

SCOPE

LATEST NEWS & EVENTS @ NMRC

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NMRC National Medical
Research Council
Singapore

P.2 Leading The Way In
Mental Health Research

P.3 Advancing Population
Health With PULSES

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With Artificial Intelligence



FEATURED

Key Changes To NMRC Funding Schemes In RIE2025

FY2021 marked the start of Research, Innovation and Enterprise 2025 (RIE2025). In this funding tranche which spans from FY2021 to FY2025, the Government continues its strong commitment to research excellence, while incorporating a new emphasis to further human potential.

The National Medical Research Council (NMRC) is one of the key players driving the advancement and strengthening of translational and clinical excellence in Singapore. Several new and revamped schemes were introduced in RIE2025 to align with its goals.

NEW

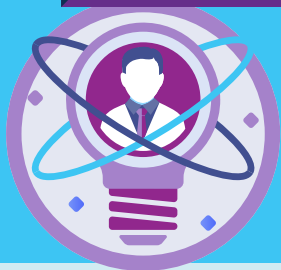
Population Health Research Grant (PHRG)



Introduced in RIE2025, the PHRG scheme aims to support researchers on innovative population health research as part of our Healthier SG effort to improve population health outcomes, particularly in the areas of Health Promotion, Preventive Health, and Health Services Research (HPHSR). Population health research is an interdisciplinary field that focuses on a range of individual and collective factors which influence the health of the entire population or population groups. Through the PHRG, Ministry of Health continues its endeavour for impactful outcomes by going beyond conventional ways of delivering health services.

NEW

HPHSR Clinician Scientist Award (HCSA)



NMRC continues to dedicate funding to nurture and strengthen the talent pool of clinician scientists. Specifically, the HCSA was introduced in RIE2025 to complement health services research. The scheme provides salary and grant funding to outstanding clinician scientists who can undertake research in the areas of health promotion, preventive health, population health and health services research to bring about significant and sustainable benefits to Singapore's health outcomes.

REVAMPED

Open Fund – Large Collaborative Grant (OF-LCG)



Started in RIE2020, the OF-LCG scheme aimed to unite collaborative efforts from the best teams in our community, including academia and public institutions, to advance health while creating economic value. Unlike in the previous funding tranche, the OF-LCG will no longer require applications to be based on “all-the-way” research. In RIE2025, the scheme focuses on supporting patient-centric translational research underpinned by basic and/or applied research. Nevertheless, the uniqueness of the OF-LCG supporting a consortium of projects remains unchanged.



BEHIND THE SCIENCE

Blazing A Path In Mental Health Research

Understanding Mental Health and Illness with

Accomplished Clinician Scientist, Professor Chong Siow Ann



Professor Chong Siow Ann

“Many of the factors that contribute to mental disorders happen very early in one’s life.”

Notable breakthroughs and achievements:

- Received the National Outstanding Clinician Scientist Award at the National Medical Excellence Awards, 2021
- Initiated the first-ever population-based mental health study in Singapore
- Published over 400 research studies in peer-reviewed journals

What makes work rewarding:

“The new insights we discover in clinical research have improved the clinical care we provide to our patients, and changed the way that we think about mental health.”

Ongoing studies:

- Mind Matters: A Study of Mental Health Literacy, 2021
- The Well-Being of the Singapore Elderly (WiSE) 2021 Study
- Novel Coronavirus, Population Well-Being and Resilience: A Follow-Up Study

When the first National Mental Health Blueprint was implemented in 2007, there was a paucity of information pertaining to the mental health of the general population in Singapore. As a result, the formulation of policies and development of public health measures and services proved difficult.

To address this knowledge gap, Prof Chong Siow Ann and his team conducted the *Singapore Mental Health Study* in 2007. This study set out to describe the mental health landscape of Singapore. One finding, among various others, was that a significant proportion of people had never sought help for their mental disorders. This landmark study provided actionable information for policymakers and healthcare providers.

The 2007 study also gave traction for further studies, one of which was a national study on the mental health literacy of the general population. This national study established that social stigma and a lack of awareness about the availability and effectiveness of professional help were obstacles to help-seeking.

Since then, Prof Chong and his team (co-led by A/Prof Mythily Subramaniam) have conducted numerous studies, including the second Singapore Mental Health Study in 2020 (mainly funded by the NMRC and the Ministry of Health (MOH)), in collaboration with strategy planners and policymakers. Their research findings have contributed significantly to better-informed strategies, policies and programmes by the MOH to improve the country’s mental health.

Prof Chong believes that to destigmatise mental health, we must first rethink our perception of it and have a more nuanced understanding of its complexity. Mental disorders are rarely caused by biological genetic factors alone. Rather, a complex interplay of social and environmental factors, as well as people’s unique vicissitudes in life, affect their mental health. Hence, studying, understanding and treating mental illness can be particularly challenging.

Adverse childhood experiences in particular are associated with the development of physical and mental disorders later in life—Prof Chong and his team have further established this correlation. “Prevention is better than cure,” says Prof Chong, advocating that our youth’s mental health is a key area to prioritise. He highlights that early intervention for at-risk youth and developing their emotional resilience are crucial preventive measures.





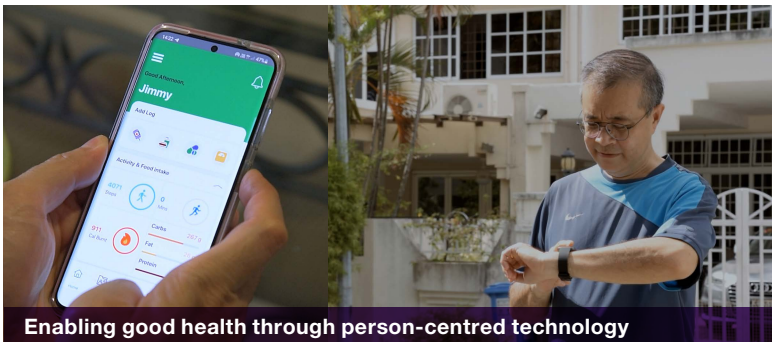
SCIENCE IN LIFE

Advancing Population Health With PULSES

The Singapore Health Services (SingHealth) Population-based, Unified, Learning System for Enhanced and Sustainable Health (PULSES) Centre Grant (CG) improves population health

The PULSES CG targets unmet healthcare needs in our population and drives interventionist initiatives and research to improve our population's health. Aiming to bridge research and care delivery, the PULSES programme adopts a comprehensive approach to population health. It takes into consideration health, social, economic and environmental factors, to deliver the best healthcare solutions to our community.

PULSES' agenda, under the renewed RIE2025, will be spearheaded by the SingHealth Regional Health System's (RHS) newly established Centre for Population Health Research and Implementation (CPHRI). Through inter-agency cooperation, CPHRI aims to address the unmet needs in four areas of population health: 1) Vulnerable adolescents; 2) Diabetes; 3) Complex needs; and 4) Pre-frailty and frailty.



Enabling good health through person-centred technology

Highlights for RIE2025 CG

- Leverage people-centred technology to **develop and implement an Artificial Intelligence-enabled mobile application** that empowers people with diabetes and hypertension in making and sustaining positive behavioural changes.
- **Launch the Elderly Life Activity Space Envelope (EASE) Project** to study seniors' activities and travel patterns and understand how to help them maintain health, build relationships, achieve greater autonomy and maximise their potential as contributors to society.
- **Investigate the prevalence of psychosomatic symptoms** among vulnerable adolescents and examine the barriers to and facilitators of interventions.
- **Evaluate the effectiveness of implementing a novel Empowered Community of Care (ECoC)** in the southeast region of Singapore to improve population health outcomes through a realist implementation science framework.
- Study the influences of family on health to **design family-level interventions** to stem chronic diseases and improve population health in Singapore.
- Conduct regular pulse sensing surveys and interviews through research panels to support national policy development and implementation.
- **Strengthen CPHRI's partnerships** with government agencies, research and academic institutions, community and industry bodies, as well as international partners.
- Organise and host the **inaugural Singapore Population Health Symposium** in April 2022 in collaboration with the Geriatric Education and Research Institute (GERI).

Project Details

- Status/Progress: In Progress
- Host Institution: SingHealth

Notable Achievements from RIE2020 CG

- Multiple talent development and human capital awards (e.g. NMRC Research Training Fellowship, NMRC Transition Award, NMRC Clinician Innovator Award, HPHSR-Clinician Scientist Award, etc.).
- Support to 27 seed funding projects from 9 SingHealth institutions and 7 Fellowship Awards to Duke-NUS.
- Community engagement studies conducted to co-create a population health research agenda and better understand population health needs.
- >10,000 participants recruited for community-based research and outreach programmes, such as the Individual Physical Proficiency Test for Seniors (IPPT-S) study which preliminarily indicated that the prevalence of pre-frailty/frailty, depression and malnutrition was significantly reduced during the 1-year follow-up.
- >70 research publications in the top 10% journals as of March 2022.
- 2 technical disclosures and >\$1.8M committed from industry in-kind funding.
- >\$25M in international and national competitive research funding, including renewal funding under the RIE2025 PULSES II CG.
- >\$9M philanthropic funding granted for ongoing/future research work.
- Set up of the CPHRI, which acts as the nexus for population health research, implementation and evaluation in SingHealth.





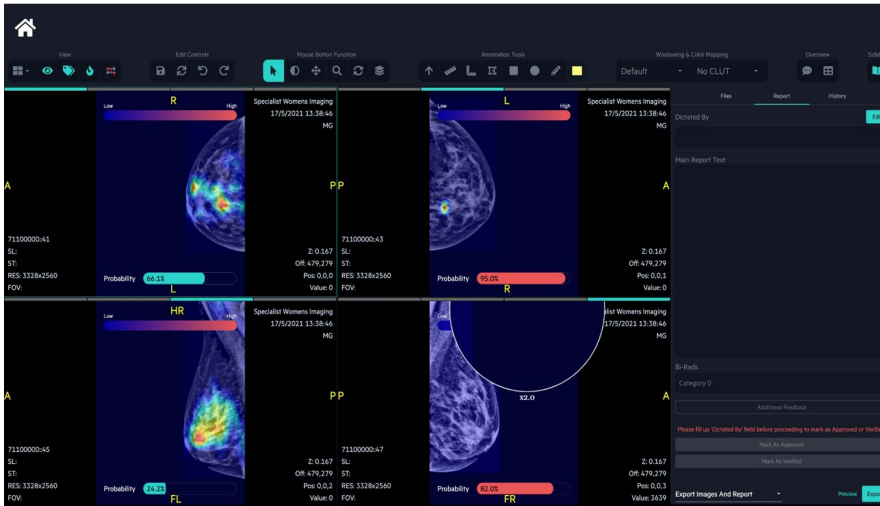
FROM LAB TO LIFE

Fighting Breast Cancer With Artificial Intelligence (AI)

National Health Innovation Singapore (NHIC)

Innovation to Startup (I2Start) Project

— Better Breast Cancer Screening with FathomX



FxMammo's AI-Generated Lesion Heat Map helps radiologists identify areas of interest

Breast cancer is the most commonly-occurring cancer among women in Singapore, with over 2,000 women diagnosed with the disease each year.

Mammography is currently the most effective tool for breast cancer screening. Since early detection is crucial to increase the chances of survival, a mammography is usually performed on women at risk of developing breast cancer through a range of breast screening programs. In Singapore, this is done once every two years.

Dr Mikael Hartman and his team came up with an AI solution to optimise the

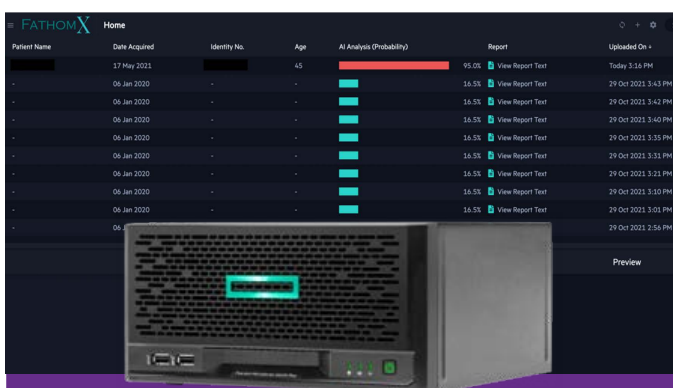
breast screening process. Their project resulted in FathomX's flagship product FxMammo, a medical device software that combines AI-enabled tools with productivity, annotation and report generation tools. FxMammo is currently awaiting regulatory approval.

The AI technology deployed in FxMammo automatically detects common abnormalities (e.g. masses, calcifications, architectural distortion of breast tissue and asymmetries between both breasts) from mammogram images to diagnose breast cancer — with lower rates of false-positive/negative diagnoses. Additionally, FxMammo reduces the time

taken to assess each mammogram image, leading to a more efficient use of radiologist manpower and an overall improvement in the clinical workflow.

The FxMammo project is an awardee of the I2Start program; I2Start combines various resources from the Singapore-MIT Alliance for Research and Technology (SMART), NHIC and Enterprise Singapore (ESG) to support innovation around health and biomedical science. In addition to funding support, the project team accessed various Innovation and Enterprise (I&E) workshops involving medical device regulation, fundraising, product development and quality management systems. During the NHIC phase, the project team successfully optimised FxMammo's performance, strengthened its quality management system for regulatory registration purposes and obtained additional funding from private investors.

FathomX has, since incorporation, secured a series of paid pilots, research collaborations and deployment partnerships across the Asia-Pacific. The company is also developing a series of digital health products in the breast screening space. FathomX is currently on the path towards obtaining regulatory approval, and a subsequent market expansion, for its flagship FxMammo.



FxMammo enhances existing clinical workflows



FxMammo is the product of a collaborative entrepreneurial journey between FathomX and cross-sector stakeholders