Meeting Report

THIRD ANNUAL COUNTRY SURVEILLANCE MEETING TO FACILITATE MALARIA ELIMINATION IN THE GREATER MEKONG SUBREGION

30 October 2020

Virtual meeting

World Health Organization
Western Pacific Region

WORLD HEALTH ORGANIZATION

REGIONAL OFFICE FOR THE WESTERN PACIFIC

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Convened by:

WORLD HEALTH ORGANIZATION
REGIONAL OFFICE FOR THE WESTERN PACIFIC

30 October 2020
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NOTE

The views expressed in this report are those of the participants of the Third Annual Country Surveillance Meeting to Facilitate Malaria Elimination in the Greater Mekong Subregion and do not necessarily reflect the policies of the conveners.

This report has been prepared by the World Health Organization Regional Office for the Western Pacific for Member States in the Region and for those who participated in the virtual Third Annual Country Surveillance Meeting to Facilitate Malaria Elimination in the Greater Mekong Subregion on 30 October 2020.

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Keywords:

Malaria – epidemiology, prevention and control / Mekong valley / Sentinel surveillance

ABBREVIATIONS

ACD	active case detection
China CDC	Chinese Center for Disease Control and Prevention
CMPE	Lao PDR Center for Malaria, Parasitology, and Entomology
CNM	Cambodian National Center for Parasitology, Entomology and Malaria Control
DHIS2	District Health Information System 2
DVBD	Thailand Division of Vector Borne Disease
eCDS	electronic communicable disease system
ERAR	Emergency Response to Artemisinin Resistance
FTAT	focal testing and treatment
GMS	Greater Mekong Subregion
iDES	integrated drug efficacy surveillance
LLIN	long-lasting insecticidal net
MCBRS	malaria case-based reporting and surveillance
MEDB	Malaria Elimination Database
MIS	malaria information system
MME	Mekong Malaria Elimination
NIMPE	Viet Nam National Institute of Malariology, Parasitology and Entomology
NMP	national malaria programme
RAI2E	Regional Artemisinin Initiative 2 Elimination
WHO	World Health Organization
YIPD	Yunnan Institute of Parasitic Diseases

SUMMARY

On 30 October 2020, representatives from the Greater Mekong Subregion (GMS) Member States – Cambodia, China, the Lao People's Democratic Republic, Myanmar, Thailand and Viet Nam – met with partners to strengthen surveillance for malaria elimination in the subregion. The third annual surveillance meeting was hosted virtually by the World Health Organization (WHO) Mekong Malaria Elimination (MME) programme. During the meeting, representatives exchanged information on surveillance progress and challenges in their countries. Presentations centred around surveillance updates, the Malaria Elimination Database and data sharing. The outcomes from these discussions led to recommendations that aim to further strengthen surveillance to accelerate malaria elimination in the GMS towards the shared goal of a malaria-free status in the region by 2030.

The key conclusions of the meeting included the following:

Overview of GMS malaria elimination

- From January to September 2020, the GMS countries demonstrated approximately a 61% decrease of *Plasmodium falciparum* cases and a 32% decrease of *P. vivax* cases compared to the same period in 2019.
- Malaria is now mostly concentrated in remote areas, where the disease disproportionately affects travellers to malaria-risk areas as well as mobile and migrant populations.
- The border closures and movement restrictions caused by the coronavirus disease 2019 (COVID-19) pandemic resulted in limitations in the implementation of field activities, including case surveillance.
- However, countries have managed to adapt to remote surveillance systems and create new standard operating procedures.

Surveillance in the GMS

The 1-3-7 approach is still a key malaria surveillance and response strategy in the GMS. Prompt reporting and data sharing on COVID-19 have been essential in tracking movements. Similar approaches could be applied to the surveillance of malaria cases.

Malaria Elimination Database (MEDB)

All countries are reporting monthly to the MEDB. The Database should be utilized as a surveillance platform within the GMS, especially in relation to cross-border collaboration. WHO will continue maintaining and strengthening the platform, data verification and analyses. So far, four countries (Cambodia, Lao People's Democratic Republic, Myanmar and Thailand) have already given the green light to give access to the MEDB to malaria partners. However, it is advised to give access to partners across the whole region.

Country updates

- **Cambodia**: In the coming year, Cambodia is focusing on: improving the Malaria Information System (MIS) features with the inclusion of data on patient ID and *P. vivax* radical cure (as well as a follow-up tool), strengthening pharmacovigilance, and developing an app for real-time sharing response and for the last mile of *P. falciparum* elimination.
- **China (Yunnan)**: The biggest challenge remains the presence of cases along the border areas. Going forward, China is looking to improve joint cross-border malaria prevention and control.
- **Lao People's Democratic Republic**: In the coming year, the country plans to implement weekly reporting from high-burden health facilities and village malaria workers using text messages, create more granular outbreak alert thresholds, scale up and accelerate elimination activities, and integrate treatment adherence into the District Health Information Software, or District Health Information System 2 (DHIS2), especially for *P. vivax* malaria.

- **Myanmar**: Challenges remain in using digital platforms for malaria surveillance, especially in hard-to-reach areas. More support is needed to improve technical skills, resources, as well as capacity for data encoding, analysis and documentation.
- **Thailand**: The malaria surveillance system continues to be integrated into national malaria programming. An online malaria system has been developed and includes real-time case-based surveillance, foci and vector mapping. A plan is in place to integrate malaria activities into the general health system and link the Health Management Information System with the MIS to improve malaria data quality
- **Viet Nam**: The country has completed the integration of its MIS into the electronic communicable diseases system (eCDS). Going forward, Viet Nam will focus on reviewing the content of its surveillance guidelines, strengthening the eCDS, and providing further technical support and training.

1. INTRODUCTION

1.1 Meeting organization

The World Health Organization (WHO) Mekong Malaria Elimination (MME) programme hosts the Malaria Elimination Database (MEDB) to strengthen surveillance activities in countries and to facilitate data sharing and collaboration among countries. Currently, all countries in the Greater Mekong Subregion (GMS), including Cambodia, China (Yunnan Province), the Lao People's Democratic Republic, Myanmar, Thailand and Viet Nam, are sharing monthly malaria surveillance data with the MME. In addition, the GMS countries continue to manage their own national surveillance activities to track and investigate cases, adjust programming and identify foci.

WHO hosted the one-day virtual meeting bringing together representatives from malaria control programmes, surveillance focal points from GMS countries as well as technical experts and partners to review the current status and performance of national surveillance systems and to discuss the future priorities for the MEDB and areas of improvement for data sharing.

The main discussion points included: the status and challenges in countries regarding surveillance systems, the use of surveillance data for programmatic actions, areas for surveillance improvement, the performance of the MEDB and ways to utilize the surveillance data on the MEDB to accelerate malaria elimination.

1.2 Meeting objectives

The objectives of the meeting were:

1) to review the status of surveillance systems, particularly for elimination capabilities, in the GMS and to identify challenges and make recommendations for practical solutions to strengthen surveillance;
2) to discuss the performance of the MEDB and preparation/planning of activities for the coming year as well as the ways to utilize the surveillance data to accelerate malaria elimination;
3) to discuss the feasibility of countries sharing more frequent granular/disaggregated data – that is, weekly aggregates by data sectors (public health facility, community, private sector);
4) to request approval from some GMS countries on granting shared access to the MEDB to malaria partners in the GMS; and
5) to discuss the possibility of starting surveillance assessments in GMS countries.

2. PROCEEDINGS

2.1 Opening session

Dr Ailan Li, WHO Representative, Cambodia, delivered the welcome address to the meeting participants. In the welcome address, she emphasized that between January and September 2020, the number of malaria cases in the subregion has decreased by 51% in comparison to the same period last year. She noted that deaths caused by malaria reached a record low, with only nine deaths recorded in the subregion.

Dr Luciano Tuseo from the MME programme provided a briefing of the meeting objectives. This was followed by the nomination of Dr Siv Sovannaroth, representative from the Cambodia National Centre for Entomology and Parasitology Control (CNM), as the chair of the meeting.

2.2 Updates from GMS countries on status of surveillance systems particularly for elimination capabilities

2.2.1 Cambodia

Dr Siv Sovannaroth, representative from the Cambodian CNM, provided an update on the country's epidemiology progress. Between January and September 2020, malaria cases decreased by 75% when compared to the same period in 2019. In 2019, 91 operational districts (ODs) reached the *Plasmodium falciparum* elimination target. By the end of December 2020, the CNM expects all 101 ODs to achieve the Malaria Elimination Action Framework's *P. falciparum* elimination target, except for one OD in Kampong Speu province.

He emphasized the surveillance achievements in Cambodia. The country's Malaria Information System (MIS) allows for the availability of real-time web-based data, which include data on a wide range of indicators including case/foci investigation data, stock/commodity data, long-lasting insecticidal nets (LLINs) and hammock net. By October 2020, the majority of cases are notified to the CNM within 24 hours, and 217 *P. falciparum* and mixed case foci had been investigated by September 2020. The surveillance data are used for programmatic actions including annual stratification, resource allocation, epidemic response and surveillance intensification.

As the main challenges to surveillance in Cambodia, Dr Siv mentioned: mobile and migrant populations and forest goers need to be integrated into the system; human resources are limited and funding restrictions can be challenging; and there is a need to update strategies for elimination in the country.

In the future, Cambodia is focusing on improving its MIS features. These will include the integration of data on patient identification, *P. vivax* radical cure (and follow-up tool) and pharmacovigilance. The CNM has developed an Android app for the last mile of *P. falciparum* to share real-time malaria data, and this will be available in iOS shortly.

During the discussion, Cambodia noted it is working on revising its 1-3-7 strategy into a 1-1-7 malaria surveillance and response strategy.

2.2.2 China (Yunnan Province)

Dr Xiaodong Sun, representative from the Yunnan Institute of Parasitic Diseases (YIPD), presented the surveillance update for China (Yunnan Province). The country has not had an indigenous malaria case since 2017 and had recorded 121 imported cases by September 2020. Between 2017 and 2020, 86% of all cases were *P. vivax* and 83.8% originated from Myanmar.

China has two web-based systems for malaria surveillance. The first one for infectious diseases is the *Chinese Information System for Disease Control and Prevention*. The second one is known as the *Information Management System Specific to Malaria Elimination*.

The nationwide surveillance system follows the 1-3-7 system. The surveillance system for vectors is a national project that encompasses three counties with high risk of malaria retransmission. In Yunnan, the surveillance system is email based. The vector density is monitored every two weeks from June to October by the Chinese Center for Disease Control and Prevention (China CDC). Insecticide resistance is tested once every two years by the YIPD using WHO tubes. In Yunnan, the counties follows the 1-3-7 approach, surveillance data are collected almost in real time and it has established a quick response mechanism for each reported case. The data are available at all levels of China CDC, and there are quick feedback mechanisms to guide responses from higher levels of the Center.

The key achievements include passing the national malaria assessment on 5 June 2020 and reaching the target on schedule. In addition, the province has recorded no indigenous cases and only one malaria related death in the last four years. The challenges have been managing malaria transmission at the border areas and the shortage of drugs for the radical treatment of *P. vivax*.

Going forward, the YIPD will focus on improving joint cross-border malaria prevention and control, which includes strengthening the management of mobile populations in border areas. The YIPD will also prioritize further collaboration with other GMS countries on surveillance facilitated by WHO. In addition, the YIPD plans to purchase, with coordination from WHO, some effective antimalarial drugs such as primaquine, artesunate + pyronaridine (as an artemisinin-based combination therapy) and pyronaridine (as an injection).

During the discussion, Dr Sun noted that cross-border collaboration is supported through joint projects, information-sharing initiatives, as well as technical and strategic meetings.

2.2.3 Lao People's Democratic Republic

Dr Odai Sichanthongthip, representative from the Lao Center for Malaria, Parasitology, and Entomology (CMPE), provided the malaria surveillance update in the country. The total number of tested malaria cases has increased by about 100% between January to September 2019 when compared to the same period in 2017 and 2018. Promisingly, the number of positive malaria cases decreased around 60% in 2020 and 2019 when compared to 2017. *P. falciparum* cases also remarkably decreased by 75% since 2017. Overall, 85% of malaria cases came from seven districts. In total, 92 out of 1100 health facilities reported *P. falciparum* malaria cases, for which 75% of the reports came from just 20 health facilities. Similar to other GMS countries, malaria cases in the Lao People's Democratic Republic occur more commonly among adults and men rather than either children or women.

Dr Odai outlined the progress of the 1-3-7 approach. He noted that case numbers in elimination provinces decreased dramatically in 2020. Although notification within one day is being accomplished, investigation (by day 3) and foci responses (by day 7) need to be improved. The 2018 *Elimination Surveillance & Response Guidelines* are currently under revision. District and provincial teams will conduct full foci response for all locally acquired cases, and health centres are working to classify all cases and complete active case detection (ACD) for all non-locally acquired cases.

Data from the MIS are largely integrated into the District Health Information System 2 (DHIS2), and pending modules for entomological surveillance and supervisory visits will be developed and included in the first quarter of 2021. The Lao People's Democratic Republic also plans to improve indicators in the DHIS2 relating to foci investigation, case investigation, integrated drug efficacy surveillance (iDES) and case management data. In addition, data relating to the outbreak alert system and passive case detection will increase from monthly to weekly. In 2019, the CMPE also started the classification of elimination districts and health facility strata to implement elimination-level activities and decide which intervention package should be applied.

In terms of outbreak alerts, there have been fewer alerts in 2020 in comparison to 2019. In 2020, the country only recorded outbreak alerts in three districts (Nong, Phouvong and Sanxai). Overall, provinces have improved the implementation of their outbreak response, but timeliness is still an issue. It should also be noted that the outbreak response has had limited impact in Attapeu as the interventions are effective for at-risk populations in this area.

The Lao People's Democratic Republic has implemented an enhanced focal testing and treatment (FTAT) response to increase the impact in targeted high-burden areas (200 villages, 29 health facilities). This has included expanding the role of village malaria workers to work with village leaders and FTAT forest goers every two weeks. All outpatient department cases are tested at targeted high-burden health facilities, and the CMPE has started conducting G6PD (glucose-6-phosphate dehydrogenase) testing as part of the radical *P. vivax* cure for targeted high *P. vivax* burden health centres. In terms of procurement and supply management, the CMPE is working to ensure an uninterrupted supply of commodities to the targeted health facilities and villages.

The Lao People's Democratic Republic also provided a comprehensive outline of the recent achievements. The CMPE noted that the outbreak response is being actively implemented, and the ACD mechanisms (including FTAT) are detecting a higher proportion of cases. In terms of data management,

commodity dashboards have been integrated into the DHIS2 at the health centre level and the timeliness of reporting and data quality is improving significantly. Lastly, testing rates were well maintained in 2020 despite the COVID-19 pandemic.

The challenges for surveillance include the need to adapt finer-scale outbreak alert thresholds at the health facility level. The CMPE also needs to continue to improve subnational data analysis and the use of data for decision-making. Another challenge is ensuring village malaria workers are trained and equipped with personal protective equipment in case of a COVID-19 outbreak and ensuring that there are no stock-outs, especially of rapid diagnostic tests in areas doing ACD.

Dr Odai also provided an outline of four upcoming priorities. First, the CMPE will focus on improving the frequency of reporting from high-burden areas. Second, efforts will be made to scale up and accelerate elimination activities. Third, data on treatment adherence (especially for *P. vivax*) will be integrated into the DHIS2. Lastly, the CMPE will update and improve the elimination dashboards, particularly the foci register.

2.2.4 Myanmar

Dr Wint Phyo Than, representative from the Myanmar National Malaria Programme (NMP), emphasized that malaria elimination activities are implemented in 258 townships in the country. A total of 56 411 cases were reported in 2019, of which 60% were *P. vivax*. From January to August 2020, malaria cases reduced by 17% in comparison to the same period in 2019. In July 2020, there was a 7% increase in *P. vivax* cases due to unusual seasonal malaria transmission. Overall, 12 townships account for 81 % of all *P. falciparum* and 12 townships account for 75% of all *P. vivax* cases. Dr Wint highlighted the outbreak and containment efforts implemented in Kachin following a spike of cases in 2020.

Myanmar's surveillance system covers over 26 implementing partners, 12 000 public health facilities, 18 000 community volunteers and 1800 general practitioners. Surveillance in conflict areas is covered through the engagement of ethnic health organizations, international nongovernmental organizations (NGOs) and 12 000 malaria posts. Other surveillance initiatives have included expanding private sector engagement in coordination with 350 general practitioners in elimination townships through the support of WHO and the Bill & Melinda Gates Foundation. Partners report to the NMP in line with national surveillance guidelines and timelines, and data from the defence services have been integrated since 2017.

Surveillance data are stratified to the township level to ensure the delivery of targeted interventions. There are five categories of stratification, with the state or region responsible for malaria elimination planning, and townships responsible for the implementation of malaria elimination activities. The surveillance data resulted in the timely and effective response to contain small outbreaks in 2020. Efforts are under way to intensify malaria interventions in 12 high-burden townships. The targets and budget of the new national strategic plan (2021–2025) are based on the lower-level stratification data. The NMP is currently waiting for the endorsement from the Ministry of Health and Sports for mandatory malaria notifications. Surveillance data will also be used for LLIN mass distributions in 2022 based on stratum classifications.

In terms of strengthening the surveillance system, Myanmar is working with implementing partners to transition to a web-based system. The Myanmar NMP has held meetings and discussions with the malaria case-based reporting and surveillance (MCBRS) developer for the transition. As of October 2020, the developer is collecting customization requirements for technical and financial issues. A readiness assessment will be completed with Save the Children with technical support from WHO to transition the MCBRS to the NMP server. WHO will provide technical support for hosting the server, administration and data security including backups. This will allow the web-based reporting system to link to the DHIS2 platform.

As of 20 October 2020, the MCBRS app is being implemented in 20 townships and has reported 308 989 tests and 2013 cases. In total, 2195 active users from the NMP and implementing partners have received training on the app. The MCBRS app is utilized in Bilin, Ye and Mawlamyine townships in Mon state. All tested cases are recorded in the MCBRS app and are used by township focal points. All positive cases were notified in real time and followed by case investigation, foci investigation and response.

The presentation also covered the key challenges to strengthen surveillance in Myanmar. There are weaknesses in the completeness, timeliness, and accuracy of reporting and data utilization. There continues to be a slow transition from a paper-based to an electronic-based reporting system due to poor internet connectivity in some state, nonstate actor and hard-to-reach areas, as well as poor skills of the staff. There is still limited availability of malaria data from private hospitals and defence services. The NMP also noted that there is limited technical and human resource capacity for data encoding, analysis and documentation. Lastly, further support is needed to transition to the MCBRS and link the web-based system to MCBRS (DHIS2 platform).

2.2.5 Thailand

The Thailand Division of Vector Borne Diseases (DVBD) presented the four main interventions under the Malaria Elimination Strategy (2017–2026). The first intervention is accelerating elimination. Thailand has implemented the 1-3-7 strategy since 2016, with improved diagnosis and treatment at 575 health promoting hospitals, 352 malaria posts and 287 malaria clinics, through intensified ACD, increased insecticide-treated net coverage, directly observed treatments, case follow-up and therapeutic efficacy studies. The second intervention relates to innovative measures and models. Under this component, the DVBD will continue working with operational researchers and will ensure that updated findings will be applied in the field. The third intervention concerns fostering collaboration at the national and international levels. This entails implementing collaborative policies and enhancing investment and resource sharing. The last intervention involves building the capacity of the community, which covers behaviour change communication and community participation. All of these interventions are monitored and evaluated for better outcomes.

Thailand's emphasis that access and surveillance go together and are equally important. The coverage of the public health system is universal and provides diagnosis and treatment at all levels, in all sectors and for all populations. Social security and migrant health insurance are accessible to registered migrants. Active foci are in areas well served by the public health system.

The country's online MIS provides almost real-time information relating to notification, investigation and response. The system will play an important role in providing information on foci vector mapping by GIS, resource mobilization and budget allocation, iDES, and outbreak detection. It will also be possible to access case data and treatment information from all hospitals.

Thailand has achieved significant progress in reducing the prevalence of malaria, with most malaria transmission foci concentrated in provinces in the border areas with Myanmar, Cambodia and Malaysia. In 2019, there were 4449 confirmed cases, 13 deaths and 605 active foci. Overall, 92% of cases are *P. vivax*, 5% are *P. falciparum*, and the remaining few cases are classified as mixed or other. In addition, 66% of malaria patients are men, and 70% are over 15 years old. Active foci still persist along the Thailand–Myanmar border and in the south of the country, but the number of foci and cases per foci have greatly decreased in comparison to earlier years.

The 1-3-7 strategy continues to be improved and adapted in Thailand. From 2019 to October 2020, the completeness of day 1 data collection increased from 79% to 88%, day 3 from 88% to 96%, and day 7 from 75% to 84%. In addition, active foci decreased by 14% from 701 to 605.

Foci are stratified into four types: active, residual non-active, receptive (with vector) and non-receptive. Interventions including passive case detection and ACD have been developed around this package of classifications. Residual non-active foci are monitored over a period of three years before being

considered for classification as either receptive or non-receptive. The DVBD has established a foci register and plans to integrate foci mapping and boundaries into the register.

The surveillance system also captures vector information from foci investigations and entomology surveys. The data collected includes mosquito species, distribution and biting times. This is used to inform LLIN, indoor residual spraying and vector control operations by foci.

Malaria is a notifiable disease under the 2015 Infectious Disease Act, covering all cases from the public and private sectors, as well as the community. The surveillance system includes all laboratory-confirmed positive malaria cases, and all confirmed cases are investigated and classified according to WHO guidelines. Annual foci classification is done at the sub-village or -hamlet level and response activities are carried out as per foci classification intervention packages. Patient follow-up is done in conjunction with iDES, which includes complete follow-up visits for radical cure. The follow-up procedures are based on national standard operating procedures, which provide guidelines on approaches to *P. falciparum* and *P. vivax* cases, follow-up procedures and use of filter papers. The results inform the performance of first-line drugs and patient compliance.

Joint cross-border mapping and joint elimination activities will be conducted along and across the borders, as well as use new tools such as mass drug administration and household rapid diagnostic tests. Outbreaks are detected at the village level and monitored weekly through the MIS epidemic outbreak dashboard. Outbreak responses are sent out through the system of emergency operation centres to alert subdistrict health focal points. Real-time data are also shared with stakeholders such as local government and district health boards to support advocacy for malaria elimination.

The main challenges for surveillance include the timeliness and completeness of case notification from community and private hospitals, the non-health sector, and NGOs. To address this, the DVBD will continue to enforce malaria as a notifiable disease and will introduce mobile technology for real-time reporting and foci management. This will allow for foci mapping with geographical boundaries and household details to improve the quality and effectiveness of foci response activities. Another challenge is incomplete and delayed data on mobile and migrant populations. In the coming year, the DVBD plans to expand the role of community health workers and relevant NGOs to complete case investigation, including for mobile and migrant populations. An online system for countrywide notification and response will be established to address imported cases. Another challenge is the need to integrate vertical malaria programming, primarily diagnosis and treatment, case notification and investigation, into the general health system. In parallel, links between the Health Management Information System and the malaria online system will be strengthened. The DVBD will also provide capacity-building to health practitioners in areas where transmission has been interrupted. The last challenge relates to the prevention of re-introduction of malaria in malaria-free provinces. This will be supported by sharing real-time data with stakeholders such as local administrative organizations and district health boards, encouraging the analysis of surveillance data at the subnational level for programmatic actions and initiating joint cross-border elimination activities focusing on notification, patient follow-up, foci mapping and response.

During the discussion, it was mentioned that the DVBD includes data from the private sector (from private health-care facilities and from camps for internally displaced people) and health volunteers in malaria mapping exercises.

2.2.6 Viet Nam

Dr Ngo Duc Thang, representative from the Viet Nam National Institute of Malariology, Parasitology and Entomology (NIMPE) presented the update of the country's surveillance systems. In 2019, Viet Nam recorded 5887 malaria cases, of which 4665 were confirmed cases and there were no malaria deaths. In total, 66.7% were *P. falciparum*, 32.4 % were *P. vivax*, 0.7 % were mixed cases, and 0.2% were from other species. Malaria cases continue to decline, and the number of confirmed cases decreased by 73.4% from 2010 to 2019.

The integration of the malaria management system in the eCDS has been implemented since 1 July 2020. With this upgrade, the system rapidly collects data on case/foci investigation, stocks and commodities including long-lasting insecticidal hammock nets and LLINs. In 2019, the Malaria Risk Stratification was updated by collecting information from the previous five years for all communes (over 11 000) in the country. The stratification is being used to inform the targeting of interventions (e.g. LLINs). The surveillance data are routinely reviewed by all levels of the health-care system. Since 2019, Viet Nam has delivered trainings on surveillance and key monitoring and evaluation indicators for malaria elimination. The NIMPE is in the process of improving the surveillance system to ensure prompt responses and enhance the dashboard and data visualizations. However, it is noted that active surveillance and response are needed for hotspots.

The main challenges for surveillance in Viet Nam are the need for more training on foci investigation and response protocols. The involvement of hospitals and the private sector in the surveillance system to quickly notify and investigate cases is still not optimal. The NIMPE noted that there is a lack of awareness of malaria elimination and prevention from local authorities and communities in areas with a low malaria burden. Viet Nam needs to reorganize the provincial and district-level preventive medicine systems. In addition, there is limited domestic funding to reduce malaria cases.

Going forward, Viet Nam plans to revise Decision 741 relating to surveillance guidelines. The updated document will also cover case notification, investigation, foci investigation and response. The Government will conduct workshops in November 2020 to review the content of the surveillance guidelines. In the coming year, Viet Nam will continue to strengthen the eCDS/malaria management system for all levels. This includes continuing to build elimination-capable malaria surveillance and response systems as well as strengthening case investigation and foci investigation and response, monitoring drugs (such as iDES) and insecticide resistance, and carrying out regular epidemiological supervision. The NIMPE will also focus on enhancing cross-border collaboration as well as improving the performance of peripheral-level centres regarding case management and surveillance.

During the discussion, Viet Nam confirmed it was still conducting the 1-3-7 strategy for malaria surveillance and response but is looking at revising the process.

2.3 Surveillance update

2.3.1 Overview and update on the Malaria Elimination Database

Mr Rady Try, MME Technical Officer, provided an update on the MEDB. The MEDB was established as the regional data-sharing platform during the time of the Emergency Response to Artemisinin Resistance, or ERAR, initiative in 2014. The first version used business intelligence software and moved to DHIS2 in 2015. Most data elements and indicators were revised in May 2016 to align with the elimination stage of the GMS countries. The MME programme continues to host the MEDB under the Regional Artemisinin Initiative 2 Elimination (RAI2E) grant and has submitted a proposal for its coverage in the RAI3E grant. All GMS countries are now reporting data monthly to the MEDB, enabling detailed analysis and surveillance monitoring in the GMS. Dashboards are available for each GMS country with the main malaria indicators.

Mr Try highlighted that during the May 2018 Call for Action, ministers in GMS countries committed to "exchange core surveillance data on malaria, including but not limited to imported or cross-border malaria cases and drug resistance". In line with this commitment, the MEDB has allowed MME to publish regular quarterly surveillance data from GMS countries since 2018. In January 2020, the frequency of these publications has increased to a monthly basis. Overall, countries and partners have provided positive feedback on the usefulness of the data visualizations. The data from the MEDB are published in the MME annual bulletin, which provides an overview of malaria elimination in the GMS including surveillance, vector control, drug resistance and insecticide use. Another advantage of the MEDB is that it makes it possible to provide detailed and customized analysis, such as on the number of cases at the health facility level or annual parasite incidence. In addition, it provides an opportunity to monitor the progress towards elimination by sharing cross-border data. This information was used in

recent Thailand–Cambodia cross-border collaboration efforts, and user accounts to access the MEDB have been provided to NMPs and partners. Lastly, the MEDB also informs advisory bodies such as the Regional Steering Committee and Malaria Policy Advisory Committee about the malaria elimination progress and challenges in the GMS.

In 2019, the two main activities of the MEDB included delivering a data analysis training on the Regional Data Sharing Platform and hosting a Thailand–Cambodia cross-border meeting. The training was given to national and subnational level malaria focal points in Cambodia (January 2019), Viet Nam (June 2019) and Myanmar (July 2019). The Thailand–Cambodia cross-border meeting was held in Ubon Ratchathani, Thailand (April 2019). The MEDB has also been used for malaria partner and annual parasite index mapping in the Regional Steering Committee newsletters.

The key improvements of the MEDB include enhanced data collection and coverage. Data from implementing partners in Myanmar are now reflected in the MEDB, and Cambodia, Thailand, China and the Lao People's Democratic Republic provide elimination data. In addition, more countries are sharing sector as well as age- and sex-disaggregated data. The utilization of the MEDB has also increased. In addition to publishing more frequent epidemiology summaries, the database is accessible for all NMPs and subnational representatives in Cambodia, Myanmar and Viet Nam.

Mr Try also outlined the ongoing challenges with the MEDB, including: the timeliness of reporting from Myanmar, the exclusion/limitation of private sector data in national databases, and the absence of foci data. Another challenge related to NMPs' hesitancy to provide access to partners (so far only partners in Cambodia and the Lao People's Democratic Republic have access).

With the new funding from the RAI3E, the MEDB will:

- support plans to request weekly data from NMPs in GMS;
- improve timing and level of detail of data reporting, especially in Myanmar;
- continue providing technical support for transition to elimination phase programming such as case-based surveillance;
- provide technical support to GMS countries for surveillance assessment (if applicable) in collaboration with the relevant partners;
- continue providing necessary training and guidance to facilitate data-sharing across countries, especially at subnational levels;
- support cross-country collaboration initiatives by facilitating the surveillance data-sharing in border areas; and
- facilitate in NMPs providing access to partners.

2.4 Surveillance improvement

2.4.1 Discussion on the feasibility of countries to improve data access, collection and sharing

Dr Noor Abdisalan, Team Leader from WHO's Global Malaria Programme, led the discussion on the feasibility of countries to improve data access, collection and sharing. The focus of the discussion centred around the inputs and requested actions from the Global Fund's Technical Review Panel. Under the RAI2E, WHO established a regional data platform to facilitate data sharing, while strengthening the overall capacity of national programmes to generate, analyse, store, share and use information. During the development of the RAI3E, the Panel noted an absence of a feedback and alert system that can inform the countries about each *P. falciparum* malaria case in the region. The Technical Review Panel also noted that in several areas not all malaria data (particularly from the private sector) are reported to the surveillance system. In consideration of these gaps, MME has received funds under RAI3E to maintain the Mekong MEDB as the core data repository for the GMS. WHO will continue maintaining and strengthening the platform, ensuring a shift towards weekly data sharing, and integrating more granular data and other data sets. Data verification and analysis will be strengthened, and the MEDB will also serve as a repository for all regionally relevant data collected via RAI3E and other sources. This will also serve to link WHO threat maps with results of therapeutic efficacy studies and findings

from insecticide resistance monitoring activities. It was highlighted that the data availability implies an agreement by the countries to give access to the data of their respective national surveillance systems.

In relation to the request to more frequently share granular and disaggregated data, it was acknowledged that it would imply additional work for NMPs and a potential solution would be to provide MME access to national databases. This approach has already been implemented in the Lao People's Democratic Republic and Thailand. Most countries share almost all data elements apart from data elements related to foci, which are currently not shared by any of the six GMS countries. Disaggregated data by age group and gender are currently provided by Cambodia, the Lao People's Democratic Republic and Myanmar. However, disaggregation by sector (public health facility/community/private sector) is only provided by Cambodia and the Lao People's Democratic Republic. Cambodia and the Lao People's Democratic Republic share data at the health facility level, Myanmar and China share data at the township/county level, and Viet Nam provides province-level data.

So far, three countries (Cambodia, Lao People's Democratic Republic and Thailand) have already approved giving malaria partners access to the MEDB. This approval is pending from Myanmar, Viet Nam and Yunnan Province of China. A surveillance assessment has been proposed since RAI2E, but no country has started this yet. In an elimination context, this activity should be conducted in order to identify bottlenecks in surveillance. It was noted that WHO together with the Clinton Health Access Initiative will provide support for surveillance assessments.

In the concluding remarks, all countries were encouraged to consider the suggested surveillance improvements as follows:

- Share all requested data elements with disaggregated by age group/gender and sector
- Share the lowest level of data possible (i.e. health facility/village)
- Share data on a weekly basis
- Provide direct access to national database or manually share through excel/any other formats
- Provide access to the MEDB to malaria partners in the GMS.

During the discussion, it was mutually agreed that MME should send an official letter with relevant documents to all GMS NMPs regarding the proposed six areas of surveillance improvements: 1) share data breakdown by age group/gender and sector; 2) share lowest-level data (health facility/village); 3) share data on a weekly basis; 4) provide direct access to national databases; 5) provide access to the MEDB to malaria partners in the GMS; and 6) and conduct surveillance assessments.

2.4.2 Discussion on the performance of MEDB and preparation/planning of activities for the coming year as well as the ways to utilize the surveillance data on MEDB to accelerate malaria elimination

Following this, Dr Tuseo invited partners to raise any questions or comments for WHO and the respective NMPs. During this session, the United States Agency for International Development, or USAID, noted that the MME annual bulletin remains very useful but would like to see some more trend analyses of cross-border data. This addition could allow countries to review their situation vis-a-vis bordering provinces and could improve cross-border collaboration. The Clinton Health Access Initiative added that it found the MME monthly epidemiology summaries helpful in terms of getting an overview of the region and regularly shares the document with relevant partners.

3. CONCLUSIONS AND RECOMMENDATIONS

Dr Luciano Tuseo summarized the major discussion points and recommendations of the meeting.

3.1 Conclusions

Overview of GMS malaria elimination

- From January to September 2020, the GMS countries demonstrated approximately a 61% decrease of *P. falciparum* cases and a 32% decrease of *P. vivax* cases compared to the same period in 2019.
- Malaria is now mostly concentrated in remote areas, where the disease disproportionately affects travellers to malaria-risk areas as well as mobile and migrant populations.
- The border closures and movement restrictions caused by the COVID-19 pandemic resulted in limitations in the implementation of field activities, including case surveillance.
- However, countries have managed to adapt to remote surveillance systems and create new standard operating procedures.

Surveillance in the GMS

The 1-3-7 approach is still a key malaria surveillance and response strategy in the GMS. Prompt reporting and data sharing on COVID-19 have been essential in tracking movements. Similar approaches could be applied to the surveillance of malaria cases.

Malaria Elimination Database

All countries are reporting monthly to the MEDB. The Database should be utilized as a surveillance platform within the GMS, especially in relation to cross-border collaboration. WHO will continue maintaining and strengthening the platform, data verification and analyses. So far, four countries (Cambodia, Lao People's Democratic Republic, Myanmar and Thailand) have already given the green light to give access to the MEDB to malaria partners. However, it is advised to give access to partners across the whole region.

Country updates

- **Cambodia**: In the coming year, Cambodia is focusing on: improving the MIS features with the inclusion of data on patient ID and *P. vivax* radical cure (as well as a follow-up tool), strengthening pharmacovigilance, and developing an app for real-time sharing response and for the last mile of *P. falciparum* elimination.
- **China (Yunnan Province)**: The biggest challenge remains the presence of cases along the border areas. Going forward, China is looking to improve joint cross-border malaria prevention and control.
- **Lao People's Democratic Republic**: In the coming year, the country plans to: implement weekly reporting from high-burden health facilities and village malaria workers using text messages, create more granular outbreak alert thresholds, scale up and accelerate elimination activities, and integrate treatment adherence into DHIS2, especially for *P. vivax* malaria.
- **Myanmar**: Challenges remain in using digital platforms for malaria surveillance, especially in hard-to-reach areas. More support is needed to improve technical skills, resources, as well as capacity for data encoding, analysis and documentation.
- **Thailand**: The malaria surveillance system continues to be integrated into national malaria programming. An online malaria system has been developed and includes real-time case-based surveillance, foci and vector mapping. A plan is in place to integrate malaria activities into the general health system and link the Health Management Information System with the MIS to improve malaria data quality.
- **Viet Nam**: The country has completed the integration of its MIS into the eCDS. Going forward, Viet Nam will focus on reviewing the content of its surveillance guidelines, strengthening the eCDS and providing further technical support and training.

3.2 Recommendations

3.2.1 Recommendations for Member States

Member States are encouraged to consider the following:

1) Provide access to the data of national surveillance systems in order to support the MEDB.
2) Initiate surveillance assessments in conjunction with elimination activities in order to identify bottlenecks in surveillance.
3) Share the lowest level of data available (such as village or health facility).
4) Provide data disaggregated by age, gender and sector (public health facility, community and private sector).
5) Improve joint cross-border malaria prevention and control.
6) All countries will confirm the status of their surveillance activities and systems with WHO in November 2020.

3.2.2 Recommendations for WHO

WHO is requested to consider the following:

Mekong Malaria Elimination programme

1) Add elimination data to the monthly Epidemiology Summaries shared by MME, if it is provided by country counterparts.
2) Continue maintaining and strengthening the MEDB platform, ensuring a shift towards weekly data sharing, as well as integration of more granular data and other data sets.
3) Communicate with GMS countries to confirm the status of proposed surveillance improvements shared in this meeting.
4) Continue to facilitate access to the MEDB for partners across the region.
5) Send an official letter with relevant documents to all GMS NMPS regarding the proposed six areas of surveillance improvements: share data breakdown by age group/gender and sector, share lowest level data (health facility/village), share data on a weekly basis, provide direct access to national databases, share access to the MEDB with malaria partners in the GMS, and conduct surveillance assessment. The letter will be addressed to NMPs for inputs and agreement to improve national and regional surveillance.

Country offices

1) Foster collaboration with other GMS countries in surveillance.

ANNEX 1

Programme agenda

Date and Time	Agenda	Speaker/s
Friday 30 October 2020		
Opening Ceremony		
14:00-14:05	Welcome address by WR, Cambodia	Dr Ailan Li (WHO)
14:05-14:10	Introduction of participants	
14:10-14:15	Objectives of the surveillance meeting Nomination of chair	Dr Luciano Tuseo (WHO)
	Chairperson: Dr Siv Sovannaroth, Chief of Technical Bureau, CNM, Cambodia	
Country update		
14:15-15:15	Updates from GMS countries on status of surveillance systems particularly for elimination capabilities • Short briefing update on malaria epidemiology • Readiness of surveillance system for malaria elimination (full functioning and availability of elimination data such i.e. case/foci investigation data, stock/commodity data, LLIHN/LLIN data, etc.) • Availability of real-time or almost-real time data • Use of surveillance data for programmatic actions (e.g. stratification) by national and subnational level as well as stakeholders • Achievements, challenges in surveillance strengthening, and ways forward with a timeline for improvements (include identified areas where WHO assistance is needed) 1. Cambodia (10mn) 2. China (Yunnan) (10mn) 3. Lao PDR (10mn) 4. Myanmar (10mn)	CNM YIPD CMEP NMP DVBD NIMPE

	5. Thailand (10mn) 6. Viet Nam (10mn)	
Surveillance update		
15:15-15:25	Malaria Elimination Database (MEDB)	Mr Rady Try (WHO)
15:25-15:40	**Coffee/tea break (on your own)**	
Surveillance Improvement		
15:40-16:40	Discuss the feasibility of countries to: • Share more frequently granular/disaggregated data i.e. weekly aggregate by data sectors (public health facility, community, private sector) • Give approval from GMS countries on sharing access to the MEDB to malaria partners in GMS • Possibility to start surveillance assessment in GMS countries	WHO SEARO/WHO GMP/CNM/YIPD/CMPE/NMP DVBD/NIMPE Dr Noor Abdisalan
16:40-17:00	Q&A on the performance of the MEDB and preparation/planning of activities for the coming year as well as the ways to utilize the surveillance data on the MEDB to accelerate malaria elimination	Q&A (WHO SEARO/WHO GMP/CNM/YIPD/CMPE/NMP DVBD/NIMPE/WHO/Partners)
Conclusion and closing		
17:00-17:10	Conclusions	Dr Luciano Tuseo (WHO)
17:10-17:15	Closing Remarks	Chair of the meeting

ANNEX 2

List of participants, temporary advisers, representatives, international partners and Secretariat

COUNTRY PARTICIPANTS

Dr Chea Huch, Deputy Director, National Centre for Entomology and Parasitology Control
N° 372, Preah Monivong, corner Street 322, Phnom Penh, Cambodia,
Email: huch.cnm@gmail.com

Dr Siv Sovannaroth, Chief of Technical Bureau, National Centre for Entomology and Parasitology Control, N° 372, Preah Monivong, corner Street 322, Phnom Penh, Cambodia
Email: sivsovannaroths@gmail.com

Dr Leang Rithea, Vice Chief of Technical Bureau, National Centre for Parasitology Entomology & Malaria Control, N° 372, Preah Monivong, corner Street 322, Phnom Penh, Cambodia
Email: rithealeang@gmail.com

Dr Jun Feng, Research Assistant of National Institute of Parasitic Diseases, Chinese Center for Disease Control and Prevention, 6 Xiyuan Road, Simao District, Puer, Yunnan, China
Email: fengjun@nipd.chinacdc.cn

Dr Hong Tu, Chief Technician of Yunnan Institute of Parasitic Diseases, 6 Xiyuan Road, Simao District, Puer, Yunnan,China, Email: tuhong@nipd.chinacdc.cn

Dr Xiaodong Sun, Chief Physician of Yunnan Institute of Parasitic Diseases, 6 Xiyuan Road, Simao District, Puer, Yunnan, China, Email: sxdsxyab@163.com

Dr Keobouphaphone Keochinda, Head of Malaria Diagnosis and Treatment, Centre for Malaria, Parasitology and Entomology, N° 365, Unit 22, DongDok village, Xaythany district, Vientiane
Lao PDR, Email: Chinda07@gmail.com

Dr Maniphone Khanthavong, TES Focal person, Centre for Malaria, Parasitology and Entomology
N° 365, Unit 22, DongDok village, Xaythany district, Vientiane, Lao PDR
Email: kv.maniphone@gmail.com

Dr Phoutnalong Vilay, Vice Head, Malaria Surveillance Unit, Centre for Malaria, Parasitology and Entomology, N° 365, Unit 22, DongDok village, Xaythany district, Vientiane, Lao PDR
Email: phoutnalongvilay@gmail.com

Dr Viengphone Sengsavath, Deputy Director, Centre for Malaria, Parasitology and Entomology,
N° 365, Unit 22, DongDok village, Xaythany district, Vientiane, Lao PDR
Email: viengphone@gmail.com

Dr Odai Sichanthongthip, Technical Staff of Epidemiology Section, Centre for Malaria, Parasitology and Entomology, N° 365, Unit 22, DongDok village, Xaythany district, Vientiane, Lao PDR
Email: odai_taos@yahoo.com

Dr Aung Thi, Director, National Malaria Control Program, Department of Public Health
Office No. 4, Nay Pyi Taw, Myanmar, Email: aungthi08@gmail.com

Dr Wint Phyo Than, Deputy Director, Malaria, National Malaria Control Program
Department of Public Health, Office No. 4, Nay Pyi Taw, Myanmar,
Email: wintphyothan@gmail.com

Dr Kyawt Mon Win, Assistant Director, National Malaria Control Program, Department of Public Health, Office No. 4, Nay Pyi Taw, Myanmar, Email: kyawtmonwin@gmail.com

Dr Cheewanan Lertpiriyasuwat, Director, Division of Vector Borne Diseases, Department of Disease Control, Ministry of Public Health, 88/21 Taladkwan Sub-district, Muang District Nonthaburi, Thailand, Email: cheewananl@gmail.com

Dr Rungrawee Tipmontree, Public Health Technical Officer, Senior Professional Level, Division of Vector Borne Diseases, Department of Disease Control, Ministry of Public Health
88/21 Taladkwan Sub-district, Muang District, Nonthaburi, Thailand,
Email: rtipmontree@gmail.com
Mrs Siriporn Yongchaitrakul, Public Health Technical officer, Senior Professional Level
Division of Vector Borne Diseases, Department of Disease Control, Ministry of Public Health
88/21 Taladkwan Sub-district, Muang District, Nonthaburi, Thailand
Email: yoosiriporn@gmail.com

Ms lsara Srisaard, Public Health Technical officer, Practitioner Level, Division of Vector Borne Diseases, Department of Disease Control, Ministry of Public Health, 88/21 Taladkwan Sub-district, Muang District, Nonthaburi, Thailand, Email: isara-s@hotmail.com

Ms Paphanij Suangtho, Public Health Technical officer, Professional Level, Division of Epidemiology, Department of Disease Control, Ministry of Public Health, 88/21 Taladkwan Sub-district, Muang District, Nonthaburi, Thailand, Email: paphanij@gmail.com

Dr Nguyen Quang Thieu, Vice Director, National Institute of Malariology, Parasitology and Entomology, 245 Luong The Vinh Street, Nam Tu Liem District, Hanoi, Viet Nam
Email: thieunq@gmail.com

Dr Doan Binh Minh, Vice-Director, Head of Entomology Department, National Institute of Malariology, Parasitology and Entomology, 245 Luong The Vinh Street, Nam Tu Liem District Hanoi, Viet Nam, Email: doanbinhminhvn@yahoo.com.vn

Ms Pham Nguyen Thuy Vy, Head of Department, High-tech Laboratory, National Institute of Malariology, Parasitology and Entomology, 245 Luong The Vinh Street, Nam Tu Liem District Hanoi,Viet Nam, Email: thuyvy83.pntv@gmail.com

Dr Ngo Duc Thang, Chief of Epidemiology Department, National Institute of Malariology, Parasitology and Entomology, 245 Luong The Vinh Street, Nam Tu Liem District
Hanoi, Viet Nam, Email: thangnimpevn@yahoo.com

Dr Dang Trinh Minh Anh, Researcher, High-tech Laboratory Department, National Institute of Malariology, Parasitology and Entomology, 245 Luong The Vinh Street, Nam Tu Liem District Hanoi, Viet Nam, Email: dangminhanh2484@gmail.com

Ms Nguyen Thi Minh Chau, Researcher, High-tech Laboratory Department, National Institute of Malariology, Parasitology and Entomology, 245 Luong The Vinh Street, Nam Tu Liem District Hanoi, Viet Nam, Email: chau2929@yahoo.com

REPRESENTATIVES

Dr Jonathan Cox, Senior Program Officer, Malaria, Global Health Program, Bill and Melinda Gates Foundation, 440 5th Ave N., Seattle, WA 98109, Washington, United States of America,
Email: jonathan.cox@gatesfoundation.org

Dr Rida Slot, Project Management Specialist (Malaria), Office of Public Health and Education, United States Agency for International Development, American Embassy, #1, Street 96, Sangkat Wat Phnom, Khan Daun Penh, Phnom Penh, Cambodia
Email: rslot@usaid.gov

Dr Michael Thigpen, Captain, US Public Health Service, Resident Advisor, Office of Public Health and Education, United States Agency for International Development, American Embassy, #1, Street 96, Sangkat Wat Phnom, Khan Daun Penh, Phnom Penh, Cambodia, Email: mthigpen@usaid.gov

Dr Lenna Neat Arango, Resident Advisor, Office of Public Health and Education United States Agency for International Development, American Embassy, #1, Street 96, Sangkat Wat Phnom, Khan Daun Penh, Phnom Penh, Cambodia, Email: lneat@usaid.gov

Dr Saad El-Din Hassan, Resident Advisor, Office of Public Health and Education United States Agency for International Development, American Embassy, #1, Street 96, Sangkat Wat Phnom, Khan Daun Penh, Phnom Penh, Cambodia, Email: shassan@usaid.gov

Dr Nu Nu Khin, Project Management Specialist (Health Program Manager), U.S. President's Malaria Initiative (PMI), Global Health Security, American Embassy, 110 University Avenue Road, Yangon, Myanmar, Email: nnkhin@usaid.gov

Dr Mark Maire, CDC Resident Advisor, Division of Parasitic Diseases and Malaria, Center for Global health, U.S. Centers for Disease Control and Prevention, American Embassy, 110 University Avenue Road, Yangon, Myanmar, Email: mmaire@usaid.gov

Dr Gunawardena Dissanayake, USAID/PMI, U.S. President's Malaria Initiative (PMI), Global Health Security, Office of Public Health, USAID/ Burma, American Embassy, 110 University Avenue Road, Yangon, Myanmar, Email: gdissanayake@usaid.gov

Mr David Sintasath, Resident Advisor for Malaria, Regional Development Mission for Asia (RDMA), Athenee Tower, 25th Floor, 63 Wireless Road, Bangkok, Thailand
Email: dsintasath@usaid.gov

Ms Niparueradee Pinyajeerapat, Project Management Specialist (Public Health), Regional Development Mission for Asia (RDMA), Athenee Tower, 25th Floor, 63 Wireless Road, Bangkok, Thailand, Email: npinyajeerapat@usaid.gov

Mr Izaskun Gaviria, Senior Fund Portfolio Manager, High Impact Asia Grant Management Division, Global Health Campus, Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), Chemin du Pommier 40, 1218 Grand-Saconnex, Geneva, Switzerland,
mail: Izaskun.Gaviria@theglobalfund.org

Mr Soso Getsadze, Specialist, Health Products Management, High Impact Asia Department Global Health Campus, Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), Chemin du Pommier 40, 1218 Grand-Saconnex, Geneva, Switzerland,
Email: Soso.Getsadze@theglobalfund.org

Timothy Finn, Senior Programme Manager at Malaria Elimination Initiative, Global Health Group / University California San Francisco, Global Health Sciences, Vientiane, Lao PDR
Email: Timothy.Finn@uc

Montira Inkochasan, Regional Migration Health Programme Support Officer, Regional Migration Health Unit, International Organization for Migration for Asia and Pacific, Bangkok, Thailand
Email: minkochasan@iom.int

Dr Sharon Thangadurai, Chief of Party, Cambodia Malaria Elimination Project, University Research Co., LLC, Building #31, St 352, Sangkat Beungkengkang I, Phnom Penh, Cambodia
Email: sthangadurai@urc-chs.com

Dr Myo Set Aung, Director-Program Implementation, PR-GFATM, Save the Children, 126/A Damahzedi Road, Bahan Township, Yangon, Myanmar,
Email: MyoSet.Aung@savethechildren.org

Dr Min Min Thein, Head of Malaria, PR-GFATM, Save the Children, 126/A Damahzedi Road, Bahan Township, Yangon, Myanmar, Email: kathryn.rosecrans@savethechildren.org

Ms Kathryn Rosecrans, Senior Manager, Strategic Information, PR-GFATM, Save the Children, 126/A Damahzedi Road, Bahan Township, Yangon, Myanmar,
Email: kathryn.rosecrans@savethechildren.org

Kemi Tesfazghi, Program Director, Greater Mekong Subregion Elimination of Malaria through Surveillance (GEMS+), Population Services International, No 29, Street 334, Boeung Keng Kang I, Chamkamon, Phnom Penh, Cambodia, Email: ktesfazghi@psi.org

Mr Bram Piot, Senior Evidence & Monitoring Advisor, Greater Mekong Subregion Elimination of Malaria through Surveillance (GEMS+), Population Services International, No 29, Street 334, Boeung Keng Kang I, Chamkamon, Phnom Penh, Cambodia, Email: bpiot@psi.org

Thomas Cai, Country Director, Health Poverty Action, #46, Street 103, Sangkat Phsar Doeum Thkov, Khan Chamcarmorn, Phnom Penh, Cambodia, Email: t.cai@healthpovertyaction.org

Ms Amita Chebbi, Senior Director, Asia Pacific Leaders Malaria Alliance, 11 Biopolis Way, #04-01/02 Helios, Singapore, Singapore, Email: achebbi@aplma.org

James K Tibenderana, Technical Director, Malaria Consortium, The Green House,
244-254 Cambridge Heath Road, London, United Kingdom,
Email: j.tibenderana@malariaconsortium.org

Ms Arantxa Roca-Feltrer, Head of Surveillance, Monitoring & Evaluation, Malaria Consortium Development House, 56-64 Leonard Street, London, United Kingdom,
Email: a.roca@malariaconsortium.org

Htin Kyaw Thu, Technical Specialist, Malaria Consortium, Development House, 56-64 Leonard Street, London, United Kingdom, Email: h.thu@malariaconsortium.org

Ann-Sophie Stratil, Epidemiologist, Malaria Consortium, Development House, 56-64 Leonard Street, London, United Kingdom, Email: a.stratil@malariaconsortium.org

Prudence Hamade, Senior Technical Advisor, Malaria Consortium, Development House, 56-64 Leonard Street, London, United Kingdom, Email: p.hamade@malariaconsortium.org

Dr Faisal Mansoor, Head of the Programme Principal Recipient for The Global Fund, United Nations Office for Project, 12 (O)m Pyithu Lane, Township, Yangon, Myanmar
Email: FaisalM@unops.org

Dr Eisa Hamid, Regional Senior Programme, M&E and Health Systems Specialist, United Nations Office for Project, 12 (O)m Pyithu Lane, Township, Yangon, Myanmar
Email: eisah@unops.org

Dr Muhammad Farooq Sabawoon, Programme and M&E Specialist, United Nations Office for Project, Samdech Sothearos Blvd (3) Corner of Shihanouk (Street 274), Center 6th Floor Room 628 1230, Phnom Penh, Cambodia, Email: farooqs@unops.org

Dr Yu Nandar Aung, Program and M&E Specialist, Office of the Resident Coordinator UN House, United Nations Office for Project, Lane Xang Avenue, PO Box 345, Vientiane, Lao LDR
Email: YunandarA@unops.org

Dr Zaw Win Tun, Public Health Officer, United Nations Office for Project, 12 (O)m Pyithu Lane, Township, Yangon,Myanmar, Email: zawwint@unops.org

Dr Min Min Zin, Monitoring and Evaluation Officer (Malaria), United Nations Office for Project, 12 (O)m Pyithu Lane, Township, Yangon, Myanmar, Email: MinZ@unops.org

Dr Myat Yi Lwin, Programme Management Specialist, United Nations Office for Project
12 (O)m Pyithu Lane, Township, Yangon, Myanmar, Email: myatyil@unops.org

Ms Cecilia Hugo, Executive Coordinator, ACT Malaria Foundation, Inc., 12th Floor Regus Centre, Times Plaza Bldg., Corner UN and Taft Avenue, Ermita, Manila, Philippines
Email: cecil_hugo@actmalaria.net

Ms Inessa Ba, Regional Malaria Manager, Clinton Health Access Initiative, 7th Floor, No. 49 Kyun Taw Street, Sanchaung Township, Yangon, Myanmar, Email : iba@clintonhealthaccess.org

Ms Evelyn Wong, Regional Case Management Advisor, Clinton Health Access Initiative, 7th Floor, No. 49 Kyun Taw Street, Sanchaung Township, Yangon, Myanmar
Email: ewong@clintonhealthaccess.org

SECRETARIAT

Dr Abdisalan Noor, Team Leader, Surveillance, Global Malaria Programme, 20 Avenue Appia, Geneva, Switzerland, Email: anoor@who.int

Ms Charlotte Rasmussen, Technical Officer, Global Malaria Programme, 20 Avenue Appia, Geneva, Switzerland, Email: rasmussenc@who.int

Dr James Kelley, Technical Officer, Regional Office for the Western Pacific, P.O. Box 2932, Manila, Philippines, Email: kelleyj@who.int

Ms Glenda Gonzales, Technical Officer, Regional Office for the Western Pacific, P.O. Box 2932, Manila, Philippines, Email: gonzalesg@who.int

Dr Neena Valecha, Regional Advisor, Malaria, Department of Communicable Diseases
I.P. Estate, Mahatama Gandhi Marg, 110002, New Delhi, India, Email: valechan@who.int

Dr Risintha Gayan Premaratne, Technical Officer, Department of Communicable Diseases
I.P. Estate, Mahatama Gandhi Marg, 110002, New Delhi, India, Email: premaratner@who.int

Dr Maria Bustos, Technical Officer, Malaria, 88/20 Permanent Secretary Building
Ministry of Public Health Tiwanon Road 11000, Nonthaburi, Thailand,
Email: bustosm@who.int

Dr Deyer Gopinath, Medical Officer, Malaria, 88/20 Permanent Secretary Building
Ministry of Public Health Tiwanon Road 11000, Nonthaburi, Thailand
Email: gopinathd@who.int

Dr Badri Thapa, Scientist (Malaria Control), No. 403 (A1), Shwe Taung Kyar Street, Bahan Township, Yangon, Myanmar, Email: THAPAB@who.int

Dr Matthew Shortus, Medical Officer, 125 Saphanthong Road, Unit 5 Ban Saphangthongtai Sisattanak District, Vientiane, Lao PDR, Email: shortusm@who.int

Dr Chitsavang Chanthavisouk, Technical Officer, 125 Saphanthong Road, Unit 5 Ban Saphangthongtai, Sisattanak District, Vientiane, Lao PDR, Email: chanthavisoukc@who.int

Dr Tran Cong, Dai, Technical Officer, Malaria, 63 Tran Hung Dao Street, Hoan Kiem District Hanoi, Viet Nam, Email: TranCongD@who.int

Ms Wei Ding, National Professional Officer, 401, Dongwai Diplomatic Office Building 23, Dongzhimenwai Dajie Chaoyang Distict, Beijing, China, Email: dingw@who.int

Dr Luciano Tuseo, MME Coordinator, No. 61-64, Preah Norodom Blvd. (corner St. 306)
Sangkat Boeung Keng Kang I, Khan Chamkamorn, Phnom Penh, Cambodia
Email: tuseol@who.int

Mr Rady Try, Technical Officer (Database Manager), No. 61-64, Preah Norodom Blvd. (corner St. 306), Sangkat Boeung Keng Kang I, Khan Chamkamorn, Phnom Penh Cambodia,
Email: tryr@who.int

Ms Elodie Kiriana Jacoby, Consultant, Communication and Programme Management Officer
No. 61-64, Preah Norodom Blvd. (corner St. 306), Sangkat Boeung Keng Kang I, Khan Chamkamorn Phnom Penh, Cambodia, Email: jacobye@who.int

Ms Sreyleak Kheng, Assistant, No. 61-64, Preah Norodom Blvd. (corner St. 306),
Sangkat Boeung Keng Kang I, Khan Chamkamorn, Phnom Penh, Cambodia
Email: khengs@who.int

Dr Jean-olivier Guintran, Medical Officer, No. 61-64, Preah Norodom Blvd. (corner St. 306)
Sangkat Boeung Keng Kang I, Khan Chamkamorn, Phnom Penh, Cambodia
Email: guintranj@who.int

Ms Giulia Manzoni, Consultant, Intensification Plan Project, No. 61-64, Preah Norodom Blvd. (corner St. 306), Sangkat Boeung Keng Kang I, Khan Chamkamorn, Phnom Penh, Cambodia
Email: giulia.manzoniwho@gmail.com

Mr Matteo Dembech, Technical Officer, No. 61-64, Preah Norodom Blvd. (corner St. 306)
Sangkat Boeung Keng Kang I, Khan Chamkamorn, Phnom Penh, Cambodia
Email: dembechm@who.int