

# Review of: "SARS-CoV-2 Virion: A Humane Debacle - An Analytical Approach"

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**Potential competing interests:** No potential competing interests to declare.

The present study, which focuses on predicting COVID-19 mortality using Machine Learning (ML) algorithms, is a commendable piece of research that showcases both relevance and significance in the current global context. The structure is well organized, and the tables and figures show essential data, which helps to connect the main aspects of the issue proposed in the research. However, there are some aspects that could be improved to enhance clarity and precision in scientific writing.

## 1- Abstract

**Background:** the first sentence starts with a general statement about the World Health Organization declaring COVID-19 a pandemic. While this is important background information, it might be helpful to include a more focused background on the relevance of predicting COVID-19 mortality and the current state of the research in this area.

**Research Gap:** The abstract would benefit from mentioning the gap in existing research that this study aims to address. What makes this research novel and different from previous work on COVID-19 mortality prediction?

**Methods:** The abstract briefly mentions comparing several ML algorithms, but it would be valuable to specify the performance metrics used for evaluation and the criteria for selecting the best performing algorithm.

**Impact/Contribution:** It is crucial to highlight the potential impact of the study's findings. How could the proposed predictive tool for decision-making improve the management of COVID-19 cases and overall public health strategies?

**Limitations:** While the abstract focuses on the study's objectives and potential benefits, it is essential to include a brief mention of the limitations. This will help readers understand the scope and potential constraints of the research.

## 2- Introduction

**Statistics Presentation:** While it's essential to provide statistics, it might be more effective to present them in a more concise and organized manner. Instead of mentioning specific dates for the reported cases, deaths, and vaccine doses, consider providing a general timeframe for the data source. For example, "As of October 2022, the World Health Organization (WHO) has reported a total of 626 million confirmed cases of COVID-19, with 6.5 million deaths worldwide. Additionally, 12.8 billion vaccine doses have been administered globally."

**Focus:** The introduction could benefit from a more focused statement of the study's main objective or research question.

Currently, it presents COVID-19 statistics and vaccine information without explicitly indicating what the study aims to achieve or address.

Citation Format: Ensure that the citation format adheres to the specific referencing style required for the research paper (e.g., APA, MLA, etc.).

3- The presented information about the COVID virion and its variants provides relevant details but could benefit from some improvements in conciseness and clarity, as follows:

Variant Naming: The list of variants could be more concise by grouping similar variants together. For example, instead of listing each Omicron variant separately, you could mention "Omicron variants (BA.1, BA.2, BA.4, etc.)."

Terminology: Instead of "infectious disease causing severe acute respiratory syndrome," you can simply refer to it as "COVID-19, a severe acute respiratory syndrome."

Grammar: In the second sentence, "Fig.1" should be "Fig. 1," and "Table 1" should be "Table 1," with spaces after the period.

Citations: The source for the quantitative analysis of viral load (Ron Sender et al.) should be mentioned in-text with proper citation details.

Additional Information: Consider adding more context about the significance of SARS-CoV-2 variants and their impact on transmission, virulence, and vaccine efficacy.

#### 4- Figure 2

It's essential to ensure that the figure is indeed accurate and based on reliable scientific data or research. When describing scientific figures, accuracy and clarity are crucial, as it helps readers understand the content and context of the research accurately. Thus, it is recommended that every figure and scheme should present the arrows indicating the correct information as described in the subtitle. Figure 2 needs to be revised. To be clear, the figure should indicate with arrows every virus' part mentioned in the text.

#### 5- Results section:

The provided text presents the results of applying seven different classification algorithms: Naive Bayes, J48, Bayes Net, JRip, SVM, RandomForest, and K-NN. The section appears to contain relevant information about the accuracy, precision, and recall of each algorithm. However, there are some aspects that could be improved for clarity and organization.

Table Reference: Instead of referencing "Table 2" at the end of the paragraph, consider incorporating the table's content within the section for better cohesion.

Organization: To enhance readability, it might be helpful to group the results for each algorithm together. This will make it easier for readers to compare the performance of the algorithms.

## 6- Conclusion

The provided conclusion highlights the research paper's aim, the impact of the COVID-19 pandemic, and the best-performing ML algorithm. However, there are some aspects that could be improved to make the conclusion more relevant, informative, and impactful.

**Specificity:** The conclusion could benefit from being more specific about the "disease spread abnormalities" and the factors that contribute to "high recovery rates." Provide more details about the specific aspects of disease spread and recovery rates that the research addresses.

**Research Objectives:** Reiterate the research objectives in the conclusion and mention whether they were successfully achieved. This will help readers understand the extent to which the study fulfilled its purpose.

**Data Limitations:** Discuss any limitations in the data or methods used for the research. Addressing the limitations will enhance the credibility of the findings and provide context for readers.