

# Study: Cardiovascular risk, complications among COVID-19 patients changed as pandemic progressed

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The rate of heart attacks, strokes, and other cardiovascular complications increased among patients hospitalized with COVID-19 between March

2020 and December 2021, according to a new study led by UT Southwestern Medical Center researchers. The rise came even as patients hospitalized with the virus tended to be younger and less likely to have had cardiovascular disease (CVD) as the pandemic wore on.

The findings, published in *Circulation: Cardiovascular Quality and Outcomes*, are the latest based on data from the American Heart Association COVID-19 CVD registry, a national multicenter registry that originated at UT Southwestern.

"Despite all the advances in treatment, despite vaccinations, COVID-19 remains a disease capable of leading to significant mortality and significant need for [mechanical ventilation](#) and is definitely still something that needs to be taken seriously," said Eric Hall, M.D., a second-year cardiology fellow at UTSW who co-led the study with James de Lemos, M.D., Professor of Internal Medicine and Chief of the Division of Cardiology at UT Southwestern.

In the early days of the pandemic, Dr. de Lemos and UTSW colleague Sandeep Das, M.D., M.P.H., Professor of Internal Medicine, had the foresight to approach the American Heart Association about building a registry of hospitalized COVID-19 patients that focused on cardiovascular risk factors and complications. The project grew to include contributions from more than 100 hospitals across the country.

In the latest study using this registry, Drs. Hall, de Lemos, Das, and colleagues looked for trends in cardiovascular risk factors and complications from the start of the pandemic in March 2020 until December 2021. The study included 46,007 patients from 134 hospitals. The team collected demographic information as well as risk factors for [cardiovascular disease](#) such as [obesity](#), smoking, and hypertension. They analyzed this data for changes over time based on three-month intervals, with March 2020 considered separately because of its potential as an

outlier.

Their analysis showed several important trends. For example, the average age of patients admitted to hospitals with COVID-19 decreased over time, with the mean age in the early months of the pandemic around 62, and the mean age in the last few months of 2021 around 55. Patients admitted in the later months of 2021 were also more likely to be obese, rising from 12.5% in the early months to 15.6% by the end of the study period. These patients were also about 5% less likely to have had prior cardiovascular disease compared with those hospitalized during the pandemic's early days.

Despite dips in age and prior history of cardiovascular disease, cardiovascular complications from COVID-19 rose from 7% in March 2020 to nearly 10% in December 2021, researchers found. The authors note that these findings were driven by an increase in myocardial infarction and stroke—events that were more likely to be diagnosed in the latter part of the study period when more was known about COVID-19.

In-hospital deaths declined from nearly 21% in March 2020 to nearly 11% by December 2021. However, Dr. Hall noted, when the analysis was restricted to a period between July 2020 and December 2021, [mortality](#) didn't change—a finding that highlights the serious nature of this illness despite advances in prevention and patient care.

"When we started this registry at the beginning of the pandemic, there was widespread concern that cardiac complications would be very common among patients hospitalized with COVID-19. While we definitely see these complications, we show here that their rate has been lower than we initially feared," Dr. de Lemos said. "But, given the huge number of patients hospitalized with COVID-19, the cumulative impact of these cardiovascular complications has been large."

The findings open the door to further study of patients who developed cardiovascular issues in conjunction with COVID-19, Dr. de Lemos said. He added that the data could also shed light on the intersection of respiratory illness and cardiovascular disease, which could help inform future pandemics.

**More information:** Eric J. Hall et al, Longitudinal Trends in Cardiovascular Risk Factor Profiles and Complications Among Patients Hospitalized for COVID-19 Infection: Results From the American Heart Association COVID-19 Cardiovascular Disease Registry, *Circulation: Cardiovascular Quality and Outcomes* (2023). DOI: [10.1161/CIRCOUTCOMES.122.009652](https://doi.org/10.1161/CIRCOUTCOMES.122.009652)

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