6TH ASIA DENGUE SUMMIT

15TH – 16TH JUNE 2023
MONTIEN HOTEL SURAWONG
BANGKOK, THAILAND

PROGRAMME BOOK

Co-convenors:

ADVA Asia Dengue Voice & Action Group

Fondation Mérieux

gdac Global Dengue + Aedes-Transmitted Diseases Consortium

SEAMEO TROPMED Network for Tropical Medicine and Public Health

The International Society for Neglected Tropical Diseases

Supported by:

Tropical Medicine Cluster, Chulalongkorn University

Queen Saovabha Memorial Institute, The Thai Red Cross Society

Mahidol University Faculty of Tropical Medicine

Ministry of Public Health

In Support of:

World Dengue Day

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ADS 2023 | June 15–16, 2023

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June 2023 | VV-MEDMAT-88004

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WELCOME MESSAGE

Dear Friends and Colleagues,

It is both an honor and a pleasure to share link and to invite you to the 6th Asia Dengue Summit (6th ADS) from 15th–16th June 2023 under the theme “Road Map to Zero Dengue Death”.

Dengue is a global threat in which thousands of physicians like you seek to prevent and treat Dengue by using the best information. According to the theme of the congress this is an opportunity to come and share your recent informative data and also for networking with your colleagues in Dengue around the world.

The local organizing committee of the 6th ADS is Tropical Medicine Cluster, Chulalongkorn University, Bangkok, Thailand together with the 6th ADS Co-hosts namely Queen Saovabha Memorial Institute, The Thai Red Cross Society; Faculty of Tropical Medicine, Mahidol University; The Ministry of Public Health and is co-convened by Asia Dengue Voice and Action (ADVA); Global Dengue and Aedes Transmitted Diseases Consortium (GDAC); Southeast Asian Ministers of Education Tropical Medicine and Public Health Network (SEAMEO TROPMED); Fondation Mérieux (FMx) and the International Society for Neglected Tropical Diseases (ISNTD).

The 6th ADS will serve as the platform for Dengue experts from all over the world to share information on all aspects of Dengue which will lead to better prevention and control of global Dengue.

Most of all, the 6th ADS will initiate the program on ADVA Task Force and the Young ADVA for Dengue Prevention and Control in order to strengthen the sustainability of overall mission.

We hope you will also find time to explore and enjoy the hospitality of Thailand, the “Land of Smiles” as well.

Sawasdee

Prof. Usa Thisyakorn
Chairperson, 6th Asia Dengue Summit
Executive Director, Tropical Medicine Cluster, Chulalongkorn University, Bangkok, Thailand

Prof. Terapong Tantawichien
Co-Chairperson, 6th Asia Dengue Summit”Chairman, Tropical Medicine Cluster, Chulalongkorn University, Bangkok, Thailand

Assoc. Prof. Nattachai Srisawat
Co-Chairperson, 6th Asia Dengue Summit
Project Director, Tropical Medicine Cluster, Chulalongkorn University, Bangkok, Thailand

ABOUT US

The Asia Dengue Voice & Action Group (ADVA) was officially set up in 2013 with a mission to identify opportunities to make practical recommendations in dengue-related areas such as improving surveillance and laboratory capacity for dengue disease confirmation with other relevant dengue initiatives, including V2V (vaccine to vaccination) and the Dengue Vaccine Initiative.
ADVA advocates for a collaborative approach to sharing surveillance data and relevant information to ensure the success of dengue prevention through vaccination across regions. ADVA also reinforces the importance of a united front against dengue, and presents a collaborative model for joint effort in the region to prevent the disease through the introduction and implementation of dengue vaccination.
The group has formulated recommendations with an ultimate aim of translating the science of dengue vaccination into messages for policy makers, general public and health care workers.

The Global Dengue & Aedes-Transmitted Diseases Consortium (GDAC) is a consortium composed of the Partnership for Dengue Control (PDC), the International Vaccine Institute (IVI), the International Vaccine Access Center (IVAC) at the Johns Hopkins Bloomberg School of Public Health and the Sabin Vaccine Institute. The World Health Organization advises and collaborates with GDAC.

The Southeast Asian Ministers of Education Organization (SEAMEO) is a regional intergovernmental organization established in 1965 among governments of Southeast Asian countries to promote regional cooperation in education, science and culture in the region.

Fondation Mérieux's mission is to fight the infectious diseases that affect vulnerable populations in developing countries, especially mothers and children, by building local capacities. They work in over 20 countries worldwide, in regions prone to infectious outbreaks, and mount their own projects, working closely with local and international partners.

The ISNTD is an independent organisation providing a multidisciplinary global platform to an international network of individuals working in the fields of Neglected Tropical Diseases, diseases of poverty and global development. The aim of the ISNTD is to focus on and highlight the research and programmes of colleagues and organisations worldwide, to ultimately have an impact on the health and prosperity of the world's poorest and most vulnerable, while sharing the goal of reaching sustainable healthcare provision & poverty reduction in the developing world.
The ISNTD believes that this goal cannot be achieved without strengthening the ties between all the parties already involved in NTD alleviation and addressing the socio-ecological and socio-political context of NTDs, in order to achieve not only the cure but also the prevention of NTDs with true and sustainable local leadership.

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ABOUT US

Tropical Medicine Cluster, Chulalongkorn University

Professor Terapong Tantawichien, Chairman of Tropical Medicine Cluster at Chulalongkorn University and the Executive Committee: Professor Usa Thisyakorn, Associate Professor Pradermchai Kongkam, and Associate Professor Nattachai Srisawat proposed to recruit experts in the field of Tropical Medicine at Chulalongkorn University to work together as a team on Tropical Medicine since 2018.

The proposal was approved by the Research Cluster, Chulalongkorn University Committee Meeting, chaired by Professor Kiat Ruxrungtham on the 21st January 2019. The objective of the Tropical Medicine Cluster is to produce advanced research on Tropical Medicine with the outcomes of high impact publications and visibility in the international arena.

Saovabha Memorial Institute, Thai Red Cross Society

Saovabha Institute has been established since December 7, 1922, has always been prosperous. The Institute is committed to fulfilling His Majesty the King's determination of "For the Fatherland, for Science, for the Human Nation" of His Majesty the King, who founded this institute, by producing, researching and providing quality services. Although the history of the Saowapa Institute began with rabies. But the institute's mission covers the production of snake venom serum. anti-rabies serum and vaccines against various diseases widely Rabies vaccine is not specific. There is also research into poisonous animals and poisonous plants.

- The mission of production and product quality assurance
- Service mission
- Research mission

https://www.saovabha.org/home

Faculty of Tropical Medicine, Mahidol University

Mahidol University
Faculty of Tropical Medicine

The Faculty of Tropical Medicine was co-founded by Prof. Chamlong Harinasuta and Prof. Khunying Tranakchit Harinasuta in 1960 as one of the faculties of the University of Medical Sciences (presently Mahidol University). Its three main tasks include teaching, research for advanced knowledge in medical sciences, and medical services, with the emphasis on tropical diseases.

At the beginning, there were five departments sharing offices with the Faculty of Medical Technology (in the same compound with the Faculty of Medicine Siriraj Hospital). The objective of the establishment was to teach Thai medical doctors in the Diploma in Tropical Medicine and Hygiene (D.T.M. & H.). The Faculty was relocated to its present location in 1961, the same time as the establishment of the Hospital for Tropical Diseases with 20 beds. At present, the Faculty comprises an Office of the Dean, a 250-bed hospital and 10 departments

https://www.tm.mahidol.ac.th/eng/news-about.php

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ABOUT US

Ministry of Public Health (Thailand)

The Ministry of Public Health is responsible for health promotion, disease prevention and control, medical care services and rehabilitation and other affairs, by law, prescribed as authority of the Ministry of Public Health or agencies belong to it.

The organization aims to be the core agency in developing the health system with quality, efficiency and equality; with participation of the people, communities and all sectors for good health of all Thai people in order to achieve a good and sustainable society following the King's Sufficiency Economy philosophy.

Mission:

- Determine national and international health policy and strategy, concordantly with ongoing changes.
- Develop efficient and equitable integrated health service system for both normal situation and emergency with emphasis on basic rights, specialized service and emergency medicine, surveillance system, disease prevention and control and health threats.
- Promote participation of all sectors to raise health consciousness, promote health and improve health behaviors.
- Develop health management system and mechanism to meet the quality standard, in line with Sufficiency Economy philosophy
- Determine health research and knowledge management direction policy.

Tropical Medicine and Infectious Disease

an Open Access Journal by MDPI

Tropical Medicine and Infectious Disease

Tropical Medicine and Infectious Disease (ISSN 2414-6366) publishes authoritative and original articles, critical and systematic reviews, editorials, perspectives, short communications, commentaries, book reviews, letters to the editor and Special Issues on all aspects of tropical medicine and infectious disease. Our aim is to encourage scientists to publish their experimental and theoretical results in as much detail as possible. There is no restriction on the length of the papers. The full experimental details must be provided so that the results can be reproduced. There is, in addition, a unique feature of this journal:

We accept studies showing meaningful but negative results. While there are many journals that focus on tropical medicine and infectious disease studies, none of them actively accept negative results. As a result, most negative data do not end up in the public domain, even if the data were meaningfully negative and the study was well-designed. By accepting such negative results, our journal encourages scientists to share these data, so that they will not need to repeat experiments that somebody else has already done.

The scope of the journal includes, but is not limited to:

- Clinical tropical medicine
- Tropical public health
- Tropical infectious diseases
- Parasitology and entomology
- Bacteriology, mycology and virology
- Epidemiological and social science studies
- Chemotherapy and pharmacology
- Immunology
- Disease prevention, control and elimination
- Emerging and re-emerging infectious diseases
- Emerging public health threats
- Global health and One Health

Website: https://www.mdpi.com/journal/tropicalmed

COMMITTEE

Local Organising Committee:

Professor Usa Thisyakorn *(Chair)*

Professor Terapong Tantawichinen *(Co-Chair)*

Professor Nattachai Srisawat *(Co-Chair)*

Emertius Professor Suttee Yoksan

Associate Professor Olarn Prommalikit

Associate Professor Auchara Tangsathapornpong

Dr Wongwat Liulak

Dr Jurai Wongsawat

Asia Dengue Voice & Action Group (ADVA)
Steering Committee:

Professor Zulkifli Ismail

Professor Usa Thisyakorn

Professor Sri Rezeki Hadinegoro

Associate Prof Daniel YT Goh

Dr Maria Rosario Capeding

Professor Terapong Tantawichien

Emertius Professor Sutee Yoksan

Asia Dengue Voice & Action Group (ADVA)
International Advisors:

Professor Duane Gubler

Professor Tikki Pangestu

Professor Ooi Eng Eong

Emertius Professor Lulu Bravo

Professor Pratap Singhasivanon

Mr Kamran Rafiq

Dr Valentina Picot

AGENDA

Day 1 - Thursday 15th June 2023

TIME	PROGRAMME	SPEAKERS
0730 – 0800	Registration	
0800 – 0815	**Welcome Address**	Prof. Usa Thisyakorn
	Opening Remarks	Dr. Tares Krassanairawiwong *Director-General of the Department of Diseases Control Thai MOPH*
0815 – 0835	Moderator: Prof. Usa Thisyakorn	
	Keynote Address Dengue: Past, Present and Future	Prof. Usa Thisyakorn
0835 – 0855	**Plenary 1: Road Map to Zero Dengue Death**	Dr. Jurai Wongsawat
0855 – 0915	**Plenary 2: Adult Dengue**	Prof. Terapong Tantawichien
0915 – 0930	**Traditional Thai Puppet Show**	Joe Louis
0930 – 1015	**Coffee Break** **Oral Free Paper Presentation and E-Poster Viewing** (Exhibition Hall) Chairperson: Prof. Iqbal Memon	
	ROOM 1	**ROOM 2**
1015 – 1115	**Symposium 1:** **Dengue Epidemiology** Chairperson: Prof. Duane J Gubler Moderator: Dr. Jurai Wongsawat	**Symposium 2:** **Dengue Pathogenesis** Chairperson: Prof. Tikki Pangestu Moderator: Prof. Emeritus Sutee Yoksan
	Global Epidemiology Speaker: Prof. Richard Maude	**Virus-Host Interactions** Speaker: Prof. Moi Meng Ling
	Dengue in ASEAN Community Speaker: Dr. Anggraini Alam	**Cellular Immune Responses to Dengue Infection** Speaker: Dr. Anon Srikiatkhachorn
	Dengue in South Asia Speaker: Prof. Duane J Gubler	**Virological Determinants of Dengue Virus Transmission** Speaker: Prof. Emeritus Sutee Yoksan
1115 – 1245	**Industry Symposium 1** Takeda Pharmaceuticals	**Industry Symposium 2** SD BIOSENSOR

AGENDA

	ROOM 1	ROOM 2
1245 – 1345	**Symposium 3:** **Clinical Features of Dengue Patients** Chairperson: Prof. Terapong Tantawichien Moderator: Prof. Nattachai Srisawat	**Symposium 4:** **Diagnosis of Dengue Virus Infection** Chairperson: Dr. Maria Rosario Capeding Moderator: Prof. Emeritus Sutee Yoksan
	Dengue in Pregnancy Speaker: Assoc. Prof. Surasith Chaithongwongwatthana	**Diagnosis of Dengue Virus Infection: An Update** Speaker: Dr. Taweewun Hunsawong
	Dengue: From Childhood to Elderly Speaker: Prof. Terapong Tantawichien	**Magnitude of Antibody Cross-reactivity in Medically Important Mosquito-Borne Viruses** Speaker: Prof. Emeritus Sutee Yoksan
	Dengue in ICU setting Speaker: Prof. Nattachai Srisawat	**Hematologic Changes in Dengue patients** Speaker: Prof. Darintr Sosothikul
1345 – 1445	**Coffee Break** **Oral Free Paper Presentation and E-Poster Viewing** (Exhibition Hall) Chairperson: Prof. Emeritus Lulu C Bravo	
1445 – 1545	**Symposium 5:** **Organopathy in Dengue Patients** Chairperson: Prof. Sri Rezeki Hadinegoro Moderator: Assoc. Prof. Weerapong Phumratanaprapin	**Symposium 6:** **Dengue Virology and Immunology** Chairperson: Assoc. Prof. Daniel YT Goh Moderator: Prof. Emeritus Sutee Yoksan
	Kidney Complications Speaker: Assoc. Prof. Weerapong Phumratanaprapin	**Genetic Diversity of Dengue** Speaker: Prof. Somchai Jongwutiwes
	Liver Complications Speaker: Dr. Chalermrat Bunchorntavakul	**Antigenic Evolution of Dengue Viruses over the Past decades** Speaker: Dr. Chonticha Klungthong
	Neurological Symptoms and Complications of Dengue Virus Infection Speaker: Prof. Thiravat Hemachudha	**Role of Dengue Virus Genome** Speaker: Prof. Ooi Eng Eong
	Dengue and Cardiovascular System Speaker: Prof. Apichai Khongphatthanayothin	
1545 – 1600	**Close of Day 1**	

TAK-003
From Vaccine to Vaccination Reality

Thursday,
15th June 2023
11:15 – 12:45

Location

Montien Hotel Surawong
54 Thanon Surawong, Silom
Bang Rak, Bangkok 10500

Agenda

11:40 – 11:45
Introduction

11:45 – 12:00
A balanced immunity?
Prof. Ooi Eng Eong

12:00 – 12:15
Learnings from TAK-003 implementation in Indonesia and what is next
Prof. Sri Rezeki Hadinegoro

12:15 – 12:30
Dengue vaccine, the way forward in Thailand
Dr. Nakorn Premsri

12:30 – 12:45
Q&A

Our speakers

PROF. OOI ENG EONG
Deputy Director, Programme in Emerging Infectious Diseases, Duke-NUS Medical School, Singapore

PROF. SRI REZEKI HADINEGORO
Consultant, Faculty of Medicine University of Indonesia, Cipto Mangunkusumo Hospital

DR. NAKORN PREMSRI
Director, National Vaccines Institute, Thailand

MODERATOR

DR. GOH CHOO BENG
Medical Affairs Head, Takeda India and Southeast Asia (ISEA)

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AGENDA

Day 2 - Friday 16th June 2023

TIME	PROGRAMME	SPEAKERS
0730 – 0800	Registration	
0800 – 0815	**Welcome Back**	Prof. Nattachai Srisawat
0815 – 0835	Moderator: Prof. Nattachai Srisawat **Plenary 3: Severe Dengue**	Prof. Nattachai Srisawat
0835 – 0855	**Plenary 4: Environmental Influence on Dengue**	Assoc. Prof. Pratap Singhasivanondh
0855 – 0915	**Plenary 5: World Dengue Day: A Call for Action**	Mr. Kamran Rafiq
0915 – 1015	**Coffee Break** **Oral Free Paper Presentation and E-Poster Viewing** (Exhibition Hall) Chairperson: Assoc. Prof. Daniel YT Goh	
	ROOM 1	**ROOM 2**
1015 – 1115	**Symposium 7:** **Dengue in Special Hosts** Chairperson: Assoc. Prof. Weerapong Phumratanaprapin Moderator: Prof. Terapong Tantawichien	**Symposium 8:** **Dengue Vector Control** Chairperson: Dr. Valentina Picot Moderator: Dr. Eggi Arguni
	Dengue – Old Disease, New Challenges in an Ageing Population Speaker: Prof. Leo Yee-Sin	**Dengue Vector Control: Assessing What Works?** Speaker: Dr. Jirod Nararak Dr. Piti Mongkalangoon, Ph.D
	Dengue in Patients with Medical Comorbid Conditions Speaker: Prof. Terapong Tantawichien	**The World Mosquito Program's Wolbachia Success Stories** Speaker: Dr. Eggi Arguni Dr. Nadege Rossi
	WHO Case Classification for Dengue Speaker: Prof. Lucy CS Lum	**Social Awareness and Capacity Building** Speaker: Dr. Fatima Gimenez
1115 – 1245	**Industry Symposium 3** Johnson & Johnson	**Industry Symposium 4** Fujifilm

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	ROOM 1	ROOM 2
1245 – 1345	**Symposium 9:** **Management of Dengue Patients** Chairperson: Prof. Ooi Eng Eong Moderator: Prof. M. Ashraf Sultan	**Symposium 10:** **Arboviruses Vaccines** Chairperson: Dr. Maria Rosario Capeding Moderator: Dr. Sunate Chuenkitmongkol
	Updates in Clinical Management of Dengue Speaker: Prof. M.Ashraf Sultan	**Dengue Vaccines: From Bench to Community** Speaker: Dr. Maria Rosario Capeding
	Dengue Therapeutics Research and Development Speaker: Prof. Sophie Yacoub	**One Step Closer to a Chikungunya Vaccine** Speaker: Dr. Stephanie Meyer
	Psychosocial Impact of Dengue infection in adolescents Speaker: Prof. Vitharon Boon-yasidhi	**Addressing Vaccine Hesitancy** Speaker: Prof. Iqbal Memon
1345 – 1445	**Coffee Break** **Oral Free Paper Presentation and E-Poster Viewing** (Exhibition Hall) Chairperson: Prof. Zulkifli Ismail	
1445 – 1545	**Finale: Way Forward** **Dengue Task Force and Young ADVA** Chairperson: Prof. Nattachai Srisawat Peer Mentors: Mr. Dafydd Green Dr. Anggraini Alam Dr. Fatima Gimenez	
	Invited Speakers from The Newton Sixth Form School, Bangkok	
	Dengue: A Global Threat	Ms. Radanut Bawarntanaoran
	Dengue Awareness Campaign	Ms. Apinporn Tungthirasuk
	Dengue Prevention and Control: Partnership and Networking	Ms. Chomphunuch Thaweeaphiradeethongkam
1545 – 1600	**Awards for Oral Presentation (5 Awards)** **Closing Address**	Prof. Usa Thisyakorn
Close of 6th Asia Dengue Summit 2023		

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ORGANISING COMMITTEE

PROF. USA THISYAKORN

Tropical Medicine Cluster
Chulalongkorn University
Bangkok, Thailand

Professor Usa Thisyakorn is the Executive Director of Tropical Medicine Cluster, Chulalongkorn University; an Advisor of Faculty of Tropical Medicine, Mahidol University, Department of Health, Bangkok Metropolitan Administration and Faculty of Medicine, Thammasat University.

Her additional positions include Dengue Advisory Group of International Society for Neglected Tropical Diseases, Steering Committee Member of Asia Dengue Voice and Action, Council Member of World Society for Virology, Board Member of World Society for Pediatric Infectious Diseases, Past President of International Society of Tropical Pediatrics, Asian Society for Pediatric Infectious Diseases, Pediatric Society of Thailand as well as Pediatric Infectious Disease Society of Thailand.

In 1989, she received a Rockefeller grant for dengue research at the Centers for Diseases Control and Prevention in Atlanta and Scientific Awards in 1994 from the Elizabeth Glaser Pediatric AIDS Foundation for Pediatric HIV training at the National Institutes of Health in Bethesda. In 2000, under Professor Thisyakorn's guidance as Chair of the Medical Committee on the Save a child's life from AIDS Project, the project was selected as one of the UNAIDS best practices in the year 2000. This project has contributed significantly to the recognition of Thailand by the World Health Organization as the first country in Asia to successfully eliminate mother-to-child transmission of HIV in 2015. For her contributions, she has received several awards including Woman of the Year from the Foundation for Thai Society, The Outstanding Asian Pediatrician from the Asia Pacific Pediatric Association and The Outstanding Woman in the International Stage/Network from Ministry of Social Development and Human Security on the occasion of the International Women's day 2019.

Professor Thisyakorn has served as an editorial board of several medical journals and has contributed over 150 indexed publications to date.

ORGANISING COMMITTEE

PROF. TERAPONG TANTAWICHIEN

Head of Division of Infectious Diseases and Deputy Chairman,
Department of Medicine,
Faculty of Medicine, Chulalongkorn University
Thailand

Prof. Terapong Tantawichien is Professor in the Division of Infectious Diseases, Department of Medicine, Faculty of Medicine at Chulalongkorn University, Thailand, and has previously held positions at King Chulalongkorn Memorial Hospital and Kuzell Institute, California Pacific Medical Centre, San Francisco, USA. He received his medical degree from Chulalongkorn University in 1987 and is board certified in internal medicine and infectious diseases (Thailand). Prof. Terapong began his teaching career in 1993 when he started teaching infectious diseases at Department of Medicine, Faculty of Medicine, Chulalongkorn University. He is a member of the Royal College of Physicians (Thailand) and the Infectious Diseases Association of Thailand. He was also Secretary-General of the Infectious Diseases Association of Thailand (2002-3, 2004-5) and Deputy Chairman of Scientific Committee, The Royal College of Physician of Thailand (2009-10). Presently he is President of the Infectious Diseases Association of Thailand (2014-15, 2015-2017) and Head of Division of Infectious Diseases and has played an active part in infectious disease activities in Thailand.

Prof. Terapong occasionally gives special lectures at several other universities and institutions. He regularly attends academic conferences and seminars both in and outside the country. In addition to teaching, he is a regular contributor to medical researchers in Thailand and collaborated on many manuscripts with his student and colleague. He had more 60 international medical publications and was awarded the 1st Young Investigator Award from the Infectious Diseases Association of Thailand in 2001 and the Research Award from the Royal College of Physician of Thailand in 2014. His main scientific interests are rabies vaccination, adolescent and adult immunisation, dengue in adult, nosocomial infections and infections in immune-compromised hosts.

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ORGANISING COMMITTEE

PROF. NATTACHAI SRISAWAT

Director, Excellence Center for Critical Care Nephrology,
King Chulalongkorn Memorial Hospital, Thai Red Cross,
Division of Nephrology, Department of Medicine,
Chulalongkorn University, Thailand & Collaborating CRISMA faculty member
Department of Critical Care Medicine,
University of Pittsburgh School of Medicine, USA

Professor Nattachai's main research focused in critical care nephrology field, focusing on and acute kidney injury (AKI) and tropical infection associated AKI such as dengue infection, leptospirosis.

For AKI, Professor Nattachai & his team had conducted one of the largest registry of AKI epidemiology to study prevalence, risk factors, and outcome of AKI in Southeast Asia.

Currently, Professor Nattachai and his team are exploring the role of post AKI care in AKI survivors to improve long term outcome. In the field of dengue, the team are studying on clinical scoring (Thai Dengue Score), biomarkers to predict severe dengue by using high throughput technique, and organ support therapy.

ORGANISING COMMITTEE

EMERITUS PROF. SUTEE YOKSAN

M.D., Ph.D. (Pathobiology)

Director,
Centre for Vaccine Development,
Mahidol University
Thailand

Sutee Yoksan graduated from Mahidol University with a M.D. in 1979 and a Ph.D. in 1987. After obtaining his MD he did training in clinical pathology at the Department of Pathology, Ramathibodi Hospital Faculty of Medicine, Mahidol University. To increase his research capability he continued laboratory work at the Department of Tropical Medicine and Medical Microbiology, U. Hawaii, USA, Sir William Dunn School of Pathology, U. of Oxford, UK. and Queensland Institute of Medical Research, Brisbane, Australia.

From 1984-2014, he had been Director of the Center for Vaccine Development, Mahidol University. Dr. Sutee is a world leader in research on dengue and other arthropod-borne viral infections. He has published over 180 scientific papers and book chapters on many areas of vaccine research and development, namely dengue, Japanese encephalitis, Chikungunya and Zika vaccines.

At present he serves as a consultant of the Center for Vaccine Development, Institute of Molecular Biosciences, Mahidol University, Thailand.

ASSOC. PROF. OLARN PROMMALIKIT

Dean,
Student Development,
Faculty of Medicine,
Kasetsart University

Associate Professor Olarn Prommalikit graduated from the Faculty of Medicine, Khon Kaen University in 1996 and continued his postgraduate studies.

He then started lecturing at the department of pediatrics at Srinakharinwirot University from 2001, nurturing young minds and mentoring them to become future medical professionals.

He began to take on different roles within the Faculty of Medicine in the University and sits on the board of different executive committees and society; for example, Pediatric Infectious Disease Society of Thailand PIDST.

Associate Professor Olarn has a passion to share his knowledge and has invested much time in the life of his students. He is currently lecturing at the Department of Pediatrics, Faculty of Medicine, Srinakharinwirot University and also lecturing in the Faculty of Medicine, Kasetsart University.

Associate Professor Olarn Prommalikit is currently the Dean for Student Development in Faculty of Medicine, Kasetsart University.

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ORGANISING COMMITTEE

ASSOC. PROF. AUCHARA TANGSATHAPORNPONG

Associate Dean for Finance and Administration,
Chief of the Pediatrics Infectious Diseases Division,
Faculty of Medicine, Thammasat University.

Associate Professor Auchara Tangsathapornpong has been a professor of pediatrics at Thammasat University for almost 30 years. She received her diploma from the Thai Board of Pediatrics, Faculty of Medicine, Khon Kaen University, and completed her fellowship in pediatrics, specializing in infectious diseases at Ramathibodi Hospital, Mahidol University, Thailand. She received certificate in the Advanced WHO/TDR Course on Immunology, Vaccinology and Biotechnology Applied to Infectious Diseases organized by WHO at the Immunology Research and Training Centre, University of Lausanne, Switzerland. Her current positions include Associate Dean for Finance and Administration and Chief of the Pediatrics Infectious Diseases Division at Faculty of Medicine, Thammasat University. Her other positions include Executive committee of Pediatric Infectious Disease Society of Thailand and Chair of the Pediatric Infectious Diseases Fellowship Training Program of Thailand.

In 2015, 2021, 2022, she received a Thammasat Research Honor Award for facilitating a variety of vaccine research projects. In 2021, she received an Honorary Award for Outstanding Female doctors in combating COVID-19 from The Thai Medical Women's Association Under The Royal Patronage of Her Majesty The Queen. Associate Professor Auchara Tangsathapornpong has contributed as editor and author of many book chapters and a variety of other publications.

DR. WONGWAT LIULAK

Medical Advisor of Division of Health Promotion,
Department of Health, Bangkok

Dr. Wongwat Liulak is currently the Medical Advisor of Division of Health Promotion, Department of Health, Bangkok Metropolitan Administration. His main responsibility is health promotion, disease prevention and providing quality health care service in public health centers under Bangkok Metropolitan Administration governance.

Notable positions held by Dr. Wongwat Liulak at Bangkok Metropolitan Administration include Director of Ladkrabang Hospital, Director of Health Center 46, Director of Health Promotion Division of Health Department, Director of Communicable Disease Control Division of Health Department, Director Public Health System Development Office of Health Department, Deputy Director General of Health Department, High Bangkok Inspector at Office of Permanent Secretary.

As facilitator and leader of One Health Program for "Rabies-free area" in Ladkrabang district, Bangkok; the program has been selected as one of the best achievement at the International Workshop on National Immunization Programs and Vaccine Coverage in ASEAN Countries, Pattaya, Thailand in 2015. His main mission regarding Dengue under Bangkok Metropolitan Administration presently is "Prevention and Control of Dengue".

ORGANISING COMMITTEE

DR JURAI WONGSAWAT M.D.

Senior advisor,
Bamrasnaradura Infectious Diseases Institute,
Department of Diseases Control,
Ministry of Public Health, THAILAND

Dr Jurai Wongsawat graduated M.D. and pediatric residency training from Faculty of Medicine, Siriraj Hospital , Mahidol University, and later received pediatric infectious diseases fellowship certification from Faculty of Medicine, Chulalongkorn University, Thailand. She then received more training in field of modern epidemiology from Division of Epidemiology, Public Health and Primary care, Imperial College London, UK. Her area of interests include emerging infectious diseases (EIDs), aedes -borne diseases, and immunizations. She has experienced on clinical researches regarding pediatric HIV, COVID-19 in children, and aedes- borne viral infections.

She currently serves as a senior advisor at the Department of Diseases Control (DDC) , Ministry of Public Health,Thailand. Her duties and responsibilities are consultants of infectious diseases control programmes for the Thai DDC, including immunizations, aedes – borne diseases (dengue, chikungunya and zika), general communicable diseases in children, and EIDs. She also serves as a committee for the Pediatric Infectious Disease Society of Thailand. As being one of the consultants for aedes-borne diseases control programme , she has continued opportunity to help planning strategies to achieve goals for aedes-borne viral diseases prevention and control s at the national level.

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DR. TARES KRASSANAIRAWIWONG

Director-General of Department of Diseases Control,
Ministry of Public Health (MOPH), Thailand

Dr. Tares Krassanairawiwong currently serves as Director-General of Department of Diseases Control (DDC) , Ministry of Public Health (MOPH), Thailand. His background was ophthalmologist, while obtaining more trainings and certificates on preventive medicine and honorary doctorate of philosophy (public health). He has extensive experiences on public health management as being leader for several important organizations under Thailand MOPH including; Inspector General, Deputy Permanent Secretary, Secretary General of the Food and Drug Administration, and Director General of the Department of Health Service Support. At present, his experiences significantly help pushing forward several diseases control programmes under the DDC to achieve its goals, including dengue control programme.

PROF DUANE J GUBLER

Professor and Founding Director
Signature Research Programme in
Emerging Infectious Disease
Duke-NUS Graduate Medical School,
Singapore

Prof. Duane J Gubler, ScD, FAAAS, FIDSA, FASTMH, is Emeritus Professor and founding director of the Signature Research Program in Emerging Infectious Diseases at the Duke-NUS Medical School, Singapore. He is Adjunct Professor in his alma mater, Johns Hopkins Bloomberg School of Public Health, the Duke University School of Medicine and Duke Global Health Institute. He has spent his entire career working on tropical infectious diseases with an emphasis on dengue and other Aedes-transmitted diseases. He has extensive field experience in Asia, the Pacific, tropical America and Africa, and has published extensively on all aspects of dengue and other vector-borne infectious diseases, with over 350 publications and 2 books to his credit. Prof. Gubler was founding Chief of the Dengue Branch, United States Centers for Disease Control and Prevention (CDC) in Puerto Rico for 9 years, Director of the Division of Vector-Borne Infectious Diseases, CDC in Fort Collins, Colorado for 15 years and Chair, Department of Tropical Medicine, Medical Microbiology and Pharmacology, University of Hawaii School of Medicine, in Honolulu for 5 years. He has and continues to serve on numerous WHO, national and international committees and study groups, and on the Scientific Advisory Boards of a number of companies and institutions. Prof. Gubler was founding Chair, Board of Councillors, Pediatric Dengue Vaccine Initiative in Seoul, Korea, founding Chair, Partnership for Dengue Control in Lyon, France, and the Global Dengue and Aedes-transmitted Diseases Consortium in Seoul, Korea, for which he currently serves as Chairman. Prof. Gubler is a Fellow, Infectious Disease Society of America, Fellow, American Association for the Advancement of Science, and Fellow and Past President of the American Society of Tropical Medicine and Hygiene.

SPEAKERS' BIOGRAPHIES

PROF. IQBAL AHMAD MEMON

M.B.B.S(KU), FRCP(Canada), DABP, FAAP(USA); FCPS- Peds GI/Liver
Fellowship in Pediatric Gastroentrology / Hepatology & Nutroition Univ. of Texas

Professor Iqbal Ahmad Memon is a highly qualified and accomplished medical professional specializing in Pediatrics, Gastroenterology, Hepatology, and Nutrition. He holds several prestigious qualifications, including an M.B.B.S from Karachi University in 1972/73, American Board of Pediatrics certification in October 1979 (DABP), and Fellowship of the American Academy of Pediatrics in June 1980 (F.A.A.P). He also completed a Fellowship in Pediatric Gastroenterology/Liver Disease and Nutrition at the University of Texas Medical Branch in Galveston, Texas, USA, from 1982 to 1983.

Currently, Professor Iqbal Ahmad Memon is involved in various professional tasks. He serves as a Consultant in Pediatrics and Gastroenterology at Park Lane General Hospital in Clifton, Karachi. Additionally, since July 2012, he holds the position of Professor of Pediatrics and Head of the Department at Sir Syed College of Medical Sciences in Karachi, Pakistan. He is also actively engaged in public health initiatives as the Patron of the Child Survival Program of the Government of Sindh since 2010.

Professor Memon has played a pivotal role in the eradication of polio in Pakistan. He has served as the Chairman of the Expert Review Committee for the Sindh Polio Eradication Program since 1998 and is a member of the National Technical Advisory Group for Polio Eradication Program in Pakistan and Afghanistan (NITAG-Polio) since 2017. Furthermore, he has contributed to global health efforts as a founding member of the Asian Strategic Advisory for Pneumococcal Infection (ASAP), where he also serves as the Convener of the Pakistan Chapter.

His expertise in pediatric healthcare has been recognized internationally. He has been a member of the Standing Committee of the International Society of Tropical Pediatrics (ISTP) since 2008. Professor Memon is actively involved in various professional associations, holding positions such as Chairman of the Save our Children-CHK Trust in Karachi since 1998, President of the Asia Pacific Pediatric Association from 2022 to 2024, Council Member of the Asian Society of Pediatric Infectious Diseases (ASPID), Council Member of the Asian Pan Pacific Society of Pediatric Gastroenterology Hepatology and Nutrition (APPSPGHAN), and Council Member of the Commonwealth Association of Pediatric Gastroenterology and Nutrition (CAPGAN).

With his extensive experience, Professor Iqbal Ahmad Memon has made significant contributions to the field of pediatrics, especially in the areas of gastroenterology, hepatology, and nutrition. His involvement in academic and professional roles, along with his dedication to public health initiatives, reflects his commitment to improving healthcare outcomes for children in Pakistan and beyond.

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PROF. RICHARD MAUDE

Head of Epidemiology Department, MORU, Bangkok, Thailand
Assistant Director of Graduate Studies, Nuffield Department of Medicine, University of Oxford, UK
Honorary Consultant Physician, John Radcliffe Hospital, Oxford, UK
Visiting Professor, The Open University, Milton Keynes, UK
Visiting Associate Professor, Hong Kong University

Professor Maude is Head of the Epidemiology Department at Mahidol Oxford Tropical Medicine Research Unit, Bangkok, Thailand where he has worked since 2007. He is a Professor of Tropical Medicine at the University of Oxford and Honorary Consultant Physician at the John Radcliffe Hospital, Oxford, UK. He holds visiting appointments at the Open University, UK and Hong Kong University. His research aims to improve the collection and use of geospatial data to inform health policy for communicable disease control and elimination. This employs multidisciplinary methods and a strong policy focus combining field studies, descriptive epidemiology and modelling of communicable diseases in the Asia-Pacific region. Areas of interest include spatiotemporal epidemiology, GIS mapping, disease surveillance, pathogen genetics, climate and population movement with a focus on malaria, dengue, novel pathogens and environmental health. He has over 160 peer-reviewed publications.

He leads the Health GeoLab Hub at MORU which aims to strengthen and sustain the technical capacity of the health sector in countries in the Asia-Pacific Region in the management and use of geospatial data and technologies through research, technical support and training. His international roles include Co-Chair of the Asia-Pacific Malaria Elimination Network Surveillance and Response Working Group, Co-Chair of the Roll Back Malaria Surveillance Monitoring and Evaluation Reference Group Community Health Committee, and Co-Chair of the COVID-19 Clinical Research Coalition Clinical Epidemiology Working Group. He is also a member of the UNICEF Digital Health Centre of Excellence (DICE) roster of experts, Global Fund TA Pool for GIS and Institute for Malaria and Climate Solutions (IMACS) virtual centre of excellence. He runs training courses for government disease control programmes and academics on epidemiology, data analysis, modelling and GIS.

DR. ANGGRAINI ALAM, MD

Head of Infection and Tropical Diseases,
Child Health Department/Medical Staff Group,
Medical Faculty Universitas Padjadjaran-Hasan Sadikin General Hospital

Anggraini Alam, MD, PaedConsultant, PhD, is a consultant in infection and tropical diseases with substantial experience and expertise in the field. Within the Indonesian Pediatric Society, Dr. Alam has been entrusted with various leadership responsibilities and roles, such as becoming the Head of the Working Group of Infection & Tropical Diseases of the Indonesian Pediatric Society. Dr. Alam is renowned expert in the field, she contributed of the national guideline of Dengue for Children and Adolescent, and Dengue National Strategies, as well.

She is also a lecturer and Head of Infection and Tropical Diseases at Child Health Department/Medical Staff Group, Medical Faculty Universitas Padjadjaran-Hasan Sadikin General Hospital, as a board member of Indonesian College of Pediatric. She is also board member of the ASPID and member of the SAG on COVID-19, Antimicrobial Resistance, and Infectious Disease of the International Pediatric Association.

SPEAKERS' BIOGRAPHIES

PROF. TIKKI PANGESTU

Visiting Professor,
Lee Kuan Yew School of Public Policy,
National University of Singapore,
Singapore

Prof. Pang joined the Lee Kuan Yew (LKY) School of Public Policy after 13 years at the World Health Organisation (WHO) in Geneva, Switzerland as Director of its Research Policy & Cooperation department. In this capacity he worked with countries to strengthen their national health research systems, developed mechanisms and initiatives to improve the efficiency and transparency of global health research, and helped formulate an Organisation-wide research policy.

Prior to his WHO career, Prof. Pang was the Professor of Biomedical Sciences at the Institute of Postgraduate Studies & Research, and Associate Professor/Lecturer at the Faculty of Medicine, the University of Malaya, Kuala Lumpur. He was previously Co-Director of the WHO Collaborating Centre for Dengue & Dengue Haemorrhagic Fever at the University of Malaya, Kuala Lumpur, Malaysia (1982-1995), and a member of the WHO Technical Advisory Group which developed the guideline Dengue Haemorrhagic Fever: Diagnosis, Treatment and Control (1986).

Prof. Pang's main research and academic interests lie in the area of infectious diseases, the impact of genomics on public health, global health governance, national health research systems, knowledge translation, research transparency and accountability, and the use of evidence in health policy development. In these areas, he has published more than 200 scientific articles and 12 books, edited volumes and reports, which includes several major WHO reports, including Genomics and World Health (2002), the World Report on Knowledge for Better Health (2004) and a History of Research in WHO (2010). Prof. Pang's involvement with the LKY School of Public Policy began in 2009 through the ST Lee Project on Global Health Governance.

Prof. Pang is a Fellow of the Royal College of Pathologists (UK), American Academy of Microbiology (USA), Institute of Biology (UK) and the Academy of Medicine of Malaysia. He was the Founding Editor of Health Research Policy & Systems and the Asia-Pacific Journal of Molecular Biology and Biotechnology.

SPEAKERS' BIOGRAPHIES

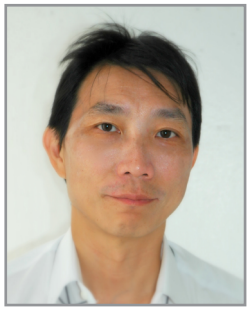
PROF. MOI MENG LING

School of International Health,
Graduate School of Medicine,
the University of Tokyo,
Japan

Prof. Moi Meng Ling is Professor at the School of International Health, the University of Tokyo. She received her MSc and PhD in Medicine from Tsukuba University, Japan, after graduating from University Putra Malaysia with first class honors.

She is a virologist that is working on prevention measures against tropical and emerging virus diseases. She has been working on research fields from viral pathogenesis and transmission, diagnostics and vaccine development, surveillance of viral emergence, and population immunity to tracking viral spread, epidemiology, and field research. Her projects have led to the successful development of in vitro and in vivo models for flaviruses and COVID-19 vaccine evaluation studies. The novel models have also led to a better understanding of the immune responses induced after dengue and zika virus infection. She was previously the Deputy Head of WHOCC for Reference and Research of Tropical and Emerging Virus Diseases (JPN-67) and is working closely with WHO GLAD-HP and GOARN, local and international community to reduce the international spread of high treat pathogens disease and to improve rapid diagnostics to these outbreaks, including Zika and SARS-CoV-2.

She became the first foreigner to receive the prestigious Japan's AMED President Prize for her work in dengue and arboviruses in 2020, and is one of the few leading arbovirologists specializing in dengue in the country.



DR. SRIKIATKHACHORN, ANON

Associate Professor,
Department of Cell and Molecular Biology,
College of the Environment and Life Sciences,
University of Rhode Island, Providence, RI.

Dr Srikiatkhachron is a pediatric immunologist with experience in immunologic studies of human immunity and in viral infectious diseases. His work has focused on the immunity elicited by viral pathogens and the immunological consequences of host-pathogen interactions. He has served as leader of the core laboratory of an NIH funded program project to study dengue pathogenesis. His research interests include the mechanisms of vascular leakage in dengue hemorrhagic fever, particularly the effects of DENV and immune response on endothelial cell functions, and clinical manifestations and classification of clinical dengue.

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DR. R. TEDJO SASMONO

Head & Senior Research Fellow
Dengue Research Unit
Eijkman Institute for Molecular Biology,
Ministry of Research, Technology, and Higher Education, Jakarta,
Indonesia.

Dr. R. Tedjo Sasmono is a Senior Research Fellow at the Eijkman Research Center for Molecular Biology, National Research and Innovation Agency, Indonesia. Dr. Sasmono research is focused on infectious diseases, particularly in the field of virology with the specialty in dengue and other arboviruses. He obtained his Ph.D. degree in molecular biology from the University of Queensland in 2003 and conducted his postdoctoral fellowship at Monash University, Australia. Currently, Dr. Sasmono is the group leader for Vector-borne and Emerging Diseases Pathobiology. His other activities include serving as a member of the National Ethics Committee for Health Research and scientific advisors for dengue vaccine and Wolbachia trials in Indonesia. Additionally, he acts as a scientific advisor for Exeins Health Initiative in Indonesia. Throughout his scientific career, Dr. Sasmono has received numerous international scholarships, awards, grants, and fellowships.

DR. MARTIN HIBBERD

EMERGING INFECTIOUS DISEASE
Department of Pathogen Molecular Biology
London School Of Hygiene & Tropical Medicine

Dr Martin Hibberd BSc(Hons) PhD; is Professor of Emerging Infectious Diseases since 2012 and Head of the Department of Infection Biology (since 2022) at the London School of Hygiene and Tropical Medicine (LSHTM).

He has adjunct positions at University of the Philippines, Manila, in Human Genetics (at NIH) and the Genome Institute of Singapore (where he was previously associate director from 2003 to 2016). He also has a visiting position at the Philippine Genome Centre.

He graduated from Brunel University in 1985 in Applied Biology and received his Doctorate from King's College, London in 1994.

He has worked at UK public health agencies, Imperial College London and the Genome Institute of Singapore, before his current job at LSHTM.

He has a broad scientific background spanning both microbial and human determinants of infectious and inflammatory diseases. His current research interests utilize genomic applications to cover both pathogen and host aspects of infectious disease; together with integrating modelling and genomic approaches to understand transmission and outbreaks.

He has over 230 publications, in journals with an impact factor averaging 9, with more than 25,000 citations in total, and an h-index of 79.

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DR. MARSHA SINDITIA SANTOSO

Clinical Research Associate,
Exeins Health Initiative

Dr. Marsha Santoso is a Clinical Research Associate at Exeins Health Initiative, a biomedical research institution based in Jakarta, Indonesia, overseeing projects on molecular surveillance and diagnostics. She received her medical degree at Universitas Indonesia Faculty of Medicine then earned her masters degree in International Public Health from the University of Sydney. She has clinical experience in both urban and rural healthcare, as well as research in dengue molecular epidemiology and diagnostics.

ASSOC. PROF. SURASITH CHAITHONGWONGWATTHANA

Associate Professor,
Department of Obstetrics and Gynecology,
Faculty of Medicine, Chulalongkorn University,
Bangkok, Thailand

Dr. Surasith Chaithongwongwatthana is currently an Associate Professor of the Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand. Dr. Surasith has been working in the area of infectious diseases that affect reproductive health for over 20 years. His research works relate to genital tract infections, HIV, perinatal infections and maternal immunization.

Dr. Surasith serves as a member of various national committees, including the Development Committee on Thailand Practice Guideline for Management of Hepatitis B and C 2021. Dr. Surasith holds an M.D., Certified Board of Obstetrics and Gynecology and M.Sc. (Health Development) from Chulalongkorn University. He also gets a Diploma in STDs/AIDS from Prince of Songkhla University, Thailand and a Certificate in Sexual and Reproductive Health and Rights from Uppsala University, Sweden.

SPEAKERS' BIOGRAPHIES

DR. MARIA ROSARIO Z. CAPEDING

Pediatric Infectious Disease Specialist, Clinician, Researcher Scientist

Head, Medical Research Unit,
Tropical Disease Foundation, Inc

Consultant, Infectious Diseases
Asian Hospital and Medical Center
Philippines

Dr. Capeding is a pediatrician, an infectious disease specialist, and a clinical microbiologist of the Research Institute for Tropical Medicine, Philippines. She is the Head of the Department of Microbiology, Consultant of the Medical Department, and Head of the Dengue Study Group of the said institute. She is the Section Head of Infectious Diseases of the Department of Pediatrics, Asian Hospital and Medical Center, Philippines.

She has engaged in significant researches on the safety, immunogenicity and efficacy of childhood vaccines: Haemophilus influenzae type b, Pneumococcal and Meningococcal Conjugate; Influenza; Hepatitis A; Hepatitis B; DtaP-Hib-IPV-HepB combination vaccine; Typhoid Conjugate; Cholera; Japanese Encephalitis, and Dengue.

She is an accomplished medical researcher though her contributions: 54 original articles and reviews in peer reviewed international and local journals; presented scientific papers in 77 international medical conferences; acted as an expert or member of advisory board to 31 international consultative meetings; and 47 completed and current researches and clinical trials. She is an active member of national and international professional medical societies and global, regional scientific fora. She is also a frequent lecturer to numerous conventions of medical societies, postgraduate courses and local chapter meetings.

Dr. Capeding is an awardee of the 23rd Dr. Jose P. Rizal Memorial Award for Research by the Philippine Medical Association (PMA). She was given the distinction as one of the world's Top Women in Biotech Industry 2014. The paper, Clinical Efficacy and Safety of a Novel Tetravalent Vaccine in Healthy Children in Asia: Phase 3, Randomized, Observer-Masked, Placebo-Controlled Trial, Maria Rosario Capeding, Ngoc Huu Tran, Sri Rezeki, et. al. (The Lancet, 2014. 384:1358-1365 was adjudged Paper of the Year 2014 by the International Society for Vaccines (ISV). She is a recipient of the 2015 Outstanding Professional of the Year Award in the Field of Medicine and Eric Nubla Excellence Award given by the Philippine Professional Regulation Commission.

DR. TAWEEWUN HUNSAWONG, PHD

Head of Virology-Serology section,
Department of Virology,
USAMD-AFRIMS, Bangkok, Thailand

A virologist with 17 years of experiences in serological and immunological testing for arbovirus and respiratory virus research studies. She had her PhD in Microbiology from Faculty of Science, Mahidol University. Currently, she is a Head of Virology-Serology section, Department of Virology, USAMD-AFRIMS, Bangkok, Thailand. Her research studies are focusing on arboviruses (dengue, zika and chikungunya viruses) and respiratory virus like influenza and SARS-CoV-2 pathogenesis, anti-viral drug treatment and vaccine development using both in vitro and animal experiments.

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ASSOC. PROF. DR. DARINTR SOSOTHIKUL, MD.

Chief, Division of Hematology and Oncology,
Department of Pediatrics, Faculty of medicine,
Chulalongkorn University

Dr. Darintr Sosothikul is an Associate Professor at Division of Hematology and Oncology Department of Pediatrics, Faculty of Medicine Chulalongkorn University and King Chulalongkorn Memorial Hospital Thailand where she is also an attending physician. In addition, she is a Director of Integrative and Innovative Hematology/ Oncology Research Unit at Chulalongkorn University, Bangkok, Thailand. In 1996, Dr Sosothikul obtained her medical degree from Prince of Songkla University. In 2000, continued her education as clinical fellow in Pediatric Hematology/Oncology at the same institute, where she obtained her certified subspecialty board in 2002. From 2003-2005, she was a visiting research fellow in Hemostasis and Thrombosis at the Division of Hematology/Oncology, Children Hospital of Michigan, Wayne State University School of Medicine.

In addition, Dr Sosothikul is a member of the Thai Medical Council, Thai Pediatric Society and The Royal Collage of Pediatricians of Thailand. She is also a member of American Society of Hematology, The International Society of Hematology and The International Society on Thrombosis and Haemostasis. Dr Sosothikul is currently an Executive Committee of Thai Society of Hematology, National Hemophilia Foundation, Thailand and National Hemophilia Program, Ministry of Public Health, Thailand and Steering Committee of Association of Hemophilia and Allied Disorders – Asia Pacific.

Dr Sosothikul's areas of interest include bleeding, thrombosis, immunodeficiency and dengue virus infection.

SPEAKERS' BIOGRAPHIES

PROF. EMERITUS LULU C. BRAVO, MD

Professor Emeritus College of Medicine,
University of the Philippines Manila

Lulu Bravo is a Professor Emeritus at the College of Medicine, University of the Philippines Manila. She is the former Vice Chancellor for Research and Executive Director of the National Institutes of Health, University of the Philippines Manila (2005 – 2011) and current head of the Vaccine Study Group of the NIH – UPM.

She is the President of the Immunization Partners in Asia Pacific (IPAP), current Executive Director and past President of the International Society of Tropical Pediatrics (ISTP) 2008 – 2011, past Chair and Founder of the Asian Strategic Alliance for Pneumococcal Disease Prevention (ASAP) 2007 – 2011, and Executive Director, Sec-General (1998 – 2006) & past President of the Asian Society for Pediatric Infectious Disease (ASPID) 2006 – 2008. She has served in various capacities in many other Asian medical and professional societies and as WHO Technical Advisor. She has served as well in national medical organizations such as PMA, PPS, PIDPS, PSMID and the Philippine Foundation for Vaccination (PFV) of which she is the founding President and current Executive Director. In the international scene, she is a member of the Rota Council, Pneumococcal Awareness Council of Experts (PACE) and member of the Dengue Vaccine Initiative (DVI). Her work has earned for her various national and international honors and awards in the professional, academic and research fields, including the Outstanding Physician (2009) and the prestigious Dr. Jose P. Rizal Memorial Award for Academe (2011) given by Philippine Medical Association, the 2012 Asian Outstanding Pediatrician Award given by the Asia Pacific Pediatric Association and 2018 Outstanding Professional in Medicine given by the Professional Regulation Commission of the Philippines. In 2008, she presented both written and oral evidence to the UK's House of Commons to justify the $ 2.5 Billion vaccination advance market commitment to provide needed vaccines for the developing world. She was named Pneumonia Fighter in 2018 by the JustActions Organization, a US-based advocacy movement and corporation associated with People Empowerment.

Dr. Lulu Bravo completed her MD, pediatric residency and subspecialty training in infectious disease at Philippine General Hospital-College of Medicine of the University of the Philippines Manila. She supplemented her fellowship in pediatric infectious disease at the University of Texas Southwestern Health Science Center in Dallas, USA in 1986. She has published more than 100 scientific articles, books and book chapters in both local and international circles.

SPEAKERS' BIOGRAPHIES

PROF. SRI REZEKI HADINEGORO

Professor of Paediatric Infectious Disease;
Senior Lecturer at Division of Infectious and Tropical Diseases,
Department of Child Health,
Faculty of Medicine, University of Indonesia,
Indonesia

Professor Sri Rezeki Hadinegoro MD, PhD is a paediatrician who graduated from the Faculty of Medicine University of Indonesia, Jakarta. She has been working at the Department of Child Health in the same university since 1983. In 1986 she was certified as an Infection and Tropical Paediatric consultant. She obtained a Fellowship from the Japan Society on Promoting of Sciences (JSPS), in Kobe University and Iwate Medical University, Japan from 1993 to 1995. She graduated with her PhD in medicine from the Faculty of Medical University of Indonesia in 1996.

Prof. Hadinegoro is active in several organisations and conducts research in the field of infection and tropical paediatrics, especially in dengue and immunisation. Over the past fourteen years she has held a position in the Immunisation Committee, Indonesian Paediatric Society (IPS). Currently, she is chairman of the Indonesian Technical Advisory Group on Immunisation (ITAGI), Indonesian Ministry of Health (2007); and member of National Adverse Event Following Immunisation Committee, Indonesian Ministry of Health (past chairman 1999-2012). Regionally and internationally, Prof. Hadinegoro was appointed as a board member of Asian Society of Paediatric Infectious Disease (ASPID, past president in 2008-2010), member of the Asian Strategy Alliance of Pneumococcal Diseases Prevention (ASAP) since 2007, board member of World Society of Paediatric Infectious Disease (WSPID, 2009-2013), member of Asia Pacific Dengue Prevention Board (APDPB) since 2012, steering committee of Asian Dengue Vaccination Advocacy (ADVA) since 2012, and president elect of International Society of Tropical Paediatrics in 2015.

Prof. Hadinegoro has authored papers in scientific journals and several books. She has also been a recipient of medical awards for her strong support and participation in those activities.

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ASSOC. PROF. WEERAPONG PHUMRATANAPRAPIN, MD

Dean, Faculty of Tropical Medicine, Mahidol University
Director, WHO Collaborating Centre for Case Management,
Training and Research on Malaria
Head, Dialysis Unit, Hospital for Tropical Diseases, Mahidol University

Dr. Weerapong Phumratanaprapin is an Associate Professor in the Department of Clinical Tropical Medicine, Faculty of Tropical Medicine, Mahidol University. He is a medical doctor specializing in nephrology and preventive medicine (travel medicine), with diplomas from the Thai Board of Internal Medicine, the Thai Board of Nephrology, the Thai Board in the Specialty of Family Medicine, and the Thai Board of Preventive Medicine (Travel Medicine). He actively teaches graduate students and supervises several Masters and PhD students at the Bangkok School of Tropical Medicine, Faculty of Tropical Medicine, Mahidol University.

In 2019, Dr. Weerapong was awarded an Outstanding Award in Preventive Medicine (Travel Medicine) by the Preventive Medicine Association of Thailand.

Dr. Weerapong's research fields focus on acute kidney injury and renal complications associated with dengue, malaria and other tropical diseases. He has extensive case management experience with dengue-associated acute kidney injury at the Hospital for Tropical Diseases.

DR. CHALERMRAT BUNCHORNTAVAKUL

Associate Professor of Medicine
Division of Gastroenterology and Hepatology
Rajavithi Hospital, Ministry of Public Health
Bangkok, Thailand
Affiliated with College of Medicine, Rangsit University

Dr. Bunchorntavakul received his MD degree in 2001 from the faculty of Medicine, Ramathibodi Hospital, Mahidol University in Bangkok (with first-class honors). He completed his clinical fellowship in Gastroenterology at Siriraj Hospital, Mahidol University, Bangkok, Thailand, and a research fellowship in Hepatology and Liver Transplantation at the University of Pennsylvania, Philadelphia, PA, USA. Currently, Dr. Bunchorntavakul is the academic chairman/ program director of Internal Medicine training at Rajavithi Hospital and the Medical Director of the Liver Transplant Program of the Excellent Center of Organ Transplantation, Ministry of Public Health, Thailand. He also serves as a committee member of several professional societies, such as the Gastroenterological Association of Thailand (as secretary general), the Thai Association for the Study of the Liver (as steering committee), and the Royal College of Physicians of Thailand (as steering committee).

Dr. Bunchorntavakul has authored or co-authored over 54 peer-reviewed articles on a spectrum of GI and liver diseases, particularly in the field of viral hepatitis, cirrhosis, and liver transplantation (with a current H-index of 20). In addition, he has contributed to several international textbook chapters and has served as an editorial board member of the Journal of Clinical and Translational Hepatology.

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PROF. THIRAVAT HEMACHUDHA, MD, FACP

Director,
Faculty of Medicine,
Thai Red Cross Emerging Infectious Diseases Health Science Centre, WHO Collaborating Centre for Research and Training on Viral Zoonoses

Professor Thiravat Hemachudha is a renowned specialist in clinical, virological, and immunological studies in encephalitis. He serves on the WHO Expert Advisory Panel on Rabies. Professor Hemachudha established the WHO-CC on Rabies Pathogenesis and Prevention at Queen Saovabha Memorial Institute, Thai Red Cross Society, as well as the WHO-CC on research and training on viral zoonosis and TRC EID-Health Science Centre at the Faculty of Medicine. These initiatives aim to increase preparedness and improve diagnostics for pathogens.

He has been engaging in rabies pathophysiologic studies in patients and animal models, as well as the development of novel therapeutics since 1984. He and his team developed a new post-exposure prophylaxis guide and abandoned the use of nerve tissue-derived vaccines in 1988. The intradermal route of delivery of tissue culture rabies vaccine was initiated in 1987. Professor Hemachudha proposed these advancements to the WHO rabies committee meeting in Geneva in 1992. WHO published these new recommendations in the WHO Technical Report series 824 (WHO Expert Committee on Rabies, 8th report, 1992).

The most recent meeting in 2018 resulted in an update recommending the use of RIG of the volume needed to cover all wounds. The meeting focused on the clinical expression, progression, and pathophysiology of human and naturally infected furious and paralytic rabies. The knowledge gained from these studies, including insights into bioenergetic failure and immunopathogenic mechanisms, has been applied to better manage other viral encephalitides.

Overall, Professor Thiravat Hemachudha's groundbreaking work and expertise have significantly contributed to the field of encephalitis research and the prevention of rabies. His active involvement in the WHO Expert Advisory Panel and establishment of WHO Collaborating Centers demonstrate his commitment to global health and improving strategies for diagnosing, treating, and preventing infectious diseases.

SPEAKERS' BIOGRAPHIES

PROF. APICHAI KHONGPHATTHANAYOTHIN, M.D., M.P.P.M

Chief of Pediatric Cardiology, Bangkok General Hospital
Professor of Pediatrics, Faculty of Medicine, Chulalongkorn University, Thailand
Professor of Clinical Pediatrics, Keck School of Medicine of University of Southern California

Dr. Apichai Khongphatthanayothin is a pediatric cardiologist with special expertise in cardiac arrhythmia and genetics of cardiac disease in children and adults. After graduation with a medical degree from Chulalongkorn University in Bangkok, Thailand, he attended post-graduate training in the field of Pediatrics and Pediatric Cardiology at the University of Southern California, USA. He is board certified in Pediatrics, Pediatric Cardiology and Adult Congenital Heart Disease. His research interests include pediatric arrhythmia (heart rhythm abnormality), pediatric cardiac intensive care, pulmonary hypertension, congenital heart disease and cardiovascular genetics.

Trainings:
M.D. (First Class Honor): Faculty of Medicine, Chulalongkorn Univeristy, Bangkok, Thailand
American Board of Pediatrics: University of Southern California, Los Angeles, CA, USA
American Board of Pediatrics Cardiology: University of Southern California
Fellow in Cardigenetics: Academic Medical Center, Univerisity of Amsterdams, Netherland
American Board of Internal Medicine (Adult Congenital Heart Disease)

Current Positions:
Chief of Pediatric Cardiology, Bangkok General Hospital
Professor of Pediatrics, Faculty of Medicine, Chulalongkorn University, Thailand
Professor of Clinical Pediatrics, Keck School of Medicine of University of Southern California

Interests:
Pediatric Cardiac Arrhythmia
Genetics of Heart Disease
Pediatric Cardiac Intensive Care

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ASSOC. PROF. DANIEL YT GOH

M.B; B.S, M.Med (Paediatrics), FRCPCH(UK), FCCP(USA), FAMS (Singapore)
Senior Consultant Paediatrician, Paediatric Pulmonary and Sleep Service,
National University Hospital, Singapore and Associate Professor, Department of Paediatrics,
Yong Loo Lin School of Medicine, National University of Singapore

Dr Daniel Goh is an Executive Committee member of the **Asian Strategic Alliance for the Prevention of Pneumococcal Diseases *(ASAP)***, Executive committee member of the **Asian Dengue Voice and Action *(ADVA)*** and member of the organizing committee of the 5th Asia Dengue Summit. He is also a Standing Committee Member of the **Asia Pacific Pediatric Association *(APPA)***.

Dr Goh is Past-President of the **Singapore Paediatric Society** and Past-President of the **Asean Paediatric Federation**.

His main clinical interests are in Childhood Respiratory diseases, including chronic lung diseases in children and allergic airway diseases, Sleep and sleep-related breathing disorders as well as Bronchology and childhood fiberoptic bronchoscopy.

He has a keen interest in vaccinology and vaccine advocacy.

Dr Goh was the recipient of the **Young Investigator Award 1994** at the 28th Singapore-Malaysia Congress of Medicine, Singapore Academy of Medicine for his research on Local Airspora Allergens. He was recipient of the **NUHS-Mochtar Riady Pinnacle Awards for Excellence** in 2015 and recipient of the Singapore **National Day Award 2018** - Public Administration Medal (Bronze), Ministry of Education. He was awarded the **Outstanding Asian Paediatrician Award 2018**, presented by the Asia Pacific Paediatric Association.

A/Prof Daniel Goh was awarded the National Outstanding Clinician Mentor Award at the National Medical Excellence Awards 2022 (NMEA 2022) by the Minister of Health,Singapore on 26 September 2022.

This annual national award recognises the efforts of outstanding clinicians, clinician scientists and other healthcare professionals for their contributions to Singapore Healthcare System.

SPEAKERS' BIOGRAPHIES

PROF. SOMCHAI JONGWUTIWES

Professor (Position Classification 11),
Department of Parasitology,
Faculty of Medicine, Chulalongkorn University, Thailand

Professor Somchai Jongwutiwes is an accomplished researcher and academician in the field of parasitology. He has held various positions at Chulalongkorn University in Thailand, starting as a lecturer in the Department of Parasitology in 1987 and progressing to his current position as Professor (Position Classification 11) in the same department since 2011. Throughout his career, he has made significant contributions to the understanding of molecular epidemiology, population genetics, and molecular evolution of malaria and opportunistic parasites.

Professor Jongwutiwes has been actively involved in teaching and mentoring students at different levels, including medical students, nurse students, postgraduate students, and foreign medical students. His teaching topics have focused on malaria, opportunistic parasites, and the pathogenesis of parasitic diseases. He has conducted short-course training for foreign medical students at Chulalongkorn University, as well as taught at Naresuan University and the Police Hospital.

In addition to his teaching and research roles, Professor Jongwutiwes has also served the scientific community in various capacities. He has been recognized with several honors and awards, including the WFP Distinguished Achievement Award from The World Federation of Parasitologists in 2010. He has served as a reviewer for numerous reputable journals and has been invited to contribute chapters in books related to his expertise. He has also been a reviewer for tenure promotion at several universities and colleges in Thailand.

With a strong publication record, Professor Jongwutiwes has made significant contributions to the field of parasitology. His research papers have covered a wide range of topics, including the analysis of sequence diversity in Plasmodium falciparum and Plasmodium malariae, the detection of cryptic Plasmodium infections, and the genetic diversity of various parasites. His work has been published in reputable journals such as Scientific Reports, Clinical Infectious Diseases, and Malaria Journal.

Overall, Professor Somchai Jongwutiwes has demonstrated expertise in molecular epidemiology, population genetics, and molecular evolution of malaria and opportunistic parasites. His dedication to teaching, research, and service to the scientific community has contributed significantly to the field of parasitology. His work continues to advance our understanding of parasitic diseases and their impact on human health.

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SPEAKERS' BIOGRAPHIES

DR. CHONTICHA KLUNGTHONG

Head of the Molecular Virology Section
Department of Virology, US Army Medical Directorate
Armed Forces Research Institute of Medical Sciences

Dr. Chonticha Klungthong obtained her PhD in Microbiology, at Mahidol University, Bangkok Thailand, and currently serves as a research scientist and head of the Molecular Virology section at the Department of Virology, US Army Medical Directorate of the Armed Forces Research Institute of Medical Sciences (USAMD-AFRIMS). In this role, she supervises lab personnel in the section and provides training on molecular techniques to colleagues at field sites as well as partners institutes in Thailand, Bhutan, Nepal, and the Philippines.

Dr. Chonticha has also conducted research and contributed to a number of scientific papers published in peer-review international journals. Her laboratory focuses on molecular characterization, epidemiology, and evolution of viruses that cause Febrile Vector Borne Infections (FVBI) and respiratory diseases.

PROF. OOI ENG EONG

BMBS, PhD, FRCPath

Professor and Deputy Director,
Programme in Emerging Infectious Diseases, Duke-NUS Medical School
Singapore

Prof. Ooi trained in medicine at the University of Nottingham and conducted his doctoral studies on molecular epidemiology at the National University of Singapore. He has been working in the field of dengue for 20 years and his research interest spans dengue epidemiology to molecular pathogenesis of arboviral diseases. His laboratory interfaces clinical studies with virology and immunology to address research questions. He has published in journals such as The Lancet, Science and Nature Medicine. He is a three-time recipient of the Clinician-Scientist (Senior Investigator) Award by the National Medical Research Council of Singapore.

SPEAKERS' BIOGRAPHIES

ASSOC. PROF. PRATAP SINGHASIVANONDH

Dean,
Faculty of Tropical Medicine,
Mahidol University,
Thailand

Dr. Pratap Singhasivanon is an Associate Professor in the Department of Tropical Hygiene. He obtained his medical degree from Kasturba Medical College, India, before receiving his postgraduate Diploma in Tropical Medicine and Hygiene from Mahidol University. He has a Master of Public Health degree from Harvard University and a Doctor of Public Health degree from the University of Michigan, USA.

Dr. Pratap Singhasivanon is an authority on the epidemiology of tropical diseases, vector-borne infectious diseases, and the application of geographic information system (GIS) in monitoring multi-drug resistant malaria. His primary research area is the epidemiology of malaria, but he has an interest in many other vector-borne diseases that affect populations in Southeast Asia. He often collaborates with medical doctors, specialists and researchers in international health agencies in medical research. Dr. Pratap has established several initiatives to improve the performance of all faculty staff, raising the international profile of the Faculty of Tropical Medicine around the world. He constantly works toward developing and implementing national health policies in Thailand and contributing to the improvement of regulations and planning in Thailand's public health system. Dr. Pratap regularly works closely with Thailand's Ministry of Public Health in both research and human-resource capacity-building and development.

MR. KAMRAN RAFIQ

Co-Founder and Communications Director
International Society for Neglected Tropical Diseases

Kamran is the Co-Founder and Communications Director at the International Society for Neglected Tropical Diseases. After graduating from The School of Pharmacy, University of London in Pharmacology and Toxicology Kamran went on to complete his Masters in Neuroscience at the Institute of Psychiatry and The Maudsley, Kings College London. He has worked as a research scientist at Schering-Plough Research Center at the San Raffaele Hospital in Milan, Italy working on neuropeptides and novel mechanisms of pain transmission and Parkinson's Disease modelling. Upon returning to the UK he worked for Reuters Business Insights setting up their drug discovery intelligence unit and then as Sales Director for Datamonitor being an integral part of the acquisition and subsequent integration of the company Life Science Analytics and then as Managing Director at Global Data overseeing both Pharma/Biotech and Medical Device Diagnostics market teams. As well as co-founding the ISNTD he sits on the editorial board of Break Dengue and also has co-founded the behavioural research company Actingforhealth.org

SPEAKERS' BIOGRAPHIES

PROF. LEO YEE SIN

Executive Director
National Centre for Infectious Diseases
Singapore

Professor LEO Yee Sin is the Executive Director of the National Centre for Infectious Diseases, Singapore.

As an adult Infectious Disease specialist, Professor Leo has led her team through multiple outbreaks in Singapore. These include Nipah in 1999, SARS in 2003, the pandemic influenza in 2009, Zika in 2016 and multiple surges of Dengue. She successfully managed Singapore's first imported case of the Monkeypox in May 2019. Her current priority is now in the fight against COVID-19.

Professor Leo has published more than 400 peer-reviewed scientific papers. With her experience and expertise in outbreak management, she is frequently called upon as advisor and conference speaker at the national, regional and international level. She has served in multiple World Health Organization workgroups on outbreak management, and as an international expert in scientific and research bodies.

Apart from her clinical and administrative duties, she is also heavily involved in research and teaching. Topics of her research interest include dengue, influenza, emerging infections, HIV and COVID-19.

She has won many awards among which are four National Day Awards including the most prestigious Public Service Star in recognition for her outstanding battle against SARS and COVID-19 in 2003 and 2022 respectively, and two Public Administration Medals in 2012 and 2020. Other awards include the Excellence Service Star Award 2005, Red Ribbon Award 2014, Lee Foundation- NHG Lifetime Achievement Award 2021 and the NUS Distinguished Alumni Service Award 2021.

Professor Leo is also named in BBC's 100 women list in 2020 and was inducted into the Singapore Women's Hall of Fame in 2022.

In April 2022, Professor Leo was conferred the title of Knight of the French Order of the Legion of Honour, by France's Ambassador to Singapore Marc Abensour on behalf of the President of the French Republic.

SPEAKERS' BIOGRAPHIES

PROF. DR. LUCY LUM CHAI SEE

Senior Consultant, Department of Paediatrics,
University of Malaya Medical Center, Kuala Lumpur
Honorary Professor, Department of Paediatrics, Faculty of Medicine,
University of Malaya, Kuala Lumpur

Lucy Lum is a pediatrician with 30 years of experience in dengue management and pediatric intensive care. She collaborated with clinicians in Southeast Asia and Latin America in developing the 2009 revised dengue case classification, evaluation, and clinical research.

Serving as a WHO temporary advisor in dengue outbreak areas in Laos PDR and the Solomon Islands she, together with local healthcare workers, adapted the clinical case management to the minimally resourced environment. In 2012 she was commissioned by WHO Department of Control of Neglected Tropical Diseases to develop a handbook on clinical management of dengue. The Western Pacific Regional Office in 2013, invited her to coordinate the development of a training package in dengue case management, in line with the WHO 2009 Dengue Guidelines. This package serves as the principal training material for the Western Pacific region and Africa.

Before her retirement, she started a second career to promote child health and early childhood nutrition and development focusing on the first 1000 days when the foundation for life-long health is laid. Her collaboration with NGOs in community out-reach programs aims to improve nutrition among young children of urban poor families. Her dream is to live the circular economy with a carbon-neutral footprint where every child can realize his best potential.

DR. VALENTINA SANCHEZ PICOT, DVM

Head of Clinical Research and Head of Public Health Initiatives,
Mérieux Foundation

Valentina Sanchez Picot is Doctor in Veterinarian Medicine with over 20 years of experience in applied research conduct particularly in LMICs and in challenging humanitarian contexts.

Currently she is Head of Clinical Research and Head of Public Health Initiatives at the Mérieux Foundation – She has conducted numerous international multicentre research studies with focus on infectious diseases primary related to Lower Acute Respiratory Infections (e.g. Pneumonia), and also emerging diseases (e.g. Ebola, Covid19) - mostly in Asia and Africa.

She is also responsible for the management of public health initiatives and educational programs that include various thematic areas such: Vaccinology, Diagnostics, Epidemiology, AMR and other specific diseases oriented thematic such as Arboviruses, Rabies and Cholera.

SPEAKERS' BIOGRAPHIES

DR. EGGI ARGUNI

MD., MSc., PhD.
Pediatric Infection Disease Consultant

Dr Eggi Arguni is a clinician, lecturer and researcher at the Department of Child Health, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Indonesia. She obtained a Master degree in Pediatric Clinical Sciences and Pediatric degree in the same institution. She completed her PhD on molecular biology and immunology at Graduate School of Medicine, Chiba University Japan. Her current clinical work is as Pediatrician at Dr. Sardjito General Hospital, Yogyakarta at the Division of Infectious and Tropical Disease. Her research interests are in the fields of immunology, infectious and tropical disease, especially in dengue and HIV in children.
One of her present research collaborations is World Mosquito Program in Yogyakarta (WMP Yogyakarta) as a part of WMP Global, which implementation research to develop more effective tool to prevent and control outbreak of dengue by new novel method using a non-pathogen bacterium, Wolbachia.

DR. JIROD NARARAK

Instructor and Researcher,
Department of Entomology,
Faculty of agriculture,
Kasetsart University, Bangkok

I am instructor and researcher at the Department of Entomology, Faculty of Agriculture, Kasetsart University, Bangkok. My research focuses on household pest control and has a particular interest in identifying the active ingredient from plants to control mosquitoes.

SPEAKERS' BIOGRAPHIES

DR. PITI MONGKALANGOON

Chief of Aedes-Borne Disease and other Vector-Borne Disease Branch
Assistant Director of Division of Vector-Borne Diseases

Dr. Piti Mongkalangoon is a Public Health Technical Officer at the Senior Professional Level, specializing as a Senior Entomologist. In their current role, Dr. Mongkalangoon holds two key responsibilities. Firstly, as the Chief of the Aedes-Borne Disease and other Vector-Borne Disease Branch Group. Secondly, the position of Assistant Director within the Division of Vector-Borne Diseases.

Dr. Mongkalangoon's educational background includes a B.Sc. in Agriculture with a major in Entomology from Kasetsart University in 1987. He further pursued an M.Sc. in Environmental Biology from Mahidol University in 2001, focusing their thesis on the penetrance of Wolbachia-mediated cytoplasmic incompatibility in *Aedes albopictus* host. His academic journey concluded with a Ph.D. in Entomology from Kasetsart University in 2011, where they conducted experimental studies to evaluate the behavioural responses of *Aedes aegypti* to synthetic pyrethroids used in vector control under field conditions.

Dr. Mongkalangoon's research interests revolve around vector control strategies, vector ecology and behaviour, mosquito systematic and cytogenetics, and the design and development of innovative tools for mosquito surveillance and control. They are particularly intrigued by vector control methods involving chemical, biological, genetic, and ecological approaches. Additionally, they are keen on exploring natural repellents and other preventive measures to combat mosquito-borne diseases.

Dr. Mongkalangoon possesses expertise in mosquito identification at different life stages, mosquito ecology, mosquito colonization, mosquito dissection and determination, mosquito control techniques, and a range of entomological experiments. He is knowledgeable about other medical insects and arthropods, including their biology, identification, and pest control methods.

With his extensive background and expertise, Dr. Piti Mongkalangoon has made valuable contributions to the field of entomology and public health, particularly in the realm of vector-borne diseases and mosquito control strategies.

SPEAKERS' BIOGRAPHIES

DR. NADEGE ROSSI, PHD

Programme Coordinator,
World Mosquito Program in New Caledonia

Dr. Nadege Rossi is currently the programme coordinator of the World Mosquito Program in New Caledonia. She works in partnership with Monash University, Institut Pasteur of New Caledonia, New Caledonia government and the cities where the program is implemented. The French government and the South Province also financially support the program.

Since October 2018, she and her team have been working to reduce the risk of dengue outbreaks in New Caledonia by releasing mosquitoes (*Ae. aegypti*) carrying a natural bacteria named *Wolbachia* (more information here).

She obtained a phD degree in ecology (University of Toulon, France) and worked several years for national and European environmental programs before being involved in the World Mosquito Program.

DR. FATIMA IGNACIO GIMENEZ, MD

Active Consultant , Infectious Disease Section (PCMC)
Active Consultant ,Victor R. Potenciano Medical Center (VRPMC)
Active Consultant ,The Medical City (TMC)
Visiting Volunteer Consultant, Armed Forces of the Philippines V Luna Hospital
Visiting Consultant, Philippine Heart Center

Dr Fatima Ignacio Gimenez, is a pediatric infectious disease specialist. Currently she holds several positions as the president of the Pediatric Infectious Society of the Philippines (PIDSP), the chair of the Immunization Committee of the Philippine Pediatric Society (PPS),and the training officer of the fellowship program on pediatric infectious disease of the Philippine Childrens` Medical Center.

She is affiliated with several other private institutions and is a volunteer visiting consultant with the Armed Forces of the Philippines.

Dr Gimenez is part of the editorial board of the PIDSP Journal, a contributor to several publications and clinical practice guidelines. An advocate of immunization, she has been using her voice to champion the cause. She is a columnist of the Philippine Daily Inquirer, a leading newspaper in her country, and feels privileged to be given space to write and share knowledge on various topics apart from health-related concerns.

SPEAKERS' BIOGRAPHIES

PROF. MUHAMMAD ASHRAF SULTAN

Director
Mid-City Hospital
Lahore, Pakistan

Muhammad Ashraf Sultan is a director at Mid-City Hospital in Lahore, Pakistan. Prior to this he was Professor and Chairman of Department of Paediatrics, King Edward Medical University/Mayo Hospital Lahore, a position he held from 2004–2013. He obtained his MBBS in 1977, Diploma in Child Health in 1981, a Master's degree in tropical paediatrics from Liverpool School of Tropical Medicine in 1990. Professor Sultan is a member of the Royal Colleges of Physicians (UK) and a fellow of the Royal College of Paediatrics and Child Health (UK).

Professor Sultan is a supervisor, second fellowship in Paediatric Infectious Disease, College of Physicians and Surgeons, Pakistan. He was also the program director of the diploma in child health and doctor of medicine (MD) paediatrics program at King Edward Medical University, Pakistan. Professor Sultan had served as a member of national technical advisory group (NITAG) on immunization and as the focal person of the Integrated Management of Childhood Illnesses Strategy pre-service induction program. He is currently a member standing committee of International Pediatric Association (IPA) for the second term and Asia Pacific Pediatric Association (APPA) alongside other national and international professional societies. He is also a co-chair of IPA Strategic Advisory Group on COVID19, AMR and Infectious Diseases and a member of SAG IPA on Immunization. Prof Sultan has recently been decorated with Outstanding Asian Pediatrician Award by Asia Pacific Pediatric Association.

Professor Sultan has over 40 publications in national and international journals with a special interest in pediatric infectious diseases. He is the editor in chief of the Asia-Pacific Journal of Pediatrics and Child Health since 2015 and contributed in drafting the clinical guidelines and reports on the management of acute watery diarrhea in children, Dengue Fever and Dengue Hemorrhagic fever in children, as well as on the vaccination schedule for children less than 5 years of age. He has been invited as speaker at various regional, national and international congresses and symposia.

SPEAKERS' BIOGRAPHIES

PROF. VITHARON BOON-YASIDHI, MD

Professor, Child and Adolescent Psychiatry Division,
Department of Pediatrics, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand
Secretary General, the Pediatric Society of Thailand, and the Royal College of Pediatricians of Thailand
Advisor to the Executive Committee, the Child and Adolescent Psychiatric Society of Thailand

Dr. Vitharon Boon-yasidhi is a highly accomplished medical professional specializing in Child and Adolescent Psychiatry. Besides having been trained to be a pediatrician, he also had General Psychiatry and Child and Adolescent Psychiatry training from Yale University, USA. He currently holds the position of Professor in the Child and Adolescent Psychiatry Division of the Department of Pediatrics at the Faculty of Medicine Siriraj Hospital, Mahidol University in Bangkok, Thailand. Dr. Boon-yasidhi is also actively involved in various leadership roles, serving as the Secretary General of the Pediatric Society of Thailand and the Royal College of Pediatricians of Thailand. Additionally, he serves as an Advisor to the Executive Committee of the Child and Adolescent Psychiatric Society of Thailand.

Throughout his career, Dr. Boon-yasidhi has received numerous accolades and recognition for his contributions to the field of Child and Adolescent Psychiatry. He was awarded the Outstanding Siriraj Textbook Award in 2022 for his work as the editor of the textbook "Child and adolescent psychiatry in clinical practice." In 2016, he received the Faculty of Medicine Siriraj Hospital Outstanding Clinical Investigator Award for his research on the "Effect of HIV diagnosis disclosure on psychosocial outcomes in Thai children with perinatal HIV infection."

With his vast knowledge, experience, and commitment to improving the lives of children and adolescents, Dr. Vitharon Boon-yasidhi continues to make significant contributions to the field of Child and Adolescent Psychiatry in Thailand and beyond.

ASSOC. PROF. SOPHIE YACOUB

Head of the Dengue Research Group,
Associate Professor,
Oxford University Clinical Research Unit (OUCRU-Vietnam),

Sophie is the head of the Dengue Research Group and associate professor at the Oxford University Clinical Research Unit (OUCRU-Vietnam), part of the Centre for Tropical Medicine and Global Health, University of Oxford. She is a Wellcome Trust clinical career development fellow and a Physician in Infectious Diseases and General Medicine and holds an honorary Consultant appointment at London North West University Healthcare NHS Trust in the UK. She has a PhD from Imperial College London and an MSc from the London School of Hygiene and Tropical Medicine.

Sophie is currently leading a large translational programme of dengue research at OUCRU in Vietnam, focusing on pathogenesis studies, clinical trials and innovative technology centered on wearable devices, physiological monitoring and utilizing AI for clinical decision support systems. The overall aim of the group is to improve the management and clinical outcomes of patients with dengue on a national and global level.

SPEAKERS' BIOGRAPHIES

DR. SUNATE CHUENKITMONGKOL, M.D.

Deputy Director of National Vaccine Institute
Executives Office
National Vaccine Institute (NVI)
Thailand

Dr. Sunate Chuenkitmongkol is a medical doctor with a Vaccine Development background. Currently, working as Deputy Director of Scientific Affair at National Vaccine institute (NVI) Thailand. After completed her M.D. degree from Mahidol University, Bangkok, she has pursued on a Diplomat of Internal Medicine from

Faculty of Medicine Ramathibodi hospital, Mahidol University, Bangkok. With her extensive experience in Vaccine Clinical Trial Study Design and Clinical Operation from phase II – IV, she has published more than 12 researches on Epidemiology, Vaccine Immunogenicity & Safety Studies. Before joining National Vaccine institute Thailand, Dr. Sunate has over 16 years of her vaccine industry working experience in the realm of Dengue vaccine : Clinical Development Program, Pre-launch Preparation including Market Access Strategy. With her adamant leadership, she has guided and mentored the team to working on Dengue Vaccine in Thailand throughout its various stage from launching through Crisis Management. Her methodology is focusing on providing insight and develop urgent strategic plan to regain trust from Medical societies and regulatory authority on safety of dengue vaccine including drive local recommendations on dengue vaccine practice following new supplementary data released. Also, she has initiated Thai Dengue VOICE Advocacy by collaborating with academic institute concerning government stakeholders such as DDC MOPH, journalists and patient advocacy to accelerate vaccine acceptance and adoption as well as working with External ASEAN expert group to build advocacy on dengue vaccine (ADVA: ASEAN Dengue vaccine Advocacy)

Presently, as a Deputy Director of National Vaccine Institute, she greatly supports National Advisory Committee of Immunization Program on technical, formative, operational and implementation of new vaccine i.e. COVID-19 Vaccines, HPV, Pneumococcal Vaccines, Influenza Vaccine in Thailand.

During the COVID-19 Pandemic, with her full spectrum on vaccine industry, she has advised Clinical Research Development for Local developers receiving NVI funding: mRNA COVID vaccine, NDV-HXP-S (New castle Disease Virus Recombinant S Protein), Subunit Protein from Plant based and etc. She has significantly support in COVID vaccine strategies , by joining NACIP and National Vaccine Committee and advocate updated Global scientific data on COVID Vaccines in Immunogenicity , Efficacy ,RWE Effectiveness and Evidence on Heterologous regimen to have decision on vaccine use amidst Delta outbreak. And for COVID vaccine communication, she has working closely with HCP, Medical Organization and Lay public by organizing webinar series, streaming live and setting collaboration with WHO, Academic as well as Private sector.

In addition, her supporting role has laid upon vaccine field by helping to prioritize the investment of the development of certain vaccines that likely to cause huge public health impact (potentially dengue & influenza vaccines).

On International Cooperation, she has also promoted the regional initiative, ASEAN Vaccine Security and Self-Reliance (AVSSR) endorsed at the ASEAN Summit in November 2019. As her tenure over the regional project, she has been assigned to facilitate all the ASEAN Member States (AMSs) in implementing the AVSSR Strategic and Action Plan 2021-2025 aiming for regional vaccine security together with the great support from development partners: ROK and China. In addition, she has brought up the vaccine security issue on an international scale in order to mobilize collective capacities through global platforms and bilateral collaborative partnerships such as CEPI, WHO, UNICEF, and IVI.

SPEAKERS' BIOGRAPHIES

PROF. ZULKIFLI ISMAIL

Clinical Professor,
KPJ Healthcare University College,
Malaysia

Prof. Zulkifli Ismail is a consultant paediatrician and paediatric cardiologist at a private hospital and Clinical Professor at the KPJ Healthcare University College. He was formerly a professor of paediatrics and paediatric cardiology in the Universiti Kebangsaan Malaysia (UKM). Dr. Ismail has served as the head of the paediatric department and the director of Hospital Universiti Kebangsaan Malaysia (HUKM) as well as the medical director of its private wing, UKM Specialist Centre.

Prof. Zulkifli also served as a past president of the Malaysian Paediatric Association (MPA) and is currently the editor of Berita MPA, a quarterly newsletter publication distributed to fellow members of the Association. He chairs the Positive Parenting Management Committee (www.mypositiveparenting.org) and serves as the chief editor of the Positive Parenting Guide, a quarterly publication aimed to equip Malaysian parents with reliable and practical local information on maternal, child and family care since 2002. He is the Technical Chairman of Immunise4Life (www.ifl.my), a vaccination advocacy programme of the Ministry of Health Malaysia.

Prof. Zulkifli is currently the president of the Asia Pacific Paediatric Association (APPA) and current chairman of the Asian Strategic Alliance for Pneumococcal disease prevention (ASAP). He also serves as a board member of the National Population and Family Development Board (LPPKN), a member of the Ministry of Health Unrelated Transplant Approval Committee (UTAC) and in the editorial board of the Malaysian Journal of Paediatrics & Child Health (MJPCH). He has also served as a reviewer for the Medical Journal of Malaysia and the Philippines Paediatric Infectious Disease Journal.

Prof. Zulkifli has more than 35 publications in peer-reviewed international and local journals in addition to numerous abstracts and articles for the lay-public on various issues involving child health, paediatrics and vaccinology. He has authored or co-authored two books for parents, one for medical students and one for nurses. In 2008, he was conferred the Darjah Panglima Mahkota Wilayah by the Malaysian King that carries the honorific title of 'Datuk'.

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DR. STÉPHANIE MEYER, PHARMD, MSC

Global Medical Expert, Valneva

Stéphanie Meyer holds a degree in Pharmacy from the French University of Strasbourg and a master in clinical development of new medicines from the Pharmacy School of Poitiers, France. She has over 15 years of experience in vaccines within clinical development and medical affairs. She joined Valneva as Global Medical Expert working in close collaboration with the local and global teams to drive the medical affairs activities on the chikungunya vaccine candidate. Before joining Valneva, she gained strong experience in multiple infectious diseases such as dengue, influenza, Japanese encephalitis or rabies across several stages of new product development and launch.

MR. DAFYDD GREEN

Business Development Director

Dafydd holds a degree in Chinese Studies from Oxford University, where he focused on health policy and researched province-level rural healthcare financing initiatives He previously worked on the healthcare desk of the UK Embassy in China, focusing on lung health policy and industry partnerships.

Now based in Singapore, Dafydd works on various digital health initiatives, including: Health informatics , PROM gathering , Registry development, eLearning . In his work, Dafydd has partnered closely with tertiary and primary care groups, patient societies, pharmaceutical and insurance companies, government bodies, as well as academic institutions. He is passionate about centralising, structuring and analysing various health datasets, and using this to communicate healthcare matters in a more visual and engaging manner.

Dafydd was also a member of a team that set up The Global Health Network, an initiative led by Oxford University and the Gates Foundation to enable easier, faster, and better research across a range of disciplines in the world's most challenging settings

DELEGATES' ABSTRACTS

001 Emotional stress and anxiety: an unrecognized problem in adolescents hospitalized with dengue infection

Sophida Boonsathorn[1], Usa Thisyakorn[2]

1. Faculty of Medicine Ramathibodi Hospital
2. Tropical Medicine Cluster, Chulalongkorn University

Background:

Over decades, the average age of dengue cases has risen worldwide. Adolescent patients experience emotional stress during hospitalization, which can sometimes be overlooked. However, information on the influence of dengue infection on adolescent emotions is scarce. We hereby describe the case of a teenage girl who experienced emotional stress after being hospitalized with dengue fever.

Case presentation:

A previously healthy 16-year-old girl presented with a high-grade fever and loss of appetite for two days. She was hospitalized and diagnosed with dengue fever. She was treated symptomatically with intravenous fluid but continued to vomit and had abdominal discomfort. Her platelet count continued to decline, reaching 10,000/cu.mm. On the third day of admission. In addition, hematemesis was noted with evidence of plasma leakage. After platelet transfusions and intravenous fluid therapy, she recovered without complications and was discharged home five days later. During hospitalization, she expressed emotional discomfort and fear about her illness, which was exacerbated by hematemesis. She was also persistently worried and frustrated about missing school and her academic performance. Ultimately, her stress and anxiety subsided weeks after she was discharged.

Conclusion:

A shift in age groups toward adolescents and young adults has been observed in dengue cases worldwide. Dengue infection causes not only physical suffering but also negatively affects the patient's psychological state. This case highlights the impact of emotional stress and the potential trauma of hospitalization in an adolescent dengue patient. Therefore, clinicians should not overlook anxiety symptoms in adolescents hospitalized with dengue infection.

002 Serum Cortisol and Clinical Model to Predict Dengue Severity

C Bongsebandhu-phubhakdi[1], V Supornsilchai[1], S Aroonparkmongkol[1], U Limothai[1], S Tachaboon[1], J Dinhuzen[1], W Chaisuriyong[1], S Trongkamolchai[2], M Wanpaisitkul[2], C Chulapornsiri[2], A Tiawilai[3], T Tiawilai[3], T Tantawichien[1], U Thisyakorn1, N Srisawat[1]

1. Faculty of Medicine, Chulalongkorn University and King Chulalongkorn Memorial Hospital, Bangkok, Thailand
2. Banpong Hospital, Ratchaburi, Thailand
3. Photharam Hospital, Ratchaburi, Thailand

Background:

Dengue infection presents with a wide range of clinical symptoms. Serum cortisol is known as one of severity predictor of serious infection but is not yet clearly understood in dengue infection. We aimed to investigate the possibility to predict dengue severity by cortisol and the clinical model.

Methods:

A prospective study was conducted in Thailand. Serum cortisol and other related clinical data and laboratory tests were collected at day 1 at hospital admission.

Results:

The study recruited 265 patients (median age (IQR)17(13,27.5)). Approximately 10%were severe dengue infection. The best cut-off value of serum cortisol level for predicting severe dengue was 18.2 mcg/dL with an AUC of 0.62(95% CI, 0.51, 0.74). The sensitivity, specificity, PPV and NPV were 65.4,62.3,16and94%, respectively. When we combined serum cortisol with persistent vomiting and day of fever the AUC increased to 0.76

Conclusion:

We suggest that serum cortisol at day of admission, persistent vomiting and day of fever may be the significant parameter to develop the model to predict dengue severity.

Funding: Ratchadapiseksompotch Fund, Faculty of Medicine, Chulalongkorn University. Grant no.RA064/13

Contact email: chansuda.b@chula.ac.th, chansuda.b@gmail.com

003 The clinical characteristics of dengue infection in adolescents in comparison to younger children

O Prommalikit[1], U Thisyakorn[2], C Thisyakorn[3]

1. Department of Microbiology, Faculty of Medicine, Kasetsart University, Bangkok, Thailand
2. Tropical Medicine Cluster, Chulalongkorn University, Bangkok, Thailand
3. Department of Pediatrics, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

Background:

Variation of clinical manifestations in dengue disease at different age groups were seen. We have conducted this study in order to show the clinical characteristics of dengue disease in adolescents in comparison to younger children.

Methods:

This study was conducted in the department of Pediatrics, Faculty of Medicine, Chulalongkorn University from 1987-2007. The study was done in all hospitalized pediatric dengue patients from aged 0-15 years. All patients were seen by one or both of the authors and confirmed as having dengue infection by serology and/or virus isolation. Comparison was done in all parameters between patients aged 0-8 years and 9-15 years.

Results:

Of 2,090 children aged 0-15 years diagnosed with dengue, 1,089 were children aged 9-15 years while 1,001 were children aged 0-8 years. Younger children presented significantly more frequently with seizures. All severity of dengue disease can be seen in all age groups. Serologically, both primary and secondary dengue infection can be seen in all age groups while primary dengue infection was more common in children aged less than 8 years.

Conclusion:

Dengue during adolescents is common and most of them acquire secondary dengue infection. Clinical manifestations show some difference from younger age group.

004 Hemodynamic And Fluid Responsiveness Assessment In Patients With Severe Dengue

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Abstract:
Dengue can manifest from a mild illness to a life threathening hypovolaemic shock for which fluid has been the mainstay of treatment. There has been growing evidence that the shock in dengue may also be of cardiogenic and vasoplegic in nature which may benefit from inotrope or vasopressor rather than fluids. The objective of this study was to identify the type of shock in severe dengue and to assess the fluid responsiveness using an echo-guided algorithm. In addition this study also aims to determine the mean hours and volume of fluids received before the patient was no longer volume-responsive. This was a cross sectional study of dengue shock admitted to ICU Hospital Sungai Buloh between the period of 1st February and 31st August 2017. Resuscitation and treatment was guided by echocardiography that was done by credentialed intensivist and validated by cardiologist. The shocks in dengue were variable with the highest type being cardiogenic. Following identification of the type of shocks, patients were managed with fluids, vasopressor or inotrope accordingly. Assessment of fluid responsiveness showed that in the cardiogenic shock group, only 15% of them was fluid responsive. Majority of these patients were in cardiogenic shock at presentation to ICU due to the overzealous fluid resuscitation of 28ml/kg received in ward and emergency department. In conclusion, echocardiography serves as an essential tool in early detection of type of shock and non-fluid responsiveness in order to prevent iatrogenic fluid overload as well as to guide timely initiation of vasopressors and/or inotropes accordingly.

005 Dengue at Photharam Hospital: One Among Ten Clinical Trial Sites of the World First Dengue Vaccine

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Background:

Dengue is the most globally prevalent vector-borne viral disease affecting over 120 countries. An alarming 5.2 million dengue cases were recorded in 2019. Fifty per cent of the world's population is at risk of dengue with Asia contributes to 70% of the global dengue burden.

Methods:

Analysis of the data of dengue patients admitted to Photharam hospital, a provincial hospital in Ratchaburi province, Thailand from January 2014 to December 2022 was done. The diagnosis of dengue patients adhered to clinical and laboratory criteria for the diagnosis of dengue patients as established by the World Health Organization 1997.

Results:

During the study period, 2273 dengue patients were admitted to Photharam hospital, Ratchaburi, Thailand. Patients can be seen across all age groups, more so in adults, with no differences through gender (Fig.1). The disease was seen year-round, with higher incidence during the rainy season from June to September (Fig.2). All degrees of dengue severity can be seen in all age group (Fig.3). The overall case fatality rate was 0.002%.

Conclusion:

Our findings show changing epidemiology in Photharam hospital in terms of age group distribution of dengue patients. The finding will be an evidence for developing the key strategies for proper prevention and control of dengue epidemic.

006 An economic evaluation of Wolbachia deployments for dengue control in Vietnam

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Background:

Dengue is a major public health challenge and a growing problem due to climate change. The release of *Aedes aegypti* mosquitoes infected with the intracellular bacterium *Wolbachia* is a novel form of vector control against dengue. However, there remains a need to evaluate the benefits of such an intervention at a large scale. In this paper, we evaluate the potential economic impact and cost-effectiveness of scaled *Wolbachia* deployments as a form of dengue control in Vietnam – targeted at the highest burden urban areas.

Methods:

Ten settings within Vietnam were identified as priority locations for potential future *Wolbachia* deployments (using a population replacement strategy). The effectiveness of *Wolbachia* deployments in reducing the incidence of symptomatic dengue cases was assumed to be 75%. We assumed that the intervention would maintain this effectiveness for at least 20 years (but tested this assumption in the sensitivity analysis). A cost-utility analysis and cost-benefit analysis were conducted.

Results:

From the health sector perspective, the *Wolbachia* intervention was projected to cost US$420 per disability-adjusted life year (DALY) averted. From the societal perspective, the overall cost-effectiveness ratio was negative, i.e. the economic benefits outweighed the costs. These results are contingent on the long-term effectiveness of *Wolbachia* releases being sustained for 20 years. However, the intervention was still classed as cost-effective across the majority of the settings when assuming only 10 years of benefits.

Conclusion:

Targeting high burden cities with *Wolbachia* deployments would be a cost-effective intervention in Vietnam and generate notable broader benefits besides health gains.

007 Effectiveness of iso-osmotic-hyperoncotic intravenous solution (IOHOS) as an alternative treatment for Dengue severe with hypotensive shock among pediatric patients in a tertiary hospital: a 5-year retrospective cohort study

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Background:

Dengue is a major public health importance in the Philippines. 2 types of fluids are used, colloid or crystalloid however both have side effects hence a combined solution was proposed determining the effectiveness of iso-osmotic hyper-oncotic intravenous solution (IOHOS) over pure crystalloid in the resuscitation of Dengue severe with hypotensive shock on pediatric patients.

Method:

Retrospective cohort, 5-year chart review over January 2016 - December 2020 in a Tertiary Hospital in Northern Luzon. 60 charts of dengue severe with hypotensive shock pediatric patients were studied, 30 on crystalloid (Plain Lactated Ringers Solution (PLRS) 10ml/kg bolus) while 30 on iso-osmotic hyper-oncotic solution (IOHOS) (PLRS at 7ml/kg with side drip of Voluven-6% Hydroxyethyl Starch in 0.9 NaCl at 3ml/kg comprising 10ml/kg bolus).

Results:

56% lower mortality (RR:0.444, 95%CI 0.153-1.287 NNT: 6, p-value: 0.135), 86% lower chance for the shock recurrence (RR:0.142, 95%CI 0.018-1.091 NNT:5, p-value: 0.060) , 47% lower pleural effusion risk(RR: 0.548, 95%CI 0.250-1.159, NNT: 5, p-value: 0.113) , 84% lower periorbital edema risk, (RR:0.166, 95%CI 0.021-1.302 NNT:6 p-value: 0.087) and 50% lower bleeding risk (RR:0.5, 95%CI 0.168-1.484 NNT:7.5 p-value: 0.211) with ISOHOS. Higher cardiac rate seen in crystalloid solution (p-value:<0.001). Time improvement of narrowed pulse pressure and poor capillary refill time were significant (p-value: 0.014 and 0.0001 respectively). There were positive correlations with hemoglobin, hematocrit, urine output and negative correlation with hospital stay.

Conclusion:

IOHOS is an effective alternative treatment in Dengue Severe with hypotensive shock showing lower mortality, shock recurrence, pleural effusion, periorbital edema, and bleeding risk over crystalloid.

008 Risk Factors of Intensive Care Unit Admission among Pediatric Dengue Patients Admitted in a Tertiary Hospital from 2010 to 2020: A Retrospective Study

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Background:

Dengue is a mosquito-transmitted infection causing significant global disease burden especially in tropical countries like the Philippines. It commonly presents as a self-limiting illness but can progress to severe disease which requires interventions in the intensive care unit. Several clinical factors were identified which can determine disease severity, however an accurate predictive model for development of severe dengue is yet to be established. This study aimed to determine the demographic, clinical, and laboratory risk factors of ICU admission among pediatric dengue patients.

Methods:

This retrospective cohort study determined the demographic, clinical, and laboratory risk factors of intensive care unit admission among pediatric dengue patients (N = 224) admitted from 2010 to 2020. Univariate and multiple binary logistic regression analysis were conducted to determine the risk factors predicting ICU admission. A model was then developed using statistically significant risk factors. The predictive and diagnostic properties of the model were subsequently determined.

Results:

The developed clinical risk score included the female sex (odds ratio [OR]=4.84, p=0.004), abdominal pain or tenderness (OR=5.40, p=0.003), persistent vomiting (OR=4.48, p=0.005), and low platelet count (OR=63.90, p=0.001) as significant risk factors of pediatric ICU admission which yielded good predictive and diagnostic properties (OR 103.82, p=0.001; accuracy 86.7%; sensitivity 97%; specificity 76.4%).

Conclusion:

The development of this clinical risk score system will help clinicians to identify patients who require pediatric ICU admission, cognizant of their clinical presentation and potential for disease progression, hence facilitating prompt and appropriate management to prevent further disease complications.

009 A SIMPLE NOMOGRAM TO PREDICT DENGUE SHOCK SYNDROME: A MACHINE LEARNING-BASED STUDY ON 4522 SOUTH EAST ASIAN CHILDREN

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Background:

Dengue infection in children might lead to the deadly dengue shock syndrome (DSS). A simple clinical tool to detect patients at risk of DSS early should prompt timely management.

Methods:

We retrospectively studied 2221 Thai children with confirmed dengue admitted to King Chulalongkorn Memorial Hospital between 1987 and 2007. Additionally, we utilized a dataset from a previous cohort on 2301 Vietnamese dengue children to create a pooled dataset of the two cohorts. Optimization of the approach to developing and validating a DSS predictive model was done by comparing logistic regression and alternative machine learning algorithms.

Results:

4522 children with a mean age of 9.8 ± 3.4 years were included in the analysis. Among 12 candidate clinical parameters, Bayesian Model Averaging algorithm retained the most predictive subset of five covariates, including body weight, history of vomiting, liver size, hematocrit level, and platelet counts. Logistic regression outperformed other machine learning algorithms, with the area under the curve values of 0.83, 0.85, and 0.83 in the training, testing, and validating datasets respectively. At its optimal threshold, this model had a sensitivity of 0.78, a specificity of 0.74, and an accuracy of 0.82 on validating dataset with consistent performance across age and gender subgroup analyses. A logistic regression-based nomogram was created to facilitate the application of this model.

Conclusions:

Dengue shock nomogram is a novel and robust clinical tool to predict children at risk of DSS progression. Further studies should determine its validity in guiding clinical decisions.

010 Mosquito repellence induced by tarsal contact with hydrophobic liquids

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Abstract:
The legs of mosquitoes are distinctly long and slender among insects. This unique leg shape plays a crucial role in the mosquito's escape response after sucking blood from vertebrate hosts, reducing the load applied from the tarsus to the host's skin thus reducing the chances of detection during landing. Here, we show that the restriction of delicate tarsus manoeuvring can induce a novel contact-based repellent system facilitated by dynamic wetting. We tested mosquito (Ades albopictus) substrate preference by topically applying oils of high wettability with mosquito tarsi. The mosquitoes initiated an escape response immediately after contacting the surfaces coated in oil and avoided landing on these substrates. We suggest that contact-based dynamic wetting generates an attractive force acting on the mosquito's tarsi triggering an escape response due to the threat of the restriction of delicate tarsus movement and thus, avoidance behaviors. Our results demonstrate that a liquid's high wettability with mosquito tarsi is associated with a low surface tension and low viscosity. This novel wetting-based method of repellence opens opportunities in the design of safer, more effective products.

011 Role of non-structural protein 1 glycosylation in dengue virus fitness and virulence

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Background:

The non-structural protein 1 (NS1) of dengue virus (DENV) is a highly conserved 46-55 kDa protein which contains two N-glycosylation sites at positions 130 and 207 (N130 and N207). Secreted hexameric NS1 (sNS1) has been proposed to play an important role in dengue pathogenesis. However, the role of the two N-glycans in NS1's biological functions has not been carefully examined.

Methods:

In this study, we generated stable DENV mutants that lack glycan structures at either N sites of NS1 and subsequently determined the in vitro and in vivo fitness in cell lines and symptomatic animal model, respectively.

Results:

We show that the lack of glycan at either N sites of NS1 did not impair the replication and growth of the virus in both mosquito and mammalian cell lines. However, while the N130 de-glycosylated mutant displayed a parental in vivo fitness in IFNAR-/- mice, the N207 de-glycosylated mutant was significantly attenuated as evidenced by higher survival rate and faster clearance of the virus in circulation, compared to the WT virus. Exogenous administration of purified N207 de-glycosylated sNS1 in DENV WT-infected mice led to disease attenuation, indicating that N207 sNS1 was dominant over WT sNS1. Further experiments revealed that the in vivo attenuation of N207 de-glycosylated DENV mutant was due to reduced lymphopenia, thereby allowing more effective viral clearance.

Conclusion:

Our results suggested that the glycans at position N207 but not N130 on NS1, play an important role in DENV in vivo fitness and virulence, by modulating the T cell response.

012 Dengue virus precursor membrane/envelope protein influences in vivo virulence

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Background:

The pathogenesis of dengue virus (DENV) has remained elusive, which hinders the development of antiviral drugs and effective vaccines. Previously, we showed that precursor-membrane and envelope protein (prME) plays a critical role in driving the in vivo fitness of D2Y98P, a representative DENV2 strain in Southeast Asia. Our study aims to further characterise the role of prME in DENV virulence and elucidate its mechanism(s) driving pathogenesis.

Methods:

We adopted a chimerisation approach that replaces prME from D2Y98P with that from non-virulent DENV2 NGC strain (NGC-D2Y chimera). Seven selected amino acid substitutions were then introduced in NGC-D2Y to partially revert NGC prME sequence to D2Y98P sequence (NGC7-D2Y). The fitness of these viruses was compared to the parental strains (NGC and D2Y98P) in mice and cell lines.

Results:

In vitro kinetic studies revealed that NGC-D2Y and NGC7-D2Y displayed comparable fitness with D2Y98P, suggesting that viral entry and replication were not affected by the chimerisation. In IFNAR-/- mice, NGC-D2Y was strongly attenuated, as evidenced by lower viral loads and mild symptoms. Increased virulence was observed with NGC7-D2Y, whereby mice displayed comparable initial viremia titers to D2Y98P but eventually recovered. RNA-sequencing of white blood cells revealed that B and T cell activation was significantly more down-regulated in mice infected with D2Y98P compared to NGC7-D2Y, suggesting a possible role for prME in the suppression of adaptive immunity.

Conclusion:

Our results highlight that prME drives in vivo virulence through interaction

013 The role of N-acetylcysteine in management of dengue-associated fulminant hepatitis in adolescent:A case report

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Background:
Dengue infection can range from mild to severe diseases. Dengue-associated fulminant hepatitis is one of the manifestations of severe dengue with a case fatality rate of around 50%. Intravenous N-acetylcysteine (NAC) has been used in non-acetaminophen acute liver failure (ALF) and adults with fulminant liver failure in dengue.

Objective:
To evaluate the management of dengue-associated fulminant hepatitis in adolescents.

Case:
A previously healthy 17-years-old girl was admitted to the hospital with a history of 4 days of fever and vomited. The vital signs and physical examination were unremarkable. The CBC revealed no haemoconcentration with a haematocrit level of 34.5% and thrombocytopenia of 62,000/ml. On day 6 of the fever, she developed abdominal pain and a convalescence rash. The CBC showed a haematocrit level of 41.5% and thrombocytopenia of 20,000/ml. Transaminase enzyme level was increased with ALT 785 U/L and AST 2394 U/L. IgM and IgG dengue was positive, concluding the secondary infection. The next day, she was delirious and had dyspnoea, without haemorrhage. Laboratory showed hypoglycaemia 43 g/dL, increased ALT 15000 U/L and AST 3528 U/L, increased ammonia 184 mcg/dl, and prolonged APTT 76.2s. She was transferred to ICU due to encephalopathy hepatic. Chest X-ray showed pleural effusion and head CT scan was normal. She was treated with NAC infusion for 20 hours and the transaminase enzyme decreased to ALT 3091 U/L and AST 1512 U/L and continued to the normal level. She was discharged in good condition.

Conclusion:
Dengue infection can be a fatal, especially secondary infection. The use of NAC in dengue-associated fulminant hepatitis in adolescents is effective and can be life-saving.

Keyword: severe dengue, hepatitis, NAC, adolescent

014 The proportion travelers and foreigners received treatment for dengue virus in Hospital for Tropical Diseases.

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Background:

Dengue fever was also a significant cause of illness in travelers and foreigners with an increasing number of case in hospital for tropical diseases. This aim of the study proportion travelers and foreigners received treatment for dengue virus.

Methods:

Retrospective data of patients with dengue virus infection to find out the proportion. Date were collected from 2017-2021 using a structured interview record. Data included clinical sings or symptoms and results of laboratory analyses.

Results:

A total of 185 dengue virus infection patients were enrolled, of which 108 (58.37%) were male and 77 (41.63%) were female. The study findings had dengue fever (DF) 120 (64.86%), dengue hemorrhagic fever (DHF) 62 (33.52%), dengue shock syndrome (DSS) 3 (1.62%). Mortality 2 patients. Patients was symptomatic on admitted to hospital; continuous fever 65.95 %, intermittent fever 36.23%, chill 57.84%, severe headache 68.12%, stiff neck 1.62%, seizure 3.24%, cough 25.95%, sore throat 24.32%, dyspnea 21.62%, muscle pain 77.30%, thigh pain 23.78%, retro-orbital pain 34.05%, rash 17.84%, nausea 42.70%, vomit 38.38%, stomachache 18.38%, diarrhea 24.32%, bleeding manifestation 18.92%, dysuria 5.95%. Patients had complications; transaminitis 14.59%, hypokalemia 4.32%, hyponatremia 2.16%, hepatitis 1.08%, pulmonary edema 1.62%, jaundice 0.54%, septic shock 0.54%, DIC 1.08%, liver failure 0.54%, acute respiratory failure acidosis 1.08 %, upper gastrointestinal bleeding (UGIB) 0.54%, hepatic encephalopathy 0.54%, anemia 1.08 %.

Conclusion:

The study found hospital stay was <1 week for the majority of the participants, mortality 2 patients stay 2 day and 21 day. Nonetheless mortality 2 patients because multiple organ failure and co-infection.

Keyword: Proportion, Travelers, Foreigners, Treatment, Dengue virus

015 A case report: Patient is immune thrombocytopenic purpura infected with dengue hemorrhagic fever

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Background:

Dengue is an arthropod-borne viral disease tendency highly endemic in Bangkok, Thailand. Immune thrombocytopenic purpura (ITP) is an autoimmune disease cooccurring autoantibody. Thrombocytopenia commonly in the both dengue hemorrhagic fever (DHF) and ITP.

Case presentation:

A 31-years old female. Her had congenital disease chronic ITP in association with systemic lupus erythematosus (SLE). Her was admitted to the hospital for tropical diseases. Her presented with fever chills and headache of two day's duration and physical examination revealed a high-grade fever (38.1.1ºC), pulse rate of beats 90/min, blood pressure of 101/71 mmHg , O2 Saturation 98%, body weight 54 kg and hight 160 cms. Blood investigation revealed the following: positive for dengue NS-1 antigen by immunochromatography test , white blood cell (WBC) count 4,300 cells/mm3 (5,000-10,000 cells/mm3), hemoglobin 12.3 g/dL (12.0-16.0 g/dL), hematocrit 36.2% (37.0-47.0 %), platelet count 59,000 cells/mm3 (150,000-450,000 cells/mm3) , blood urea nitrogen (BUN) 7.2 mg/dL (6-20 mg/dL), creatinine serum 0.85 mg/dL (0.51-0.95 mg/dL), aspartate transaminase (AST) 43 U/L (0-32 U/L), alanine transaminase (ALT) 36 U/L (0-33 U/L) .

Her admitted 5 days, monitoring platelet counts, AST and ALT in everyday until normalization. Platelets further dropped to the lowest count 39,000 cells/mm3 on day 4. However, her no bleeding during critical phase.

Conclusion:

The report is rare case in patient is ITP in association with SLE infected with dengue hemorrhagic fever in Bangkok, Thailand.

Keyword: Dengue hemorrhagic fever, Immune thrombocytopenic purpura

016 Prevalence for travelers and foreigners testing dengue NS1Ag and/or dengue antibody IgG/IgM in hospital for tropical diseases between 2019-2021.

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Background:

The hospital for tropical diseases had more international travelers and foreigners. Patients with a history of acute febrile illness were diagnosed as having dengue fever. laboratory diagnosis and clinical manifestation was essential for appropriate patient management.

Methods:

Retrospective during 2019 - 2021 in hospital for tropical diseases. Included nationality, age, diagnosis, result of testing dengue NS1Ag and dengue antibody IgG/IgM, fever days and symptoms.

Results:

In 2019 a total of 112 patients; myanmar 35.71%, laos 28 %, cambodia 9.82%, vietnam 8.93%, america 3.57%, india and france 2.68%, germany and israel 1.79%, pakistan, austria, south africa, poland, ivoirienne, japan, new zealand, norway and malaysia 0.89%. Dengue NS1Ag positive 60.71%, anti-dengue IgG positive 15.18%, anti-dengue IgM positive 3.57%, NS1 Ag/IgG/IgM positive 8.93%, NS1 Ag/IgM positive 3.57%, anti-dengue IgG/IgM positive 33.04%. Diagnosis DF 75 (66.96%), DHF 32(28.57%). In 2020 a total of 35 patients; Myanmar 48.57%, Laos 22.86%, Cambodia 14.29%, Vietnam 8.57%, Pakistan and Nigeria 2.86%, Dengue NS1Ag positive 51.43%, anti-dengue IgG 11.43%, anti-dengue IgM 5.71%, NS1 Ag/IgG/IgM positive 17.14%, NS1 Ag/IgM positive 2.86%, anti-dengue IgG/IgM positive 28.57%. DF 29 (82.86%), DHF 3 (8.57%), DSS 1(8.57%). In 2021 a total of 12 patients; Myanmar 58.33%, Laos 16.67%, Cambodia 16.67% and Germany 8.33%. Dengue NS1Ag positive 50%, anti-dengue IgG 25%, NS1 Ag/IgG/IgM positive 25%, NS1Ag/IgM positive 18.33%, anti-dengue IgG/IgM positive 25%. Diagnosis DF 7(58.33%), DHF 3(25%), DSS 1(8.33%).

Conclusion:

The result of testing dengue NS1Ag and/or dengue antibody IgG/IgM by the immunochromatographic assay associated virological markers. Nevertheless, result correlations fever days and symptoms.

Keyword: Travelers, Foreigners, Testing, Dengue NS1Ag, Dengue antibody IgG/IgM

017 Surfactants alter mosquito's flight and physical condition

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Abstract:

Mosquitoes carry lethal pathogens for humans and hundreds of thousands of people are killed by mosquito-borne diseases every year. Therefore, controlling mosquitoes is essential to protect the lives of people around the world. Insecticides are highly effective in controlling mosquitoes and have been used extensively worldwide. However, they have potentially harmful effects on biodiversity and environment, and some mosquitoes are resistant to insecticide ingredients and survive upon their application. Therefore, there is a demand for a method to control mosquitoes without using conventional insecticide ingredients. Here, we used Aedes albopictus to test whether solutions with low surface tension, particularly surfactant solutions can alter mosquito behavior by spreading over the hydrophobic cuticle of mosquitoes. We found that solutions with low surface tension indeed attached to mosquitoes flying or resting on the wall, and made them fall. In addition, solutions with yet lower surface tension covered the mosquito surface more quickly and widely, knocking down or killing mosquitoes. These results suggest that surfactants such as sodium dioctyl sulfosuccinate can be used to alter mosquito behavior without relying on conventional insecticides.

018 SARS-CoV-2 and dengue coinfection in Filipino children: epidemiology profile, clinical presentation and outcomes

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Background:

The emergence of SARS-CoV-2 in dengue-endemic regions has raised concern on the possibility of coinfection, especially in children who bear the highest burden of illness. This study determined the incidence and described the profile of Filipino children with SARS-CoV-2 and dengue coinfection, and compared disease severity and outcome in children with coinfection to a matched group of children with SARS-CoV-2 monoinfection.

Methods:

This was a retrospective matched cohort study of pediatric patients 0-18 years old diagnosed with SARS-CoV-2 and dengue coinfection or SARS-CoV-2 monoinfection in the Philippines and reported to the Surveillance and Analysis of COVID-19 in Children Nationwide (SALVACION) registry from 01 March 2020 to 30 June 2022.

Results:

A total of 3,341 SARS-CoV-2 infections in children were reported. The SARS-CoV-2 and dengue coinfection incidence is 4.34% (n=145). We matched 120 coinfections to monoinfections according to age, gender, and timing of infection. More coinfection cases were classified as mild or moderate COVID-19, while more asymptomatic cases were seen in those with monoinfection. Rates were similar for severe and critical COVID-19 in both groups. Coinfections predominantly presented with typical dengue rather than COVID-19 symptoms and laboratory parameters. No differences in outcomes were observed between coinfection and monoinfection. The case fatality rates are 6.7% for coinfection and 5.0% for monoinfection.

Conclusion:

One in every 25 SARS-CoV-2 infections had a dengue coinfection. Continued surveillance is needed to establish the interaction of SARS-CoV-2 and dengue virus, evaluate the impact of COVID-19 and/or dengue vaccination on coinfection, and monitor complications of coinfection.

019 The iDEM trial (intervention for Dengue Epidemiology in Malaysia) to measure the effectiveness of integrated vector management on the incidence of dengue in urban Malaysia: a cluster randomized controlled trial

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Background:

Dengue fever is a nationwide and year-round threat in Malaysia. The routine reactive dengue vector control consists of fogging and source reduction.

Methods:

We carried out a large cluster randomized controlled trial (cRCT) in the Federal Territory of Kuala Lumpur and Putrajaya to investigate the effectiveness of proactive integrated vector management (IVM) targeting different stages of mosquito life cycle. Each cluster was a locality, i.e. an urban housing development with shared facilities and one or more medium- or high-rise apartment blocks. 280 localities were randomized either to control, i.e., routine control activities, or to an IVM strategy consisting of (1) targeted outdoor residual spraying with K-Othrine Polyzone, (2) auto-dissemination devices with the active ingredients of pyriproxyfen and Beauveria bassiana and (3) community engagement. The primary outcome was incidence of dengue reported to the e-Dengue national surveillance system. Entomological outcomes were measured in 12 localities in each arm. The effect of the intervention was estimated by the rate ratio (RR) with its 95% confidence interval.

Results:

The baseline population of the trial was 734, 900 comprising 23% of the population of Kuala Lumpur. Overall, 1912 and 2145 cases were recorded in the intervention and control arm respectively between June-2020 and September-2022.

Intention-to-treat analysis showed that dengue incidence was lower in the intervention arm, although with a relatively small RR of 0.86 (95%CI: 0.7-1.06) that was not statistically significant.

Conclusion:

This study shows how public health surveillance can be used to efficiently assess integrated public health interventions in large randomized trials.

020 Mechanisms increasing the age of dengue cases in Thailand uncovered through mathematical models

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Background:

From 1981 to 2017, mean age of people reported as dengue hemorrhagic fever in Thailand rose significantly from 8.1 to 24.3 years (average yearly increase of 0.45 years). Attributing this trend to various factors, including changes in surveillance methods, reduced contact between humans and mosquitoes, and demographic shifts has different implications for global dengue epidemiology.

Methods:

We developed twenty nested epidemiological models of dengue virus infection, accounting for changes in population demographics, infection hazards, and reporting rates, and assessed the impact of each factor on the observed age trend through simulations of age trajectories.

Results:

Shifts in the age structure of susceptibility accounted for 58% of the observed change in age. When models included heterogeneous reporting by age and reductions in per-serotype infection hazard, an additional 42% of the observed trend was explained. The reductions in infection hazards were mainly driven by changes in the number of infectious individuals, due to shifts in age demographics, rather than changes in the transmissibility of individual infections.

Conclusions:

We conclude that demographic transition is the primary driver of the observed age trend, as it affects both the age structure of susceptibility and the number of infectious individuals. With the projected age structure of the Thai population, the results suggest that the burden of dengue hemorrhagic fever will shift towards individuals with more comorbidities. These insights are relevant not only to Thailand but also to many other regions of the world undergoing similar changes in population demographics.

021 Identification of biomarkers for prediction of dengue deterioration

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Background:

Dengue infections represent a threat to half of the world's population and are public health priority in many countries. Although dengue is less prevalent than malaria and less deadly than yellow fever, it is of concern to health authorities due to its spreading and severity. Dengue and its severe manifestations are leading causes of hospitalization and place tremendous pressure on medical resources, resulting in a heavy economic and social burden. Our aim is to identify novel biomarkers for prediction of deterioration that mandates hospitalization of patients diagnosed with acute dengue infection.

Methods:

Protein profiles of serum samples from hospitalized- (n=20), non-hospitalized dengue patients (n=20) and healthy controls (n=10) were analyzed on Sciomics antibody microarray-based scioDiscover platform to identify biomarkers predictive for patient's deterioration. For biostatistics a two-sided t-test or F-test based on moderated statistics were applied and AUC values were calculated. Results of a blood testing (platelet count, hematocrit) were evaluated in the same setting.

Results:

In this study, 86 protein biomarker candidates for dengue deterioration were identified at a significant level. Best performance showed CRP (AUC 0.912), ICAM-1 (AUC 0.802) and Ferritin (AUC 0.728). Downregulated Thrombin had AUC 0.932. Performance of the blood tests was superior to the serum biomarkers with platelet count AUC 0.987 and hematocrit AUC 0.838. Performance of the best candidates was confirmed by Elecsys® assays.

Conclusions:

We have shown applicability of the antibody array platform for discovery of the biomarkers for dengue deterioration. Based on our findings, strategy for further validation is being discussed.

022 Symptoms and cytokines in dengue infection

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Introduction:

Although endemic in tropical country like Indonesia, dengue infection especially cytokines role in its pathophysiological process are still lacks understanding. Wide range of symptoms also make dengue harder to diagnose. This study aims to find the differences and correlation between symptoms with cytokines in dengue infection.

Methods:

This is a cross sectional study where probable dengue infection patients were taken for anamnesis and physical examination. Blood samples were sent for confirmation of dengue infection using NS1, IgG anti Dengue, and IgM anti Dengue. After confirmation, additional blood samples were sent for CBC, TNF-α, IL-6, IL-10, IL-17, serotyping and Ct value.

Result:

Sixty confirmed dengue infection patients was collected at the end of study. Symptoms include headache, retro-orbital pain, nausea, vomiting, and bleeding. Shock also documented as outcome in this study. Cytokines level including TNF-α, IL-6, and IL-17 are higher in patient that had these symptoms. There is also significant correlation between cytokines and symptoms with correlation coefficient vary from weak to strong. Among this cytokines, IL-17 can predict bleeding in dengue infection with AUC 0.92 ($p < 0.001$, 95%CI 0.84-1) at cut-off >103.43 pg/mL (sensitivity 87%, specificity 87%). Shock is predicted by IL-6 with AUC 1 ($p < 0.001$, 95%CI 1) at cut-off > 339.03 pg/mL (sensitivity 100%, specificity 100%).

Conclusion:

Cytokines not only correlated with symptoms in dengue infection, but also play a significant role in pathophysiological process of developing these symptoms. These cytokines can predict worsening progression with IL-17 and IL-6 being the best predictor.

023 Efficacy and Safety of Butantan-DV Live-Attenuated Tetravalent Dengue Vaccine over two years in a Phase 3 Clinical Trial

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Background:

We assessed the efficacy and safety of Butantan-DV, a live-attenuated tetravalent dengue (DENV) vaccine, in participants ages 2-59.

Methods:

Participants were stratified by age (2-6, 7-17, and 18-59 years old) and randomized 2:1 to receive a single dose of Butantan-DV or placebo in an ongoing, phase 3, double-blind trial in Brazil, with projected five years follow-up (NCT02406729). The primary objectives were to describe the safety through Day 21 and to evaluate vaccine efficacy (VE) to prevent symptomatic virologically confirmed dengue (VCD) by RT-PCR after Day 28 postvaccination to any DENV serotype and regardless of participants' baseline serostatus. Safety was evaluated as the frequency of participants with solicited (local and systemic) vaccine-related adverse events (AEs). Secondary objectives, VE by baseline serostatus and by serotype were also evaluated.

Results:

16,235 participants were enrolled and received Butantan-DV (n=10,259) or placebo (n=5,976) between 2016 and 2019. Solicited systemic vaccine-related AEs were observed in a slightly higher proportion of participants receiving Butantan-DV (58.3%) compared to placebo (45.6%) through Day 21. The overall 2-year VE was 79.6% (95% CI:70.0%-86.3%). Regarding baseline serostatus, overall VE was 73.6% (95% CI:57.6%-83.7%) in dengue-naïve participants and 89.2% (95% CI:77.6%-95.6%) in dengue-experienced participants. Serotype-specific VE was 89.5% (95% CI:78.7%-95.0%) against DENV1 and 69.6% (95% CI:50.8%-81.5%) against DENV2. No cases of DENV3 or DENV4 were observed during the first 2 years.

Conclusions:

A single dose of Butantan-DV was generally well tolerated and efficacious against DENV1 and DENV2 symptomatic VCD, regardless of baseline serostatus, through the first 2 years of follow-up.

024 The Changing Epidemiology of Dengue at Thammasat University Hospital Over the Period 2006–2022

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Background:

Dengue is the most common mosquito-borne viral disease in humans. There were 5.2 million dengue cases reported in 2019. Fifty per cent of the world's population is vulnerable to dengue infection with Asia contributing over two-thirds of the global burden.

Methods:

We conducted retrospective study among patients with dengue infection who attended at Thammasat University Hospital (TUH) in Thailand from January 2006 to December 2022. The diagnosis of dengue patients adhered to the criteria as established by the WHO 1997.

Results:

Between 2006 and 2022, there were 7,998 dengue patients at TUH including 5,967 (74.6%) with dengue fever, and 2,031 (25.4%) with dengue hemorrhagic fever/dengue shock syndrome. Patients can be seen across all age groups, more so in adolescents and adults, with no differences through gender. The highest numbers of dengue cases were reported in individuals aged 15-19 years (16.9%) and 20–24 years (16.7%). The disease was seen year-round, with higher incidence during the rainy season. The number of reported dengue patients was markedly declined during 2020 to 2022, which corresponded with COVID-19 pandemic. The overall case fatality rate from dengue was 0.075%. The case fatality rate was higher for children (0.08%) than for adults (0.05%).

Conclusion:

The epidemiology has certainly changed and appears to be shifting from child to adult aged population. This changing epidemiology is important for our public health control program.

Keywords: dengue, dengue hemorrhagic fever, epidemiology

025 The Essential Role of N153-Linked Glycan in DENV Pathogenesis

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Background:

Dengue virus (DENV) poses a huge disease burden globally with an estimated 390 million infections annually. The main viral structural protein, envelope protein (E), is a promising sub-unit vaccine candidate. It is glycosylated at two asparagine (N) sites (N67 and N153), but its glycosylated variants and their biological importance have been largely overlooked at the level of complex organism.

Methods:

Using reverse genetic, we have generated a partially deglycosylated DENV mutant that lacks glycan structures at N153 (N153Q) and investigated the in vitro and in vivo fitness of the mutant.

Results:

Our data showed that the N153Q grown in baby hamster kidney cells (BHK-21) was as fit as wildtype (WT) virus but was slightly attenuated in human hepatocyte (Huh-7) and monkey kidney epithelial cells (Vero). In contrast, N153Q was strongly attenuated in IFNAR-/- mice, as evidenced by milder clinical manifestations and rapid viral clearance from the circulation. Whole blood transcriptomic data suggested that there was no difference in the host responses to infection with WT and N153Q. Interestingly, N153Q virus was found to be neutralized more effectively by immune serum from DENV-infected mice and convalescent dengue patients compared to WT, suggesting that N153 glycans shield DENV from antibody neutralization. This hypothesis was further supported by the restoration of N153Q virulence in B cells depleted and B cell knockout mice.

Conclusion:

Our findings provide novel insights on the role of N153-linked glycans in DENV pathogenesis, with potential implications for the development of effective therapeutic antibodies, vaccine candidates and anti-viral drugs.

026 Dengue dead cases in Bangkok during 2008-2022

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Background: Dengue is now endemic in over 120 countries throughout the tropical and subtropical regions of the world. An alarming 5.2 million dengue cases were recorded in 2019. Fifty per cent of the world's population is at risk of dengue with Asia contributes to 70% of the global dengue burden. The global increase in dengue cases and also the potential spread of the disease to non-endemic areas are the problems of concern. The trend towards higher age in dengue patients in many areas of the world is one of the major public health control programs.[1,2]

Methods: Dengue dead cases in Bangkok reported to Center of Epidemiological Information, Bureau of Epidemiology, Ministry of Public Health, Thailand from January 2008 to December 2022 were analyzed.[3]

Results: Between 2008 and 2022, there were 75 dead cases in Bangkok as shown in Figure 1. There was no death reported in the years 2014 and 2020-2021. Dengue death was seen all year round with higher incidence during the rainy season (Figure 2). Dengue dead cases can be seen across all age groups, more so in adolescents and adults, with no differences through gender (Figure3). The dengue severity in all 75 dead cases were 39 Dengue Shock Syndrome (DSS), 29 Dengue Hemorrhagic Fever (DHF) and 7 Dengue Fever (DF) as shown in Figure 4.

Conclusion: The trend towards higher age in dengue dead cases in Bangkok during the study period is a problem of concern and needs further clarification. Continuous status updates on dengue dead cases in Thailand should be incorporated into global health recommendations regarding preventive measures.

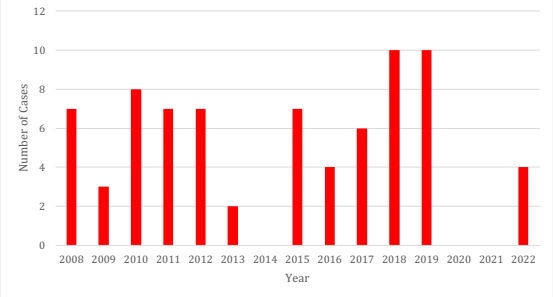

Figure 1. Number of Dengue dead cases in Bangkok during 2008-2022

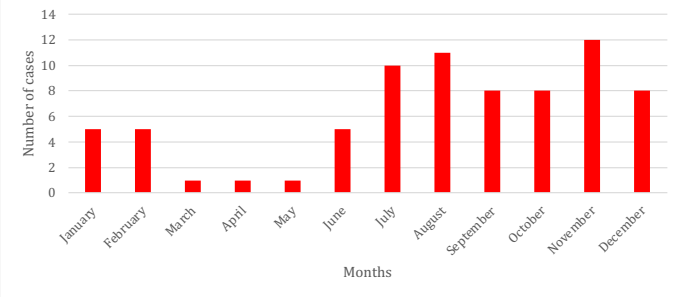

Figure 2. Monthly distribution of Dengue dead cases in Bangkok during 2008-2022

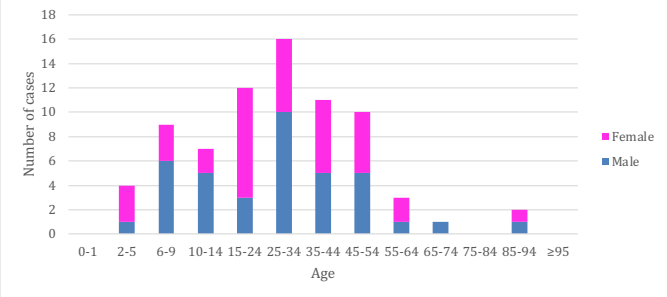

Figure 3. Number of Dengue dead cases by age group and sex distribution in Bangkok during 2008-2022

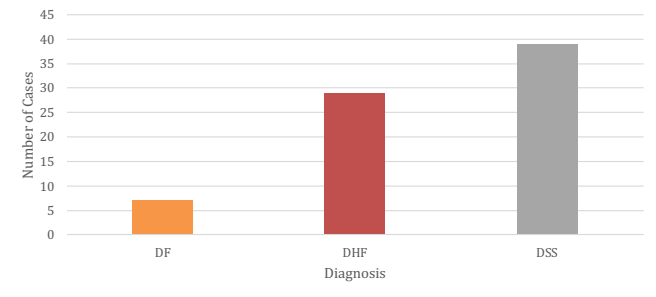

Figure 4. Number of Dengue dead cases by severity in Bangkok during 2008-2022

References: 1. Dengue and severe dengue. WHO, May 2021. [Cited 2021 October 10] Available from: https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue. 2. Srisawat N, Jaimchariyatam N, Tantawichien T, Thisyakorn U. eds. Dengue. Bangkok: Text and Journal Publication Co.,Ltd;2019. 3. Weekly epidemiological report. Bureau of Epidemiology, Department of Disease Control, Ministry of Public health, Thailand. Available at: http://doe.moph.go.th/surdata/disease.php?dcontent=situation&ds=87 Accessed Jan 7, 2022

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027 The Essential Role of N153-Linked Glycan in DENV Pathogenesis

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Background:

Vietnam is a hyperendemic country for Dengue virus (DENV), which has multiple serotypes for several decades. A 2019 dengue outbreak resulted in the largest case number. We characterized DENV strains responsible for the 2019-2020 season.

Method:

DENV specimens were collected in Hanoi, Vietnam in 2019-2020. DENV serotypes were determined by real-time RT-PCR. The envelope region was amplified and sequenced directly from sera using the Sanger method. Virus isolation was performed in C6/36 cell line, and the obtained isolates were subjected to the whole genome sequencing by NGS. These sequences were molecularly characterized using phylogenetic methods.

Results:

We observed DENV-1 (25%), DENV-2 (73%), and DENV-4 (2%) in 88 cases. Phylogenetic analyses revealed that all DENV-1 were genotype I and clustered to local strains circulating during the 2017 outbreak, whereas DENV-2 consisted of two genotypes: Asian-I related to local strains from 2006-2022, and cosmopolitan, the predominant genotype. The current cosmopolitan virus was identified as the Asian-Pacific lineage related to strains from southeast Asia countries and China. Multiple introductions occurred in 2016-2017, possibly from other countries rather than from expansion of localized Vietnam cosmopolitan strains detected in the 2000s. We also analyzed the genetic relationship between Vietnam's cosmopolitan strain and recent global strains. This analysis revealed that the invading Asian-Pacific lineage viruses are not restricted to Asia but have spread to Peru and Brazil in South America.

Conclusion:

In Hanoi, DENV-1 genotype I and DENV-2 genotype Asian-I persisted as local strains, while the introductions of DENV-2 cosmopolitan genotype viruses were observed.

028 Evaluation of cutaneous immune response in a controlled human in vivo model of mosquito bites

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Background:

Mosquito-borne dengue is a global health problem - approximately 400 million people are infected annually and approximately 20,000 of those cases result in fatalities. Inoculation of the virus takes place in the skin when a mosquito bites, which triggers immune responses that influence the development of infection and disease. Our research aimed to examine the innate and adaptive immune responses in the skin of individuals residing in areas where Aedes aegypti mosquitoes are prevalent, following controlled feeding sessions.

Methods:

This is a single-arm, cross-sectional interventional study. Following the enrollment of 30 healthy adult Cambodian participants, we perform 3-mm skin biopsies at baseline as well as 30 min, 4 h, and 48 h after a controlled feeding by uninfected Aedes aegypti mosquitos. The primary endpoints were the measurement of changes in early and late innate and adaptive immune responses in bitten vs unbitten skin by gene expression profiling, immunophenotyping, and cytokine profiling.

Results:

Our results revealed induction of neutrophil degranulation and recruitment of skin-resident dendritic cells and M2 macrophages. As the immune reaction progressed T cell priming and regulatory pathways were upregulated along with a shift to Th2-driven responses and CD8+ T cell activation. Reduced pro-inflammatory cytokine production profiles were observed after stimulation of participants' bitten skin cells with Aedes aegypti salivary gland extract.

Conclusion:

Our findings highlight significant immune genes, cell compartments, and pathways involved in the human reaction to mosquito bites. This information can be utilized to design innovative therapeutics and vaccines that target the vector and impede vector-borne dengue disease.

029 Identification of a baicalein-derived compound with potent pan-serotype DENV and pan-ZIKV antiviral activity

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Background:

Dengue is one of the top ten global threats, with approximately 3.8 billion people at risk of being infected in the tropical and sub-tropical regions. Despite its potential to manifest as a severe disease and the economic burden it imposes on endemic countries, there is a lack of approved antiviral agents to treat the infection. Flavonoids such as baicalein have been studied for their antiviral properties against a myriad of viruses. Baicalein has been reported to be active against DENV infection and ZKV infection, with in vitro efficacy in the micromolar range.

Methods:

Baicalein-derived compounds were generated through systematic and iterative chemistry optimization. The generated compounds were then screened based on their anti-DENV activity and low cytotoxicity. The IC50 and selective indices of the lead compound, Compound 11064, was determined against DENV and ZIKV. Mode of action studies were conducted through time-of-addition assay, entry bypass assay, and viral translation reporter assay.

Results:

Compound 11064 displayed pan-serotype DENV and pan-strain ZIKV antiviral activity in vitro with excellent selectivity indices in multiple cell lines, as well as improved antiviral efficacy as compared to baicalein. Compound 11064 does not inhibit viral RNA synthesis or viral protein translation, and targets multiple steps in the DENV replication cycle, namely in the late entry and post-entry steps.

Conclusion:

Compound 11064 has the potential to be a broad-spectrum anti-flaviviral drug.

030 The 8-bromobaicalein inhibited the replication of dengue, and Zika viruses and targeted the dengue polymerase

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Abstract:

Dengue and Zika viruses are mosquito-borne flaviviruses burdening millions every year with hemorrhagic fever and neurological symptoms. Baicalein was previously reported as a potential anti-flaviviral candidate and halogenation of flavones and flavanones potentiated their antiviral efficacies. Here, we reported that a chemically modified 8-bromobaicalein effectively inhibited all dengue serotypes and Zika viruses at 0.66–0.88 micromolar in cell-based system. The compound bound to dengue serotype 2 conserved pocket and inhibited the dengue RdRp activity with 6.93 fold more than the original baicalein. Moreover, the compound was mildly toxic against infant and adult C57BL/6 mice despite administering continuously for 7 days. Therefore, the 8-bromobaicalein should be investigated further in pharmacokinetics and efficacy in an animal model.

031 Unravelling Dengue Cost Burden in Thai Private Healthcare Settings: A Review of 5-year Cohort Insurance Claims

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Background:

Thailand is a country affected by high risk of dengue. Most of previous studies reported dengue treatment costs only in public healthcare settings. In this study, we aim to estimate the economic burden of dengue in private healthcare settings using the private insurance claims.

Methods:

The anonymized claims data of patients with dengue fever (DF) and dengue hemorrhagic fever (DHF) were extracted from claims database between January 2018 and December 2022 including sex, age, dengue type at discharge, hospitalization, length of stay (LOS), Intensive Care Unit (ICU) utilization, and treatment costs. Descriptive statistics and t-test analysis were estimated.

Results:

The total number of claims was 712 comprising 594 patients. Of these, 62% of patients were DF and 43% were age <15 years. 94% were hospitalized with median LOS of 4 days. The median total cost of treatment was 30,144 THB per IPD episode. DHF demonstrated a significantly higher cost than DF (p-value = 0.01). Subgroup analysis revealed higher total cost of treatment in patient age ≥15 than in age <15 years (p-value = 0.01). ICU admission occurred at 3.4% with an additional cost at 31,410 THB per IPD episode.

Conclusion:

The results from our study inform the actual costs an individual need to absorb if there is no health coverage in private healthcare setting of Thailand. In this study, majority of dengue cases were IPD cases. Though children are the most affected, economic burden was higher in adult (age ≥15) and the treatment costs also increased with disease severity.

032 Antiviral activity, safety, and pharmacokinetics of JNJ-1802 as pre-exposure prophylaxis against DENV-3 in a human challenge model.

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Background:

Dengue is a global public health threat. No antiviral prophylaxis or treatment is currently available. We present interim results of a dosing cohort in a Phase 2a, randomized, double-blind, placebo-controlled trial (NCT05048875) aimed to evaluate the antiviral activity, safety, and pharmacokinetics of repeated oral doses of JNJ 1802, a pan-serotype dengue antiviral, as pre-exposure prophylaxis against dengue serotype 3 (DENV-3) infection in a human challenge model (HCM).

Methods:

Healthy participants (20–51 years) were randomized to receive oral JNJ-1802 (n=11) or placebo (n=6) in fasted conditions. A JNJ-1802 loading dose (600 mg once daily) was administered on Day (D) -5 for 5 days, followed by a maintenance dose (200 mg once daily) for 21 days. rDEN3Δ30 was subcutaneously injected on D1. The primary objective was to assess the antiviral activity of JNJ-1802 (versus placebo) based on the log10 area under the DENV-3 RNA viral load curve from D1 until D29 (AUCD1 D29 VL). Safety and JNJ-1802 pharmacokinetics were also evaluated.

Results:

A Tobit analysis showed a significant reduction of mean log10 AUCD1-D29 VL in the JNJ-1802 versus the placebo group (1-sided $p<0.0001$). Overall, JNJ-1802 was generally safe and well tolerated. JNJ-1802 plasma concentrations rapidly increased from D-5 to D1 and were well maintained up to D21 with low inter-subject variability.

Conclusion:

Using a first-in-class antiviral in an HCM in a prophylactic setting, a statistically significant difference in JNJ-1802 antiviral activity versus placebo was observed with no safety concerns identified. Additional dose regimens are being studied to further elucidate the JNJ-1802 exposure-response relationship.

033 Soluble urokinase plasminogen activator receptor as prognostic biomarker for severe dengue in adults

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Background:

Dengue requiring hospitalization is estimated at 19.0% in Asia, which may strain healthcare facilities during outbreaks. Sensitive biomarkers to predict severe dengue (SD) in early disease is lacking. Therefore, poses a challenge in clinical dengue management.

Methods:

In a longitudinal cohort of adult dengue patients recruited in Singapore, we evaluated on the utility of soluble urokinase plasminogen activator receptor (suPAR) as a prognostic biomarker of SD. Plasma suPAR levels were quantified by ELISA.

Results:

In total 129 patients: 40 dengue fever (DF), 46 dengue warning signs (DWS), 13 SD and 30 controls were included. suPAR levels were significantly elevated in the dengue group compared with controls. By pairwise comparisons, levels were significantly raised in the SD versus either DWS or DF in all disease phases. By logistic regression, a unit increase in suPAR level was associated with an increased risk of SD in the febrile phase [OR: 2.1, 95%CI (1.2-3.7), P = 0.009] and critical phase [OR: 1.70, 95%CI (1.27-2.28), P < 0.001]. In the febrile and critical phases, the AUROCs for suPAR to predict SD were 0.82 (95%CI 0.63-0.99) and 0.86 (95%CI 0.75-0.97), respectively. Using a cut-off of >4ng/ml, suPAR was 86.0% sensitive and 69.0% specific in the febrile phase, and 91.0% sensitive and 68.0% specific in the critical phase to predict SD. The NPV for SD in febrile and critical phases were 97.0% and 98.0%, respectively.

Conclusion:

Plasma suPAR levels were elevated in adult dengue patients in proportion to disease severity and maybe a reliable predictor of SD.

034 Efficient Reverse Genetics Approach Involving Infectious Subgenomic Amplicon for Engineering Dengue Virus

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Abstract:

Dengue virus, which belongs to the Flaviviridae family, can induce a range of symptoms from mild to severe, including dengue fever, dengue hemorrhagic fever, and dengue shock syndrome. While infectious cloning technology is a useful tool for understanding viral pathogenesis and symptoms, it exhibits limitations when constructing the entire Flavivirus genome. The instability and toxicity of the genome to bacteria make its full-length construction in bacterial vectors a time-consuming and laborious process. To address these challenges, we employed the modified infectious subgenomic amplicon (ISA) method in this study, which can potentially be a superior tool for reverse genetic studies on the dengue virus. Using ISA, we generated recombinant dengue viruses de novo and validated their robust replication in both human and insect cell lines, which was comparable to that of the original strains. Moreover, the efficiency of ISA in genetically modifying the dengue virus was elucidated by successfully inserting the gene for green fluorescence protein into the genome of dengue virus serotype 4. Overall, this study highlighted the effectiveness of ISA for genetically engineering the dengue virus and provides a technical basis for a convenient reverse genetics system that could expedite investigations into the dengue virus.

035 Understanding the role of regulatory T cells in a cohort of Cambodian acute dengue-infected children

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Background:

Regulatory T cells (Tregs) play an essential role in homeostasis by controlling unwanted immune response and maintaining peripheral tolerance. Severe dengue is considered an immunopathology, where Exacerbated and skewed immune responses can lead to severe disease. However, the role of Tregs in dengue pathogenesis, and their association with disease severity has not been investigated. Therefore, the aim of this study is to investigate frequency and function of Tregs in acute dengue infection in patients with different disease severity.

Methods:

Blood samples were collected within 96 hours after fever onset from hospitalized children (≥ 2 years old) with dengue-like syndrome who were admitted in hospitals in Phnom Penh and Kampong Thom province, Cambodia. Dengue-positive patients were classified based on the WHO 1997 criteria upon hospital discharge into dengue fever (DF), dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS). Isolated peripheral blood mononuclear cells were used for multi-color flow cytometry immune-phenotyping and in vitro suppression assays.

Results:

The frequency of Tregs (CD4+CD25hiCD127lowFOXP3+) was decreased in DHF/DSS patients compared to DF patients. Consequently, the ratio of Treg to T effector cells was decreased in DHF/DSS patients compared to DF patients. Moreover, the expression of the inhibition marker CD31 is decreased in DHF/DSS patients compared to DF patients. Even though their frequency is decreased, a higher percentage of Tregs express the proliferation marker Ki-67 in DHF/DSS patients compared to DF patients. Tregs from DHF/DSS patients show higher frequencies of Th1-like Tregs. *In vitro* Treg suppression assays show that Tregs obtained from dengue patients have less suppressive function compared to healthy donor Tregs.

Conclusion:

These results show decreased frequency and an altered phenotype and function in Tregs from DHF/DSS patients compared to DF patients or healthy donors.

036 Evaluation of Immunogenic T cell Epitopes of Dengue 2 NS1 in Acute and Past Dengue Infections

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3. Duke-NUS Medical School

Background:

As there is limited data on dengue NS1 specific T cell responses, we sought to identify immundominant regions of NS1 and the impact of mutations within this T cell epitope in patients infected with recent strains of Dengue 2 (DENV2) cosmopolitan strain in Sri Lanka.

Materials and Methods:

DENV2 samples (n=59) from patients with acute dengue from years 2017-2018 were sequenced and analyzed for mutations within NS1 region. Using IFNγ ELISpot assays, immunodominant regions were mapped in those with past infection (n=36). As mutations within NS1 were identified in within the R22 region, R22 specific and the mutated region (SL22) specific IFNγ ELISpot responses were assessed in patients with dengue fever (DF=35) and dengue haemorrhagic fever (DHF=13) and in 10 healthy individuals.

Results:

Individuals with past dengue, had the highest frequency of responses IFNγ ELISpot responses to R22 region. A mutation (T164M) was seen in DENV2 cosmopolitan strain in Sri Lanka, in this highly conserved region. Patients with DHF had significantly higher frequency of responses to R22 ($p=0.04$) compared to those with DF. Although those with DHF also had higher responses to SL22 (peptide with the mutation) and the respective regions in DENV1 and DENV3, this was not significant. Those with past dengue also had significantly higher IFNγ ELISpot responses to SL22 compared to R22 ($p=0.02$).

Conclusions:

The T164M mutation within DENV2 NS1 appears to elicit a higher frequency of T cell responses, which could contribute to early clearance of NS1 as seen with this strain.

037 A performance comparison between fluorescent Immunoassay and Immunochromatography for rapid dengue detection in clinical specimens

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Abstract:

Dengue virus (DENV 1–4) infection has been a global health threat where no specific treatment is currently available. Therefore, a rapid and accurate diagnosis is critical for an appropriate management as it could reduce the burden of severe clinical manifestation. Currently, dengue immunochromatography (IC) is commonly used to primarily differentiate acute febrile illnesses. Fluorescent immunoassay (FIA) utilized a highly sensitive detection system and claimed 70–100% sensitivity and 83.5–91.7% specificity for dengue infection in a preliminary report. This report recruited samples with acute febrile illnesses sent for dengue screening and tested IC and FIA in parallel. The performance of both tests was verified by a definitive diagnosis retrieved from combinatorial reverse transcription-quantitative polymerase chain reaction and enzyme-linked immunosorbent assay (ELISA) for IgM and IgG confirmation tests. Results showed that the viral nonstructural protein (NS1) performance of FIA was slightly higher than IC with the sensitivity, specificity, PPV, NPV, agreement, kappa, and its standard error at 79.11, 92.28, 86.81, 87.31, 352 (87.13%), 0.725 ± 0.035, respectively; whereas those of the IC were at 76.58, 92.28, 86.43, 85.98, 348 (86.14%), 0.703 ± 0.037, respectively. Moreover, the IgM and IgG performance of FIA had higher specificity, PPV, and agreement than the IgM IC performance, suggesting that the FIA was more specific but less sensitive for antibody detection. No correlation was observed in IgM and IgG levels of ELISA and FIA assays. In conclusion, the FIA and IC were highly sensitive, specific, and substantially agreed in NS1 detection but moderately agreed in IgM and IgG detection.

038 Centrality and dengue virus exposure risk in Bangkok

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Background:

Urbanization is linked to the dengue endemicity, where high population density coupled with poor environmental hygiene provide a conducive environment for mosquito vector breeding and increased probability of transmission. Incidence rates are strongly influenced by human mobility ferrying the virus from places of high environmental risk throughout the city. More detailed knowledge of how the degree of centrality and environmental characteristics impact intra-urban dengue risk is necessary to guide intervention strategies.

Methods:

As a pilot study, prior to roll-out across Bangkok, the DENV sero-prevalence rates were measured using the Panbio Indirect IgG ELISA on stored blood samples from 272 children aged 3-15 years from within Bangkok. These were mapped according to their homes and schools, whose environmental typology (satellite imagery for NDVI, height and surface of buildings) and degree of centrality (services density, frequency of transportation and visits using social media data) were established.

Results:

Median(IQR)age was 10.7(7.6-12.6) years. DENV seroprevalence rates among children 3-9 years and 10-15 years were 6.5%and 37.2%, respectively. Children going to schools characterized by an open environment or one of low centrality had much lower sero-prevalence rates (Open vs. dense: 16.8% vs. 27.2%; Low vs high centrality: 14.8% vs. 25.2%). There was no difference in sero-prevalence rates according to the degree of centrality of their homes. However, sero-prevalence rates in homes in open environments were higher (27.1% vs. 12.6%).

Conclusions:

This pilot study confirms the importance of the degree of centrality and the type of environment, especially that pertaining to schools, for dengue risk.

039 Capacity strengthening for arbovirus preparedness in Africa: lessons from Asia

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3. J Tibenderana, Malaria Consortium, United Kingdom

Background:

Arboviruses, and in particular dengue, are increasing globally and represent a serious public health threat in large areas of the world. Whilst its burden is highly established in Asia, it is an emerging threat in Africa. However, a 2022 WHO-led survey had revealed that Africa has very deep shortfalls in preparedness and capacity to deal with arboviruses.

Methods:

To assist in addressing these capacity shortfalls, the FCDO-funded "Resilience Against Future Threats" (RAFT) project launched the South-South Exchange initiative in 2022. The initiative brought key representatives from selected African countries to Thailand to exchange expertise and help confront the arbovirus challenge across continents.

Results and Conclusion:

The first cycle of exchange visits involved ten senior representatives from five African countries, who spent one week in Thailand with government and research experts. All participants agreed the visit was highly successful and helpful. These exchange visits are now being supplemented with a series of research and networking webinars to deepen connections and promote cross-learnings for expanded and coordinated research, training, and improved response capacity.

040 A cross-sectional insight into the burden of dengue and risk factors of transmission in nine districts in Sri Lankak

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Background:

It is important to understand the differences in dengue seroprevalence rates in different regions in Sri Lanka to assess the burden of infection and plan out dengue vaccination programmes.

Methods:

Age-stratified seroprevalence rates were assessed using the PanBio Dengue IgG Indirect ELISA in 5208 children aged 10 to 19 years, in nine districts representing the nine provinces in Sri Lanka. A stratified multi-stage cluster was used to select 146 schools representing the districts. Probability proportionate to size (PPS) sampling technique based on the age distribution of general population and the urbanicity in each district was used to select the number of clusters to be enrolled for the study from each district.

Results:

The overall dengue seroprevalence rate in children was 24.8%, with the highest rates reported from Trincomalee (54.3%) and the lowest rates from Badulla (14.2%), which is a high-altitude estate area. Although a weak but positive correlation was observed between the dengue antibody positivity rates and age in districts which had seroprevalence rates of >25%, there was no increase in antibody titres with age in the other districts. Seroprevalence rates were significantly higher in urban areas (35.8%) compared to rural (23.2%) and estate areas (9.4%), but there was no association between seropositivity rates and population density (Spearmans r=- 0.01, p=0.98), in each district.

Conclusion:

The seroprevalence rates in many districts were <25% which was very different to those reported from Colombo. Therefore, it would be important to consider these differences when rolling out dengue vaccines in Sri Lanka.

041 Validation of a Commercial Dengue ELISA Assay to Determine the Dengue Serostatus in Sri Lankan Individuals

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Background:

Seroprevalence studies are important to determine the burden of dengue and to decide on vaccine rollouts, and many commercial kits such as the Panbio Dengue IgG indirect ELISA, are used to determine serostatus. As a previous study showed that this assay gave false-negatives in those with primary infection, we proceeded to evaluate this assay in children in Sri Lanka.

Methods:

We randomly selected 71 serum samples from healthy children who underwent a sero-survey in the Colombo district in Sri Lanka. Samples were evaluated for possible previous dengue exposure using the Panbio Dengue IgG indirect ELISA and compared with foci reduction neutralizing tests (FRNTs) for all for dengue viruses (DENV), which was used as the reference.

Results:

40/71 (56.34%) were seropositive and 31/71 (43.66%) were classified as seronegative for DENV antibodies based on the ELISA. Based on the FRNT results, all individuals who were seropositive had neutralizing antibodies (Nabs) for at least one DENV serotype, with 31/40 (77.5%) having a multitypic profile and 09/40 (22.5%) having a monotypic profile. Of the seronegative individuals, 20/31 (64.5%) were naïve for Nabs, while 9/31 (29.03%) were positive for one serotype and 2/31 (6.45%) had a multitypic profile. Interestingly, 10/11 individuals classified as seronegative, had Nabs against DENV2.

Conclusion:

Our results showed 34.5% of individuals who were previously infected with DENV, were identified as seronegative, based on this commercial ELISA and therefore, the cut-off of this assay, needs to be optimized using a larger cohort in the Sri Lankan population to identify true seronegatives.

042 OpenDengue: a global database of public dengue case data

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Background:
Global infectious disease databases are essential for tracking the spread of diseases, understanding long-term drivers of transmission and predicting outbreaks. While more countries are now making dengue case data publicly available, no platform integrates data from all dengue-endemic countries globally, hindering comparison and analyses.

Methods:
We systematically extracted data for each dengue-endemic country from ministry of health reports, regional databases (PAHO PLISA and Tycho), ProMED mail reports, peer-reviewed literature and other online sources. We develop a range of custom extraction, de-duplication and standardization protocols to aggregate data in a common reusable machine-readable format.

Results:
We found data for 52 countries spanning the period 1990-2022. Weekly or monthly data was available for most countries, but only from the mid 2010s onwards and sub-national data was available for 16 countries. Collectively this database documents the spatio-temporal distribution of over 32 million dengue cases and charts the gradual rise of dengue worldwide. We developed a website (https://opendengue.github.io/master-repo/) and open access repository where this aggregated data can be downloaded for re-analysis and new data sources added.

Conclusion:
Important gaps still remain in publicly available dengue data, particularly in Asia and Africa. We are actively seeking new collaborators to identify new data sources to fill specific gaps and iteratively improve this growing resource for the dengue community.

043 High-throughput, cell-based screening for the discovery of novel pan-flavivirus small molecules

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Background:

The flavivirus is a member of family Flaviviridae where nearly half of the members are identified as important human pathogens such as dengue virus (DENV), yellow fever (YFV), and Zika virus (ZIKV). Currently, there are no approved antivirals against flaviviruses and an insufficient vaccination coverage for the limited vaccines that are available. The discovery and development of novel broad-spectrum antivirals are urgently needed to effectively combat emerging and re-emerging flaviviruses.

Methods:

Two approaches were simultaneously pursued to identify pan-flavivirus inhibitors; a target-based screen using rational drug design and a phenotypic screen of commercial compound libraries. For the target-based approach, the published parent compound NGI-1 was selected, and thirty-five analogs were synthesized in-house. Additionally, two small molecule libraries (10,800 compounds) were acquired for single point testing against DENV. All compounds were evaluated for antiviral activity by use of an in vitro cell-based assay with robotic liquid handling and high-content imaging analysis. Hit compounds were further assessed to determine the half maximal effective dose (EC50) against DENV serotypes 1 – 4, ZIKV, YFV and for 50% cytotoxic concentration (CC50) using the MTT assay.

Results:

NGI-1 parent inhibited DENV serotypes 1-4 with EC50 values of 0.70 – 4.39 μM and a CC50 >100 μM. Three of the NGI-1 analogs were the most potent in reducing viral yield with EC50 values of 0.52 – 3.18 μM. Further optimization is in progress to address undesirable profiles.

Conclusion:

NGI-1 and potent analogs exhibited antiviral efficacy against DENV serotypes. Future investigations will assess these molecules against YFV, and ZIKV as a potential pan-flavivirus inhibitors.

044 TAK-003 (QDENGA) DENGUE VACCINE CLINICAL EXPERIENCE: AN INTEGRATED SAFETY ANALYSIS BY BASELINE SEROSTATUS

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Background:

The tetravalent dengue vaccine TAK-003 (Qdenga®), has demonstrated efficacy in an ongoing phase 3 trial in dengue-naïve and -exposed participants. An integrated safety analysis (ISA) of healthy participants (children aged 4–11 years, adolescents 12–17 years, and adults 18–60 years) from this ongoing trial plus four other phase 2/3 placebo-controlled TAK-003 trials was conducted by baseline dengue serostatus and age.

Methods:

This ISA evaluated adverse events (AEs) following TAK-003 or placebo dosing (two doses 3 months apart): solicited local/systemic AEs within 7 and 14 days of doses, respectively, unsolicited AEs within 28 days of doses, and serious AEs (SAEs) up to 57 months post first dose.

Results:

21,790 participants received TAK-003 (n=4472 seronegative; n=9808 seropositive) or placebo (n=2063 seronegative; n=4975 seropositive); 476 participants serostatus unknown. Local or systemic reactogenicity by baseline serostatus: rates for TAK-003 recipients were 38.0–67.1% (seronegative) and 35.1–50.7% (seropositive) versus 21.4–56.8% (seronegative) and 16.1–48.4% (seropositive) for placebo; rates were lowest in children. Most common events: injection site pain, headache and myalgia, regardless of serostatus. Unsolicited AEs after first or second dose: 7.2–23.8% of TAK-003 and 10.3–35.5% of placebo recipients. Most common AEs for any serostatus or treatment subgroup: nasopharyngitis and upper respiratory tract infection. SAEs after any dose: 2.0–8.9% of TAK-003 and 0–10.6% of placebo recipients with similar rates by serostatus and age subgroups.

Conclusion:

TAK-003 was well tolerated, with no important safety risks identified, irrespective of baseline serostatus and age in participants aged 4–60 years.

Takeda funded ISA/medical writing support.

045 Mutations in NS1 and NS2B Attenuates a Clinical Isolate of Dengue Virus Serotype 3

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Background:

Dengue is an acute arboviral disease that affects an estimated 100 million people globally each year. There are four types of dengue virus (DENV1-4), all of which are transmitted principally by Aedes aegypti. Although vaccines containing recombinant chimeric viruses have now been licensed in some countries to prevent dengue, a vaccine that contains purely full genome DENVs that elicit the full range of DENV-specific humoral and cellular immune responses may still be needed. In this study, we explored the extent attenuations identified in DENV2 would weaken wild-type DENV3.

Methods:

We used DENV3 (D3/SG/05K863DK1/2005), which was isolated from an acutely ill dengue patient, as the wild-type (WT) virus in this study. Infectious clones with mutations that were previously identified in DENV2, namely NS1-G53D and NS2B-I114T were generated using site-directed mutagenesis and Gibson assembly. Virus genome stability, viral replication kinetics and Nanostring immunology panel profiling were performed on mosquito and/or mammalian cells.

Results:

NS1-G53D reduced viral replication in Aedes aegypti. However, this single mutation reverted to WT DENV3 within just a single passage in C6/36 cells. NS2B-I114T mutation reduced the plaque size of DENV3 but did not attenuate infection in Aedes aegypti. Introducing both NS1-G53D and NS2B-I114T substitutions into DENV3 produced stable mutant through 5 passages in C6/36 cells and produced consistently small plaques on a plaque assay. Immune gene profiling in infected monocyte derived dendritic cells showed gene expression profiles suggestive of features observed in DENV2 PDK53.

Conclusion:

Engineering of mutations that attenuate DENV through different mechanisms may produce novel mutants with features suitable for further development as live attenuated vaccines.

046 A high-resolution dengue forecasting system in Vietnam

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Background:

There is a need for dengue outbreak forecasting systems that can accommodate variable time scales and at small spatial scales. Spatially targeted interventions for dengue control are usually performed at the local scale, and key decisions need to be made on different time scales. The ability to identify in advance the precise location, size and duration of a dengue outbreak is important for targeted mitigation efforts. We aim to develop a real-time, short-term, high-resolution Dengue outbreak forecasting system, starting with two exemplar cities in Vietnam: Ho Chi Minh City and Hanoi. The system will deliver time-critical information directly to citizens, policy makers and health professionals with forecasts over different time scales, and at the spatial scale of district, an administrative level below state and country. This is an international multidisciplinary project, integrating high-resolution data sources including land use, human mobility, entomological, socio-economic, and genomic data. Methods: This project integrates data sources with epidemiological and meteorological modelling to develop a dengue outbreak forecasting model. We will combine verifiable probabilistic forecasts of weather and near-term climate conditions, with mathematical and machine learning models of dengue transmission. A model will be developed for each data source, which will be part of a bespoke data processing pipeline. This data pipeline will also propagate uncertainties from model outputs throughout each step. Results: We will present about the overall structure of the data processing pipeline, initial results from our models and the visualization framework for the platform.

047 Correlation Between Aedes vector Indices and Reported dengue cases in Gothatuwa MOH area

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Introduction:

Aedes larval survey data and Ovitrap data is important for the control of Dengue epidemics. The objective of the present study was to relationship between Aedes vector Indices and reported dengue cases (2021-2022) in Gothatuwa MOH area

Method:

The Study was conducted in Bopeththa GN area in the Gothatuwa MOH area from 2021 to 2022 monthly entomological surveillance was done mainly larval and ovitrap survey for a period of two years. Ovitrap survey were conducted in 50 randomly selected houses and larval survey were conducted in 100 premises selected by a systematic sample approach.

Results:

Reported cases 70 at Bopeththa Gn area in 2021 and 240 in 2022 based on figure larval indices namely Breatue Index (BI) , Container Index (CI), Premises Index (PI) were calculated and along with the ovitrap index (OI) mean value of indices for Ae aegypti reported for 2021 and 2022 were BI 18 ±3, 9±1 and CI 14.8+-3.2 ,and 14.3±1.5 and PI 5±1, 5±1, and Ovitrap index 72±48, 96±46 and separate calculate for Ae. albopictus for those indecies BI 10±5, 21±1 and CI 35.5±6.6, 30.1±1.5 and PI 18±2, and 13±1

Conclusion:

Over time, there is a gradual decrease in the number of dengue patients. Following vector control measures based on larval indices, as well as the removal of a large number of eggs by ovitrap collection may be the reasons for this. Pearson's correlation analysis reviewed that the association between dengue cases and larval and ovitrap indices was a significant relationship.

048 The impact of metformin on flaviviral vaccine immunogenicity

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Vaccination is a cost-effective measure to reduce the burden of infections and is responsible for saving millions of lives annually. Yet, the reasons why some individuals respond better to vaccination than others remain unclear. Previous studies have indicated that the host baseline profiles partly influence the biological pathways that are correlated with vaccine immunogenicity. However, it remains uncertain whether these correlates are purely statistical or functional. As metformin, a safe and commonly administered anti-diabetic medication that has known properties of immune and metabolic modulation in a randomized, double-blind, placebo-controlled trial, we recruited healthy adult subjects to receive a short course of placebo or metformin from 3-days before to 3-days after live-attenuated yellow fever (YF17D-204) vaccination. We found that whilst those who received placebo showed the expected direct correlation between YF17D-204 viremia and plaque reduction neutralizing test (PRNT) titers, metformin-treated subjects lacked such correlation; high PRNT titers were found even in those with low YF17D viremia. No significant difference in cytokine levels between the two arms was found, indicating that this enhanced response was not due to altered cytokine expression. Transcriptomic profiling revealed increased enrichment of mRNA transcripts belonging to the mitochondrial electron transport chain (ETC) and protein translation pathways in the metformin arm compared to placebo. Blood transcriptomics module analyses further indicated that these processes likely occurred in monocytes and B cells. The altered expression of ETC-related genes is likely due to the inhibition of metformin on complex I of the ETC, where reduced ETC activity led to compensatory increased expression of these genes. With the cessation of metformin, elevated ETC expression likely increased oxidative phosphorylation that is known to support adaptive immune response to vaccination. Our findings thus suggest that cellular respiration, beyond being a statistical correlate of PRNT titers, is functionally involved in the development of humoral immunity.

050 Dengue Shock Syndrome with Encephalopathy, Hepatic Involvement and Bleeding: A Case Report

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Background:

Dengue Shock Syndrome (DSS) is a severe form of dengue infection that can be life-threatening. Although rare, neurological symptoms can occur in patients with dengue. In this study, we present a case of a DSS patient who exhibited encephalopathy, hepatic involvement, and hemorrhagic manifestations.

Case presentation:

A 22-year-old woman with Dengue Shock Syndrome was referred from a secondary hospital because of decreased consciousness on the seventh day of fever. The patient had a seizure while in the ER and was given diazepam to stop the seizure then admitted to the ICU. Vital signs were BP 79/44 mmHg, RR 20 breaths/minute, Pulse Rate 80 beats/minute, and Oxygen saturation 100% on room air. Serological tests revealed IgM negative while IgG was positive. Hemoglobin 13.1 g/dL, Hematocrit 39.1%, and Thrombocyte 27,000. The patient's liver enzymes were increased (SGOT 180 U/L and SGPT 89 U/L). The patient was given crystalloid and norepinephrine for support. On the second day of care, the patient experienced nosebleeds and melena. The patient was given tampon epinephrine for nosebleeds and Proton Pump Inhibitor (PPI) for melena. A contrast CT scan was performed, and no infection, infarct, hemorrhage, or increase in ICP was found. The patient was moved to the ward on the third day of treatment and discharged on the sixth day.

Conclusion:

Dengue shock syndrome can be challenging to treat. presentation of the disease and complications that arise can be fatal if not treated properly.

051 Cases Series of Dengue Shock Syndrome with Neurological Manifestation

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Background:

Dengue Shock Syndrome (DSS) is a severe manifestation of dengue infection that can be life-threatening, particularly in tropical countries such as Indonesia where dengue fever is endemic. This report presents two cases of DSS patients treated in the ICU

Case presentation:

The first case involved a 25-year-old woman with a history of germinoma who presented with fever, headache, nausea, and vomiting. She had hemodynamic disturbance, thrombocytopenia, and tested positive for IgM and IgG for dengue. She received crystalloids and colloids, and was admitted to the ICU. On the fifth day of care, she had a seizure and a 0.74x0.58x0.80 cm suprasellar mass was detected on contrast CT scan, with no signs of meningitis, infarct, or increased intracranial pressure. She was discharged on the 10th day.

The second case involved a 22-year-old woman referred to the hospital due to DSS with decreased consciousness and had a seizure upon arrival. Lab tests showed thrombocytopenia, IgM negative and IgG positive for dengue. She received diazepam for seizure and crystalloids and norepinephrine to treat her BP of 79/44 mmHg. On the second day, she had nosebleeds and melena, and was given tampon epinephrine and a proton pump inhibitor. A contrast CT scan found no infection, infarct, hemorrhage, or increase in ICP. The patient was discharged on the sixth day.

Conclusion:

The cases illustrate the importance of early recognition and appropriate management of DSS. Prompt and appropriate management is essential to reduce morbidity and prevent mortality in DSS patients with or without comorbidities.

052 Hydration for Children with Severe Acute Malnutrition and Dengue Shock – a case report and scoping review of the literature

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Background:

We aim to describe a case of dengue shock in a child with severe acute malnutrition. Malnourished children are considered at risk of pulmonary edema and cardiac failure from rapid intravenous fluids thus guidelines recommend slower hydration for these patients with septic shock and hypovolemic shock from diarrhea. Shock in dengue is distinct while there are no specific guidelines for hydration in malnourished patients with dengue shock.

Methods:

Medical records of children with malnutrition with dengue shock were reviewed and a scoping review on dengue shock and malnutrition with focus on hydration was done.

Results:

A child with severe acute malnutrition (7year-old/female, height 106cm, weight 12.5kg, BMI for age below -3) and dengue shock was given 20cc/kg isotonic fluid rapid bolus which resolved the shock, another episode later occurred and another 20cc/kg rapid bolus was given then tapering of fluids was done. Only periorbital edema was noted as sign of fluid overload. Electrolyte imbalance was present.

Dengue shock in children with malnutrition is not often described. Some studies show that malnutrition is not a risk factor for severe dengue. Trials of hydration in dengue did not include children with malnutrition. Emerging evidence for severe acute malnutrition and hypovolemic shock shows no difference in outcomes between giving rapid hydration and following the cautious approach.

Conclusion:

Our case shows that patients with severe acute malnutrition and dengue shock can be hydrated according to standard recommendations for dengue using actual body weight with careful monitoring for complications. More robust evidence is needed.

053 Dengue prediction in Bandung Indonesia using machine learning methods

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Background:

Dengue hemorrhagic fever (DHF) is a notifiable vector-borne disease caused by female mosquito that impacts tropical countries, including Indonesia. Over the past four years, there was a notable upward trend in DHF cases, which peaked in 2019 and 2020 at the national level. Although Covid movement restriction applied during 2020-2021, dengue was still a major problem in Bandung, with the highest DHF cases recorded in 2021. *Aedes aegpyti* and Ae. albopictus are prevalent throughout the country, and the climatic variations heavily impact dengue transmission dynamics. This study was addressed to find the correlation between DHF and the climatic factors (sun exposure, temperature, and humidity), also risk of dengue from ovitrap index from Indonesia's vector surveillance application (Silantor) in Bandung Indonesia.

Methods:

This study implemented several machine learning methods (Linear Regression, Ridge Regression, Lasso Regression, Regression Tree, Random Forest, and Support Vector Regression) to find the most precision model (with RMSE, R2, and Mean Absolute Error [MAE]) in predicting dengue trend from 2018 to 2022. The machine learning models utilized a cross-validation method where the 2018 to 2021 data were used for data training and 2022 for data testing.

Results:

Random Forest model was the best model (RMSE = 3.65, R2 = 32.5%, and MAE = 2.76). Thereafter, the biggest Variable of Importance (VIF) was ovitrap index and temperature.

Conclusion:

In conclusion, ovitrap index and climatic factors could be the predictors and early warning for DHF outbreaks. This study demonstrates that machine learning is a potential technique for dengue prediction.

054 Laboratory evaluation of autogeny in *Aedes aegypti* and *Culex quinquefasciatus* mosquitoes

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Introduction:

Species that can lay autogenous eggs may allow them to manage persistence in harsh environments where vertebrate hosts are scarce to obtain blood meals. The development of autogenous *Aedes aegypti* and *Culex quinquefasciatus* mosquitos is important as they are primary vectors of dengue and lymphatic filariasis in Sri Lanka. In this study, autogenous reproduction and the extent of the above species were evaluated.

Methodology:

Aedes and *Culex* adult F1 generations were arranged in four rearing cages each containing 50 mosquitoes with a 1:1 male-to-female ratio each. Adults were fed 10% sugar in cage 01 (*Aedes*) and cage 02 (*Culex*). In cage 03 Adult mosquitos were fed on human blood. Egg-laying cups with germination papers were placed inside each cage to facilitate oviposition. The number of laid eggs was counted every day until the end of egg laying.

Results:

Aedes mosquitoes didn't show autogeny in all three replicates, where 10% s sugar-fed culex female mosquitoes laid 11,09 and 14 eggs accordingly with an 11.3 mean value. Mosquitoes which received blood laid 1563,1421 and 1482 eggs accordingly for three replicates with a 1488.7 mean value.

Discussion and conclusion:

Aedes mosquitoes were highly anautogenous whereas *Culex* mosquitoes showed some degree of autogenic properties. As Previous literature evidence are insufficient for the autogeny of *Culex quinquefasciatus* in Sri Lanka, this experiment should be conducted with more replicates to provide a broader picture of the autogeny ability of *Culex* mosquitoes in Sri Lanka.

Key words: *Aedes aegypti*, *Culex quinquefasciatus*, Autogeny

055 A Retrospective Cohort Study on the Clinical Profile and Outcome of Confirmed Dengue Patients Who Were Vaccine Recipients (Dengue Tetravalent Vaccine, Live) and Non-Vaccine Recipients from January 2018 to December 2019 Admitted in a Tertiary Hospital in Bataan

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Background:

In 2016, Dengue vaccine was introduced through a school based immunization program in the Philippines. It was suspended nearly 3 years after reports showed an increased risk of hospitalization among vaccinees. The study described and compared the profile and outcome of dengue patients who received the dengue vaccine and who did not.

Methodology:

This is a retrospective, cohort study which included 10-15 year old patients admitted as dengue with warning signs or severe dengue between January of 2018 and December 2019. Patients with comorbidities were excluded. Clinical data were analyzed using statistical tools such as student t test on comparing continuous data while Chi square or Fisher exact test for categorical values.

Results:

A total of 177 non-vaccine recipients and 62 vaccine recipients were included. The mean age group is 12.5 years old with male predominance (56.5%). Severe dengue was observed among 22.6% of vaccine recipients and 15.8% of non-vaccinees (p-value 0.2296). The mean duration of fever of vaccinated group was 3.7 days, while for non-vaccinated group was 3.5 days (p value 0.3268). Abdominal pain and anorexia (p values 0.0049 and 0.0075) were seen significantly among the non-vaccinated group, while joint pains and narrowed pulse pressure (p values 0.0001) were significantly observed and higher among the vaccinated group. Majority of the vaccinated patients stayed in the hospital for 4 ± 2.4, while 4.8 ± 1.9days of stay were among the non-vaccinated patients (p-value 0.0104).. Lastly, There were no recorded deaths among vaccinated patients, while there was almost 2% of mortality among non-vaccinated pediatric patients (p-value 0.5702).

Conclusion:

Majority of the vaccinated patients experienced joint pains and narrow pulse pressure and shorter length of hospital stay. There was no mortality on those who were vaccine recipients. Dengue vaccine may provide a remarkable protection for children provided proper guidelines and monitoring.

056 Dengue virus infection and dissemination in mosquitoes is reduced upon bloodmeal exposure to the dengue antiviral JNJ-A07

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Background:

Half of the global population is at risk of dengue virus (DENV) infection; however, no antiviral therapies exist yet. DENV-infected mosquitoes may ingest a drug while blood-feeding on a drug-treated patient. It is unknown whether an antiviral drug ingested by mosquitoes can inhibit virus replication and dissemination, and thus reduce transmission to other hosts. We investigated the antiviral activity of JNJ-A07, a potent DENV inhibitor in a mouse model (PMID: 34616043), when administered to the bloodmeal of Aedes aegypti mosquitoes.

Methods:

Toxicity of JNJ-A07 to mosquitoes was assessed based on survival and fecundity after JNJ-A07 exposure via the bloodmeal. Two administration regimens were evaluated, whereby mosquitoes were either given JNJ-A07 (2 µM) 6 days prior to (pre-exposure prophylaxis; PrEP) or 6 days after (post-exposure prophylaxis; PEP) a DENV-infectious bloodmeal. DENV infection and dissemination in mosquitoes were determined by measuring infectious virus particles in the mosquitoes' bodies and heads, wings, and legs, respectively, collected at day 3 and/or day 7 post-infection (p.i.).

Results:

Exposure to JNJ-A07 had no detrimental effect on mosquito lifespan or fecundity. Mosquitoes given a DENV-infectious bloodmeal spiked with JNJ-A07 did not exhibit DENV infection and dissemination. In the PrEP scenario, JNJ-A07 blocked DENV infection in mosquitoes at day 7 p.i. (0% vs control: 55%). In the PEP scenario, the ongoing DENV infection was curbed (57% vs control: 76.2%), resulting in lower virus dissemination to mosquito secondary organs (13.4% vs control: 73.1%).

Conclusion:

Mosquito exposure to JNJ-A07 in the bloodmeal may decrease DENV transmission by mosquitoes.

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057 Dengue vaccine breakthrough after 10 years in Indonesia

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Background:
Dengue infection is an important public health in Indonesia. In 2011, Indonesia was involved in multi-center trial of chimeric-yellow fever tetravalent dengue vaccine (CYD-TDV). Jakarta was one of the sites which included 748 subjects, given CYD-TDV at 0, 6 an 12 months in June 2011 until June 2012. Aim of study was to evaluate dengue vaccine breakthrough 10 years later in 2022.

Methods:
A case-control study was conducted in five districts primary health cares in Jakarta aged 12 years and above by giving questionnaire asking history of dengue infection and obtaining clinical and laboratory confirmation from hospital admitted. Inclusion criteria of cases were subjects who were given CYD-TDV in 2011-2012, willing to participate as respondent. Control subjects were matched from the five-district primary healthcare and have not received dengue vaccine.

Results:
We enrolled 207 cases and 212 controls, with median age in cases 19 years (IQR 5) and control 15 years (IQR 4), gender M/F in cases 106/101 and in cases 101/111. Dengue infection as dengue vaccine breakthrough occurred in cases were 10 subjects and in control were 11 subjects (not significantly different in both group). However, when stratified yearly, dengue vaccine breakthrough in year 2014 occurred 1 subject, 2016 (3 subject), 2019 (1 subject), 2020 (1 subject) and year 2022 occurred in 4 subjects (versus 1 subject in control group).

Conclusion:
Dengue vaccine breakthrough was found highest in year 2022. Antibody wanes several years later after dengue vaccination, this has implication of the need of dengue vaccination booster.

058 Occurrence of COVID-19 in children who have received dengue vaccination

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Background:
Possible cross-reactions and false positive phenomena in rapid dengue serology tests due to antigenic similarities were reported between SARS-CoV-2 and DENV. Aim of the study to evaluate occurrence of COVID-19 in children who have received chimeric-yellow fever tetravalent dengue vaccine in June 2011 until June 2012.

Methods:
A case-control study was conducted in five district primary health cares in Jakarta aged 12 years and above by giving questionnaire asking history of COVID-19, clinical and laboratory confirmation were obtained from hospital admitted and blood drawn performed in subset to measure neutralization RBD IgG SARS-CoV-2 antibody titer. Dengue vaccine group enrolled were subjects who received CYD-TDV in 2011-2012, willing to participate. Non-dengue vaccine group were matched from five district primary healthcare, have not received dengue vaccine.

Results:
This study included 207 cases and 212 controls, with median age in cases 19 years (IQR 5) and control 15 years (IQR 4). Occurrence of COVID-19 in dengue vaccine group was 19 subjects higher than non-dengue vaccine group with 11 subjects (P=0.131) before given COVID-19 vaccination. Occurrence of COVID-19 in dengue vaccine group was 16 subjects significantly higher than non-dengue vaccine group with 4 subjects (P=0.005) after given COVID-19 vaccination. Neutralization RBD IgG SARS-CoV-2 antibody titer in dengue vaccine group was 71.96 U/ml (IQR 39.47) and non-dengue vaccine group was 51.92 U/ml (IQR 49.03), (P=0.361).

Conclusion:
Our study showed that occurrence of COVID-19 in dengue vaccine group was higher than non-dengue vaccine group, therefore there was no cross-reaction between dengue and COVID-19.

059 Laboratory evaluation of repellent activity of three herbal essential oils against dengue vector *Aedes aegypti* (L.)

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Introduction & objectives:

Plant-based repellents have been applied as a personal protection measure in traditional practice against disease transmitting mosquitoes. Developing safe and effective topical repellents is a promising way of dengue prevention. This preliminary study aimed to assess the repellent activity of three oils derived from common plants found in Sri Lanka against dengue vector *Aedes aegypti (L.)*.

Methods:

Three herbal essential oils; Eucalyptus oil *(Eucalyptus globulus)*, Lemon grass oil *(Cymbopogon citratus)* and Citronella oil *(Cymbopogon nardus)* diluted in 100% ethanol and percentage repellence was recorded against dengue vector *Aedes aegypti* (F1 females) for a range of concentrations under laboratory conditions following standard protocol (WHO, 2009). The lowest concentration of each oil that can give 99.99% repellent activity (Effective Dose) was estimated using probit analysis. The Complete Protection Time for each oil was estimated based on the estimated effective dose.

Results:

The Effective Dose for Lemon grass oil *(Cymbopogon citratus)* was 14.93% (v/v) and the Complete Protection Time was 120 minutes. Citronella oil *(Cymbopogon nardus)* had an Effective Dose of 7.84% (v/v) and 60 minutes of Complete Protection Time. Eucalyptus oil *(Eucalyptus globulus)* had an Effective Dose of 99.95% (v/v) and Complete Protection Time of 30 minutes. None of the oils tested didn't show skin irritations.

Discussion & conclusions:

Findings indicate that Lemon grass oil *(Cymbopogon citratus)* having the highest repellent activity among the three essential oils evaluated in the study whereas Eucalyptus oil showing the least performance. Therefore, Lemon grass oil is recommended as the best candidate out of the three herbal oils studied for development of a plant-based repellent product against dengue vector *Aedes aegypti* in Sri Lanka.

Key words: repellent activity, herbal oils, dengue vector, *Aedes aegypti*

060 Risk factor assessment and spatial point pattern analysis of dengue infection in Urban Slum and semi urban area, Colombo, Sri Lanka

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Background:

As over half of the dengue cases in Sri Lanka occur in the Colombo district, we sought to evaluate the potential risk factors for dengue transmission and the age stratified seroprevalence in an Urban Slum (US) and Semi Urban (SU) in Colombo.

Method:

Individuals were randomly recruited from the SU and US areas and the presence of dengue antibodies was assessed using a commercial ELISA in individuals aged 5 to 30 years, from US (n=226) and SU (n=214) areas. The individual data and the area-based data collected during the house visits and the geocoded residential location was linked with the ArcGIS survey 123 platform. Spatial point pattern distribution statistically estimated by using the Kernal Density in ArcGIS Pro 3.1.1.

Results:

The overall seroprevalence in the US was 89.3% and 79.9% in SU areas. The seropositivity rates were 97% in the 16–20-year-olds in the in the US area, and 80% in the same age group in the SU area. The dengue-specific IgG antibody levels significantly increased with age (Spearman's r=0.58, p<0.0001) in the US area, but not in the SU area (Spearman's r=0.04, p=55). The age stratified seroprevalence increased significantly with age in both the US (Spearman's r=0.97, p=0.03) and SU area (Spearman's r=1.00, p=0.01). From the area-based indicators the urbanicity (p=0.017) the US area (OR=1.97) was found as significant risk factor with the DENV seroprevalence.

Conclusion:

There is intense transmission of dengue in the Colombo district with transmission rates being higher in US areas.

061 Establishing a community-based cohort study in the Philippines

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Background:

There have been few prospective community-based cohort studies in the Philippines. We describe the procedures, requirements, timeline, logistics achievements and challenges in establishing a dengue cohort study in Cebu, Philippines.

Methods:

The cohort was established by two pediatricians/epidemiologists under the advisory of leading dengue experts. A detailed study protocol was developed and submitted for ethical clearance. Three (3) local and seven (7) international institutions collaborated and provided grant support in this study. Research nurses and medical technologists, medical doctors, data managers, municipal health officers, barangay health workers, biostatistician, and administrative personnel were trained in data collection, analysis, research dissemination, and other study-related activities.

Results:

From May to June 2017, we enrolled 2,996 children 9-14 years of age into the study and determined their baseline dengue serostatus. From June to August 2017, 1,810/2,996 (60.4%) children received a single dose of CYD-TDV as part of a government program. Fever surveillance in the fixed cohort of 2,996 children was carried out from November 2017 to October 2023. Annual blood collections were also conducted. Finally, a close-out interview and mapping of the participant's permanent residence were also done.

Conclusion:

Implementation of the study activities was possible through the support of different institutions and the local community. Challenges faced included difficulty in obtaining funds during the initial period; continuing need to inform and educate the stakeholders, cohort participants and their parents especially during the announcement of CYD-TDV safety concerns; lockdowns associated with the COVID-19 pandemic and turn-over of staff.

062 Inhibitory effects of domperidone on dengue virus serotype 2 infection and NS1-induced endothelial cell hyperpermeability.

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Background:

Infection with dengue virus (DENV) leads to different clinical manifestations and disease severity in humans. Neither antiviral drug nor specific treatment is currently available for dengue. This study determined potential repurposing of domperidone, an antiemetic and gastrokinetic agent, against DENV infection.

Methods:

Immortalized human hepatocyte-like cells (imHC) and human microvascular endothelial cells (HMEC) were used in this study. The cytotoxicity of domperidone was evaluated by an ATP detection-based luminescence assay. Domperidone (31.25 □M) was applied to imHC cultures during or after the step of DENV entry. DENV production, viral protein expression and NS1 secretion in the imHC cultures were assessed by a focus forming unit assay, immunoblotting analysis and NS1 ELISA. Effects of domperidone (15.6 □M) on NS1-induced cell hyperpermeability were determined by measurement of trans-endothelial electrical resistance in HMEC cultures.

Results:

The concentration of domperidone which caused 50% cytotoxicity (CC50) in imHC cells was 100.4 □M. When imHC cells were exposed to DENV-2, treatment with the non-toxic dose of domperidone after virus entry showed a significant decrease of DENV-2 production by approximately 56% at 24 hours post infection. The same treatment also resulted in significant reductions of intracellular DENV E and NS1 protein expression and extracellular NS1 levels. The inhibitory effect of domperidone on the DENV-2 production was not observed when treated during the step of virus entry. Treatment of HMEC with domperidone in the presence of soluble DENV-2 NS1 demonstrated the significant inhibition of endothelial cell hyperpermeability.

Conclusion:

These findings suggest potential repurposing of domperidone against dengue.

063 The impact of indoor breeding places in dry season for dengue cases

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Abstract:
The Nugegoda Health Medical Officer office belonging to the Colombo district includes 15 village officer domains. These 15 domains are completely different from each other in terms of population density, people's living conditions, nature of the environment, etc. Rich people live in Nawala domain and poor people live in Obeysekarapura domain. There are a group of slum-like houses that are adjacent to each other throughout this Obeysekarapura domain. When we consider the recent reports of dengue cases in the entire Health Medical Officer jurisdiction, dengue cases are reported in even during the dry season. Despite continuous control programs, the cases did not decrease in any way. The first quarter of the year was relatively dry throughout the country. During this time, the number of patients in Obeysekarapura domain increased more than the total number of patients in all the other 14 domains. No matter how much testing was done with field assistance, no infected areas were found. In fact, outdoor breeding is very minimal because these houses do not have a garden. So as the health entomology officer of the area, I decided to find answers to this problem. I conducted several entomological surveys in this area. I looked very carefully not only at outdoor breeding places but also at indoor breeding places. It was a surprise. There were a large number of indoor breeding places with high density of larvae all over the area. Indoor breeding places were found in water storage containers under kitchen faucets, refrigerator trays, water storage barrels. In particular, a high density of larvae was found in the containers placed in the faucets. Due to poor economic conditions, they do not repair these. Instead, they keep water storage containers. About 80% of these indoor breeding samples were Aedes aegypti, which is the major vector. Therefore, the reason why Obeysekarapura dengue cases were reported during the study period was found as follows. This situation can be seen in any area with such slums. My acting area is Boralasgamuwa, and I Confirmed this result by doing a larval surveillance in bodhirajapura domain. Also Boralasgamuwa is high density populated area. I informed the field assistants that it is essential to check indoor breeding. I pointed out that if indoor breeding can be zero during the study period, cases can be zero. The other important thing is that this indoor breeding does not change compared to outdoor breeding. For example, if there is a container for water tap leak in a house, it is a potential breeding place throughout the year. This situation is also common for refrigerator trays, water storage barrels. However, this fact can be used to make our control program successful. A separate list of houses with indoor breeding can be prepared and in Obeysekarapura area, it is about 10% of the total number of houses. Therefore, during a dry season, by immediately checking only those houses and removing those breeding places, the epidemic can be stopped before it comes.

064 Optimization of Dengue Hemorrhagic Fever (DHF) Handling in High Potential Impact Areas from January to March 2023 in Semarang City, Indonesia

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Background:

Dengue hemorrhagic fever (DHF) still an endemic disease in Semarang City. In 2022, there were 865 cases of DHF in Semarang City with a Case Fatality Rate 3.82%. It is very important to analyze the potential impact of an area to determine the level of DHF intervention in Semarang City.

Methods:

A descriptive observational study to assess the potential impact of DHF in Semarang City. Secondary data from the Health Office database of Semarang City in January to March 2023. The potential impact analyzed from the vulnerability, exposure, sensitivity and adaptive capacity of an area. Data converted to a scale of 1 to 7, from very low to very high.

Results:

In January to March 2023, From 177 urban villages, there are 2 areas with high and very high potential impact, Jomblang and Mangunharjo. Various strategies have been carried out, especially in high and very high potential impact area, including real-time monitoring of case transmission through the "Tunggal Dara" application, weekly feedback from sub-districts and districts (covering cases, free larvae, inspection of larvae mosquitoes), community empowerment, students in schools, regulations to strengthen DHF awareness, focus group discussions with tropical infectious disease experts about death cases, monitoring evaluation of case reporting and fulfillment of DHF logistics (larvicides, DHF RDT, insecticides), conducting screening and counseling massively, and cross-sectoral cooperation.

Conclusion:

There are 2 areas with high potential impact that need more optimal handling. The importance of a comprehensive database to assess the potential impact of DHF in an area.

DELEGATES' ABSTRACTS

065 Dengue amid COVID-19 pandemic

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Background: Dengue is a global public health threat affecting over 120 countries. An alarming 5.2 million dengue cases were recorded in 2019. Fifty per cent of the world's population is at risk of dengue with Asia contributes to 70% of the global dengue burden. The double trouble of Coronavirus disease 2019 (COVID-19) caused by novel severe respiratory syndrome coronavirus (SARS-CoV-2) and dengue virus is a severe problems especially for developing countries due to overburdened public health infrastructure, economic obstacles, and limited diagnostic capability.

Methods: Dengue patients data reported to Center of Epidemiological Information, Bureau of Epidemiology,Ministry of Public Health, Thailand from January 2019 to December 2021 was analyzed.

Results: Dengue virus remains in Thailand amid the COVID-19 pandemic. Patients can be seen across all age groups, more so in adolescents and adults, with no differences through gender. The disease was seen year-round, with higher incidence during the rainy season from June to September.

Conclusion: Thailand remains at risk for dengue outbreaks in the midst of COVID-19 pandemic. Continuous status updates on dengue patients in Thailand should be incorporated into global health recommendations regarding preventive measures before travel.

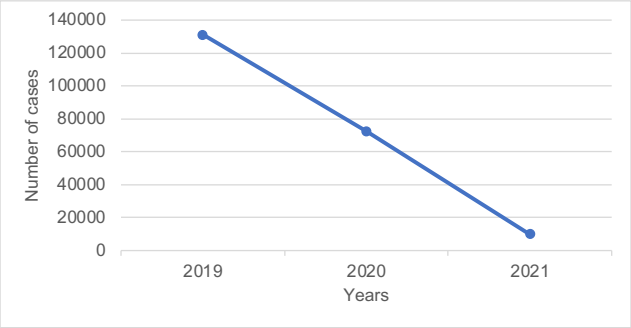

Fig 1. Number of dengue patients in Thailand between 2019 and 2021

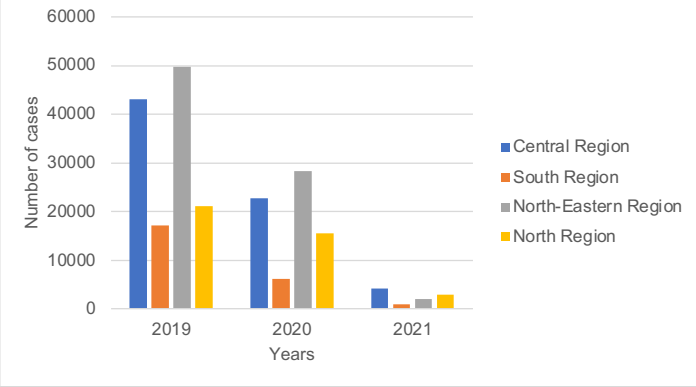

Fig 2. Distribution of dengue patients from different regions in Thailand from 2019 to 2021

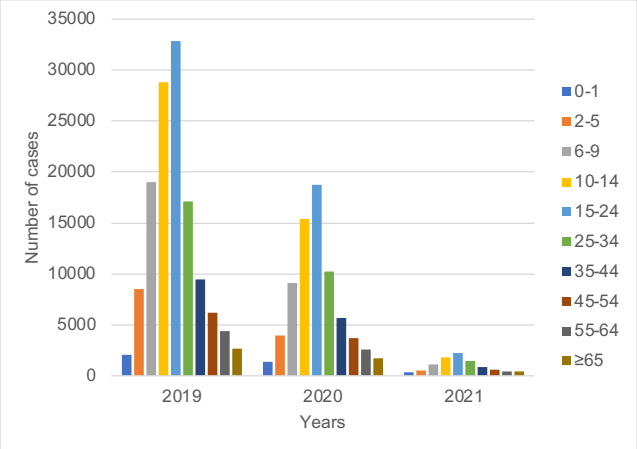

Fig 3. Age distribution of dengue patients in Thailand from 2019 to 2021

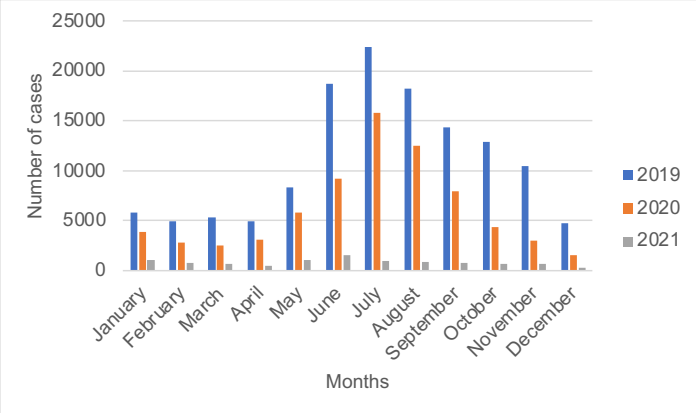

Fig 4. Seasonal distribution of dengue patients in Thailand from 2019 to 2021

Reference: 1. Dengue and severe dengue. WHO, May 2021. [Cited 2021 October 10] Available from: https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue. 2. Srisawat N, JaimchariyatamN,TantawichienT,ThisyakornU.eds.Dengue.Bangkok:TextandJournalPublicationCo.,Ltd;2019.3.WeeklyepidemiologicalreportBureauofEpidemiology,DepartmentofDiseaseControl MinistryofPublichealth,Thailand.Availableat:http://doe.moph.go.th/surdata/disease.php?dcontent=situation&ds=87AccessedJan7,2022.4.WorldHealthOrganization(WHO).Denguehaemorrhagic fever:diagnosis,treatmentandcontrol.2nded.Geneva:WHO,1997.5.SrisawatN,IamsirithawornS,TantawichienT,ThisyakornU.COVID-19:LessonsfromThailand.AnnAcadMedSingap.2021;50:96-8.

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066 Climatological Factors Affecting Hospitalized Virologically Confirmed Dengue In Cebu, Philippines: A Micro-Ecological Study

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Background:

Dengue incidence has a seasonal pattern in the Philippines, usually peaking during the rainy season (June-November). We investigated the association of season and tropical cyclones with the occurrence of hospitalized virologically confirmed dengue (VCD) in older children in Cebu.

Methods:

Children with acute febrile episodes presenting in four hospitals in Cebu Province born between 2003-2008 were included in an observational study. We obtained clinical data and blood samples for dengue RT-PCR to determine VCD. Cumulative rainfall, cyclone classification, and climate data from January 2018 to January 2022 were obtained from the Philippine Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA). We assessed the association between the rainy versus dry season and post-tropical cyclones with the number of hospitalized VCD.

Results:

From 2018-2022, 619 hospitalized VCD cases were reported. 373 (60%) VCD occurred during the wet season while 246 (40%) occurred during the dry season (p-value=<0.0001). Dengue cases increased in January 2019 after the landfall of Typhoons Samuel and Usman resulting in a spike of VCD during the dry season. COVID-19 pandemic quarantine and the onslaught of Typhoon Odette affected fever presentation and hospital operations. VCD cases were mapped showing the highest numbers located in the northeastern coastal areas of Cebu.

Conclusion:

We found that more dengue cases occurred during the rainy than during the dry season, but the aftermath of typhoons was associated with an increase in hospitalized VCD during the dry season. The findings may have implications on the impact of extreme weather events on the incidence of dengue.

067 Asymptomatic acute dengue virus infections among blood donors in an endemic area

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9. Division of Nephrology, Department of Medicine, Faculty of Medicine, King Chulalongkorn Memorial Hospital, Bangkok, Thailand.
10. Center for Critical Care Nephrology, The CRISMA Center, Department of Critical Care Medicine, University of Pittsburgh, School of Medicine, Pittsburgh, PA, USA.
11. Academy of Science, Royal Society of Thailand, Bangkok, Thailand.

Background:

Most people with dengue virus (DENV) infection remain asymptomatic, increasing the risk of DENV transfusion transmission (TT-DENV) in endemic areas. This study aimed to determine the evidence of DENV infection in blood donors from different geographic regions of Thailand.

Methods:

We performed a cross-sectional study on blood donor samples collected from the Thai red cross-national blood center and four regional blood centers between March to September 2020. The residual blood of 1,053 donors was screened for the presence of DENV nonstructural protein 1 (NS1), anti-DENV immunoglobulin G (IgG) antibodies, and IgM using enzyme-linked immunosorbent assay (ELISA) kits. The NS1 and IgM positive samples that identify acute infection were verified by four different techniques including quantitative real-time (q) RT-PCR, RT-nested-PCR, virus isolation in C6/36 cells and mosquito amplification.

Results:

Anti-DENV IgG seroprevalence was 89%, and the prevalence increased with age, with the lowest in the 18–20 years age group (80.6%) and the highest in the 41-50 years age group (96.0%). In addition, 0.4% and 2.1% of Thai blood donors were NS1 and IgM positive, respectively. Twenty-five donors tested positive for anti-DENV IgM or NS-1, indicating recent infection; however, all of them were negative for qRT-PCR, RT-nested-PCR, virus, and mosquito amplification.

Conclusions:

There was a high rate of asymptomatic dengue virus infection among healthy blood donors in Thailand. It can hypothetically result in TT-DENV. Particular attention should be devoted to the donor selection criteria, and additional screening tests might be required.

068 Age distribution of dengue cases in Thailand from 2019 to 2022

Chatchai Chulapornsiri[1], Umaporn Limothai[2,3,4], Sasipha Tachaboon[2,3,4], Janejira Dinhuzen[2,3,4], Supachoke Trongkamolchai[1], Mananya Wanpaisitkul[1], Anongrat Tiawilai[5], Thawat Tiawilai[5], Terapong Tantawichien[4,6], Usa Thisyakorn[4], Nattachai Srisawat[2,3,4]

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Background: Dengue is often considered as a pediatric disease. However, an increase in the average age of clinically apparent dengue cases has been reported. This study aimed to describe the changes in age distribution and clinical features of patients hospitalized with dengue fever.

Methods: This study is a multi-center prospective observational study. A total of 390 patients with dengue infection were admitted to two hospitals in Ratchaburi province and one in Bangkok, Thailand, between September 2019 to April 2022, were included in the study.

Results: Overall, the mean age for dengue confirmed cases was 21.6 ± 12.4 years and 21.6 ± 15.6 for severe cases. The highest incidence of dengue virus infections was observed in the age group of 25-44 followed by 10-14 and 15-19 years old. The mean age of dengue-confirmed cases increased from 21.1 ± 12.5 to 23.0 ± 12.9 between 2019 and 2020. Then it steadily decreased during 2021 (19.3 ± 10.6) and 2022 (15.9 ± 6.3). Severe dengue cases increased from 10.8% to 18.4% between 2019 and 2021. Overall, the incidence of severe dengue was highest in the elderly group (40%, aged more than 65 years old) followed by the children group (28%, aged less than 9 years old).

Conclusion: The age distribution of dengue cases seems to be shifting towards older age groups between 2019 and 2020. The incidence of dengue virus infections was highest in the age group of 25-44 years old, and severity rates were highest in the elderly group.

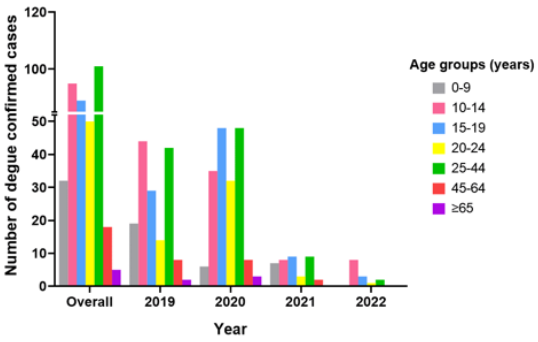

Figure 1. Age distribution of dengue patients in Thailand from 2019 to 2022.

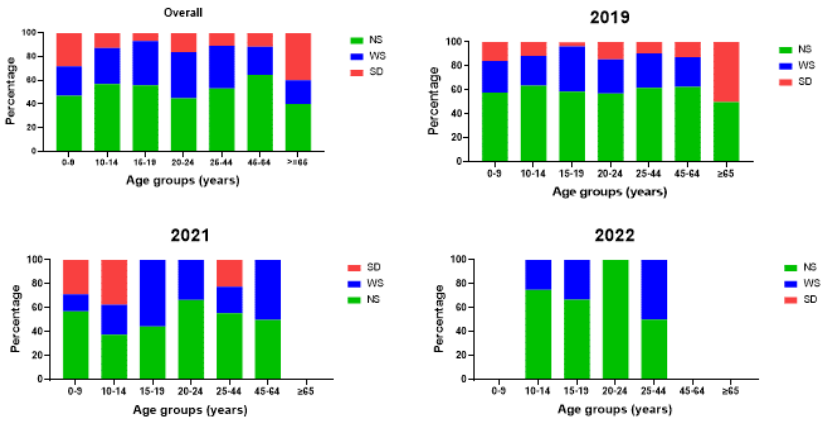

Figure 2. Age distribution of non-severe dengue cases, dengue with warning signs and severe dengue.

Years	All dengue cases			Non sever			Dengue with warning signs			Severe dengue		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
2019	21.1	12.5	158	21.1	12.0	96	20.4	11.2	45	23.1	18.2	17
2020	23.0	12.9	180	23.0	12.4	81	22.6	12.1	69	22.3	15.4	26
2021	19.3	10.6	38	19.5	11.3	19	21.3	11.2	12	15.1	7.6	7
2022	15.9	6.3	14	15.2	5.8	10	17.5	8.1	4	NA	NA	0
Overall	21.6	12.4	390	21.4	12.0	206	21.5	11.5	130	21.6	15.6	50

Table 1. Age distribution trend of non-severe dengue cases, dengue with warning signs and severe dengue.

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069 Plasma proteome profiling of dengue patients with mild to severe symptoms

Umaporn Limothai[1-3], Sasipha Tachaboon[1-3], Janejira Dinhuzen[1-3], Supachoke Trongkamolchai[4], Mananya Wanpaisitkul[4], Chatchai Chulapornsiri[4], Anongrat Tiawilai[5], Thawat Tiawilai[5], Terapong Tantawichien[3], Usa Thisyakorn[3], Nattachai Srisawat[1-3]

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5. Photharam Hospital, Ratchaburi, Thailand.

Background:

Early prognostic markers of severe dengue may improve case management and reduce dengue-related mortalities. This study aimed to identify the host-responsive protein that can be developed as a biomarker for predicting severe dengue.

Methods:

Total of 24 plasma samples from dengue-infected patients were collected on the first day of admission and were used to explore the plasma proteome by label-free liquid chromatography-mass spectrometry approach. Patients were followed up until discharge to determine the final diagnosis, and they were divided into non-severe and severe dengue, as defined by WHO 2009 criteria.

Results:

Twenty plasma proteins exhibited differentially expressed ($p<0.05$), with 3 over-expressed and 17 under-expressed in severe dengue compared with non-severe group. The over-expressed proteins were related to regulation of lipoprotein lipase activity process and cholesterol metabolism pathway. Many of the under-expressed proteins were related to antigen binding, immune response process, complement and coagulation cascades pathway. Several proteins such Apolipoprotein C-3, Complement C3, Fibrinogen alpha chain and Kininogen-1 might be potential biomarkers for predicting severe dengue. The enzyme-linked immunosorbent assay (ELISA) will be used to validate these protein levels in a large-scale cohort in the future.

Conclusion:

These findings identified potential biomarkers and shed light on the pathogenesis of severe dengue. However, the proteins identified in this study must be validated in an extended cohort with diverse populations.

070 Lipid profile as a predictor of severe dengue

Umaporn Limothai[1-3], Sasipha Tachaboon[1-3], Janejira Dinhuzen[1-3], Supachoke Trongkamolchai[4], Mananya Wanpaisitkul[4], Chatchai Chulapornsiri[4], Anongrat Tiawilai[5], Thawat Tiawilai[5], Terapong Tantawichien[3], Usa Thisyakorn[3], Nattachai Srisawat[1-3]

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5. Photharam Hospital, Ratchaburi, Thailand.

Background: It is well known that the dengue virus alters the lipid metabolism of host cells to facilitate viral replication. Circulating lipids have received attention recently as potential indicators of dengue severity, however the data is still inconsistent.

Methods: We performed a multi-center prospective observational study of hospitalized patients at to two hospitals in Ratchaburi province and one in Bangkok, Thailand, between September 2019 to April 2022. A total of 393 patients (6-83 years old) classified as non-severe (NS, N=343) and severe dengue (SD, N=50) according to 2009 WHO criteria were studied. The lipid profiles over the hospitalization period and their relationships with disease severity were analyzed.

Results: The levels of total cholesterol (TC) and high-density lipoprotein cholesterol (HDL) were below the lower normal range for both NS and SD patients across all hospitalization periods. In addition, TC, HDL, and low-density lipoprotein cholesterol (LDL) levels in SD were significantly below that of NS patients at all time points, including day one at hospital admission, day 3, day of defervescence (4–7 days post-fever onset), and day of discharge. TG behaved differently, which was higher in SD patients. HDL level on the day of hospital admission displayed the highest diagnostic performance in discriminating between SD from NS (ROC-AUC= 0.70, 95%CI 0.612-0.787, p<0.0001).

Conclusions: The results demonstrated that dyslipidemia was associated with severe dengue. Low HDL may serve as a potential predictor for severe dengue.

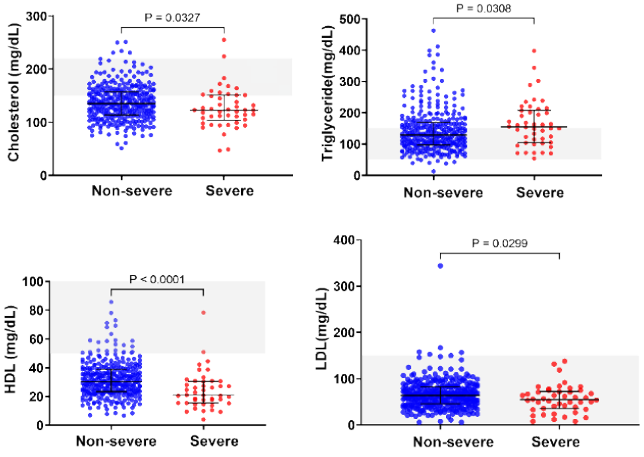

Figure 1. Lipid profile for severe and non-severe dengue on admission

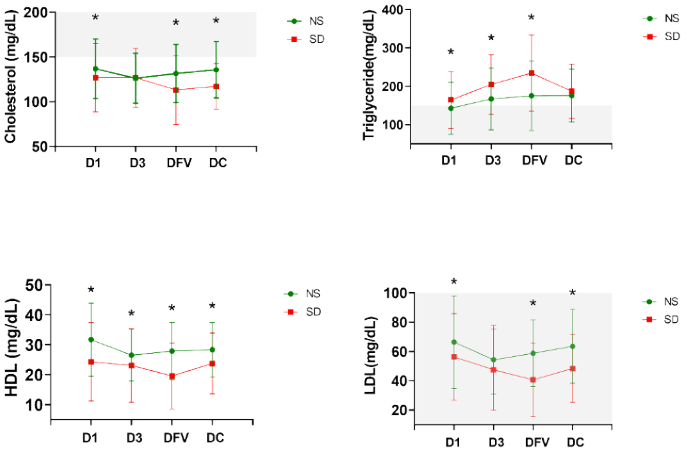

Figure 2. The dynamic changes of lipid profiles over the hospitalization period.

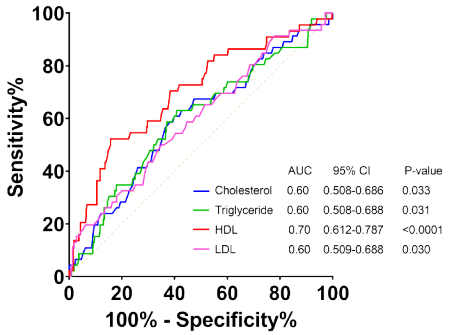

Figure 3. Receiver operating characteristic analysis of lipid profiles for predicting severe dengue.

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072 Rapid evaluation of possible antibody-dependent enhancement in Dengue virus infection

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3. Research Institute for Microbial Diseases, Osaka University, Osaka 565-0871, Japan.

Background:

Antibody-dependent enhancement (ADE) phenomenon has been reported for several virus infections such as dengue viruses (DENV). We developed a rapid reporter-based assay using single-round infectious particles (SRIPs) instead of live DENV to evaluate the possibility of ADE by sera.

Methods:

SRIPs were generated by transfection of human embryonic kidney 293 T cells with a plasmid encoding premembrane and envelope (prME) proteins from DENV1~4, along with a plasmid carrying yellow fever virus replicon containing the luciferase gene and plasmid expressing DENV1 capsid. We also used our platform to generate immortalized myeloid cell lines (referred to as Mylc cell lines) from human iPS cells.

Results:

By co-culturing our Mylc cells with SRIPs in the presence of serially diluted 4G2 Ab (anti-flavivirus envelope protein Ab), we observed a significantly augmented infection at a particular concentration of 4G2 Ab. In contrast, sera from three Japanese as negative control have no enhancing activities at any concentration. We then evaluated 20 serum samples from volunteers with dengue history against DENV1~4 SRIPs. The majority showed ADE peaks at high dilutions, i.e., at a lower concentration of serum; and some showed ADE activity at the highest serum concentration examined.

Conclusion:

We established a rapid assay using DENV-SRIPs and Mylc cells to detect ADE by serum within 24 hours. Pre-screening of one's serum and tracing an ADE-pattern may be helpful in predicting clinical outcomes after infection and evaluating the efficiency of dengue vaccine candidates in generating neutralizing antibodies.

073 The community acceptance of dengue vaccine in Indonesia

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Background:

Acceptance issue was known as the big problem of vaccination program in Indonesia. The aim of this study is to assess the community acceptance of dengue vaccine.

Method:

A quasi-experimental with pre- and post-test design was conducted to assess the acceptance of dengue vaccine according to community opinion. Participant of the study are 280 subjects consist of 3 provinces (D.I. Yogyakarta, Central Java, and Bali). Three groups of respondent who filled questionnaire; 1) parent with children age 0-11 years, 2) parent with children age 12-18 years, and 3) Adults age 19-59 years old. Data collection was conducted using a questionnaire procedure. Descriptive statistics and Chi-square test were performed in data analysis.

Result:

Based on the baseline pre-test assessment, the proportion of community acceptance of dengue vaccine is 64.29 percent (CI95%; 58.67 – 69.89). No significant different acceptance between male and female (p= 0.485) and between urban/rural (p= 0.803). The proportion of community acceptance of dengue vaccine significantly increased (p<0.001) after receiving educational intervention by health provider, there are 80.71% for 1st post-test (immediate after intervention) and 81.79% for 2nd post-test (60 days after intervention).

Conclusion:

The prevalence of community acceptance of dengue vaccine according to community was less than seventy percent. The acceptance would be increased if education intervention was implemented.

Key words: dengue vaccine, acceptance, community

074 Knowledge, Attitudes, and Impacts of COVID-19 on Readiness and Practices about Dengue in Vietnam: A Structural Equation Modeling

LTBM Nguyen, TV Nguyen, TPD Dang, HPT Do, VT Le, TTT Le, TBT Le, TH Nguyen
Online Research Club and Viet Nam

Background:

Dengue infection represents a huge public health problem worldwide, occurring in tropical and subtropical regions, including Vietnam. This study aims to assess the knowledge, attitudes, and impacts of the COVID-19 pandemic on readiness and practices regarding dengue fever among Vietnamese industrial workers.

Methods:

A cross-sectional, community-based survey was conducted among 245 employees and relatives in two companies in Ho Chi Minh City and Dong Nai Province in Vietnam from November to December 2022. We used a structural equation modeling to validate the relationship between eight hypotheses of related factors.

Results:

The majority of our responders were females (60.8%), 40 years old (40.0±6.37), Kinh ethnicity (94.3%), finished high school or higher (90.7%). We selected factors confirmed in previous studies and met loading factors of at least 0.7. A structural equation modeling revised with age and impacts of the COVID-19 pandemic tested and fitted the data well ($\chi 2=852.943$, df=335, $p<0.001$, RMSEA=0.079, CFI=0.929, TLI=0.919). We confirmed six out of eight tested hypotheses with significance. The study results demonstrated that knowledge and attitudes towards dengue prevention and treatment were positively related to increased readiness ($p<0.001$), which in turn was positively associated with improved practices ($p=0.025$). Furthermore, our model confirmed the relationship between age and readiness (negative, $p=0.041$) and practice (positive, $p=0.018$), as well as the negative relationship between the impacts of the COVID-19 pandemic on dengue preventive practices ($p=0.027$).

Conclusions:

Recommended approaches should focus on KAP factors towards dengue fever, including the impact of the COVID-19 pandemic, that are likely to increase readiness.

075 Elucidating the effect of obesity on flaviviral infection and host response to infection

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Background:

Dengue affects approximately 100 million people annually, with developing severe dengue. Several factors predispose individuals to severe dengue, one of which is obesity. However, how obesity alters the host response to dengue virus infection to increase the risk of severe dengue remains poorly understood. In this study, we used the live attenuated yellow fever (YF17D-204, hereon referred to as YF17D) vaccine to identify differences in the host response in obese compared to normal BMI individuals to acute flaviviral infection.

Methods:

We recruited 34 and 35 individuals with normal and above average BMI, respectively. To assess how obesity affects the host response to infection, we vaccinated these individuals using YF17D. We subsequently assessed and compared the clinical and molecular outcomes of vaccination between the two groups.

Results:

Proportionately more obese subjects experienced all systemic symptoms, myalgia and axillary lymphadenopathy after YF17D vaccination. Compared to normal BMI subjects, haematological analysis in obese subjects showed the following differences: Significantly elevated white cell at all time points measured. Lymphocyte counts were also high at both baseline and at day 4 (D4) after vaccination. Neutrophil and monocyte counts were higher at D4; neutrophil but not monocyte counts returned to levels comparable to normal BMI subjects at D6. Whole blood bulk RNA analysis is currently in progress.

Conclusion:

Our findings show that obesity increases the rate of symptomatic outcome with haematological changes suggestive of more reactive immune response to flaviviral infection compared to non-obese individuals.

076 Development of National Proficiency Testing Program to Improve the Quality of Dengue Viruses' Laboratory Diagnostic by Molecular Methods in Thailand

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Background:

Since 2009, The National Institute of Health of Thailand had developed the national-level proficiency testing scheme in DENV RNA detection for laboratory testing to ensure the accuracy of test methods and result as required by laboratory standard ISO 15189.

Objectives:

The aim of this work were supporting the extension of Dengue molecular testing to the medical laboratory network around Thailand and reduce the cost from participating in foreign EQA program.

Methods:

The testing materials were created by inoculating dengue virus into normal human serum. Samples were sent to participating laboratories twice a year. The program was developed according to ISO 17043 and open for applicants from government and private organizations. The participant numbers are increasing every year.

Result:

There were 18 and 20 laboratories participating in the pilot study between 2009-2010. The assessment result has excellent scores of 83%, 78%, 100% and 94% respectively. Borderline score 11%, 6% and unacceptable 6% and 16% in 2009. In recent years, the participants were increasing more than 90%. The assessment results showed that participants form 2011-2023 pass the assessing with excellent score 65–100%.

Conclusion:

Results of proficiency testing program from the beginning till present had showed the increasing and improvement of Dengue laboratory testing in Thailand. The laboratory must use the evaluation result to assess their quality of testing. Analysis of the cause solving problem will lead to continuous improvement of the quality system. The participating cost of this national PT program was 10 times lower than the foreign EQA.

077 Knowledge, attitude and practice of dengue vaccine among health care providers in Indonesia

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Background:

Dengue is the most prevalent arboviral disease in the world. Dengue vaccine has been introduced and licensed in endemic countries like Indonesia. Nevertheless the knowledge, attitude and practice (KAP) of health care providers toward the dengue vaccine were not yet widely understood. This study aim to assess the KAP of dengue vaccine among health care providers.

Method:

A cross-sectional study was conducted to assess the KAP of dengue vaccine among health care providers. Participants are health care providers from 3 provinces (D.I. Yogyakarta, Central Java, and Bali). Data were collected using a questionnaire. Data analysis was performed using descriptive statistics.

Results:

Of 88 health care providers, 73.9% are female, nurses and midwive accounted for (68.5%). The study revealed only 26.1% ever heard about dengue vaccine, among these 87% know that the vaccine is important and will prevent disease severity. About 89.8% participants agree if dengue vaccine will include in the NIP. 59.1% participants agree vaccine to be administered for children and adolescents. Related to practice, 85.2% health care providers willing to encourage neighbours, relatives and family to be vaccinated against dengue. Half of participants (58%) willing to start vaccinate themselves before encourages others. About 80.7% participants will support dengue vaccine program.

Conclusion:

Only 26.1% among health care providers know the present of dengue vaccine. However, most of health care providers think that the vaccine is important to prevent disease severity. They also agree and willing to support dengue vaccine program.

Key words: dengue vaccine, knowledge, attitude, practice, immunization

078 Cohort optimisation for maximum public health impact of vaccination with TAK-003: a case study with application in Thailand

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Background:

In contrast to many infectious diseases, dengue affects all ages and the epidemiological profile varies across countries. Vaccination program design should consider both routine and broad catch-up cohorts to achieve maximum public health impact. The study objective was to understand how to design optimal dengue vaccination strategies, using Thailand as a case study.

Methods:

Based on a deterministic compartment transmission model for TAK-003, various combinations of routine and catch-up vaccination strategies were tested to determine the influential factors on public health impact. The age range of 4-11 year-olds tested covered the Thai dengue incidence before the peak.

Results:

All vaccination strategies demonstrated a considerable public health impact with 41-57% and 47-70% of symptomatic and hospitalized cases avoided respectively, over a 20-year time horizon. The ages for maximum public health impact for routine vaccination was 8 (one age cohort considered), 6-7 (five cohorts considered) and 5-6 (ten cohorts considered) years, suggesting larger catch-up cohorts lower the starting age for routine vaccination. Under an illustrative vaccine price of $25/dose, which may vary by country, all vaccination strategies were cost-saving compared to no vaccination.

Conclusion:

Catch-up vaccination of additional age cohorts in the first year of vaccine introduction results in considerably higher public health impact and cost savings, with optimal routine age dependent on the number of cohorts. While results indicate that maximum public health impact can be achieved with routine vaccination between 5-8 years, real world practicalities (e.g. achievable coverage) should be considered in combination during vaccination program design.

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079 Exploring attitudes to research involving human subjects among Vietnamese university students: establishing a prospective longitudinal mixed-methods student cohort at the University of Medicine and Pharmacy at Ho Chi Minh City

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Background:

Research capacity is increasing in low/middle-income countries, with progressive development in the range and complexity of studies being undertaken. Senior stakeholders direct health-policy decision-making and ensure that research is conducted according to international standards for ethical and scientific quality. However to date there has been little exploration of the views of younger generations' around the ethics of research involving human subjects.

Methods:

We have developed a longitudinal mixed-methods cohort involving students from the University of Medicine and Pharmacy in Ho Chi Minh City, Vietnam, designed to explore students' views around clinical and public-health oriented research. We focus in particular on dengue, as an example of a specific locally relevant disease, and probe students' views on such topics as appropriate remuneration for research participants, involvement of vulnerable groups etc. We use a synergistic approach, involving deliberative engagement (science cafes, debates etc.) combined with formal quantitative and qualitative methods (surveys, focus group discussions and in-depth interviews).

Results:

A snapshot of the cohort and its activities after one year will be presented, involving 429 active students majoring in either Medicine or Public Health. Equal numbers of male and female students participated, primarily from southern or central Vietnam where dengue is endemic, and representative of the spectrum of socioeconomic groups.

Summary:

The cohort provides a unique resource to investigate the views of this important but hitherto underrepresented group in Vietnamese society. Feedback indicates a clear interest in contributing thoughts and ideas to the ongoing development of clinical research in Vietnam.

080 Association *Salmonella typhi* coinfection based on Tubex reactivity in dengue patient with dengue severities: focusing in TNF-α, IL-6, TLR-4 and TLR-6 plasma level

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Background:

Indonesia is an endemic area of dengue virus (DENV), typhoid, malaria, leptospirosis and other arboviruses. Therefore, the possibility of coinfection in DENV patients can occur. Co-infections may lead to severe manifestations, missed or delayed diagnosis and treatment of DENV infection. The aim of this study is to define incidence of coinfection in DENV patients with *Salmonella typhi* in Bengkulu, Sumatera, Indonesia 2020. In addition, we also evaluated characteristics of immune responses in coinfection DENV patients with different disease severities.

Method:

Adult subjects more than 16 years old with fever and other clinical symptoms of DENV less than 3 days were included in this study. DENV infection was confirmed by NS1 antigen test and RT-PCR. DENV disease severity was classified into DD and DHF based on hematocrite value. Tubex TF were conducted to confirm *Salmonella typhi* infection in the convalescent phase. The examination of TNF-α, IL-6, TLR-4, and TLR-6 was performed by ELISA method..

Result:

Sixty-three subjects met the study criteria and DENV-2 was the most dominant serotype. Monoinfection and coinfection cases were found in 24 subjects and 39 subjects respectively. The levels of IL-6, TLR-4, and TLR-6 in the monoinfected and coinfected groups showed significant differences.

Conclusion:

Coinfection caused an increasing in plasma IL-6, TLR-4, and TLR-6, whereas TNF-α and IL-6 caused more severe disease in DENV patients.

081 Molecular endpoints to assess vaccine safety and efficacy

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Abstract:

The Viral Research and Experimental Medicine Centre @ SingHealth Duke-NUS (ViREMiCS) is part of the SingHealth Duke-NUS Academic Medical Centre. Specializing in arboviruses like dengue and Zika virus as well as other emerging pathogens, ViREMiCS aims to advance the clinical translation of vaccines and therapeutics by working with academia and industry partners to validate and apply molecular indicators of safety and immunogenicity.

ViREMiCS has established a toolkit of ISO-accredited assays that measure conventional clinical trial endpoints like viral load, binding and neutralizing antibody titres, and T-cell response. These assays are tightly integrated with a suite of ISO-validated molecular tools that measure gene expression and cytokine levels with precision and have been brought to bear on clinical trials for vaccines and therapeutics against dengue virus, Zika virus and SARS-CoV-2. Furthermore, bioinformatics pipelines have been established to integrate multi-omics datasets to identify potential safety signals that correlate with adverse events, as well as to identify host response signatures for vaccine and therapeutic efficacy.

Collectively, ViREMiCS proposes a seamless framework which encompasses adaptive clinical trial design and application of molecular endpoints for safety and immunogenicity to generate a high quality evidence base for regulatory decision making to support licensure of vaccines and therapeutics.

082 A pre-membrane protein D29V substitution attenuates a clinically-tested dengue vaccine strain

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Background:

After decades of dengue vaccine development, our understanding of the molecular basis of virus attenuation remains incomplete. Here, we explored the genetic and mechanistic basis of attenuation of dengue virus serotype 2 (DENV2) PDK53 strain that is a major component of a licensed dengue vaccine, TAK003.

Methods:

We constructed an infectious clone of DENV2 16881, the wild-type DENV from which PDK53 was derived. Using site-directed mutagenesis on the 16681 infectious clone, we generated 16681 mutants, each bearing one of the 5 amino acid substitutions and 1 nucleotide change in the 5'UTR for attenuating mutations.

Results:

In addition to the previously identified NS1 G53D mutation, we identified the mutation on position 29 of the prM protein, where an aspartate (D) to valine (V) substitution altered both the rate of viral RNA replication as well type-I interferon (IFN) induction; the latter functionally limits plaque size of the mutant virus. This prM mutation impaired neither virion assembly nor virus maturation. Instead, immunoprecipitation with mass spectrometry found that wild-type prM bound host high mobility group box 1 (HMGB1) protein to localize this protein in the cytosol whereas the D29V prM mutant lost the ability to bind HMGB1. We also observed that binding of wild-type prM to HMGB1, a ubiquitously expressed protein involved in gene transcription regulation, was critical to limit transcriptional response to wild-type 16681 infection. The loss of binding by D29V prM resulted in differential expression of large number of genes upon mutant and PDK53 infection, amongst which are type-I IFN and the IFN stimulated genes that attenuated infection.

Conclusion:

The interaction between prM and HMGB1 is a hitherto undefined mechanism of DENV evasion of virus-restrictive host response to infection. We suggest that this interaction could be exploited for developing new attenuated DENVs.

083 Community members' acceptance of dengue vaccination introduction post COVID-19 pandemic era in Indonesia: a qualitative study

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Background:

In the context of COVID-19 pandemic and massive vaccine rollout, immunization program for other diseases seems challenging. This research aimed to explore communities' acceptance of dengue vaccine introduction post COVID-19. Health belief model (HBM) was used to guide the discussion.

Methods:

The study was descriptive qualitative and conducted in three provinces of Yogyakarta, Bali, and Central Java. In each province, two districts were selected to represent the urban and rural settings, while in each district, two primary health centers (puskesmas) were selected to conducting two focus group discussions (FGDs). The two FGDs were held with parents of under 9 year-old children and parents of adolescence. Thematic analysis was undertaken for 24 FGDs involving each 8-10 participants.

Results:

FGD participants tended to compare the susceptibility and seriousness of COVID-19 and dengue to accept the vaccination's benefit. While the fatality of COVID-19 was huge and happened very fast, it was not with dengue. Fatality was seen as hearsay; participants rarely witnessed the dead of the relatives from dengue. One week hospitalization following dengue infection meant that dengue can be treated. As with COVID-19, they accepted the dengue vaccine if they are included in the National Immunization Program (NIP). The NIP inclusion indicated disease severity, the urgency and seriousness of the government, the safety of the vaccine, and the guarantee that they are free.

Conclusions:

This study highlights the complication of new vaccine introduction post pandemic era. The findings are needed for the stakeholders' engagement to development communication strategies for vaccine acceptance.

Key words: dengue vaccine, acceptance, community, pandemic

084 Species- and organ-specific micro-evolution of dengue virus in *Aedes aegypti* and *Aedes albopictus*

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Background:

DENV is transmitted in an urban cycle between humans and *Aedes aegypti (Ae. aegypti)* or *Aedes albopictus (Ae. albopictus)* mosquitoes, both of which are present in most Asian cities. While Ae. albopictus has been associated with a few dengue epidemics over the past decades, almost all major epidemics of dengue haemorrhagic fever have occurred only in areas where *Ae. aegypti* is present. The reason for this difference in potential for epidemic transmission between the two mosquito vectors is unclear. One plausible explanation is *Ae. aegypti* selects for DENV populations that have better potential for epidemic transmission.

Methods:

To test our hypothesis that the genome diversity of DENVs differ significantly between *Ae. aegypti* and *Ae. albopictus*, we performed next-generation sequencing of DENV2 populations isolated 14 days post-infection from the midguts and salivary glands of *Ae. aegypti* and *Ae. albopictus* mosquitoes infected with the same DENV2 blood meal.

Results:

Whilst *Ae. aegypti* and *Ae. albopictus* share the same consensus changes in the dengue genome after a mosquito passage, significantly more SNVs were detected in Ae. albopictus compared to *Ae. aegypti* in both the midgut and salivary glands. We show that the differences *Ae. aegypti* and *Ae. albopictus* exerts on the micro-evolution of DENV occurs primarily in the midgut, indicating inter-species differences in this anatomical and physiological barrier for DENV transmission.

Conclusions:

Here, we provide a molecular basis that DENVs transmitted predominantly in an *Ae. aegypti*-human cycle may produce viruses genetically distinct from those transmitted predominantly in an *Ae. albopictus*-human cycle. Future studies on the emergence of virulent strains evolving out of species-specific selective pressure on the DENV genome may prove insightful.

085 An overview of Vietnamese medical students' perceptions and attitudes towards dengue human challenge studies

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Background:

Human challenge studies are a novel concept in Vietnam. In addition to the views of senior stakeholders, investigating the opinions of younger generations is equally important to understand the acceptability of such studies in the country. As part of the activities of the University of Medicine and Pharmacy at Ho Chi Minh City Student Cohort, we are exploring the views of Vietnamese medical students toward human challenge studies, with a special focus on dengue.

Methods:

We used a deliberative engagement approach to provide students with a platform to access and discuss information on the human challenge study concept and implications for dengue vaccine development. Following several science cafes/debates and role-play events, 68 students (35 female, 33 male) attended either a focus-group discussion or an in-depth interview to explore their attitudes and willingness to participate in human challenge studies.

Results:

In general, students' attitudes to human challenge studies were positive. The potential for scientific advancements leading to enhanced community health and better disease control were the most highly valued characteristics of such studies. While acknowledging uncertainty around the potential risks, both the reputation of the research institution and the fact of approval by a recognized ethics committee were crucial factors influencing students' consideration of whether to participate in a dengue challenge study.

Conclusion:

This study provides an overview of factors influencing Vietnamese students' willingness to participate in human challenge studies, especially for dengue. These insights indicate the complexity of students' motivations to participate in dengue human challenge studies.

086 Assessment of positivity rate of Aedes aegypti and Aedes albopictus in western province, Sri Lanka

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Background:

In Sri Lanka, it is recognized that the primary and the secondary vectors for dengue transmission are *Aedes aegypti* and *Aedes albopictus* respectively which are invasive mosquitoes. All the districts are potentially suitable for the survival and establishment of both vectors. A desk review was conducted to analyze the vector positivity proportion in Western Province including all three administrative districts from 2018 to 2021 to establish the receptivity in the area to assist vector control interventions.

Methods:

Vector positivity data were collected from Monthly house to house vector immature stages surveillances carried out by National Dengue Control Unit and local health sectors covering all the potential and existing breeding places in the study area to collect larval and pupal stages of the two vectors. The number of positive containers for any immature stage was recorded and identified to species level.

Results:

During the entomological surveillances conducted the *Ae. aegypti* positivity rate was gradually increased from 31% to 42% through the study period in Colombo district while in Gampaha and Kaluthara districts the same rate was marginally fluctuated around 15% and 3% respectively.

Conclusion:

The increase trend of the *Ae. aegypti* proportion was vividly seen in Colombo district which is undoubtedly the most urbanized area of all with higher population density and land use. However, in Gampaha and Kaluthara districts which are with less population density, the increments of *Ae. aegypti* proportion were occurred moderately with minor fluctuation during all four years. Due to the continuous heavy urbanization rate *Ae. aegypti* is gradually replacing the secondary vector, *Ae. albopictus* in Colombo district when compared the vector positivity data with the other two counterpart districts. The vector control interventions should be adjusted accordingly while identifying the different vector bionomics possessed by the two vectors.

Key words: *Aedes aegypti*, Aedes albopictus, positivity, dengue, surveillance

087 The effect of face-to-face educational intervention on acceptance of dengue vaccination among health care providers and health care workers in Indonesia

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Background:

The acceptance of dengue vaccine and vaccination among health care providers and health care workers play an essential role in the success of the dengue infection prevention program. To evaluate baseline acceptance of dengue vaccine and the effect of face-to-face educational toward vaccine dengue acceptance among the health care providers.

Methods:

This study was a quasi-experimental with pre- and post-test designed by involving 88 healthcare providers, including general physician, nurse, nutritionist, and health environment personnel from 12 primary health centers from Bali, Yogyakarta and Central Java provinces. A valid and reliable questionnaire was used to evaluate the acceptance at pre-intervention (face-to-face educational intervention) and post-test immediately and day-60 after intervention. day). A descriptive and paired t-test statistical method was applied to examine the significant differences (pre- and post-test) among the respondents.

Results:

The study showed 77.3% and 79.5% of subjects have acceptance the current marketed dengue vaccine by health workers and health providers, respectively. There is an increase acceptance among health workers and health providers toward dengue vaccine (p-value < 0.05), immediately after intervention (92.0% and 90.9%, respectively) and their acceptance still persistence after 60 days of educational intervention (94.3% and 93.2%, respectively)

Conclusion:

Face-to-face educational intervention has significant effect to increase the health care providers and health care workers toward acceptance of dengue vaccine and vaccination.

088 Persistent immune thrombocytopenia following Dengue fever with warning sign in limited facility—a pediatric case report

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Abstract:

Immune thrombocytopenica (ITP) is an autoimmune disorder characterised by autoantibody mediated immunologic destruction of normal platelets. It can be either primary or secondary due to other medical disorders. Thrombocytopenia is a common laboratory finding in dengue fever. However, platelet count usually normalises during the recovery phase of dengue infection. Persistent thrombocytopenia requires further investigations. Here, we report a case of ITP following dengue infection responsive to corticosteroid treatment.

A previously healthy 10 years old boy was admitted to our institution for Dengue fever, which was confirmed by a positive Dengue NS-1 Antigen testing and Dengue Immunoglobulin M (IgM). He was treated with intravenous fluid and serial monitoring of full blood count. His platelet count remained low at 1 to 6 × 10^9/L by second week of infection. There was no history of recurrent infection, joint pain, appetite and weight loss, consumption of traditional medications or significant family history of bleeding disorders or malignancy. Lymph nodes were not enlarged and hepatosplenomegaly not present. Peripheral blood films confirmed thrombocytopenia. without blasts cells. The immature platelet fraction (IPF) test confirmed the diagnosis of ITP. He was given metilprednisolon pulse therapy for three consecutive days because there was no intravenous immunoglobulin (IVIG) therapy available. The platelet count showed improvement to 34× 10^9/L. The full dose maintained for two weeks and the platelet count back to normal range. Persistent thrombocytopenia in dengue warrants further investigations to rule out secondary cause. Corticosteroids can be alternative when IVIG is not available for ITP that induced by dengue.

089 Updated Impact on Dengue Incidence After the Large-Scale Deployment of Wolbachia-infected Aedes aegypti in Yogyakarta Province, Indonesia

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Background:

Field release of *Wolbachia* infected *aedes aegypti* in Yogyakarta city have previously demonstrated the reducing of dengue incidence. Following up this success, *Wolbachia* deployment was then scaled into two neighbouring districts which give highest contribution of dengue cases in the province level. We described the updated impact of *Wolbachia* intervention towards dengue incidence in these three areas.

Methods:

In Yogyakarta Province, *w*Mel *Wolbachia*-carrying mosquitoes deployed in three area i.e., Yogyakarta City, Bantul District and Sleman District. The release was conducted in cascade methods which started on 2016 in Yogyakarta city and scaled up into city level in 2020, followed by deployment in Sleman and Bantul in 2021 and 2022 respectively, the release covers in total 228.4 km2 with more than 2 million inhabitants in province level. Passive surveillance data on notified hospitalised dengue cases was used to evaluate the epidemiological impact of *Wolbachia* deployments, using interrupted time series analysis.

Results:

The monitoring result showed *w*Mel *Wolbachia* percentage in Yogyakarta city stayed at more than 80% until 2022. Rapid and sustained introgression into local Ae.aegypti population in Sleman and Bantul District was achieved. Exploratory analysis showed that monthly dengue incidence in Yogyakarta city was reduced from 15.3 per 100.000 population in 2006-2017 to 5.9 per 100.000 population in 2018-2020 and 2.6 per 100.000 population in 2021-2020. In Sleman district we observed a low dengue monthly incidence in 2022 i.e., 2.6 per 100.000 population from previously 4.1 per population in 2009-2021.

Conclusions:

We demonstrate a stable reduction in dengue incidence two years after *Wolbachia* deployment in Yogyakarta city and a low dengue incidence Sleman districts after 12 months following successful introgression of Wolbachia into local Ae. aegypti populations deployment of Wolbachia. These findings support the effectiveness of this new *Wolbachia* infected *Ae. aegypti* approach for dengue control.

Keywords: *Aedes aegypti*; Indonesia; *Wolbachia*; dengue incidence; long term impact

090 A Cross-Sectional Study of Knowledge, Attitude, and Practice towards Dengue and Dengue Vaccine among Rural and Urban Community in Indonesia

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Background:

Evidence of good knowledge of the community is essential to support all the preventive actions needed for dengue. This study aims to assess the knowledge, attitude, and practice of the Indonesians' rural and urban communities on dengue and dengue vaccines.

Methods:

The design of this study is a cross-sectional quantitative survey administered in three provinces in Indonesia, representing rural and urban communities. A total of 380 participants completed the structured questionnaire after signing a consent. The analytic procedure conducted is descriptive statistics.

Results:

Almost half of the participants stated the cause of dengue fever is the mosquitoes with signs and symptoms are fever and red spots on the skin. Similarly, for preventive action, they choose to have good sanitation and fogging if needed, while only 71% choose vaccination.

Regarding dengue vaccination, only 37% stated had ever heard and noted it is for preventive action and to reduce the number of cases. The majority of the participants agree to have the dengue vaccine included in the government program as a preventive action; however, less than 60% approve of giving the vaccination to toddlers, children, and adolescents. In practice, 81,8% of participants will encourage neighbors, relatives, and family. About 62,9% will actively support the dengue vaccine program and 60,7% will have vaccinated themselves.

Conclusion:

The findings of this study suggest that the community in Indonesia demonstrates modest knowledge, attitudes, and practices toward dengue and dengue vaccines. These findings highlight the importance of actions needed for the high burden of dengue, including vaccination.

091 Severe Dengue with an Increase Hemoglobin Level in Infant, A Rare Case in Rural Areas of Cianjur, Indonesia

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Background:
Dengue virus infection is caused by the dengue virus which has four serotypes. Severe dengue is defined as dengue with one or more of the following conditions; plasma leakage leading to dengue shock syndrome and/or fluid accumulation with respiratory distress, severe bleeding, and organ involvement. Severe dengue in infants is a rare case. This case identifies the signs of severe dengue in infants in rural areas with limited facilities.

Case:
A seven-month-old boy was hospitalized in Cimacan District General Hospital because of suffering from a high fever and persistent of vomiting for three days of admission. From the physical examination, the patient looks lethargic, heart rate of 150 beats per minute, blood pressure of 70/50 mmHg, temperature of 40^{o}C, hepatomegaly, petechiae on upper extremities, cold extremities, and oliguria. In the hematological parameter test, Hemoglobin (Hb) 13g/dL, hematocrit (Hct) 38.4%, leucocyte 3410/mm3, thrombocyte 37.000/mm3, and positive NS1Ag. Pleural effusion was found on the right lateral decubitus chest X-ray. The patient was resuscitated with Ringer's lactate 20ml/kg BW within 30 minutes, but the shock persists. Blood gas analysis, blood glucose, and calcium were normal but the Hct was elevated. Colloid 10ml/kg BW was given within 60 minutes then the hemodynamic and diuresis were improved. On the seventh day of the fever, the clinical condition was stable. The patient recovered with a Hb level was 8.9g/dL, Hct 26.3%, leucocyte 5940/mm3, and thrombocyte 82.000/mm3.

Conclusions:
An increased hemoglobin level in the infant was associated with severe dengue. Early detection was needed for better outcomes.

Keywords: Severe dengue, infants, pleural effusion, hemoglobin level

092 Dengue Fever with Coinfection in Children: Case Series in an Endemic and Low Resource Hospital

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Background:
Community bacterial coinfection with dengue in children is not been widely studied, but proven to prolong hospitalization and increase the severity and mortality, especially in a low-resource hospital.

Method:
This is a case series of dengue infections in children who had evidence of coinfection.

Case illustration:
The first patient was an 8-year-old girl who came with a six-day fever and stable vital signs, but the fever was persistent the next day and worsened to a shock state. The esterase leukocyte in her urine is positive. The second patient was a 13-year-old girl who complained of a five-day fever and septic shock. She also had profuse diarrhoea and increasing leukocytes in her faecal sample. The last patient was a 5-year-old girl who came with a four-day fever, decreasing oxygen saturation, tachypnea, and the sign of shock. Her lung x-ray showed infiltrates but no pleural effusion and she had increasing procalcitonin level. All of these cases showed thrombocytopenia which getting subsequently lower until the 3rd to 5th days of hospitalisation. The first two cases recovered after 5-6 days, but the last case was unresolved but discharged against medical advice.

Conclusion:
Bacterial coinfection with dengue can predict the severity of the disease. The atypical manifestations of dengue infection, such as persistent fever for more than 5 days, diarrhoea, and flu-like symptoms should give more awareness to a more severe condition and the consideration to be more aggressive treatment, such as the use of vasopressor in treating the septic shock and using antibiotics.

093 Modeling the impact of the tetravalent dengue vaccine TAK-003 in a dengue outbreak response: The Sri Lanka experience

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Background:

In 2017, an outbreak of DENV-2 occurred in Sri Lanka. This outbreak coincided with the first year of an ongoing phase 3 trial (NCT02747927) examining the efficacy of two doses of a tetravalent dengue vaccine, TAK-003, also taking place in Sri Lanka. Using data from the trial and the epidemiology of the Sri Lanka outbreak, we used a model to evaluate the potential impact of TAK-003 on virologically confirmed dengue (VCD) cases and hospitalizations during an outbreak situation.

Methods:

An age-structured, host-vector, spatial and stochastic transmission model was paired with the trial's vaccine efficacy (VE) data (95% against VCD and 97% against hospitalized VCD) and the epidemiology of the 2017 outbreak. Key assumptions for the baseline scenario included 30 days from outbreak start until vaccination initiation, and a vaccine coverage rate of 65% within 90 days. Sensitivity analyses assessed the robustness of our results across uncertainties in VE, vaccination start date and intensity, and probability of hospitalization.

Results:

All vaccination scenarios were associated with a reduction in VCD and hospitalizations, with a 69% and 73% reduction using the baseline scenario compared with no vaccination, respectively. Key drivers associated with reduction in VCD included vaccine coverage, the speed of vaccination initiation, and vaccine performance. When these factors were combined, an extreme high scenario (vaccination initiated at Day 15, 80% coverage rate, baseline VE) resulted in 80.3% and 82.3% reduction in VCD and hospitalizations, respectively, compared with no vaccination.

Conclusion:

Results indicate that TAK-003 could help with dengue outbreak control.

Funding: This study was funded by Takeda.

094 Knowledge, Attitudes and Practices Toward Dengue Fever, Vector Control, and Vaccine Acceptance Among the General Population (GEMKAP): Asia-Pacific Country Subgroup

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Background:

Dengue is associated with a significant public health burden. As effective dengue vaccines become available, it is important to identify the key factors that motivate people to vaccinate. Here we present data from the Asia-Pacific GEMKAP subgroup.

Methods:

A cross-sectional, quantitative, electronic survey was administered among a nationally-representative adult population (n=3,800) in Latin America and Asia-Pacific.1 The Asia-Pacific subgroup consisted of Indonesia (n=600), Malaysia (n=400), and Singapore (n=400). Willingness to vaccinate against dengue and Knowledge, Attitudes, and Practices (KAP) towards dengue disease, vector control, prevention, and vaccination was measured on a standardized 0-100% scale. The Capability, Opportunity, Motivation for Behavior Change (COM-B) framework was used to identify factors correlated with willingness to vaccinate through regression analysis.

Results:

Across Asia-Pacific, KAP scores were low for Knowledge (47%) and Practice (47%) and moderate for Attitude (63%). Only 41% of respondents reported high willingness (Score: 8-10/10) to vaccinate against dengue. Indonesia (51%) had the highest willingness to vaccinate, followed by Malaysia (40%) and Singapore (25%). In all countries, key factors associated ($p<0.001$) with willingness to vaccinate included previous dengue, positive attitude on vaccines, availability of subsidies and incentives of vaccines to the public and trust in the healthcare system and government. In Indonesia, recommendations from healthcare practitioners and the opinions of community and religious leaders were additional drivers to increase vaccine uptake.

Conclusion:

The KAP and COM scores across countries suggest the need for a common multi-pronged approach across Asia-Pacific countries, with some country-specific customization, including education, to increase vaccine acceptance and ultimately reduce dengue burden and improve outcomes.

This study was funded by Takeda Pharmaceuticals International AG Singapore Branch.

References: Shafie, A.A.; Moreira, E.D., Jr.; Di Pasquale, A.; Demuth, D.; Yoong, J.Y.S. Knowledge, Attitudes and Practices toward Dengue Fever, Vector Control, and Vaccine Acceptance Among the General Population in Countries from Latin America and Asia Pacific: A Cross-Sectional Study (GEMKAP). Vaccines 2023, 11, 575. https://doi.org/10.3390/vaccines11030575

095 Discovering the Synergistic Combinations of Repurposed Drugs to Treat Dengue

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Abstract:
Dengue virus (DENV) cases have increased worldwide, and Singapore alone witnessed more than 23,267 total dengue fever cases so far this year. There are no specific antivirals against DENV for use in clinics and vaccine development is complicated by a lack of complete protection against all four serotypes. Since antiviral treatments are of paramount importance, drug repurposing represents a potentially viable approach panorama, where candidate drug compounds could be identified and optimized. We tested 12 compounds identified on the basis of the efficacy of compounds of similar classes for their ability to reduce the replication of DENV. We found 2 inhibitors that exhibited significant anti-dengue activity with limited cytotoxicity. Notably, multiple synergistic combinations in the nanomolar range of these 2 compounds with the already existing anti-dengue drugs were identified as a potential proof-of-concept for combination therapy approaches. Furthermore, we explored the mechanism by which the drug combination may be acting in order to open the door for new approaches to treating dengue.

096 Comparison of the Severity of Dengue Infection in Children with a History of Covid-19 Infection: Observational Study from Adventist Hospital, Bandung

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Introduction: Indonesia got its first case of COVID-19 infection in March 2020 and was quickly declared a pandemic. However, apart from the COVID-19 pandemic, Indonesia as a tropical country has another viral infection problem, namely Dengue. In a previous study, patients with positive dengue serology obtained positive results for the COVID-19 antibody test, however when they were tested for rt-PCR, they obtained negative results, so that a cross reaction was suspected in cases of dengue co-infection with COVID-19. Conditions coinfected with COVID-19 and dengue tend to have higher morbidity and risk of death, often accompanied by complications such as septic shock, ARDS (Acute Respiratory Distress Syndrome), and multi-organ failure. Previous research explained that children with confirmed dengue who had a history of exposure to SARS-CoV-2 showed milder symptoms of the course of the disease compared to those without a history of exposure to SARS-CoV-2.
Therefore, researchers **wanted to compare the severity of dengue in children who tested positive and negative for Ig-G Sars-CoV-2 antibodies**.

Methods: This is a **case-control observational study** conducted at the Children's Department of Bandung Adventist Hospital in August 2022. All children aged <18 years with laboratory-confirmed dengue (NS1 antigen detection and/or anti-dengue antibody) were enrolled in the study. All enrolled children were tested for evidence of old or recent SARS-CoV-2 infection using PCR and/or Rapid Diagnostic test. Disease severity is classified on a clinical basis and grouped according to the provisions of the Indonesian Ministry of Health.
Statistic analysis. Data entry was performed in Microsoft excel 2020 (Microsoft, Redmond, WA), and statistical analysis was performed in SPSS software version 22. Categorical variables are expressed as percentages. Continuous variables are described as mean and standard deviation or median and interquartile range. **Proportions were compared between groups using the x2 test or Fisher's exact test, whichever is applicable. Numerical variables were compared between the two groups by Student's t-test or Mann- Whitney U test, depending on the normality of the distribution. P value <0.05 was considered significant**

Discussion: Present study showing there is no significance differences in severity of cases (based on diagnosis) between children who has recent infection of Sars-Cov-2 with children who has notalthough the severe cases is found higher in the Ig-G positive group. There is hypothesis that thereis possibility of the cross reactivity of COVID-19 and dengue that possibly cause mimicry of COVID-19 antibody. Therefore the presence of Sars-Cov-2 antibody might decrease severity of dengue.
Previous study also found the cross-reacticity of the two viruses will result in false positive result when it comes with both viruses co-infection case.
Clinical symptoms in Ig-G positive group and Ig-G negative group shows no significance differences.The similar result also found in previous study. Previous study shows dengue with previous COVID-19 infection often show the warning signs than the control group but shows no significant difference.
Laboratory profile in Ig-G positive and Ig-G negative group also shows no significance differences. In Ig-G positive group lowest platelet count is found to be not significant lower than the Ig-G negative group. This result also found in previous study that says the abnormalities in hematological examination is similar between the two groups.
The presence of MIS-C in post COVID-19 infection children can make it difficult to differ with dengue shock syndrome.

Conclusion: There is no difference severity of dengue in children with previous COVID-19 infection.
The hypothesis of cross-reactivity between the two viruses can not confirmed from the study.
This study has limitation with the small sample size that might cause some bias in the result, therefore further research needed to confirm the result.

097 Spatiotemporal Prevalence and Characterization of the Lineage I Insect-Specific Flavivirus, Quảng Bình Virus, Isolated from *Culex* spp. Mosquitoes in Singapore

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Abstract:

Insect-specific flaviviruses (ISFs) are flaviviruses that can replicate efficiently in arthropods but are unable to replicate in vertebrate hosts. This contrasts with medically important flaviviruses, such as dengue (DENV), Zika (ZIKV) and West Nile (WNV) viruses. As ISFs do not cause disease in humans, they are not a human health concern. Importantly, ISFs have uncovered insights into flavivirus evolution, virus-host transmission mechanisms and various biotechnological applications, resulting in an exponential increase in ISF discovery over the past 15 years. Using the established MAVRIC assay (**m**onoclonal **a**ntibody against **v**iral **R**NA **i**ntermediates in **c**ells), we report the first isolation of an ISF in Singapore from a pool of Culex gelidus mosquitoes that showed a partial NS5 sequence homology of 95% to Quảng Bình virus (QBV). QBV is an ISF first isolated from Vietnam in 2009 and has since been detected recurrently throughout China. To determine the prevalence of QBV in Singapore, a total of 17,070 mosquitoes, in 721 mosquito pools across 17 locations, were screened using a QBV-specific RT-qPCR assay. A total of 37 QBV-positive pools of mosquitoes were detected in northwest, west, central and northeast regions of Singapore. Interestingly, QBV was detected recurrently in northwest and west regions between a 12-month and 4-month period, respectively. Of these 37 pools, QBV isolates were obtained from 3 Culex gelidus pools. Like other ISFs, these QBV isolates grew efficiently in C6/36 mosquito cells but failed to replicate in a Vero vertebrate cell line. We also show that QBV was able to inhibit DENV2 and WNVKUN in C6/36 cells by 2.9 logs and 1.8 logs respectively. This report represents the first spatiotemporal study of an ISF in Singapore and highlights QBV's potential as a biological control against medically important flaviviruses.

098 Clinical implications of platelet indices in patients with dengue and malaria infections

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Background:

Dengue hemorrhagic fever (DHF) and malaria are significant infectious diseases. Although the clinical significances of platelet indices (PIs), biomarkers of platelet activation, have been studied in various diseases, clinical implications in patients with dengue and malaria have not been considerably examined. We investigated the potential roles of PIs in patients with DHF, *Plasmodium vivax* and *P. falciparum* malaria, and admitted to the Hospital for Tropical Diseases, Bangkok, Thailand.

Methods:

A total of 219 eligible patients, consisting of 52 with DHF, 71 with P. vivax, and 96 with *P. falciparum* were examined.

Results:

Upon admission, we found that no significances were observed in platelet distribution width (PDW), plateletcrit (PCT), or platelet count (PC) between patients with *P. vivax* and *P. falciparum*. Increasing of mean platelet volume (MPV) was observed only in *P. falciparum* malaria. Comparative studies of PIs in study patients illustrated that PCT and PC in DHF were statistically lower than malaria patients. We noticed that MPV in DHF was significantly lower than *P. falciparum*. In addition, we indicated that no statistical alterations in PIs among those patients in different groups during the first 4 days of admission.

Conclusions and Recommendations:

Nonspecific clinical manifestations in patients with DHF, and malaria could be observed and overlapped with other tropical diseases. Although significant reductions in PCT and PC in DHF might be a clue for differential diagnosis of malaria, the use of MPV and PDW might be impractical. We suggest that appropriate laboratory diagnoses for malaria and dengue infections are still crucial for the differential diagnosis of acute febrile patients who have a risk of dengue or malaria infections. To clarify clinical implications of PIs in patients with dengue and malaria, further investigations are needed, particularly in patients with different severities, levels of health care settings, and geographical areas.

Keywords:

Dengue hemorrhagic fever, *Plasmodium falciparum* malaria, *Plasmodium vivax* malaria, platelet indices, potential prognostic marker, Thailand

099 Genetic Diversity and Dispersal of DENGUE Virus among Three Main Island Groups of the Philippines during 2015–2017

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Abstract:

Dengue has been one of the major public health concerns in the Philippines for more than a century. The annual dengue case burden has been increasing in recent years, exceeding 200,000 in 2015 and 2019. However, there is limited information on the molecular epidemiology of dengue in the Philippines. We, therefore, conducted a study to understand the genetic composition and dispersal of DENV in the Philippines from 2015 to 2017 under UNITEDengue. Our analyses included 377 envelope (E) gene sequences of all 4 serotypes obtained from infections in 3 main island groups (Luzon, Visayas, and Mindanao) of the Philippines. The findings showed that the overall diversity of DENV was generally low. DENV-1 was relatively more diverse than the other serotypes. Virus dispersal was evident among the three main island groups, but each island group demonstrated a distinct genotype composition. These observations suggested that the intensity of virus dispersal was not substantive enough to maintain a uniform heterogeneity among island groups so that each island group behaved as an independent epidemiological unit. The analyses suggested Luzon as one of the major sources of DENV emergence and CAR, Calabarzon, and CARAGA as important hubs of virus dispersal in the Philippines. Our findings highlight the importance of virus surveillance and molecular epidemiological analyses to gain deep insights into virus diversity, lineage dominance, and dispersal patterns that could assist in understanding the epidemiology and transmission risk of dengue in endemic regions.

Keywords: dengue virus; evolution; molecular epidemiology; genetic diversity; phylogeography

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