

Peer Review

Review of: "The Contentious Origins of SARS-CoV-2: A Comprehensive Review of Current Knowledge"

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1. Strengths

Timeliness and Relevance: The review addresses a critical and highly debated topic in public health, synthesizing recent literature (up to January 2025) to provide an updated perspective on SARS-CoV-2 origins.

Comprehensive Scope: The paper effectively integrates diverse lines of evidence, including phylogenetic analyses, epidemiological data, and environmental sampling, to evaluate both zoonotic spillover and laboratory leak hypotheses.

Methodological Rigor: The exclusion of non-peer-reviewed sources enhances credibility, and the use of systematic searches in PubMed/Scopus ensures a robust foundation for analysis.

Practical Recommendations: The proposed measures (e.g., One Health approaches, enhanced surveillance) are actionable and aligned with current global health priorities.

Effective Summarization: Tables 1 and 2 succinctly present citation trends and key findings, aiding readability and clarity.

2. Weaknesses and Suggestions for Improvement

Balanced Presentation of Hypotheses: While the zoonotic origin hypothesis is thoroughly supported, the laboratory leak hypothesis is dismissed relatively quickly. A deeper exploration of circumstantial evidence (e.g., the proximity of the Wuhan Institute of Virology to early cases, gain-of-function research debates) would strengthen objectivity.

Peripheral Content: The reverse zoonosis section, though informative, detracts from the primary focus on origins. Consider condensing or integrating it into broader transmission dynamics.

Methodological Transparency: The number of studies analyzed and inclusion/exclusion criteria are not explicitly stated. Clarifying these details would improve reproducibility.

Reference Inconsistencies: Formatting discrepancies (e.g., spacing, author lists) in citations (e.g., references 39, 40) require standardization to adhere to journal guidelines.

Discussion of Limitations: The review should address limitations of the cited studies (e.g., sampling biases in environmental data, geopolitical barriers to data sharing) to contextualize uncertainties.

3. Additional Recommendations

Address Emerging Evidence: Given the paper's forward-looking publication date (February 2025), briefly acknowledge ongoing investigations (e.g., WHO-led studies, novel intermediate host discoveries) that may soon resolve lingering questions.

Public Health Communication: Expand the "Scientific Inquiry and Transparency" section to propose specific strategies for combating misinformation (e.g., collaborative fact-checking platforms, scientist-media partnerships).

4. Conclusion

This review provides a valuable synthesis of current evidence on SARS-CoV-2 origins and offers pragmatic recommendations for pandemic preparedness. While minor revisions are needed to enhance balance and methodological clarity, the paper's scholarly rigor and relevance justify **acceptance pending revisions**. Addressing the noted weaknesses will ensure the manuscript meets the highest standards of scientific discourse and contributes meaningfully to the field.

Decision: Accept with Minor Revisions

Declarations

Potential competing interests: No potential competing interests to declare.