NEWS RELEASE

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People who recover from dengue are at higher risk of long-term health complications than those who recovered from COVID-19, Singapore study finds

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 per cent 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 healthcare 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."

Patients who recovered from dengue face 55 per cent higher risk of heart complications compared to those who recovered from COVID-19

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 per cent increased long-term risk of any heart complications**, **213 per cent increased risk of cognition or memory disorders, and 198 per cent increased risk of movement disorders** in dengue patients compared to COVID-19 patients.

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 healthcare 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 per cent**, 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 per cent), compared to patients who recovered from COVID-19 (6494 of 1,206,208 patients, or 0.5 per cent).

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

Additionally, dengue patients had a **198 per cent** higher risk of new extrapyramidal (movement) disorders, when compared to COVID-19 patients who recovered (25 of 11,610, or 0.2 per cent in the dengue group compared to 1270 in 1,238,195, or 0.1 per cent, 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 healthcare 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 generalised to the paediatric populations. Individual susceptibility to COVID-19 and dengue, such as genetic, behavioural, 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.

END

Notes to Editor:

Paper titled "Dengue versus COVID-19: comparing the incidence of cardiovascular, neuropsychiatric and autoimmune complications" published in *Journal of Travel Medicine*, Volume 31, Issue 5, July 2024
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About Nanyang Technological University, Singapore

A research-intensive public university, Nanyang Technological University, Singapore (NTU Singapore) has 35,000 undergraduate and postgraduate students in the Business, Computing & Data Science, Engineering, Humanities, Arts, & Social Sciences, Medicine, Science, and Graduate colleges.

NTU is also home to world-renowned autonomous institutes – the National Institute of Education, S Rajaratnam School of International Studies and Singapore Centre for Environmental Life Sciences Engineering – and various leading research centres such as the Earth Observatory of Singapore, Nanyang Environment & Water Research Institute and Energy Research Institute @ NTU (ERI@N).

Under the NTU Smart Campus vision, the University harnesses the power of digital technology and tech-enabled solutions to support better learning and living experiences, the discovery of new knowledge, and the sustainability of resources.

Ranked amongst the world's top universities, the University's main campus is also frequently listed among the world's most beautiful. Known for its sustainability, NTU has achieved 100% Green Mark Platinum certification for all its eligible building projects. Apart from its main campus, NTU also has a medical campus in Novena, Singapore's healthcare district.

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