



## PRESS RELEASE

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### **Pregnant women are missing vital nutrients crucial for them and their babies**

*15 December 2023* – Pregnant women are not receiving the essential nutrients that they themselves and their babies need from modern diets, warned scientists from the Yong Loo Lin School of Medicine, National University of Singapore (NUS Medicine), the Agency for Science, Technology and Research (A\*STAR), the National University Hospital (NUH), University of Southampton, its National Institute for Health and Care Research (NIHR) Biomedical Research Centre, and the University of Auckland.

The team surveyed more than 1,700 women from the United Kingdom, Singapore and New Zealand, between 18 and 38 years old before conception and followed many of these women during the ensuing pregnancy. The results showed that nine out of ten women had marginal or low levels of folate, riboflavin, vitamins B12 and D around the time of conception, and many had developed B6 deficiency in late pregnancy.

Several of these essential nutrients are abundantly found in meat and dairy products, components which are crucial for foetal development in the womb.

For women living in high-income countries, who have plans or are attempting to get pregnant, the prevalence of vitamin insufficiencies is a serious concern, said lead author and Professor of Epidemiology Keith Godfrey, from the University of Southampton.

He added, “Our study shows that almost every woman trying to conceive had low or marginal levels of one or more vitamins, and this figure is only going to get worse as the world moves towards plant-based diets. People think that nutrient deficiency only affects people in underdeveloped countries – but it is also affecting the majority of women living in high-income nations.”

The study was the first to show that supplements, available over the counter, can reduce vitamin insufficiencies during the preconception, pregnancy and lactational periods. Half the women in this study were randomly assigned to receive a standard vitamin supplement while the other half received an enhanced vitamin supplement, starting in preconception and continued throughout pregnancy. After one month of supplementation and before conception, it was noted that vitamin levels were already substantially higher among participants who were given the enhanced supplements, compared to those who took the standard supplements.

To make up for the lack of vital nutrients, pregnancy supplementation in amounts available in over-the-counter supplements, substantially reduced vitamin deficiency before and during pregnancy. Some of the nutritional benefits were maintained through the lactational period of six months.

One of the senior authors, Associate Professor Chan Shiao-Yng from the Department of Obstetrics and Gynaecology at NUS Medicine, Deputy Executive Director at A\*STAR's

Singapore Institute for Clinical Sciences (SICS), and Senior Consultant at NUH said, “Modern diets appear to be associated with reduced intakes of some vitamins and other micronutrients essential for the child’s development. Vitamin insufficiencies will continue to grow unless women are supported with specific advice about nutrient-rich foods or start taking more supplements.”

Co-author Professor of Paediatric Endocrinology Wayne Cutfield, from the University of Auckland, said while folic acid is recommended for women planning conception and during pregnancy, expecting mothers should be given over-the-counter multivitamins to reduce nutrient deficiencies.

“The wellbeing of a mother ahead of conceiving and during a pregnancy has a direct influence on the health of the infant, their lifelong physical development, and ability to learn,” he concluded.

The journal paper titled ***Maternal B-vitamin and vitamin D status before, during, and after pregnancy and the influence of supplementation preconception and during pregnancy: Prespecified secondary analysis of the NiPPeR double-blind randomized controlled trial***, was published in [PLOS Medicine](#).

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### **About National University of Singapore (NUS)**

The National University of Singapore (NUS) is Singapore’s flagship university, which offers a global approach to education, research and entrepreneurship, with a focus on Asian perspectives and expertise. We have 16 colleges, faculties and schools across three campuses in Singapore, with more than 40,000 students from 100 countries enriching our vibrant and diverse campus community. We have also established more than 20 NUS Overseas Colleges entrepreneurial hubs around the world.

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 2024 by subject and the Quacquarelli Symonds (QS) World University Rankings by subject 2023).

For more information about NUS Medicine, please visit <https://medicine.nus.edu.sg/>.

### **About the Agency for Science, Technology and Research (A\*STAR)**

The Agency for Science, Technology and Research (A\*STAR) is Singapore's lead public sector R&D agency. Through open innovation, we collaborate with our partners in both the public and private sectors to benefit the economy and society. As a Science and Technology Organisation, A\*STAR bridges the gap between academia and industry. Our research creates economic growth and jobs for Singapore, and enhances lives by improving societal outcomes in healthcare, urban living, and sustainability. A\*STAR plays a key role in nurturing scientific talent and leaders for the wider research community and industry. A\*STAR's R&D activities span biomedical sciences to physical sciences and engineering, with research entities primarily located in Biopolis and Fusionopolis. For ongoing news, visit [www.a-star.edu.sg](http://www.a-star.edu.sg).

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Founded in 2007, the Singapore Institute for Clinical Sciences' (SICS) mission is to promote health and human capacity in Singapore, Asia and globally. The first institute within the Agency for Science, Technology and Research (A\*STAR) to focus on clinical sciences and translational research, SICS posits that health has its origins in good beginnings and continued interactions between our physiological makeup and environment. To fulfil our vision of building gateways and an evidence base for positive health, our institute strongly promotes clinical research that supports the understanding of metabolism, neuroscience and how they impact human development. To take our research into the real world, we launched seminal

nationwide birth cohort studies such as Growing Up in Singapore Towards healthy Outcomes (GUSTO) and Singapore PREconception Study of long-Term maternal and child Outcomes (S-PRESTO). By paving the way for scientific research to make a difference to the social and economic fabric of our communities, we are committed to 'Changing Tomorrow's Health, Today'.

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#### **About the National University Hospital (NUH)**

The National University Hospital (NUH) is Singapore's leading university hospital. While the hospital at Kent Ridge first received its patients on 24 June 1985, our legacy started from 1905, the date of the founding of what is today the NUS Yong Loo Lin School of Medicine. NUH is the principal teaching hospital of the medical school.

Our unique identity as a university hospital is a key attraction for healthcare professionals who aspire to do more than practise tertiary medical care. We offer an environment where research and teaching are an integral part of medicine, and continue to shape medicine and transform care for the community we care for.

We are an academic medical centre with over 1,200 beds, serving more than one million patients a year with over 50 medical, surgical and dental specialties. NUH is the only public and not-for-profit hospital in Singapore to provide trusted care for adults, women and children under one roof, including the only paediatric kidney and liver transplant programme in the country.

The NUH is a key member of the National University Health System (NUHS), one of three public healthcare clusters in Singapore.

For more information about NUH, please visit <https://www.nuh.com.sg/>.