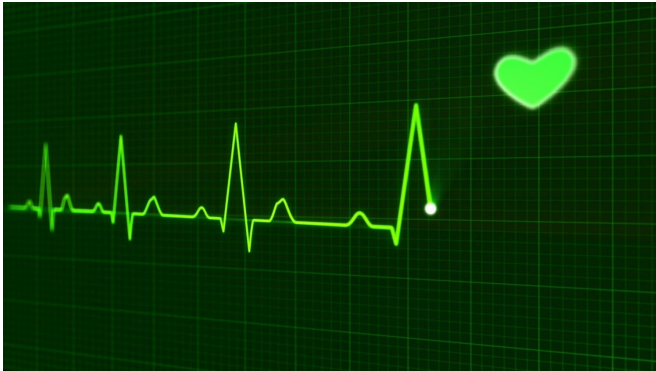# Having an unhealthy heart could lead to a higher risk of being diagnosed with COVID-19

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People with unhealthy heart structures and poorer functioning hearts have a significantly higher risk of being diagnosed with COVID-19 infection, according to research by Queen Mary University of London, in collaboration with the Medical Research Council Lifecourse Epidemiology Unit (The University of Southampton).

The researchers made use of the comprehensive and internationally unique UK Biobank database, which includes health and genetic information from over half a million participants from across the UK, including detailed magnetic resonance imaging (MRI) of their hearts as well as linkages to COVID-19 test results from Public Health England.

The team investigated records from 310 Biobank participants to see whether pre-existing features of the heart anatomy and function, as demonstrated on heart MRI scans, were linked to having a positive COVID-19 test result.

The findings, published in Aging Clinical and Experimental Research, demonstrate that people with pre-existing unhealthy heart structures and poorer heart function were more likely to test positive for COVID-19. These relationships appeared important even after accounting for possible predisposing factors such as age, sex, ethnicity, deprivation, diabetes, high blood pressure, high cholesterol, and previous heart attack.

Dr. Zahra Raisi-Estabragh, BHF clinical research training fellow at Queen Mary University of London and lead researcher, said: "In this research, we've discovered that poorer heart structure and function is linked to a higher risk of subsequent COVID-19. This is important because some studies have suggested that COVID-19 may cause structural damage to the heart. However, these studies only use heart scans from people after infection, so they cannot be certain whether the poor heart structures pre-existed COVID-19.

"In our study, we used imaging data obtained before COVID-19, and showed that many of these abnormalities likely pre-exist and predispose people to COVID-19, rather than occur as a result of infection. This is a very important distinction for guiding our management of patients with COVID-19."

Steffen Petersen, professor of cardiology at Queen Mary University of London who supervised the project said: "There is currently a lot of uncertainty around the relationships between the heart and COVID-19. Our work adds a new perspective to this issue, helping to inform patient care and public health strategies. However, further studies in diverse populations and settings are required to definitively answer these questions."

Professor Nick Harvey, professor of rheumatology and clinical epidemiology at the MRC LEU,

University of Southampton, who co-supervised the work added "This national collaboration and the wealth of information available in the UK Biobank database permitted a highly detailed analysis, providing novel and unique insights into the complex interactions between the heart and COVID-19. It illustrates the importance for the University of Southampton and the MRC LEU of our ongoing contribution to the leadership of the large, state-of-the-art, multidisciplinary imaging study as part of the unique world-leading UK Biobank resource."

Provided by Queen Mary, University of London