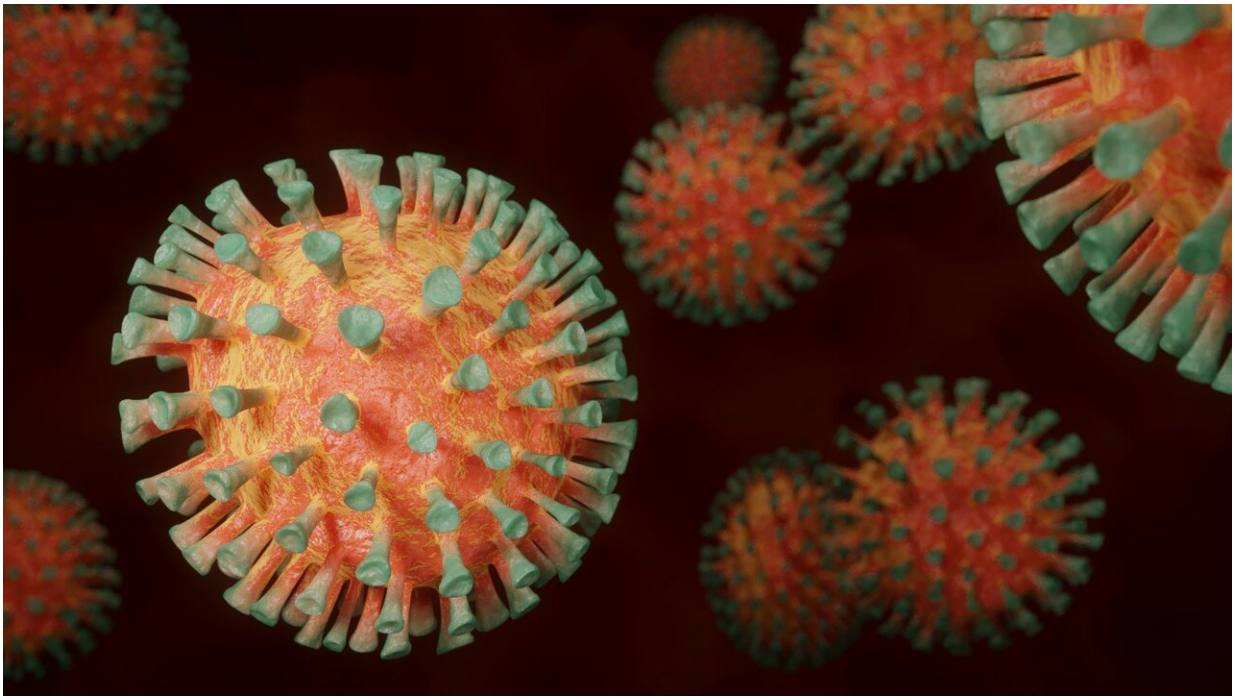
Certain pre-existing conditions may double, triple mortality risk for COVID-19

October 8 2020



Credit: Pixabay/CC0 Public Domain

A large, international study of COVID-19 patients confirmed that cardiovascular disease, hypertension, diabetes, congestive heart failure, chronic kidney disease, stroke and cancer can increase a patient's risk of dying from the virus. Penn State College of Medicine researchers say their findings may help public health officials improve patient care and develop interventions that can target these high-risk populations.

The researchers found that cardiovascular disease may double a patient's risk of dying from COVID-19. They also discovered that other pre-existing conditions may increase a COVID-19 patient's risk of death by one-and-a-half to three times. The results were recently published in *PLOS ONE*.

"This study suggests that these chronic conditions are not just common in patients with COVID-19, but their presence is a warning sign to a higher risk of death," said Dr. Paddy Ssentongo, a doctoral student in epidemiology at the College of Medicine and research assistant professor in Penn State's Department of Engineering Science and Mechanics. "There is a high prevalence of cardiovascular disease and hypertension around the world and in particular, the U.S. With the persistence of COVID-19 in the U.S., this connection becomes crucially important."

The research team conducted a systematic review and meta-analysis of studies published from December 2019 through early July 2020, to determine which chronic conditions put hospitalized patients at risk of dying from COVID-19. They explored 11 co-existing conditions that pose a risk of severe disease and death among COVID-19 patients, including cardiovascular disease, diabetes, high blood pressure, cancer, chronic kidney disease, chronic obstructive pulmonary disease, stroke, congestive heart failure, asthma, chronic liver disease and HIV/AIDS.

Ssentongo and colleagues analyzed data from more than 65,000 patients from 25 studies worldwide. Patients in the selected studies had an average age of 61 years. They found that certain pre-existing health conditions affected survival rates more than others. When compared to hospitalized COVID-19 patients without pre-existing conditions, researchers determined that patients with diabetes and cancer are 1.5 times more likely to die, patients with cardiovascular disease, hypertension and congestive heart failure are twice as likely to die, and patients with chronic kidney disease are three times more likely to die.

"Although the health care community has circulated anecdotal information about the impact of these risk factors in COVID-19 mortality, our systematic review and meta-analysis is the most comprehensive to date that attempts to quantify the risk," said Vernon Chinchilli, distinguished professor and chair of public health sciences, and senior author of this research. "As the COVID-19 pandemic continues through 2020 and likely into 2021, we expect that other researchers will build on our work."

The researchers said that prior studies exploring the association of pre-existing chronic conditions and COVID-19 mortality had limitations in the number of countries included, the number of studies included and the number of conditions explored. They also said these studies had unaddressed sources of bias that limited the conclusions that can be drawn from them.

"We took an all-inclusive, global approach for this study by examining 11 chronic conditions and including patients from four continents: Asia, Europe, North America and Africa," Ssentongo adds. "Research suggests that SARS-CoV-2, the virus that causes COVID-19, may become seasonal and require annual vaccination. Once an approved and effective vaccine is available, high-risk individuals with these pre-existing conditions should receive vaccination priority to prevent high mortality rates."

Even though additional research is needed to fully understand health risks and implications, particularly in understanding the effects of race and ethnicity on COVID-19 survival rates, Ssentongo said these findings can help inform global prevention and treatment strategies.

More information: Paddy Ssentongo et al, Association of cardiovascular disease and 10 other pre-existing comorbidities with COVID-19 mortality: A systematic review and meta-analysis, *PLOS*

ONE (2020). DOI: 10.1371/journal.pone.0238215