Peer Review Report

Review Report on Real-time analysis of predictors of COVID-19 infection spread in countries in the European Union through a new tool

Original Article, Int J Public Health

EVALUATION

Q 1 — Please summarize the main findings of the study.

A new online analysis tool was developed to determine the predictors of COVID-19 infection spread in the countries of the European Union. Vaccination, average temperature, COVID-19 variants, and mask usage, followed by restriction measures have the strongest effect on infection spread with relevant country variations. Nine public data sources were used to build two integrated databases.

Q 2 — Please highlight the limitations and strengths.

Study strengths: The real-time analysis provided by the new online tool constitute a concrete advantage. Study limitations: Introduction, methods and discussion are insufficiently described.

Q 3 — Please provide your detailed review report to the authors. The editors prefer to receive your review structured in major and minor comments. Please consider in your review the methods (statistical methods valid and correctly applied (e.g. sample size, choice of test), is the study replicable based on the method description?), results, data interpretation and references. If there are any objective errors, or if the conclusions are not supported, you should detail your concerns.

Title: Real-time analysis of predictors of COVID-19 infection spread in the countries of the European Union; Please use "through a new tool" (or other similar expression) in the title.
– Countries of European Union or member states of European Union?

Keywords: please select some MeSH terms. Please use the maximum number of keywords (see instructions for authors) and try to not repeat words from the abstract.

Abstract
Objectives: objectives are not clear; "paper introduces a novel interactive visualization and analysis tool using several sources of COVID-19 data." Please clear define study objectives.
Methods: please define the timeframe, regarding "Strongest predictors were percentage of people vaccinated at least once, average daily temperature, percentage of variant B.1.1.529. (Omicron) by week and country, percentage of respondents reported using a mask, followed by country specific measures such as lock-downs"; Timeframe?
– Please present this information http://covidpredictors.tk:3838/ in study findings. Please note that this link is not available online… Please provide a functional link.
– Conclusions: The online analysis tool allows researchers and health communicators to compare country variations. Only?

Contribution to the field
– "Our results show that vaccination, average temperature, COVID-19 variants, and mask usage, followed by restriction measures have the strongest effect on infection spread with relevant country variations."
Timeframe?

Introduction
– Introduction is too short. Please cite at least 15 references. At least some of these references must be explained in the section of Discussion.
– Similar (or related studies) must be cited in introduction. Please see here:
https://scholar.google.com/scholar?hl=pt-PT&as_sdt=0%2C5&q=new+tools+to+evaluate+covid+spread&btnG=
– The following methodologies must be explained in introduction: random forests, hierarchical clustering, and rank correlation.
– Preferably, studies using the following methodologies: random forests, hierarchical clustering, and rank correlation must be cited/explained in introduction.
– This link is not available: http://covidpredictors.tk:3838/
– Please present study aims at the end of introduction.
– You can give a name to the new developed tool.

Methods
– Methods are too compact; please use some graphics and tables to improve readability.
– Methods need to be exhaustively described to ensure study reproducibility.
– References are missing in methods; please cite studies applying similar methodologies.
– Line 62: "The data streams are captured via APIs (Application Programming Interfaces) whenever possible." Is this legal? Is a previous authorization to automatically collect data from databases required?
– Internal and external validation?
– Quality control?
– Have you compared the outputs of the present tool with other models/tools?
– Please present a section about statistical methodologies.
– How was the tool validated?

Results
– Please create subheadings in results. Results are too compact.
– Lines 259-260: We find that the percentage of the Omicron variant is most important in the Nordic countries, the Mediterranean, and Ireland, and less important in Eastern and Central Europe. Please give more details.
– Please check the format of Tables and figures in instructions for authors.

Discussion
– Discussion is insufficient. Please cite some of the new references of introduction here.
– The present tool must be compared with other similar or related tools.
– Regarding the "Strongest predictors were percentage of people vaccinated at least once, average daily temperature, percentage of variant B.1.1.529. (Omicron) by week and country, percentage of respondents reported using a mask, followed by country specific measures such as lock-downs", these predictors must be compared with other models. Please see related studies.
– Please present study strengths and limitations in separated sections at the end of discussion; Please discuss possible study biases.
– Please present a section about practical implications and future research at the end of discussion.

Conclusion
– Study conclusion must reply to study objectives. Please place results or practical implications in discussion. Please talk about the new developed tool in introduction.

References
– References must be formatted according to the instructions for authors

Please maximize figure 6.

PLEASE COMMENT

Q 4   **Is the title appropriate, concise, attractive?**

Title: Real-time analysis of predictors of COVID-19 infection spread in the countries of the European Union; Please use "through a new tool" (or other similar expression) in the title.
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Q 5   Are the keywords appropriate?

Yes.Keywords recommendations: please select some MeSH terms. Please use the maximum number of keywords (see instructions for authors) and try to not repeat words from the abstract.

Q 6   Is the English language of sufficient quality?

Yes, but I am not an English native speaker.

Q 7   Is the quality of the figures and tables satisfactory?

Yes.

Q 8   Does the reference list cover the relevant literature adequately and in an unbiased manner?)

Yes, but the number of cited references is too limited.

QUALITY ASSESSMENT

	Rating (out of 5)
Q 9 Originality	3 / 5
Q 10 Rigor	3 / 5
Q 11 Significance to the field	3 / 5
Q 12 Interest to a general audience	4 / 5
Q 13 Quality of the writing	3 / 5
Q 14 Overall scientific quality of the study	2 / 5

REVISION LEVEL

Q 15   Please make a recommendation based on your comments:

Reject.