

Author Response

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Keywords: COVID-19, Emergency department, Mortality prediction, Performance measures, Scoring systems.

Indian Journal of Critical Care Medicine (2024): 10.5005/jp-journals-10071-24609

Dear Editor,

We express our appreciation for the interest shown by Finsterer and Scorza in our research.¹ We would like to underscore the central objective of our study, which aimed to assess and compare the prognostic accuracy of six distinct severity-of-illness scoring systems. Our focus was predicting in-hospital mortality among patients with RT-PCR confirmed COVID-19 upon their presentation to the emergency department (ED). In response to their comments, we provide the following clarifications:

Retrospective Study Design and Missing Data

In consideration of one of the limitations highlighted in our paper's limitation section, it is important to note that, as a characteristic of retrospective studies, participants may be chosen based on certain characteristics, potentially influencing the generalizability of our findings. Addressing the concern of missing data, we acknowledge its significance and that is why we employed multiple imputations within bootstrap samples to effectively handle missing data. This well-established and statistically robust approach generated multiple complete datasets, allowing us to reduce bias, account for uncertainty, and enhance the reliability of our findings.¹ This is a far superior approach to performing complete-case analysis.

Medication as an Input Variable

We need to refocus the attention of the authors of the letter back to the primary objective of our study. None of these scoring systems, by design, includes medication as an input variable.^{2,3} The rationale behind this design choice is to leverage the severity of illness at admission without introducing potential bias from treatment information. We would like to clarify that we are uncertain whether the authors of this letter anticipated us to speculate on the integration of additional data into the validated scoring systems.

Assessment of Mental Status

The evaluation of mental status relied on data extracted from electronic medical records based on the six scoring systems. We employed widely recognized tools, namely the Glasgow Coma Scale (GCS) and the AVPU (Alert, Voice, Pain, Unresponsive) scale, which provide practical and routinely documented assessments of consciousness and orientation in patients.^{2,4} In emergency situations involving the assessment of septic patients, there is no evidence to suggest that testing problem-solving or decision-making abilities will influence patient outcomes. This is particularly relevant as many of our septic patients may experience altered mental status, and the GCS and AVPU scales serve as valuable indicators for evaluating a patient's mental status.

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How to cite this article: Rahmatinejad Z, Hoseini B, Pourmand A, Reihani H, Rahmatinejad F, Eslami S, *et al.* Author Response. *Indian J Crit Care Med* 2024;28(2):183–184.

Source of support: Mashhad University of Medical Sciences, Mashhad, Iran (grant #4000506)

Conflict of interest: None

Vaccination Status

We had no access to vaccination data, given that the vaccination process had not yet been initiated during the study period in our study setting.

Cause of Mortality

We cannot definitively draw conclusions about the causation of mortality in this retrospective study. The patients included in the study presented to the ED in a critically ill state during the height of the COVID-19 pandemic, a period when vaccination was not readily available. It is important to note that our study's primary objective was not to determine the precise cause of mortality but rather to analyze and understand the characteristics and outcomes of patients in this specific context.

Mechanical Ventilation

While we incorporated mechanical ventilation into the calculation of scoring systems, in our study 16% of patients required mechanical ventilation, of whom 87% did not survive.

Inclusion of RT-PCR-confirmed Cases

As mentioned previously, our study's primary objective was not to document all findings in COVID-19 patients; rather, we concentrated on scoring systems. While we understand their interest in additional information such as X-rays, CT scans, and other variables, it's essential to note that none of the scoring systems necessitated such data.

In summary, within dynamic healthcare contexts such as the COVID-19 pandemic, retrospective studies offer valuable real-world insights, serving as a fundamental platform for prospective research. The utilization of multiple imputations within bootstrap samples enhances the reliability of the results. When the goal is the development of predictive models, rather than the comparison of severity-of-illness scores, then subsequent models for COVID-19 outcomes can explore additional variables that are not routinely incorporated into existing scoring systems.^{5,6}

We read the submitted letter regarding our study with enthusiasm. As already stated above, the esteemed authors have posed numerous questions that are not directly related to the primary focus of our study.¹ These inquiries delve into areas such as X-ray findings in patients, CT scans, medication, mental status assessment based on problem-solving or decision-making, and even causation of mortality.

Ethical Approval

Mashhad University of Medical Sciences (Ethical code: IR.MUMS.MEDICAL.REC.1402.129).

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