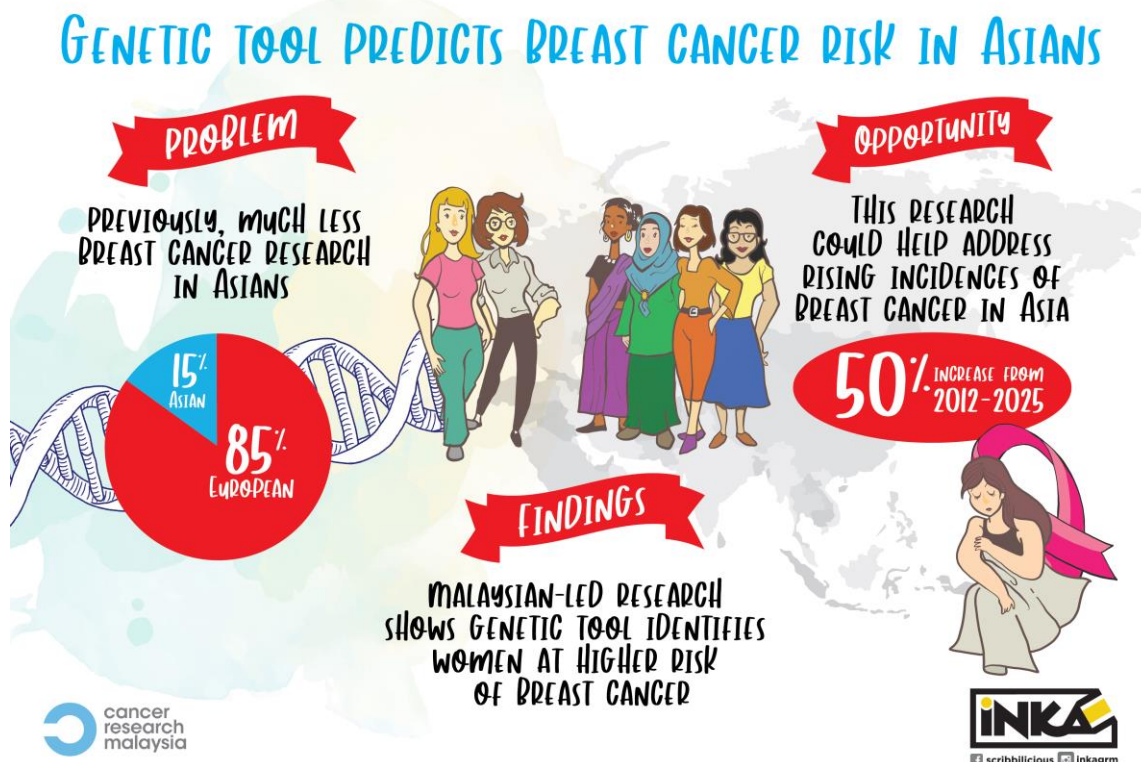


## WHAT IS YOUR BREAST CANCER RISK SCORE?

MALAYSIA – SINGAPORE – CAMBRIDGE TEAM  
EVALUATE GENETIC TOOL FOR ASIAN WOMEN

KUALA LUMPUR – A ground-breaking genetic study in Asian women led by Malaysian scientists in collaboration with Singapore and the University of Cambridge revealed that a genetics tool developed to help European women assess breast cancer risk also works in Asian women.



The tool, called a Polygenic Risk Score (PRS), separates people into different risk groups based on their genetic sequence, to predict their future risk of developing breast cancer. The results can empower women to decide which screening and prevention is right for them, and help reduce inefficiency, unnecessary cost, and even possible harm caused by over-diagnosis.

“This is the first large study of the PRS in an Asian population. Previously, Asian studies were nearly six times smaller than studies in European women, and due to lack of data in Asians, it was unclear if PRSs are effective in predicting breast cancer risk in non-European women. Through the significant increase in data from Malaysia and Singapore, we now know PRS can help us identify more accurately who is at high risk of breast cancer. Our results suggest that only 30% of Malaysian and Singaporean women have a predicted risk similar to that of European women, and that using the PRS accurately identifies these high-risk women,” said Professor Datin Paduka Dr Teo Soo Hwang, OBE, Chief Scientific Officer at Cancer Research Malaysia and co-lead of the project.

The collaborative study, published in the prestigious Nature Communications science journal, was the result of a collaboration between Cancer Research Malaysia and Associate Professor Ho Weang Kee, University of Nottingham; Professor Douglas Easton and Professor Antonis Antoniou, University of Cambridge, UK; Professor Nur Aishah Mohd Taib, Universiti Malaya; Professor Dato' Dr Yip Cheng Har, Subang Jaya Medical Centre; Associate Professor Mikael Hartman, National University Health System, Dr Li Jingmei, Genome Institute of Singapore, and six hospitals in Singapore; and a large population-based prospective cohort from Singapore.

“Combining genetic factors into one comprehensive model is critical to move from the research to a tool for women to use. We evaluated the PRS in 45,212 Asian women, from Singapore, Malaysia, Japan, Korea, China, Hong Kong, Thailand, Taiwan, USA, and Canada. Studies such as these require large sample sizes, and so, bringing together patients from University Malaya, Subang Jaya Medical Centre, National University Hospital, Singapore, and six other major treatment centres in Singapore really gave us the sample size to be able to evaluate the tool in Asians,” said Associate Professor Ho Weang Kee, first author of the study.

“Our study is a critical piece of the puzzle that helps us better understand breast cancer risks in different women around the world. There are differences in the genetic make-up of Asian women compared to women of European descent, which means their propensity to develop breast cancer may be different. Understanding this can help us to work out why some women are at higher risk of the disease, which in turn should help us to improve screening, prevention and ultimately treatment of the disease,” said Professor Douglas Easton, Director of the Centre for Cancer Genetic Epidemiology, University of Cambridge, and co-lead of the study.

“We have been developing a model for predicting breast cancer risk in European women that includes the PRS and this is now approved for clinical use. This study is the first big step towards enabling the use of such tools in the clinical management of women of Asian ancestry,” said Professor Antonis Antoniou, University of Cambridge, and co-lead of the study.

Women are generally recommended to start screening at age 50. However, in most Asian countries, many women who could be at risk of breast cancer do not go for screening. This leads to late detection and a lower survival rate.

“The Polygenic Risk Score is an important step forward and lays the foundation for risk-based mammography screening in Singapore,” said Associate Professor Mikael Hartman, National University Health System, Singapore.

“Risk-based screening may be particularly important in low- and middle-resource countries that do not have population-based screening, such as Malaysia. Without the funding for population-based screening, identifying individuals with higher risk may be an important strategy for early detection,” said Professor Nur Aishah Mohd Taib, Universiti Malaya Cancer Research Institute, Malaysia.

There is an urgent need to develop an appropriate screening strategy for Asian women. Malaysia anticipates a 49% increase in breast cancer cases from 2012 to 2025. Malaysia has

a much lower five-year survival rate compared to other Asian countries at only 63%, whereas South Korea is at 92% and Singapore is at 80%.

“Research collaborations like this are extremely important, bringing together data and expertise from the UK and Malaysia to help find solutions to one of the world’s leading causes of death – cancer,” said His Excellency Charles Hay MVO, British High Commissioner to Malaysia.

The study was supported by numerous research grants and charitable funding, principally from the Medical Research Council and Academy of Sciences Malaysia via the Newton-Ungku Omar Fund, the Wellcome Trust Collaborative Science Award, Yayasan Sime Darby, Yayasan PETRONAS, and Estee Lauder Group of Companies.

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## About Cancer Research Malaysia

Cancer Research Malaysia is the only non-profit organisation in Malaysia dedicated to saving lives through impactful research focusing on the Malaysian population and communities across Asia. Our research has already led to the discovery and implementation of new and effective breast cancer prevention strategies and our priority is ensuring that Asians are not left out in the fight against cancer. Together with our partners and supporters, Cancer Research Malaysia's vision is a future free of the fear of cancer. Funding for our lifesaving research depends on donations and sponsorship from the public and corporations. For more information, please visit [www.cancerresearch.my](http://www.cancerresearch.my) or follow us at

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## About the University of Cambridge

The mission of the University of Cambridge is to contribute to society through the pursuit of education, learning and research at the highest international levels of excellence. To date, 109 affiliates of the University have won the Nobel Prize.

Founded in 1209, the University comprises 31 autonomous Colleges, which admit undergraduates and provide small-group tuition, and 150 departments, faculties and institutions. Cambridge is a global university. Its 19,000 student body includes 3,700 international students from 120 countries. Cambridge researchers collaborate with colleagues worldwide, and the University has established larger-scale partnerships in Asia, Africa and America.

The University sits at the heart of the 'Cambridge cluster', which employs 60,000 people and has in excess of £12 billion in turnover generated annually by the 4,700 knowledge-intensive firms in and around the city. The city publishes 341 patents per 100,000 residents.

[www.cam.ac.uk](http://www.cam.ac.uk)

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## **About University of Nottingham**

The University of Nottingham is a research-intensive university with a proud heritage, consistently ranked among the world's top 100. Studying at the University of Nottingham is a life-changing experience and we pride ourselves on unlocking the potential of our 44,000 students - Nottingham was named both Sports and International University of the Year in the 2019 Times and Sunday Times Good University Guide, was awarded gold in the TEF 2017 and features in the top 20 of all three major UK rankings. We have a pioneering spirit, expressed in the vision of our founder Sir Jesse Boot, which has seen us lead the way in establishing campuses in China and Malaysia - part of a globally connected network of education, research and industrial engagement. We are ranked eighth for research power in the UK according to REF 2014. We have six beacons of research excellence helping to transform lives and change the world; we are also a major employer and industry partner - locally and globally.

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## **About the National University Health System (NUHS)**

The National University Health System (NUHS) aims to transform how illness is prevented and managed by discovering causes of disease, development of more effective treatments through collaborative multidisciplinary research and clinical trials, and creation of better technologies and care delivery systems in partnership with others who share the same values and vision.

Institutions in the NUHS Group include the National University Hospital, Ng Teng Fong General Hospital, Jurong Community Hospital and Alexandra Hospital; three National Specialty Centres - National University Cancer Institute, Singapore (NCIS), National University Heart Centre, Singapore (NUHCS) and National University Centre for Oral Health, Singapore (NUCOHS); the National University Polyclinics (NUP); Jurong Medical Centre; and three NUS health sciences schools – NUS Yong Loo Lin School of Medicine (including the Alice Lee Centre for Nursing Studies), NUS Faculty of Dentistry and NUS Saw Swee Hock School of Public Health.

With member institutions under a common governance structure, NUHS creates synergies for the advancement of health by integrating patient care, health science education and biomedical research.

As a Regional Health System, NUHS works closely with health and social care partners across Singapore to develop and implement programmes that contribute to a healthy and engaged population in the Western part of Singapore.

For more information, please visit <http://www.nuhs.edu.sg>.

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### **About A\*STAR's Genome Institute of Singapore (GIS)**

The Genome Institute of Singapore (GIS) is an institute of the Agency for Science, Technology and Research (A\*STAR). It has a global vision that seeks to use genomic sciences to achieve extraordinary improvements in human health and public prosperity. Established in 2000 as a centre for genomic discovery, the GIS will pursue the integration of technology, genetics and biology towards academic, economic and societal impact.

The key research areas at the GIS include Human Genetics, Infectious Diseases, Cancer Therapeutics and Stratified Oncology, Stem Cell and Regenerative Biology, Cancer Stem Cell Biology, Computational and Systems Biology, and Translational Research.

The genomics infrastructure at the GIS is utilised to train new scientific talent, to function as a bridge for academic and industrial research, and to explore scientific questions of high impact.

For more information about GIS, please visit [www.a-star.edu.sg/gis](http://www.a-star.edu.sg/gis).

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## **About Universiti Malaya**

Situated in the southwest of Kuala Lumpur, Universiti Malaya (UM) is the first university in Malaysia. UM is being supported by two academies, thirteen faculties, three institutes and three academic centres that comprehensively encompass medicine, science, technology, social sciences and humanities. UM also has the first and biggest teaching hospital in Malaysia, which is the University of Malaya Medical Centre (UMMC). The core of UM's contributions to the academia and society is through teaching, research, publication, innovation, and commercialisation.

UM has emerged among the world's top 60 universities and is ranked 59th on the Quacquarelli Symonds (QS) World University Rankings 2021. Since its establishment, UM has successfully produced approximately 200,000 graduates. For more information, please visit [www.um.edu.my](http://www.um.edu.my).

## **About Subang Jaya Medical Centre**

Subang Jaya Medical Centre is the flagship of Ramsay Sime Darby Health Care, a joint venture between Ramsay Health Care, Australia and Sime Darby. It is a licensed 444-bed multi-disciplinary and tertiary care private hospital nestled in the bustling municipality of Subang Jaya, about 30 minutes' drive to Kuala Lumpur city centre and the Kuala Lumpur International Airport via major highways. The Hospital was established in 1985 and for decades, has provided comprehensive and complex care in all specialties. SJMC is also a tertiary referral hospital, receiving local patient referrals from within Malaysia as well as international patients from the Asia-Pacific region, in addition to serving as a major health care provider to a population catchment of an estimated 6.47 million.

## Appendix: Full List of Funders

This study was supported by grants from Newton-Ungku Omar Fund [grant no: MR/P012930/1] and Wellcome Trust [grant no: v203477/Z/16/Z]. The Malaysian Breast Cancer Genetic Study was established using funds from the Malaysian Ministry of Science, and the Malaysian Ministry of Higher Education High Impact Research Grant [grant no: UM.C/HIR/MOHE/06]. The Malaysian Mammographic Density Study was established using funds raised through the Sime Darby LPGA tournament and the High Impact Research Grant. Additional funding was received from Yayasan Sime Darby, PETRONAS, Estee Lauder Group of Companies and other donors of Cancer Research Malaysia.

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