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## Author response to: An outcome study in patients with COVID-19 admitted to ICU: HAS a miss?



Dear colleagues,

I have read your letter that analysed the paper that we recently published in *Heart and Lung*,<sup>1</sup> which expressed several concerns about the choice of laboratory parameters which were analysed as potential risk factors contributing to intensive care and in-hospital mortality of critically ill COVID-19 patients. I thank you for your effort and have read the articles that you referenced with great interest (some of those are valuable meta-analyses which accumulate knowledge from different population analyses).

While I wholeheartedly agree that prior articles that you have quoted in your letter have shown a significant ability of the hypoalbuminemia, anaemia, and hyperglycaemia triad (HAS) to predict ICU mortality in our cohort; at the time data acquisition process started (October 2020), less peer-reviewed published papers were available and in those papers,<sup>2–5</sup> the HAS triad was not associated with an adverse effect on ICU survival rates.

Due to the inability of our hospital information system to output laboratory findings as a Microsoft Excel or comma-separated value spreadsheet format readable in the statistics package I used for data analysis<sup>6</sup> (i.e. one row per subject), laboratory findings needed to be entered in the dataset by hand. Also, during the data acquisition period, my colleagues and myself were under increased workload (as stated in the article, UH Dubrava was repurposed to be the central COVID-19 only hospital in the country, and we worked eight to ten 24-hour ICU shifts monthly). Because of those factors, variable selection needed to be purposeful, and not a “throw everything at the wall and see what sticks” approach and was guided by literature findings published at that time. As you observed, our efforts were mostly focused on severity of inflammatory response and COVID pneumonia, as well as predictive ability of widely used clinical scoring systems (SOFA, CCI) to predict ICU mortality.

Now, in retrospect and after reading the meta-analyses you kindly quoted, it seems like some of the analysed variables could have been avoided and haemoglobin, serum albumin and glucose could have been acquired and analysed. However, further analyses on a sub-population from our cohort (propensity matched controls from this dataset were used to determine effect of intravenous immunoglobulins

on hospital survival rates – statistical analysis is completed, but the manuscript is still under preparation, it will be published by authors Čulo, Svaguša and Šribar) have shown that none of the mentioned variables (HAS) have shown an effect on ICU survival rates.

I am looking forward to reading your findings on factors that affect ICU survival in critically ill COVID-19 patients in your centre, and I hope that our joint efforts will help all the clinicians worldwide achieve better survival rates of critically ill COVID-19 patients.

### References

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