Comment on: Predicting In-Hospital Mortality in COVID-19 Older Patients with Specifically Developed Scores

To the Editor:

We read with interest the article by Marcello Covino et al,[1] who evaluated the prognostic performance of four prognostic scores in 210 confirmed COVID-19 patients aged 60 years or more hospitalized via the Emergency Department. They found that all four scores had a good predictive value for in-hospital death: the ISARIC-4C score[2] had the highest area under receiver operating characteristic curve (AUROC) 0.80 (0.74–0.85), followed by the COVID-GRAM 0.78 (0.72–0.84),[3] NEWS 0.76 (0.70–0.82),[4] and quick COVID-19 severity index (qCSI) 0.75 (0.68–0.81).[5]

Given the burden of the pandemic in older population, we applaud the authors for specifically evaluating these new scores in older patients. However, despite the interest of such scores for predicting short-term outcomes and helping physicians provide adequate medical care, we are afraid that their relative complexity could hinder their use in difficult contexts, especially in nursing-homes and primary care. On that point, we agree with the authors that the easy-to-use qCSI, which uses three every-day clinical measures, is of particular interest.

As underscored by the authors, short-term prognosis is mainly driven by respiratory state, even in older patients. Additionally, the best prognostic scores mainly explore respiratory function, which is mostly clinically evaluated by bedside parameters. The World Health Organization (WHO) propose an easy-to-use severity scale in their COVID-19 clinical guidance, based solely on respiratory evaluation (S1: no pneumonia; S2: pneumonia, with $SpO2 \geq 90\%$ on room air; S3: severe pneumonia, with respiratory rate > 30 breaths/min or $SpO2 < 90\%$ on room air; S4: critical disease, with acute respiratory distress syndrome).[6] To our knowledge, this pragmatic scale has not yet been evaluated in a geriatric setting.

In a multicenter observational study of patients aged more than 75 in COVID-19 geriatric units of four French hospitals, we sought to evaluate the WHO severity scale specifically in a very old population, compared with other usual prognostic tools frequently used in COVID-19,
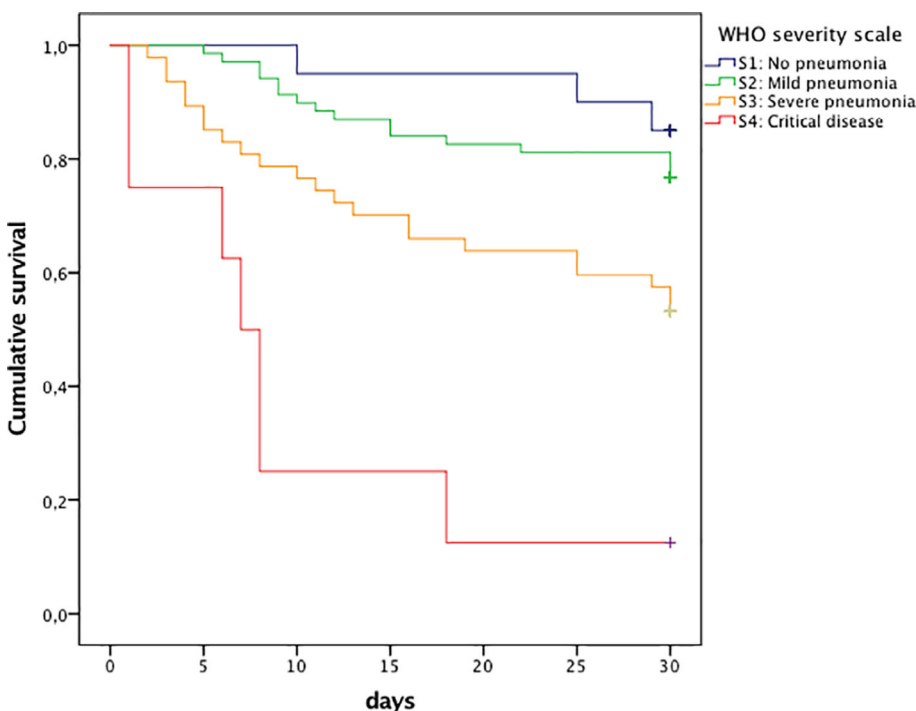
FIGURE 1 Short-term survival after COVID-19 according to the WHO severity scale

including pneumonia severity index,[7] NEWS,[4] qCSI,[5] quick SOFA (qSOFA),[8] and CURB65.[9] We included all consecutive patients aged more than 75 years and hospitalized for COVID-19 (with positive RT-PCR test). Clinical presentation and comorbidities were recorded at admission to build prognostic scores. An AUROC analysis was used to compare the ability of the various scores to predict 1-month mortality. This study was approved by the local ethics committee.

We included 142 consecutive patients (median age 86 years) who were then followed up for 1 month after admission. Overall, 48 (33.8%) patients had died by the end of follow-up. As shown in Figure 1, the WHO severity scale at admission predicted short-term mortality remarkably well. When compared with the more complex pneumonia severity index[7] (AUROC 0.74 (0.60–0.88)), the WHO severity scale (0.70 (0.60–0.79)) had similar performance when it was used to predict 1-month mortality. NEWS (0.66 (0.55–0.77)), qCSI (0.65 (0.54–0.76)), qSOFA (0.61 (0.50–0.72)), and CURB65 (0.51 (0.40–0.62)) were of lower interest in this very old comorbid population, and did not reach the performance described by Covino et al. for in-hospital mortality in younger patients.

In conclusion, these findings support the use of a simple evaluation based on respiratory function to determine prognosis after COVID-19. For this purpose, the WHO severity scale was found to have satisfactory performance in a geriatric setting. More complex evaluations that are difficult to implement at the bedside, especially in such a sanitary crisis, do not appear to add prognostic value in the short term, even in frail older patients.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Study concept and design: P. Manckoundia, A. Putot; acquisition of data: G. Odille, N. Girard, S. Sanchez, S. Lelarge, A. Mignot, S. Putot, F. Larosa, J. Vovelle, V. Nuss, S. Da Silva, J. Barben; analysis and interpretation of data: J. Barben, A. Putot; preparation of manuscript: all authors.

SPONSOR'S ROLE

None.

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See the Reply by De Matteis et al.

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REFERENCES

1. Covino M, Matteis GD, Burzo ML, et al. Predicting in-hospital mortality in COVID-19 older patients with specifically developed scores. *J Am Geriatr Soc.* 2021;69(1):37-43. https://doi.org/10.1111/jgs.16956.
2. Knight SR, Ho A, Pius R, et al. Risk stratification of patients admitted to hospital with Covid-19 using the ISARIC WHO clinical characterisation protocol: development and validation of the 4C mortality score. *BMJ.* 2020;370:m3339. https://doi.org/10.1136/bmj.m3339.
3. Liang W, Liang H, Ou L, et al. Development and validation of a clinical risk score to predict the occurrence of critical illness in hospitalized patients with COVID-19. *JAMA Intern Med.* 2020;180(8):1081-1089. https://doi.org/10.1001/jamainternmed.2020.2033.
4. Smith GB, Prytherch DR, Meredith P, Schmidt PE, Featherstone PI. The ability of the National Early Warning Score (NEWS) to discriminate patients at risk of early cardiac arrest, unanticipated intensive care unit admission, and death. *Resuscitation.* 2013;84(4):465-470. https://doi.org/10.1016/j.resuscitation.2012.12.016.
5. Haimovich AD, Ravindra NG, Stoytchev S, et al. Development and validation of the quick COVID-19 severity index: a prognostic tool for early clinical decompensation. *Ann Emerg Med.* 2020;76(4):442-453. https://doi.org/10.1016/j.annemergmed.2020.07.022.

6. Clinical management of COVID-19. https://www.who.int/publications-detail-redirect/clinical-management-of-covid-19. Accessed November 6, 2020.

7. Fine MJ, Auble TE, Yealy DM, et al. A prediction rule to identify low-risk patients with community-acquired pneumonia. *N Engl J Med*. 1997;336(4):243-250.

8. Singer M, Deutschman CS, Seymour CW, et al. The third international consensus definitions for sepsis and septic shock (Sepsis-3). *JAMA*. 2016;315(8):801-810. https://doi.org/10.1001/jama.2016.0287.

9. Lim WS, van der Eerden MM, Laing R, et al. Defining community acquired pneumonia severity on presentation to hospital: an international derivation and validation study. *Thorax*. 2003;58(5):377-382.

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To the Editor:

We thank Odille et al[1] for the interest in our research and for bringing additional relevant updates to improve our work. In our manuscript, as the researchers outlined, the main finding is that the prognosis of COVID-19 older patients is mainly driven by respiratory status at admission.[2]

Consequently, the severity scores including a respiratory function evaluation, such as those adopted for sepsis and pneumonia,[3-5] the general early warning scores (EWS),[6] and the specifically developed EWS, are able to stratify prognostic risk of COVID-19 patients. Likewise, as suggested by Odille et al,[1] the World Health Organization (WHO) pragmatic
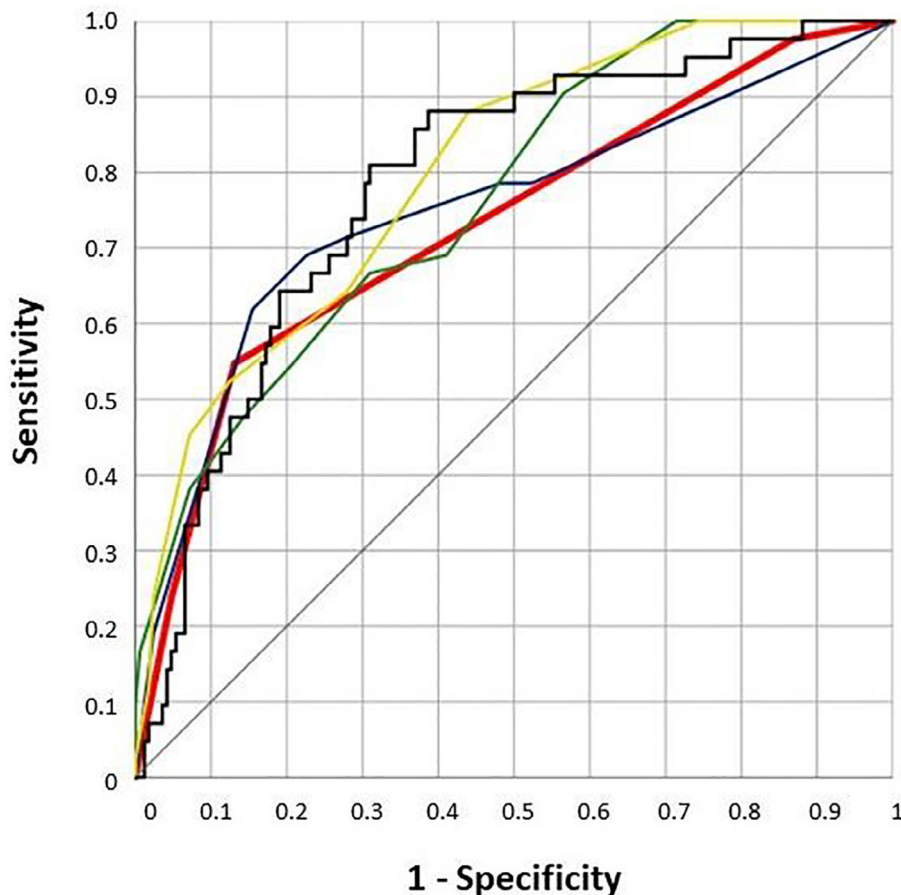
FIGURE 1 ROC curves of the evaluated scores with respect to in-hospital death