Reviewer #1:

This paper utilizes a public database to analyze racial/ethnic disparities among patients with septic shock in the United States during the COVID-19 pandemic. The paper is well-structured, with comprehensive data and clear statistical methods. However, there are several issues that need to be addressed.

1.Title and Background Ambiguity: The title "COVID-19-associated septic shock" and the objectives and hypotheses in the background section imply that the study focuses on septic shock with COVID-19 infection. However, the actual study population includes all patients with septic shock during the COVID-19 pandemic (2020-2021), not solely those with COVID-19 infection. Therefore, there is ambiguity between the title and background descriptions and the actual content of the paper. Additionally, the study only reflects the background of the COVID-19 pandemic in terms of the time frame (2020-2021) but does not demonstrate the impact of COVID-19 on septic shock and related disparities.
Response: Thank you for the clarification. The patient population included were patients admitted with septic shock and a positive COVID 19 infection status. The statement about patient selection and identification was rephrased to reflect that the patients included are the ones with septic shock and COVID 19 infection.

"Adult patients aged 18 years or older with a diagnosis of septic shock were identified using the International Classification of Diseases, 10th Revision, Clinical Modification (ICD-10-CM) code R65.21, which has been used and validated in previous epidemiological studies. Following that, patients with COVID-19 were identified using the ICD-10-CM codes U07.1, U00, U49, U50, U85, J12.82. Patients with missing data for variables including age, sex, race/ethnicity, median household income, elective admission status, insurance type or in-hospital mortality, were excluded. Patients without COVID-19 were excluded from this study."

2. Clarity of Research Objectives: While the title, abstract, and background section mention exploring racial/ethnic disparities in septic shock, it is unclear what the purpose of this exploration is. Is it to identify the causes of the disparities, assess the effectiveness of interventions, or provide recommendations to reduce the disparities?
Response: Thank you for your comment. We hypothesize that there are racial differences in terms of COVID-19 associated septic shock outcomes, whereby NHB and Hispanic are hypothesized to have higher risk of in-hospital mortality compared to NHW (as a reference group). Our study is designed to first evaluate the differences (or disparities) in outcomes before and after adjustment for the demographics, socioeconomic factors, hospital-level factors and comorbidities. We have clarified under introduction to reflect the hypothesis and research objective. Additionally, we have opted to use the word 'differences' rather than disparities.

"This study aims to examine epidemiologic data to explore racial and ethnic differences in outcomes in COVID-19 associated septic shock. We hypothesize that racial and ethnic disparities exist in the outcomes of septic shock associated with COVID-19, with non-Hispanic Black (NHB) and Hispanic populations experiencing higher mortality compared to non-Hispanic White (NHW) populations, even after accounting for sociodemographic factors."

3.Selection of Secondary Outcomes: Severe sepsis can lead to multi-organ failure. In fact, the authors have also collected data on conditions like "Congestive heart failure." However, why is the primary focus of the secondary outcomes on kidney injury? Is this based on personal preference or supported by the literature? I did not see a rationale provided for this selection.
Response: Thank you for your feedback. The current manuscript is a secondary analysis of a previously accepted study in this journal, which examined racial and ethnic differences in septic

shock over the period from 2016 to 2021, not specifically related to COVID-19. Data on congestive heart failure was not collected as an outcome in the initial study and, therefore, was not included in this analysis. In response to a previous reviewer's suggestion, the focus of this study was narrowed to COVID-19-related septic shock.

4.Handling of Missing Data: The methods section mentions that "Patients with missing data for key variables were excluded," but are there missing values for other variables? If so, were they imputed? It is recommended to explain this in the methods section.
Response: Thank you for this important comment. We would like to clarify that we also excluded missing values for variables including median household income (1.8%), primary insurance type (0.2%) and elective admission status (0.08%). Given the missing data constituted less than 5%, we performed a complete case analysis. This has been added to methods section.

"Given the missing data constituted less than 5%, we performed a complete case analysis."

5.Conclusion section: The authors predominantly focus on describing the mortality disparities in septic shock, with only the final sentence highlighting the racial/ethnic disparities. This does not align with the title and research objectives.
Response: Thank you for this important comment. We have refined the abstract to emphasize the differences in other outcomes to align with the research objectives.

"Background
Septic shock, the most severe form of sepsis, remains a major global health challenge with high mortality. The COVID-19 pandemic has exacerbated this burden, as severe SARS-CoV-2 infection often leads to sepsis and septic shock. Racial and ethnic differences in critical illness outcomes are well-documented, but their impact on COVID-19 associated septic shock remains unclear.

Aim
To examine epidemiologic data to explore racial and ethnic differences in outcomes in COVID-19 associated septic shock

Material and Methods
Using the National Inpatient Sample (2020–2021), we conducted a retrospective cohort study to assess racial and ethnic disparities in septic shock outcomes among adults (≥18 years) with concurrent COVID-19. Primary and secondary outcomes included in-hospital mortality, acute kidney injury (AKI), AKI requiring dialysis, and mechanical ventilation. Adjusted multivariable logistic regression accounted for demographics, comorbidities, hospital characteristics, and in-hospital events.

Results
Among 304,190 weighted hospitalizations, Non-Hispanic Black (NHB, 25.3%) and Hispanic (30.4%) populations were younger and had greater comorbidity burdens than Non-Hispanic White (NHW) patients. Compared to NHW, adjusted analyses showed higher in-hospital mortality (adjusted odds ratio [aOR] 1.21, 95% CI 1.15–1.27), mechanical ventilation use (aOR 1.19, 95% CI 1.12–1.27) and AKI requiring dialysis (aOR 1.16, 95% CI 1.07-1.25, $p < 0.001$) among Hispanic patients. NHB patients had similar mortality to NHWs but had higher risk of mechanical ventilation (aOR 1.15, 95% CI 1.09-1.22) and AKI requiring dialysis (aOR 1.65, 95% CI 1.54–1.76). Mean length of stay and cost were longest and highest for Hispanic patients.

Conclusions
Our study showed that there was higher mortality in Hispanic patients, and higher renal and

respiratory complication in both NHB and Hispanic groups compared to NHW group. Future research identifying the causes of the observed differences in complications are required to inform targeted strategies that may mitigate modifiable risk factors and optimize early detection of organ failure to optimize outcomes in this population."