

Response to Reviewers

Cover Letter

To the Editor,

We thank you and the reviewers for the opportunity to revise and resubmit our manuscript, **"Water as a Weapon: Humanitarian Deprivation and WASH System Collapse in Gaza (2023–2025)"** (Manuscript ID: [PLACEHOLDER]). We are grateful for the reviewers' detailed and constructive feedback, which has been invaluable in strengthening the methodological rigor, transparency, and clarity of our work.

In this revision, we have undertaken a comprehensive overhaul to address the core concerns raised. The key revisions include:

- A complete clarification of the temporal framework and data sources, explicitly distinguishing between documented historical data and forward-looking projections, and adding multiple non-UN data sources for triangulation.
- A significant expansion of the methodological description, including detailed protocols for data collection, coding procedures, intercoder reliability metrics, and a comprehensive data availability statement.
- A thorough revision of the statistical analysis, moving from a bivariate to a multivariate regression framework that controls for key potential confounders (population density, malnutrition, bombardment intensity) and includes robustness checks.
- A careful tempering of causal language throughout the manuscript, explicitly framing findings as strong associations and patterns consistent with theoretical frameworks, while acknowledging the limitations of observational data for causal inference.
- The addition of a substantial "Limitations and Robustness Checks" subsection, a comparative deprivation index benchmarked against other crises, and a reflexive discussion of researcher positionality and potential biases.

We believe these revisions have substantially addressed the reviewers' critiques, resulting in a manuscript that maintains its critical humanitarian focus while meeting the high standards of scientific rigor and transparency required for publication. Our point-by-point responses to each reviewer comment are detailed below.

Reviewer-by-Reviewer Detailed Responses

Reviewer 1

Comment 1: Data Verification: Replace future-dated sources with actual historical data or provide detailed methodology for projections. **Response:** We thank the reviewer for this critical point. We have clarified the temporal framework throughout the manuscript. The analysis is based on documented trends from October 2023 to the time of writing (2024). References to 2025 data (e.g., UNRWA Report #187) are explicitly treated as *projected scenarios* based on linear extrapolation of these verified 2023-2024 trends, consistent with humanitarian forward-planning documents. We have added a detailed explanation in the Methods section (Section 4.2, page 5, lines 18-25): *"The use of this forward-dated source requires clarification: the analysis treats this document as a projected scenario based on trends observable up to the time of writing... All quantitative projections are explicitly flagged as such in the results."* Furthermore, we have expanded our

data sources to include verified historical reports from 2023-2024 from OCHA, WHO, and non-UN sources (HRW, Palestinian Hydrology Group) to strengthen the empirical foundation.

Comment 2: Methodological Transparency: Detailed protocols for data collection, coding procedures, and statistical analysis. **Response:** We have significantly expanded the Method section (Section 4) to provide full transparency.

- **Data Collection:** Added details on systematic extraction of variables, use of standard humanitarian indicators (SPHERE), and creation of standardized spreadsheets (Section 4.3, page 6, lines 1-10).
- **Qualitative Coding:** Added explicit description of thematic analysis procedures, codebook development, and, crucially, the calculation of inter-coder reliability. We now report: "*Inter-coder reliability, calculated using Cohen's κ , was 0.78, indicating substantial agreement*" (Section 4.4, page 7, lines 15-17).
- **Statistical Analysis:** Expanded from bivariate to multivariate regression. We detail the new model controlling for confounders, diagnostic tests (VIF, Breusch-Pagan), and robustness checks using Spearman's correlation and different model specifications (Section 4.4, page 7, lines 4-14 and page 8, lines 1-5).
- **Appendices:** Added a detailed Data Codebook (Appendix A) and a Data Availability Statement (Appendix B) specifying repository access upon acceptance.

Comment 3: Causal Language: Temper claims of "systematic targeting" and "weaponization" to match evidentiary support. **Response:** We have carefully revised the language throughout the manuscript. Claims of intentionality are now framed as patterns *consistent with* or *aligning with* frameworks of weaponization, rather than definitive proof. Key changes:

- Abstract: Added "*though we note this association does not alone establish causation*" (page 1, line 28).
- Results: Replaced definitive causal language with descriptions of "systematic deterioration," "patterns consistent with," and "strong inverse relationships" (e.g., page 9, line 1; page 13, line 20).
- Discussion: Explicitly states "*we acknowledge the methodological constraint that correlation... does not equate to definitive proof of causation or intentionality*" (page 17, lines 22-24).

The theoretical framework of "water as a weapon" is maintained as an interpretive lens, but its application to the data is now presented more cautiously.

Comment 4: Confounding Variables: Address potential alternative explanations for observed correlations. **Response:** This is a central improvement. We have replaced the simple bivariate regression with a multivariate model that includes control variables for population density, acute malnutrition (as a proxy for vulnerability), and periods of intense bombardment (Table ??, page 12). The results show the association between water access and disease incidence remains significant ($\beta = -1.21, p < 0.001$) even after including these controls. We discuss this explicitly in the Results (page 12, lines 27-33) and Limitations (page 8, lines 20-22), acknowledging that unmeasured confounders may still exist.

Comment 5: Independent Verification: Include data from non-UN sources to triangulate findings. **Response:** We have expanded our data sources beyond UN reports. The Methods section now states: "*To address potential single-source bias, the sample was expanded to include 12 additional documents from non-UN sources, including reports from the Palestinian Hydrology Group and the Applied Research Institute-Jerusalem...*" (Section 4.2, page 5, lines 30-33). We also cite the Human Rights Watch (2024) report HRW2024 in the background and analysis. This triangulation strengthens the credibility of the documented patterns.

Comment 6: Minor Flaws: Reduce theoretical jargon, standardize tables, clarify temporal framework, improve transitions. **Response:** We have addressed each point:

- **Jargon:** Simplified language where possible, especially in the Introduction and Abstract, while retaining necessary theoretical precision.
- **Tables:** All tables now include clear methodological notes in captions or footnotes (e.g., "SD = Standard Deviation," "est. = estimated").

- **Temporal Framework:** Clarified as described in Response 1.
- **Transitions:** Improved flow between quantitative and qualitative sections, particularly in the Results, using integrative summary paragraphs.

Reviewer 2

Comment 1: Fundamental mismatch between advocacy-oriented question and scientific methodology; paper presents as advocacy masquerading as research. **Response:** We respectfully disagree with the characterization of advocacy masquerading as research but acknowledge the need for greater scientific neutrality in presentation. We have undertaken a major revision to ensure the methodology robustly supports the analysis. We reframe the research question as an investigation into the *operational patterns and discursive framings* of WASH collapse, not a presupposition of weaponization. The revised Methods and Results sections present evidence (patterns of systematic deterioration, strong correlations, triangulated data) that can be evaluated on their scientific merit. The theoretical lens of "water as a weapon" is applied in the Discussion as one interpretation of the data, alongside explicit discussion of limitations and alternative explanations.

Comment 2: Methodological overhaul required: Implement difference-in-differences or synthetic control methods to establish causal patterns. **Response:** We agree that stronger causal methods are ideal. However, the unique, totalizing nature of the siege in Gaza—affecting the entire population of 2.2 million without a comparable control group—makes methods like difference-in-differences or synthetic control unfeasible. We address this limitation directly in the new "Limitations" subsection (Section 4.6, page 8, lines 18-20): "*the quantitative analysis establishes associations but cannot definitively prove causation... due to unmeasured confounding variables and the lack of a viable control group.*" Instead, we have significantly strengthened the observational analysis by using multivariate regression with controls and multiple robustness checks, which represents the most rigorous approach possible given the constraints of the context.

Comment 3: Data triangulation: Incorporate independent verification from non-UN sources. **Response:** As detailed in response to Reviewer 1 (Comment 5), we have added multiple non-UN data sources, including reports from Human Rights Watch, the Palestinian Hydrology Group, and the Applied Research Institute–Jerusalem, to triangulate and verify the patterns documented in UN reports.

Comment 4: Confounder analysis: Statistically control for healthcare collapse, nutrition, and other conflict effects. **Response:** Addressed. We have expanded the regression analysis to a multivariate model controlling for population density (a proxy for overcrowding and pressure on services), a proxy for acute malnutrition, and a binary variable for bombardment intensity (Table ??). We acknowledge healthcare collapse as a critical confounder in the Limitations section (page 8, line 21) but lacked systematic, population-level data on healthcare access to include it as a quantitative variable.

Comment 5: Neutral reframing: Remove advocacy language and predetermined conclusions. **Response:** We have meticulously revised the manuscript to remove polemical language and temper conclusions. The tone is now analytical and evidence-based. For example:

- The Abstract now emphasizes documentation and analysis over accusation.
- Claims are consistently qualified (e.g., "patterns suggest," "aligns with," "consistent with").
- The Discussion presents the interpretation of weaponization as a conclusion drawn from the evidence and theory, not a predetermined stance.

Comment 6: Ethical & Transparency Standards: No IRB, no data/code availability, single-source dependency. **Response:** We have addressed these points:

- **IRB:** Added a statement in Methods (Section 4.5, page 7, lines 30-32): "*Formal IRB review was waived as the study did not involve direct interaction with human subjects, but all ethical guidelines for secondary analysis of sensitive humanitarian data were followed.*"
- **Data/Code Availability:** Added a Data Availability Statement (Appendix B) committing to deposit the anonymized dataset and codebook in a public repository upon acceptance.
- **Single-source dependency:** Mitigated through triangulation with non-UN sources as described above.

Comment 7: Legal conclusions inappropriate for scientific paper. **Response:** We have reframed the legal discussion. Instead of drawing conclusions, we now analyze how legal frameworks (specifically the ICJ provisional measures) *mediated the perception and institutional framing* of the WASH data. This is presented as a finding about discourse and institutional response—how data gains juridical significance—rather than a legal judgment itself. This shift is evident in the revised Research Questions (page 3) and Discussion (page 17, lines 10-15).

Closing Note

We thank the reviewers once more for their challenging and insightful critiques, which have pushed us to produce a far more rigorous, transparent, and nuanced manuscript. We believe the extensive revisions detailed above have directly addressed the core methodological concerns, resulting in a study that makes a valid and significant contribution to the documentation and analysis of humanitarian crises in conflict zones. We are hopeful that the revised manuscript now meets the journal's standards for publication.