

Folder eCC\_00008221 is in stage Annual\_Report\_Due

**Name of the University, Hospital, Research Institute, Academy or Ministry**

Mahidol University

**Name of the Division, Department, Unit, Section or Area**

Department of Clinical Tropical Medicine, Faculty of Tropical Medicine

**City** Bangkok **Reference Number** THA-42

**Title** WHO Collaborating Centre for Clinical Management of Malaria

**Report Year** 09-2013 to 09-2014

**1. Please briefly describe the progress made in the implementation of your agreed workplan as WHO collaborating centre during the past 12 months (or the reporting period listed above). Please report on how each workplan activity was implemented, if any outputs have been delivered, if any results have been achieved and if any difficulties have been encountered during this time. If an activity has previously been completed, has not started yet, or been placed on hold, please indicate this.**

**Activity 1**

Title: Conduct international training in clinical management of malaria

Description: •International training on clinical management of malaria to be done annually at WHO-CC.

Participants will include those supported by WHO thru fellowship as well as those who will be supported by other partners.

•Either the Regional Adviser (malaria) or the WHO-Mekong Malaria Program Coordinator will be involved as resource person. They will also help disseminate the information regarding the training and, together with concerned WHO Regional and Country Office staff, and facilitate fellowship to be supported by WHO.

December 11-13, 2013

Collaborating with faculty of Tropical Medicine, Mahidol University, SEAMEO-TROPMED Network to organize Joint International Tropical Medicine Meeting, (JITMM), Bangkok, Thailand.

September 15-19, 2014

Organized “the 12th International Training Course on Management of Malaria” in collaboration with WHO SEARO, WHO Mekong Malaria Programme, and WHO Indonesia during 15-19 September 2014 at Faculty of Tropical Medicine, Mahidol University, Thailand. There were 44 participants from 11 countries namely Bangladesh, Bhutan, Cambodia, India, Indonesia, Japan, Myanmar, Nepal, Sri Lanka, Sudan, and Thailand. Professor Anand Joshi (Team Leader of Malaria and Neglected Tropical Diseases, WHO/Indonesia) was invited to be facilitator and speaker of this training course.

**Activity 2**

Title: Provide consultative services to strengthen capacity in clinical management of complicated/severe malaria.

Description: WHO-CC staff would serve as STC or work on APW for training on clinical management of malaria in other countries within and outside SEA Region

WHO-CC staff would serve as temporary advisers during WHO meetings related to clinical management of malaria and on drug resistance either at the Country, Region or HQs.

The Regional Adviser and /or WHO-MMP Coordinator will identify countries that would need the expertise from WHO-CC and facilitate the contract as necessary.

October to December, 2013

Collaboration with Royal college of Physicians of Thailand and Ministry of Public Health of Thailand to write guidelines in management of malaria in Thailand (in Thai).

December 11-13, 2013

Collaborating with Faculty of Tropical Medicine, Mahidol University, SEAMEO-TROPMED Network to organize Joint International Tropical Medicine Meeting, (JITMM), Bangkok, Thailand.

August 25-29, 2014

Sending Malaria Consultant to WHO/ Indonesia to evaluate "A feasibility study on malaria clinical management training course (severe and uncomplicated malaria) in well equipped hospitals and the primary health care centers in Indonesia", 25-29 August 2014. PTEO: SEINO1408504; 2.6; 61174. Venue and dates: Jakarta and Timika, Indonesia; 25-29 August 2014.

### Activity 3

Title: Network with other Institutions for training, technical collaboration, research and information exchange in the management of uncomplicated and complicated / severe malaria and in the epidemiology of drug resistance.

Description: Maintain website at WHO-CC and update its contents related to malaria case management including drug resistance. Consultations between the WHO-CC and SEARO will be done to agree on what would be posted in the website as part of WHO-CC documents.

Conduct joint meetings and / or international conferences related to malaria. This will be done in collaboration with other partners / institutions. WHO will be requested for technical and financial support. There will be negotiation between WHO-CC and SEARO on the specific meetings / conferences and the agenda that could be supported by WHO as part of the WHO-CC activity.

WHO staff could help coordinate the meeting and could also serve as resource speaker / facilitator.

Followings were publications in international journals:

Independent emergence of Plasmodium falciparum artemisinin resistance mutations in Southeast Asia.

Takala-Harrison S, Jacob CG, Arze C, Cummings MP, Silva JC, Dondorp AM, Fukuda MM, Hien TT, Mayxay M, Noedl H, Nosten F, Kyaw MP, Nhien NT, Imwong M, Bethell D, Se Y, Lon C, Tyner SD, Saunders DL, Ariey F, Mercereau-Puijalon O, Menard D, Newton PN, Khantavong M, Hongvanthong B, Starzengruber P, Fuehrer HP, Swoboda P, Khan WA, Phyo AP, Nyunt MM, Nyunt MH, Brown TS, Adams M, Pepin CS, Bailey J, Tan JC, Ferdig MT, Clark TG, Miotto O, Maclnnis B, Kwiatkowski DP, White NJ, Ringwald P, Plowe CV. *J Infect Dis.* 2014 Sep 1. pii: jiu491. [Epub ahead of print]

Population Pharmacokinetics and Antimalarial Pharmacodynamics of Piperaquine in Patients With Plasmodium vivax Malaria in Thailand. Tarning J, Thana P, Phyo AP, Lwin KM, Hanpithakpong W, Ashley EA, Day NP, Nosten F, White NJ. *CPT Pharmacometrics Syst Pharmacol.* 2014 Aug 27;3:e132. doi: 10.1038/psp.2014.29.

Ethics, economics, and the use of primaquine to reduce falciparum malaria transmission in asymptomatic populations. Lubell Y, White L, Varadan S, Drake T, Yeung S, Cheah PY, Maude RJ, Dondorp A, Day NP, White NJ, Parker M.

*PLoS Med.* 2014 Aug 19;11(8):e1001704. doi: 10.1371/journal.pmed.1001704. eCollection 2014 Aug.

Genome-Wide Prediction of the Polymorphic Ser Gene Family in Tetrahymena thermophila Based on Motif Analysis. Ponsuwanna P, Kumpornsin K, Chookajorn T. *PLoS One.* 2014 Aug 18;9(8):e105201. doi: 10.1371/journal.pone.0105201. eCollection 2014.

Efficacy and day 7 plasma piperazine concentrations in african children treated for uncomplicated malaria with dihydroartemisinin-piperazine. Zongo I, Somé FA, Somda SA, Parikh S, Rouamba N, Rosenthal PJ, Tarning J, Lindegardh N, Nosten F, Ouédraogo JB. *PLoS One.* 2014 Aug 18;9(8):e103200. doi: 10.1371/journal.pone.0103200. eCollection 2014.

Characterization of recombinant malarial RecQ DNA helicase. Suntornthiticharoen P, Srila W, Chavalitsheewinkoon-Petmitr P, Limudomporn P, Yamabhai M. *Mol Biochem Parasitol.* 2014 Aug;196(1):41-4. doi: 10.1016/j.molbiopara.2014.07.013. Epub 2014 Aug 9.

The association of Duffy binding protein region II polymorphisms and its antigenicity in *Plasmodium vivax* isolates from Thailand. Chootong P, McHenry AM, Ntumngia FB, Sattabongkot J, Adams JH. *Parasitol Int.* 2014 Dec;63(6):858-64. doi: 10.1016/j.parint.2014.07.014. Epub 2014 Aug 7.

Comprehensive identification of single nucleotide polymorphisms associated with beta-lactam resistance within pneumococcal mosaic genes. Chewapreecha C, Marttinen P, Croucher NJ, Salter SJ, Harris SR, Mather AE, Hanage WP, Goldblatt D, Nosten FH, Turner C, Turner P, Bentley SD, Parkhill J. *PLoS Genet.* 2014 Aug 7;10(8):e1004547. doi: 10.1371/journal.pgen.1004547. eCollection 2014 Aug.

An integrated lab-on-chip for rapid identification and simultaneous differentiation of tropical pathogens. Tan JJ, Capozzoli M, Sato M, Watthanaworawit W, Ling CL, Mauduit M, Malleret B, Grüner AC, Tan R, Nosten FH, Snounou G, Rénia L, Ng LF. *PLoS Negl Trop Dis.* 2014 Jul 31;8(7):e3043. doi: 10.1371/journal.pntd.0003043. eCollection 2014 Jul.

Spiroindolone KAE609 for falciparum and vivax malaria. White NJ, Pukrittayakamee S, Phyo AP, Rueangweerayut R, Nosten F, Jittamala P, Jeeyapant A, Jain JP, Lefèvre G, Li R, Magnusson B, Diagona TT, Leong FJ. *N Engl J Med.* 2014 Jul 31;371(5):403-10. doi: 10.1056/NEJMoa1315860.

Rationale for the Coadministration of Albendazole and Ivermectin to Humans for Malaria Parasite Transmission Control. Kobylinski KC, Alout H, Foy BD, Clements A, Adisakwattana P, Swierczewski BE, Richardson JH. *Am J Trop Med Hyg.* 2014 Jul 28. pii: 14-0187. [Epub ahead of print]

Polymorphisms in *Plasmodium falciparum* Chloroquine Resistance Transporter and Multidrug Resistance 1 Genes: Parasite Risk Factors that Affect Treatment Outcomes for *P. falciparum* Malaria after Artemether-Lumefantrine and Artesunate-Amodiaquine. Venkatesan M, Gadalla NB, Stepniewska K, Dahal P, Nsanzabana C, Moriera C, Price RN, Mårtensson A, Rosenthal PJ, Dorsey G, Sutherland CJ, Guérin P, Davis TM, Ménard D, Adam I, Ademowo G, Arze C, Baliraine FN, Berens-Riha N, Björkman A, Borrmann S, Checchi F, Dhorda MD, Djimdé AA, El-Sayed BB, Eshetu T, Eyase F, Falade C, Faucher JF, Fröberg G, Grivoyannis A, Hamour S, Houzé S, Johnson J, Kamugisha E, Kariuki S, Kiechel JR, Kironde F, LeBras PE, Malmberg M, Mwai L, Ngasala B, Nosten F, Nsohya SL, Oguike AN, Otienoburu SD, Ogutu B, Ouédraogo JB, Piola P, Rombo L, Schramm B, Somé AF, Thwing J, Ursing J, Wong RP, Zeynudin A, Zongo I, Plowe CV, Sibley CH. *Am J Trop Med Hyg.* 2014 Jul 21. pii: 14-0031. [Epub ahead of print]

Silver quartz crystal microbalance for differential diagnosis of *Plasmodium falciparum* and *Plasmodium vivax* in single and mixed infection. Wangmaung N, Chomean S, Promptmas C, Mas-oodi S, Tanyong D, Ittarat W. *Biosens Bioelectron.* 2014 Dec 15;62:295-301. doi: 10.1016/j.bios.2014.06.052. Epub 2014 Jun 30.

Randomized Comparison of the Efficacies and Tolerabilities of Three Artemisinin-Based Combination Treatments for Children with Acute *Plasmodium falciparum* Malaria in the Democratic Republic of the Congo. Onyamboko MA, Fanello CI, Wongsan K, Tarning J, Cheah PY, Tshetu KA, Dondorp AM, Nosten F, White NJ, Day NP. *Antimicrob Agents Chemother.* 2014 Sep;58(9):5528-36. doi: 10.1128/AAC.02682-14. Epub 2014 Jul 7.

High-throughput ultrasensitive molecular techniques for quantifying low-density malaria parasitemias. Imwong M, Hanchana S, Malleret B, Rénia L, Day NP, Dondorp A, Nosten F, Snounou G, White NJ. *J Clin Microbiol.* 2014 Sep;52(9):3303-9. doi: 10.1128/JCM.01057-14. Epub 2014 Jul 2.

Quantifying low birth weight, preterm birth and small-for-gestational-age effects of malaria in pregnancy: a population cohort study. Rijken MJ, De Livera AM, Lee SJ, Boel ME, Rungwilailaekhiri S, Wiladphaingern J, Paw MK, Pimanpanarak M, Pukrittayakamee S, Simpson JA, Nosten F, McGready R. *PLoS One.* 2014 Jul 1;9(7):e100247. doi: 10.1371/journal.pone.0100247. eCollection 2014.

Population pharmacokinetics of quinine in pregnant women with uncomplicated *Plasmodium falciparum* malaria in Uganda. Klopogge F, Jullien V, Piola P, Dhorda M, Muwanga S, Nosten F, Day NP, White NJ, Guerin PJ, Tarning J.

J Antimicrob Chemother. 2014 Jun 25. pii: dku228. [Epub ahead of print]

Validation of a chloroquine-induced cell death mechanism for clinical use against malaria. Ch'ng JH, Lee YQ, Gun SY, Chia WN, Chang ZW, Wong LK, Batty KT, Russell B, Nosten F, Renia L, Tan KS. Cell Death Dis. 2014 Jun 26;5:e1305. doi: 10.1038/cddis.2014.265.

Electron microscopic features of brain edema in rodent cerebral malaria in relation to glial fibrillary acidic protein expression. Ampawong S, Chaisri U, Viriyavejakul P, Nontprasert A, Grau GE, Pongponratn E. Int J Clin Exp Pathol. 2014 Apr 15;7(5):2056-67. eCollection 2014.

Whole-Genome Scans Provide Evidence of Adaptive Evolution in Malawian *Plasmodium falciparum* Isolates. Ocholla H, Preston MD, Mipando M, Jensen AT, Campino S, MacInnis B, Alcock D, Terlouw A, Zongo I, Oudraogo JB, Djimde AA, Assefa S, Doumbo OK, Borrmann S, Nzila A, Marsh K, Fairhurst RM, Nosten F, Anderson TJ, Kwiatkowski DP, Craig A, Clark TG, Montgomery J. J Infect Dis. 2014 Jun 19. pii: jiu349. [Epub ahead of print]

Reversibility of retinal microvascular changes in severe *falciparum* malaria.

Maude RJ, Kingston HW, Joshi S, Mohanty S, Mishra SK, White NJ, Dondorp AM. Am J Trop Med Hyg. 2014 Sep 3;91(3):493-5. doi: 10.4269/ajtmh.14-0116. Epub 2014 Jun 16.

Differential roles of an Anopheline midgut GPI-anchored protein in mediating *Plasmodium falciparum* and *Plasmodium vivax* ookinete invasion. Mathias DK, Jardim JG, Parish LA, Armistead JS, Trinh HV, Kumpitak C, Sattabongkot J, Dinglasan RR. Infect Genet Evol. 2014 Jun 11. pii: S1567-1348(14)00194-4. doi: 10.1016/j.meegid.2014.05.025. [Epub ahead of print]

A barcode of organellar genome polymorphisms identifies the geographic origin of *Plasmodium falciparum* strains. Preston MD, Campino S, Assefa SA, Echeverry DF, Ocholla H, Amambua-Ngwa A, Stewart LB, Conway DJ, Borrmann S, Michon P, Zongo I, Ouédraogo JB, Djimde AA, Doumbo OK, Nosten F, Pain A, Bousema T, Drakeley CJ, Fairhurst RM, Sutherland CJ, Roper C, Clark TG. Nat Commun. 2014 Jun 13;5:4052. doi: 10.1038/ncomms5052.

Evidence for soft selective sweeps in the evolution of pneumococcal multidrug resistance and vaccine escape. Croucher NJ, Chewapreecha C, Hanage WP, Harris SR, McGee L, van der Linden M, Song JH, Ko KS, de Lencastre H, Turner C, Yang F, Sá-Leão R, Beall B, Klugman KP, Parkhill J, Turner P, Bentley SD. Genome Biol Evol. 2014 Jun 10;6(7):1589-602. doi: 10.1093/gbe/evu120.

KAF156 Is an Antimalarial Clinical Candidate with Potential for Use in Prophylaxis, Treatment, and Prevention of Disease Transmission. Kuhen KL, Chatterjee AK, Rottmann M, Gagaring K, Borboa R, Buenviaje J, Chen Z, Francek C, Wu T, Nagle A, Barnes SW, Plouffe D, Lee MC, Fidock DA, Graumans W, van de Vegte-Bolmer M, van Gemert GJ, Wirjanata G, Sebayang B, Marfurt J, Russell B, Suwanarusk R, Price RN, Nosten F, Tungtaeng A, Gettayacamin M, Sattabongkot J, Taylor J, Walker JR, Tully D, Patra KP, Flannery EL, Vinetz JM, Renia L, Sauerwein RW, Winzeler EA, Glynn RJ, Diagona TT. Antimicrob Agents Chemother. 2014 Sep;58(9):5060-7. doi: 10.1128/AAC.02727-13. Epub 2014 Jun 9.

Participants' perceptions and understanding of a malaria clinical trial in Bangladesh. Das D, Cheah PY, Akter F, Paul D, Islam A, Sayeed AA, Samad R, Rahman R, Hossain A, Dondorp A, Day NP, White NJ, Hasan M, Ghose A, Ashley EA, Faiz A. Malar J. 2014 Jun 4;13:217. doi: 10.1186/1475-2875-13-217.

Pharmacokinetics of co-formulated mefloquine and artesunate in pregnant and non-pregnant women with uncomplicated *Plasmodium falciparum* infection in Burkina Faso. Valea I, Tinto H, Traore/Coulibaly M, Toe LC, Lindegardh N, Tarning J, Van Geertruyden JP, D'Alessandro U, Davies GR, Ward SA. J Antimicrob Chemother. 2014 Sep;69(9):2499-2507. Epub 2014 Jun 2.

Uncomplicated *Plasmodium vivax* malaria in pregnancy associated with mortality from acute respiratory distress syndrome. McGready R, Wongsan K, Chu CS, Tun NW, Chotivanich K, White NJ, Nosten F. *Malar J*. 2014 May 27;13:191. doi: 10.1186/1475-2875-13-191.

Glomerular changes and alterations of zonula occludens-1 in the kidneys of *Plasmodium falciparum* malaria patients. Wichapoon B, Punsawad C, Chaisri U, Viriyavejakul P. *Malar J*. 2014 May 9;13:176. doi: 10.1186/1475-2875-13-176.

Gestational diabetes mellitus prevalence in Maela refugee camp on the Thai-Myanmar border: a clinical report. Gilder ME, Zin TW, Wai NS, Ner M, Say PS, Htoo M, Say S, Htay WW, Simpson JA, Pukrittayakamee S, Nosten F, McGready R. *Glob Health Action*. 2014 May 12;7:23887. doi: 10.3402/gha.v7.23887. eCollection 2014.

Single-cell genomics for dissection of complex malaria infections. Nair S, Nkhoma SC, Serre D, Zimmerman PA, Gorena K, Daniel BJ, Nosten F, Anderson TJ, Cheeseman IH. *Genome Res*. 2014 Jun;24(6):1028-38. doi: 10.1101/gr.168286.113. Epub 2014 May 8.

Malaria: a molecular marker of artemisinin resistance. White NJ. *Lancet*. 2014 Apr 26;383(9927):1439-40. doi: 10.1016/S0140-6736(14)60656-5. No abstract available.

Causes of non-malarial fever in Laos: a prospective study. Mayxay M, Castonguay-Vanier J, Chansamouth V, Dubot-Pérès A, Paris DH, Phetsouvanh R, Tangkhabuanbutra J, Douangdala P, Inthalath S, Souvannasing P, Slesak G, Tongyoo N, Chanthongthip A, Panyanouvong P, Sibounheuang B, Phommasone K, Dohnt M, Phonekeo D, Hongvanthong B, Xayadeth S, Ketmayoon P, Blacksell SD, Moore CE, Craig SB, Burns MA, von Sonnenburg F, Corwin A, de Lamballerie X, González IJ, Christophel EM, Cawthorne A, Bell D, Newton PN. *Lancet Glob Health*. 2013 Jul;1(3):e46-e54.

Molecular characterization of *Plasmodium falciparum* uracil-DNA glycosylase and its potential as a new anti-malarial drug target. Suksangpleng T, Leartsakulpanich U, Moonsom S, Siribal S, Boonyuen U, Wright GE, Chavalitsheewinkoon-Petmitr P. *Malar J*. 2014 Apr 17;13:149. doi: 10.1186/1475-2875-13-149.

Origin of robustness in generating drug-resistant malaria parasites. Kumpornsin K, Modchang C, Heinberg A, Eklund EH, Jirawatcharadech P, Chobson P, Suwanakitti N, Chaotheing S, Wilairat P, Deitsch KW, Kamchonwongpaisan S, Fidock DA, Kirkman LA, Yuthavong Y, Chookajorn T. *Mol Biol Evol*. 2014 Jul;31(7):1649-60. doi: 10.1093/molbev/msu140. Epub 2014 Apr 16.

Selection of drug resistance-mediating *Plasmodium falciparum* genetic polymorphisms by seasonal malaria chemoprevention in Burkina Faso.

Somé AF, Zongo I, Compaoré YD, Sakandé S, Nosten F, Ouédraogo JB, Rosenthal PJ. *Antimicrob Agents Chemother*. 2014 Jul;58(7):3660-5. doi: 10.1128/AAC.02406-14. Epub 2014 Apr 14.

Preliminary pharmaceutical development of antimalarial-antibiotic cotherapy as a pre-referral paediatric treatment of fever in malaria endemic areas. Gaubert A, Kauss T, Marchivie M, Ba BB, Lembege M, Fawaz F, Boiron JM, Lafarge X, Lindegardh N, Fabre JL, White NJ, Olliaro PL, Millet P, Grislain L, Gaudin K. *Int J Pharm*. 2014 Jul 1;468(1-2):55-63. doi: 10.1016/j.ijpharm.2014.04.023. Epub 2014 Apr 13.

Two fatal cases of melioidosis on the Thai-Myanmar border. Chu CS, Winearls S, Ling C, Torchinsky MB, Phyo AP, Haohankunnathum W, Turner P, Wuthiekanun V, Nosten F. *Version 2. F1000Res*. 2014 Jan 6 [revised 2014 Mar 31];3:4. doi: 10.12688/f1000research.3-4.v2. eCollection 2014.

Genetic variability of *Plasmodium malariae* dihydropteroate synthase (dhps) in four Asian countries. Tanomsing N, Mayxay M, Newton PN, Nosten F, Dolecek C, Hien TT, White NJ, Day NP, Dondorp AM, Imwong M. *PLoS One*. 2014 Apr 3;9(4):e93942. doi: 10.1371/journal.pone.0093942. eCollection 2014.

Pharmacokinetic interactions between primaquine and chloroquine. Pukrittayakamee S, Tarning J, Jittamala



P, Charunwatthana P, Lawpoolsri S, Lee SJ, Hanpithakpong W, Hanboonkunupakarn B, Day NP, Ashley EA, White NJ.

Antimicrob Agents Chemother. 2014 Jun;58(6):3354-9. doi: 10.1128/AAC.02794-13. Epub 2014 Mar 31.

Laboratory detection of artemisinin-resistant *Plasmodium falciparum*. Chotivanich K, Tripura R, Das D, Yi P, Day NP, Pukrittayakamee S, Chuor CM, Socheat D, Dondorp AM, White NJ. Antimicrob Agents Chemother. 2014 Jun;58(6):3157-61. doi: 10.1128/AAC.01924-13. Epub 2014 Mar 24.

Single nucleotide polymorphisms in *Plasmodium falciparum* V type H(+) pyrophosphatase gene (pfvp2) and their associations with pfcr1 and pfmdr1 polymorphisms. Jovel IT, Ferreira PE, Veiga MI, Malmberg M, Mårtensson A, Kaneko A, Zakeri S, Murillo C, Nosten F, Björkman A, Ursing J. Infect Genet Evol. 2014 Jun;24:111-5. doi: 10.1016/j.meegid.2014.03.004. Epub 2014 Mar 20.

Ex-vivo cytoadherence phenotypes of *Plasmodium falciparum* strains from Malian children with hemoglobins A, S, and C. Beaudry JT, Krause MA, Diakite SA, Fay MP, Joshi G, Diakite M, White NJ, Fairhurst RM. PLoS One. 2014 Mar 19;9(3):e92185. doi: 10.1371/journal.pone.0092185. eCollection 2014.

Liver changes in severe *Plasmodium falciparum* malaria: histopathology, apoptosis and nuclear factor kappa B expression. Viriyavejakul P, Khachonsaksumet V, Punsawad C. Malar J. 2014 Mar 17;13:106. doi: 10.1186/1475-2875-13-106.

Correlation of biomarkers for parasite burden and immune activation with acute kidney injury in severe *falciparum* malaria. Plewes K, Royackers AA, Hanson J, Hasan MM, Alam S, Ghose A, Maude RJ, Stassen PM, Charunwatthana P, Lee SJ, Turner GD, Dondorp AM, Schultz MJ. Malar J. 2014 Mar 12;13:91. doi: 10.1186/1475-2875-13-91.

Transient lesion in the splenium of the corpus callosum in acute uncomplicated *falciparum* malaria. Laothamatas J, Sammet CL, Golay X, Van Cauteren M, Lekprasert V, Tangpukdee N, Krudsood S, Leowattana W, Wilairatana P, Swaminathan SV, DeLaPaz RL, Brown TR, Loareesuwan S, Brittenham GM. Am J Trop Med Hyg. 2014 Jun;90(6):1117-23. doi: 10.4269/ajtmh.13-0665. Epub 2014 Mar 10.

Profiling the humoral immune responses to *Plasmodium vivax* infection and identification of candidate immunogenic rhoptry-associated membrane antigen (RAMA). Lu F, Li J, Wang B, Cheng Y, Kong DH, Cui L, Ha KS, Sattabongkot J, Tsuboi T, Han ET. J Proteomics. 2014 May 6;102:66-82. doi:

Nuclear factor kappa B in urine sediment: a useful indicator to detect acute kidney injury in *Plasmodium falciparum* malaria. Punsawad C, Viriyavejakul P. Malar J. 2014 Mar 7;13:84. doi: 10.1186/1475-2875-13-84.

Treatment of suspected hyper-reactive malarial splenomegaly (HMS) in pregnancy with mefloquine. Jaroensuk J, Stoesser N, Leimanis ML, Jittamala P, White NJ, Nosten FH, McGready R. Am J Trop Med Hyg. 2014 Apr;90(4):609-11. doi: 10.4269/ajtmh.13-0706. Epub 2014 Mar 3.

A population survey of the glucose-6-phosphate dehydrogenase (G6PD) 563C>T (Mediterranean) mutation in Afghanistan. Jamornthanyawat N, Awab GR, Tanomsing N, Pukrittayakamee S, Yamin F, Dondorp AM, Day NP, White NJ, Woodrow CJ, Imwong M. PLoS One. 2014 Feb 21;9(2):e88605. doi: 10.1371/journal.pone.0088605. eCollection 2014.

Loop-mediated isothermal amplification assay for rapid diagnosis of malaria infections in an area of endemicity in Thailand. Sattabongkot J, Tsuboi T, Han ET, Bantuchai S, Buates S. J Clin Microbiol. 2014 May;52(5):1471-7. doi: 10.1128/JCM.03313-13. Epub 2014 Feb 26. Erratum in: J Clin Microbiol. 2014 Jul;52(7):2746.

Clinical audit to enhance safe practice of skilled birth attendants for the fetus with nuchal cord: evidence from a refugee and migrant cohort. Parr M, Dabu CP, Wai NS, Say PS, Ner M, Tun NW, Min A, Gilder ME, Nosten FH, McGready R. BMC Pregnancy Childbirth. 2014 Feb 20;14:76. doi: 10.1186/1471-2393-14-76.

Dense genomic sampling identifies highways of pneumococcal recombination.

Chewapreecha C, Harris SR, Croucher NJ, Turner C, Marttinen P, Cheng L, Pessia A, Aanensen DM, Mather AE, Page AJ, Salter SJ, Harris D, Nosten F, Goldblatt D, Corander J, Parkhill J, Turner P, Bentley SD. *Nat Genet.* 2014 Mar;46(3):305-9. doi: 10.1038/ng.2895. Epub 2014 Feb 9.

Mass primaquine treatment to eliminate vivax malaria: lessons from the past.

Kondrashin A, Baranova AM, Ashley EA, Recht J, White NJ, Sergiev VP. *Malar J.* 2014 Feb 7;13:51. doi: 10.1186/1475-2875-13-51.

Chloroquine is grossly under dosed in young children with malaria: implications for drug resistance. Ursing J, Eksborg S, Rombo L, Bergqvist Y, Blessborn D, Rodrigues A, Kofoed PE. *PLoS One.* 2014 Jan 23;9(1):e86801. doi: 10.1371/journal.pone.0086801. eCollection 2014.

Factors associated with cerebral malaria. Adhikari B, Tangpukdee N, Krudsood S, Wilairatana P. *Southeast Asian J Trop Med Public Health.* 2013 Nov;44(6):941-9.

Population pharmacokinetic assessment of the effect of food on piperazine bioavailability in patients with uncomplicated malaria. Tarning J, Lindegardh N, Lwin KM, Annerberg A, Kiricharoen L, Ashley E, White NJ, Nosten F, Day NP.

*Antimicrob Agents Chemother.* 2014 Apr;58(4):2052-8. doi: 10.1128/AAC.02318-13. Epub 2014 Jan 21.

Schizontemia as an indicator of severe malaria. Tangpukdee N, Krudsood S, Wilairatana P. *Southeast Asian J Trop Med Public Health.* 2013 Sep;44(5):740-3.

A morphometric and histological study of placental malaria shows significant changes to villous architecture in both *Plasmodium falciparum* and *Plasmodium vivax* infection. Chaikitgosiyakul S, Rijken MJ, Muehlenbachs A, Lee SJ, Chaisri U, Viriyavejakul P, Turner GD, Pongponratn E, Nosten F, McGready R. *Malar J.* 2014 Jan 4;13:4. doi: 10.1186/1475-2875-13-4.

Tafenoquine plus chloroquine for the treatment and relapse prevention of *Plasmodium vivax* malaria (DETECTIVE): a multicentre, double-blind, randomised, phase 2b dose-selection study. Llanos-Cuentas A, Lacerda MV, Rueangweerayut R, Krudsood S, Gupta SK, Kochar SK, Arthur P, Chuenchom N, Möhrle JJ, Duparc S, Ugwuegbulam C, Kleim JP, Carter N, Green JA, Kellam L.

*Lancet.* 2014 Mar 22;383(9922):1049-58. doi: 10.1016/S0140-6736(13)62568-4. Epub 2013 Dec 19.

Field survey focused on *Opisthorchis viverrini* infection in five provinces of Cambodia. Miyamoto K, Kirinoki M, Matsuda H, Hayashi N, Chigusa Y, Sinuon M, Chuor CM, Kitikoon V. *Parasitol Int.* 2014 Apr;63(2):366-73. doi: 10.1016/j.parint.2013.12.003. Epub 2013 Dec 14.

Targeting *Plasmodium* PI(4)K to eliminate malaria. McNamara CW, Lee MC, Lim CS, Lim SH, Roland J, Nagle A, Simon O, Yeung BK, Chatterjee AK, McCormack SL, Manary MJ, Zeeman AM, Dechering KJ, Kumar TR, Henrich PP, Gagaring K, Ibanez M, Kato N, Kuhen KL, Fischli C, Rottmann M, Plouffe DM, Bursulaya B, Meister S, Rameh L, Trappe J, Haasen D, Timmerman M, Sauerwein RW, Suwanarusk R, Russell B, Renia L, Nosten F, Tully DC, Kocken CH, Glynne RJ, Bodenreider C, Fidock DA, Diagana TT, Winzeler EA. *Nature.* 2013 Dec 12;504(7479):248-53. doi: 10.1038/nature12782. Epub 2013 Nov 27.

Single dose primaquine for clearance of *Plasmodium falciparum* gametocytes in children with uncomplicated malaria in Uganda: a randomised, controlled, double-blind, dose-ranging trial. Eziefula AC, Bousema T, Yeung S, Kanya M, Owaraganise A, Gabagaya G, Bradley J, Grignard L, Lanke KH, Wanzira H, Mpimbaza A, Nsoya S, White NJ, Webb EL, Staedke SG, Drakeley C. *Lancet Infect Dis.* 2014 Feb;14(2):130-9. doi: 10.1016/S1473-3099(13)70268-8. Epub 2013 Nov 13.

Population Pharmacokinetics of Lumefantrine in Pregnant and Nonpregnant Women With Uncomplicated *Plasmodium falciparum* Malaria in Uganda. Klopogge F, Piola P, Dhorda M, Muwanga S, Turyakira E, Apinan S, Lindegårdh N, Nosten F, Day NP, White NJ, Guerin PJ, Tarning J. *CPT Pharmacometrics Syst Pharmacol.* 2013 Nov 13;2:e83. doi: 10.1038/psp.2013.59.

Liquid chromatographic-mass spectrometric method for simultaneous determination of small organic acids potentially contributing to acidosis in severe malaria. Sriboonvorakul N, Leepipatpiboon N, Dondorp AM, Pouplin T, White NJ, Tarning J, Lindegardh N. J Chromatogr B Analyt Technol Biomed Life Sci. 2013 Dec 15;941:116-22. doi: 10.1016/j.jchromb.2013.10.005. Epub 2013 Oct 16.

Entomological determinants of insecticide-treated bed net effectiveness in Western Myanmar. Smithuis FM, Kyaw MK, Phe UO, van der Broek I, Katterman N, Rogers C, Almeida P, Kager PA, Stepniewska K, Lubell Y, Simpson JA, White NJ. Malar J. 2013 Oct 11;12:364. doi: 10.1186/1475-2875-12-364.

The effect of insecticide-treated bed nets on the incidence and prevalence of malaria in children in an area of unstable seasonal transmission in western Myanmar. Smithuis FM, Kyaw MK, Phe UO, van der Broek I, Katterman N, Rogers C, Almeida P, Kager PA, Stepniewska K, Lubell Y, Simpson JA, White NJ. Malar J. 2013 Oct 11;12:363. doi: 10.1186/1475-2875-12-363.

The reliability of the physical examination to guide fluid therapy in adults with severe falciparum malaria: an observational study. Hanson J, Lam SW, Alam S, Pattnaik R, Mahanta KC, Uddin Hasan M, Mohanty S, Mishra S, Cohen S, Day N, White N, Dondorp A. Malar J. 2013 Oct 1;12:348. doi: 10.1186/1475-2875-12-348.

#### **Activity 4**

Title: Review and update the standard guidelines for clinical management of malaria in small and large hospitals

Description: •Review of evidence on drug resistance, outcome of clinical trials and other studies related to malaria case management

- Update the Regional guidelines for clinical management of malaria in hospitals as necessary depending on the available evidence
- The activities will be carried out either on APW or Technical services agreement (TSA) between WHO-CC and SEARO.
- The Regional Adviser (malaria) and other concerned WHO staff would provide the necessary technical inputs.

October to December, 2013

Collaboration with Royal college of Physicians of Thailand and Ministry of Public Health of Thailand to write guidelines in management of malaria in Thailand (in Thai).

#### **Activity 5**

Title: Conduct WHO-supported research in malaria.

Description: •It is understood that the research activities to be linked to WHO-CC will be only those to be agreed with and supported by WHO either technically and/or financially. The research could be related to case management of malaria, malaria diagnostics, malaria drugs, drug resistance, and vaccines. Other research activities being done by the Institution on their own will not be part of the WHO-CC activities.

WHO staff would help identify the research needs from WHO perspectives. They would help develop the protocol, raise funds as needed and monitor the conduct of the research. They would also support the dissemination of the results.

None

**2. Please briefly describe your collaboration with WHO in regards to the activities of the WHO collaborating centre during the past 12 months (e.g. means of communication, frequency of contact, visits to or from WHO). Please feel free to mention any difficulties encountered (if any) and to provide suggestions for increased or improved communication (if applicable).**



August 25-29, 2014

Sending Malaria Consultant to WHO/ Indonesia to evaluate “A feasibility study on malaria clinical management training course (severe and uncomplicated malaria) in well equipped hospitals and the primary health care centers in Indonesia”, 25-29 August 2014. PTEO: SEINO1408504; 2.6; 61174. Venue and dates: Jakarta and Timika, Indonesia; 25-29 August 2014.

**3. Please briefly describe any interactions or collaborations with other WHO collaborating centres in the context of the implementation of the above activities (if any). If you are part of a network of WHO collaborating centres, please also mention the name of the network, and describe any involvement in the network during the last 12 months.**

August 25-29, 2014

Sending Malaria Consultant to WHO/ Indonesia to evaluate “A feasibility study on malaria clinical management training course (severe and uncomplicated malaria) in well equipped hospitals and the primary health care centers in Indonesia”, 25-29 August 2014. PTEO: SEINO1408504; 2.6; 61174. Venue and dates: Jakarta and Timika, Indonesia; 25-29 August 2014.

September 15-19, 2014

Organized “the 12th International Training Course on Management of Malaria” in collaboration with WHO SEARO, WHO Mekong Malaria Programme, and WHO Indonesia during 15-19 September 2014 at Faculty of Tropical Medicine, Mahidol University, Thailand. There were 44 participants from 11 countries namely Bangladesh, Bhutan, Cambodia, India, Indonesia, Japan, Myanmar, Nepal, Sri Lanka, Sudan, and Thailand. Professor Anand Joshi (Team Leader of Malaria and Neglected Tropical Diseases, WHO/Indonesia) was invited to be facilitator and speaker of this training course.

**4. Please briefly describe any type of technical, programmatic, advisory or other support received from WHO during the past 12 months for the implementation of the agreed activities listed above (if any).**

September 15-19, 2014

Organized “the 12th International Training Course on Management of Malaria” in collaboration with WHO SEARO, WHO Mekong Malaria Programme, and WHO Indonesia during 15-19 September 2014 at Faculty of Tropical Medicine, Mahidol University, Thailand. There were 44 participants from 11 countries namely Bangladesh, Bhutan, Cambodia, India, Indonesia, Japan, Myanmar, Nepal, Sri Lanka, Sudan, and Thailand. Professor Anand Joshi (Team Leader of Malaria and Neglected Tropical Diseases, WHO/Indonesia) was invited to be facilitator and speaker of this training course. WHO SEARO also support and nominated 15 participants from Myanmar and India to attend this training course.