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 Editors' notes

Dengue recovery linked to higher long-term health risks than COVID-19

by Nanyang Technological University



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People who caught dengue and recovered are more likely to face long-term health complications about a year later compared to those who contracted COVID-19, according to the findings of a nationwide study led by Nanyang Technological University, Singapore (NTU Singapore).

Specifically, those who caught dengue have a 55% higher risk of heart complications, such as irregular heartbeats, heart disease, and blood clots, compared with those who fell sick with COVID-19 and recovered.

Based on tests and medical claim records of 11,707 residents in Singapore with dengue and 1,248,326 who had COVID-19 (delta and omicron variant) between July 2021 and October 2022, the study looked for newly arising health problems related to the heart, neurological and immune system that appeared 31 to 300 days after the infection. The research team said that the circulation of dengue and COVID-19 in the study period provided a unique opportunity for comparison.

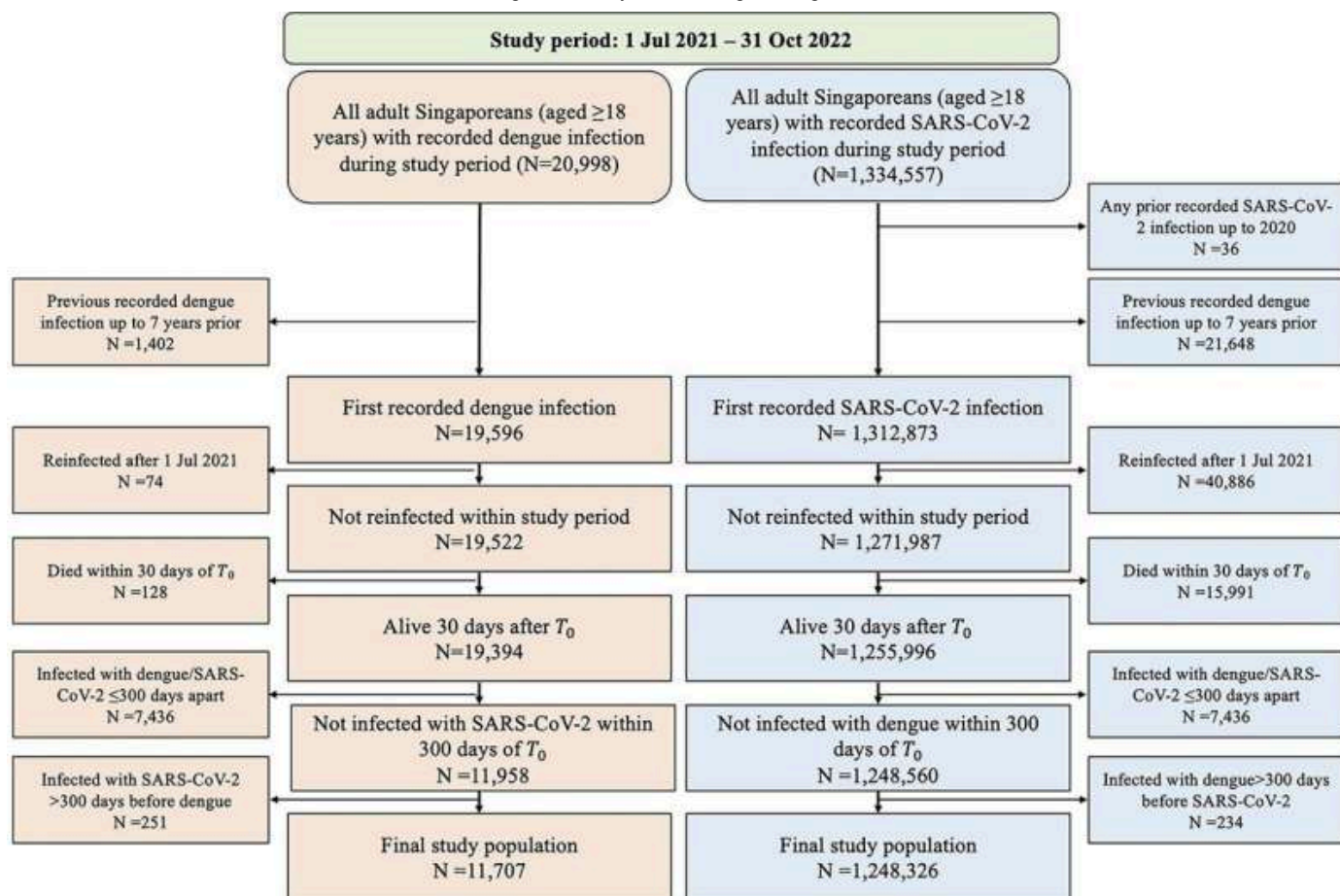
[The study](#), published in the *Journal of Travel Medicine* in July 2024, is the first to examine the long-term risk of multiple health complications following dengue and the first to contrast the post-recovery risk of dengue and COVID-19 patients.

The study was carried out by researchers from NTU's Lee Kong Chian School of Medicine (LKCMedicine), Ministry of Health, Singapore, Singapore General Hospital, and National Centre for Infectious Diseases, Singapore and the National Environment Agency.

Lead author of the study, Assistant Professor Lim Jue Tao, Infectious Disease Modelling at LKCMedicine, said, "We were motivated to conduct the study due to the increasing geographic range of dengue due to climate change. Dengue is one of the most common vector-borne diseases globally, and long-term health issues resulting from dengue can substantially increase the health care burdens of the infected person and the country.

"We also decided to compare the results against those who recovered from COVID-19 as our previous work had suggested increased risk of similar long-term health complications. Overall, our study underscores the need for people to guard against dengue in their environment and can be a resource to support public health planning."

The researchers' statistical analysis of their data revealed that people who had dengue were at higher risk of developing long-term health complications compared to those who had COVID-19— with 55% increased long-term risk of any heart complications, 213% increased risk of cognition or memory disorders, and 198% increased risk of movement disorders in dengue patients compared to COVID-19 patients.



Cohort construction flowchart. * T_0 taken as date of notification to national COVID-19/dengue registry; in Singapore, both dengue and COVID-19 are legally notifiable diseases to the local Ministry of Health (MOH), not later than 24 hours from time of diagnosis. Credit: *Journal of Travel Medicine* (2024). DOI: 10.1093/jtm/taae081

The risk of complications in dengue patients was compared to those who had COVID-19, as previous work already suggested increased risk of the same conditions in individuals who recovered from COVID-19. The comparison of the health issues faced by both groups of patients post-recovery therefore offers unique insights to the need for post-acute management of patients and health care planning.

Risk is the percentage increase in the chance of developing a specified heart or neurological complication in the 300 days following dengue diagnosis versus COVID-19 diagnosis.

The study found that individuals who caught dengue had a 55% higher risk of new long-term heart complications, such as dysrhythmia, ischemic heart disease and thrombotic disorders (101 of 11,166 patients, or 0.9%), compared to patients who recovered from COVID-19 (6494 of 1,206,208 patients, or 0.5%).

Dengue patients also had a 213% higher risk of cognition and memory disorders than those who had COVID-19 (39 of 11,632, or 0.3% in the dengue group compared to 1749 in 1,239,104, or 0.1% in COVID-19 group).

Additionally, dengue patients had a 198% higher risk of new extrapyramidal (movement) disorders, when compared to COVID-19 patients who recovered (25 of 11,610, or 0.2% in the dengue group compared to 1270 in 1,238,195, or 0.1%, in COVID-19 group).

Commenting as an independent expert, Professor Kwok Kin-on, infectious diseases epidemiologist at The Jockey Club School of Public Health and Primary Care, Chinese University of Hong Kong, said, "This study is crucial as it provides the first comprehensive comparison of post-recovery health issues between dengue and COVID-19 patients, offering valuable insights for health care planning and patient management. Additionally, the findings underscore the need for increased vigilance and targeted interventions for those recovering from dengue to mitigate long-term health impacts."

The researchers noted that there are limitations to the study. They include tracking only adults aged 18 years and older, which means the findings from the study cannot be generalized to the pediatric populations. Individual susceptibility to COVID-19 and dengue, such as genetic, behavioral, or environmental factors, which can influence risk estimates, were also not considered.

In future research, the team of researchers will compare the risk of long-term health complications across different dengue serotypes (variants), and the economic costs incurred from these complications.