Disparities in Coronavirus Disease 2019 Outcomes for African Americans: More Studies Are Warranted

To the Editor—We read with interest the article by Wiley et al [1], in which they describe coronavirus disease 2019 (COVID-19) outcomes among 94,683 patients presenting to emergency departments in 87 US health systems. Compared with white patients, the authors found no difference in hospitalization risk for African Americans, but higher risk of in-hospital death. These findings contradict several other studies, some with similar or longer study periods, reporting higher risk of hospitalization and similar or lower risk of in-hospital death for African Americans [2–8]. While their use of a large data set might support more generalizable results, the disparities that may exist in smaller individual settings could have been overlooked.

Wiley et al [1] attributed the racial disparities in mortality rate observed in their study to differences in prescribing dexamethasone. Because the magnitude and attributes of COVID-19 racial disparities might be changing during the course of the pandemic [6–8], the authors could assess temporal variations in disparities by stratifying the data into different time periods (eg, before vs after dexamethasone). It would also be useful to assess whether the prevalences of certain underlying conditions and risk factors were higher among black hospitalized patients, which might explain the higher risk of in-hospital death. Moreover, multivariate analyses should be performed separately in each racial group to identify potential differences in independent predictors (eg, receipt of dexamethasone) of hospitalization for COVID-19 or in-hospital death, even in the absence of outcome disparities between racial groups.

Systematic reviews and meta-analyses are useful in addressing discrepancies in study findings. To date, 2 relevant reviews have been published. One of them did not conduct meta-analysis owing to the heterogeneity caused by combining data from ecological studies and public databases [9]. In the other review, not only did the meta-analysis combine UK and US studies, which in itself is cause for concern, but African Americans were also underrepresented (<3%), and the major roles for social determinants were overlooked [10]. Moreover, the outcome measures were inadequately defined, and they were grouped as one without carefully examining the denominator (eg, mortality rate among infected, hospitalized, or intubated patients) or performing subgroup analyses. Precise definition of the outcome is important, because the disparities in one outcome are likely to influence those in the next event. We reviewed the descriptions of the outcomes in the original studies included in these 2 articles and found that some were misrepresented, resulting in only a limited number of studies eligible for assessing the relative risk of each specific COVID-19 outcome for African Americans (Supplementary Table 1). Notably, there has been no meta-analysis regarding racial disparities in the risk of hospitalization for COVID-19.

Thus, more studies, including systematic reviews and meta-analyses, are needed to further understand the trends in and dynamics of COVID-19-related racial disparities and possible reasons for inconsistent findings. These should include studies ranging from smaller community hospitals to larger integrated healthcare databases. Racial disparities in comorbid conditions and other risk factors should be assessed for all well-defined outcomes along the COVID-19 health continuum, to determine whether they are correlated with or predict disparities in subsequent events. This will provide mechanistic insights into possible causes for disparities and aid in tailored public health strategies for eliminating disparities. To this end, future studies addressing COVID-19 health disparities should present data disaggregated by race, perform multivariate analyses stratified by race, and assess temporal and geographic variations and trends in disparities.

Supplementary Data
Supplementary materials are available at Clinical Infectious Diseases online. Consisting of data provided by the authors to benefit the reader, the posted materials are not copyedited and are the sole responsibility of the authors, so questions or comments should be addressed to the corresponding author.

Notes
Financial support. This work was supported by the National Institutes of Health (grant U54 MD013376 to Y. C. C.).
Potential conflicts of interest. All authors: No reported conflicts. All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest.
Shiva Mehravaran,1 Hussien Ahmed H. Abdelgawad,1 and Yun-Chi Chen2
1Center for Urban Health Disparities Research and Innovation, Morgan State University, Baltimore, Maryland, USA, and 2Department of Biology, Morgan State University, Baltimore, Maryland, USA

References
1. Wiley Z, Ross-Driscoll K, Wang Z, Smothers L, Mehta AK, Patzer RE. Racial and ethnic differences and clinical outcomes of COVID-19 patients presenting to the emergency department. Clin Infect Dis 2022; 74:387–94.
2. Dai CL, Kornilov SA, Roper RT, et al. Characteristics and factors associated with COVID-19 infection, hospitalization, and mortality across race and ethnicity. Clin Infect Dis 2021; 73:2103–204.
3. Escobar GJ, Adams AS, Liu VX, et al. Racial disparities in COVID-19 testing and outcomes: retrospective cohort study in an integrated health system. Ann Intern Med 2021. doi: 10.7326/M20-6979.
4. Price-Haywood EG, Burton J, Fort D, Seoane L. Hospitalization and mortality among black patients and white patients with Covid-19. N Engl J Med 2020; 382:2534–43.
5. Miller J, Fadel RA, Tang A, et al. The impact of sociodemographic factors, comorbidities and physiologic response on 30-day mortality in COVID-19 patients in metropolitan Detroit. Clin Infect Dis 2021; 72:e904–10.
6. Romano SD, Blackstock AJ, Taylor EV, et al. Trends in racial and ethnic disparities in COVID-19 hospitalizations, by region—United States, March–December 2020. MMWR Morb Mortal Wkly Rep 2021; 70:560–5.
7. Pennington AF, Kompaniyets L, Summers AD, et al. Risk of clinical severity by age and race/ethnicity among adults hospitalized for COVID-19—United States, March-September 2020. Open Forum Infect Dis 2021; 8:ofaa638.
8. Rosenthal N, Cao Z, Gundrum J, Sianis J, Safo S. Risk factors associated with in-hospital mortality in
Reply to author

To the Editor—We thank Drs Mehravaran, Ahmed, and Chen for their correspondence. We agree that our large data set may report more generalizable results, as the Cerner Real-World data set includes hospitals of varying sizes (bed ranges include those <100, 100–199, 200–299, 300–499, 500–599, and ≥1000) and types (critical access hospitals, community hospitals, academic medical centers, and regional health authorities). As we did not have hospital identifiers in our data, we were unable to explore hospital-level variation in racial disparities in outcomes. We did, however, explore whether the associations between risk of hospitalization or in-hospital mortality varied across geographic region and found that results were consistent across regions.

Our study does contradict some prior publications in findings comparing risk of hospitalization and in-hospital mortality in Black patients (compared to White patients). Many of these studies, including research by some of our team [1], were conducted early in the pandemic when treatment options that are now known to decrease coronavirus disease 2019 (COVID-19) mortality (eg, dexamethasone) and decrease length of stay (eg, remdesivir) were not widely utilized or available. Although our study was not specifically designed to assess whether the introduction of these treatments resulted in racial disparities, our results led to this post hoc hypothesis. Stratification to different time periods (eg, pre- vs post-dexamethasone) would have been ideal; however, the specific dates of treatment within this data set were adjusted to protect patient health information, so we did not have an exact date to attribute as the start date for dexamethasone treatment in COVID-19. In sensitivity analyses, we did explore variation in outcomes pre- and post-September 2020 and found that the racial disparities observed in in-hospital mortality were not present in the early months of the timeframe of this data set but were evident after September 2020, when targeted therapy options were more readily available. For example, the odds ratio of mortality in hospitalized Black patients (compared to White patients) was 0.99 (95% confidence interval [CI]: .88–1.11, \( P = .822 \)) pre-September but increased to 1.18 (95% CI: 1.06–1.31; \( P = .002 \)) post-September. Lower proportions of Black patients were prescribed dexamethasone: 29.4% (n = 7426) compared to Hispanics (40.9%; n = 13,021) and Whites (37.5%; n = 14,088) [2]. In new stratified analyses suggested to explore whether the receipt of dexamethasone had an impact on in-hospital mortality outcomes, we found mortality benefit in both Black and White patients who received dexamethasone (risk ratio [RR] 0.75 [95% CI: .64–.87; \( P < .001 \)] and RR 0.77 [95% CI: .71–.84; \( P < .001 \)]), respectively. Future research is needed to identify whether differential prescribing patterns and treatment effects contributed to racial disparities in outcomes.

As the authors note, it is also possible that differences in patient demographic or clinical characteristics by racial/ethnic group could partially explain these findings. This is evident in our study, where we found that White patients presenting to the emergency department (ED) were older and had more comorbidities [2]. Although we did control for these variables in our multivariable-adjusted models, there is likely residual confounding that could also partially explain these findings. We agree that systematic reviews and meta-analyses are needed to best understand the racial disparities that are evident in COVID-19 and identify strategies to mitigate them.

Note

Potential conflicts of interest. The authors: No reported conflicts of interest. All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest.

Zanthia Wiley,1 Katie Ross-Driscoll,2 Zhensheng Wang,2 Laken Smothers,3,4 Aneesh K. Mehta,1 and Rachel E. Patzer1

1Department of Medicine, Division of Infectious Diseases, Emory University, School of Medicine, Atlanta, Georgia, USA; 2Health Services Research Center, Emory University School of Medicine, Department of Medicine, Department of Surgery, Emory University School of Medicine, and Department of Epidemiology, Rollins School of Public Health, Atlanta, Georgia, USA; 3Department of Epidemiology, Rollins School of Public Health, Atlanta, Georgia, USA; and 4Health Services Research Center, Emory University School of Medicine, Department of Medicine, Atlanta, Georgia, USA

Better Hybrid Systems for Disease Detections and Early Predictions

To the Editor—We have read with interest the manuscript by Nguyen et al describing an overview of hybrid simulations, advantages, and their limitations in healthcare settings [1]. The authors also discuss the data-related challenges in hybrid simulations. We appreciate the manuscript but thought it was directed at...