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On 21 June 2017, Dean Pratap Singhasivanon chaired the Tropical Medicine Alumni Association (TMAA) Annual General Meeting 2017 hosted by the Faculty of Tropical Medicine, Mahidol University, Parasitology and Tropical Medicine Association of Thailand and Tropical Medicine Alumni Association. The main purpose of this meeting was to report the overall operation. There was also a special lecture by distinguished speaker Dr. In Kyu Yoon, Deputy of Science, IVI Director, Global & Aedes - Transmitted Diseases Consortium (GDAC) on the topic of "ZIKA in the Presence of Dengue" at Chalermprakiat conference room, 5<sup>th</sup> floor, Chalermprakiat building, Faculty of Tropical Medicine, Mahidol University.





























On 29 March 2017, Prof. Dr. Polrat Wilairatana, Director of the Hospital for Tropical Diseases, Faculty of Tropical Medicine, Mahidol University chaired the special event of the year, "the 10th Sornchai Looareesuwan Oration". On this occasion, Prof. Dr. Prapon Wilairatana gave a special talk on the topic of "Quest for an ideal antimalarial - a long march" at Chalermprakiat conference room, 5<sup>th</sup> floor, Chalermprakiat building, Faculty of Tropical Medicine, Mahidol University.





Prof. Moe Moe San and delegations from University of Medicine-1, Yangon, Myanmar paid a visit to the Mahidol Bangkok School of Tropical Medicine (Mahidol-BSTM), Faculty of Tropical Medicine, Mahidol University and Mahidol Oxford Tropical Medicine Research Unit (MORU) during 8 - 9 June 2017.



# Remote, rural populations in Myanmar receive: Malaria Consortium seals partnership with Myanmar improved healthcare



Considerable progress has been made in reducing malaria in Myanmar. However, it remains a significant public health issue in a country which still has the highest incidence of the disease in the Greater Mekong Sub-region.

Access to health care is limited, especially in the rural areas and trained community health workers step in to support different diseases. As Myanmar moves towards elimination, the need to ensure continued engagement of village health volunteers and sub-national health care providers is crucial.

In response, Malaria Consortium piloted the introduction of integrated community case management (iCCM), which includes diagnosis and treatment of three diseases; malaria, diarrhoea and pneumonia, combined with screening for malnutrition. The pilot covered three townships in the remote rural areas of western Myanmar's Sagaing region, Kalay, Pinlebu and Banmauk, where lack of access to health facilities can prove fatal for children under five.

As Myanmar benefits from an existing network (established by the Ministry of Health and Sports) of local villagers who act as malaria volunteers, Malaria Consortium built on this network by retraining them to deliver iCCM to their communities. While providing volunteers with additional skills, this approach has a potential benefit of retaining their existing expertise.

Results demonstrate that malaria volunteers have been successful in diagnosing and treating childhood illnesses, screening for malnutrition, while remaining vigilant about increasingly rare malaria cases. Moreover, the participation and cooperation of key government departments - NMCP, Child Health and Development Division, Nutrition Development and Research Division — in this pilot has been vital to the project's success. At a dissemination meeting in July 2017 all stakeholders will be informed of lessons learnt and recommendations.

The pilot's success is reflected in a grant Malaria Consortium recently won from Comic Relief and GSK and which will continue to support the populations of Sagaing region. The project will cover three additional : specialists in Africa and Asia. townships (Kathar, Wuntho and Kawlin) for the next two years.

potential to become a feasible and effective strategy for extending \*medical entomology starting in August 2017, one being selected from the Myanmar's health services to remote communities and improving the health countries of the Greater Mekong sub-region and one from South Asia. It is our of these communities in line with the Global Goals for Sustainable Development. This new project will inform policy decision on integrated community case management implementation in Myanmar."

# Government



Malaria Consortium has officially signed a new Memorandum of Understanding with the Department of Public Health and Ministry of Health and Sports Myanmar, paving the way for future collaboration

and project implementation.

The agreement is significant as it widens the scope of work Malaria Consortium can conduct and further strengthens our special relationship with the Myanmar Government.

In addition to working with the National Malaria Control Programme, the memorandum allows Malaria Consortium to work closely with the Departments of Child Health, Nutrition, Maternal Health, Health Emergencies and Disasters, across all of Myanmar.

"This memorandum is a great honour," said Malaria Consortium Asia Director Siddhi Aryal. "It means we can continue to support the Republic of the Union of Myanmar in the areas of surveillance, operational research, quality system service delivery, policy and health emergencies while broadening the scope of engagement in supporting the expanding health systems in the country."

For more information, visit: https://goo.gl/xHhdN3

# Dr. Sylvia Meek's legacy lives on in scholarship for entomology students

Malaria Consortium is proud to announce its partnership with Faculty of Tropical Medicine (FTM), Mahidol University to continue Sylvia Meek's legacy through the Dr. Sylvia Meek FTM Scholarship for Entomology.



The Scholarship for Entomology has been set up in the memory of Malaria Consortium's Global Technical Director, whose untimely passing away in 2016 has left a big void in the fight against infectious diseases and malaria in particular.

Both Malaria Consortium and FTM are committed to ensuring Sylvia's values are carried on by Asia's future entomologists. Sylvia was a great scientist, her dedication and compassion were an inspiration to her associates and colleagues and her legacy will support a new generation of public health

In Asia, FTM will be hosting the scholarship, which will support two students Siddhi Aryal, Malaria Consortium Asia Director said, "iCCM has the through a two-year Masters' programme in tropical medicine specialised in intention for this scholarship to be in place for at least a second intake in 2018.

The scholarship will start on 15 August 2017.

Funding for the pilot came from Vitol Foundation and UK Aid from the UK : For more information, visit: http://www.malariaconsortium.org/who\_we\_are lovernment. The new two-year project is funded by Comic Relief and GSK. 🔭 /dr-sylvia-meek-faculty-of-tropical-medicine-scholarship-for-entomology.htm

# for elimination



Malaria Consortium technical experts led the submission of a recently published peer-reviewed article on malaria surveillance strengthening in Cambodia through a web-based upgraded malaria information system (MIS).

The article, published in JMIR Public Health and Surveillance, is titled "Experiences From Developing and Upgrading a Web-Based Surveillance System for Malaria Elimination in Cambodia." It outlines Cambodia's experience in transitioning its MIS from malaria control to malaria elimination framework.

Malaria Consortium supported the country to include best practices and apply lessons learnt to ensure its MIS remained up to date with specific needs. The organisation emphasised that a tailored approach is necessary to retain high-quality functionality, operationalisation, feasibility and sustainability of an information system in the context of malaria elimination. The article also highlights the main steps required to ensure a smooth and progressive shift from an offline information system toward an integrated web-based system.

For more information, visit: https://goo.gl/59wz2v

# Projects in pictures: Trans-border malaria programme Cambodia



changes in the region which can drive migration, such miarant workers in-between the place of infection and areas where other people infected might transmitting the disease

In Cambodia, malaria infection is highest in border regions and among mobile and migrant populations who often live in remote parts of the country, work in forests or travel through endemic areas. The remoteness and mobility of these communities often means they have poor or infrequent access to health care which can lead to malaria cases going undetected and untreated. In other situations, people seeking treatment do so at unregistered private providers, leading to unreported malaria cases and unknown and possibly unsuitable case management practices.

Malaria Consortium's Trans-border Malaria Programme, in partnership with the Raks Thai Foundation and Population Services Khmer, is strengthening early malaria detection and treatment services and surveillance activities in Thailand and Cambodia.

This programme is being funded by the Global Fund to fight Aids, Tuberculosis and Malaria.

For more photos, visit: https://goo.ql/ziFdJ2

## Building a malaria information system in Cambodia: Two experts discuss how to defeat dengue in the Asia Pacific region

To mark ASEAN Dengue Day (15/06), we interviewed Dr. Rabindra Romauld Abeyasinghe, Coordinator, Malaria, other Vectorborne and Parasitic Diseases Unit at WHO's Manila Regional Office and Sergio Lopes, Malaria Consortium Cambodia Country Technical Coordinator. Both experts talked about the challenges, the importance of vector control and community-based initiatives. Please see some questions below, and for the full interview visit:https://goo.ql/fSmA5e

How can we prevent and treat dengue?



Dr. Rabindra Romauld Abeyasinghe: Dengue is caused by four different viral serotypes, which makes it very difficult to control as a single person may experience up to four episodes of dengue during their lifetime. In addition to this, there is a lack of specific treatment and effective vaccine. The only available vaccine, which is currently registered in several countries of the region, is not 100 percent effective and requires multiple doses. It is also recommended for use in children aged nine years and above who have had previous exposure to dengue and, as such, some of the most vulnerable cannot be protected with it. So for now, prevention through sustainable The flexibility of the  $\dot{}$  reductions in Aedes mosquito densities remains the key method. The main programme allows Malaria : interventions for dengue prevention are the reduction of the mosquitoes Consortium to respond to through vector control and increasing awareness in at-risk communities.

In the Asia Pacific region, WHO is advocating a new approach to vector as seasonal farming, new control, encouraging countries to move away from the previously practiced businesses and new roads. approach of reacting to dengue outbreaks with vector control because Aedes It also allows us to mosquitoes are transmitting multiple diseases. WHO now recommends intercept and treat countries adopt the new, proactive approach to routinely reduce Aedes mosquito densities in communities, irrespective of whether they are experiencing a dengue outbreak or not.

#### How is Malaria Consortium contributing to the fight against dengue?

Sergio Lopes: Malaria Consortium has been generating evidence on potential strategies to control dengue in Southeast Asia. We have been supporting research and development/adaptation of clinical guidelines for dengue in order to ensure good training to health staff managing the disease. Malaria Consortium trained 100 health workers in four townships in regions with high dengue burden in Yangon and Ayeyarwady, Myanmar.

Regarding vector control, Malaria Consortium has been developing cutting edge research to find alternatives for current vector control strategies. Since mosquitoes (Aedes in particular) are quite prone to developing resistance to available insecticides, Malaria Consortium has tested biological alternatives, such as larvae eating guppy fish, that can work at scale and support an effective reduction in Aedes mosquitoes. This strategy proved to be quite successful and well-accepted by communities affected by dengue. Malaria Consortium is continuing to investigate alternatives for dengue control and is currently starting a new trial to understand how effective the engagement of school children, parents and teachers can be in supporting vector control activities.



MOCID staffs attended seminar on "Development of a neutralization assay for multiple flaviviruses based on single-round infectious particles"



In the front row, Prof. Tatsuo Shioda (2nd from left), Dr. Ryosuke Suzuki (middle) and Dr. Atsushi Yamanaka (2nd from right)





Dr. Ryosuke Suzuki, Prof. Tatsuo Shioda and MOCID staffs at the seminar

On 25 May 2017, Prof. Tatsuo Shioda and MOCID multiple flaviviruses based on single-round infectious staffs attended Dr. Ryosuke Suzuki's seminar on the particles" on the 5<sup>th</sup> floor of Chalermprakiat building, topic of "Development of a neutralization assay for Faculty of Tropical Medicine, Mahidol University.

# Visiting guest from Japan



Prof. Emi E. Nakayama, Ms. Juthamas Padungsombat, Ms. Narinee Srimark, Prof. Tatsuo Shioda, Mr. Keita Suzuki and Mr. Aekkachai Tuekprakhon (from left to right)

MOCID welcomed a visiting PhD student from Japan, Mr. Keita Suzuki. During his stay from 20 - 24 March 2017, he came to develop Diagnostic kits for Chikungunya virus. We organized a farewell party for him. It was nice working with him!

### New Staff of MOCID



Ms. Sasicha Somboon Position: Administrative officer

Ms. Sasicha graduated from Faculty of Arts, Silpakorn: On 16 May 2017, MOCID organized a welcome party for University. She joined MOCID in May 2017 as an administrative: new staff, Ms. Sasicha Somboon. Welcome to MOCID! officer. She said "I really appreciate to be a part of MOCID."



MOCID staffs at welcome party



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#### MORU UBON celebrates 30th anniversary

MORU began collaborating closely with Sappasithiprasong Hospital in Ubon Ratchathani in 1986 when Nick White began melioidosis research there with Prof. Wipada Choawagul. An early result was the landmark randomised controlled trial on treatment of melioidosis published in 1989, which led to a halving of the mortality due to the disease. Since then, the melioid research unit has expanded its research remit to include the clinical epidemiology of infectious disease, sepsis and severe sepsis, the evaluation of diagnostic tests, the immunology of infectious disease, and health behaviours to reduce the infection.

Two days of activities were held 16 - 17 March to celebrate the 30th anniversary of MORU's Ubon Ratchathani study site. These included dinners and a

meeting on Infection Control to Prevent Antimicrobial Resistance (AMR) Jintanothai (Infection control nurse, Mahidol University) and Maliwan (Neung) attended by over 200 hospital staff and healthcare workers from other Hongsuwan from MORU. hospitals in Ubon Ratchathani and nearby provinces.

Melioid Lab founder Dr. Wipada Chaowagul; Direk Limmathurotsakul, Head of Sappasithiprasong Hospital); Mahidol University physicians Drs. Kumthorn with Sappasithiprasong Hospital. Malathum and Susan Assanasan (Infectious disease physician; Duangporn





The MORU Ubon Melioid Lab wishes to thank Sappasithiprasong Hospital, the Speakers included: MORU Director Nick Day, LOMWRU's David Dance; Faculty of Tropical Medicine, Mahidol and Oxford Universities, the Wellcome Trust and our colleagues and team members for all their support. We look MORU Microbiology; Dr. Pramot Srisamang (Infectious disease physician, forward to many more years of providing quality research studies in collaboration

- Thank you, Maliwan (Neung) Hongsuwan, for text and photos

#### GenRe-Mekong ramps up VN and Laos malaria surveillance





It has been a busy several months for the the GenRe-Mekong project, a MORU supported collaboration with IMPE-QN, the central Viet Nam Malaria Control Programme, and CMPE, the National Malaria Control Programme of Lao PDR.

To support control and elimination interventions in the Mekona Sub-region, the GenRe-Mekong project will collect dried blood spot samples from malaria patients and genotype them at MORU labs. GenRe will also collect travel information to reconstruct epidemiological population movement and gene flow patterns within Vietnam and Laos and across their borders. The data collected will be shared with participating national and regional malaria control programmes.

After MORU's Richard Maude and Olivo Miotto met in late February with the national malaria control programmes of Vietnam and Laos, GenRe-Mekong got down to business. On 4 April, Olivo Miotto and Ranitha Vongpromek held GenRe-Mekong field training for over 40 people, largely clinical staff of 18 sites in 5 provinces of Central Vietnam, in Buon Ma Thuot, Dak Lak Province. The training event was impeccably organized by Viet Nam GenRe-Mekong coordinator Dr. Nguyen Thuy-Nhien of the Oxford University Clinical Research Unit (OUCRU) in Ho Chi Minh Citv.

In May, nearly 80 participants from 5 malaria endemic Lao provinces attended GenRe-Mekong field training that included presentations by LOMWRU's Mayfong Mayxay (seated) and extensive hands-on dried blood sample collection practice by participants (pictured). Coordinated jointly by CMPE and LOMWRU, the project is led by Dr. Keo of CMPE and Dr. Mayfong Mayxay of LOMWRU. Based at LOMWRU in Vientiane, Sonexay Phalivong will be the project coordinator for Laos.

- With thanks to Olivo Miotto for text and photos

#### Mahidol begins Asia's first study of RTS,S malaria vaccine

On Tuesday 6 June, researchers vaccinated volunteers and began Mahidol University's Phase 2 clinical trial of the malaria vaccine RTS,S/ASO1 (RTS,S). Expected to last six months and recruit 190 adult volunteers, the study is the first to evaluate RTS,S in an Asian population.

A collaboration between Mahidol, MORU, PATH's Malaria Vaccine Initiative and GlaxoSmithKline (GSK), the study aims to assess the safety and immunogenicity of RTS,S malaria in combination with antimalarial drugs.

RTS.S is the malaria vaccine most advanced in development globally, and will be administered to children 5 to 17 months of age in selected areas of three countries in Africa – Ghana, Kenya, and Malawi - starting in 2018, through

a pilot implementation programme coordinated by the World Health Organization safe and effective, RTS,S could be the urgently needed tool to expedite (WHO).

Several extensive clinical trials of RTS.S/ASO1 have previously been conducted in children in sub-Saharan Africa. In a large Phase 3 trial of RTS,S/ASO16 at 11 sites in seven sub-Saharan African countries, efficacy against clinical malaria in children aged 5-17 months following three primary doses was 45.1% (CI 41.4 to 48.7), 35.2% (CI 30.5 to 39.5) and 28.3% (CI 23.3 to 32.9) during 20, 32 and 48 months of follow-up, respectively.

While such a "leaky" vaccine is not ideal in high transmission settings, it could be useful in combination with other interventions such as mass drug administrations in the elimination of malaria in the Greater Mekong Subregion, leading malaria researchers say.

"RTS,S is the most advanced of the malaria vaccine candidates. This is the first time the vaccine is evaluated in an Asian population. If found to be



Profs. Sasithon (3rd left) and Nick White (centre) and colleagues show their delight that Mahidol's RTS,S/ASO1 vaccine study has started. Right: The RTS,S/ASO1 vaccine and adjuvant.

the elimination of malaria in the Greater Mekong Subregion," said Dr. Lorenz von Seidlein, Coordinator of MORU's TME programme.

The two major aims of the Bangkok study are to confirm that co-administering antimalarial drugs with the vaccine is safe and will not reduce the vaccine's ability to create an immune response, and to assess the safety of RTS,S in Thai adults. This is an initial step toward determine if RTS,S could be used as part of targeted efforts to eliminate malaria in Southeast Asia and help slow the spread of drug resistant Plasmodium falciparum malaria parasites - the malaria-causing parasite species most deadly to humans.

The study is supervised by Mahidol Prof. Sasithon Pukrittayakamee, Dr. Borimas Hanboonkunupakarn and Dr. Podjanee Jittamala and is coordinated by Pongphaya Pongsuwan. MORU investigators Sir Nick White, Nick Day, Arjen Dondorp and Lorenz von Seidlein will support the study implementation.

- Text and photos courtesy of Lorenz von Seidlein

#### Advanced survival analysis draws colleagues from across SEA



From 24 - 26 May, the Clinical Trials Support Group (CTSG) conducted a 3-day Advanced Survival Analysis Statistics Workshop. Held at MORU Bangkok, the course drew about 40 participants from Thailand and across the region, with colleagues attending from MORU, SMRU, LOMWRU, COMRU, MOCRU and Mahidol University, and from OUCRU in Vietnam. Survival analysis is a class of modelling techniques that can be used to analyse Time-to-Event data.

Organised by the CTSG Statistics team, and funded by MORU, the course teaching team was (front row seated, from left): Dr. Eric Ohuma (University of Oxford), Dr. Sue Lee (MORU), Dr. Margarita Moreno Betancur (University of Melbourne), Prof. Julie Simpson (University of Melbourne), Dr. Ronald Geskus (OUCRU) and Dr. Mavuto Mukaka (MORU). Topics covered included: Kaplan-Meier Estimation, Cox regression and Competing Risks Modeling.

- With thanks to Mavuto Mukaka for text and photo

#### MORU holds health research ethics training in Yangon

Phaik Yeong Cheah and Kyaw Myo Tun conducted the Health Research Ethics workshop at the Defence Services Medical Academy (DSMA) in Yangon on 30 - 31 May for 40 DSMA researchers and postgraduate students. Workshop topics included consent, community engagement and data sharing. Most sessions were interactive and participatory. This workshop was supported in part by the Oxford Burma Visiting Fund awarded to Phaik Yeong.

- Text and photos courtesy of Phaik Yeong Cheah



#### Pathogen control and biosecurity training at Pak Chong



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On 23 May 2017, MORU's Thailand Veterinary Laboratory Capacity Building (CATH2) project coordinating team visited the OIE South-East Asia Regional Reference Laboratory for Foot and Mouth Disease (RRL-FMD), at Thailand's Department of Livestock Development in Pak Chong, Nakhon Ratchasima. Led by project leader Dr. Stuart Blacksell, the CATH2 team met with RRL-FMD director Dr. Pranee Rodtian (2nd right front row, right photo) and her staff and guided them on how to prepare the site's information system and biosecurity to implement a Pathogen Asset Control System (PACS).

Funded by the US Government's Defense Threat Reduction Agency's Cooperative Biological Engagement Program (DTRA-CBEP), CATH2 provides national and regional training and education in sample collection, packaging and transport, biosafety and biosecurity, and molecular diagnostics.

 With thanks to Soiratchaneekorn (Tal) Ruangchaiman for text and Thawinee Jaruschotikul and Possawat Jorakate for photos

#### TME Laos brings water pumps to participating villages



The LOMWRU team recently installed 8 hand pumps providing safe drinking water in 4 villages in Nong District, Savannakhet Province, Lao PDR after villagers requested the pumps in return for participating in a targeted malaria elimination (TME) project.

Funded by the Bill and Melinda Gates Foundation, the TMC project seeks to accelerate malaria elimination by providing mass drug administrations (MDA) to communities with a relatively high P. falciparum prevalence that are covered by village health malaria workers and have access to long lasting insecticide treated bed nets.

The TME project operates in four Greater Mekong Subregion countries: Myanmar, Cambodia, Laos and Vietnam. LOMWRU's Dr. Mayfong Mayxay is the principal investigator (PI) for the Lao PDR study, while Dr. Koukeo (inset right) is the field site PI.

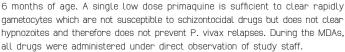
Savannakhet has the third highest malaria incidence of Laos' 18 provinces. A survey conducted in 18 rural villages in Savannakhet in 2015 using uPCR detected Plasmodium infections in 175 of 888 samples (20%). Most villages in Savannakhet are relatively accessible and malaria elimination is a high priority for the local government.

Starting in April 2016 a pilot project to eliminate malaria was initiated in four villages. The project showed that MDA in Savannakhet is feasible and well accepted; more than 80% of the targeted villagers participated in the three rounds of drug administrations.

The drug regimen consists of three monthly rounds (MO, M1 and M2) of three daily treatment doses of DHA/piperaquine (7 mg/kg dihydroartemisinin and 55 mg/kg piperaquine phosphate) combined with a single low dose primaquine (15mg or 0.25mg/kg).

Frequency and timing of the MDA rounds relates to the modelled maximum effects on transmission reduction and the post-treatment prophylactic effect of piperaquine, which is around 30 days in sensitive strains.

All residents in the study villages are encouraged to take part in three rounds except for women in the first trimester of pregnancy and children under



- With thanks to Lorenz von Seidlein for text and photos



#### LOMWRU hosts rickettsial coordination meeting



On Friday 17 March, rickettsiologists from at least 13 countries met for the Rickettsial Coordination Meeting at Vientiane, Lao PDR. Organised by Dr. Matt Robinson (2nd right) and LOMWRU, the meeting included colleagues from MORU, MOCRU, COMRU, SMRU and LOMWRU who met with key collaborators to discuss rickettsial research and coordinate plans to fight rickettsial infections — major neglected but treatable causes of fever in SC and South Asia that include scrub and murine typhus. Another meeting is scheduled for later this year.

- With thanks to Paul Newton for text and photo

#### PneumoDEEP team meet in Mae Sot



It is now 10 years since work started on the Maela ARI study: the SMRU pneumonia/pneumococcal colonisation cohort study led by Claudia and Paul Turner. From September 2007 - November 2010, the study team recruited 999 pregnant women from SMRU's antenatal clinical at Maela camp and followed their infants from birth until their second birthday. Over 23,000 nasopharyngeal swabs were collected during the study and >1,000 pneumonia episodes characterised. To date the study data has led to >20 publications, contributed to 6 PhD projects, and formed the basis one of the largest bacterial species genome sequencing projects completed to date (Pneumo3K).

To celebrate the anniversary, Clare Ling (centre) and SMRU kindly hosted (from left) COMRU's Paul Turner and key collaborators Stephen Bentley (Pathogen Genomics, Wellcome Trust Sanger Institute), Nick Croucher (School of Public Health, Imperial College London) and Jukka Corander (Department of Biostatistics, University of Oslo) for a two day meeting to discuss new analyses on the ARI study swab collection. Funded by the MRC JPIAMR scheme, the pneumoDEEP team will sequence several thousand of swabs to gain insights into pneumococcal transmission and antimicrobial resistance. In parallel, a large metagenomic sequencing project, using swabs from the Maela ARI study plus a new prospective study at COMRU, will generate data to model interactions between species colonising the nasopharynx.

#### MSc IHTM course team visits MORU and SMRU



Clockwise from bottom left: Kavarenah Ariana-Guevarra; Proochista Ariana; Mavuto Mukaka; Kartika Saraswati; Claire Keene; Andres Noe; Carine Asnong; Nick Day; Karen Valentine; Hellen Barsosio; Qhayiya Magaqa; Frank Kagoro; Yuzana Khine Zaw; Eric Ohuma; Tsi Njim; and Ernest Guevarra.

Proochista Ariana, the director of the MSc in International Health and Tropical Medicine (IHTM), University of Oxford, visited MORU and SMRU to run doctoral supervision and teacher training workshops on 25 - 26 May. One participant commented: "The course provided a better understanding on the role of supervisors and practical tips to better engage with your students." Proochista was joined by Eric Ohuma, senior statistician and a member of the MSc IHTM teaching team, who was also involved in the statistical course in survival analysis and competing risk at MORU on 24 - 26 May (see story below).

The Oxford's MSc IHTM is a multidisciplinary, interdisciplinary course that covers a wide array of current topics in global health ranging from vaccinology to health economy. It aims to equip students with understanding and skills to develop innovative solution for global health challenges.

Eight students from the 2017 MSc IHTM cohort are currently based in ; MORU and SMRU for their placement projects. More information on the course can be found at: https://www.tropicalmedicine.ox.ac.uk/msc-internationalhealth-and-tropical-medicine

Various funding opportunities are available, including the Wellcome Trust Master's Fellowships in Public Health and Tropical Medicine (Application deadline: 31 August 2017). For more information,

visit: https://www.tropicalmedicine.ox.ac.uk/funding-opportunities.

- Thank you Kartika (Tika) Saraswati for text and Frank Kagoro for photo

#### Congratulations, Aung!

Please join us in extending well-deserved congratulations to leading Myanmar malariologist Dr. Aung Pyae Phyo of SMRU who successfully sailed through a 4 hour DPhil viva in Oxford on 28 April.

Titled "The management of Plasmodium falciparum on the background of artemisinin combination therapy resistance," Dr. Aung's thesis is about the evolution of artemisinin resistance and genotype-phenotype relationship on the Thai-Myanmar border



and the pragmatic management of resistant cases including the evaluation of phase 2 antimalarial compounds.

- Thanks to Liz Ashley for text and Dr. Aung Pyae Phyo for photo 

#### Live on Facebook, Village Drama against Malaria



Attendees at a Village Drama Against Malaria performance in Ou Chet Pram village, Pailin Province, Cambodia, in early April 2017.

On 25 April, World Malaria Day 2017, Village Drama Against Malaria broadcast live on Facebook a malaria awareness and engagement performance by villagers in Phnom Dambong village, Pailin Province.

Over 300 villagers and local authorities attended the fun. lively, sometimes raucous performance of music, karaoke, short health talks, games and drama.

The show was held to support Cambodia's efforts to eliminate falciparum malaria - the deadliest form of malaria and particularly important in western Cambodia where multidrug resistant malaria parasites have emerged and are spreading to north-western Thailand and into Myanmar.

Using Cambodian drama, art, music workshops and village concerts, Village Drama Against Malaria mobilises rural communities to eliminate malaria. Village children and youth are key targets during Village Drama Against Malaria activities, which mix new technology (drones, video diaries, social media) with old methods (drama, community meetings, health talks).

Working closely with Cambodia's Public Health Department and local health clinics, Village Drama focuses on villages at high risk of malaria. Before each show, a drama group works for 2 days with villagers and the Public Health Department to create a script for a 2-3 hour show starring locals.

Started in July 2016, Village Drama Against Malaria worked with the Cambodia health and local authorities to select 15 Pailin Province villages for shows on malaria infection, symptoms and prevention and other important local issues such as infant vaccination. Public health authorities report high participation rates and positive feedback from villagers and local health workers.

Funded by a Wellcome Trust (UK) Provision for Public Engagement award, Village Drama is organised by Ms. Nou Sanann, of the Mahidol Oxford Tropical Medicine Research Unit (MORU) community engagement team, and Dr. Yok Sovann, Deputy Director of Malaria, PHD, Pailin Province, with support from MORU Cambodia Targeted Malaria Elimination (TME) team members Rupam Tripuram and Tom Peto.

#### Cheers! Bangkok hosts SEA's 1st Pint of Science Festival:



Thailand and SE Asia's first Pint of Science Festival kicked off on Monday 15 May with a look at Killer Bugs: Disease, Detection and Destruction and an enthusiastic reception from 50+ attendees (pictured) that included scientists from MORU and other institutions, business people with a background in science and students.

Hosted by MORU's Phaik Yeong Cheah and Sandy Sachaphimukh, the sold-out evening featured lively presentations from MORU's Markus Winterberg (Applied Proteomics: A Short Story of Cake and Urine); LOMWRU's Matt Robinson (Bac Chat) and Direk Limmathurotsakul, who spoke on his initiative, Antibiotic Footprint in Thailand. The evening's discussions ranged from how monks bless a mass-spectrometer and the amount of antibiotics fed to chickens in Thailand to a how a bacterium named Bob makes decisions.

Held 15 - 17 May at FabCafé Bangkok and open to all, Pint of Science Thailand gave the public and participating scientists a chance to meet and directly engage with each other on a variety of topics in a lively, informative manner in both English and Thai.

Despite the sudden rain storm just before kick-off, FabCafé was once again jam-packed Tuesday 16 May as Olivo Miotto hosted the 2nd evening, The Hidden Secrets of Epidemics and Evolution.

Noel Hidalgo Tan of SEAMEO SPAFA kicked off the evening with Crouching Tiger, Hidden Elephants: The unseen cave paintings of Southeast Asia, a 'Buddhas versus elephants' guessing game and a story of hidden cave art in South-East Asia.

Noel was followed by MORU MAEMOD's Wirichada (Pan) Pan-ngum and Lisa White's The Outbreak Breakout, a hands-on disease modelling exercise that everyone joined in. Mahidol's Narupat Hongdilokkul closed the night with Evolution Director, a look at how evolution works.

On Wednesday 17 May, LOMWRU's Matt Robinson MC'd the final Pint of Science Thailand evening, Tackling Diseases of the Past and Present. Well received and another full house, the evening included the Identify the famous scientist game — and 2 lucky winners who got to take home the much-coveted limited edited Pint of Science Thailand T-shirt.

Jittiporn Chaisaingmongkol of the Chulabhorn Research Institute led off with Precision Medicine in Cancer: How to Make your Gene Talk, a look at personalised medicine for cancer treatment. MORU's Bipin Adhikari followed with his history, Leprosy: Discovered by a Norwegian, Still Causing Problems Today. With a little help from Marvin Gaye, Andrea Ruecker of MORU closed with The Sex Lives of Malaria Parasites.

Much fun was had by all, with many sad to see the end of a fruitful and entertaining festival.

- Text by John Bleho with big help from Matt Robinson; all photos by Nicky Almasy



The Pint of Science organising committee — Sandy, Matt, Mia, Nattapat, Andrea and Phaik Yeong — joined by friends, colleagues and volunteers.

#### Fruits of a husband's devotion



On Saturday 8 April, SMRU counsellor Ms. Norda held malaria awareness sessions with MDR-TB patients and their caregivers at SMRU's Wang Pa TB clinic (top right). The active discussions included prevention, correct malaria treatment, the anopheles mosquito's feeding times, what to do when you develop a fever and the importance of timely blood tests.

This was followed by meditation and yummy lunch prepared by recovered TB patients. This included 'Mohinga' noodle and fish soup and vegetable dishes, many grown on-site. The home-grown vegetables enjoyed by the clinic's TB patients are the product of a man's love for his MDR-TB wife.

The man stayed with his wife the first 3 months of her time at Wang Pa. Knowing that she'd have to spend 20 months at the TB centre, he planted edible vegetables around the MDR-TB wards: water and bitter squash, roselle, coriander, butterfly pea, chilli, mint, yam and galangal.

Although the man left long ago, patients, their families and clinic staff continue to benefit from the man's devotion to his wife. Children play under the shady squash shelf, and everyone enjoys and cares for the herbs and vegetables he planted for his wife (pictured bottom right), who has recovered and will soon return home.

- Thank you, Suphak Nosten, for the inspiring story and photos

#### New ultra-sensitive malaria RDTs tested in Laos



This April and May the targeted malaria elimination (TME) study in Laos' final prevalence survey evaluated new tools to detect asymptomatic malaria. These included new rapid diagnostic tests (RDTs) that may be similar in 5 sensitivity to a PCR performed on dried blood spots and reading machines: that fire a laser at RDTs and use a thermal camera to detect faint positive: results beyond the range of the human eye.

Developed by Intellectual Ventures Laboratory with support from the Bill and Melinda Gates Foundation via Global Good, both are potential new malaria elimination tools as they could identify rapidly the asymptomatic reservoir of falciparum infections. Results are expected late summer 2017 comparing the new RDTs and readers to a gold standard method of malaria detection, the quantitative PCR results from Mallika Imwong's molecular laboratory at MORU.

A team led by LOMWRU scientists Mayfong Mayxay and Koukeo Phommasone (bottom right), Tiengkham Pongvongsa (bottom centre), head of malaria control in Savannakhet Province, and WWARN's Mehul Dhorda and MORU's Lorenz von Seidlein and Tom Peto hosted Kevin Nichols and Stephen Burkhor (top left) of Intellectual Ventures Laboratory (IVL) to field test the tools.

Funded by the Bill and Melinda Gates Foundation, the MORU TME project seeks to accelerate malaria elimination by providing mass drug administrations (MDA) to communities that have relatively high P. falciparum prevalence, access to village health malaria workers and where every household has one or more long lasting insecticide treated bed nets. The TME project operates in four Greater Mekong Subregion countries: Myanmar, Cambodia, Laos and Vietnam.

In Laos, the TME project focuses on rural villages in Savannakhet province, which has the third highest malaria incidence in Lao PDR. A survey conducted ; in 18 rural villages in Savannakhet in 2015 using uPCR detected Plasmodium infections in 175 of 888 samples (20%). Most villages in Savannakhet are relatively accessible and malaria elimination has a high priority for the local government. LOMWRU's Dr. Mayfong Mayxay is the principal investigator (PI) for the Lao PDR study, while Dr. Koukeo Phommasone is the field site PI.

> - Thank you Laos TME team for text and Lorenz von Seidlein and Tom Peto for photos

#### Bangkok hosts regional bioethics workshop



On 6 - 8 June, 34 delegates met to discuss bioethics and engagement issues relating to biomedical research in SE Asia at a workshop at MORU Bangkok. Funded by a Wellcome Trust Strategic Award and jointly organized by MORU and Oxford University Clinical Research Unit (OUCRU), our sister Unit in Vietnam, the workshop brought together institutional review board (IRB) and research ethics committee members, researchers in ethics and engagement, and key members of clinical trials units from OUCRU and MORU and their collaborators.

Delegates from Thailand, Lao PDR, Cambodia, Myanmar, Vietnam, Indonesia and Nepal discussed case studies describing ethical issues they or their IRB had faced in their work. The main issues included the role of IRBs, consent, data sharing, research with minors and vulnerabilities in research. Invited speakers included Prof. Mike Parker and Dr. Susan Bull from the Ethox Centre, University of Oxford.

- With thanks to Bipin Adhikari and Phaik Yeong Cheah for text and photo

#### SMRU mobile teams begin early TB detection in Karen state



The SMRU TB programme headed by Dr. Michele Vincenti has begun a pilot project that uses mobile teams led by experienced TB medics to improve early detection and treatment of TB among the rural population in Myanmar's Karen state.

Supported by the Global Fund and UNOPS, the project targets remote villages that have a malaria post staffed by malaria post workers from the Malaria Elimination Task Force (METF) network. Mobile teams train malaria post workers to identify patients with TB symptoms so that they can be sent to a health facility for evaluation and confirmation and receive proper TB treatment. The mobile teams also train post workers to support TB patients' treatment once they return home.

To date, the mobile team has visited 6 villages and screened more than 1,000 people for TB after holding TB awareness raising sessions. They found their first TB patient in a remote village and brought him to be treated at SMRU's KoKo TB centre.

- With thanks to Suphak Nosten for text and photos

# SMRU to begin ANC and MCH services in remote Karen villages



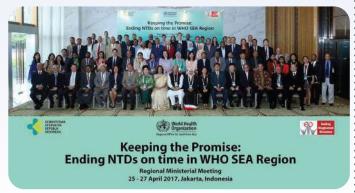
On 1 June, an SMRU team travelled to Mae Salid in Karen State, Myanmar for a community engagement meeting with roughly 30 local village representatives. The meeting introduced to village chiefs, health personnel and community leaders SMRU's plans to provide antenatal care (ANC) and maternal and child health (MCH) services in remote Karen villages.

After the meeting, village leaders indicated they were willing to collaborate with SMRU to improve the health of their women and babies.

Headed by SMRU Deputy Director Dr. Rose McGready, SMRU's Maternal and Child Health (MCH) research program utilizes operational field based research to identify and solve problems relevant to women and young children on both sides of the Thai-Myanmar border.

- Text courtesy of Napat Khirikoekkong; photo by Suphak Nosten

# Highlights of Activities



Participation as an expert at the Regional Ministerial Meeting, WHO SEARO



Paper presentation on "Climate Change, Disaster and Risk Reduction Protecting People's Right to Health" at the 1st Meeting of Scholars for Humanity International Network, Iloilo City, Philippines



Meeting with Mr. Edward B Dela Rosa, Assistant Executive Director Learning Development Division, National Institute for Technical Education and Skills Development, Technical Education and Skills Development Authority (TESDA), Philippines on "TVET Health Care Programmes"



Orientation for SEAMEO Secretariat Staff about SEAMEO TROPMED

Network, TROPMED Network Office



 Meeting with the H.€. Gerardo Bayugo, Deputy Minister of Health, Ministry of Health, Philippines on "Advanced Training Course on Health Promotion"



> Training for Staff of New SEAMEO Centres



▶ Participation at the 3rd High Officials Meeting on SEA-TVET "21st Century TVET in Southeast Asia: Advancing towards Harmonization and Internationalization", Kuala Lumpur, Malaysia



▶ Member: Evaluation Committee "SEAMEO-Australia Education Links Award 2016/2017, Addressing Barriers to Inclusion" at SEAMES



Panel Discussion: "60 Years of Thai-German partnership for Sustainable Development", Ministry of Foreign Affairs, Bangkok, Thailand



♠ Resource Person: "Teaching in the Context of an International Student Body", College of Public Health (TROPMED Philippines), University of the Philippines Manila



• Resource Person: "Qualitative Methods in Research", College of Public Health (TROPMED Philippines), University of the Philippines Manila



◆ Consultation meeting with the Directorate Generals of the Ministry of Education and Culture (MOEC) and the Directorate General of Learning, Ministry of Research, Technology and Higher Education, Jakarta, Indonesia



• Participation at the SEAMEO Capacity Building Workshop for "Communicating the SEAMEO Education Agenda", Jakarta, Indonesia

# Silom Community Clinic @TropMed



### In Loving Memory: Patrick J. Flaherty

It is with profound sadness that we announce the passing of our beloved friend and colleague, Patrick J. Flaherty, Deputy Program Director of NCHHSTP's Division of HIV/AIDS Prevention's (DHAP's) HIV/STD Research Program in Bangkok, Thailand.

Patrick was a beloved person at his post in Bangkok and within DHAP. He was highly regarded by his colleagues as a consummate professional and 3 an outstanding public health advisor. Patrick served CDC in Beijing, China; in 8 – 13 April 2017 in Washington, D.C., USA. More than 600 registered Atlanta at the Office of the Chief Operating Officer and the National Center • for Injury Prevention and Control; and in Washington, DC with the Association of State and Territorial Health Officials. He joined the Epidemiology Branch in : DHAP in September 2012 and was anticipating departure from his post in : our research activities at SCC @TropMed. Bangkok later this year.

"I am so sorry to hear about the passing of Patrick Flaherty." I understand that he was a remarkable individual, filled with compassion, kindness, and humility, as well as dedicated to our mission to help the people of the United States and the world. This was exemplified by his job, and his many actions as a volunteer to help people during the Ebola crisis, working with people with HIV, and mentoring young professionals.

Thailand office will draw on its amazing reserves of resiliency, humor, compassion, and mutual support during this difficult time, as you have: done in previous emergencies and with previous staff losses.

Seeing the outpouring of emails and stories following Patrick's: passing, it is clear that he made an impression on a lot of people. He . U.S., and Vietnam. The first enrollment was on 19 December 2016 in a CRS defines the spirit of what makes USG employees remarkable: he consistently looked for the common good; he was committed to the work; and he was compassionate about the people we serve and the people we work with. Patrick was a kindred spirit that inspired us to be better.

Please extend my sincere condolences to all. Thank you the CDC: Thailand staff for the outstanding work you do every day, and we wish you the best during this difficult time." stated Thomas E. Price, MD, Secretary of Health and Human Services (HHS)









# 2017 HPTN Annual Meeting and HPTN 083 Protocol Training

The HIV Prevention Trials Network (HPTN) held its annual meeting from participants attended the meeting. This event included an array of study-specific meetings, Community Working Group sessions, skill-building activities, and plenary sessions discussing targeted HIV prevention approaches relevant to

During the Community Working Group sessions, our Thai community representatives also participated in team building exercises; a plenary session on youth and transgender inclusion in Community Advisory Board development; and a best practices session for recruitment in 8 stations: use of social media, recruitment through street theater, tabling for outreach/ sensitization, partner engagement, and recruitment of commercial sex workers, transgender people, and MSM.

SCC @TropMed is one of three Thai clinical research sites (CRS) for HPTN 083: A Phase 2b/3 Double Blind Safety and Efficacy Study of Injectable This is a devastating loss for everyone, and I know that the CDC. Cabotegravir Compared to Daily Oral Tenofovir Disoproxil Fumarate/ Emtricitabine (TDF/FTC) for Pre-Exposure Prophylaxis in HIV-Uninfected Cisgender Men and Transgender Women who have Sex with Men. This study is a novel efficacy trial to evaluate a long acting injectable antiretroviral agent (Cabotegravir LA) as HIV pre-exposure prophylaxis. HPTN 083 has 45 CRSs in seven countries: Argentina, Brazil, Peru, South Africa, Thailand, the

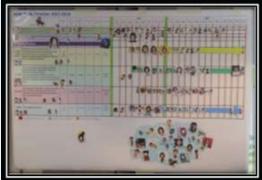
> From 15 - 17 May 2017, the key staff of three CRSs in Thailand: Chiang Mai University (CMU) HIV Prevention CRS, Thai Red Cross AIDS Research Centre (TRC-ARC) CRS, and Silom Community Clinic CRS (i.e. SCC @TropMed), as well as one CRS from Vietnam (Yen Hoa Health Clinic CRS) attended the HPTN 083 protocol training at JW Marriott Hotel Bangkok Thailand. SCC @TropMed will start enrolling study participants into HPTN 083 in August - September 2017.

> Details of HPTN 083 study "Give Pr&P a Shot" are available in a multi-language website: http://giveprepashot.org/

The Thai language is available at: http://giveprepashot.org/th/

# HSRP Strategic Planning Meeting





The SCC @TropMed held the HIV/STD Research Program (HSRP) Strategic Planning Meeting on 9 May 2017 in the 17th Floor Pratap Singhasivanon Conference Room, Hospital for Tropical Diseases, Faculty of Tropical Medicine, Mahidol University. The main objective of this meeting was to brainstorm how to maximize our effectiveness implementing multiple large research studies starting this year and how teams can coordinate across different activities.

Over 50 HSRP staff attended this strategic planning meeting. In order to make the discussion constructive and encourage active involvement in the workshop, we divided into 6 breakout groups: protocol implementation and monitoring; client flow in the clinic; innovation/new ideas; specimen procedures and management; data and information flow; and recruitment and outreach.



"It was really inspiring to see everyone engaged and so committed to finding solutions to the problems that we may face" stated Dr. Michael Thigpen, Director of HIV/STD Research Program, Thailand MOPH - U.S. CDC Collaboration (TUC).

# Basic Life Support Training







The SCC @TropMed organized the training on "Basic Life Support (BLS) for Health Care Providers and Clinic Staff" on 14 June 2017. This training was conducted by the professional emergency team from Hospital for Tropical Diseases, Faculty of Tropical Medicine, Mahidol University.

The main objective of this course was to ensure all clinic and administrative staff could respond in an emergency situation such as when a person has a cardiac arrest and how to provide cardiopulmonary resuscitation (CPR), how to use an automatic electronic defibrillator (AED) and how to provide cardiovascular support before the person can reach hospital in a safe, timely and effective manner.

Over 30 HSRP staff completed the training and can respond if a person has a cardiac arrest or is not breathing. All participants also practiced individually and in pairs on four different BLS stations: Chest Compressions, Airway Breathing, use of Endotracheal Tubes and use of AEDs for Defibrillation.



# WORLDWIDE ANTIMALARIAL RESISTANCE NETWORK (WWARN) ASIA REGIONAL CENTRE @TropMed

#### Malaria Data Access Committee launched

TDR, the WHO-hosted Special Programme for Research and: Training in Tropical Diseases, has convened an independent Data ; Access Committee to support data contributors to the WorldWide • Antimalarial Resistance Network (WWARN) in making decisions on access to malaria datasets.

framework of its data-sharing platform to help researchers meet; a range of institutions. the demands of funders and journals by promoting different options for how they make their data accessible. These new options will continue to protect the rights and privacy of the people and datasets where data contributors have delegated decision-making communities from which the data originate and recognise the power to the Data Access Committee. investment of the researchers who conducted the studies and collected the data.

Faculty of Tropical Medicine, Mahidol University and other institutions: requested, how the data will be used and how the original contributors greater access to WWARN's data which includes contributions from ; will be credited. If the application for data is approved by the DAC, researchers around the world.

To accomplish this transition, TDR has convened an independent Data Access Committee to review applications for access to data held within the WWARN repository. Data contributors will soon be decision making. When complete, these will be shared with the able to decide if they want to delegate decisions about data access: to the committee

Members of the committee include:

- Piero Olliaro, TDR, the Special Programme for Research and Training in Tropical Diseases, Switzerland (non-voting Chair);
- Mahamadou Thera, University of Bamako, Mali
- Jantina de Vries, University of Cape Town, South Africa
- Martin Meremikwu, University of Calabar, Nigeria
- Lyda Osorio, Universidad del Valle, Colombia

- Neena Valecha, National Institute of Malaria Research, India
- Huynh Hong Quang, Institute of Malariology Parasitology and Entomology, Vietnam

The committee members were nominated by the malaria research community and selected to ensure representation from WWARN is updating the technical, governance and ethical malaria endemic regions, a range of expertise, gender balance and

The committee will make decisions about data access only on

The committee will be responsible for reviewing applications from researchers wishing to use data held in the WWARN repository. The WWARN DAC will potentially give researchers at the Those requesting data will be required to list the data sets data will be released to the requestor under an agreement which secures the terms of use.

> The committee is now developing terms of operation and malaria community and data contributors will be invited to decide if they would like to delegate decisions to the committee.

> For more information about the committee or the updates to the data access process, visit the Accessing Data webpage.

For further questions, email: malariaDAC@iddo.org.

# TropMed Activities









On 8 June 2017, Asst. Prof. Dr. Yodchanan Wongsawat, Deputy Dean for Research and International Relations, Faculty of Engineering, Mahidol University and team paid a visit to Tissue Culture and Immunocytochemistry Unit, Faculty of Tropical Medicine, Mahidol University and Mahidol Oxford Malaria Laboratory.

Opening Ceremony for Graduate Diploma in Tropical Medicine and Hygiene (D.T.M.&H.), Master of Clinical Tropical Medicine (M.C.T.M.) and Master of Clinical Tropical Medicine (Tropical Pediatrics) [M.C.T.M. (Trop. Ped.)] for the academic year 2017 on 3 April 2017





Brainstorming the FTM Strategic Plan 2018 – 2021 with its theme "TropMed Aloha" during 21 – 22 April 2017 at the Regent Cha Am Beach Resort, Phetchaburi province

# TropMed Activities



Walk Rally to promote Body Mass Index (BMI) reduction for health on 1 May 2017 at the Hospital for Tropical Diseases, Faculty of Tropical Medicine, Mahidol University







FTM Student - Lecturer Sport Day on 3 May 2017





"The 3rd Journey to Happiness" project led by Assoc. Prof. Dr. Chatchawan Silpakit, Director of the Contemplative Education Center, Mahidol University on 20 June 2017



Fire safety drill on 21 June 2017



















On 17 March 2017, Dean Pratap Singhasivanon chaired the 2017 Annual Meeting organized by the Parasitology and Tropical Medicine Association of Thailand (PTAT) together with Tropical Medicine Alumni Association (TMAA), Faculty of Tropical Medicine, Mahidol University at Chalermprakiat conference room, 5th floor, Chalermprakiat building, Faculty of Tropical Medicine, Mahidol University. Several important sessions at the meeting

included report on 2016 PTAT activities, 2017 Young Parasitologist Award Winner announcement and special lecture on "Update on Leishmaniasis in Thailand" by Asst. Prof. Lt. Col. Phunlerd Piyaraj from Phramongkutklao College of Medicine, Dr. Suradej Siripatanapipong from Faculty of Science, Mahidol University and Assoc. Prof. Dr. Narissara Jariyapan from Faculty of Medicine, Chiang Mai University.











co-hosted the international conference "A One Health Approach to Helminth Control in South East Asia" at Pratap Singhasivanon conference room, 17th floor, Rachanakarindra building, Faculty of Tropical Medicine, Mahidol University.

Consultant: Assoc. Prof. Pratap Singhasivanon, Dean, Faculty of Tropical Produced by: Office of International Cooperation and Networking (OICN) Medicine, Mahidol University

Editors: Prof. Srivicha Krudsood and Asst. Prof. Usa Boonyuen

Coordinators: Peerawat Maipanich, Rattanawadee Nanlar, Jittapim Na

Bangchang, Siriprang Chotchaimongkol and Siripilai Triratanarungsi

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