MALARIA PROGRAMME MANAGERS MEETING TO REVIEW PROGRESS ON IMPLEMENTATION OF THE REGIONAL ACTION FRAMEWORK FOR MALARIA CONTROL AND ELIMINATION IN THE WESTERN PACIFIC 2016–2020

25–27 June 2018
Manila, Philippines
Malaria Programme Managers Meeting to Review Progress on Implementation of the Regional Action Framework for Malaria Control and Elimination in the Western Pacific 2016–2020
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MEETING REPORT

MALARIA PROGRAMME MANAGERS MEETING TO REVIEW PROGRESS ON IMPLEMENTATION OF THE REGIONAL ACTION FRAMEWORK FOR MALARIA CONTROL AND ELIMINATION IN THE WESTERN PACIFIC 2016–2020

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REGIONAL OFFICE FOR THE WESTERN PACIFIC

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NOTE

The views expressed in this report are those of the participants of the Malaria Programme Managers Meeting to Review Progress on Implementation of the Regional Action Framework for Malaria Control and Elimination in the Western Pacific 2016–2020 and do not necessarily reflect the policies of the World Health Organization.

This report was prepared by the World Health Organization Regional Office for the Western Pacific for governments of Member States in the Region and for those who participated in the Malaria Programme Managers Meeting to Review Progress on Implementation of the Regional Action Framework for Malaria Control and Elimination in the Western Pacific 2016–2020, which was held in Manila, Philippines from 25 to 27 June 2018.
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Malaria – prevention and control / Regional health planning / Programme management
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<th>ABBREVIATIONS</th>
<th>Definition</th>
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<tr>
<td>ACT</td>
<td>artemisinin-based combination therapy</td>
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<td>AL</td>
<td>artemether-lumefantrine</td>
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<td>API</td>
<td>annual parasite incidence</td>
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<td>ASMQ</td>
<td>artesunate-mefloquine</td>
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<td>DHA-PIP</td>
<td>dihydroartemisinin-piperaquine</td>
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<td>DHIS2</td>
<td>District Health Information System 2</td>
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<td>ECAMM</td>
<td>external competency assessment of malaria microscopists</td>
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<td>EQA</td>
<td>external quality assurance</td>
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<td>G6PD</td>
<td>Glucose-6-phosphate dehydrogenase</td>
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<td>GMP</td>
<td>Global Malaria Programme</td>
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<td>GMS</td>
<td>Greater Mekong Subregion</td>
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<td>GVCRC</td>
<td>Global Vector Control Response 2017–2030</td>
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<tr>
<td>iDES</td>
<td>integrated drug efficacy surveillance</td>
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<tr>
<td>IRS</td>
<td>indoor residual spraying</td>
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<tr>
<td>ITN</td>
<td>insecticide-treated net</td>
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<tr>
<td>LLIN</td>
<td>long lasting insecticidal net</td>
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<td>MDG</td>
<td>Millennium Development Goals</td>
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<tr>
<td>MECP</td>
<td>Malaria Elimination Certification Panel</td>
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<td>MEOC</td>
<td>Malaria Elimination Oversite Committee</td>
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<td>MME</td>
<td>Mekong Malaria Elimination</td>
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<td>MPR</td>
<td>malaria programme review</td>
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<td>NMP</td>
<td>national malaria programme</td>
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<td>NSP</td>
<td>national strategic plan</td>
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<td>NTG</td>
<td>national treatment guidelines</td>
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<tr>
<td>oAMT</td>
<td>oral artemisinin-based monotherapy</td>
</tr>
<tr>
<td>OD</td>
<td>Operational District</td>
</tr>
<tr>
<td>PBO</td>
<td>piperonyl butoxide</td>
</tr>
<tr>
<td>RAI</td>
<td>Regional Artemisinin-resistance Initiative</td>
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<tr>
<td>RAI2</td>
<td>Regional Artemisinin-resistance Initiative 2-Elimination</td>
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<tr>
<td>RDT</td>
<td>rapid diagnostic tests</td>
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<tr>
<td>SDG</td>
<td>Sustainable Development Goals</td>
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<tr>
<td>SOP</td>
<td>standard operating procedure</td>
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<td>UHC</td>
<td>universal health coverage</td>
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<td>WMR</td>
<td>World Malaria Report</td>
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SUMMARY

The Regional Action Framework for Malaria Control and Elimination in the Western Pacific (2016-2020), guided by the Global Technical Strategy for Malaria 2016–2030, aims to support the acceleration of malaria control and elimination by addressing regional priorities and challenges. Assessment of regional and national progress is recommended as part of the Regional Action Framework. Since 2018 is the midterm, WHO is reviewing national malaria programmes’ progress towards achieving national and regional indicators, targets and milestones against 2015 baselines. Additionally WHO is also reviewing the operationalization of the Global Vector Control Response 2017–2030 (GVCR), which was endorsed by the World Health Assembly in 2017, as a tool to strengthen integrated vector control through alignment and integration of national strategies.

The WHO Regional Office for the Western Pacific hosted a three-day Malaria Programme Managers Meeting at the Regional Office in Manila on 25–27 June 2018 with participants from malaria programmes of the ministries of health, partners and stakeholders, regional networks, malaria experts as well as WHO staff working in countries on malaria.

The conclusions of the meeting include the following:

1) Considerable progress has been made towards achieving the targets and milestones for each pillar established in the Regional Action Framework compared to 2015 baselines, and most countries have progressed towards achieving the targets set in their national strategic plans (NSPs).

2) From 2015 to 2017, malaria cases in the Western Pacific Region increased by 26% and deaths decreased by 35%: Papua New Guinea, Solomon Islands and Cambodia accounted for over 90% of total cases in 2017. In some areas of high transmission, the case load dropped significantly from 2015 to 2017: Lao People’s Democratic Republic (74%), Philippines (52%) and Viet Nam (51%).

3) The three E-2020 countries in the WPR – China, Malaysia and the Republic of Korea – have progressed towards midterm milestones and have established case-based surveillance systems. However, they continue to be challenged by border malaria, vivax malaria (Republic of Korea) and increasing transmission of Plasmodium knowlesi (Malaysia).

4) China achieved an important milestone in 2017, reporting zero indigenous malaria cases; while the Republic of Korea reported a 30% reduction in cases from 2015 to 2017 and maintained zero indigenous deaths.

5) The seven burden reduction countries in the Region achieved a number of midterm milestones including development of validated NSPs with established targets for elimination and costed implementation plans. Cambodia, Lao People’s Democratic Republic and Viet Nam piloted case-based surveillance.

6) Challenges in countries of the Greater Mekong Subregion (GMS) include a lack of clarity around populations at risk, especially in areas of high transmission, and achieving universal access to malaria services and commodities, including long lasting insecticide-treated nets (LLINs) or indoor residual spraying (IRS) and quality artemisinin combination therapies (ACTs). Delays in establishing case-based surveillance in elimination settings have slowed down progress towards regional targets.

7) The Pacific island countries of Solomon Islands and Vanuatu have strengthened case reporting using District Health Information System (DHIS2) and have integrated their health reporting systems. Still, universal access to vector control and diagnosis and treatment
services is inadequate due to supply management challenges, the devolution of government services to provinces (Solomon Islands) and a weak health system (Papua New Guinea).

8) GVCR concepts and implementation guidance were presented. Efforts have been made by national programmes to provide vector control interventions such as, LLINs or IRS, to populations at risk, but universal coverage (access to and use by all people at risk) for vector control has not been achieved in most regional countries.

Member States are encouraged to do the following:

1) Accelerate efforts to achieve universal access to malaria vector control and diagnosis and treatment for all at-risk populations. Clearly define and identify at-risk populations and mobilize resources to support services, especially in areas of high transmission.

2) Accelerate adoption of case-based surveillance in areas of elimination in burden reduction countries, especially in the GMS, and adopt foci investigation, classification and response, entomological surveillance and integrated drug efficacy surveillance (iDES).

3) In the three E-2020 countries, strengthen surveillance to prevent re-establishment where transmission has been interrupted; prepare for elimination certification through subnational validation, assessing needs as per the WHO Malaria Elimination Certification Panel and Malaria Elimination Oversight Committee.

4) In Papua New Guinea, Solomon Islands and Vanuatu, ensure universal access to vector control interventions and diagnosis and treatment services. In Solomon Islands, develop an elimination plan and begin case-based surveillance in areas of low burden.

5) Identify and improve bottlenecks found in supply systems to ensure availability of quality and efficacious antimalarial medicines and services; update national treatment guidelines (NTGs) based on latest therapeutic efficacy surveillance results and utilize the Global Fund rapid supply mechanism to quickly purchase smaller quantities of new ACTs;

6) Develop and implement comprehensive vector control and surveillance plans including insecticide resistance monitoring, based on GVCR concepts and implementation guidance.

WHO is requested to do the following:

1) Support national malaria control programmes to update their NSPs and NTGs as needed, including preparatory work such as malaria programme reviews (MPRs) and full operationalization of said plans; encourage investments to strengthen national programmes to accelerate towards malaria elimination.

2) Support country expansion of case-based surveillance and adoption of foci investigation, classification, entomological surveillance and iDES in areas of low malaria transmission. Continue monitoring of national and regional progress against NSP and Regional Action Framework indicators.

3) Promote coordinated, prioritized support to strengthen programmes in conjunction with other technical partners, in particular through improved case-based surveillance in areas of elimination in burden reduction countries.

4) Encourage the E-2020 countries to continue efforts to accelerate towards elimination, supporting surveillance strengthening to prevent malaria re-introduction and facilitate engagement of each country with the WHO Malaria Elimination Oversight Committee to better prepare for certification of elimination.
5) Support the identification of procurement bottlenecks for WHO prequalified or registered products while encouraging pre-shipment and post-marketing quality testing to improve universal access.

6) Support strengthening of integrated vector control response, providing technical assistance towards the development of national vector control needs assessments, national vector control plans, and coordinated training on the GVCR concepts and processes.
1. INTRODUCTION

1.1 Background

Significant progress towards malaria control and elimination has been demonstrated in the World Health Organization (WHO) Western Pacific Region. The 10 malaria-endemic countries in the Region, excluding Papua New Guinea, have reported a decline in malaria cases by 31% and malaria deaths by 82% from 2010 to 2015. Countries targeting elimination by 2020, including China, Malaysia and the Republic of Korea, have reduced malaria cases and deaths by 93% and 88% during the same period, respectively. Still, malaria continues to pose a significant threat to health with nearly 10% of the 1.8 billion people in the Region at risk of malaria and more than 30 million people at high risk. Malaria transmission currently is most intense in Papua New Guinea, Solomon Islands and Vanuatu, while transmission is focal in other countries, disproportionately affecting ethnic minorities, migrant workers and populations along borders. Eliminating malaria poses unique challenges requiring intensified and coordinated efforts.

The Regional Action Framework for Malaria Control and Elimination in the Western Pacific (2016–2020), endorsed by the Regional Committee in 2016, underpins the Global Technical Strategy for Malaria 2016–2030 and aims to support acceleration of malaria control and elimination in the Western Pacific by addressing regional priorities and challenges such as weak surveillance, access to quality assured interventions and commodities, especially among high-risk population groups, as well as drug and insecticide resistance. As detailed in the Regional Action Framework, regional malaria control and elimination efforts require careful monitoring of progress and periodic evaluation to build on the successful achievement of malaria-related Millennium Development Goals while accelerating and linking the Sustainable Development Goals (SDGs) agenda with the Global Technical Strategy.

As 2018 is the midterm of the Regional Action Framework and annual data have been collected by the WHO Regional Office for the Western Pacific in accordance with the WHO mandate, it is important to review progress towards national and regional indicators, targets and milestones. The Regional Office organized a three-day malaria programme managers meeting in Manila on 25–27 June 2018 with participants from malaria programmes of the ministries of health, partners and stakeholders, regional networks, malaria experts as well as WHO staff working in countries on malaria. The meeting was an opportunity to: assess progress towards the Regional Action Framework indicators, targets and milestones; highlight achievements; and identify challenges in progress. Additionally, the meeting allowed participants to review the operationalization of WHO global and regional guidelines and to recommend strategic changes to national implementation strategies.

1.2 Objectives

The objectives of the meeting were:

1. to highlight progress made by the Region and national malaria programmes (NMPs) towards achieving indicators, targets and milestones in the Regional Action Framework, against 2015 baselines;

2. to discuss key challenges, particularly in high-burden countries, identified by NMPs that hinder achievement of national and regional targets and milestones;

3. to recommend strategic changes for NMPs to achieve national and regional targets and milestones; and

4. to review progress in achieving universal access to malaria vector control interventions and discuss gaps in achieving universal access and to identify priority actions to address challenges through integrated vector control in alignment with the Global Vector Control Response 2017–2030 (GVCR).
1.3 Opening remarks

Dr Shin Young-soo, WHO Regional Director for the Western Pacific, greeted all those in attendance. He highlighted the tremendous achievement of China reporting zero indigenous malaria cases in 2017, for the first time in history. He recognized that at the 2018 World Health Assembly in Geneva, ministers from the Greater Mekong Subregion (GMS) countries renewed their commitment to accelerating elimination of malaria before 2030. Also, he noted that the GVCR will help streamline vector control strategies leading to a strengthened, coordinated response to all vector-borne diseases.

Dr Shin emphasized the need to strengthen malaria control and elimination, highlighting that cases across the Region have been on the rise and a significant risk for malaria remains in the most vulnerable populations. He noted that efforts must be made to halt transmission of malaria in affected countries through improved access to diagnosis and effective antimalarial medicines, as well as strengthened surveillance, including case-based surveillance in areas of low transmission. He encouraged open discussions about how to confront the challenges and determine what support is needed from WHO and other partners. Dr Shin concluded by thanking all participants for their commitment to malaria control and elimination in the Region.

1.4 Nomination of chair, vice-chair and rapporteur and administrative announcements

Dr Shin Young-soo presided over the election of the officers for the meeting. Dr Bouasy Hongvanthong, Director, Center of Malariology, Parasitology and Entomology, Ministry of Health, Lao People’s Democratic Republic, was nominated as Chair. Dr Len Tarivonda, Director, Ministry of Health, Disease Prevention and Control Bureau, Port Vila, Vanuatu was nominated as Vice-Chair. And Dr Siv Sovannaroth, Chief of Technical Bureau, National Center for Entomology, Parasitology and Malaria Control, Phnom Penh, Cambodia was nominated as Rapporteur. The nominations were endorsed by all participants.

The meeting agenda is included in Annex 1 and the list of participants in Annex 2.

2. PROCEEDINGS

2.1 Session 1: Global and regional technical updates

2.1.1 Updates on global malaria situation, policies and guidelines

Dr Abdisalan Noor, Team Leader, Surveillance, WHO Global Malaria Programme (GMP) presented the World Malaria Report 2017 (WMR). He highlighted that the number of malaria cases globally has risen from 210 million in 2013 to over 216 million in 2016, and malaria deaths have slightly decreased from 465,000 to just over 445,000 during the same period. He pointed out that over 43% of all malaria cases globally are reported from Nigeria, the Democratic Republic of the Congo and India. The Western Pacific Region accounts for a very small proportion of cases overall but is home to key challenges for malaria elimination including drug-resistant malaria with Cambodia having the highest failure rate (>10%) for four different artemisinin-based combination therapies (ACTs).

Dr Noor stated that countries are not on track to meet the 2020 morbidity and mortality targets globally and that much effort and commitment will be required to get back on track. To achieve the 2020 and 2025 Global Technical Strategy targets, he stated that a number of challenges must be overcome. With the decreasing number of cases, continued financial commitment will be required. As we are unlikely to see new transformative tools, strengthening capacity with current tools is essential. Malaria can be diagnosed and is entirely treatable; as such, no one should be dying of malaria. Maintaining the status quo in terms of malaria control and elimination efforts is not an option if targets are going to be achieved.
He highlighted what GMP is doing to support countries to meet their targets. One such activity is the “10 + 1 Initiative” where support is directed to the 10 most burdensome countries in Africa plus India. If these countries are able to reduce their case burden, great impact can be achieved as they contribute about 70% of the global malaria burden. Dr Noor then introduced support provided by GMP towards accelerating elimination. He discussed the E-2020 initiative, which supports 21 countries identified by WHO in 2016 as having the potential to achieve elimination by 2020. This includes 3 countries in the WPR – China, Malaysia and Republic of Korea. Currently the MEOC and MECP are serving these countries to achieve zero local transmission by 2020 and obtain WHO certification of elimination.

Dr Noor discussed policy and normative guidance supported by GMP including launch of the GVCR in October 2017 and Malaria Surveillance, Monitoring and Evaluation: A Reference Manual in March 2018. GMP is holding a strategic advisory group on malaria eradication to re-examine strategies as well support efforts for the RTS,S malaria vaccine in Africa. He concluded by discussing the trends in malaria mortality in the Western Pacific Region showing that it is lowest of all the other regions in the world (0.5 deaths per 100,000 population), but much effort is still required to push this to zero.

2.1.2 Technical updates on malaria vector control and insecticide resistance

Dr Jan Kolaczinski, Coordinator, Entomology and Vector Control, GMP, provided a brief introduction to the GVCR, which was adopted at the Seventieth World Health Assembly. The GVCR was supported by interventions made across all WHO regions and 36 countries. A dedicated WHO resolution, WHA70.16 on an integrated approach for the control of vector-borne diseases, was adopted.

He then discussed malaria vector surveillance, evaluation of vector control interventions and provided some recommendations and implementation guidance to Member States. Malaria vector surveillance is detailed in Chapter 5 of the Malaria Reference Manual. Dr Kolaczinski based his presentation of vector surveillance on the reference manual discussing key indicators for national programmes to measure by high and moderate priority. He urged countries to follow the WHO Framework for a National Insecticide Resistance Monitoring and Management Plan, stating that a plan depends on a good understanding of the resistance situation and operational considerations. At minimum, the plan should include testing for insecticide resistance by phenotypic monitoring with concentration bioassays and if resistance is confirmed, resistance intensity should be measured using synergist-insecticide bioassays or molecular techniques. He then mentioned the DHIS2 module being developed by GMP to support countries to effectively manage entomological data and highlighted the Malaria Threats Map tool, which was the basis for the Global Report on Insecticide Resistance in Malaria Vectors: 2010–2016.

Recommendations and implementation guidance were discussed. Dr Kolaczinski mentioned the core malaria vector control interventions of universal coverage, either LLINs or IRS, and the supplementary interventions of larval source management and personal protection. Space and aerial spraying for vector control are not recommended. Current and planned work at GMP includes: supporting development of GVCR regional action plans, conducting vector control needs assessments with national strategies, expanding use of malaria threats map application and guidance for elimination settings on malaria vector surveillance, evaluating vector control tools via a vector control advisory group, and developing global guidelines for vector control, articulating the current evidence base.

A number of issues were discussed including use of pyrethroid and piperonyl butoxide (PBO) LLINs to improve vector control. PBO is a chemical synergist that acts by inhibiting enzymes involved in the natural defence mechanisms of insects, which results in pyrethroid not being detoxified in the insect and the pyrethroid on the LLIN remaining potent against mosquitoes despite resistance. During discussions, Dr Abeyasinghe stated that PBO nets are only a solution in the absence of mosquito resistance to monooxygenase. Fewer mosquito numbers are required to measure enzyme resistance;
evidence should be produced in countries wanting to use PBO nets. In other discussions, China requested for practical guidance and processes from WHO in order to validate vulnerability and receptivity post-elimination.


Dr Noor presented the WHO *Malaria surveillance, monitoring and evaluation, a reference manual 2018*, which is the combined and harmonized version of 2 previous WHO guidelines on disease surveillance for control and elimination. He discussed each chapter of the manual: malaria surveillance as a core intervention; establishing a malaria surveillance system; concepts and practice of malaria surveillance; surveillance of antimalarial drug efficacy and drug resistance; early warning detection and response to malaria outbreaks and epidemics; and monitoring and evaluation of national programmes. The chapter on entomological surveillance, now integrated into the manual, was presented by Dr Kolaczinski.

Dr Noor highlighted a number of key messages of the manual. First, NMPs must plan surveillance actions along a continuum of malaria transmission from very high to very low, incorporating activities for both areas of transmission. Rapid diagnostic tests (RDTs) and light microscopy were recommended for malaria diagnosis. Dr Noor also highlighted a number of important principles for an effective malaria surveillance system, including integration with the health information system and linking all surveillance data directly to a decision at some level of the health system. After malaria transmission is interrupted in areas, surveillance should become part of a broad responsibility of general health services. He then discussed each chapter; details can be referenced from the manual.

Some terminology definitions were discussed, including classification of foci as residual non-active and how to respond. He noted that even when foci are cleared, there still might be a need for vector control based on context. Dr Abeyasinghe noted that foci classification is a guide for national determination, and local response should be dependent on vulnerability and receptivity. The WHO manual is a guide, but the national level decides classification based on local context. The WHO manual is a guide, but the national level decides classification based on local context. Dr Noor noted that the greatest risk is locally transmitted cases, not imported, and it is important to properly measure population at risk. The value is to examine foci and link to importation and defining risk of foci where transmission may occur.

2.1.4 Midterm regional targets and milestones of the Regional Action Framework: a progress update

Dr Rabindra Abeyasinghe, Coordinator, Malaria, other Vectorborne and Parasitic Diseases, reviewed the Regional Action Framework goals, pillars and objectives. He then discussed progress towards achieving the midterm regional milestones and targets and highlighted successes and challenges. Along with the three pillars and two supporting elements, he highlighted the key guiding principles, including country ownership and leadership, locally tailored interventions, improved surveillance, equity in access to services, innovative tools, strengthened national systems (rather than parallel mechanisms) and universal health coverage (UHC).

From 2015 to 2017, malaria cases in the Western Pacific Region increased by 26% from just over 410,000 to 552,000. During the same period, malaria deaths decreased by 35% from 215 to 140. Papua New Guinea accounted for 79% of cases and 71% of deaths in the Region in 2017. Together, Papua New Guinea, Solomon Islands and Cambodia accounted for over 95% of total malaria cases confirmed in the Region in 2017. Cases have increased in these countries since 2015 and are impacting the road map for malaria elimination, stalling overall progress. Dr Abeyasinghe presented a checklist of milestones.
By the end of 2017:

- All countries have updated their malaria national strategic plans (NSPs) and defined targets for malaria elimination; all countries have a costed annual implementation plan for NSPs.
- Countries of the GMS have established case-based surveillance for elimination in all areas, including in areas with ACT and other drug resistance.

The 10 malaria endemic countries in the Western Pacific Region have validated malaria NSPs and costed annual workplans. However, almost all countries in the Region will need to update their NSPs in 2019 for their 2020–2025 plans. Integration of elimination priorities varies apart from the three countries targeting elimination by 2020 – China, Malaysia and the Republic of Korea. Surveillance as a key intervention will require better integration into national workplans from 2018 onward. Implementation of case-based surveillance in the four GMS countries of the Region has varied. China is currently the only GMS country with a fully capable elimination-ready surveillance system. The other three – Cambodia, the Lao People’s Democratic Republic and Viet Nam – have piloted case-based surveillance, but more effort must be made to improve current systems, particularly in areas transitioning from control to elimination. Dr Abeyasinghe encouraged countries to fully align their strategies with the Regional Action Framework and strengthen efforts to implement case-based surveillance.

By the end of 2018:

- At least 80% coverage with LLINs and/or IRS achieved for all at-risk populations, especially in areas of high malaria transmission
- At least 80% of targeted, at-risk populations have access to parasite-based malaria diagnosis and treatment
- Each country has established a national-level surveillance system capable of accelerating elimination through case-based surveillance.
- Malaria prevention, diagnosis and treatment should be included in packages of essential health care under national UHC policies.

Vector control coverage was covered on day 3 of the meeting. Access to diagnosis was noted as difficult for countries to measure. Data to reflect access are currently not collected at the national or regional levels. Many at-risk groups, mobile and migrant or otherwise marginalized populations are hard to reach. Although important to ensure accountability of these groups, measuring access remains very difficult. The number of at-risk populations nationally is generally known in the seven burden reduction countries (high and low risk) but is not available at subnational levels for targeted interventions. Access can only be measured when countries are able to quantify, or estimate, the number of individuals at risk, which will most likely require modelling estimates. The ideal approach to measure at-risk values is being addressed and discussed within each country.

The three E-2020 countries have established elimination-capable surveillance systems, allowing for rapid case notification and response as necessary. The seven burden reduction countries must work to shift operational thinking towards case- and foci-based investigation and response. More work is required to implement and scale up case-based surveillance. Regarding UHC, Member States are committed to developing policies to support universal coverage, but most malaria-endemic countries only mention this in their malaria NSPs. Each country must do more to develop policy and include malaria prevention, diagnosis and treatment activities for all, including the most at risk.

By the end of 2019:

- Malaria incidence rate reduced by at least 40% in Solomon Islands
- Malaria incidence rate reduced by at least 40% in high transmission areas of Cambodia and the Philippines
Solomon Islands has reported an upsurge in cases since 2015. To reduce malaria incidence by 40%, the NMP must improve mobilization of core malaria control activities in high transmission areas, including increasing LLIN coverage and universal access to diagnosis and treatment. Improved data reporting over the past few years in Solomon Islands should result in more accurate tracking of cases and targeted interventions. Due to increases in vivax malaria, probable relapse cases should be closely monitored.

The Philippines has reported fewer annual cases since 2015, and the NMP is on track to meet 2019 milestones. However, the Province of Palawan continues to have high transmission, and efforts to control and reduce transmission in the southern areas of the island remain a challenging priority. Cambodia has reported an upsurge of cases since 2015 including a number of outbreaks. The NMP is mobilizing village health workers in the periphery to help increase access; challenges remain.

Key regional successes at the midterm of the Regional Action Framework were highlighted:

- China reported zero locally transmitted cases in 2017.
- The Republic of Korea reported a 30% reduction in cases from 2015 to 2017 and maintained zero indigenous deaths.
- Progress has been reported in achieving universal access to malaria diagnosis and treatment.
- Efforts are being made to attain universal coverage of LLINs or IRS for at-risk populations.
- In some areas of high burden, the case load has dropped significantly between 2015 and 2017: Lao People’s Democratic Republic (74%), the Philippines (52%) and Viet Nam (51%).
- Strengthened surveillance in many countries (Cambodia, Lao People’s Democratic Republic, Solomon Islands, Vanuatu and Viet Nam), piloting case-based surveillance; integration of systems in areas.

Key regional challenges at the midterm were also highlighted:

- Surveillance systems strengthening not adequate
- The need for clearly defining at-risk populations and ensuring universal access to malaria commodities and services
- Foci investigation/classification not fully adopted
- Logistical supply system challenges impacting on ensuring availability of diagnostics and treatments
- Ensuring quality and efficacy of medicines and updating of treatment guidelines
- Delays in establishing case-based surveillance in elimination settings
- Suboptimum use of available resources in many countries resulting in reduced impact.

2.1.5 Regional surveillance database and update on World Malaria Report 2018

Dr James Kelley, Technical Officer, Malaria, other Vectorborne and Parasitic Diseases, presented an update on the regional database, progress to date and a way forward. He then demonstrated use of the DHIS2 database dashboards. The regional database functions as a data repository to monitor progress of the Regional Action Framework, support malaria programming and direct regional priorities. The database was developed and introduced in September 2017 at the Surveillance Strengthening Meeting in Manila where consensus was reached on data elements and submission of monthly, subnational data, and national focal points for data submission were also identified. The live version was launched in February 2018.

Malaysia, Papua New Guinea, the Philippines, the Republic of Korea, Solomon Islands and Vanuatu have only reported annual data to date. Cambodia is the only country reporting data disaggregated by
age and gender. Data from the four GMS countries in the Region are imported into the Regional Office database from the Mekong Malaria Elimination (MME) hub on a quarterly basis. Data entered from the six non-GMS countries is limited to annual World Malaria Report (WMR) subnational forms. Overall, limited data are being submitted. Dr Kelley encouraged countries to submit data elements as agreed and contained in the Regional Action Framework, so progress towards achieving SDG targets can be monitored. District-level population data have not been submitted and may be difficult for countries to determine. However, to strengthen surveillance and to accurately calculate key indicators, subnational at-risk population data (including for malaria foci) should be determined. E-2020 countries are not regularly submitting local and imported case data. To improve the database, monthly data from January 2015 to present should be submitted by all countries, and data elements and administrative units should be verified. The DHIS2 mapping function is under development; subnational-level shapefiles will need to be validated.

Dr Kelley shared a brief update on the WMR 2018 data submission progress. Each year, difficulty has been reported regarding country access to the online data entry site, which can be resolved by clearing the cache or using an incognito browser. Also, national policy forms have been separated from the primary dataset in 2018. The insecticide resistance forms will be disseminated in September 2018.

2.2 Session 2: Burden reduction countries: updates and discussion

2.2.1 Progress towards achieving national milestones and targets, 2015–2018

National representatives from the malaria programmes in the Lao People’s Democratic Republic, Papua New Guinea and Solomon Islands provided updates for 2015–2017 towards accelerated malaria control and achieving national milestones and targets based on the Regional Action Framework.

**Lao People’s Democratic Republic**

The Lao People’s Democratic Republic has set ambitious goals for malaria control and elimination, aiming to eliminate falciparum malaria from 13 provinces by 2020. Additionally, the NMP aims to eliminate all forms of malaria from 13 provinces by 2025 and from all 18 provinces by 2030. Phase 1 of the NSP (2016–2020) calls to move progressively towards malaria elimination in the northern provinces while aligning with the GMS regional elimination efforts. In 2017, the total population in Lao People’s Democratic Republic was 6,688,054, of whom 1,412,821 (21%) were at high risk. Much of the population at risk is mobile and migrants; the level of risk depends on locational factors such as work and living conditions.

From 2015 to 2017, the number of people tested for malaria averaged 250,000, and the number of confirmed cases declined from 35,886 in 2015 to 9,336 in 2017, 85% of which were males. In 2017, 49% of cases were *Plasmodium falciparum* (*P. falciparum*) and 49% were *P. vivax*. Over 90% of cases were among those over 5 years old. In terms of case management, 84% of cases were tested in public health facilities, 11% in the community and 5% in the private sector; 70% of cases treated in public health facilities and 25% by community workers. The country currently has six WHO-certified level 1 microscopists. According to the malaria information system, from 2015 to 2017, 1.1 million RDTs, 650,000 ACTs and 2.1 million LLINs were procured, of which 85% of RDTs and 29% of ACTs were used, and 82% of LLINs distributed with 76% usage.

In 2017, the NMP maintained 98% reporting completeness (15,060 reports submitted of 15,360 expected). There were no case or foci investigations conducted in 2017 from the 143 districts (case-based surveillance activities began in 2018). The current NSP was completed in 2016 and will need to be renewed in 2019/20. The national treatment guidelines (NTG) need renewal in 2018, and a malaria programme review (MPR) needs to be done in 2019. As for funding, of the US$ 4 million in 2017 budget for malaria activities, 25% was domestic; the 2018 budget of US$ 5.9 million is only 19% domestic and in 2019 the budgeted US$ 5.9 million falls to 8% domestic funding.
The key challenges for the NMP to reach elimination include: policy changes influencing human resource incentives and reduced interest and effort, structural reform in the Ministry of Health leading to integration of malaria activities as part of the provincial centre for disease control and prevention unit, maintaining an effective village malaria worker (VMW) network to sustain detection capabilities at the community level, affordable tools for testing and treating *P. vivax* cases, and resistance to first-line ACT (i.e. artemether-lumefantrine, or AL) in high-burden areas in the south leading to recurrent infections. Priority actions include: a full roll-out of primaquine (PQ) single dose for *P. falciparum* cases, including those detected by village malaria worker services; a technical working group to finalize updates to the NTG and any changes to first- and second-line drug treatment; pilot integrated drug efficacy surveillance (iDES) in elimination-targeted provinces; strengthening of epidemic surveillance and response in the southern provinces and case-based surveillance and response in the northern provinces; and ensuring that antimalarial stock-out indicators are visible and used at the health facility level.

**Papua New Guinea**

Papua New Guinea has a validated and costed NSP (2014–2020). The aim of the NMP is to reduce malaria incidence 50% by 2020 relative to 2014 baseline. In 2017, the total population was 8,771,383, of whom 8,155,134 (93%) were at high risk (≥ 1/1000) of malaria infection. From 2015 to 2017, the number of patients tested for malaria increased from 6.6 million to over 9.9 million, and the number of confirmed cases increased from 297,778 in 2015 to 476,609 in 2017; on average, a 50% test positivity rate was reported. In 2017, 72% of cases were *P. falciparum* and 22% were *P. vivax*; 23% of cases were among those below the age of 5 years.

In terms of case management, 98% of cases were tested in public health facilities and 2% in the community. Of the 900,000 cases treated, 90% were treated in public health facilities and 10% by community workers. The country currently has 13 WHO-certified level 1 microscopists. From 2015 to 2017, 3.6 million RDTs, 2 million ACTs and 3.6 million LLINs were procured. Commodity usage data were not presented. The NMP reported 91% reporting completeness in 2017. Because Papua New Guinea is in the burden reduction phase, case-based surveillance is not being done in any of the 89 districts. The current NSP was completed in 2014 and will need to be renewed in 2020/21, and the NTG will need renewal in 2018/2019. An MPR needs to be done in 2019. As for funding, all of the US$ 11 million budgeted for malaria activities in 2017 was provided by external donors, either the Global Fund to fight AIDS, Tuberculosis and Malaria, China–Australia–Papua New Guinea trilateral project or WHO. The 2018 budget is projected to decrease to US$ 7 million, short of required funds.

The key challenges for the NMP include ongoing local transmission in most parts of the country and an overall lack of accessibility to early diagnosis and treatment due to geographical barriers and a weak health system. There has been a resurgence of malaria since 2016, due to procurement and supply management, inadequate funding and human resource challenges. Priority actions include ensuring continuous availability of RDTs and ACTs, expanding the enhanced test, treat and track strategy and continuing to deploy LLINs to achieve high coverage among at risk populations. The NMP is working to ensure adequate supplies of RDTs and ACTs and improve data recording and reporting. A pilot of malaria elimination activities at the subnational level is planned as well as mobilizing necessary funding to implement control activities and to address human resource issues.

During discussions, Dr Abeyasinghe emphasized the need for Papua New Guinea and other countries to seek external funding sources in the coming years as a reduction in funding from the Global Fund is expected. He discussed the ongoing “trilateral” initiative between the Governments of Papua New Guinea and Australia (Department of Foreign Affairs and Trade) with China (National Institute of Parasitic Diseases) providing technical support. The aim of the initiative is to improve quality of diagnostics (approximately US$ 1 million per year). The number of WHO-certified level 1 microscopists has increased as part of the initiative, but still big gaps exist to achieve universal coverage. A recent outbreak (with over 300 deaths) has primarily been due to stock-outs of
antimalarial drugs at rural health facilities. WHO has proposed to expand the scope of the trilateral project beyond improving quality of diagnostics. There is an urgent need to sustain LLIN coverage and determine reasons for stock-outs.

**Solomon Islands**

Solomon Islands has set the goal to reduce the malaria incidence from 44 per 1000 population in 2012 to 25 per 1000 by 2020. The NMP also aims to continue to move towards malaria elimination (in line with the Government’s commitment to national elimination by 2030) but has not set concrete targets. In 2017, the total population of Solomon Islands was 620 083, of whom over 99% were at high risk ($\geq 1/1,000$). Much of the population at risk lives in remote villages with active malaria transmission and where the environment favours vector proliferation.

From 2015 to 2017, the number of people tested for malaria increased from 169 000 to over 222 000, and the number of confirmed cases increased from over 24 000 in 2015 to over 52 000 in 2017, 50% of which were males. In 2017, 34% of cases were *P. falciparum* and 66% were *P. vivax*; 20% of cases were among those below the age of 5 years and 80% over 14 years old. In terms of case management, 100% of cases were tested and treated in public health facilities. The country currently has 3 WHO-certified level 1 microscopists. From 2015 to 2017, 1 million RDTs, 358 000 ACTs and 489 000 LLINs were procured. Of those, 26% of RDTs and 58% of ACTs were used; 79% of LLINs were distributed with 57% usage, according to the 2015 Demographic and Health Survey.

In 2017, 71% reporting completeness of the Malaria Case Registry Form was reported. This is low due to irregular functioning of some health facilities, unavailable operational staff combined with limited coordinated supervisory visits to all health facilities. There were no case or foci investigations conducted in 2017 in the 10 provinces, and the NMP reported 44 health zones as active foci and 1 cleared focus. The current NSP was completed in 2015 and will need to be renewed in 2019; the NTG will need renewal in 2018. An MPR needs to be done in 2018. As for funding, of the US$ 2.5 million in 2017, 20% was domestic; the 2018 budget of US$ 3 million is only planned to be 45% domestic and in 2019 the budgeted US$ 2.7 million falls to 36% domestic funding.

The key challenges for the NMP to reach elimination include the urgent need to increase LLIN coverage and usage (currently a low 57%) to combat the recent resurgence of incidence. Priority actions include: increasing access and usage of LLIN through behaviour change interventions, maintaining adequate diagnostic and effective treatment services, and exploring complementary preventive options as deemed acceptable and affordable.

### 2.3 Session 3: Countries transitioning towards elimination: updates and discussion

#### 2.3.1 Progress towards achieving national milestones and targets, 2015–2018

Countries in the Region transitioning from burden reduction to elimination include Cambodia, the Philippines, Vanuatu and Viet Nam. Each country provided updates towards accelerated malaria control and achieving national milestones and targets based on the Regional Action Framework.

**Cambodia**

Cambodia has ambitious targets for malaria control and elimination. The NMP has developed a phased strategy to accelerate towards elimination. Phase 1 (2018) calls to move progressively towards elimination in 18 operational districts (ODs); phase 2 in 39 ODs and phase 3 in 4 ODs by 2020. In 2017, 8.6 million people were at risk of malaria (84% of total population) and reside in 53 ODs, 53% of total ODs. Most of the population at risk includes mobile and migrant groups.

From 2015 to 2017, the number of patients tested for malaria averaged 200 000, and the number of confirmed cases declined from 51 442 in 2015 to 46 590 in 2017, 81% of which are male cases. In
2017, 63% of cases were *P. falciparum* or mixed species and 37% were *P. vivax*. Very few cases were below the age of 5 years in 2017, while over 80% were between the ages of 15 and 49 years. Over the past three years, 2.2 million LLINs were reported distributed with 100% coverage of the target population in villages and 57% targeted mobile and migrant populations.

There were no case or foci investigations conducted in 2017, although some activities for case-based surveillance were done. The current NSP was completed in 2011 and extends through 2025, and the National Elimination Framework should be revised before 2021. The NTG will need renewal in 2018 and an MPR needs to be done in 2019. The key challenges for the NMP include implementation delays of elimination activities and case-based surveillance. Also, the Ministry of Health recently changed the policy of implementing the public–private mix (PPM), which has slowed progress. Electronic payments to implement community-based activities stalled, leading to delays.

During discussions, the issue of dihydroartemisinin plus piperaquine (DHA-PIP) and artesunate–mefloquine (ASMQ) adoption was discussed. The Cambodia delegation noted that ASMQ has been adopted at the national level but not scaled up completely, particularly because DHA-PIP resistance has only been in some parts of the country. In 2017, there was a policy to destroy expired and resistant drugs, which were collected in early 2018. As such, there should be no DHA-PIP in the field apart from leakage. The NMP did not respond to questions about use of DHA-PIP in outbreak areas. Otherwise, LLINs were distributed to 1.8 million people during the Regional Artemisinin-resistance Initiative (RAI) and RAI2-Elimination (RAI2E) to date. However, the target was 8 million people, and only 4 million were prioritized for targeting due to budget restraints. The NMP selected villages with an annual parasite index (API) over 5 per 1000 for LLIN distribution, while areas with an API below 1 per 1000 were designated as elimination areas and LLINs were not distributed. This likely led to gaps in coverage, contributing to recent outbreaks.

**Philippines**

The Philippines NMP has a costed NSP (2017–2022). The aim of the NMP is to reduce malaria incidence by 90% by 2022 relative to 2016 baselines. The aim to accelerate towards elimination includes increasing the number of malaria-free provinces from 32 to 74. Currently, 42 provinces have been declared malaria free. In 2017, the total population of the Philippines was 104,921,400, of whom 708,000 (less than 1%) were at high risk. From 2015 to 2017, the number of people tested for malaria increased from just over 200,000 (with less than 25% tested by RDT) to roughly 295,000 in 2017 (with more than 75% tested by RDT). The number of confirmed cases decreased from 8107 in 2015 to 3998, with around 52% being males. In 2017, 81% of cases were *P. falciparum* and 15% were *P. vivax*; 22% of cases were among those under 5 years old.

Regarding case management, over 90% of total cases were tested in the communities and around 7% were tested in public health facilities. Of the 2027 cases treated, 50% were treated in the community and 30% in the public health facilities. The country currently has 10 WHO-certified level 1 microscopists. From 2015 to 2017, over 250,000 RDTs, roughly 54,000 ACT doses and 2.3 million LLINs were procured. On average, 65% of RDTs and 100% of LLINs were used or distributed, respectively. The programme reported 90% reporting completeness in 2017. Of the 81 provinces, all are conducting case-based surveillance. A total of 74 provinces reported zero local cases in 2017, and 188 barangays, or villages, have active transmission. The current NSP was completed in 2017 and will need to be renewed in 2020; the NTG will need renewal in 2020. As for funding, 49% of the US$ 13.5 million in 2017 was provided by the Government of the Philippines at the national level. The 2019 budget is projected to be reduced to US$ 7.4 million (55% domestic), to be distributed primarily to the provinces for operational expenses.

There are a number of challenges facing the NMP. Transmission remains entrenched in hard-to-reach communities in Palawan (90% of the malaria burden) and areas in Mindanao where conflict continues. Returning overseas workers with malaria infections risk re-introducing infection in malaria-free areas. Given the waning number of malaria cases in the country, skilled laboratory personnel are
diminishing. Despite efforts to address access to health services in geographically isolated areas in Palawan, low health-seeking behaviour among residents is a stumbling block in bringing down malaria cases. Priority actions include updating or developing relevant, suitable and timely policy guidelines and forms; assessing laboratory services and developing a master plan; capacity-building among malaria personnel on malaria elimination; establishing malaria elimination hubs; enhancing monitoring and surveillance; and strengthening entomology capacities. The NMP stated that following up cases is mandated in low transmission areas but is not being fully implemented.

**Vanuatu**

Vanuatu aims to reduce malaria incidence to below 1 per 1000 population by 2020 and maintain zero mortality due to malaria. The country’s malaria elimination target is to reach zero local cases nationwide by 2025. In 2017, the total population was 282,287, of whom 99,869 (34%) were at high risk. Much of the population at risk lives in areas favourable for malaria transmission and where vector breeding occurs in coastal and inland villages.

From 2015 to 2017, the number of people tested for malaria increased from 14,664 to over 31,553, and the number of confirmed cases increased from 423 in 2015 to 1075 in 2017, 50% of which were males. In 2017, 26% of cases were *P. falciparum* and 74% were *P. vivax*, while 85% were among those above the age of 14 years. In terms of case management, 100% of cases were tested (31,533) and treated (1075) in public health facilities. The country currently has 6 WHO-certified level 1 microscopists. From 2015 to 2017, 100,000 RDTs, 5378 ACTs and 253,000 LLINs were procured. According to the 2011 Demographic and Health Surveys, of those, 48% of RDTs and 65% of ACTs were used; 93% of LLINs were distributed with 52% usage.

Case and foci investigations were conducted in three of six provinces, while two provinces reported zero local cases in 2017. There were 23 active foci (population of 95,869), 23 non-active foci and 17 cleared foci documented in 2017. The current NSP was completed in 2015 and will need to be renewed in 2020, and the NTG will need renewal in 2020. An MPR was done in 2018. As for funding, of the US$ 620,000 in 2017, 23% was domestic; the 2018 budget of US$ 404,000 is also planned to be 23% domestically sourced.

The key challenges for the NMP are limited human resources and limited funds for supervisory visits. Priority actions include fully implementing the NTG, improving case-based surveillance in the public and private sectors, and case, foci-classification and response, risk stratification for LLIN universal coverage and IRS in selected foci. The NMP is also working to improve advocacy, awareness and intersectoral collaboration, as well as entomological monitoring in sentinel sites for vector behaviour and insecticide resistance.

**Viet Nam**

Viet Nam aims to reduce malaria morbidity to below 0.15 per 1000 population, and malaria mortality to below 0.02 per 100,000 population, to sustain prevention of malaria re-introduction in 16 provinces and to reach zero indigenous case in other 34 provinces by 2020. The NMP reported that 50 provinces have reached zero local transmission. In 2017, the population was approximately 95 million, of which 33 million were at low risk and 1 million were at high risk of malaria. Much of the population at risk includes mobile and migrant groups living overnight in the forest along the national border areas.

From 2015 to 2017, the number of those tested averaged roughly 2.5 million people each year, and the number of confirmed cases declined from 9331 in 2015 to 4548 in 2017. In 2017, 65% of cases were *P. falciparum* and 35% were *P. vivax*, and 91% of cases were among those aged 15 years or older. In terms of case management, 34% of cases were tested (785,000) and 37% were treated (3093) in public health facilities; while 66% (1.5 million) were tested and 63% treated by commune health workers. The country currently has six WHO-certified level 1 microscopists. Over the past three years, 1.7 million RDTs, 1.23 million ACTs and 3.6 million LLINs were distributed. Of those, 98% of RDTs...
and 91% of ACTs were reported used; 100% of LLINs were reported distributed with above 90% usage, according to the 2017 malaria information system.

Case investigations were conducted in 31 provinces (districts not reported), and 636 of 714 districts reported zero local cases. Active foci are in 361 villages with an estimated population of 320 000. The current NSP was completed in 2016, and the NTG will need renewal in 2019. The most recent MPR was in 2017. As for funding, of the US$ 12.6 million budget in 2017, 24% was domestic; the 2018 budget of US$ 15.1 million will be funded with 12% domestic monies and the proposed 2019 budget of US$ 11.2 million will be 16% domestic funds.

The key challenges for the NMP include: population movement, ACT resistance (failure rate of DHA-PIP increasing), vector resistance to insecticides; limited capacity of surveillance system and limited involvement of private sector and funding support (domestic and external). Priority actions include: changing first-line treatment in areas where DHA-PIP is failing, improving the case management performance of peripheral levels, maintaining high coverage of vector control measures by LLINs, strengthening the malaria information system, enhancing capacity of human resources to implement case investigation and foci investigation and response, and maintaining funding for malaria elimination. During discussions, Dr Abeyasinghe emphasized the importance of providing universal coverage in areas that lack access. He also noted that when Viet Nam decided to choose API > 5 for priority target villages, there were no community workers, which likely lead to gaps in coverage.

2.4 Session 4: Technical updates on diagnosis and case management

2.4.1 Strengthening quality assurance for malaria diagnostics in the Region

Ms Glenda Gonzales, Technical Officer, Malaria, other Vectorborne and Parasitic Diseases, and Mr Kenneth Lilley, Quality Manager and Scientist, Australian Army Malaria Institute presented on quality assurance (QA) for malaria diagnosis. They emphasized that early and accurate parasitological diagnosis is important to ensure care of parasite-positive patients and better compliance with antimalarial treatment regimens. It also ensures that antimalarial medicines are not used inappropriately. They presented the minimum components of QA for malaria diagnosis, including: a central coordinator to oversee efforts; a referee (core) group of microscopists, supported by an external QA programme, with expertise in training and slide validation; good initial pre-service training with standards that must be met by trainees; regular refresher training and assessment of competence, supported by a well-validated reference slide bank; and a sustainable cross-checking system to detect gross inadequacies. Also, regular structured supervision, effective logistical management, clear standard operating procedures (SOPs) at all levels of the system and an adequate budget for funding.

Activities for NMPs to strengthen malaria diagnosis QA include: initially developing microscopy guidelines based on WHO manuals and QA activity planning and implementation, conducting refresher training, implementing external competency assessment of malaria microscopists (ECAMM) while undergoing regional external quality assurance (EQA) of key national labs, and supporting establishment of regional and national slide banks while ensuring procurement of appropriate laboratory supplies. For RDTs, it is important to develop guidelines and undergo WHO product testing, lot testing and prequalification, while for molecular diagnostic tools, WHO external quality assessment scheme should be done for malaria nucleic acid amplification test (NAAT).

The regional and country situation was presented, showing which countries have developed SOPs, have a slide bank, conduct cross-check monitoring, microscopy training, ECAMM and EQA. All but the Republic of Korea (unknown) were noted as having SOPs, training and ECAMM, while all have had EQA. Regarding slide banks, China, Malaysia, Viet Nam and the Philippines (in three regional centres) have developed a slide bank; Cambodia and the Lao People’s Democratic Republic have begun the process. Recommendations included reviewing and updating QA systems to improve effectiveness, functionality and transparency, as well as to formalize and resource the national
reference laboratory. Although SOPs were mostly present in countries, they should be reviewed and updated as needed, following WHO-recommended SOPs. Basic training on microscopy and regular comprehensive refresher training should be done, as well as national competency assessments. The countries need to plan for regular and systemic supervision and conduct panel testing and blinded slide cross-checking, particularly in areas with decreasing malaria cases.

2.4.2 Improving access to and quality of antimalarials in the Region

Dr Abeyasinghe presented the concept of universal access to malaria preventive interventions, challenges to ensuring universal access, and the importance of early and effective treatment. For malaria diagnostic tests, he noted that all sick people who fulfil the definition of a suspected malaria case should have access to a reliable malaria test, administered by a trained health worker at a health facility or community health centre. This does not include asymptomatic people in the context of strategies for eliminating malaria. The use of RDTs or microscopy should not be planned as a separate activity run by the NMP but should be fully integrated into case management programmes, as part of overall efforts to strengthen laboratory services and case management.

He emphasized that universal access to services does not imply only the availability of diagnostic and treatment services. They should also be quality assured, acceptable to the community, available throughout the year, especially in high transmission seasons, with no stock-outs, and they should be free or of affordable price. Universal access to diagnostic and treatment services may be different in burden reduction phase and elimination phase. Some of the challenges to providing universal access include: a poor understanding of disease distribution in time and space, resulting in inaccurate quantification and malaria distributions; limited physical access due to terrain and topography, or weak health systems; ineffective treatment regimens; beliefs and practices among health workers and the community; and availability of poor-quality alternatives.

The main principles of effective malaria case management are to ensure that all parasite-positive patients have access to effective malaria treatment regimens and compliance with treatment regimens. It is critical to ensure antimalarial medicines are not used inappropriately and to avoid antimalarial medicine use in parasite-negative patients, which reduces side-effects and drug interactions, and improves community confidence. Accurate tracking of testing and treatment of malaria cases improves reliability of surveillance data, and the recognition and better management of non-malarial febrile illnesses improves confidence regarding efficacy of malaria treatment.

Dr Abeyasinghe noted that national programmes must ensure antimalarial drug quality in both public and private sectors thorough regulation, inspection and law enforcement. Some practical steps include preventing the availability and use of oral artemisinin-based monotherapy (oAMT), ensuring counterfeit/falsified and substandard antimalarials are not in the market, ensuring prequalification of ACT manufacturers prior to importation, and ensuring regular access to quality assured treatments. It is also important that programmes conduct TES for antimalarial drugs using standard WHO protocols and that NMPs monitor implementation and impact of new malaria treatment recommendations. The programmes must detect decreasing antimalarial efficacy and drug resistance as early as possible and promote rational use of antimalarial medicines, limit unnecessary use of antimalarial drugs (test before treating) and ensure strict adherence to the full treatment course.

2.4.3 Pharmaceutical system strengthening efforts and implications for antimalarial drug quality

Dr Uhjin Kim, Technical Officer, Essential Medicines and Technologies, WHO Regional Office for the Western Pacific, discussed SDG target 3.8: Achieve universal health coverage (UHC). She presented on financial risk protection, access to quality essential health-care services, and access to safe, effective, quality and affordable essential medicines and vaccines for all. Medicines are part of SDG target 3.8 and actions to meet this call for malaria include eliminating oAMT, countering substandard and falsified products, promoting rational use of medicines and ensuring timely access to needed ACTs. National programmes need to know to what extent oAMTs and substandard or fake antimalarials are available and used in their country. In a recent study testing 386 samples of 16
different antimalarials obtained from selected GMS countries, 30% (117) were found to be non-conformant in both public and private facilities with no substantial difference between registered and non-registered products. A total of 12 oAMT samples were found in Myanmar, Thailand and Viet Nam.

Regulatory oversight at the global and regional levels includes the evaluation of drug quality, efficacy and safety. Some elements of regulatory oversight must remain local, including licensing decisions, local manufacturing oversight, pharmacovigilance, appropriate distribution controls (stability and cold chain), and product security (substandard and falsified products). A number of meetings have been held for regulatory systems strengthening and cross-border collaboration to combat falsified and oAMT products. For NMPs to accelerate towards elimination, they must be able to quickly switch treatment regimens in resistant foci through expedited ACT registration and procurement and distribution of small quantities of ACTs (i.e. using the Global Fund rapid supply mechanism).

2.4.4 Antimalarial drug resistance: regional progress updates on TES and iDES

Dr Dorina Bustos, Technical Officer WHO Thailand, presented a review of TES results done by 2 networks (GMS and the Pacific) and discussed integrated drug efficacy surveillance (iDES) in eliminating countries (China, Malaysia and Republic of Korea). WHO developed a standardized \textit{in vivo} protocol for the assessments of therapeutic efficacy of antimalarials including chloroquine for \textit{P. falciparum} and \textit{P. vivax}. This protocol is the gold standard to monitor drug efficacy and update national treatment policy. There are 2 TES network sites covering WPR. The Pacific network includes Malaysia, the Philippines, Papua New Guinea, Solomon Islands, Vanuatu, Indonesia and Timor-Leste. The GMS network includes Cambodia, China (Yunnan), Lao PDR, Myanmar, Thailand and Viet Nam.

From 2013 to 2017, there were 51 TES sentinel sites in the six GMS countries: Cambodia (11), Lao PDR (5), Viet Nam (8), Yunnan, China (4), Myanmar (10) and Thailand (13).

Dr Bustos presented findings from recent TES and shared the latest information on the efficacies of antimalarial drugs in the Region. She noted that the presence of artemisinin resistance is generally first evaluated during TES following treatment with an ACT. Resistance can also be evaluated in special clinical studies with artesunate monotherapy alone or before receiving a partner drug. She noted that the prevalence of one specific K13 C580Y haplotype is increasing, replacing other haplotypes in an area that includes Cambodia, eastern Thailand and southern Lao People’s Democratic Republic, leading to spread of resistance. Data from 2017 revealed that first-line ACT efficacy against \textit{P. falciparum} is good across the Region: 100% in Cambodia (ASMQ), Malaysia (AL) and the Philippines (AL); 83% in the Lao People’s Democratic Republic (AL); 54–95% in Viet Nam (DHA-PIP); 95–100% in Yunnan, China (DHA-PIP, 2014–2015); 99–100% in Papua New Guinea (AL, 2014–2015); 95% in Solomon Islands (AL); and unknown in Vanuatu.

She also discussed iDES and emphasized the importance of a strong case-based surveillance system to integrate iDES, which helps to ensure curative treatment. Basically, iDES ensures that data collected on all malaria cases in the routine surveillance system are being used to also generate information about drug efficacy. For all patients enrolled in iDES, data are needed for a minimum of two points: day 0 and end-day, which depends on the drug being used. Malaysia has been successfully conducting iDES, which also proves challenging: only 45% of cases completed day 28 follow-up; all were completely cured, but for those that did not follow up, drug failure is unknown.

2.5 Session 5: Countries targeting elimination by 2020: updates and discussion

2.5.1 Eliminating malaria – completing the last mile, lessons to be learnt from China

Professor Gao Qi, WHO Temporary Adviser and former Director of National Key Laboratory on Parasitic Diseases, China, presented on malaria elimination in China. In 1970, China reported over 30 million malaria cases; in 2010, that number fell to less than 10 000 with 4262 local infections. China’s \textit{National Malaria Elimination Action Plan 2010–2020} targeted no local infection by 2015, except along the border in Yunnan, and targets national malaria elimination by 2020.
Major achievements include political support and multisectoral collaboration such as full ministerial support and signature of the elimination plan. All government, China CDC, institutes and nongovernment organizations have been consistently involved in malaria elimination activities at all levels, and public and clinical sections work together for case management and reporting. China has increased financial support (RMB 42 million in 2010 to RMB 135 million in 2015), while local government budgets have increased as well as rural public health care funds. Moreover, the NMP has strengthened facilities for malaria elimination, including establishment of an infectious disease case reporting system, as well as the national information reporting system and malaria diagnostics reference laboratory network in 24 provinces.

China also has a very strong web-based surveillance system and has integrated malaria surveillance as a key programme intervention, including the 1-3-7 strategy (number of days) for case and foci notification, investigation and response time, respectively. The major challenges are to sustain commitment for malaria elimination, cross-border malaria and imported malaria. Subnational verification is ongoing: in 2017, Shanghai was verified malaria free; nine provinces are targeted for subnational verification in 2018 (Jiangxi in May), 12 provinces in 2019 and two provinces in 2020 (Yunnan and Tibet).

2.5.2 Progress towards achieving national milestones and targets, 2015-2018
The three E-2020 countries provided updates towards accelerated malaria elimination and achieving national milestones and targets based on the Regional Action Framework.

China

China reported zero indigenous malaria cases and 2672 imported cases in 2017, compared to 39 indigenous and 3077 imported cases in 2015. Over 2.4 million people were tested for malaria, all in the public health sector. Currently, there are 10 central-level and eight provincial WHO-certified level 1 microscopists in China. Of the 2851 districts in China, 569 conducted case investigation in 2017. The case reporting in China is in real time. All medical facilities must report their detected malaria cases timely through the web-based reporting system. In 2017, a total of 801 medical facilities reported all malaria cases (imported) within one day after diagnosis. Most of the imported cases were from African countries (86%).

The NMP oversees malaria elimination with 15 staff at the national level. Since 2013, only domestic resources funded the malaria elimination campaign. In 2017, the National Experts Group on Malaria Elimination and the National Experts Group on Severe Malaria Treatment were established. Malaria along the border with Myanmar and imported malaria pose a great challenge to prevent reestablishment of malaria. The priorities for 2018 include: continuing to implement the 1-3-7 surveillance and response approach; strengthening regional and intersectoral collaboration to reduce the risk from imported malaria; and continuing to conduct subnational malaria verification.

Malaysia

Malaysia reported 85 human indigenous and 415 imported cases in 2017, compared to 242 indigenous and 415 imported cases in 2015. However, Malaysia reported 1600 and 3614 P. knowlesi malaria cases in 2016 and 2017, respectively. The malaria elimination programme oversees malaria elimination with seven staff members at the national level, and the NMP is fully funded through the Ministry of Health. Roughly 1 million people were tested for malaria each year from 2015 to 2017, and less than 1% was tested at the community level. There are currently 16 WHO-certified level 1 microscopists in Malaysia. From 2015 to 2017, 15 000 LLINs were distributed. Malaria diagnosis and treatment activities are integrated within the health services, while case and foci investigations and focus response are carried out by special malaria units. All 163 districts conducted case investigation in 2017: 33 active foci and 28 non-active foci were reported in 2017.
The country faces challenges from infections imported by undocumented migrant workers and Malaysians working in other endemic countries in the agriculture or forestry sectors, and infections among hard-to-reach populations (including aboriginal populations). To improve access to malaria preventive and diagnostic services, the NMP has trained selected plantation workers to be malaria focal points. The priorities for 2018 include: continuing to undertake vigilance for imported malaria, conducting subnational verification of malaria elimination at provincial level, and developing guidelines for control of simian malaria and implementation of micro-stratification using receptivity and vulnerability indices which is the core requirement of Malaysia’s prevention of malaria re-introduction programme.

**Republic of Korea**

The Republic of Korea reported 436 indigenous and 79 imported cases in 2017, compared to 628 indigenous and 71 imported cases in 2015. The country has 11 national-level staff members who oversees malaria elimination activities in the country, and the programme is fully funded by the Government on a budget of approximately US$ 500 000 per year. Of the reported cases, 90% were *P. vivax*. Of the 226 districts in the country, 108 conduct case investigation and 20 districts investigate indigenous cases. The current NSP will need renewal in 2019.

Malaria cases along border districts with the Democratic People’s Republic of Korea and among military personnel are major challenges to reach the national elimination target. The priorities for 2018 includes setting up a cross-border collaboration effort on malaria elimination on the demilitarized zone, increasing cooperation between the Ministry of National Defense and the Korea Centers for Disease Control and Prevention (KCDC) as well as enhancing surveillance among military personnel and civilians in high risk areas.

2.5.3 The process for WHO certification of malaria elimination

Ms Cecil Hugo, WHO temporary adviser, Executive Coordinator of ACTMalaria and member of WHO Malaria Elimination Certification Panel, presented the process for WHO certification of elimination. The certification process is based on World Health Assembly resolution WHA13.55 (1960) that requests the Director-General to establish an official register listing areas where malaria elimination has been achieved, after inspection and certification by a WHO evaluation team. Between 1955 and 2018, 35 countries and territories were certified and entered in the WHO official register. She noted that subnational verification is not required for certification but helps when it comes time to verify.

Ms Hugo discussed the criteria for WHO certification of elimination that can be found in the WHO Framework for Malaria Elimination, and the key steps along the path to WHO certification. She noted that after countries meet the minimum criteria of three years with zero indigenous cases, the official request is sent to the WHO Director-General, after which the country prepares a national elimination report. She emphasized that countries should prepare the report and dossier well in advance as it can take 1–2 years.

The MECP reviews national dossiers and supports an evaluation mission to the country to verify findings in the report, after which the Committee makes a recommendation to certify or not. The MECP recommendation is subsequently endorsed by MPAC, which forwards the final recommendation to the WHO Director-General. She discussed a guide that is under development for countries to use for the certification process; it is expected to be released in 2019. She then presented a generic timeline for the minimum time required from submission of the national elimination report and dossier to the awarding of a certificate of elimination (roughly 3–4 months).
2.6 Session 6: Universal health coverage for malaria control and elimination

2.6.1 Integrated health service delivery to strengthen malaria activities for UHC and SDG 3.8

Ms Anjana Bhushan, Coordinator, Integrated Service Delivery, WHO Regional Office for the Western Pacific, highlighted UHC in the context of SDG target 3.8 as well as the attributes and inputs needed to reach UHC. The attributes of a health system include responsiveness, efficiency, fairness, quality and resilience; system inputs include service delivery, financing, and governance and the information flow between these to inform the health system. Dr Bhushan presented the common UHC attribute challenges for malaria, including infrastructure and regulation standards and resource allocation, access, leadership coordination and public health capacity. Even where gains have been made at the population level, inequities pose challenges. She noted that the SDGs call for equity-focused policies and actions within and beyond health.

Ms Bhushan discussed Universal Health Care: Moving Towards Better Health, Action Framework for the Western Pacific Region (2015), which aims for all people having access to quality health services without suffering the financial hardship associated with paying for care. She then discussed the whole-of-system approach to achieve UHC through service delivery, health financing and governance to reach equity and services for all. To support malaria control, the health system must be aligned, carefully balancing access, costs and quality of services. Notable barriers to reduce to increase access to care include geophysical or physical barriers, economic barriers (direct, indirect or opportunity costs), sociocultural (knowledge, ethnicity and gender) and health system-related barriers (provider bias, privacy and quality).

During discussions, Dr Abeyasinghe emphasized the need to reorient the NMP when the programme eliminates malaria in order to justify the investment. This can be done with integrated surveillance systems (i.e. what is being done in the Lao People’s Democratic Republic). The data should be used to maximize impact and progress the SDG agenda. He noted that dedicated funding must be secured when transmission goes very low, by strengthening key components, integrating services and freeing up monies from other services that can be used for impact.

2.6.2 Importance of domestic financing to achieve and sustain malaria control and elimination

Ms Maria Teresa Pena, consultant, Health Policy and Financing Unit, WHO Regional Office for the Western Pacific, emphasized the importance of transitioning to sustainable domestic financing for malaria control and elimination, particularly as cases decline. The broader regional context of malaria financing includes changing health needs of the population such as emerging pandemics and ageing populations. Economic growth and increasing expectations for quality health services exist together with low government health spending and high out-of-pocket payments. As malaria cases decline, programmes will see reduced external donor funding for malaria activities and commodities. There is a need for flexible financing and more integrated service delivery to sustain financing during malaria elimination.

Ms Pena discussed the details around investments in malaria control and elimination for each programme in the region, which can be sourced from the World Malaria Report 2017. She noted the key challenges and issues around malaria financing, including: human resources and their management and absorption of programme staff in the general health system; a shift towards domestic financing possibly leading to funding gaps for malaria elimination, alternative sources of financing, coordination of various health financing schemes, and allocation of funding according to intervention priority; and the public financial management system including the budgeting process, channelling of external financing and procurement and supply management system.
2.7 Session 7: Global Vector Control Response and integrated vector management

2.7.1 WHO GVCR-related to global malaria control and elimination

Dr Jan Kolaczinski presented the GVCR, beginning with a background on the problem and discussing the strategy. He noted that 80% of the global population is at risk of one or more vector-borne disease, and that 17% of the global burden of communicable diseases is due to vector-borne diseases with over 700,000 deaths caused by vector-borne diseases annually. Many vector-borne diseases overlap geographically, for which integration of vector control programmes may be beneficial. When implemented well, vector control can reduce multiple diseases and have greater impact. The GVCR, adopted as resolution WHA70.16, outlines a broad approach to contribute directly to the SDG agenda.

The GVCR strategy calls for a comprehensive vector control approach enabling increased capacity, better coordination, improved surveillance and integrated action with effective tools. The goal of the strategy is to reduce the burden and threat of vector-borne diseases through effective, locally adapted and sustainable vector control. To achieve the goal, the GVCR strategy is supported by four pillars: strengthen inter- and intra-sectoral action and collaboration; engage and mobilize communities; enhance vector surveillance, and monitoring and evaluation of interventions; and scale up and integrate tools and approaches.

The *Western Pacific Regional Action Plan for Dengue Prevention and Control (2016)* addresses all *Aedes*-borne diseases and advocates an integrated response. As such, there is no plan to develop a separate GVCR regional plan. Countries should conduct or update their national vector control needs assessments and leverage them to develop or update vector control strategies, plan necessary activities, and mobilize resources from diverse sources. Dr Kolaczinski noted that country leadership is critical. Policies and activities should not be limited to the health sector and should always be evidence-based; action within and between countries should be harmonized and strengthened. Emphasis should be on integrated, community-based approaches and involvement of municipalities and local governments. Adoption of novel interventions is encouraged. The overall aim of providing support is to ensure all countries can achieve success, irrespective of their current disease burden, capacities and resources.

A number of issues were addressed during discussions. The representative from Malaysia asked about when to stop routine vector control during malaria elimination. Dr Noor responded that, according to WHO recommendations, it depends on how good the surveillance system is. For example, if the system is able to detect cases quickly and respond to potential outbreaks, then the NMP can consider stopping routine vector control. If the system is not strong, routine vector control should continue. In low transmission areas, assessments should be conducted to verify whether the surveillance system is able to capture cases, only following which withdrawal can be considered (especially given pressure from donors and governments to use monies for other activities). Dr Abeyasinghe added that this is why WHO advocates strengthened surveillance systems to monitor introduced cases and fluctuating vector densities. He also emphasized that countries need to retain capacity to respond to imported cases through vector control to prevent reestablishment of transmission in areas achieving elimination.

2.7.2 Progress in achieving universal access to malaria vector control interventions in the Western Pacific Region

Dr Abeyasinghe discussed at-risk populations in countries in the Western Pacific Region, policies on providing access to vector control interventions, mechanisms of distribution of vector control interventions and gaps in achieving universal access. Data values for at-risk populations as reported from the World Malaria Report are currently insufficient, particularly for hard-to-reach and mobile populations. The WMR data are disaggregated by low and high risk, as defined by less than or greater than 1 per 1000 population. Dr Abeyasinghe pointed out that vector control coverage data illustrate gaps for populations at risk – that is, gaps in the number of LLINs sold or delivered to countries compared to the number of people protected. He emphasized the importance of accurately measuring populations at risk and how interventions are targeting these groups.
Dr Abeyasinghe presented the indicators used in the WMR to measure universal coverage with vector control interventions. LLIN coverage and use data include: the proportion of households with at least one insecticide-treated bed net (ITN); the proportion of population with access to an ITN within their household; the proportion of population that slept under an ITN the previous night; the proportion of children under 5 years who slept under an ITN the previous night; and the proportion of pregnant women who slept under an ITN the previous night. The key indicator for IRS coverage is the number of houses sprayed that were targeted. Key challenges to providing universal access to vector control is that there is a poor understanding of disease distribution in time and space, resulting in inaccurate quantification and malaria distributions. There is limited physical access due to terrain and topography or weak health systems, and there are diverse malaria vectors with different bionomics and beliefs and practices among health workers and the community.

2.7.3 Experiences from Malaysia – vector mapping and intersectoral collaboration

Dr Hafizi Abdul Hamid presented an update of research relating to malaria vectors and vector control. The research study addressed: the mapping of malaria vectors in peninsular Malaysia, mapping of *Anopheles cracens* mosquito breeding sites in knowlesi malaria-endemic areas in peninsular Malaysia; the distribution of vectors of knowlesi malaria in Sabah – both larval and adult surveillances; and outdoor residual spraying for the control of simian malaria in Tenom, Sabah. *Anopheles maculatus* was found to prefer laying eggs in habitats near human houses, and riverine breeding sites are the major source of vectors. Instead of breeding in slow-flowing streams, the larvae breed in small water pockets along river margins. There was a clear observation between distance to breeding sites and *An. maculatus* density. One of the prime considerations for malaria risk mapping is the association between malaria incidence and distance from houses to breeding sites. Regarding the effectiveness of PolyZone (deltamethrin) for outdoor residual spraying, the research group found that Polyzone was effective against anopheline; higher doses of Polyzone produced a longer duration of residual effect.

Regarding *P. knowlesi* research, most of the knowlesi malaria cases reported in peninsular Malaysia were reported from rural villages either near or on the border to tropical forest fringes, rubber or oil palm plantations. Commercial plantations tended to offer suitable environmental conditions for *Anopheles* mosquito breeding and simple conditions such as wheel tracks with enough rainwater created perfect breeding sites for *An. cracens*. Clearly, people living and working in such plantations are most likely to be at risk for knowlesi malaria.

Dr Hamid presented on vector mapping and intersectoral collaboration in Malaysia. A web-based real-time entomological surveillance system has entomological data and vector mapping for all vector-borne disease vectors in Malaysia. The data in the system can be accessed and analysed at all levels. The responsibility of preventing dengue and malaria infection is not only that of the Ministry of Health, but it is a shared responsibility between the individual, community and agencies from the public and private sectors.

2.7.4 Opportunities for strengthening integrated vector management using malaria vector control as an entry point

Dr Rabindra Abeyasinghe presented on arboviral infections, the challenges to effective control, limitations of currently available vector control tools for the control of arboviral infections, the need for proactive sustainable control and a shift from reactive control and the main vector control interventions for *Aedes* control and importance of integrated vector management (IVM). He noted the World Health Assembly resolution for the GVCR which “recognizes the need for an integrated comprehensive approach to vector control that will enable the setting and achievement of disease-specific national and global goals and contribute to the attainment of the SDGs, to addressing the social determinants of health, and to tackling health inequities…deeply concerned by the current limited capacity and capability for vector control globally, and in particular the acute shortage in public health and development programmes of personnel with skills in public health entomology”. The resolution urges Member States, among others, to do the following:
1. to develop or adapt, as appropriate, existing national vector control strategies and operational plans to align them to the strategic approach on vector control, as summarized in the report, and consistent with the International Health Regulations;

2. to build and sustain, as appropriate, adequate human resource (especially public health entomology), infrastructural and institutional capacity and capability at all levels of government and across all relevant sectors, based on a vector control needs assessment;

3. to promote basic research on vectors and their transmission of pathogens, and applied research on vector control tools including biological tools and technologies; and

4. to strengthen national and subnational capacity, as appropriate, for vector surveillance, forecasting and intervention monitoring, including for vector pesticide resistance, and the impact of pesticides on environmental and human health, and to integrate them with public health surveillance systems.

For malaria, the Global Technical Strategy includes a goal for the prevention of re-establishment of malaria, for which surveillance systems need to be strengthened to address vulnerability and to strengthen integrated vector management to manage receptivity. In addition, NMPs should protect gains made in subnational elimination of malaria to achieve certification of elimination, but also post certification.

Integrated vector management is a decision-making process for the management of vector populations so as to reduce or interrupt transmission of vector-borne diseases. The components of integrated vector management include: the selection of methods based on knowledge of local vector biology, disease transmission and morbidity; utilization of a range of interventions, often in combination and synergistically; collaboration within the health sector and with other public and private sectors that impact on vector breeding; engagement with local communities and other stakeholders; and rational use of insecticides and good management practices.

2.8 Closing remarks
Dr Rabindra Abeyasinghe, Acting Director, Division of Communicable Diseases, WHO Regional Office for the Western Pacific, gave the closing remarks. He thanked everyone for coming to Manila to review and discuss progress made and challenges confronting their malaria programmes and how to improve malaria control and accelerate to malaria elimination.

3. CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions
Considerable progress has been made towards achieving targets and milestones for each pillar established in the Regional Action Framework for Malaria Control and Elimination in the Western Pacific (2016–2020) compared to 2015 baselines, and most countries have progressed towards achieving targets set in their NSPs.

From 2015 to 2017, malaria cases in the Western Pacific Region increased by 26% and deaths decreased by 35%: Papua New Guinea, Solomon Islands and Cambodia accounted for over 90% of total cases in 2017. In some areas of high transmission, the case load dropped significantly from 2015 to 2017: Lao People’s Democratic Republic (74%), the Philippines (52%) and Viet Nam (51%).

The three regional E-2020 countries – China, Malaysia and the Republic of Korea – have progressed towards midterm milestones and have established case-based surveillance systems. They continue to be challenged by border malaria, vivax malaria (Republic of Korea) and increasing transmission of P. knowlesi (Malaysia).
China achieved an important milestone in 2017, reporting zero indigenous malaria cases; while the Republic of Korea reported 30% reduction in cases from 2015 to 2017 and maintained zero indigenous deaths.

The seven burden reduction countries in the Region achieved a number of midterm milestones, including development of validated NSPs with established targets for elimination and costed implementation plans; Cambodia, the Lao People’s Democratic Republic and Viet Nam piloted case-based surveillance.

Challenges in the GMS include a lack of clarity around populations at risk, especially in areas of high transmission, and achieving universal access to malaria services and commodities, including LLIN or IRS and quality ACTs. Delays in establishing case-based surveillance in elimination settings have delayed progress towards regional targets.

Papua New Guinea, Solomon Islands and Vanuatu have strengthened case reporting using DHIS2 and have integrated their health reporting systems. Still, universal access to vector control and diagnosis and treatment services is inadequate due to supply management challenges, the devolution of government services to provinces (Solomon Islands) and a weak health system (Papua New Guinea).

GVCR concepts and implementation guidance were presented. Efforts have been made by national programmes to provide vector control interventions, LLINs or IRS to populations at risk, but universal coverage (access to and use by all people at risk) for vector control has not been achieved in most countries in the Region.

3.2 Recommendations

3.2.1 Recommendations for Member States

Member States are encouraged to consider the following:

1. Accelerate efforts to achieve universal access to malaria vector control and diagnosis and treatment for all at-risk populations. Clearly define and identify at-risk populations and mobilize resources to support services, especially in areas of high transmission.
2. Accelerate adoption of case-based surveillance in areas of elimination in burden reduction countries, especially in the GMS, and adopt foci investigation, classification and response, entomological surveillance and iDES.
3. In the three E-2020 countries, strengthen surveillance to prevent re-establishment where transmission has been interrupted. Prepare for elimination certification, assessing needs as per the MECP and MEOC.
4. In Papua New Guinea, Solomon Islands and Vanuatu, ensure universal access to vector control interventions and diagnosis and treatment services. In Solomon Islands, develop an elimination plan and begin case-based surveillance in areas of low burden.
5. Identify and improve bottlenecks found in supply systems to ensure availability of quality and efficacious antimalarial medicines and services. Update NTGs based on latest therapeutic efficacy surveillance results and utilize the Global Fund rapid supply mechanism to quickly purchase smaller quantities of new ACTs.
6. Develop and implement comprehensive vector control and surveillance plans including insecticide resistance monitoring, based on GVCR concepts and implementation guidance.
3.2.2 Recommendations for WHO

WHO is requested to do the following:

1. Support national malaria control programmes to update their NSPs and NTGs as needed, including preparatory work such as support MPRs and to support full operationalization of said plans. Encourage investments to strengthen national programmes to accelerate towards malaria elimination.

2. Support country expansion of case-based surveillance and adoption of foci investigation, classification, entomological surveillance and iDES in areas of low malaria transmission.

3. Promote coordinated, prioritized support to strengthen programmes in conjunction with other technical partners, in particular through improved case-based surveillance in areas of elimination in burden reduction countries.

4. Encourage the E-2020 countries to continue efforts to accelerate towards elimination, supporting surveillance strengthening to prevent malaria re-introduction and facilitate engagement of each country with WHO MEOC to better prepare for certification of elimination.

5. Support the identification of procurement bottlenecks for WHO prequalified or registered products while encouraging pre-shipment and post-marketing quality testing to improve universal access.

6. Support strengthening of integrated vector control response, providing technical assistance towards the development of national vector control needs assessments, national vector control plans and coordinated training on the GVCR concepts and processes.
# TIMETABLE

## Day 1: Monday, 25 June 2018

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<td>08:30 – 09:00</td>
<td>Registration</td>
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<tr>
<td>09:00 – 09:30</td>
<td><strong>Opening Session</strong></td>
<td>Dr Shin Young-soo, Regional Director, WPRO</td>
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<tr>
<td></td>
<td>Welcome address</td>
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<td></td>
<td>Meeting objectives</td>
<td>Dr Rabindra Abeyasinghe, Coordinator/MVP, WPRO</td>
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<tr>
<td></td>
<td>Self-introduction of participants and observers</td>
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<td>Nomination of the Chair and Rapporteur</td>
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<td>Administrative announcements</td>
<td>Dr James Kelley, TO Malaria, WPRO</td>
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<tr>
<td>09:30 – 10:00</td>
<td>Group photograph followed by coffee/tea break</td>
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<tr>
<td>10:00 – 10:20</td>
<td>Global and regional technical updates</td>
<td>Dr Abdisalan Noor, Team Leader, SUR, HQ/GMP</td>
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<tr>
<td>10:20 – 10:40</td>
<td>Technical updates relating to malaria vector control from Global Malaria Programme, including insecticide resistance and its management, including Malaria Threat Map</td>
<td>Dr Jan Kolaczinski, Coordinator Entomology and Vector Control, GMP</td>
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<tr>
<td>10:40 – 11:00</td>
<td>Malaria surveillance, monitoring and evaluation, a reference manual</td>
<td>Dr Abdisalan Noor</td>
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<td>11:00 – 11:30</td>
<td>Discussion</td>
<td>Moderator: Chair</td>
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<td>11:30 – 11:55</td>
<td>Midterm regional targets and milestones of the Regional action framework for malaria control and elimination 2016-2020: a progress update</td>
<td>Dr Rabindra Abeyasinghe</td>
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<tr>
<td>11:55 – 12:20</td>
<td>Regional Surveillance Database and update on World Malaria Report 2018</td>
<td>Dr James Kelley</td>
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<tr>
<td>12:20 – 13:20</td>
<td>Lunch break</td>
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<tr>
<td>13:20 – 13:50</td>
<td>Progress towards accelerated malaria control and achieving national milestones and targets, 2015-2018</td>
<td>Lao People's Democratic Republic</td>
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<td>13:50 – 14:20</td>
<td>Progress towards accelerated malaria control and achieving national milestones and targets, 2015-2018</td>
<td>Papua New Guinea</td>
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<td>Mobility Break</td>
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<tr>
<td>14:25 – 14:55</td>
<td>Progress towards accelerated malaria control and achieving national milestones and targets, 2015-2018</td>
<td>Solomon Islands</td>
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<td>14:55 – 15:30</td>
<td>Coffee/tea break</td>
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<tr>
<td>15:30 – 16:00</td>
<td>Countries transitioning towards elimination: updates and discussion</td>
<td>Cambodia</td>
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<tr>
<td>16:00 – 16:30</td>
<td>Progress towards control and elimination; achieving national milestones and targets, 2015-2018</td>
<td>Philippines</td>
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<td>Progress towards control and elimination; achieving national milestones and targets, 2015-2018</td>
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<td>17:00 – 17:30</td>
<td>Progress towards control and elimination; achieving national milestones and targets, 2015-2018</td>
<td>Viet Nam</td>
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<td>17:30 – 19:30</td>
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#### Session 4: Technical updates on diagnosis and case management

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<tr>
<td>09:00 – 09:10</td>
<td>Summary of Day 1</td>
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<tr>
<td>Ms Glenda Gonzales, TO Malaria WPRO</td>
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<tr>
<td>09:10 – 09:40</td>
<td>Strengthening quality assurance for malaria diagnostics in the region</td>
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</table>
| Ms Glenda Gonzales  
Mr Kenneth Lilley, Quality Manager and Scientist, Australia Army Malaria Institute |
| Discussion |
| 09:40 – 10:10 | Improving access to and quality of antimalarials in WP                   |
| Dr Rabindra Abeyasinghe |
| Discussion |
| 10:10 – 11:40 | Coffee/tea break                                                         |
| 10:40 – 11:20 | Pharmaceutical system strengthening efforts and implications for antimalarial drug quality |
| Ms Uljin Kim, Technical Officer/EMT |
| Discussion |
| 11:20 – 12:00 | Antimalarial drug resistance and therapeutic efficacy studies: regional progress updates on TES and iDES |
| Dr Dorina Bustos, Technical Officer TES/GMS (THA) |
| Discussion |
| 12:00 – 13:00 | Lunch break                                                              |

#### Session 5: Countries targeting elimination by 2020: updates and discussion

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<td>Eliminating malaria – completing the last mile, lessons to be learnt from China</td>
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<td>Professor Gao Qi, Professor and Director, National Key Laboratory on Parasitic Diseases</td>
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<tr>
<td>13:50 – 14:20</td>
<td>Acceleration to elimination: progress updates towards national and regional targets</td>
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<td>Malaysia</td>
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<td>Discussion (15 min)</td>
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<td>14:20 – 14:25</td>
<td>Mobility Break</td>
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<tr>
<td>14:25 – 14:55</td>
<td>Acceleration to elimination: progress updates towards national and regional targets</td>
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<td>China</td>
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<td>Discussion</td>
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<td>14:55 – 15:25</td>
<td>Acceleration to elimination: progress updates towards national and regional targets</td>
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<td>Republic of Korea</td>
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<td>Discussion</td>
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<td>15:25 – 16:00</td>
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<tr>
<td>16:00 – 16:30</td>
<td>The process for WHO certification of elimination</td>
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<tr>
<td>Ms Cecilia Hugo, Executive Coordinator, ACTMalaria and member, WHO MECP</td>
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<td>Discussion</td>
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#### Session 6: Universal Health Coverage to accelerate control and elimination of malaria

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<tr>
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<td>Importance of integrated health service delivery to strengthen malaria control, achieve elimination and prevent re-introduction on the path to Universal Health Coverage and SDG 3.8</td>
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<tr>
<td>Ms Anjana Bhushan, Coordinator/ISD, WPRO</td>
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<td>Discussion</td>
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<td>17:00 – 17:30</td>
<td>Importance of domestic financing to achieve and sustain effective malaria control and elimination</td>
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<tr>
<td>Ms Maria Teresa Pena, Consultant/HPF, WPRO</td>
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<td>Discussion</td>
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### Day 3: Wednesday, 27 June 2018

#### Session 7: Global Vector Control Response 2017-2030.

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<tr>
<td>Rashid Abdul</td>
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<tr>
<td>09:10 – 09:40</td>
<td>Global Vector Control Response 2017-2030 and its importance to global malaria control and elimination efforts</td>
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<tr>
<td>Dr Jan Kolaczinski, Coordinator, EVC, GMP</td>
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<td>Discussion</td>
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<tr>
<td>09:40 – 10:10</td>
<td>Progress in achieving universal access to malaria vector control interventions in the Western Pacific</td>
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<tr>
<td>Dr Rabindra Abeyasinghe</td>
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<td>Discussion</td>
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<tr>
<td>10:10 – 10:40</td>
<td>An update of research relating malaria vectors and vector control from the WHOCC for Ecology, Taxonomy and control of vectors of malaria, filariasis and dengue</td>
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<tr>
<td>Dr Rohani binti Ahmad, Head of Entomology Unit, Institute for Medical Research, Malaysia</td>
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<tr>
<td>Discussion</td>
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<td>10:40 – 11:10</td>
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<td>Session 8: Integrated Vector Management</td>
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<tr>
<td>11:10 – 11:40 Experiences from Malaysia – vector mapping and inter-sectoral collaboration</td>
<td>Dr Hafizi Abdul Hamid, Malaysia</td>
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<tr>
<td>11:40 – 12:10 Opportunities for strengthening integrated vector management using malaria vector control as an entry point and for preventing reestablishment of transmission</td>
<td>Dr Rabindra Abeyasinghe</td>
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<tr>
<td>12:10 – 13:10 Lunch break</td>
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<tr>
<td>13:10 – 14:00 Implementation of vector control in selected WPR Member States - strengths, weaknesses and opportunities. Experiences shared by three countries</td>
<td>Moderated by Prof Gao Qi</td>
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<td>14:00 – 14:45 Panel Discussion: Malaria surveillance and response including vector control for elimination</td>
<td>Moderated by Dr Noor Abdisalan Panelists: Prof Gao Qi, Ms Cecila Hugo, Dr Rohani Ahmed</td>
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<td>14:45 – 15:15 Coffee/tea break</td>
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<th>Session 9: Conclusions and closing</th>
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<td>15:15 – 15:30 Conclusions and recommendations</td>
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<td>15:30 – 16:00 Closing</td>
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