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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 09-2014 to 09-2015

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.

September 24-28, 2015

Organized "the 13th International Training Course on Management of Malaria" in collaboration with WHO SEARO during 24-28 September 2015 at Faculty of Tropical Medicine, Mahidol University, Thailand. There were 29 participants from 11 countries namely Australia, Bangladesh, Bhutan, Cambodia, India, Indonesia, Japan, Myanmar, Nepal, Sri Lanka, and Thailand. Dr Peter Olumese from WHO HQ was kindly to be 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.

April 2, 2015

Discussing the WHO CC's activities and collaboration with Dr. Peter Olumese from WHO HQ.

May 29, 2015

Speaker on the topic "Malaria treatment and Prophylaxis" in the Annual Scientific Meeting of hospital pharmacists in Thailand at Narai Hotel, Bangkok, Thailand.

May-September, 2015

Collaborating with Vector-borne Disease Bureau, Ministry of Public Health, Thailand to update National Guidelines for Treatment of Malaria.

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.

Informal exchange via research and scientific articles in journals as following

Unambiguous determination of *Plasmodium vivax* reticulocyte invasion by flow cytometry. Cho JS, Russell B, Kosasaivee V, Zhang R, Colin Y, Bertrand O, Chandramohanadas R, Chu CS, Nosten F, Renia L, Malleret B. *Int J Parasitol.* 2015 Sep 15. pii: S0020-7519(15)00224-6. doi: 10.1016/j.ijpara.2015.08.003. [Epub ahead of print]

Absence of association between *Plasmodium falciparum* small sub-unit ribosomal RNA gene mutations and in vitro decreased susceptibility to doxycycline. Gaillard T, Wurtz N, Houzé S, Sriprawat K, Wangsing C, Hubert V, Lebras J, Nosten F, Briolant S, Pradines B; French National Reference Centre for Imported Malaria Study Group. *Malar J.* 2015 Sep 17;14(1):348. doi: 10.1186/s12936-015-0878-x.

Ethical considerations in malaria research proposal review: empirical evidence from 114 proposals submitted to an Ethics Committee in Thailand. Adams P, Prakobtham S, Limphattharachoen C, Vutikes P, Khusmith S, Pengsaa K, Wilairatana P, Kaewkungwal J. *Malar J.* 2015 Sep 14;14(1):342. doi: 10.1186/s12936-015-0854-5.

The role of previously unmeasured organic acids in the pathogenesis of severe malaria. Herdman MT, Sriboonvorakul N, Leopold SJ, Douthwaite S, Mohanty S, Hassan MM, Maude RJ, Kingston HW, Plewes K, Charunwathana P, Silamut K, Woodrow CJ, Chotinavich K, Hossain MA, Faiz MA, Mishra S, Leepipatpiboon N, White NJ, Day NP, Tarning J, Dondorp AM. *Crit Care.* 2015 Sep 7;19:317. doi: 10.1186/s13054-015-1023-5.

Artemisinin resistance in Myanmar - Authors' reply. Imwong M, Tun KM, Hlaing TM, Grist EP, Guerin P, Smithuis F, Dondorp AM, Day NP, Nosten F, White N, Woodrow CJ. *Lancet Infect Dis.* 2015 Sep;15(9):1002-3. doi: 10.1016/S1473-3099(15)00248-0. No abstract available.

Genetic diversity of *Plasmodium falciparum* histidine-rich protein 2 in the China-Myanmar border area. Li P, Xing H, Zhao Z, Yang Z, Cao Y, Li W, Yan G, Sattabongkot J, Cui L, Fan Q. *Acta Trop.* 2015 Aug 20;152:26-31. doi: 10.1016/j.actatropica.2015.08.003. [Epub ahead of print]

Elimination of *Plasmodium falciparum* in an area of multi-drug resistance. Lwin KM, Imwong M, Suangkanarat P, Jeeyapant A, Vihokhern B, Wongsan K, Snounou G, Keereecharoen L, White NJ, Nosten F. *Malar J.* 2015 Aug 16;14:319. doi: 10.1186/s12936-015-0838-5.

Comparison between Flow Cytometry, Microscopy, and Lactate Dehydrogenase-Based Enzyme-Linked Immunosorbent Assay for *Plasmodium falciparum* Drug Susceptibility Testing under Field Conditions. Woodrow CJ, Wangsing C, Sriprawat K, Christensen PR, Nosten F, Renia L, Russell B, Malleret B. *J Clin*

Microbiol. 2015 Oct;53(10):3296-303. doi: 10.1128/JCM.01226-15. Epub 2015 Aug 12.

Molecular Evolution of PvMSP3 α Block II in Plasmodium vivax from Diverse Geographic Origins. Gupta B, Reddy BP, Fan Q, Yan G, Sirichaisinthop J, Sattabongkot J, Escalante AA, Cui L. PLoS One. 2015 Aug 12;10(8):e0135396. doi: 10.1371/journal.pone.0135396. eCollection 2015.

The suitability of laboratory-bred Anopheles cracens for the production of Plasmodium vivax sporozoites. Andolina C, Landier J, Carrara V, Chu CS, Franetich JF, Roth A, Rénia L, Roucher C, White NJ, Snounou G, Nosten F. Malar J. 2015 Aug 12;14:312. doi: 10.1186/s12936-015-0830-0.

Lumefantrine and Desbutyl-Lumefantrine Population Pharmacokinetic-Pharmacodynamic Relationships in Pregnant Women with Uncomplicated Plasmodium falciparum Malaria on the Thailand-Myanmar Border. Kloprogge F, McGready R, Hanpithakpong W, Blessborn D, Day NP, White NJ, Nosten F, Tarning J. Antimicrob Agents Chemother. 2015 Oct;59(10):6375-84. doi: 10.1128/AAC.00267-15. Epub 2015 Aug 3.

Preclinical Assessment of Viral Vectored and Protein Vaccines Targeting the Duffy-Binding Protein Region II of Plasmodium Vivax. de Cassan SC, Shakri AR, Llewellyn D, Elias SC, Cho JS, Goodman AL, Jin J, Douglas AD, Suwanarusk R, Nosten FH, Rénia L, Russell B, Chitnis CE, Draper SJ. Front Immunol. 2015 Jul 8;6:348. doi: 10.3389/fimmu.2015.00348. eCollection 2015.

Malaria eradication and elimination: views on how to translate a vision into reality. Tanner M, Greenwood B, Whitty CJ, Ansah EK, Price RN, Dondorp AM, von Seidlein L, Baird JK, Beeson JG, Fowkes FJ, Hemingway J, Marsh K, Osier F. BMC Med. 2015 Jul 25;13:167. doi: 10.1186/s12916-015-0384-6.

Past and new challenges for malaria control and elimination: the role of operational research for innovation in designing interventions. Guyant P, Corbel V, Guérin PJ, Lautissier A, Nosten F, Boyer S, Coosemans M, Dondorp AM, Sinou V, Yeung S, White N. Malar J. 2015 Jul 17;14:279. doi: 10.1186/s12936-015-0802-4.

Predicting the impact of border control on malaria transmission: a simulated focal screen and treat campaign. Silal SP, Little F, Barnes KI, White LJ. Malar J. 2015 Jul 12;14:268. doi: 10.1186/s12936-015-0776-2.

A Basis for Rapid Clearance of Circulating Ring-Stage Malaria Parasites by the Spiroindolone KAE609. Zhang R, Suwanarusk R, Malleret B, Cooke BM, Nosten F, Lau YL, Dao M, Lim CT, Renia L, Tan KS, Russell B. J Infect Dis. 2015 Jul 1. pii: jiv358. [Epub ahead of print]

Estimating Gestational Age in Late Presenters to Antenatal Care in a Resource-Limited Setting on the Thai-Myanmar Border. Moore KA, Simpson JA, Thomas KH, Rijken MJ, White LJ, Dwell SL, Paw MK, Wiladphaingern J, Pukrittayakamee S, Nosten F, Fowkes FJ, McGready R. PLoS One. 2015 Jun 26;10(6):e0131025. doi: 10.1371/journal.pone.0131025. eCollection 2015.

Intermittent presumptive treatment in pregnancy with sulfadoxine-pyrimethamine: a counter perspective. Nosten F, McGready R. Malar J. 2015 Jun 20;14:248. doi: 10.1186/s12936-015-0765-5.

Severe falciparum malaria treated with artesunate complicated by delayed onset haemolysis and acute kidney injury. Plewes K, Haider MS, Kingston HW, Yeo TW, Ghose A, Hossain MA, Dondorp AM, Turner GD, Anstey NM. Malar J. 2015 Jun 18;14:246. doi: 10.1186/s12936-015-0760-x.

Microvascular obstruction and endothelial activation are independently associated with the clinical manifestations of severe falciparum malaria in adults: an observational study. Hanson J, Lee SJ, Hossain MA, Anstey NM, Charunwathana P, Maude RJ, Kingston HW, Mishra SK, Mohanty S, Plewes K, Piera K, Hassan MU, Ghose A, Faiz MA, White NJ, Day NP, Dondorp AM. BMC Med. 2015 May 27;13:122. doi: 10.1186/s12916-015-0365-9.

Intervals to Plasmodium falciparum recurrence after anti-malarial treatment in pregnancy: a longitudinal prospective cohort. Laochan N, Zaloumis SG, Imwong M, Lek-Uthai U, Brockman A, Sriprawat K, Wiladphaingern J, White NJ, Nosten F, McGready R. Malar J. 2015 May 28;14:221. doi: 10.1186/s12936-015-0745-9.

Characterization of Plasmodium vivax Early Transcribed Membrane Protein 11.2 and Exported Protein 1. Cheng Y, Lu F, Lee SK, Kong DH, Ha KS, Wang B, Sattabongkot J, Tsuboi T, Han ET. PLoS One. 2015 May 26;10(5):e0127500. doi: 10.1371/journal.pone.0127500. eCollection 2015.

Global extent of chloroquine-resistant Plasmodium vivax - Authors' reply. Price RN, von Seidlein L, Valecha N, Nosten F, Baird JK, White NJ. Lancet Infect Dis. 2015 Jun;15(6):630-1. doi: 10.1016/S1473-3099(15)00018-3. Epub 2015 May 17.

The role of point-of-care tests in antibiotic stewardship for urinary tract infections in a resource-limited setting on the Thailand-Myanmar border. Chalmers L, Cross J, Chu CS, Phyo AP, Trip M, Ling C, Carrara V, Watthanaworawit W, Keereecharoen L, Hanboonkunupakarn B, Nosten F, McGready R. Trop Med Int Health. 2015 Oct;20(10):1281-9. doi: 10.1111/tmi.12541. Epub 2015 Jun 11.

Microgeography and molecular epidemiology of malaria at the Thailand-Myanmar border in the malaria pre-elimination phase. Parker DM, Matthews SA, Yan G, Zhou G, Lee MC, Sirichaisinthop J, Kiattibutr K, Fan Q,

- Li P, Sattabongkot J, Cui L, Malar J. 2015 May 13;14:198. doi: 10.1186/s12936-015-0712-5.
- Antigenicity and immunogenicity of PvRALP1, a novel Plasmodium vivax rhoptry neck protein. Cheng Y, Li J, Ito D, Kong DH, Ha KS, Lu F, Wang B, Sattabongkot J, Lim CS, Tsuboi T, Han ET. Malar J. 2015 Apr 29;14:186. doi: 10.1186/s12936-015-0698-z.
- Defining the in vivo phenotype of artemisinin-resistant falciparum malaria: a modelling approach. White LJ, Flegg JA, Phyo AP, Wiladpai-ngern JH, Bethell D, Plowe C, Anderson T, Nkhoma S, Nair S, Tripura R, Stepniowska K, Pan-Ngum W, Silamut K, Cooper BS, Lubell Y, Ashley EA, Nguon C, Nosten F, White NJ, Dondorp AM. PLoS Med. 2015 Apr 28;12(4):e1001823. doi: 10.1371/journal.pmed.1001823. eCollection 2015 Apr.
- Downregulation of plasma miR-451 and miR-16 in Plasmodium vivax infection. Chamnanchanunt S, Kuroki C, Desakorn V, Enomoto M, Thanachartwet V, Sahassananda D, Sattabongkot J, Jenwithisuk R, Fucharoen S, Svasti S, Umemura T. Exp Parasitol. 2015 Aug;155:19-25. doi: 10.1016/j.exppara.2015.04.013. Epub 2015 Apr 22.
- The clinical implications of thrombocytopenia in adults with severe falciparum malaria: a retrospective analysis. Hanson J, Phu NH, Hasan MU, Charunwatthana P, Plewes K, Maude RJ, Prapansilp P, Kingston HW, Mishra SK, Mohanty S, Price RN, Faiz MA, Dondorp AM, White NJ, Hien TT, Day NP. BMC Med. 2015 Apr 24;13:97. doi: 10.1186/s12916-015-0324-5.
- Targeting the cell stress response of Plasmodium falciparum to overcome artemisinin resistance. Dogovski C, Xie SC, Burgio G, Bridgford J, Mok S, McCaw JM, Chotivanich K, Kenny S, Gnädig N, Straimer J, Bozdech Z, Fidock DA, Simpson JA, Dondorp AM, Foote S, Klonis N, Tilley L. PLoS Biol. 2015 Apr 22;13(4):e1002132. doi: 10.1371/journal.pbio.1002132. eCollection 2015 Apr.
- Pregnant migrant and refugee women's perceptions of mental illness on the Thai-Myanmar border: a qualitative study. Fellmeth G, Plugge E, Paw MK, Charunwatthana P, Nosten F, McGready R. BMC Pregnancy Childbirth. 2015 Apr 15;15:93. doi: 10.1186/s12884-015-0517-0.
- Mast cell activation in the skin of Plasmodium falciparum malaria patients. Wilainam P, Nintasen R, Viriyavejakul P. Malar J. 2015 Feb 7;14:67. doi: 10.1186/s12936-015-0568-8.
- Opposite malaria and pregnancy effect on oral bioavailability of artesunate - a population pharmacokinetic evaluation. Klopogge F, McGready R, Phyo AP, Rijken MJ, Hanpithakpon W, Than HH, Hlaing N, Zin NT, Day NP, White NJ, Nosten F, Tarning J. Br J Clin Pharmacol. 2015 Apr 15. doi: 10.1111/bcp.12660. [Epub ahead of print]
- A molecular mechanism of artemisinin resistance in Plasmodium falciparum malaria. Mbengue A, Bhattacharjee S, Pandharkar T, Liu H, Estiu G, Stahelin RV, Rizk SS, Njimoh DL, Ryan Y, Chotivanich K, Nguon C, Ghorbal M, Lopez-Rubio JJ, Pfrender M, Emrich S, Mohandas N, Dondorp AM, Wiest O, Haldar K. Nature. 2015 Apr 30;520(7549):683-7. doi: 10.1038/nature14412. Epub 2015 Apr 15.
- Fighting fire with fire: mass antimalarial drug administrations in an era of antimalarial resistance. von Seidlein L, Dondorp A. Expert Rev Anti Infect Ther. 2015 Jun;13(6):715-30. doi: 10.1586/14787210.2015.1031744. Epub 2015 Apr 1.
- Plasmodium vivax malaria: challenges in diagnosis, treatment and elimination. Beeson JG, Chu CS, Richards JS, Nosten F, Fowkes FJ. Pediatr Infect Dis J. 2015 May;34(5):529-31. doi: 10.1097/INF.0000000000000671. No abstract available.
- Plasmodium vivax liver stage development and hypnozoite persistence in human liver-chimeric mice. Mikolajczak SA, Vaughan AM, Kangwanrangsan N, Roobsoong W, Fishbaugher M, Yimamnuyachok N, Rezakhani N, Lakshmanan V, Singh N, Kaushansky A, Camargo N, Baldwin M, Lindner SE, Adams JH, Sattabongkot J, Kappe SH. Cell Host Microbe. 2015 Apr 8;17(4):526-35. doi: 10.1016/j.chom.2015.02.011. Epub 2015 Mar 19.
- Modeling the dynamics of Plasmodium vivax infection and hypnozoite reactivation in vivo. Adekunle AI, Pinkevych M, McGready R, Luxemburger C, White LJ, Nosten F, Cromer D, Davenport MP. PLoS Negl Trop Dis. 2015 Mar 17;9(3):e0003595. doi: 10.1371/journal.pntd.0003595. eCollection 2015 Mar.
- Population Pharmacokinetics of Piperaquine in Young Ugandan Children Treated With Dihydroartemisinin-Piperaquine for Uncomplicated Malaria. Sambol NC, Yan L, Creek DJ, McCormack SA, Arinaitwe E, Bigira V, Wanzira H, Kakuru A, Tappero JW, Lindegardh N, Tarning J, Nosten F, Aweeka FT, Parikh S. Clin Pharmacol Ther. 2015 Jul;98(1):87-95. doi: 10.1002/cpt.104. Epub 2015 May 2.
- Spread of artemisinin-resistant Plasmodium falciparum in Myanmar: a cross-sectional survey of the K13 molecular marker. Tun KM, Imwong M, Lwin KM, Win AA, Hlaing TM, Hlaing T, Lin K, Kyaw MP, Plewes K, Faiz MA, Dhorda M, Cheah PY, Pukrittayakamee S, Ashley EA, Anderson TJ, Nair S, McDew-White M, Flegg JA, Grist EP, Guerin P, Maude RJ, Smithuis F, Dondorp AM, Day NP, Nosten F, White NJ, Woodrow CJ.

- Lancet Infect Dis. 2015 Apr;15(4):415-21. doi: 10.1016/S1473-3099(15)70032-0. Epub 2015 Feb 20.
Surveillance of artemisinin resistance in Plasmodium falciparum in India using the kelch13 molecular marker. Mishra N, Prajapati SK, Kaitholia K, Bharti RS, Srivastava B, Phookan S, Anvikar AR, Dev V, Sonal GS, Dhariwal AC, White NJ, Valecha N. Antimicrob Agents Chemother. 2015 May;59(5):2548-53. doi: 10.1128/AAC.04632-14. Epub 2015 Feb 17.
- Suitability of capillary blood for quantitative assessment of G6PD activity and performances of G6PD point-of-care tests. Bancone G, Chu CS, Chowwiwat N, Somsakchaicharoen R, Wilaisrisak P, Charunwatthana P, Bansil P, McGray S, Domingo GJ, Nosten FH. Am J Trop Med Hyg. 2015 Apr;92(4):818-24. doi: 10.4269/ajtmh.14-0696. Epub 2015 Feb 2.
- Genetic architecture of artemisinin-resistant Plasmodium falciparum. Miotto O, Amato R, Ashley EA, MacInnis B, Almagro-Garcia J, Amaratunga C, Lim P, Mead D, Oyola SO, Dhorda M, Imwong M, Woodrow C, Manske M, Stalker J, Drury E, Campino S, Amenga-Etego L, Thanh TN, Tran HT, Ringwald P, Bethell D, Nosten F, Phyto AP, Pukrittayakamee S, Chotivanich K, Chuor CM, Nguon C, Suon S, Sreng S, Newton PN, Mayxay M, Khanthavong M, Hongvanthong B, Htut Y, Han KT, Kyaw MP, Faiz MA, Fanello CI, Onyamboko M, Mokuolu OA, Jacob CG, Takala-Harrison S, Plowe CV, Day NP, Dondorp AM, Spencer CC, McVean G, Fairhurst RM, White NJ, Kwiatkowski DP. Nat Genet. 2015 Mar;47(3):226-34. doi: 10.1038/ng.3189. Epub 2015 Jan 19.
- Comparing Leishman and Giemsa staining for the assessment of peripheral blood smear preparations in a malaria-endemic region in India. Sathpathi S, Mohanty AK, Satpathi P, Mishra SK, Behera PK, Patel G, Dondorp AM. Malar J. 2014 Dec 30;13:512. doi: 10.1186/1475-2875-13-512.
- Characterization of G6PD genotypes and phenotypes on the northwestern Thailand-Myanmar border. Bancone G, Chu CS, Somsakchaicharoen R, Chowwiwat N, Parker DM, Charunwatthana P, White NJ, Nosten FH. PLoS One. 2014 Dec 23;9(12):e116063. doi: 10.1371/journal.pone.0116063. eCollection 2014.
- Pooled sequencing and rare variant association tests for identifying the determinants of emerging drug resistance in malaria parasites. Cheeseman IH, McDew-White M, Phyto AP, Sripawat K, Nosten F, Anderson TJ. Mol Biol Evol. 2015 Apr;32(4):1080-90. doi: 10.1093/molbev/msu397. Epub 2014 Dec 21.
- The duration of Plasmodium falciparum infections. Ashley EA, White NJ. Malar J. 2014 Dec 16;13:500. doi: 10.1186/1475-2875-13-500.
- Plasmodium falciparum field isolates from areas of repeated emergence of drug resistant malaria show no evidence of hypermutator phenotype. Brown TS, Jacob CG, Silva JC, Takala-Harrison S, Djimdé A, Dondorp AM, Fukuda M, Noedl H, Nyunt MM, Kyaw MP, Mayxay M, Hien TT, Plowe CV, Cummings MP. Infect Genet Evol. 2015 Mar;30:318-22. doi: 10.1016/j.meegid.2014.12.010. Epub 2014 Dec 13.
- Cellular-mediated immune responses in the liver tissue of patients with severe Plasmodium falciparum malaria. Punsawadl C, Setthapramote C, Viriyavejakul P. Southeast Asian J Trop Med Public Health. 2014 Sep;45(5):973-83.
- Drug resistance. Population transcriptomics of human malaria parasites reveals the mechanism of artemisinin resistance. Mok S, Ashley EA, Ferreira PE, Zhu L, Lin Z, Yeo T, Chotivanich K, Imwong M, Pukrittayakamee S, Dhorda M, Nguon C, Lim P, Amaratunga C, Suon S, Hien TT, Htut Y, Faiz MA, Onyamboko MA, Mayxay M, Newton PN, Tripura R, Woodrow CJ, Miotto O, Kwiatkowski DP, Nosten F, Day NP, Preiser PR, White NJ, Dondorp AM, Fairhurst RM, Bozdech Z. Science. 2015 Jan 23;347(6220):431-5. doi: 10.1126/science.1260403. Epub 2014 Dec 11.
- Assessment of therapeutic responses to gametocytocidal drugs in Plasmodium falciparum malaria. White NJ, Ashley EA, Recht J, Delves MJ, Ruecker A, Smithuis FM, Eziefula AC, Bousema T, Drakeley C, Chotivanich K, Imwong M, Pukrittayakamee S, Prachumsri J, Chu C, Andolina C, Bancone G, Hien TT, Mayxay M, Taylor WR, von Seidlein L, Price RN, Barnes KI, Djimdé A, ter Kuile F, Gosling R, Chen I, Dhorda MJ, Stepniewska K, Guérin P, Woodrow CJ, Dondorp AM, Day NP, Nosten FH. Malar J. 2014 Dec 9;13:483. doi: 10.1186/1475-2875-13-483.
- Severe vivax malaria: a systematic review and meta-analysis of clinical studies since 1900. Rahimi BA, Thakkinstian A, White NJ, Sirivichayakul C, Dondorp AM, Chocejindachai W. Malar J. 2014 Dec 8;13:481. doi: 10.1186/1475-2875-13-481.
- Artemisinin resistance--modelling the potential human and economic costs. Lubell Y, Dondorp A, Guérin PJ, Drake T, Meek S, Ashley E, Day NP, White NJ, White LJ. Malar J. 2014 Nov 23;13:452. doi: 10.1186/1475-2875-13-452.
- Cellular-mediated immune responses in the liver tissue of patients with severe Plasmodium falciparum malaria. Punsawadl C, Setthapramote C, Viriyavejakul P. Southeast Asian J Trop Med Public Health. 2014 Sep;45(5):973-83.
- Plasmodium vivax: restricted tropism and rapid remodeling of CD71-positive reticulocytes. Malleret B, Li A,

Zhang R, Tan KS, Suwanarusk R, Claser C, Cho JS, Koh EG, Chu CS, Pukrittayakamee S, Ng ML, Ginhoux F, Ng LG, Lim CT, Nosten F, Snounou G, Rénia L, Russell B. *Blood*. 2015 Feb 19;125(8):1314-24. doi: 10.1182/blood-2014-08-596015. Epub 2014 Nov 20.

Pharmacokinetic interactions between primaquine and pyronaridine-artesunate in healthy adult Thai subjects. Jittamala P, Pukrittayakamee S, Ashley EA, Nosten F, Hanboonkunupakarn B, Lee SJ, Thana P, Chairat K, Blessborn D, Panapipat S, White NJ, Day NP, Tarning J. *Antimicrob Agents Chemother*. 2015 Jan;59(1):505-13. doi: 10.1128/AAC.03829-14. Epub 2014 Nov 10.

Population pharmacokinetics of intravenous artesunate: a pooled analysis of individual data from patients with severe malaria. Zaloumis SG, Tarning J, Krishna S, Price RN, White NJ, Davis TM, McCaw JM, Olliaro P, Maude RJ, Kremsner P, Dondorp A, Gomes M, Barnes K, Simpson JA. *CPT Pharmacometrics Syst Pharmacol*. 2014 Nov 5;3:e145. doi: 10.1038/psp.2014.43.

Primaquine: the risks and the benefits. Ashley EA, Recht J, White NJ. *Malar J*. 2014 Nov 3;13:418. doi: 10.1186/1475-2875-13-418. Review.

Characterization of an in vivo concentration-effect relationship for piperazine in malaria chemoprevention. Bergstrand M, Nosten F, Lwin KM, Karlsson MO, White NJ, Tarning J. *Sci Transl Med*. 2014 Oct 29;6(260):260ra147. doi: 10.1126/scitranslmed.3005311. Epub 2014 Oct 29.

Cost of treating inpatient falciparum malaria on the Thai-Myanmar border. Kyaw SS, Drake T, Ruangveerayuth R, Chierakul W, White NJ, Newton PN, Lubell Y. *Malar J*. 2014 Oct 29;13:416. doi: 10.1186/1475-2875-13-416.

Plasma concentration of parasite DNA as a measure of disease severity in falciparum malaria. Imwong M, Woodrow CJ, Hendriksen IC, Veenemans J, Verhoef H, Faiz MA, Mohanty S, Mishra S, Mtove G, Gesase S, Seni A, Chhaganlal KD, Day NP, Dondorp AM, White NJ. *J Infect Dis*. 2015 Apr 1;211(7):1128-33. doi: 10.1093/infdis/jiu590. Epub 2014 Oct 24.

Characterization of the commercially-available fluorescent chloroquine-BODIPY conjugate, LynxTag-CQGREEN, as a marker for chloroquine resistance and uptake in a 96-well plate assay. Loh CC, Suwanarusk R, Lee YQ, Chan KW, Choy KY, Rénia L, Russell B, Lear MJ, Nosten FH, Tan KS, Chow LM. *PLoS One*. 2014 Oct 24;9(10):e110800. doi: 10.1371/journal.pone.0110800. eCollection 2014.

Complex polymorphisms in the Plasmodium falciparum multidrug resistance protein 2 gene and its contribution to antimalarial response. Veiga MI, Osório NS, Ferreira PE, Franzén O, Dahlstrom S, Lum JK, Nosten F, Gil JP. *Antimicrob Agents Chemother*. 2014 Dec;58(12):7390-7. doi: 10.1128/AAC.03337-14. Epub 2014 Sep 29.

Open-label crossover study of primaquine and dihydroartemisinin-piperazine pharmacokinetics in healthy adult Thai subjects. Hanboonkunupakarn B, Ashley EA, Jittamala P, Tarning J, Pukrittayakamee S, Hanpithakpong W, Chotsiri P, Wattanakul T, Panapipat S, Lee SJ, Day NP, White NJ. *Antimicrob Agents Chemother*. 2014 Dec;58(12):7340-6. doi: 10.1128/AAC.03704-14. Epub 2014 Sep 29.

Spatial and temporal epidemiology of clinical malaria in Cambodia 2004-2013. Maude RJ, Nguon C, Ly P, Bunkea T, Ngor P, Canavati de la Torre SE, White NJ, Dondorp AM, Day NP, White LJ, Chuor CM. *Malar J*. 2014 Sep 30;13:385. doi: 10.1186/1475-2875-13-385.

The diminishing returns of atovaquone-proguanil for elimination of Plasmodium falciparum malaria: modelling mass drug administration and treatment. Maude RJ, Nguon C, Dondorp AM, White LJ, White NJ. *Malar J*. 2014 Sep 24;13:380. doi: 10.1186/1475-2875-13-380.

Global extent of chloroquine-resistant Plasmodium vivax: a systematic review and meta-analysis. Price RN, von Seidlein L, Valecha N, Nosten F, Baird JK, White NJ. *Lancet Infect Dis*. 2014 Oct;14(10):982-91. doi: 10.1016/S1473-3099(14)70855-2. Epub 2014 Sep 8. Review.

Independent emergence of artemisinin resistance mutations among Plasmodium falciparum 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, Khanthavong 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, Maclnnes B, Kwiatkowski DP, White NJ, Ringwald P, Plowe CV. *J Infect Dis*. 2015 Mar 1;211(5):670-9. doi: 10.1093/infdis/jiu491. Epub 2014 Sep 1.

Methylene blue inhibits the asexual development of vivax malaria parasites from a region of increasing chloroquine resistance. Suwanarusk R, Russell B, Ong A, Sriprawat K, Chu CS, PyaePhyo A, Malleret B, Nosten F, Renia L. *J Antimicrob Chemother*. 2015 Jan;70(1):124-9. doi: 10.1093/jac/dku326. Epub 2014 Aug 21.

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.

May-September, 2015

Collaborating with Vector-borne Disease Bureau, Ministry of Public Health, Thailand to update National Guidelines for Treatment of Malaria.

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. WHO has not supported research either technically and/or financially to WHO CC for Clinical Management of Malaria.

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).

April 2, 2015

Discussing the WHO CC's activities and collaboration with Dr. Peter Olumese from WHO HQ.

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.

None

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).

April 2, 2015

Discussing the WHO CC's activities and collaboration with Dr. Peter Olumese from WHO HQ.