# COVID-19 patients retain elevated risk of death for at least 18 months after infection, finds large-scale study

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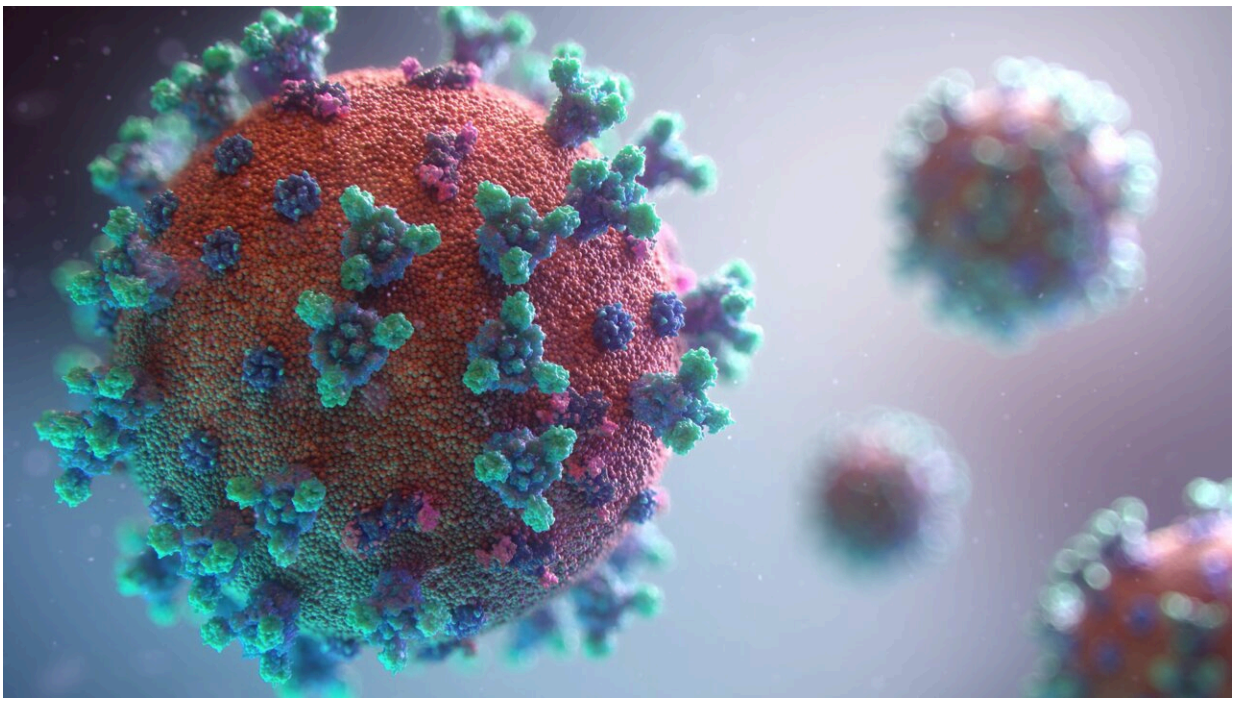

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COVID-19 is associated with higher risks of cardiovascular disease and death in the short- and long-term, according to a study in nearly 160,000 participants published today in *Cardiovascular Research*, a journal of the European Society of Cardiology (ESC). Compared to uninfected

individuals, the likelihood of COVID-19 patients dying was up to 81 times higher in the first three weeks of infection and remained five times higher up to 18 months later.

"COVID-19 patients were more likely to develop numerous cardiovascular conditions compared to uninfected participants, which may have contributed to their higher risks of death," said study author Professor Ian C.K. Wong of the University of Hong Kong, China. "The findings indicate that patients with COVID-19 should be monitored for at least a year after recovering from the acute illness to diagnose cardiovascular complications of the infection, which form part of long COVID."

This study compared the occurrence of cardiovascular conditions and death in infected versus uninfected individuals recruited before December 2020, when no vaccines were available in the UK. More than 7,500 patients with COVID-19 infection diagnosed from March 16, 2020 to November 30, 2020 were identified from UK Biobank. Each patient was matched with up to 10 individuals without COVID-19 during the study period (March 16, 2020 to the end of follow-up on August 31, 2021) and a historical cohort before the pandemic (March 16, 2018 to November 30, 2018).

Each uninfected group had more than 70,000 participants who were similar to the COVID-19 group for age, sex, smoking, diabetes, high blood pressure, cardiovascular and other health conditions, body mass index, ethnicity, and deprivation. In all three groups, the average age was 66 years and there were nearly equal numbers of women and men.

Professor Wong explained, "The historical control cohort was included to rule out the effect of routine healthcare services being reduced or canceled during the pandemic, which led to worsening health and increased mortality even in uninfected people."

Data were obtained from medical and death records for outcomes including major cardiovascular disease (a composite of heart failure, stroke and coronary heart disease); numerous cardiovascular conditions such as stroke, atrial fibrillation and myocardial infarction; death from cardiovascular disease; and all-cause death. Associations were evaluated for the acute phase (within 21 days of COVID-19 diagnosis) and the post-acute phase (starting at 22 days after diagnosis and continuing up to 18 months). Participants with a history of a particular outcome were excluded from that analysis.

Compared with the two uninfected cohorts, patients with COVID-19 were approximately four times more likely to develop major cardiovascular disease in the acute phase and 40% more likely in the post-acute phase. Compared to uninfected individuals, the risk of death in COVID-19 patients was up to 81-fold higher in the acute phase and five-fold higher in the post-acute phase. Patients with severe COVID-19 were more likely to develop major cardiovascular disease or die than non-severe cases.

COVID-19 patients had a greater likelihood of several cardiovascular conditions compared with uninfected participants in both the short- and long-term including myocardial infarction, coronary heart disease, heart failure, and deep vein thrombosis. Risks of some cardiovascular conditions—for example stroke and atrial fibrillation—were elevated in COVID-19 patients in the short-term but then returned to normal levels.

Professor Wong said, "This study was conducted during the first wave of the pandemic, and future research should evaluate subsequent outbreaks. Previous research has indicated that COVID-19 vaccination may prevent complications, and further studies are needed to investigate its effectiveness in reducing the risks of cardiovascular disease and death after COVID-19 infection in patients with COVID-19 vaccination compared to those without vaccination."

ESC spokesperson Professor Héctor Bueno of the National Centre for Cardiovascular Research (CNIC), Madrid, Spain said, "COVID-19 has had a huge impact on patients with cardiovascular disease, who were less likely to receive optimal care during the pandemic and more likely to die from the infection. This study shows that COVID-19 also increases the risk of having cardiovascular complications and dying in the first weeks after the infection and remains high for months, suggesting that specific cardiovascular monitoring may be appropriate in these patients."

**More information:** Ian Chi Kei Wong et al, Association of COVID-19 with short- and long-term risk of cardiovascular disease and mortality: A prospective cohort in UK Biobank, *Cardiovascular Research* (2022). DOI: 10.1093/cvr/cvac195

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