

BIOGRAPHY OF PROFESSOR K RANGA RAMA KRISHNAN



Professor K Ranga Rama Krishnan

Chairman, National Medical Research Council Dean, Rush Medical College, USA

Professor Ranga Krishnan has been Chairman of the National Medical Research Council (NMRC) since 2013 and has played a key advisory role to the Ministry of Health on matters relating to Health and Biomedical Research Sciences (HBMS).

Under his leadership, NMRC has grown and developed within the rapidly evolving HBMS ecosystem. Professor Krishnan leads the NMRC Board to provide leadership and guidance to NMRC in formulating strategies and priorities to promote excellence in HBMS, leading to health and economic benefits for Singapore. In particular, he helped with the formulation of the Ministry of Health (MOH)'s Healthcare Research Strategy as well as the broader national HBMS strategy. In particular, the Healthcare Research Strategy identified the key research disease areas for which Singapore should prioritise and invest in. It also led to NMRC expanding its support for Health Services Research, which is important for translating research into practical clinical use, as well as research into ageing which is highly relevant for Singapore given the rapidly ageing population.

As NMRC Chairman, he guided NMRC in its implementation of the research funding programmes as directed by the NMRC Board. He also chaired the NMRC Executive Committee which is responsible for reviewing and approving funding recommendations from the Local Review Panels on specific project funding decisions. Under his broad oversight, he ensured that NMRC's programmes run smoothly and the budget is appropriately managed and optimally utilised.

Professor Krishnan helped develop a vibrant research community in the academic medical centres and healthcare institutions, developing excellence in translational and clinical research (TCR). The NMRC-funded TCR programmes' have resulted in benefits for Singapore, including advances in the treatment for cancer and dengue as well as new approaches in managing other disease conditions. There has also been

an increased number of clinician scientists and investigators being supported, contributing critically to the delivery of healthcare impact from research.

As NMRC Chairman, Professor Krishnan served as a member of the HBMS Executive Committee which is the key whole-of-government body overseeing HBMS research in Singapore. His familiarity with the dynamics of the local HBMS scene allowed him to provide critical input to ensure that healthcare needs and priorities remain a key consideration in shaping the HBMS strategy for Singapore.

Building Technology Transfer Capability

With the increasing expectation that research has to be translated into impactful outcomes, Professor Krishnan was farsighted to see the need for NMRC to establish the National Health Innovation Centre (NHIC). He led and worked closely with staff from NMRC to structure the set-up and governance of NHIC, referencing the UK National Health System Innovation Hub model. Since NHIC's set-up in 2014, Professor Krishnan has been the Chairman of its Oversight Committee which is responsible for working with the NHIC Senior Management to set the strategy and oversee the utilisation of NHIC's budget, to best enable NHIC to meet the desired national objectives.

In a relatively short span of time, NHIC has played a critical role in facilitating the commercialisation of medical discoveries and technologies from individuals across the healthcare sector and established collaborations between the healthcare institutions and industry. NHIC is proving to be an effective vehicle to translate discoveries into real-world innovations that address unmet healthcare needs.

Managing Clinical Trials in Singapore

In his role leading the Board of the Singapore Clinical Research Institute (SCRI), Professor Krishnan helped set the vision on how SCRI should operate, based on his extensive experience working with Duke Clinical Research Institute. He used his expertise and deep understanding of how investigators-initiated clinical trials and private-public partnerships should be developed, to lay a strong foundation for the organisation. This has resulted in the success of SCRI today, supporting many particularly multi-centred clinical trials both in Singapore and outside of Singapore, but with clear leadership from Singapore-based clinician scientists.

Professor Krishnan also helped harness the strengths of various stakeholders (e.g. MOH, SingHealth, Health Sciences Authority) to work closely with SCRI to improve clinical trials efficiency in Singapore, including the establishment of the Master Clinical Trial Agreement between Singapore healthcare institutions and external pharmaceutical organisations and the National Clinical Trial insurance framework.

Health Sciences Regulation

In addition, Professor Krishnan served as a Board member of the Health Sciences Authority (HSA). With his professional expertise and wealth of experience, he helped steer HSA through many scientific and regulatory challenges, and demonstrated

dedication in sharing his insights and providing close guidance to the Health Products Regulation Group within HSA in reviewing and improving their processes, leading to a more responsive post-marketing monitoring system in ensuring safe and quality health products. He was also instrumental in providing expert advice in enhancing HSA's regulatory risk-management framework, and the port-over of therapeutic products from the Medicines/Poisons Act to the Health Products Act.

Professor Krishnan was also instrumental in establishing the Centre of Regulatory Excellence (CoRE) at Duke-NUS Medical School – the partnership has piloted a programme which aims to build up talents in regulatory science to facilitate multi-regional clinical trials.

BIOGRAPHY OF PROFESSOR DUANE J. GUBLER



**Professor Duane J. Gubler
ScD, FAAAS, FIDSA, FASTMH**

**Emeritus Professor, Programme of Emerging Infectious Diseases, Duke-NUS
Medical School, Singapore**

Chairman of NEA's Dengue Expert Advisory Panel (DEAP)

Professor Duane J. Gubler has been instrumental in advancing global knowledge of mosquito-borne and other emerging infectious diseases, in his nearly 50-year career.

From Asia and the Pacific to the Americas and Africa, he has worked all over the world to coordinate outbreak responses and advocate measures to prevent and control dengue and other emerging diseases.

Professor Gubler founded the Dengue Branch at the US Centers for Disease Control and Prevention (CDC) in 1980s, and spent 24 years at the CDC leading dengue and vector-borne diseases programmes. Professor Gubler has also served on numerous World Health Organization committees and study groups, and has coordinated major emergency responses to disease epidemics. Amongst many achievements, he led the development of the United States national Lyme disease and West Nile programmes, as well as the global response to the plague epidemic in India the mid-1990s.

In the 1990s, Professor Gubler contributed a chapter to the Monograph on Dengue in Singapore, published by the Ministry of Environment. In the chapter, he proposed a strong government-community partnership for successful dengue control, particularly focusing on source reduction. Singapore has taken this advice very seriously, with community participation today forming a key pillar of our dengue control strategy.

At the height of the 2005 dengue epidemic in Singapore, Professor Gubler was appointed a member of Singapore's Dengue Expert Panel, which was tasked with reviewing the national dengue control programme. His expert advice contributed to the significant revamp of the programme. Professor Gubler also played a pivotal role during the establishment of NEA's Environmental Health Institute (EHI) in 2002 and he continued to serve on EHI's Scientific Advisory Panel from 2006 to 2008, which

was set up to review and provide advice on the institute's research directions and programmes.

Since June 2014, Professor Gubler has chaired NEA's Dengue Expert Advisory Panel (DEAP), appointed to provide professional advice on new technologies for dengue control. The panel recommended that Singapore explore the use of male *Wolbachia*-carrying *Aedes aegypti* mosquitoes to help suppress mosquito populations and reduce the risk of dengue transmission. With the recommendation, releases of male *Wolbachia*-*Aedes* (Project *Wolbachia*) commenced in 2016, and Professor Gubler continues to provide invaluable expert guidance on evaluation of the data collected from these field studies. His insights, along with those of other DEAP members, are instrumental in helping NEA move forward with the planning, design, and implementation of future phases of Project *Wolbachia*.

Professor Gubler has also made outstanding contributions to infectious disease research and capacity building in Singapore, helping to shape Singapore's public health education for medical specialists and scientists. As Founding Director of the Emerging Infectious Diseases Programme at Duke-NUS Medical School, he led the establishment of the EID Programme in 2007 and to institutionalise and advance on the lessons learned from Singapore's experience with SARS in 2003 and H1N1 influenza in 2009. Thanks to this effort, Singapore's response to COVID-19 has been lauded by many around the world for the country's high level of readiness and efficiency.

Professor Gubler's dedication and achievements in the field of vector-borne infectious diseases are unparalleled. In 2015, Professor Gubler was awarded the Public Service Medal (Friends of Singapore) for his contributions to Singapore's national dengue control programme and research efforts. He continues to be a tireless advocate for dengue prevention and control, and Singapore is privileged to have him as an advisor.