

**Summary Report of the Technical Cross-border Workshop
On Malaria Case Management for Artemisinin
Resistance Containment**

In the context of

**The Bill & Melinda Gates Foundation supported project: “A Strategy for
the Containment of Artemisinin resistant Malaria Parasites
in Southeast Asia”**



**Cambodiana Hotel,
Phnom Penh, Cambodia**

24 – 26 February 2010

Table of Contents

Background and Introduction	3
Opening Remarks and Welcome.....	3
Containment Project Overview.....	4
Objectives of the Meeting.....	5
Session 1: Diagnosis and Treatment	7
Overview of BVBD Programme Strategies	7
Overview of CNM Programme Strategies	8
Malaria Situation, Diagnosis and Treatment in Vietnam.....	9
Session 2: Diagnosis and Treatment (continued)	11
Update of Therapeutic Efficacy Studies (TES) in the Region.....	11
Impact of Therapeutic Efficacy Studies on Policy in the GMS	12
Preliminary results of Cambodia Malaria Surveys 2009	12
Management of Non-Malaria Fevers.....	13
Molecular Methods for Malaria Diagnosis	13
Session 3: Panel Discussion	14
Session 4: Case Detection Surveillance and Follow-up	17
Malaria Surveillance System Overview in Thailand	17
Surveillance of Day 3 positives in Cambodia	18
Cross-border Surveillance	19
Web-Based Surveillance System in Thailand	20
Beyond Monitoring Drug Resistance in Cambodia: A Pilot Study	21
Group Work 1: Identifying key issues and challenges	22
Group Work 2: Identifying solutions and activities.....	22
Summary and Recommendations	24

Background and Introduction

There is growing evidence for the emergence of artemisinin resistance along the Cambodia-Thailand border area. In recognition of this worrying situation, the World Health Organization (WHO) and partners have begun to take steps to confirm and characterize artemisinin resistance, to define optimal strategies and support the preparation of plans of action in Cambodia and Thailand, and to contain the spread of artemisinin tolerant parasites. This initiative is funded by the Bill & Melinda Gates Foundation (BMGF) initially for a period of two years (2009 – 2010) with supportive contributions from USAID and Global Fund.

As the containment of artemisinin resistance is a regional and global public health concern, it will be beneficial to share experiences and lessons learned from various governmental and non-governmental organizations, local authorities, and other countries. The Malaria Consortium (MC), one of the partners in this WHO-led strategy to contain artemisinin resistant parasites along the Thai-Cambodian border has organized this fourth in a series of technical cross-border meetings to support the overall monitoring and evaluation of the Containment Project.

The overall objective of this workshop is to harmonize the cross-border Malaria Case Management procedures and strategies to contain artemisinin resistant malaria in the 7 border provinces of Thailand and 10 border provinces of Cambodia.

Specific objectives of the workshop

- To exchange information about current strategies and activities of national programmes on malaria diagnosis, treatment, active investigation, case detection and follow-up in the context of the Containment Project;
- To identify and resolve key country-specific and cross-border bottlenecks for the implementation of these strategies;
- To discuss novel strategies and tools to improve malaria diagnosis, treatment, active investigation, case detection and follow-up of Day 3 positive cases (including resident and migrant populations) through public and private sectors, and communities.
- To agree upon and harmonize practical procedures and methodologies for malaria diagnosis, treatment, active investigation, case detection and follow-up of Day 3 positive cases in zones 1 and 2, and elsewhere.

The presentations and outputs were distributed to participants and are available on CD-ROM by request.

Opening Remarks and Welcome

Dr. Duong Socheat, Director CNM and Dr. Wichai Satimai, Director, BVBD

Dr Duong Socheat welcomed everyone to the cross-border workshop at the Cambodiana Hotel, Phnom Penh. He expressed his gratitude to Dr. Wichai, Director of BVBD, Dr. Najibullah Habib, Containment Project Manager, Dr. Charles Delacollette, Dr. Ta Thi Tinh, National Institute of Malariology, Parasitology, and Entomology (NIMPE), Vietnam and all participants for their participation in the workshop. He mentioned that we are looking forward to some outstanding presentations; experience sharing and recommendations to improve our implementation. He said, 'We have committed ourselves to do everything in our power to reduce the number of death due to malaria.'

While sharing the achievements of the National Malaria Control Programme (CNM) of Cambodia, he reiterated that CNM has mobilized funds from the Global Fund in various rounds to combat malaria in Cambodia. CNM have been implementing the Containment Project in partnership with Thailand and WHO with funding from the Bill & Melinda Gates Foundation (BMGF). CNM has implemented the ban of the sale of

artesunate mono-therapies in both zones of the Containment Project. CNM will scale up all the successful interventions of the Containment Project in the future. CNM will also pilot the AMFm project very soon. CNM is committed to increase the coverage of LLINs and improve the follow-up of all Day 3 positive cases. However, in 2009 in Cambodia there has been a slight increase in malaria related mortality. This may have a multitude of causes among them heavy rains, migratory movements at the Thai-Cambodia borders, and seasonal labour. We need to understand why malaria cases are increasing in the region and what must be done to overcome this problem.

Cambodia has increased the number of health facilities which are providing services to the patients at community level. Dr Socheat hoped that we would address all the aspect of case management and follow-up in the workshop. He thanked Malaria Consortium for organizing the workshops and providing this opportunity to meet and discuss issues in detail.

Dr. Wichai Satimai expressed his appreciation to Malaria Consortium for providing this opportunity to meet together. He thanked Dr. Duong Socheat and CNM for supporting this event. He mentioned that the containment programme has faced some obstacles, in pursuing activities to harmonize cross-border activities, such as use of different drug regimens, and the follow-up of the migrant and mobile population. He explained that unfortunately Thailand had not secured Global Fund Round 9 funding to continue activities on the Thai side. However, he hoped that the CNM would continue activities along the border which would have a positive impact on improving the situation on the Thai side as well. He emphasised that we should continue to collaborate on different research taking place in the containment zones to contain the artemisinin resistance along the border. Dr Wichai was pleased to announce that Thailand will apply for Global Fund Round 10 funding to continue this collaboration at Thai-Cambodia border. In this workshop the participants will help develop some innovative ideas to support the application for R10 funding for the continuation of Containment Project.

Dr Wichai went on to thank the organizers for the invitation to workshop and to hope that the staff from Thailand would play an active role in the meeting to discuss ways to improve field activities in Thailand.

Containment Project Overview

Dr. Najibullah Habib, Containment Project Manager, WHO

Dr. Najibullah Habib, Containment Project Manager, gave a brief overview of the project.

The goal of the project is: "Containment of Artemisinin resistant Plasmodium falciparum Parasites by Removing Selection Pressure and Reducing and Ultimately Eliminating Falciparum Malaria.

There are 7 objectives for the project:

- To eliminate resistant parasites by detecting all malaria cases in target areas and ensuring effective treatment and gametocyte clearance
- To decrease drug pressure for selection of artemisinin resistant malaria parasites
- To prevent transmission of resistant parasites by mosquito control and personal protection
- To limit the spread of resistant parasites by mobile/migrant populations
- To support containment/elimination of resistant parasites through behaviour change communication, community mobilization and advocacy
- To undertake basic and operational research to fill knowledge gaps and ensure evidence-based strategies
- To provide effective management and coordination for rapid and high quality implementation

Dr. Najib explained the structure of the Containment Project and highlighted the role of each partner in the project. He also talked about the role of the International Task Force (ITF). ITF is a neutral body, comprised of an international panel of experts that provides oversight and recommendations to improve the strategy.

Update on the discussions and recommendations from the last ITF meeting held in Hanoi:

- High coverage of LLINs and VMWs in zone 1 and 2 was highly appreciated by the members. This was considered one of the big successes of the project.
- An increased need for cross-border surveillance and mapping of Day 3+ cases in both countries as well as at regional level.
- The need to develop guidelines for the use of primaquine.
- A key recommendation was to strengthen the strategies for elimination of monotherapies and fake drugs. The ITF acknowledged the support of Dr. Duong Socheat in banning the sale of monotherapies in this regard.
- To stop the use of ACT in zone 1.

Dr Najib went on to say that mobile and migrant populations at the Thai Cambodia border are the populations most at risk. They cannot be targeted without an effective and well focused IEC/BCC strategy. He updated the participants on the research being conducted in the Containment Project area and highlighted the role of BVBD, CNM, and partners in the Containment Project.

In conclusion, the Containment Project is on track, village malaria workers (VMWs) and volunteers are doing a great job on both sides and our IEC/BCC strategy is going well to create awareness regarding key messages.

Dr Najib looked forward to the discussions in this meeting and as Project Manager would like to translate any recommendations into practice and implement them in the next three months as the transmission season is approaching.

Objectives of the Meeting

Dr. David Sintasath, Regional Technical Director, Malaria Consortium

Dr. David Sintasath, Regional Technical Director Malaria Consortium, welcomed all the participants. He expressed his gratitude to Dr. Duong Socheat, Dr. Wichai Satimai, Dr. Ta Thi Tinh and the staff from different provinces and countries for their participation in the meeting. He also thanked WHO and partners for their participation.

This is the 4th of the series of meetings that Malaria Consortium has facilitated on the Containment Project. This meeting is one of the important milestones with regards to our activities in the Project. Dr. Sintasath said he was happy to welcome such a large group from many sides to help develop concrete strategies and procedures to move forward with case management and follow-up. Such meetings were one of the few opportunities for all of us to come together, exchange ideas, identify bottlenecks and discuss possible solutions to resolve those challenges.

Dr. Sintasath reviewed the main objectives of the workshop:

- To exchange information about current strategies and activities of national programmes on malaria diagnosis, treatment, active investigation, case detection and follow-up in the context of the Containment Project
- To identify and resolve key country-specific and cross-border bottlenecks for the implementation of these strategies
- To discuss implementation of novel strategies and tools to improve malaria diagnosis, treatment, active investigation, case detection and follow-up of Day 3 positive cases (including resident and migrant populations) through public and private sectors, and communities
- To agree upon and harmonize practical procedures for malaria diagnosis, treatment, active investigation, case detection and follow-up of Day 3 positive cases in zones 1 and 2, and elsewhere

He said that over the next 3 days we should discuss how we can improve our ability to diagnose and treat especially Day 3 positive cases and to reach the mobile and migrant populations. We should also discuss how to harmonize these practical procedures. Both countries have developed procedures to follow-up Day 3+ve cases, but we need to understand what is happening on each side in order to be able to harmonize activities. Vietnam has developed valuable experience regarding surveillance which can be shared. In this workshop, we will identify the key issues and challenges, but the most important thing is to come up with solutions to improve our ability to diagnose and treat malaria cases who are still positive on Day 3 (as our proxy indicator for artemisinin resistance).

Discussion

Dr. Duong Socheat asked Dr. Najib about the recommendation of the ITF regarding the use of ACT in Zone 1. He said that if the ITF has suggested stopping the use of ACT in Zone 1, then what would be the next option? It is too late to change the agreed treatment protocol.

Dr. Wichai Satimai agreed that it is the role of National Anti-Malarial Drug Committee to decide which drug should be used. The National Anti-Malarial Drug Committee of Thailand has approved Malarone after long discussions on all aspect of the drug. He asserted that it is not easy to change drug policy at this stage as the protocols have been developed and staff has been trained in the field. ITF should understand that changing protocols and re-training staff is not an easy task. He suggested Dr. Najib should support the countries on this and inform the ITF that such recommendations should be flexible enough for us to comply.

Dr. Najib acknowledged the concerns raised by the two countries regarding the use of ACT in Zone 1. He said that the ITF is an independent panel of experts and can only give recommendations; they are not national project managers or decision makers. He stated that it is also challenging for WHO to deal with such recommendations. He agreed that the programmes have procured the medicines and this is already the second year of the project. We cannot change the drug in Zone 1 in Cambodia at this stage.

Dr. Sylvia Meek agreed that this is an important issue which we cannot resolve here. What we can do here is to make a list of key unresolved issues and set up mechanisms to solve these issues. We should make sure that activities and plans are clear, as the national staff needs clear guidelines. We need to also address other important aspects such as incomplete treatments and fake/sub-standard antimalarial drugs. We should focus on practical issues and try to find viable solutions.

Dr. Sintasath emphasised that the purpose of the meeting was not only to share issues and challenges being faced at the grassroots level but also to devise workable solutions to those problems. He urged the provinces to share issues so that practical solutions could be found.

Dr. Chansuda USAID added that there are concerns about introducing DHA-PIP as the first line drug in Cambodia. However, this is a special situation, a special project on containment of resistance. WHO recommends that new drugs should have 99% efficacy. We are not sure that new drugs (i.e. DHA-PIP) have 95% efficacy.

Another participant commented that we need to think about that how long we can use Malarone in Zone 1 in Thailand. The project will be finished this year. Thailand does not have money to buy Malarone when the project finishes and we do not know about future funding. Malarone is very expensive drug and we do not know whether the Global Fund will allow us to continue its use.

Session 1: Diagnosis and Treatment

Moderator: Dr. Duong Socheat

Overview of BVBD Programme Strategies

Mrs. Saowanit Vijaykadga, Technical Officer, BVBD

Dr. Saowanit Vijaykadga, Technical Officer, BVBD, presented the overview of BVBD programme strategies.

Main points

A flow chart showing how a patient receives treatment at the various levels of health facilities in Thailand was described. At the Malaria Post (MP) level one additional 'malaria worker' has been added from the Containment Project funding to support activities at the community level. Another special post of 'Translator' has been created at the Malaria Clinics (MC) to facilitate translation of Khmer and Thai for the management of malaria cases among migrants. The malaria worker at malaria post level sends slides to the microscopist at the malaria clinic. Thick Blood Film (TBF) and microscopy are used for diagnosis at the malaria clinic. If the result is negative, the microscopist or malaria worker recommends the patient to go to the health centre or hospital for further investigation and treatment.

According to the national drug policy, Pf cases are treated with Artesunate plus Mefloquine and a single dose of Primaquine. *P. vivax* and *P. ovale* are treated with chloroquine plus primaquine. Malariae is treated with chloroquine. Severe malaria cases are referred to the hospital.

Malaria posts were opened under Global Fund Round 7 in A1 villages. There are a total of 59 malaria posts in 7 provinces which are included in the containment zones. Outside the containment zones there is only one malaria post worker in the Malaria Post. However, in the containment zones, there is an additional malaria worker to support the malaria post worker. Suspected patients are tested with an RDT and a TBF is made at the time of testing. The positive cases get the malaria treatment at household level. The National Drug Committee decided to use Malarone (Atovaquone/Proguanil) in Zone 1. The programme received Malarone in June/July 09 which is now being used.

As per the follow-up policy for both the national and containment zones, Pf and Pv cases are followed-up on day 1, 2, 3, 7, 14, 21, 28, 35, 42 in the containment zones and on day 14 and 28 at national level. The cases with Po and Pm are followed-up on day 1, 2, 3, 7, 14, 21, 28, 60 and 90 in containment zones while on day 14, 28, 60 and 90 at national level.

A total of 474 Pf and 403 Pv cases had been followed-up in both zones in 2009.

Key challenges identified were:

- Population movement within Thailand is one of the key reason for failure to complete follow-up
- Cross border movement especially short visits for one day is a big challenge for following-up and finding of the Day 3 +ve cases
- Information about the follow-up of cases is not freely available to both sides

Discussions

Dr. Charles Delacollette asked the presenter what exactly is done if a case is negative. Is the patient referred to a health centre or a malaria clinic? If the patient is negative to both RDT & TBF, he or she is recommended to go to the health centre or any public health facility. However, if the patient is negative to RDT but positive by TBF, a malaria worker provides treatment at the household level and does regular follow-up.

Dr. Philippe Guyant inquired how the information about the patients is collected. Does this information include the patients' address? Dr. Saowanit replied that 2 forms for data collection have been developed. In

one form all the information about the patients is collected including their address. In the second form data on parasites from day 0 and all follow-up days is collected.

Dr. Charles asked that all cases should be followed up 7 times but the data shows that only 60% of cases are being followed-up 7 times. What is the reason for failure of follow-up? Ms. Saowanit replied that it is difficult to follow-up 100 percent of cases 7 times. The patients, especially migrant workers, are difficult to track as they are very mobile.

Dr. Sylvia Meek appreciated the follow-up strategy of Thailand. She said that following up cases 7 times is very impressive. She suggested that during the small group discussions we need to find practical solutions to the follow-up of the mobile and migrant populations. She asked about the percentage of follow-up at Day 3. What do you do if the cases are positive on day 7? Are they given a second line treatment? Dr. Saowanit responded that day-3 positive cases are classified according to symptoms and if the patients have severe symptoms they are referred to hospital. If they do not have severe symptoms they are followed-up on a regular basis and most of them get well. However, Day 7 positive cases are given the second line treatment following the policy guidelines.

Dr. Charles asked what percentage managed follow-up on Day 3. Ms. Saowanit responded that 100% (all 474) cases were followed-up on Day 3.

Dr. Kheang Soy Ty asked how many of those cases were severe malaria and how many were simple malaria. If there were severe cases, what follow up was done and what was the treatment if they are still positive on Day 3. Ms. Saowanit responded that there are criteria for severe malaria and uncomplicated malaria. The community based staff cannot treat severe malaria; they refer the severe malaria cases to the hospital. Dr. Wichai explained that during follow-up on Day 3, if the patient is positive we do not give them second line treatment. However, if the patient is positive on Day 7, we provide second line treatment. He mentioned also that severe malaria cases are referred to the hospital.

Another participant raised a question about the difference in roles of the malaria post worker and the malaria worker. Can we sustain them after the Containment Project? Dr. Saowanit clarified that the Global Fund supports the malaria post worker and now the Containment Project is supporting the malaria worker. The salary is the same. The malaria worker's position is vulnerable and depends on the availability of future funding. There are 59 malaria post workers from the Global Fund and 59 malaria workers from the Containment Project.

Overview of CNM Programme Strategies

Dr. Kheng Sim, Vice Director, CNM, Cambodia

Dr. Sim provided a historic perspective on the burden of malaria from 1997 to 2009 in Cambodia. There had been a dramatic decline in malaria cases till 2008. However, in 2009, there was a slight increase in malaria morbidity. A total of 209 deaths were recorded out of 58,000 cases in 2008 and a total of 279 deaths out of 83,000 cases in 2009. There has also been a similar trend of increased cases at regional level i.e. Thailand, Myanmar and Vietnam.

CNM has developed the following programme policies and strategies for the public health sector:

Diagnosis: Use of combo-RDTs at public health centres and by VMWs. Microscopy at former district hospitals & referral hospitals. Social marketing of "Malacheck" combo-RDTs in the private sector through PSI

Treatment: ACT at public health facilities and delivered at the village level by VMWs (DHA/Piperaquine in Zone 1 and A+M in the rest of the country).

Zone 1: Ban of the sale of monotherapy in the private sector

Rest of the country: “Malarine” social marketed through PSI

Vector Control:

- Public sector: LLINs and LLIHNS in villages within 2km of the forest plus retreatment of existing conventional nets. Focal IRS in containment zones
- Private Sector: Bundling strategy (treatment of bed nets imported/distributed) by PSI

CNM believes that there are still counterfeit, substandard products available in the private sector. This is a potential risk for the emergence of ACT resistance. Another channel for the propagation of resistance is the movement of mobile migrant and other vulnerable populations from other provinces into the containment zones. The majority of the migrant population are internal migrants. Cambodia does not have many Thai migrants. On the contrary, Cambodians work in Thailand and get treatment at Thai border malaria clinics and posts. CNM is also collaborating with several different NGOs to try to understand and get the real data about the mobile and migrant populations. However, no one has the exact figures of mobile populations in the containment zones.

If there is a lack of cooperation from the private sector regarding the use of artesunate monotherapies, it will be a challenge for CNM to provide the optimal service. We need this cooperation to ensure concerted efforts to contain resistance. CNM has received the letter of approval from the Ministry of Health to ban monotherapies, and they have disseminated this information through different channels. They will also pilot the Public Private Mix (PPM) strategy in the project to reduce the use of sub-standard drugs. Dr. Sim acknowledged the active involvement of all partners in the containment programme. Cambodia has submitted proposals to continue the containment beyond 2 years, for this CNM has secured funding from Global Fund Round 9.

Discussions

Dr. Steven Bjorge shared the fact that DHA-PIP is listed in the global malaria program’s new treatment guidelines but it has not yet been pre-qualified. Cambodia will be allowed to use DHA-PIP under the AMFm project under special conditions.

A question was asked about how you collect data from the private sector. Are the military and police in Zone 1 included in the interventions? Dr. Sim responded that CNM collects data from public health facilities only. As far as the military is concerned, CNM does not have any policy to supply them. However, in Global Fund Round 7, the military and police were among the beneficiaries. CNM has not collected any data from the private sector yet; however, in 2010 during the pilot phase of PPM, we will include the data from private sectors as well. PPM will be piloted in 2 Operational Districts.

Dr. Sylvia asked a question about the use of A+M in zone 2. She inquired about the time frame to resolve the issues and to extend the use of DHA-PIP into zone 2. Dr. Sim responded that currently the national programme uses A+M in all other zones and will continue in 2010. Under AMFm, there have been discussions to use DHA-PIP. In case the programme does not get funding for DHA-PIP, we will continue to use co-blistered A+M in the other zones.

Malaria Situation, Diagnosis and Treatment in Vietnam

Dr. Ta Thi Tinh, National Institute of Malariology, Parasitology, and Entomology (NIMPE), Vietnam

Dr. Ta Thi Tinh, NIMPE, presented the malaria situation in Vietnam. She described the huge decline in malaria cases in the last 10 years. Malaria cases have decreased year on year and only 22 deaths, (3/1000 mortality rate) were reported in 2009.

Suspected and confirmed malaria case definitions:

Suspected malaria (clinical fever case): These are cases without confirmed blood examination or positive parasitaemia or with a delayed result from the laboratory, and which have the 4 following criteria:

- Typical symptoms of malaria: chills, fever and sweating or Atypical symptoms : Non periodic fever
- History of fever during the previous 3 days
- No other causes can be identified for fever and living in or having a history of travelling to malaria endemic areas and/or having a history of malaria.
- Adequate clinical response to anti-malarial drug therapy within 3 days.

Confirmed malaria cases are those with parasitaemia when examined by microscopy or RDT. Dr Tinh clarified that standby treatments are those that the health staff may give to the people temporarily visiting highly malaria endemic areas for more than 1 week, travellers, people who stay over night in the forest and border crossers.

According to the national treatment policy, treatment is given at all levels, from villages to central hospital levels. Uncomplicated malaria cases are treated at all levels, however severe malaria cases are treated at central, provincial or district hospital level. The first-line drugs for *P. falciparum* are DHA + PIP (3d) and Primaquine (single dose) and for *P. vivax* CQ (3d) + Primaquine (0.25 mg/kg/day x 14d). Second line treatment for *P.falciparum* is Quinine + Doxycycline (all cases, except pregnant women and children under 8) and Quinine + clindamycine for pregnant women & children < 8.

She explained that suspicion of malaria is based on epidemiological Information (i.e., those living in or travelling to malaria endemic areas and/or a history of malaria infection), clinical symptoms, and laboratory findings (whether RDT and/or microscopy).

Monitoring of patients during treatment:

- If the clinical condition deteriorates at any time, a blood slide is taken for re-examination. If there are any severe signs or a high body temperature after three-day treatment or progression of disease occurs and the patient remains parasitaemic, second line treatment is recommended
- If after 3 days of treatment, the case becomes worse and no parasitaemia is found then the health worker must look for other causes
- After completion of treatment, a blood slide is taken. If the blood slide is negative then the patient is discharged from the hospital

Procedure in case of treatment failure:

- If the patient develops more severe malaria and parasitaemia is found during the first 3 days, the patient is treated with the second line drug
- If the patient has a positive slide within the 14 days after treatment, they will be given the second line drug
- If the patient has a positive slide 14 days after the treatment, they will be treated as a new infection and be given the first line drug

She highlighted the key challenges in treatment and follow-up which are:

- Mobile and Migrant populations: especially forest workers, and cross-border migrants
- Resistance to anti-malarial drugs and vectorial insecticides
- Control of the private sector: diagnosis, treatment and follow-up
- Climate change

Discussions

Dr. Chea Nguon asked about the monitoring and follow-up of standby treatment, particularly how to ensure that the drugs are used correctly? He also asked about the treatment of suspected cases. Dr. Tinh responded that the treatment of suspected cases depends on the commune level, if there is no microscopy; we treat the suspected cases based on typical symptoms of malaria and provide ACT. For standby treatment, the procedure is that the health worker explains the signs and symptoms of malaria and how to take drugs to the migrant.

Dr. Charles stated that standby treatment is part of the national strategy in Vietnam. He asked if any evaluation of this strategy had taken place. How to ensure that the RDT is performed properly? Would this strategy contribute to a worsening resistance? Dr. Ta Thi Tinh responded that a study had been conducted among forest workers/mobile populations in Vietnam. The study showed that due to the use of the standby treatment, malaria cases had reduced. Follow-up and monitoring of this group is quite difficult.

Dr. Prudence asked that how the Vietnamese define treatment failure? Dr. Ta Thi Tinh responded that follow up is for 28 days. If a patient has fever, he or she is given the 3-day treatment. If the patient still has fever after 3 days, he is given the second line drug.

Dr. Duong Soheat asked Dr. Ta Thi Tinh to explain how climate change is affecting malaria. Is there any evidence that climate change has an impact on the malaria? She responded that the rainy season may come sooner which may have an impact on the number of malaria cases.

Session 2: Diagnosis and Treatment (continued)

Moderator: Dr. Wichai Satimai

Update of Therapeutic Efficacy Studies (TES) in the Region Dr. Charles Delacollette, Mekong Malaria Programme, WHO

Main points

- There is growing evidence of *P. falciparum* resistance to artemisinin-based derivatives on the Cambodia-Thailand border
- Multi-drug resistance is a key challenge for all Mekong malaria programmes which may slow down country and regional progress
- National antimalarial drug policies need to be updated in a timely fashion. Many alternative anti-malarials to the existing ones are not yet available or not yet approved according to Good Manufacturing Practice (GMP) or pre-qualified by WHO. This limits choice of treatment protocols and should trigger research on innovative combinations.
- The TES network needs to be strengthened to document the actual extent of multi drug resistance. Increase adherence to the WHO protocol through field monitoring / supervision and to improve cross country data comparison is needed.
- There is a need to improve quality of microscopic diagnosis in the region by strengthening QA/QC systems and exchange of materials (e.g., Centres of Excellence and reference laboratories)
- Issues linked to quality of drugs used in the testing should be addressed (i.e., ensuring standard concentrations of drug in the blood (PK {pharmacokinetic} studies), quality of data management and reporting
- Ethical review of study protocols is needed.
- Develop and implement a multi-country containment response to artemisinin resistance

Dr. Charles emphasised that ACTs are still working. Research in the Mekong region has demonstrated that there is no evidence of ACT failing.

Discussions

Dr. Philippe Guyant asked for clarification between tolerance and resistance. If Day 3 positivity is not resistance then how shall we resolve this definition issue? Dr Charles clarified that the period when parasites should have cleared is 72 hours following treatment not on Day 3. Day 3 positivity is a proxy indicator for artemisinin resistance until we have an adequate biomarker.

Impact of Therapeutic Efficacy Studies on Policy in the GMS

Dr. Chansuda Wongsrichanalai, USAID

Dr. Chansuda Wongsrichanalai described the impact of therapeutic efficacy studies in the Greater Mekong Subregion. According to WHO, a new first-line regimen should be adopted when treatment failures exceed 10%. The new drug being adopted as policy should have failure rates $\leq 5\%$. Cambodia and Thailand have adopted a new first-line drug in the containment zone 1, that's why we are diligently monitoring the drug efficacy. She pointed out that the network in the Mekong region is one of the best networks for therapeutic efficacy monitoring in the world.

A therapeutic efficacy study was conducted in Pailin in 2004 which confirmed drug resistance. Dr. Duong Socheat wrote a letter to the Lancet. In 2006 there were multiple publications from the Thai-Cambodia border confirming the emergence of artemisinin resistance. In 2008, Bill & Melinda Gates Foundation made a commitment to help contain the resistance in the Thai-Cambodia border region. The Containment Project was launched in Jan 2009.

Action on drug policy was urgently needed because:

- It needs confirmation by therapeutic efficacy studies
- No alternative drugs are readily available
- Artesunate + Mefloquine co-formulation has been developed
- ACT is being promoted in Africa and there is fear of misinterpretation of ACT as useless

More than 100 countries have adopted ACT as national policy. We need to improve Mekong resistance surveillance and other regions are looking at us to for learning and experience sharing.

Preliminary results of Cambodia Malaria Surveys 2009

Dr. Leang Rithea, CNM

The survey was conducted by CNM in collaboration with Malaria Consortium. The main purpose of the survey was to monitor and evaluate progress as part of the Bill & Melinda Gates Foundation funded project.

Specific aims were to:

- Obtain key M&E data via household, drug outlet, and health facility surveys (including malariometric, coverage and behaviour) in zones 1 and 2 of the Containment Project
- Improve upon existing tools and methodologies to be used in the wider scale Cambodia Malaria Survey planned for 2010
- Provide a supplementary baseline prior to the implementation of Cambodia's Global Fund Round 9 Malaria component.

The analysis of the survey is in progress. Some preliminary results were shared with the participants. A total 59 positive cases were found in the survey. Of the 59 cases, 35 % went to public while 65 % went to the private sector for treatment.

Some **preliminary** results regarding malaria diagnosis and treatment:

- Only 5% (n = 478) of those surveyed reported anyone in the household with a fever during the past two weeks.
- Among those with reported fever during the past two weeks, 81% took medication for the fever.
- 40% of those taking medication took the drugs the day after the onset of fever.
- Interestingly, 50% reported taking drugs other than antimalarials, antibiotics, or anti-pyretics.
- Among those with fever within the last two weeks, 17% (85) took a blood test for malaria, and 39% of these were performed at public health facilities, while 19% went to private clinics.

Management of Non-Malaria Fevers

Dr. Siv Sovannaroth, CNM

Dr. Siv Sovannaroth gave a presentation on the management of non-malaria fever. He described a study conducted in 3 sites, C1 and C2 in Pailin and C3 on the Vietnam border. Most fever cases with clinical symptoms were found in the 2 health centres in Pailin on the Cambodia/Thailand border.

The patients recruited were from age 7 years to 49 years. They had wanted to recruit from the age group of 5 year olds, but had to change this due to ethical issues. The drugs were sent to the sentinel sites by taxi. The combo RDT was used to confirm malaria.

More than half (60%) of fever cases were found to be negative for malaria in spite of having the classical symptoms such as fever and chills. The accuracy of diagnosis with microscopy and RDTs was compared. Slides were marginally more accurate than RDTs. A control group was used to compare the findings. The control group consisted of people who came along-with the patients (relatives) and gave a blood sample. The study is still ongoing.

Molecular Methods for Malaria Diagnosis

Dr. Lim Pharath

The objectives of the use of molecular methods:

- To implement a molecular diagnosis based on the collection of blood spots for screening at village level following the detection of a Day 3+ve case, in order to strengthen the accuracy of diagnosis in the containment/elimination program
- To conduct high throughput diagnosis on collected blood spots by the use of 96-well plates
- To detect parasite carriers (asymptomatic cases) and identify plasmodium species, in national surveys and focused screening and treatment (FSAT).

High through-put analyses of samples using 96-well plates have been evaluated. When screening around a Day 3 +ve case, the samples must arrive at Institute Pasteur Centre (IPC) as soon as possible after collection. In the case of FSAT samples they must arrive at IPC the next day. Materials and reagents must be ordered 1-2 months at least before the beginning of the collection.

Another advantage of molecular methods is that they can be used to distinguish recrudescence from new infection or relapse of liver stages & CQ concentrations in blood in the case of *P. vivax* infections.

Discussions

Dr. Sylvia Meek asked Dr. Leang Rithea if the survey had looked into the percentage of treatment with monotherapy. Dr. Rithea responded that this question had been asked but the data was not analysed yet. Michelle Thompson, Epidemiologist, Malaria Consortium, added that analysis was in process. The data on the outlet survey has just been entered. This should provide us more information on the use of monotherapy.

Dr. Philippe Guyant asked Dr. Siv if data had been collected about the symptoms associated with malaria. Or was fever the only symptom analysed? Dr. Siv responded that most of symptoms are associated with fever. Other symptoms such as sore throat had been collected. Dr. Prudence added that malaria occurs in older people and fever occurs mostly in young children. For children, if the fever is not malaria, what treatment should be given (e.g., paracetamol or an antibiotic)? Dr. Siv responded that when we designed the study we thought about these issues and wanted to recruit children under age 5 but could not get permission and had to start at 7 year old children.

One participant asked about the density of parasites. If the parasite density is very low, they may not be detected by microscopy. Is there a particular no. of parasites for detection limits to RDTs and microscopy? It would be useful to know. Unfortunately, the study did not look at this.

Dr. Sylvia Meek pointed out that we are here to learn, how we can improve the strategies of case management and detection. The provincial staff who have been developing and implementing the strategies to eliminate the resistant parasite are present at this meeting. The public sector is improving but what should be done for the 65% of people who are still going to private sector. How can we improve the performance of VMWs/VHVs to eliminate malaria at the community level? These are the most important questions to think about and for which we need to find better solutions. Molecular techniques are very useful methods as we need to think that how the Containment Project can get rid of those malaria parasites which are asymptomatic or are not detected by RDT or other means.

Day 2

Session 3: Panel Discussion

Dr. Khe Sokhoum (Private Provider), Mr. Loung Vothy (Village Malaria Worker), Dr. Phap Sovichet (Director of Pailin Hospital), and Mr. Dokrak Tongkong (Public Health Technical Officer, Trat)

Dr. Prudence Hamade moderated the panel discussion. Four health care providers from Thailand and Cambodia participated in the panel discussion.

Dr. Khe Sokhoum (Private Provider)

Dr. Khe Sokhoum introduced himself and added that he has been providing health services in Pailin for the last 10 years. He stated that when he first time came to Pailin, he got malaria. There used to be lots of forests in Pailin at that time. He has been providing treatment to malaria patients since then. In Pailin, private practitioners provide treatment based on symptoms. They prescribe drugs according to the national malaria guidelines.

Q. How do you diagnose the patients in your clinic?

Now I use the combo test to diagnose the malaria if the patient can afford it. We first take a history from the patient and the reason for coming to the clinic. I ask them if they have used any drugs. Then I check heart-beat and conduct the blood test. If the patient is positive then I provide malaria treatment. We give them anti-malarials according to the national guidelines. I keep malaria drugs in my clinic. Usually the patients do not come back for follow-up.

Q. How do you record the malaria patients?

We do not record the patients in the private clinics. If we suspect malaria, I test the blood and provide malaria treatment. I always test and then provide the malaria treatment. I usually buy drugs from Battambang. I purchase malacheck (RDTs) and mosquito nets from PSI. Sometime patients have side effects with mefloquine. In the past, I used to admit patient in my house to provide IV treatment and earn lots of money. Later on, I learned that it affects the health of people; therefore I have stopped this malpractice and give oral drugs. In case of severe malaria, I refer the patients to the hospital immediately.

Mr. Loung Vothy (Village Malaria Worker)

Mr. Loung Vothy is a village malaria worker from village Phnom Dambang, in Cambodia. He has been working with FHI since 2004. He mentioned that when he treats the patients they get better in 3-5 days. When they come to him with malaria, he gives them a first dose of malaria drugs to take under his direct observation but when they go home he does not know whether they take the drugs or not. If there are any side effects, they will not take the second dose of the drug. If their children have fever they do not come to the VMW. They use home-based remedies or sometimes give the old (left over) drugs to their children. They do not understand why they need to comply with the complete course of drugs. They share their drugs with their children as well. We know that regular use of bed nets reduces the chances of malaria. However, people who go to the forests do not use the nets. This is due to the lack of awareness in the community. Influx of migrants to the high risk areas is another cause of increasing malaria cases. Migrant populations usually have low immunity against malaria. They come without mosquito nets and have no experience of protecting themselves from malaria. As a VMW, he takes care of them and explains to them how to clean the surrounding environment and use mosquito nets. He always stresses the importance of carrying and sleeping under the net both at the house and in the forest.

Q. What do you do when a patient comes with fever?

When the patient comes to my house, I give them appropriate treatment. The majority of patients visit me between 8:00 am and 9:00 am. They sometimes come to me at night. I ask them about symptoms. If they have simple Pf, I give them drugs and tell them how to use the treatment. I give the medicine according to their body weight.

Q. How do you diagnose the patient?

First I check with my eyes, and then touch with my hands to feel the temperature (hot or cold). If the patient sweats and look pale, I can easily conclude that it is malaria. If they are hot then I use a damp cloth to bring down the temperature. Then I test the blood. I ask them if they have taken any medicines or if they have an empty stomach. If they have an empty stomach, I give them a banana and then give them the medicines. After giving the medicine, I ask them to wait for 30 minutes. If they vomit, I give them more medicines. I brief them that if you vomit within half hour after taking the medicine come to me. I will give you more medicines. After that I follow up the cases for three days. For diagnosis I use the Combo test that CNM has provided me recently. It is very easy to use. In past we used RDTs which only identify *P. falciparum* malaria. But the combo test provides a clear diagnosis and helps me to give the right drugs to the right patient.

Q. Any problems treating patients?

No problems - I provide treatment to normal cases. I receive drugs on a monthly basis. I have no problem in treating patients, as I live in the community. I know everyone personally. I participate in the monthly meetings and submit my report at the health centre.

Dr. Phap Sovichet (Director of Pailin Hospital)

Dr. Phap Sovichet, Director of Pailin Referral Hospital, described how patients usually come to the hospital with severe malaria. There is a malaria department and nurses to provide treatment to the severe cases. When the patient comes to the hospital, clinical history is taken. The hospital received 121 cases of malaria, 83 women and 38 men in 2009. There is a laboratory to do blood smears. They used to prescribe A+M but now we use the new medicine DHA-PIP, which is more effective to treat the malaria.

Q. How do you diagnose the cases? Do you use smear or rapid diagnostic test?

I have a team of laboratory technicians. We have a laboratory to test the blood to determine if the patient is positive for malaria. We provide treatment following the national malaria protocols. If the patient has severe malaria and cannot take oral drugs, we use arthemeter for five days according to the body weight.

Q. If the patient is still positive at Day 3, what do you do?

He responded that no such case has been found in the area so far.

Q. Do the patients come directly or referred by the volunteers?

Some patients come directly with their families and some are referred by the village volunteers.

Q. How do you record the malaria cases?

The patients referred by the health centre have referral slips which are used for our record. We take the history, address of the patient, record the types of drugs and malaria status in the slips and continue or prescribe new drugs to the patient. Some villages seem to have more malaria cases, so we ask the patients about their travel history to understand whether those villages are near the farm or forest.

Mr. Dokrak Tongkong (Public Health Technical Officer, Trat)

Mr. Dokrak Tongkong thanked the organizers of the meeting. In Trat province we are trying our best to treat all malaria cases and conduct complete follow-up of the patients. It is very important to follow-up to know whether the patients have recovered or not. We have all necessary facilities to treat the patients. Malarone is used in zone 1 and Artesunate + Mefloquine in zone 2. There are 33 malaria posts in Trat province. The majority of patients are Thai nationals but around 30% patients are foreign migrant workers. Malaria is diagnosed using RDTs (OptiMal to detect Pf and Pv) in the community levels. The first dose of treatment is given in the health facility and then the patient is followed up.

Q. Do you give the first dose in front of you?

He responded that we give the first dose in the health facility in our presence and then follow-up the patient. If we fix an appointment with the patient, then they come, however, if they do not come then we visit their houses for follow-up. We inform them to drink plenty of water and eat something before taking the drug.

Q. How do you follow-up the patients?

Mr. Dokrak responded that we have motorbikes to do the follow-up of the patients on day 1, 2, 3, 7, 14, 21 and 28. We have malaria officials who check the slides.

Q. When a malaria post worker diagnoses a Pf case, how does he inform the malaria clinic?

We use RDT for the blood test. The malaria worker also takes blood slides and sends both RDT and slide to malaria clinic to verify it.

Q. How are slides sent to the malaria clinic?

We have now an additional person, a malaria worker, at the malaria post supported by the Containment Project to take the slides to the malaria clinic.

Discussions

Dr. Steven Bjorge asked the private provider if any other diseases besides malaria are being reported to the public sector. Dr. Sokhoum responded that he reports diseases such as dengue to the public health sector. He added that there are many non-qualified private providers, running clinics in the containment zones. They should be banned as soon as possible so that people could get the quality services. He said that if legitimate private providers were given proper formats for data collection, they would collect and share the data with the public sector.

Dr. Charles asked the private provider why people go to the private sector? The private provider responded that we give them a warm welcome; we spend quality time with them and listen to their problems properly which develops trust with the patient. In the public sector the patients have to wait for a long time and the service provider cannot give them enough time.

Dr. Soy Ty asked the panel if they have observed any difference during the last 2-3 years with regards to malaria cases. The VMW said that there has been no death reported since 2007 in his area. He mentioned that this is due to the collaborative efforts of CNM and other NGOs working in the area. Dr. Phap responded that patients come with the fear that they have contracted malaria. If they are positive during the diagnosis, we provide them drugs accordingly. First we counsel them about the drugs and their side effects such as

mefloquine. We inform them that mefloquine has some side effects, but it is important to complete the treatment to be fully recovered and if you do not take complete medicine, the malaria will come back.

Dr. Chea Nguon asked whether the patients come for the follow-up on day three and if the private provider would record the results of follow up and send them to the ministry. Dr. Sokhuom responded that the patients usually do not come back for follow-up. They come back only if they have some side effects. For example, they complain that they are feeling hot due to the medicine. He provides them proper counselling. They do not take blood for follow-up.

Session 4: Case Detection Surveillance and Follow-up

Malaria Surveillance System Overview in Thailand

Dr. Prayuth Sudathip, Public Health Technical Officer, BVBD

All suspected cases of malaria are diagnosed by microscopy or RDT. The RDT is confirmed by microscopy. All the confirmed cases are investigated. In zones 1 and 2, all confirmed cases are followed-up on 7 days (Days 1, 2, 3, 7, 14, 21, 28). Optional follow-ups are done for Pf at 35 and 42 days and for Pv at day 60 and 90.

Dr. Prayuth explained passive and active case detection in Thailand. Passive case detection is done at malaria clinics, hospitals, health centres and malaria posts. He differentiated between classical active case detection and special active case detection in Thailand. Classical active case detection is done during a case investigation. Special active case detection is done during Foci investigation. Active case detection is also done during the fixed schedule malaria clinic (FSMC) and mass blood survey of mobile/migrant populations. He explained the case investigation in detail and said that all confirmed cases are investigated.

The following data is recorded during a case investigation: date of symptom onset, location where the patient is living, history of any previous malaria episodes, current treatment, and net use. Cases are classified as to the likely mechanism of infection i.e. indigenous, imported, and induced, etc. He also briefed the participants about the reporting system in Thailand.

The stratification of malarious areas in Thailand is annually revised for every village as follows:

- A. Control area with transmission
 - A1 Perennial transmission \geq 6 months per year
 - A2 Periodic transmission \leq 5 months per year
- B. Control area without transmission
 - B1 High-risk
 - no transmission reported within last 3 years
 - vectors found
 - B2 Low risk
 - no transmission reported within last 3 years
 - vectors absent

Discussions

Dr. Leang Rithea asked what is the difference between classical and special case detection. Who conducts active case detection and who manage slides? In Thailand, classical active case detection takes place during case investigations. The staff visits the community, collect 50 to 100 slides, and transport blood slides within 24 hours. Based on the results, the staff provides treatment to the patients at the community level. When taking blood slides from the migrant workers, we test as above and if positive we provide proper treatment. We take more than 100 slides during a special active case detection.

Dr. Charles mentioned that standard operating procedures are available in Thailand that needs to be translated into English to get more detailed information. He said that classical and special case detection is interlinked.

Dr. Sylvia Meek asked if we want to set up a similar system for Day 3 surveillance in Cambodia, how big should the sampling around the index case be. Is it right to test a sample of 50-100 people or should we test for example 3000 people or the whole village? Dr. Chansuda said there have been discussions around the issue of how many people surrounding the case should be screened for a long time. Interestingly in Cambodia the majority of cases come from non-malarious area such as Battambang.

Dr. Wichai explained that we need to know about the presence of vectors in the endemic areas as Thailand goes for elimination. The villages have been stratified into the different classifications such as A and B villages. If a particular vector is found in that area, active case detection should be done. We need to detect every case in the community to ensure elimination.

Surveillance of Day 3 positives in Cambodia

Dr. Lek Dysoley, CNM

All malaria data from public health facilities and VMWs will be disaggregated to village level. The number of villages with trained village malaria workers has increased from 400 to 1390. There are 103 trained mobile malaria workers as well. Cambodia has designed and introduced new reporting formats for VMWs and MMW.

Dr. Lek Dysoley mentioned that the pilot surveillance of Day 3 positives started in January 2010 at 7 referral hospitals and former district hospitals in Zone 1. Data on Day 3 positives will be recorded using a Day 3 positive case investigation form. Hospital staff will send a coded SMS message to the malaria database (MDB) at CNM which will automatically generate an SMS message confirming receipt back to the hospital phone. SMS messages and emails will be generated to OD and provincial malaria supervisors and selected national staff informing them of the Day 3 patient and contact details (e.g., phone number) of the health facility. Google earth maps will show the home village of the patient and the health facility. A Day 3 positive case record will automatically be generated in the malaria database (MDB).

The Day 3 follow-up strategy has been developed and screening will take place in the following situations:

- Village-level investigation and screening should be restricted to situations where the Day 3 positive case is a resident of the OD in which the RH/FDH is located
- The population of villages currently categorized as risk level 1 according to the CNM criteria will be screened and the houses sprayed
- Populations in risk level 2 or 3 villages will be screened and the decision to spray will then be based on the number of RDT-positive cases identified
- Guidelines are flexible and will depend on the number of cases detected and on local situations

The following factors will determine the number of people who need to be screened:

- The target will be based on the number of people that a 2-3 person team could reasonably sample in a two day period
- A field team should stop screening either once they reach their target or cover a 1 km area, whichever occurs first
- The target is likely to be between 50 and 100 and can be reviewed at a later date, based on the experience of field teams
- Guidelines need to be developed to cover instances where a high proportion of the initial screened population test positive

- Screening will use RDTs to diagnose malaria in symptomatic individuals only. Slides and filter paper blood spots (pre-cut filter papers in 96-well plates) will be prepared for all other individuals

All registered private sector outlets have been mapped and information regarding all villages in Cambodia has been collected and compiled.

The plans for 2010 are as follows:

- Introduce the health facility reporting form (village level) to public health facilities nationwide
- Introduce the health facility reporting form (village level) to selected private health facilities (PATH)
- Re-stratification of village risks using malaria incidence data from villages
- Operationalize the Day 3 mapping and follow up
 - Initially to 7 selected facilities in zone 1
 - The mapping component can be expanded easily at low cost to other facilities
 - Extend Day 3 mapping to one or more selected private facilities (PATH)
 - Community level Day 3 mapping using selected VMWs? (URC/FHI?)
- Decentralize the malaria database to OD level
- Work with Thai colleagues on cross border surveillance
- Recruit data management and IT staff to improve capacity at central level to manage data and support the provincial staff

Duo Cotexin (DHA-PIP FDC) will be used as first line treatment, first in the seven designated health facilities and then in all public and private health facilities in zone 1. The surveillance system is designed only for simple malaria cases, severe cases will be dealt separately in hospitals. Key challenges were described such as poor IT infrastructure, lack of internet and email in many districts, and the difficulty of attracting good IT and data management staff etc.

Cross-border Surveillance

Mr. Steven Mellor, Data Manager, Malaria Consortium

Both countries have improved their routine surveillance systems. The purpose of cross border surveillance is to access the relevant information regarding increases of cases, deaths and Day 3 positives in neighboring districts so that we could prepare for, respond to, and beef up surveillance on both sides to make sure that all Pf cases (with an emphasis on Day 3 positives) diagnosed either in Thai or Cambodia are followed-up on a timely basis.

The current situation is that cross border districts do not have access to data from neighboring districts with regards to the number of cases, deaths and Day 3 positives cases. Cambodia has village & HC (HIS) level malaria data for the whole country plus individual Day 3 positive mapping for some areas in the containment zone. Thailand also has village level malaria data for the whole country plus individual follow-up data for the areas covered by the BIOPHICS system. This data usually is analysed and presented separately by each country. We need to share this routine data so both countries can see the complete malaria situation in the containment zone.

Some informal data exchange happens during the cross-border meetings such as this but these needs to be formalised and the data should be made available in a timely manner at all levels.

It has been suggested that following data may be shared on regular basis including number of malaria cases by species, number of severe malaria cases, number of malaria deaths, and number of Day 3 positive cases (broken down by Thai and Cambodian nationals).

Improvements are needed in the follow-up of mobile and migrant populations. Many Cambodians receive malaria treatment in Thailand either as long or short term workers. Malaria posts exist only on the Thai side of the border. Cambodians use the Thai border clinics as day visitors just for treatment but they are classified as M2 migrants even though they do not stay/work in Thailand. Thai MC's keep the basic record of the Cambodians patients but cannot follow-up the migrants. Thai clinics issue a referral card to all malaria patients including migrants. No follow-up of malaria patients is done in Cambodia.

Suggestions to improve surveillance:

- Implement the Cambodian version of the referral cards for Cambodians seen at Thai border posts
- Investigate all Day 3 positive Cambodian cases, if the source of transmission was in Cambodia the concerned district staff should be notified by phone, email, SMS, Geo Chat
- Cambodians seen at Thai border clinics and travelling home on the same day should be classified separately from M2 as they are not migrants

Mr. Mellor explained the existing channel of communication such as formal conferences, meetings and workshops, local cross border meetings, email, and telephone. He suggested ways to improve informal communication such as making more use of simple (cheap) technologies such as Internet, email and especially mobile phones (SMS) and social networking for peer to peer communication.

At the end of his presentation he suggested that a small informal technical working group from BVDB and CNM should be established to harmonize the surveillance strategies and address data exchange issues.

Discussions

Dr. Charles pointed out that the channels of communication mentioned in the presentation are suitable for English speaking people. We really need to have channels in local language. We have to agree on what kind of data we need to exchange between the two countries. When we agree on which data to share and the justification for sharing, then we can discuss how to share it. The easiest and cheapest way is to use SMS communication. Many of the districts do not have internet in Cambodia. We need to know how much budget is required for communication; even follow-up of patients has cost implications. Information on the origin of migrants is very important. We also need to know where migrants from Cambodia or Myanmar are going. We need to use devices that can work in different language such as Thai, Khmer, and English. He suggested that Dr. Prayuth, Dr. Rithea, and Dr. Bunkea should be the part of a task force to work out these communication issues.

Dr. Wichai Satimai agreed to a combined task force from both countries to facilitate this sharing and data exchange.

Dr. David Sintasath added that Malaria Consortium should support such exchanges (both formal and informal) between the two countries to facilitate harmonization.

Web-Based Surveillance System in Thailand

Dr. Prayuth Sudathip, Public Health Technical Officer, BVBD

The objectives of the web based surveillance system in Thailand are as follows:

- To develop a Malaria Information System (MIS) by using a web and mobile technology-based system
- To early detect cases and ease case investigation
- To assess drug compliance
- To follow-up visit (tracking) of malarial patients
- To collect data regarding MDR among the patients.
- To conduct disease mapping and spatial analysis

- To generate mapping of the existence of tolerant parasites
- To perform situation analysis on mobile populations / migrants (internal and cross border)

In the past, a paper-based system was used involving the completion of 7 forms. The web-based surveillance system is more efficient, easy and user friendly. The system will initially be piloted in 2 provinces and then replicated in all zones. Cases can be identified using the Google Earth maps. There are plans to use this system for other diseases such as dengue.

The system has been implemented for two months and can be used either through internet access, or else by the use of mobile messages. It can be used for the follow-up of cases. Dr. Prayuth invited two staff member, users of the new system, to provide their feedback on the system. Both users described it as a user friendly system which has saved the labour of compiling and keeping paper files. They are able to register all data about patients in this system. After completing the information they report that information to the next level. This program facilitates our work and increases efficiency.

Beyond Monitoring Drug Resistance in Cambodia: A Pilot Study

Dr. Philippe Guyant, Partners for Development

This research aims to define the geographical distribution of potential drug resistant/tolerant carriers in order to better target the containment interventions to prevent the spread of multi drug resistance parasites. This study is taking place in Battambang Referral Hospital.

Preliminary results:

- 33 Malaria patients admitted to ICU and paediatric wards in Battambang Referral Hospital between May 09 and October 15, 2009
- 21 Pf patients including Day 3 positives (11/21)
- 2 patients still had fever and parasitaemia at D5 (1 died at D9 with acute renal failure)
- IC 50 results

Adults:

- 24/33 were adults
- Average age, 40yrs (16-82)
- 75% were males
- 13 Pf+ patients including Day 3 positives (9/13)
- 2 patients had fever and parasitaemia at D5 (1 died at D9 with acute renal failure)
- Travel history of Day 3 positives: BTB, 5; Pursat, 2; Pailin, 1; Kratie, 1

Children (<15):

- 9/33 children
- Age: 5-15yrs
- 7/9 males
- 8 Pf+ patients including Day 3 positives 2/8
- 1 patient died after 48h (high IC50 DHA: 7.9)
- Travel History of Day 3+ves 1 to Komrieng (from Sangke); 1 Day 3+ travelled to Pailin

When the 11 patients (Day 3 positive cases) were asked about their one month traveling history, the majority (8 patients) said that they had been traveling to Zone 1.

Discussions

Dr. Chansuda asked Dr. Prayuth how he cross-checked the data? Dr. Prayuth responded that he will establish quality control of data in March 2010.

Dr. Chea Nguon raised his concerns over the cost of follow-up. Thailand is paying 300 Baht per follow-up visit. 7 follow-up visits would cost 2100 Baht per person. This seems to be a very expensive strategy for Cambodia to adopt.

Group Work 1: Identifying key issues and challenges

Dr Sintasath explained the group work for Day 2 and asked participants to brainstorm and to identify key challenges for diagnosis, treatment, active investigation, case detection and follow-up (all groups should consider resident and migrant/mobile populations).

The participants were assigned to the following 3 working groups:

- Group 1: Public sector
- Group 2: Private sector (including clinics and businesses)
- Group 3: Community-based case detection and treatment

All groups highlighted the key challenges and issues pertaining to diagnosis, treatment, investigation, case detection and follow-up in both countries. The outputs of the group work on identifying key issues and challenges are summarized in Annex 1.

Day 3

Group Work 2: Identifying solutions and activities

Dr. David Sintasath explained the objectives of the group work. He showed the table to be used and requested the groups to come up with practical solutions and activities to improve diagnosis, treatment detection, follow-up, and active investigation, particularly of Day 3 positive cases.

Dr. Kheng Sim asked the participants to suggest how to increase the detection of Day 3 positives at the community level? Could village malaria workers make a blood slide? How can we transport the slides to the next level? The groups should consider the practical issues and propose concrete solutions.

The outputs from the group works on identifying solutions and specific activities related to Day 3 positives are summarized in Annex 2.

Summary of comments, questions and discussions from each group:

Group 1: Public Sector

Dr. Kheng Sim emphasised that we need to decide whether we should have **different drugs in different zones or one drug regimen in all zones** going forward. She explained that currently people get different treatment in different zones based on the needs of the project. When discussed at different forums it was agreed that people would like to have only one treatment regimen. As you know, the treatment regimes in use at present are a temporary arrangement for the Containment Project to reduce drug pressure. Cambodia's drug choices are limited since they use funding only from Global Fund for ACTs. We need to agree on one drug regimen in the future.

Dr. Charles stressed the need for **quality control of microscopy**. Dr. Steven Bjorge responded that in Thailand there are well trained microscopists. This problem can be overcome with the consistent training of microscopists in Cambodia as well.

Dr. Prudence mentioned that the slides need to be transported from community to health facility within 24 hours. There should be a health staff assigned to collect the slides from the community level on a regular basis. If we are looking only on Day 3 then we should take the slides on Day 3. However if we need to compare the slide results for density of parasitaemia then we need to make slides on both days i.e. day 0 and Day 3. We need to understand that it is logistically very difficult to get the slides to the health facility in timely fashion. Dr. Ros Sehya suggested that we should **take blood slides on day 0 and Day 3** for follow-up to compare the density of parasitemia. We should identify facilities and options for blood test which are closer to the patients home. Dr. Steven Bjorge mentioned that Day 3 positivity indicates the worse case scenario, i.e. whether drugs are working or not. We should do the slides on Day 0 and Day 3, only a Day 3 slide would be a vague indicator of resistance.

In Thailand, patients are followed-up 7 times. In Cambodia, they will try to do follow-up on Day 3 and Day 5. There is a cost for each follow-up. It is important to make a decision on how follow-up should be done in Cambodia based on the budget limitations. Dr. Sylvia Meek pointed out that the main purpose of following up on Day 3 was to **develop a response when a Day 3 positive patient was identified**. This might include FSAT along with a package of interventions including preventive (BCC) activities such as distribution and promotion of bed-net use in the surrounding community.

Dr. Saowanit asked the Cambodian participants **how a patient was managed after their return home**. Treatment is normally provided for 3 days in Cambodia. On Day 0, the medicine is given to the patients under DOT. Doses for second and third days are given to be taken at home. They are asked to return to the health facility on Day 3 for follow-up. Patients are asked to bring the empty pack of the medicine to see whether they have completed the course.

Group 2: Private Sector

Dr. Sim explained that discussions on the private sector were getting more and more attention. **The scope of private sector needs to be determined**. In Cambodia they have tried to create a dialogue with the private sector, but in the past year they have not been able to achieve much. The need to involve the private sector in provision of care and surveillance is acknowledged but at what level - registered private providers only or non-registered as well? Will the Ministry of Health support these initiatives? Until there is clear support from the Ministry of Health, CNM cannot do much with private sector. Dr Sim felt that we have not made any significant achievements regarding the private sector.

Group 3: Community

Dr. Sylvia raised the question of **community sensitization**. How do you explain to the community about the Containment Project? How do you discuss resistance with the community? What is their understanding of drug resistance and the reason to give blood even if they are healthy? Dr. Thavrin described the key health education activities taking place at community level to increase knowledge and awareness about the project. We have been conducting meetings with the village stakeholders to inform them about the importance of the project. Dr. Prudence mentioned that during the group work there was a detailed discussion on how to sensitize the communities about resistance and blood tests during the follow-up visits.

Mr. Muhammad Shafique mentioned that health is a partnership between community and service providers and without community support we cannot achieve much. He mentioned that the BCC team has been conducting community sensitization meetings with community members, village stakeholders and volunteers. They have conducted workshops with community stakeholders and volunteers and clarified their roles and responsibilities in the project so that they could play a proactive role. If the village leaders and stakeholders understand the importance of follow-up, blood tests, bed-net use, they will provide better support at the community level.

There was also much discussion about the practical challenges in the communities if VMWs were to begin taking blood slides and follow-up, particularly with migrant populations. In Thailand, involvement of plantation owners, community leaders, and military were suggested as contact points to provide treatment and follow-up of malaria patients. There were some practical solutions and innovative activities identified in the group outputs but **more detailed planning** is needed to make these operational.

Summary and Recommendations

Ms. Michelle Thompson, Epidemiologist, Malaria Consortium

Summary

- An overview of programme strategies in Thailand, Cambodia, and Vietnam provided useful information on how the different countries detect, treat, and follow-up of cases. The containment of artemisinin resistance is no longer only for Cambodia and Thailand but will be essential for other countries in the GMS to monitor the situation and to take action.
- Update on Therapeutic Efficacy Studies (TES) throughout the Mekong region: ACTs are still working with ACPR > 90% in almost all sentinel sites (measured till Day 28) except on the Cambodia-Thailand border. However, increasing parasite clearance time is noticed in an unusual proportion of patients in other pockets deserving extra monitoring, more in-depth research and action.
- Preliminary results from the containment survey showed very few Pf cases in Zone 2 and no cases in Zone 1. The majority of fever cases first seek advice or treatment in the private sector. Furthermore, preliminary results of a non-malaria fever study indicated a variety of other infectious causes of fevers presenting with malaria-like symptoms.
- Panel discussion with practitioners from various levels in Thailand and Cambodia. They described many of the difficulties of providing care in both the public and private sectors, including biological diagnosis and reporting of cases from the private sector to the National Programme.
- An overview of surveillance strategies from national programmes was presented and potential areas for cross-border surveillance and mapping were discussed.
- Update on Battambang referral hospital pilot study to follow up in-patients to day 28, using slides and PCR
- Brainstorming sessions to identify key challenges for malaria diagnosis, treatment, active investigation, case detection and follow-up.
 - Public and private sectors and community level
 - Also considered containment zones, mobile/migrant groups

Recommendations

- Innovative strategies and strengthening of existing strategies should be considered to detect, treat, and follow-up the mobile and migrant populations in Thailand and Cambodia.
- Need to establish and support a task force to discuss cross-border surveillance and what data can be routinely shared between the two countries.
- The private sector in Cambodia should be encouraged (or regulated) to report all cases diagnosed and treated, improve referrals to public health facilities.
- Training of additional microscopists is needed, plus quality control systems should be in place at all levels. The use of molecular methods should be further evaluated for the detection of asymptomatics and settings with low malaria transmission.
- VMWs should be trained in the use of RDTs and how to interpret Combo test results. They should also be considered whether they could make blood slides for Day 3 positive surveillance to support follow up of OPD cases and village-level patients. If yes, more VMWs will need to be recruited.
- All antimalarial treatments should be “directly observed” (DOT).

- Implement an intervention strategy package to respond to Day 3 positive cases in the communities/locales where transmission is suspected to have occurred.

Closing Remarks

Dr. Wichai Satimai thanked Malaria Consortium for organizing the meeting. He felt that this meeting provided a useful opportunity for discussions between the two countries, and discussion of issues, challenges and their possible solutions. There is an urgent need to overcome these challenges, especially sharing of information – and establishing a task force will be a good step to solve these issues. He looked forward to closer collaboration and information sharing of the task force.

Dr. Kheng Sim thanked colleagues from Thailand and the provinces for their active participation in the workshop. She also thanked Malaria Consortium for organizing the workshop. She reminded the participants that we spent valuable time together and learned a lot from each other so that how we can improve our program in future. At least now we have a clear direction to move forward. I am thankful to Dr. Wichai for his participation and agreeing on sharing of information on a regular basis.

Dr. David Sintasath expressed his gratitude to the participants from different countries (including Vietnam) and province staff for their active participation and sharing. One of the good outcomes of the workshop is that we learned from the provinces, shared valuable experiences, discussed the issues and challenges, and identified the possible solutions. He thanked the national programmes, WHO, and partners for their active participation and support.

Dr. Sylvia Meek thanked all the participants as well as the translators and interpreters for their excellent job. One of the purposes of this workshop is to make sure that the strategy is clear to the actual implementers - the provincial staff from both countries. The group work involved people who are implementing and who have good ideas and approaches. The provincial people have been very creative, and clearly demonstrated that very good work is happening in both countries.

Dr. Charles thanked Malaria Consortium for organizing this successful workshop. In closing, he recognized the impact of communication and the need to communicate our successes to each other. He also reminded the participants that the containment of artemisinin resistance is a regional issue that must be tackled beyond Thailand and Cambodia.

ANNEX 1. GROUP WORK OUTPUTS

Key challenges and solutions for diagnosis, treatment, active investigation, case detection and follow-up

Group 1. Public Sector					
	DIAGNOSIS	TREATMENT	FOLLOW-UP	INVESTIGATION	CASE DETECTION
CAMBODIA	<ul style="list-style-type: none"> - Limited microscopes at HC - Quality / shortage of reagents - Combo test difficult to interpret can't confirm by microscope - Cool storage not always available - Facilities not open 24hr 	<ul style="list-style-type: none"> - DOT treatment for outpatient / migrants difficult - Stock outs / supply chain problems - Shortage of Arthemeter in RH - High staff turnover at HC - Lack of equipment to manage severe malaria - Lack of chloroquine - Different treatment regime by zone - Drug shortage because of unexpected migrants - Weakness of referral system 	<ul style="list-style-type: none"> - Too many cases at HC for FU - Difficult to convince patient to return for FU - Patients don't want to stay long in the hospital - Mobiles people difficult to FU - Travel costs for the patient to return for FU - Not clear address for the patient 	<ul style="list-style-type: none"> - Staff not motivated to do case investigation 	<ul style="list-style-type: none"> - Migrants difficult to reach - Lack of incentives and transportation means to reach remote areas - HR availability - Reporting problems
THAILAND	<ul style="list-style-type: none"> - RDT cannot detect low density parasitemia - Staining quality - Transportation condition for RDTs - Cool storage not always available 		<ul style="list-style-type: none"> - Migrants difficult to follow up due to occupational movement 	<ul style="list-style-type: none"> - Performance issues of the case investigation system - Patient have illegal occupation so don't tell the truth - Language issues for migrants 	<ul style="list-style-type: none"> - Performance issues of case detection system needs to be assessed - HC should send slide to MC – sometimes takes too long - Malaria post only part time have to do other work not available 24hr

Group 2. Private Sector					
	DIAGNOSIS	TREATMENT	FOLLOW-UP	INVESTIGATION	CASE DETECTION
CAMBODIA	<ul style="list-style-type: none"> - Feasibility of laboratory diagnostic tools in remote areas - Limitation of more specific RDT (Malacheck) - Accessibility of RDT - Time consuming and quality of microscopic technician at the local level (result unreliable) - Affordability of laboratory diagnostic tools from patients. - Lack of skills for performing diagnostic tools especially in drug shop/unlicensed drug stores. 	<ul style="list-style-type: none"> - Affordability for a complete regimen from the patients - Symptomatic treatment especially from unregistered providers - Low quality of health service providers from unlicensed providers - Fake/sub-standard drugs - Availability of antimalarials recommended by national treatment guideline - Referral system for the severe cases & pregnant malaria cases. 	<ul style="list-style-type: none"> - Accessibility of diagnostic feasibility - Time constraints & affordability for transportation - Poor understanding of the importance of follow up from the patient. 	<ul style="list-style-type: none"> - Time constraints - No formal record for malaria cases 	<ul style="list-style-type: none"> - Time constraints
THAILAND	<ul style="list-style-type: none"> - Same challenges 	<ul style="list-style-type: none"> - Difficult to follow up - Same challenges - Self-medication: delay 	<ul style="list-style-type: none"> - No formal case record forms if available the private sector can collaborate to collect the malaria cases - Highly mobile workers and lost to follow up 	<ul style="list-style-type: none"> - Language barriers - Don't disclose information because of illegal status 	<ul style="list-style-type: none"> - Remote areas - Data needed: M1, M2 and movement

Group 3. Community

	DIAGNOSIS	TREATMENT	FOLLOW-UP	INVESTIGATION	CASE DETECTION
CAMBODIA	<ul style="list-style-type: none"> - Lack supply RDT (some month from HCs to VMW) - RDT does not detect low parasitaemia - No quality control for RDT use at community - Misinterpretation of test result (P. f to P.v) - RDT does not keep in proper place - Limit knowledge on malaria sign and symptom - Unable to quantify parasitaemia at community level - New replacement of VMW didn't get proper training 	<ul style="list-style-type: none"> - Mefloquine cause vomiting - Radical Treatment for PV - Compliance Treatment - Can not confirm for good compliance - No compliance with the treatment - Start with home base treatment - Patient Compliance with full course of treatment (3 days DOTs not always possible) - DHA- PIP is not GMP/ Prequalified - Monotherapy - Antimalaria need to be break down in small part - Treatment for pregnant woman - Ambiguous drug policy (need to finalize treatment guideline) - Too many medicine in different areas (Need to harmonize) - Counterfeit medicine 	<ul style="list-style-type: none"> - No proper follow-up mechanism - VMW has too much works - VMW did not understand of F/U concept because of they have not been trained - Weak F/U capacity especially at the border (Z1 and Z2 and community level) - Poor coordination and F/U especially in private sector - VMW could not conduct parasitology F/U - Migrant often change the location and hard to find them - No guideline to F/U patient - No incentive for F/U activities - Patient moved after receiving the treatment - Difficult to contact the patient - VMW has no means of communication - Data collection is limited - Not enough VMW to F/U migrant patient 	<ul style="list-style-type: none"> - VMW has no knowledge of investigation concept - No clear role for investigation - No incentive for investigation activities - F/U address of patient and transmission in malaria endemic area - F/U by VMW should be trialed/piloted - Poor information on Cross-border mobile and migrant workers in Containment Z1 and Z2 - No extensive investigation in Z1 and Z2 	<ul style="list-style-type: none"> - Lack of collaboration from community - Risk group do not collaborate because they afraid to be arrested - Investigator give data in EP3 not complete, wrong data - Non extension of case detection across the border - Patient not stay at home for staff to follow-up at Day 1, 2, 3, --- 42

		<ul style="list-style-type: none"> - Limited resources to support cross border migrant cases - Parents share their malaria treatment to their children 	<ul style="list-style-type: none"> - Logistical barriers - Difficult to F/U patient at home 		
THAILAND	<ul style="list-style-type: none"> - Blood film not good - Quality of RDT poor - Long distance to community - New microcopies - Supplies for diagnosis (slides, lancets, etc) - Communicate with staff-villages-patients 	<ul style="list-style-type: none"> - Language problem for health education to provide information to migrants - Patient's compliance, not complete regimens - Health facilities far from villages - Malarone is a new treatment and very expensive - Regimen for migrant population 	<ul style="list-style-type: none"> - Loss of follow-up - Patient move anywhere - Long distance from health facilities and patient's house - Cannot follow-up migrant and soldiers - Difficult to locate migrants - Report from hospital delayed 	<ul style="list-style-type: none"> - Information not complete - Investigator has no/limited knowledge in epidemiology - Language problem - Political problem 	<ul style="list-style-type: none"> - Lack of collaboration from community - Risk group do not collaborate because they afraid to be arrested - Investigator give data in EP3 not complete, wrong data - Non extension of case detection across the border - Patient not stay at home for staff to follow-up at Day 1, 2, 3, --- 42

ANNEX 2. GROUP WORK OUTPUTS

Identifying key priority challenges, solutions and activities for detection and follow-up for Day 3 Positives

Group 1: Public Sector

	KEY PRIORITY CHALLENGES	POSSIBLE SOLUTIONS	ACTIVITIES REQUIRED
CAMBODIA	<ul style="list-style-type: none"> - Cam: DOT treatment for outpatient / migrants difficult - Cam: Difficult to convince patient to return for FU - Different treatment regimen by zone - Limited microscopists at HC - Stock outs / supply chain problems (Included Drug & lab. material) - Reporting problems 	<ul style="list-style-type: none"> - Need patients stay at hospital at least 3 days - In case patient will not admit in hospital - Provide transport - Good collaboration between zone 1 and zone 2 - Supply lab. material for making blood smear - Strengthening the procurement system and drug management - Develop report format for FU of Day 3 positive 	<ul style="list-style-type: none"> - Select key staff for this activities - Counseling and motivate patient - Provide first dose treatment at hospital and ask patient to return on Day 3 with drug package or through VHVs for village located far from HC - Counseling and motivate patient - Recruit staff as a special team to follow up - Additional request from health facilities if needed - Training and monitoring at HC - Send slide to RH/FDH/HC - Additional request to OD - Training and monitoring
THAILAND	<ul style="list-style-type: none"> - Migrants difficult to follow up due to occupational movement - Staining quality - Shortage of cool box to keep RDTs 	<ul style="list-style-type: none"> - Increase accessibility - Setting system to refer patient or data among net work - Improve Giemsa and Buffer quality - Use cool box and control temperature 	<ul style="list-style-type: none"> - MPW/MW actively FU - Adjust time to FU patient - Support lab. material - Send patient data to VBDC/VBDC by Smart phone or email - Coordinate among net work by meeting/tel. or email - Improved by refreshing training and monitoring - Need more cool box and control temperature

Group 2: Private Sector			
	KEY PRIORITY CHALLENGES	POSSIBLE SOLUTIONS	ACTIVITIES REQUIRED
CAMBODIA	<ul style="list-style-type: none"> - Willingness of private sectors to cooperate - Coordination and monitoring - Feasibility of diagnostic tools - Skill and quality on microscopic services - Availability of anti-malarial drug recommended by national guideline - Affordability of a complete regimen from the patient - Accessibility to follow-up facilities 	<ul style="list-style-type: none"> - Encourage the private sector to work with the programme - Need regulations - Establish monitoring system between public sector and private/community sectors - Adaptation from PPM-TB model - Private sectors take blood slide samples (D0 and/or D3) and send to public sectors - AMFm mechanism - Create wide network for follow-up (patient's choice) 	<ul style="list-style-type: none"> - Advocacy workshop with private providers - Work with regulators and MOH - Train public health officers on coordination and monitoring - Train private sectors on slide preparation - Logistic supplies for private providers - Ensure the adequate availability of and accessibility to recommended regimens - Train private providers on the usage of national recommended anti-malarial - Train private providers on follow-up procedure - Provide BCC at any points (VHV/VMW/private/public providers)
THAILAND	<ul style="list-style-type: none"> - Poor malaria perception among employers and migrants - Self-medication resulting in delay treatment - Highly mobile workers /employers - Language barriers - Do not disclose information due to illegal status - Poor malaria perception among employers and migrants 	<ul style="list-style-type: none"> - BCC targeting employers/migrants - Establish employers/worker data base including movement pattern using GIS - Using local /volunteer translators - Make sure confidential information - Using local investigators using simply forms - Establish employers/worker data base including movement pattern using GIS 	<ul style="list-style-type: none"> - Developed BCC strategies targeting both employers and migrants - Expand malaria corners - Set up communication method between employer and VBDU: SMS - Share employer/migrants movement information between VBUDs - Recruit employers as malaria volunteers - Set up communication method between employer and VBDU - Share employer/migrants movement information between VBDU

		<ul style="list-style-type: none"> - BCC targeting employers/migrants - Establish appropriate collaboration and communication 	<ul style="list-style-type: none"> - Identify local translators - Provide incentive for local translators while perform case investigation - Individual explanations - Employer and migrant survey - Set up communication method between employer and VBDU - Share employer/migrants movement information between VBDU - Recruit employers as malaria volunteers - Developed BCC strategies targeting both employers and migrants - Expand malaria corners - Regular meeting - Communicate with employers using telephone - Provide incentive such as thank note.
--	--	---	---

Group 3: Community

	KEY PRIORITY CHALLENGES	POSSIBLE SOLUTIONS	ACTIVITIES REQUIRED
CAMBODIA	<ul style="list-style-type: none"> - Training supervisor + QC - Logistic to move slides from community to HF - Communication from VMW to HF - How to train VMW to take slide, storage, transport of slide, DOTs. - Detecting D3 positive patients in communities - Loss of F/U - Mobile/migrant workers are the 	<ul style="list-style-type: none"> - Recruit additional VMW and field supervisor - Provide motorbike/fuel to VMWs - Good communication with VMW and community - Strengthening BCC by training VMWs - Incentive for VMWs for DOTs and for patient on D3 - Set time of opening for VMW and telephone number if available 	<ul style="list-style-type: none"> - Train VMWs to take slide - Train VMW to understand DOTs and D0, D1, D2 and D3 - Train VMWs to promote use of mosquito net - Community sensitization about the Containment Project and needs for extra blood sample - Strengthening supervision at village level -

	<p>most challenging for Day 3 F/U</p> <ul style="list-style-type: none"> - Getting the consent of the community - Need good microscopy, need good microscopist, Health Facility with microscope 	<ul style="list-style-type: none"> - BCC promotion by VMWs, especially to migrant workers - At least 2 VMWs per village - Budget (package) for referring patient from community to HF - LLIN, insecticide and IEC materials with VMW - Orientation and sensitization meeting in community - Need a regular supply of RDT, drugs, slides and lancet - Boxes to storage slides 	
THAILAND	<ul style="list-style-type: none"> - Migrant workers - Providing services malaria control to soldier in sensitive area - Fever case on Day 3 	<ul style="list-style-type: none"> - MVV, plantation owner, MPW - HVV, community leader - Any patient > 37.5 °c poor symptom refer to hospital - Sensitive area: do nothing - Contact migrant leader - If possible contact Cambodia to follow on D28 to know the patient is cured from malaria - Contact army to follow on D28 to know the patient is cured from malaria - Make sure that patient sleep in LLIN to prevent the spread of parasite tolerant strains 	<ul style="list-style-type: none"> - Patient temperature >37.5 °c at Day 3, D2 parasite > D0, Day 3 parasite > 25% on D0 - Contact: 1) relative, 2) MPW, MW, MVV, HVV, 3) commune leader, - By using phone: 1)-from MC to community 2) from relative and community to MC - Look for D4, D5, D6 Call to patient - If poor symptom refer to hospital (patient come or send vehicle to pick up patient at home)



Technical Cross-border Workshop on Malaria Case Management* for Artemisinin Resistance Containment

*Diagnosis, Treatment, Active Investigation, Case Detection and Follow-up

Cambodiana Hotel
Phnom Penh, Cambodia
24-26 February 2010

Objectives:

- To exchange information about current strategies and activities of national programmes on malaria diagnosis, treatment, active investigation, case detection and follow-up in the context of the Containment Project;
 - To identify and resolve key country-specific and cross-border bottlenecks for the implementation of these strategies;
 - To discuss novel strategies and tools to improve malaria diagnosis, treatment, active investigation, case detection and follow-up of Day 3 positive cases (including resident and migrant populations) through public and private sectors, and communities.
 - To agree upon and harmonize practical procedures for malaria diagnosis, treatment, active investigation, case detection and follow-up of Day 3 positive cases in zones 1 and 2, and elsewhere.
-

Wednesday 24 February 2010

08:00 – 08:30	Registration	
08:30 – 09:00	Opening remarks and welcome	Dr Duong Socheat, CNM Dr Wichai Satimai, BVBD
09:00 – 09:15	Introduction of participants	
09:15 – 09:30	Containment Project Overview and Update	Dr Najibullah Habib, WHO
09:30 – 09:40	Objectives of the meeting	Dr David Sintasath, MC
09:40 – 10:00	GROUP PHOTO & TEA BREAK	

Diagnosis and Treatment

Session 1 Moderator: Dr Duong Socheat, CNM

10:00 – 12:00	Overview of current programme strategies (including diagnosis and treatment protocols), implementation, and bottlenecks (20 min + 10 discussion)	
	- Thailand	Saowanit Vijaykadga, BVBD
	- Cambodia	Dr Kheng Sim, CNM
	- Vietnam	Dr Ta Thi Tinh, NIMPE

12:00 – 13:00 LUNCH

Session 2 Moderator: Dr Wichai Satimai, BVBD

13:00 – 13:45	Update of Therapeutic Efficacy Studies in the region and impact on antimalarial drug policies	Dr Charles Delacollette / Dr Chansuda Wongsrichanalai
13:45 – 14:30	Preliminary results and perspectives from recent studies in Cambodia	
	- Containment Survey 2009: Malaria Diagnosis and Treatment	Dr Rithea Leang, CNM
	- Management of Non-Malaria Fevers	Dr Siv Sovannaroeth, CNM

14:30 – 15:00	Update on molecular methods for malaria diagnosis	Dr Lim Parath
15:00 – 15:30	TEA BREAK	

Thursday 25 February 2010

Session 3 Moderator: Dr Prudence Hamade

8:30 – 10:00	Panel discussion: Perspectives from the provinces	
	– Mr. Dokrak Tongkong, Public Health Technical Officer, Trat, Thailand	
	– Mr. Loung Vothy, Village Malaria Worker, Phnom Dambang Village, Cambodia	
	– Dr. Phap Sovichet, Director, Pailin Referral Hospital, Cambodia	
	– Dr. Khe Sokhoum, Private Provider, Cambodia	
10:00 – 10:30	TEABREAK	

Case Detection, Investigation, and Follow-up

Session 4 Moderator: Saowanit Vijaykadga, BVBD

10:30 – 11:00	Thai surveillance system	Dr Prayuth Sudathip, BVBD
11:00 – 11:30	Cambodia surveillance system (including Day 3 positives)	Dr Siv Sovannaroth, CNM
11:30 – 12:00	Discussion on cross-border harmonization strategies, challenges next steps (with focus on migrants and hard to reach)	Steve Mellor/Charles Delacoelette
12:00 – 13:00	LUNCH	

Session 5 Moderator: Dr Chea Nguon, CNM

13:00 – 14:00	Surveillance and Mapping	
	- GIS mapping of malaria cases	Dr Prayuth Sudathip, BVBD
	- Update on Battambang Referral Hospital pilot study	Dr Philippe Guyant, PFD
14:00 – 15:30	Brainstorm to identify key challenges for malaria diagnosis, treatment, active investigation, case detection and follow-up of Day 3 positives (all groups to consider resident and migrant/mobile populations)	
	▪ Group 1: Public sector	
	▪ Group 2: Private sector (including clinics, drug vendors, and businesses)	
	▪ Group 3: Community	
15:30 – 16:00	TEABREAK	
16:00 – 17:30	Presentation of groupwork	

Friday 26 February 2010

Moderators: Dr Prudence Hamade and David Sintasath, MC

08:30 – 12:30	Group Work: Develop practical and <u>harmonized</u> procedures to address identified challenges	
12:30 – 13:30	LUNCH BREAK	

Moderator: Dr Kheang Soy Ty, URC

13:30 – 15:30	Presentation of groupwork	
15:30 – 16:00	TEABREAK	
16:00 – 16:30	Summary	Malaria Consortium
16:30 – 16:45	Closing Remarks	

