

Review of: "Evolution of new variants of SARS-CoV-2 during the pandemic: mutation-limited or selection-limited?"

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Potential competing interests: No potential competing interests to declare.

Dear Authors,

I have carefully reviewed your manuscript on the evolution of new variants of SARS-CoV-2 during the pandemic. Overall, I find the study to be well-conducted and the topic highly relevant. Your exploration into whether the evolution of these variants is mutation-limited or selection-limited addresses a critical aspect of SARS-CoV-2 dynamics. Use of multiple alternative hypotheses and the evaluation based on epidemiological data is commendable. I have the following comments and suggestions: Here are my specific comments and suggestions for improvement:

1. Methodological Rigor:

The methodology appears robust, particularly the Simulations and Data Source. However, please clarify the rationale behind the choice of these methods and add some specific advantages, as this is crucial for readers to understand the study design.

2. Clarity of Hypotheses:

The hypotheses regarding the mutation and selection limits are clearly stated. The paper's strength lies in its comprehensive exploration of alternative hypotheses. This approach adds depth to the analysis and strengthens the conclusions drawn from the epidemiological data.

To enhance clarity, consider providing a brief summary or conceptual diagram that illustrates the key elements supporting each hypothesis.

3. Comprehensive Literature Review:

The literature review is well-structured, and you have adequately referenced existing studies.

4. Contribution to the Field:

Emphasize the implications of your findings for public health and future research directions. Discuss how understanding the limitations imposed by selection can inform targeted intervention strategies and contribute to the management of SARS-CoV-2 variants. Elaborate on how your study contributes to the broader understanding of SARS-CoV-2 evolution and its potential impact on transmission dynamics and vaccine development.

5. Clarity and Coherence:

The manuscript is well-written.

In conclusion, this manuscript significantly contributes to the understanding of SARS-CoV-2 evolution. Addressing these minor revisions will enhance the clarity and impact of your work. I appreciate the effort put into this study and look forward to seeing the final version.