After a hard year, good news related to coronavirus disease 2019 (COVID-19) is welcome. In this issue of JAMA Internal Medicine, Asch and colleagues provide a reason for optimism that our health care system has improved in our ability to care for persons with COVID-19. The authors performed a national analysis of COVID-19-associated mortality that spanned 955 US hospitals, representing nearly 40,000 patients. Using administrative claims data from a large national health insurer, they found that a hospital’s risk-standardized event rate (a composite of hospital mortality or referral to hospice) because of COVID-19 had significantly decreased. Specifically, the risk-adjusted mortality decreased from 16.56% to 9.29% in the early period of this study (January through April 2020) compared with the later period (May through June 2020).

Similar improvements in mortality due to COVID-19 have been seen in other studies. A study using national intensive care unit data from the UK found a reduction in mortality from 41.4% in March 2020 to 24.8% in June 2020, and a study of patients with COVID-19 in a single hospital system in New York City, New York reported that hospital COVID-19–adjusted mortality dropped from 25.6% to 7.6% between March and August 2020. These improvements in mortality likely represent multiple clinical, health care system, and epidemiologic trends.

Clinical Improvements

Since the first wave of serious COVID-19 cases, physicians have learned a great deal about the best ways to treat this serious infection. Steroids may decrease mortality in patients with respiratory failure.4,5 Remdesivir may shorten hospitalizations and the early period of this study (January through April 2020) compared with the later period (May through June 2020).
of patients with serious illness. Anticoagulation and prone positioning may help certain patients. Using noninvasive ventilation and high-flow oxygen therapy may spare subsets of patients from the harms of intubation, such as ventilator-induced lung injury.

Health Care System

Asch and colleagues found that mortality rates were higher when the community prevalence of COVID-19 was higher. One likely reason for this finding is that hospitals do not perform as well when they are overwhelmed. In particular, patients with a precarious respiratory status require expert, meticulous therapy to avoid intubation; those who undergo intubation or have kidney failure require nuanced and timely expert care with ventilatory adjustments and kidney replacement therapy, which are difficult to perform optimally when hospital capacity is strained.

Epidemiologic Factors

Although the care of patients with COVID-19 has undoubtedly improved, it is unlikely that all of the mortality improvement is because of medical care. Patients who were admitted to the hospital during the earlier period likely had greater illness severity in ways that cannot easily be adjusted for. During the spread of cases in the Northeast, patients who did not have acute shortness of breath were told to stay home because the hospitals were overwhelmed. At the time, it was not recognized that a subgroup of patients developed severe hypoxia but were unaware of it. Patients with frailty, especially those in nursing homes, who were disproportionately harmed during the first wave of the epidemic were much better protected from infection in later months, and likely represented a smaller proportion of patients entering the hospital. While COVID-19 cases have also tended to occur among younger persons, the mortality models did adjust for age, so the younger age of more recently infected persons should not affect the adjusted mortality.

A more speculative possibility of why mortality has decreased is the possibility that larger infective doses of COVID-19 may lead to more severe illness than smaller inoculums. In the beginning of the first wave, there was very limited use of face masks and social distancing. As 2020 progressed, more people wore masks and distanced themselves, which may have decreased the infecting inoculum. The finding by the authors that the strongest risk factor for a hospital's standardized event rate was community prevalence of COVID-19 is consistent with this hypothesis, although the connection between inoculum and severity is far from certain.

Conclusion

COVID-19 has been devastating to health and to society more broadly. Yet there is reason to be proud of how much medical progress, including upcoming vaccines and monoclonal antibodies, as well as increased masking and social distancing, has been made to combat a virus that was unknown until the end of 2019.