0.02%) [4]. Dengue case fatality rates are negatively associated with average income per capita. Additionally, primary health care units are linked to lower case fatality rates. A positive association was found between dengue mortality and the Gini index. Overall, investigations into the spatial distribution of dengue fever incidence indicate that these factors are geographically associated [10].

**Discussion of Public Health Implications:**  
The conclusions emphasize the need for a global approach to DENV control but could be more specific in outlining the recommended strategies. A more detailed discussion on the implementation of vaccine development, vector control, and public health initiatives would be beneficial.

Response: Many thanks for this crucial suggestion. We have now added discussion on specific recommended strategies and a little on the implementation of vaccine development, vector control, and public health initiatives on Page 5-6 as shown below.

To control the ongoing trend of dengue cases, it is essential to enhance epidemiological surveillance, community engagement and education, environmental management, rapid response to outbreaks, international collaboration and sustained investment in public health infrastructure including vaccine development and delivery [14].

**Presentation of Data:**  
The presentation of data could be improved, particularly with clearer visualizations or tables that allow for easier comparison between regions. This would enhance the readability and impact of the findings.

Response: Thank you. As the short communication allows only a maximum of two figure/table and 1,200 words, we could not provide any further table and/or figure to enhance visibility of the cases and deaths. However, Table 1 clearly shows the number of dengue cases and deaths per million population (/M) by continents in 2023 and Figure S1 shows a clearer picture of variations of dengue cases and deaths for different countries in colors. The further distribution of cases and deaths are also demonstrated in Table S1.