Volume 3, Issue 10, 2025

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

LETTER TO EDITOR: DISCUSSING THE TEMPORAL INCONSISTENCY IN AN ENVIRONMENTAL HEALTH FIELD STUDY

Abdullah Sikander

MBBS Student at Islam Medical & Dental College

abdullahsikander15@gmail.com

DOI: https://doi.org/10.5281/zenodo.18182604

Keywords

Article History
Received: 03 November 2025
Accepted: 17 December 2025
Published: 31 December 2025

Copyright @ Author

Corresponding Author: *
Abdullah Sikander

Abstract

This critique of Rathore et al. (2025) challenges the causal link between water quality and the gastrointestinal crisis following the 2022 Pakistan floods. Key concerns include: (1) significant temporal lag between the disease surge and environmental sampling; (2) a reductionist focus on water contamination that overlooks human-to-human transmission in displacement camps; and (3) the use of "synthetic" visualizations instead of raw laboratory data. While acknowledging the importance of climate-resilient infrastructure, this letter argues that the study's methodological inconsistencies undermine its conclusions, highlighting the need for real-time environmental sampling in future disaster research.

To the Editor,

I am writing to offer a critical perspective on the study by Rathore et al. (2025) regarding the water quality and gastrointestinal illness burden following the 2022 Pakistan floods [1]. While the authors highlight a critical intersection of climate change and public health, the study's reliance on temporally mismatched data, and "synthetic" visualizations raises significant concerns about its causal conclusions.

1. Temporal Inconsistency in Exposure Assessment

A primary concern is the lag between the peak of the health crisis and the environmental sampling [1]. The authors sampled water sources between October and December 2022 [1], yet they attribute these findings to a gastrointestinal surge that began in July. In the dynamic environment of a receding flood, microbial profiles fluctuate rapidly [2]. It is epidemiologically unsound to correlate late-stage water quality with early-stage acute watery diarrhea (AWD) cases, as the "first flush" of contaminants likely differed significantly from the water conditions measured three months later [3].

2. Reductionism and the Fecal-Oral Loop

The study's multivariate models adjust for "sanitation access," yet the conclusion places the weight of the crisis on drinking water quality [1]. In disaster settings, particularly in districts like Dadu and Khairpur where displacement was total, water quality is often a secondary driver compared to the lack of basic hygiene infrastructure [4]. By isolating water source contamination, the authors may be overlooking the more significant impact of human-to-human transmission in overcrowded relief camps.

3. Scientific Rigor and "Synthetic" Data

Most concerning is the authors' admission that their data visualizations are "synthetic representations" rather than plots of raw laboratory values. In environmental health research, the integrity of the dose-response curve depends on the presentation of observed, raw field data [5]. Utilizing simulated visualizations to argue

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

for a 3.41 odds ratio for diarrhea obscures the actual variance and uncertainty inherent in field-based disaster research.

Conclusion

While the study correctly advocates for flood-resilient WASH infrastructure, its specific attribution of the 2022 health crisis to measured water contamination lacks the temporal and methodological rigor required for such a definitive claim. Future research must prioritize real-time environmental sampling during the acute phase of flooding to truly understand the hydro-epidemiological drivers of these outbreaks.

Respectfully,

Abdullah Sikander

Islam Medical & Dental College.

References:

Partab Rathore, Abdul Mateen, Syeda Butool Zehra, Khalid Bilal Khan, Syed Weqas Ali, Aiman Fatima, Muhammad Umer Islam. Water quality and gastrointestinal illness burden in communities affected by the 2022 Pakistan floods: an environmental health field study. Frontier in Medical and Health Research. 2025. Available from: http://dx.doi.org/10.5281/zenodo.17971844

Doering M, Freimann R, Antenen N, Roschi A, Robinson CT, Rezzonico F, Smits THM, Tonolla D. Microbial communities in floodplain ecosystems in relation to altered flow regimes and experimental flooding. Sci Total Environ. 2021;788:147497. Available from: http://dx.doi.org/10.1016/j.scitotenv.2021.147497

Dzodzomenyo M, Asamoah M, Li C, Kichana E, Wright J. Impact of flooding on microbiological contamination of domestic water sources: a longitudinal study in northern Ghana. Appl Water Sci [Internet]. 2022 Sep 15;12(10). Available from: http://dx.doi.org/10.1007/s13201-022-01757-6

Hashizume M, Wagatsuma Y, Faruque ASG, Hayashi T, Hunter PR, Armstrong B, et al. Factors determining vulnerability to diarrhoea during and after severe floods in Bangladesh. Journal of Water and Health [Internet]. 2008 Mar 1;6(3):323–332. Available from: http://dx.doi.org/10.2166/wh.2008.062

Yoshimura I. The effect of measurement error on the dose-response curve. Environ Health Perspect [Internet]. 1990 Jul;87:173–178. Available from: http://dx.doi.org/10.1289/ehp.9087173