

Dear editors,

Dear reviewers,

Thank you for your time to review our paper. We acknowledge that our paper might have some issues in conformity with the referees' comments. We have addressed them and revised the manuscript accordingly. Changes are visible as highlighted and/or track changes.

We sincerely thank the three reviewers for their thorough and helpful comments and suggestions. We have addressed all of the raised queries and responded to all reviewers' comments.

We believe that you find these changes satisfactory, and the revisions have substantially improved the quality of the manuscript.

Reviewer #1:

Scientific Quality: Grade C (Good)

Language Quality: Grade C (A great deal of language polishing)

Conclusion: Major revision

Specific Comments to Authors: The introduction should provide more context on the importance of time series analysis in epidemiology and its relevance to the COVID-19 pandemic.

- Thank you for the overall evaluation of our paper as good. We extended the introduction emphasizing on the importance of time series analysis in COVID-19 epidemiology.
- Please, find the changes via track changes in the supplementary file, since the uploaded file in the system does not show them.

It should also clearly state the objectives of the study.

- Thank you for the valuable comment. We added the objectives of the study.

The introduction should provide a brief explanation of the classical epidemiological models (SIR, SEIR) and their limitations, and how time series analysis complements these models.

- Thank you for the critical note and suggestion. We have added this information and believe that this improved the quality of the paper.

The section on "TIMES SERIES ANALYSIS FOR ASSESSMENT OF SARS-COV-2 VARIANTS SPREAD" should provide a clearer explanation of the different time series analysis methods used in epidemiology and their application in studying the spread of COVID-19.

- The referee is right to point out this weakness of the paper. We extended the explanations including their application and benefits during the pandemic.

Each method should be briefly described with its advantages and limitations.

- We agree with the referee and add this information accordingly in the introduction citing papers that compare the models, and also the employed these models for COVID-19 predicting – SIR, SEIR, ARIMA, etc (in the introduction).
- Thank you for the suggestion to describe the mentioned methods. The models on page 8 were briefly mentioned and explained in brackets, because they are not the main topic of our paper. However, based on your suggestion, we summarized using modelling such those in a paragraph.

The section on "Excess mortality and COVID-19 in Bulgaria" should be rewritten to provide a clearer explanation of the study methodology and findings.

- We revised the section to make it more comprehensive, clear and explanatory.

The significance of including variants as factor variables in the model should be highlighted.

- We completely agree with the referee. We paid attention on this topic and also add a reference regarding virus variants.

The references should be properly formatted according to a specific citation style (e.g., Vancouver).

- Thank you for the comment. We formatted the references accordingly.