



PRESS RELEASE

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Obesity will become the most important risk factor for heart attacks within 3 decades

Obesity is set to become the leading risk factor for acute myocardial infarction (AMI) onset, with obesity associated AMI-related deaths projected to increase by three times (294.7%) in Singapore by 2050.

Singapore, 31 May 2023 — The number of heart attacks in Singapore is projected to rise nearly three-fold (194.4%) from 482 cases in 2025 to 1,418 per 100,000 population in 2050, with obesity predicted to be the main metabolic risk factor underlying AMI onset and AMI-related deaths. In 2025, it is predicted that 4 in 1,000 Singaporeans will have a heart attack. With the current forecast analysis based on the current metabolic burden in Singapore, 1 in a 100 Singaporeans will have a heart attack in 2050.

AMI, or more commonly known as heart attacks, occurs when blood is not able to flow to a section of the heart muscle due to a blockage in a coronary artery. The blockage, usually in the form of a blood clot, deprives the heart muscle of oxygen and nutrients, causing severe damage to affected heart tissue, and this is often life-threatening.

Using data from the Singapore Myocardial Infarction Registry (SMIR) from January 2007 to December 2018, the study led by Dr Nicholas Chew from the Cardiovascular-Metabolic Disease Translational Research Programme (CVMD TRP) at the Yong Loo Lin School of Medicine, National University of Singapore (NUS Medicine) and Department of Cardiology at the National University Heart Centre Singapore (NUHCS) under the National University Health System (NUHS) projected the prevalence of type 2 diabetes mellitus (T2DM), hypertension, hyperlipidemia (high cholesterol), overweight/obesity and cigarette smoking among AMI-incident and AMI-related mortality populations from 2025 to 2050, with deeper analysis based on age-group, sex and ethnicity.

Obesity is set to emerge as the fastest-growing and leading metabolic risk factor underlying AMI onset by 2050, growing by almost ten times (880%), overtaking hypertension and hyperlipidemia. For every 100,000 individuals who may have a heart attack in 2050, 3,764 of them are likely to be overweight or obese compared to 384 per 100,000 in 2025. This worrisome increase in AMI incidence will disproportionately affect females who are overweight or obese, with more than 13 times (1,204.7%) increase in the AMI cohort by 2050. A huge increase in the incidence of heart attacks is also projected among Malays, with the number of cases per 100,000 population among obese Malays expected to rise 12 times (1,191.9%), from 803 to 10,372 between 2025 and 2050.

In terms of heart attacks leading to deaths, overweight/obesity related AMI-mortality will also see an alarming four-fold (294.7%) increase, as opposed to the declining trends in AMI-related mortality associated with other risk factors like T2DM, hypertension and active/previous

smoking. The largest rise in AMI-related mortality over time is predicted in Malays with a five-fold (419.3%) increase, followed by Indians with a three and a half times (253.5%) rise.

The good news? Researchers say that the upward projected AMI trajectory can be halted by reducing upstream metabolic risks through the early detection and treatment of subclinical diseases in vulnerable groups. Nationwide programs focused on strengthening heart health can also potentially critically change the course of obesity-related deaths.

Lead author, Dr Nicholas Chew said, “We have to move away from a ‘one-size-fits-all’ approach to address challenges faced by groups at risk of AMI-onset and mortality. For example, the rise in obesity as a risk factor for metabolic disease morbidity is more predominant in younger and middle-age groups, whereas metabolic disease mortality for older populations is driven by hypertension and hyperlipidemia. This necessitates differentiated interventions.”

Epidemiological insights gleaned from the population-based analysis in this study can also potentially inform future global responses to cardiovascular-metabolic diseases.

Associate Professor Mark Chan, Deputy Director of the CVMD TRP at NUS Medicine and Senior Consultant in the Department of Cardiology at NUHCS said, “There are many European and U.S based studies that have explored the cardiovascular disease trajectories in predominantly Western populations. However, few studies forecast trends that are representative of an increasingly multi-ethnic Asia. The trends identified in this study is a good representation of larger, emerging trends in rapidly-growing Asia societies due to Singapore’s rapid rate of socio-economic development and our multi-ethnic case mix.”

The study, collaboratively undertaken by Dr Nicholas Chew, NUS Medicine Phase IV student Bryan Chong and Kuo Si Min, Senior Manager at Health Promotion Board, Ministry of Health, was published in The Lancet Regional Health-Western Pacific on 31 May 2023 and can be found here: <https://doi.org/10.1016/j.lanwpc.2023.100803>

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Our multidisciplinary and real-world approach to education, research and entrepreneurship enables us to work closely with industry, governments and academia to address crucial and

complex issues relevant to Asia and the world. Researchers in our faculties, research centres of excellence, corporate labs and more than 30 university-level research institutes focus on themes that include energy; environmental and urban sustainability; treatment and prevention of diseases; active ageing; advanced materials; risk management and resilience of financial systems; Asian studies; and Smart Nation capabilities such as artificial intelligence, data science, operations research and cybersecurity.

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About the NUS Yong Loo Lin School of Medicine (NUS Medicine)

The NUS Yong Loo Lin School of Medicine is Singapore's first and largest medical school. Our enduring mission centres on nurturing highly competent, values-driven and inspired healthcare professionals to transform the practice of medicine and improve health around the world.

Through a dynamic and future-oriented five-year curriculum that is inter-disciplinary and inter-professional in nature, our students undergo a holistic learning experience that exposes them to multiple facets of healthcare and prepares them to become visionary leaders and compassionate doctors and nurses of tomorrow. Since the School's founding in 1905, more than 12,000 graduates have passed through our doors.

In our pursuit of health for all, our strategic research programmes focus on innovative, cutting-edge biomedical research with collaborators around the world to deliver high impact solutions to benefit human lives.

The School is the oldest institution of higher learning in the National University of Singapore and a founding institutional member of the National University Health System. It is one of Asia's leading medical schools and ranks among the best in the world (Times Higher Education World University Rankings 2023 by subject and the Quacquarelli Symonds (QS) World University Rankings by subject 2023).

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About the National University Heart Centre, Singapore (NUHCS)

The National University Heart Centre, Singapore (NUHCS) brings together the resources, expertise and capabilities in the areas of Cardiology, Cardiothoracic and Vascular Surgery to better meet the needs of the growing number of patients with heart disease. A key centre for the treatment and management of complex cardiovascular diseases, its core clinical programmes include heart failure, structural heart disease, acute coronary syndrome, vascular medicine and therapy, women's heart health and heart rhythm.

Comprising a team of cardiovascular specialists and experts from a multitude of medical and surgical disciplines, the NUHCS provides a comprehensive and holistic approach to the treatment of patients with heart problems. This approach is backed by cutting edge knowledge and information gathered by the Cardiovascular Research Institute (CVRI).

The CVRI focuses on developing niche research work in creating new knowledge in support of NUHCS' core clinical programmes by working in close collaboration with both local and international renowned research institutes such as the Agency for Science, Technology and Research (A*STAR) and New Zealand's Christchurch School of Medicine and Health Sciences.

Partnerships are formed with various medical institutes as NUHCS is a selected training centre for international physicians. Education and training ensures that our medical professionals are kept abreast. Nurturing the next generation, our specialists are also actively involved in conducting workshops and teaching programmes for our medical undergraduates.

For more information, visit: <https://www.nuhcs.com.sg>.