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Peer Review

Review of: "Thermal Stress and Dengue Fever: Exploring the Correlation between Elevated Temperatures and Heat Waves in Disease Dynamics"

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This review article addresses a highly relevant and timely public health issue by examining the relationship between thermal stress, heatwaves, and dengue transmission dynamics. The topic is scientifically significant given the growing global burden of dengue and the increasing impact of climate change on vector-borne diseases. The manuscript successfully highlights the multidimensional interactions between environmental temperature, mosquito vector biology, viral replication, and human behavioral adaptations during heatwaves. The integration of public health implications, including early warning systems, vector control innovations, and climate mitigation strategies, enhances the translational relevance of the review. Additionally, the manuscript benefits from an extensive reference base and provides a broad overview of emerging research areas such as Wolbachia-based vector control, predictive modeling, and vaccine development.

Despite these strengths, the manuscript demonstrates several limitations that reduce its scientific rigor and novelty. The review appears largely narrative in structure and lacks a clearly defined methodology describing literature search strategies, database selection, inclusion/exclusion criteria, or quality assessment of included studies. The absence of systematic or scoping review methodology weakens reproducibility and may introduce selection bias. Furthermore, while the article references epidemiological findings, it does not provide a quantitative synthesis or comparative evaluation of evidence strength across different studies or geographic regions.

The manuscript also tends to provide descriptive summaries rather than critical appraisal of the cited literature. Several sections reiterate well-established relationships between temperature and mosquito

 doi.org/10.32388/BKAAL5

ecology without presenting novel mechanistic insights or identifying conflicting evidence in the field. Greater emphasis on threshold temperature ranges, nonlinear transmission models, and interaction effects between temperature, humidity, and rainfall would strengthen scientific depth. Additionally, regional variability in dengue epidemiology is insufficiently explored, particularly differences between endemic tropical regions and newly emerging transmission zones.

Another limitation is the lack of detailed discussion on socio-economic determinants and health system vulnerabilities that modulate climate-driven dengue outbreaks. The public health recommendations, while appropriate, remain relatively general and could benefit from evidence-based prioritization or implementation frameworks. Inclusion of conceptual or mechanistic models illustrating the climate-dengue interaction pathway would further enhance clarity and educational value.

Overall, this review provides a useful general overview of the influence of thermal stress on dengue epidemiology and highlights the urgent need for climate-adapted public health strategies. However, future revisions would benefit from adopting a structured review methodology, deeper critical analysis of existing evidence, and stronger integration of quantitative epidemiological and ecological modeling data to improve scientific robustness and originality.

Declarations

Potential competing interests: No potential competing interests to declare.