Letters

COMMENT & RESPONSE

COVID-19 Mortality and Stress to the Hospital System From High Patient Load

To the Editor Asch and colleagues[1] analyzed 6-month variation in hospital mortality rates for patients admitted with COVID-19, highlighting a strong association between the higher prevalence of COVID-19 in the community and an increased in-hospital mortality. In the related editorial, Boudourakis and Uppal[2] found this association plausible because hospitals perform worse when they are overwhelmed.

Lombardy, Northern Italy, a region with about 10 million inhabitants, was the first region of the western world to be severely hit by COVID-19 after February 20, 2020. The sharp rise in critically ill patients requiring urgent hospital care was a tsunami for an advanced health care system of the western world.[3] The concentration of many cases in a short period of time is thought to be a leading cause of the high mortality, which exceeded that reported in other areas of the western world.[4]

During the first devastating wave of the COVID-19 pandemic in early 2020, many referral hospitals in Lombardy, Italy, entirely converted to COVID-19 care, and faced the abrupt rise in severe COVID-19 cases arriving daily in the emergency room by rapidly expanding bed capacity: entire wards were opened overnight and health staff doubled their shifts with extraordinary abnegation. Nevertheless, a high death rate was observed, and patient load (measured through number of daily admissions and total daily census) independently contributed to in-hospital mortality,[5] possibly for the same reasons postulated by Asch et al[1] and Boudourakis and Uppal[2]: a higher stress to the hospital system caused by the impending surge in patient flow stretches the hospital's capacity, risks saturating hospital resources, and results in worse performance and worse patient outcome.

We suggest assessing the association between variables reflecting hospital stress (eg, the number of daily admissions, total daily hospital census) and the in-hospital mortality using the large database of Asch and coworkers,[1] as these data could be more informative and accurate indicators of the overload of individual hospitals than the trend of the epidemic in the community. Easy trade-off variables for estimating the stress on the hospital system (ie, number of daily admissions and total daily census) could be valuable tools to monitor in a timely way the risk of overwhelming hospital health system capacity. As the COVID-19 pandemic is far from over, beyond the ultimate imperative to flatten the curve, operational research to appraise indicators of hospital stress should be fostered and tested in different multiple settings to ameliorate hospital performance even in difficult conditions.

Alessandro Soria, MD
Giuseppe Lapadula, MD, PhD
Paolo Bonfanti, MD

Author Affiliations: Clinic of Infectious Diseases, San Gerardo Hospital, University of Milano-Bicocca, Monza, Italy.

Corresponding Author: Alessandro Soria, MD, Clinic of Infectious Diseases, San Gerardo Hospital, University of Milano-Bicocca, Via Pergolesi 33, Monza 20900, Italy (alessandro.soria@unimib.it).

Published Online: April 12, 2021. doi:10.1001/jamainternmed.2021.0599

Conflict of Interest Disclosures: Dr Soria reported support from AbbVie and Gilead. No other disclosures were reported.

1. Asch DA, Sheils NE, Islam MN, et al. Variation in US hospital mortality rates for patients admitted with COVID-19 during the first 6 months of the pandemic. *JAMA Intern Med*. Published online December 22, 2020. doi:10.1001/jamainternmed.2020.8193

2. Boudourakis L, Uppal A. Decreased COVID-19 mortality—a cause for optimism. *JAMA Intern Med*. Published online December 22, 2020. doi:10.1001/jamainternmed.2020.8438

3. Rosenbaum L. Facing Covid-19 in Italy—ethics, logistics, and therapeutics on the epidemic's front line. *N Engl J Med*. 2020;382(20):1873-1875. doi:10.1056/NEJMp2005492

4. Odone A, Delmonte D, Scognamiglio T, Signorelli C. COVID-19 deaths in Lombardy, Italy: data in context. *Lancet Public Health*. 2020;5(6):e310. doi:10.1016/S2468-2667(20)30099-2

5. Soria A, Galimberti S, Lapadula G, et al. The high volume of patients admitted during the SARS-CoV-2 pandemic has an independent harmful impact on in-hospital mortality from COVID-19. *PLoS One*. 2021;16(1):e0246170. doi:10.1371/journal.pone.0246170