The Importance of Understanding COVID-19–Related Hospitalizations

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Throughout North America, hospitalizations and deaths due to SARS-CoV-2 have fallen substantially due to the rapid roll-out of COVID-19 vaccines. Despite this monumental success, however, transmission of the virus will unfortunately persist for the foreseeable future due to a variety of factors, including incomplete population vaccination, emergence of variants, and increased exposures as social and economic activity return to normal.[1] Therefore, it is of critical importance to continue to track the burden of COVID-19 by region. Specifically, the incidence of hospitalizations due to COVID-19 will be a key metric, as highlighted by Tsai et al[2] in this issue of the *Journal of Hospital Medicine*.

Tsai et al[2] explored the challenge of accurately determining the burden of hospitalization due to COVID-19, focusing on the potential for misclassification leading to overestimations. They rigorously evaluated the proportion of overall COVID-19–associated hospitalizations reported to Los Angeles County Department of Public Health that were potentially misclassified as caused by COVID-19 because of incidentally detected virus in patients who were hospitalized for unrelated reasons. In their study, they reviewed medical records from a randomly selected subset of hospital discharges with a clinical diagnosis of COVID-19 to determine whether a clinical diagnosis of COVID-19 was warranted. Among 618 patients, COVID-19 was deemed incidental to the reason for hospitalization in 12% (95% CI, 9%-16%) of admissions.

Incidental viral detection is more common during periods of high case prevalence and when case presentations overlap with nonclassic COVID symptoms.[3] Incidental viral detection also occurs when broad testing of asymptomatic patients is instituted prior to admission, procedures, or high-risk medical therapies. Residual postinfectious shedding and false-positive results may further falsely increase case counts. The clinical and infection control implications of detectable virus is further complicated by vaccination, which leads to milder forms of the infection with less capacity for transmission.[4]

Why is establishing an overestimation COVID-19 hospitalization important? First, if misclassification leads to an overestimate of the number of hospitalizations caused by COVID-19, public health restrictions might be increased to protect overloading acute care sites when such measures are unnecessary, resulting in unintended social and economic fallouts.[5] Second, healthcare resource allocation depends on accurate estimates of disease burden—overestimation of COVID-19–related hospitalization can lead to misallocation of scarce resources, including personnel, equipment, and medication to units or hospitals.[6] Relatedly, cancelling of "nonurgent" tests, procedures, and clinic visits to reallocate resources to COVID-19–related care delays diagnosis and treatment of potentially serious illnesses. Last, overattributing hospitalizations due to COVID-19, particularly in patients who are now fully vaccinated, may lead researchers to underestimate the efficacy of vaccination efforts on the individual and population level, especially in the era of evolving variant strains.

How could this research change future practice? As the authors astutely state, the purpose of the investigation is not to alter practice on the individual patient level, but rather to help public health officials to make better decisions. One solution (similar to census adjustment) based on future research would be to potentially apply a corrective factor to "adjust" COVID-19 hospitalizations downward to explicitly account for the recognition that some proportion of patients hospitalized with COVID-19 were not actually hospitalized because of COVID-19.

Although vaccination continues to be highly successful at curbing the pandemic, transmission of COVID-19 persists due to gaps in vaccination and emergence of variants. Therefore, continued ongoing vigilance for disease burden, specifically focused on the most vulnerable aspects of the health care system—acute care centers—is critical to informing optimal public health restrictions and resource allocation.

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